



REPORT 2020

FOOD WASTE AND RESCUE IN ISRAEL

The Economic, Social and Environmental Impact

In cooperation with The Ministry of Environmental Protection

Including an expanded chapter on the Impact of the Covid-19 Pandemic on Food Insecurity in Israel

Writing and Editing:



Introduction

The National Food Waste and Rescue Report is being published by Leket Israel and BDO for the sixth year, in partnership - for the second year - with the Ministry of Environmental Protection.

According to estimates presented in the report, the total amount of food waste in Israel in 2020 stands at about 2.5 million tons and is valued at about NIS 19.1 billion. The total amount of waste constitutes about 35% of the food produced in Israel. Of this, about 1.1 million tons of food, valued at around NIS 6.4 billion, is rescuable, that is, fit for consumption.

The climate crisis and the Israeli government's commitment to reducing greenhouse gas emissions highlight the need to reduce food waste and use food rescue as a policy tool for reducing greenhouse gas emissions as well. The prevention of food waste and promotion of food rescue are important economic and environmental tools for implementing the decision the government made in July 2021, to reduce the amount of landfilled waste by 71% by 2030. According to the report's findings, 1.8 million tons of food and packaging waste were thrown away in the past year, and the environmental damage caused by food waste is estimated at NIS 3.4 billion.

The current report examines the impact of the Covid-19 crisis on food waste in Israel. The Covid-19 crisis did not result in a significant change in the total amount of food wasted in the economy. Rather, it shifted the distribution of waste among the various sectors. The change in consumption patterns led to an increase of NIS 800 million in food waste in the household sector and an increase in the amount of food waste in agriculture (mainly during the first lockdown). On the other hand, there was a NIS 2.2 billion decrease in food waste in the institutional consumption sector (hotels, workplaces, etc.), constituting about a 50% reduction in food waste in this sector compared to 2019.

The economic and social crisis that followed the Covid-19 pandemic exacerbated the problem of food insecurity in Israel. On the one hand, earning capacity was diminished and workers were let go from employment. On the other hand, traditional systems for ensuring food security were impacted by the Covid-19 restrictions. In light of this, the crisis emphasizes the importance of using food rescue as a central policy tool for addressing the problem.

The report, based on BDO's economic model for the food industry, includes comprehensive and detailed research regarding the scope of the various types of food waste in Israel. It reveals the potential for food rescue in each of the stages of the food production value chain as well as the environmental cost of food waste at each stage.

The report's findings indicate that food rescue is highly viable from an economic, social, and environmental perspective. Every shekel invested in food rescue makes it possible to rescue food with a direct value of NIS 3.6. When taking into account the environmental impact of food waste, every shekel invested in food rescue creates NIS 4.2 in value for the national economy.

The problem of food waste is not unique to Israel. The scope of waste in Israel is similar to that in other developed countries. Many other countries have enacted legislation, national policies, and multi-year targets to encourage food rescue and reduce food waste. In Israel, the Food Donation Act was passed in October 2018 and constitutes an important initial component towards the formulation of a comprehensive national food rescue plan.

It is our hope that this report will serve as a basis for public discussion regarding the problem of food waste and assist in the formulation of national policy steps that will lead to a real change in food waste and rescue patterns in Israel, both in routine times and in times of emergency.

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Uniqueness of Israeli Food Production and Consumption

500 thousand
Israeli households suffer
from food insecurity

Uniqueness of Israeli Food Production and Consumption

The household expenditure on food consumption in Israel stands at about 17% of the average household's consumption basket and about 20% of the consumption basket of households in the lower two deciles of the population. Food is much more than an essential component of a household's consumption basket. Food consumption is a basic existential need, and balanced nutrition is essential for ensuring the health of the general population and in particular the development of infants and children. Therefore, a shortage of food or insufficient consumption of essential nutrients can cause potential health issues, at a cost that exceeds the food's market value, which represents its production cost through all stages of the value chain.

Israel is characterized by a food expenditure rate that is among the highest in the developed world; at the same time, it has the highest poverty rate among OECD countries¹. As a result, food insecurity in Israel is a particularly severe problem. BDO's analysis of the 2021 report issued by the National Insurance Institute found that 18.7% of Israeli households suffer from food insecurity, which is equivalent to approximately five hundred thousand households who suffer from food insecurity in Israel². From an economic perspective,

this indicates that a food insecure household spends approximately 30% less on food than those who enjoy normative levels of consumption.

The problem of food insecurity, which routinely exists in Israel, has become worse due to the Covid-19 crisis and its economic effects as a result of the following factors:



Household incomes were harmed as people lost their jobs, were forced to go on unpaid leave, and many self-employed professionals were forced to shut down their business activity.



Supplementary frameworks in the educational system providing meals for school and kindergarten age children were forced to shut down, requiring households to increase their expenditure on food for their children.



Due to the ban on gatherings, soup kitchens were closed, making food less accessible to those suffering from food insecurity.



These trends were partially offset by the increased financial support and Covid-19 grants from the government.

1. OECD, Poverty rate, 2019.

2. National Insurance Institute, "Measures of poverty and social gaps: 2018," Annual report.

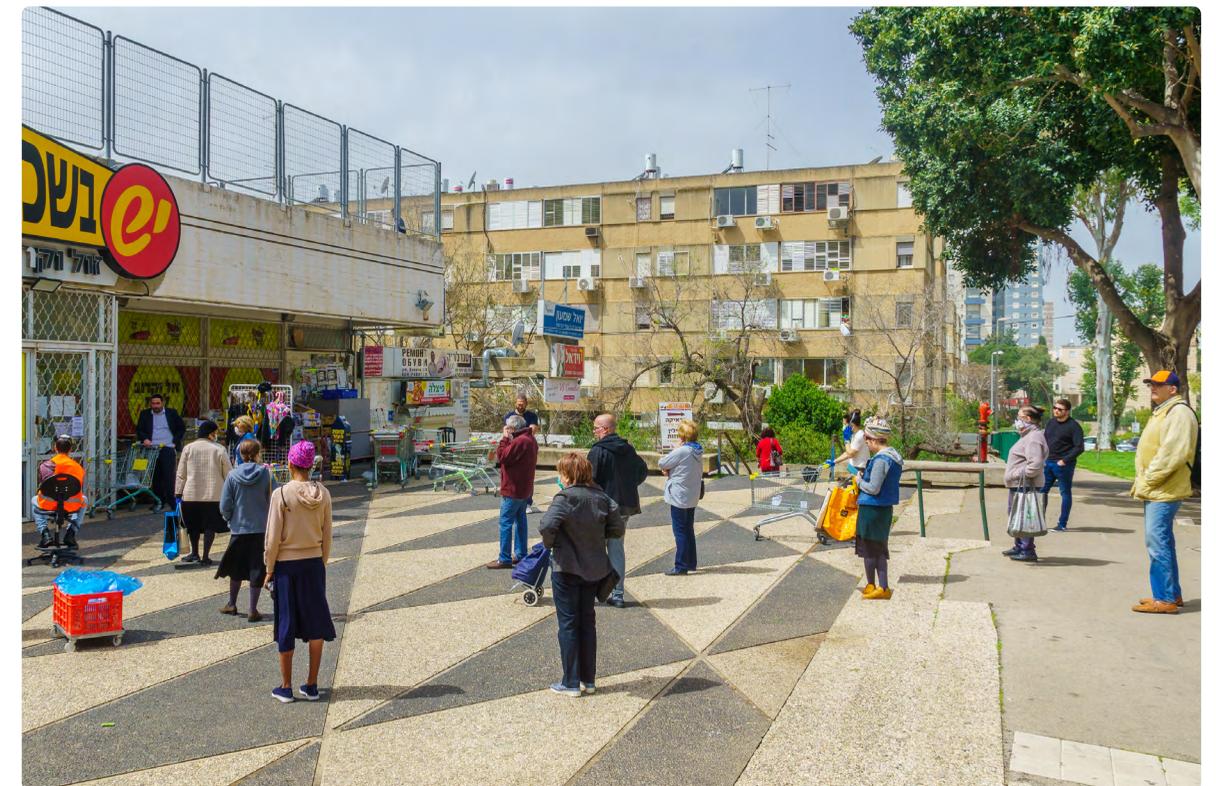
Food is a unique commodity, not only in terms of its consumption characteristics, but also in terms of its production properties. Growing and producing food requires the use of natural resources that are relatively scarce or that have substantial economic costs: energy, water, and land. Many of these are non-renewable resources³ and their use also runs the risk of impacting water, land and air quality and harming biodiversity, along with greenhouse gas emissions that lead to climate change. Moreover, collecting and disposing of food surpluses in landfills carries additional environmental costs.

In a small, arid country like Israel, water and land are valuable, limited resources. The need to use land and water resources to grow surplus agricultural produce that is later lost or wasted, incurs further environmental and social costs, beyond the direct economic cost.

The nutritional components found in food are derived almost entirely from agricultural products, including vegetables, fruit, legumes, dairy products, eggs, meat, fish, oils etc. At the same time, agricultural production has an inherently high level of uncertainty resulting from external factors such as pests, weather, diseases, and more.

This report examines the issue of food waste and the economic, social and environmental viability of its rescue, based on quantifiable estimates and assessments. It includes updated data and methodological improvements based on experience accumulated during the preparation of the five previous reports. This year's report also includes an expanded section on the impact of the Covid-19 crisis on food waste and rescue.

3. Value Chain Management Centre, Cut Waste, Grow Profit: How to reduce and manage food waste, leading to increased profitability and environmental sustainability, Background paper, 2012.



People follow the social distancing rules while wait outside a supermarket, Israel. Photo: RnDmS



Food Waste: How Much Food is Wasted in Israel?

NIS 2.5 Million tons
Loss of food in
Israel in 2020

Food Waste: How Much Food is Wasted in Israel?

The findings of the 2020 National Food Waste and Rescue Report indicate food waste at a scope similar to that of the previous report (the 2019 National Food Waste and Rescue Report), that is, about 2.5 million tons of wasted food.

The unchanged scope of food waste is not the result of streamlining or structural change in the food supply chain, but of the counteractive effects the Covid-19 crises has had on the Israeli economy. These effects stem from a combination of the increase in waste in the agricultural and household consumption sectors and the decrease in waste in the institutional consumption and retail sectors.

The increase in waste in the agricultural sector due to the pandemic stemmed from a lack of manpower during the first lockdown, restricted export channels, and a shutdown of business activity in the institutional sector (hotels, restaurants, etc.). In addition, the restrictions on travel and gatherings and the economic damage to household incomes led to changes in consumption patterns. The Covid-19 crisis caused consumers to purchase food through channels with lower food waste rates. There was an increase in online shopping, which is characterized by low waste rates, and a decrease in open market shopping, which is characterized by high waste rates. In addition, there was a shift

from food consumption in the institutional sector, which is characterized by relatively high waste rates, to household food consumption, which has lower waste rates. These changes have led to a decrease in food waste in the consumption and retail sectors [more on this in the following chapters].

Food waste estimates in Israel are based on a unique value chain model for domestic food production⁴. Estimated at approximately 2.5 billion tons, food waste in Israel constitutes about 35% of overall domestic food production. In the agricultural sector, the amount of food produced in 2020 was almost identical to that produced in 2019, which was about 7 million tons.

Total food waste in Israel through all stages of the value chain is the equivalent of about NIS 615 per month per household:

In monetary terms, about 21% of the value of the wasted food, which is equivalent to approximately NIS 4 billion, occurs during various stages of production. This loss of NIS 4 billion in value represents approximately 13% of the total value of agricultural production in Israel. Approximately 79% of the waste, equivalent to approximately NIS 15 billion, occurs during the retail stages of distribution and consumption.

4. The value chain model does not include beverages, energy boosters, sugar, honey and candy

Economically, the value of agricultural commodities per ton increases as they progress along the production value chain, and food entails the investment of additional costs for sorting, processing, transport, distribution, and retailing. The authors of this report assessed the waste value in the early stages of production (growing, packaging, and manufacturing) based on wholesale prices that were paid to farmers. Waste during the later stages in the value chain was estimated based on retail food prices.

A comprehensive value chain model for various food production and consumption stages was designed to assess food waste and the potential for food rescue in Israel. This model is based on a bottom-up approach and the analysis of data relevant to the agricultural production, storage, import, export, industrial aspects, distribution, and consumption of a sample of around 50 different types of food⁵. The data includes processed produce that was translated to terms of fresh produce.

5. We are aware such estimates may include deviations or inaccuracies that are inevitable because there is no official data. Additionally, the volume of annual food waste also depends on random variables, such as extreme weather conditions, natural events and pests, deviations in demand, etc. The data presented here is based on an annual analysis and average weather conditions. This data is indicative and intended to serve as the basis for public debate, and for further research and study.

6. Dr. Ron Porat, 2015 and 2016.

For each type of food, the volume of input and output was measured in terms of gross agricultural product and waste rate for every stage of the value chain of the food production, distribution, and consumption processes in Israel. The assessment presented here is based in part on agricultural waste surveys conducted and updated by the Volcani Center⁶. The total estimated food waste for the economy as a whole and for each food type is based on the waste estimated for each stage and each product in the value chain.

Food waste is generally divided into two main stages of the value chain

1 From agricultural production to the final stage of industrial food processing (food waste in the production process)

2 From retailing and distribution to the end consumer (food waste in consumption)

Estimated Food Waste in Israel* in 2020

Waste/ household NIS/month	Agriculture	Processing & Packaging	Industry	Retail & Distribution	Institutional Consumption	Household Consumption	Total
 Fruit & Vegetables	65	23	1	67	25	138	319
 Grains & Legumes	3	1	2	18	17	94	135
 Meat, Fish & Eggs	10	2	12	43	9	47	123
 Milk & Dairy	4	1	1	5	4	23	38
Total	81	26	17	133	56	302	615

* A waste of 615 NIS per household per month reflects the waste throughout the entire value chain, including direct household expenditure. Source: BDO estimates

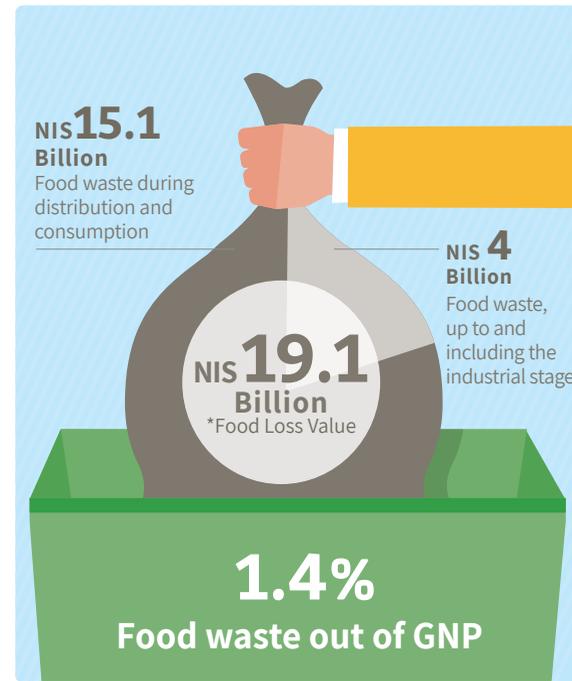
Percentage of Food Waste at All Stages of the Value Chain

	Fruit & Vegetables	Grain & Legumes	Meat, Fish & Eggs	Milk & Dairy	Total	
Agriculture	 <p>13% 517,000 tons of waste</p> <p>Out of 4,020 thousand tons</p>	 <p>6% 27,000 tons of waste</p> <p>Out of 440 thousand tons</p>	 <p>5% 35,000 tons of waste</p> <p>Out of 760 thousand tons</p>	 <p>4% 62,000 tons of waste</p> <p>Out of 1,676 thousand tons</p>	<p>9% 641,000 tons of waste</p> <p>Out of 6,896 thousand tons</p>	<p>20% Lost NIS 3.7 Billion</p>
Processing & Packaging	<p>5% 186,000 tons of waste</p> <p>Out of 3,503 thousand tons</p>	<p>3% 14,000 tons of waste</p> <p>Out of 413 thousand tons</p>	<p>1% 5,000 tons of waste</p> <p>Out of 725 thousand tons</p>	<p>1% 8,000 tons of waste</p> <p>Out of 1,614 thousand tons</p>	<p>3% 213,000 tons of waste</p> <p>Out of 6,254 thousand tons</p>	
Industry	<p>3% 16,000 tons of waste</p> <p>Out of 567 thousand tons</p>	<p>5% 19,000 tons of waste</p> <p>Out of 370 thousand tons</p>	<p>5% 31,000 tons of waste</p> <p>Out of 588 thousand tons</p>	<p>1% 20,000 tons of waste</p> <p>Out of 1,630 thousand tons</p>	<p>3% 85,000 tons of waste</p> <p>Out of 3,155 thousand tons</p>	
Net Import minus other uses	+267 thousand tons	+1,102 thousand tons	+126 thousand tons	+160 thousand tons	+1,655 thousand tons	<p>80% Lost NIS 16.6 Billion</p>
Retail & Distribution	<p>9% 313,000 tons of waste</p> <p>Out of 3,568 thousand tons</p>	<p>3% 43,000 tons of waste</p> <p>Out of 1,482 thousand tons</p>	<p>4% 36,000 tons of waste</p> <p>Out of 815 thousand tons</p>	<p>1% 27,000 tons of waste</p> <p>Out of 1,746 thousand tons</p>	<p>5% 420,000 tons of waste</p> <p>Out of 7,610 thousand tons</p>	
Consumption	<p>23% 746,000 tons of waste</p> <p>Out of 3,255 thousand tons</p>	<p>14% 199,000 tons of waste</p> <p>Out of 1,439 thousand tons</p>	<p>8% 61,000 tons of waste</p> <p>Out of 777 thousand tons</p>	<p>7% 112,000 tons of waste</p> <p>Out of 1,717 thousand tons</p>	<p>16% 1,118,000 tons of waste</p> <p>Out of 7,188 thousand tons</p>	

* Percentages are rounded to the nearest percentile to facilitate presentation ** The rate of the loss refers to the loss from the total production or consumption of the same food category at each stage in the value chain.

The data on food waste presented in this report is based on estimates that weighted information from a wide range of sources and data that was available to the authors, including the Central Bureau of Statistics, the Ministry of Agriculture, the Ministry of Environmental Protection, and the Ministry of Social Affairs. Additional sources of information included conversations and interviews with experts working in the field, study findings, and results from previous reviews, international comparative studies and more.

There are wide variations in food waste across the various food types and stages of the value chain. In each stage of the value chain, the amount of food wasted out of the total amount of food produced or consumed was examined. Thus, for example, 9% of the food produced in agriculture was wasted during the agricultural stage. Likewise, 16% of food in the consumption segment (household and institutional consumption) – goes to waste.



* Direct economic cost, without the cost of greenhouse gas emissions and air pollutants

Estimated Food Waste in Israel, in Thousands of Tons per Year						
Waste in Thousands of Tons	Agriculture	Processing & Packaging	*Industry	Retail & Distribution	Consumption	Total
Fruit & Vegetables	517	186	16	313	746	1,778
Grains & Legumes	27	14	19	43	199	302
Meat, Fish & Eggs	35	5	31	36	61	168
Milk & Dairy	62	8	20	27	112	231
Total	641	213	85	420	1,118	2,475

*The loss estimate in this sector does not include food waste that is recycled primarily as animal feed.

Source: BDO estimates

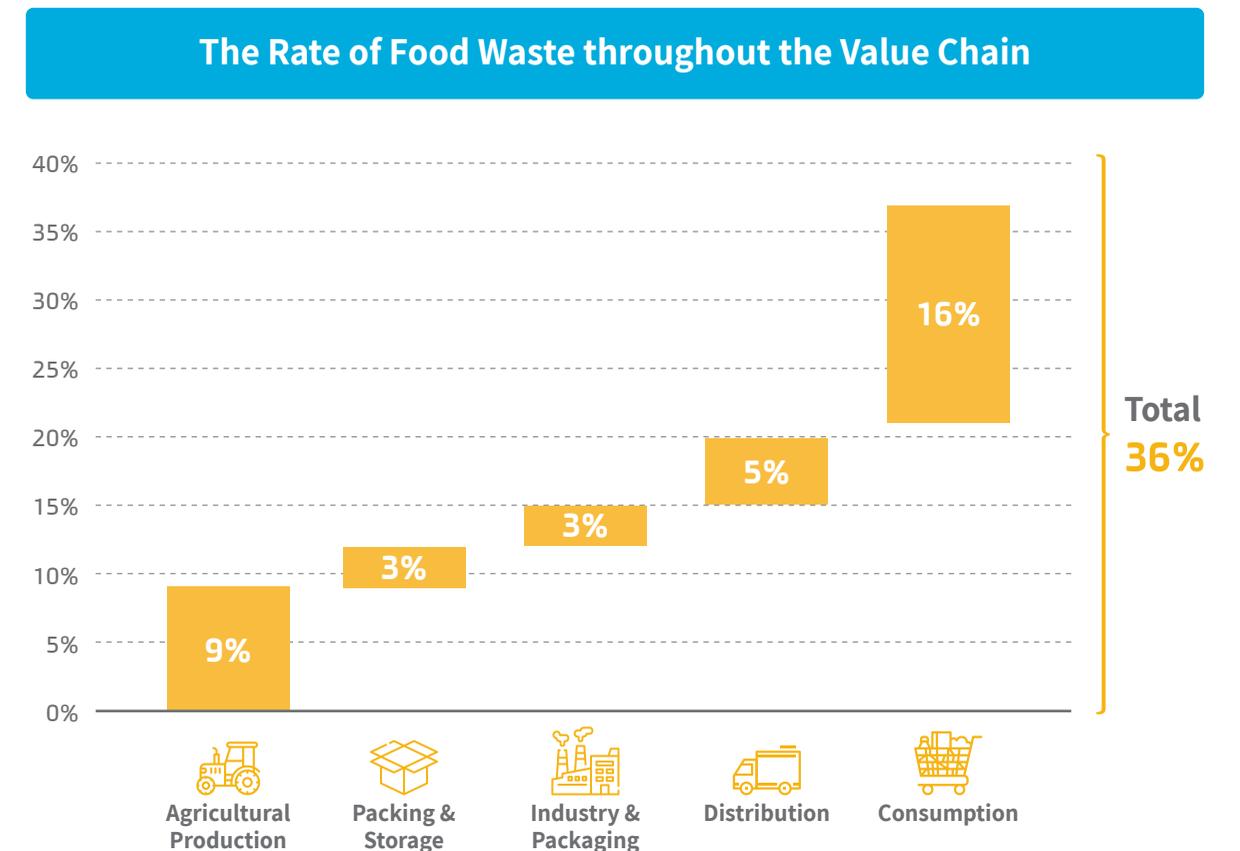
Fruit and vegetables constitute a major part of food waste in Israel. This stems from the fact that they are a substantial part of Israel's agricultural industry combined with a high waste rate of approximately 44% throughout the stages of the value chain. High waste rates for fruit and vegetables are not unique to the Israeli economy. An international comparison shows similar rates for fruit and vegetable waste in Europe. Compared to the United States, the waste rate in Israel is lower, however it consists of lower waste rates in the agricultural and consumption stages and a higher waste rates in the intermediate stages⁷.

The economic value of wasted food in Israel is around NIS 19.1 billion, constituting approximately 1.4% of the national product, as estimated by the authors of this report. Approximately 8% resulted from the unnecessary waste of natural resources

(land and water). In addition, the unnecessary cost of greenhouse gas emissions and air pollutants in each stage of the value chain due to the growing and producing of unconsumed food, is estimated at around NIS 1 billion. The cost of processing and packaging wasted food is estimated at around NIS 800 million. Therefore, the total cost of wasted food, including the waste of natural resources, the cost of greenhouse gas emissions and air pollutants, and the cost of waste processing, stands at approximately NIS 21 billion.

In quantitative terms, approximately 55% of the waste occurs in the stages of production, industry, retail, and distribution, even before the food has reached the household or institutional consumer. In monetary terms, approximately 56% of the value of the food is lost in the stages of private and institutional consumption.

7. "Global Food Losses and Food Waste," FAO, 2011





The Impact of the Covid-19 Pandemic on Food Waste in Israel



The increase in food waste and widening gap in food insecurity due to Covid-19 reinforces the need to focus on food rescue as a primary national policy tool

The Impact of the Covid-19 Pandemic on Food Waste in Israel

The Covid-19 pandemic intensified the problem of food insecurity in Israel and highlighted the importance of food rescue as a central policy tool. The pandemic impacted food insecurity in two ways: on the one hand, food insecurity increased due to the damage done to earning capacity and employees leaving the labor force, and on the other, traditional systems for ensuring food security were harmed due to Covid-19 restrictions.

The pandemic led to the greatest economic crisis the Israeli economy has seen in decades. In April 2020, at the height of the crisis, about 1.2 million workers left the workforce. Over the course of the year, approximately 825 thousand employees suffered losses to their income. After deducting the Covid-19 grants provided by the government, the result of the crisis was that about another 150 thousand people became food insecure and the problem became even more severe for the needy.

Covid-19 disrupted the activity of feeding programs in educational institutions, which normally supply over 115 million meals a year to approximately 500 thousand pupils. Over the course of the year, due to the lockdowns, the shift to remote studies in capsules, and isolation days, food distribution through these programs was reduced by about 60 million meals, most of which were intended for food insecure populations. Soup kitchens' activity was also impacted, mainly during the first lockdown.

The result was a direct loss of approximately NIS 900 million in food supply to the needy.

The pandemic led to an increase in food waste in the agricultural sector. In 2020, about another 20 thousand tons were added to fresh agricultural produce worth rescuing as compared to 2019. However, the produce was wasted due to a shortage of laborers during the lockdown period, export restrictions on agricultural produce, and the shutting down of the institutional sector.

The increase in food waste and widening gap in food insecurity due to Covid-19 reinforces the need to focus on food rescue as a primary national policy tool.

The state has chosen to deal with the economic damage caused by the pandemic mainly by providing stipends, grants to the self-employed, extending unpaid leave payments, and distributing food baskets to those in isolation through the IDF's Home Front Command. Providing stipends to the entire population rather than on a differential basis is economically inefficient. Firstly, providing a stipend to substitute the feeding programs' activity is less effective per shekel of support, as the cost of buying food individually is more expensive than that of providing food through feeding programs.

Secondly, providing stipends to all sectors of the population and not only to those who were harmed does not reflect optimal use of the budget,

which was intended to help impacted sectors. This results in a limited effect on food insecurity, in cost-benefit terms.



Covid-19: An Inequitable Pandemic

NIS 1.5 Billion decrease in food waste in the retail and consumption sector due to changes in consumption patterns caused by the pandemic

The Covid-19 crisis demonstrated that it is possible to decrease food waste by changing consumption habits and patterns. The restrictions on travel and gatherings, as well as the impact on household incomes, led to changes in consumption patterns. Food shopping shifted to channels with lower waste rates – there was an increase in online shopping, a decrease in open market shopping, and a shift from food consumption in the institutional sector, which is characterized by relatively high waste rates, to household consumption, which has a lower waste rate. These changes in consumption patterns led to a decrease of approximately 50 thousand tons of food waste in Israel in 2020.

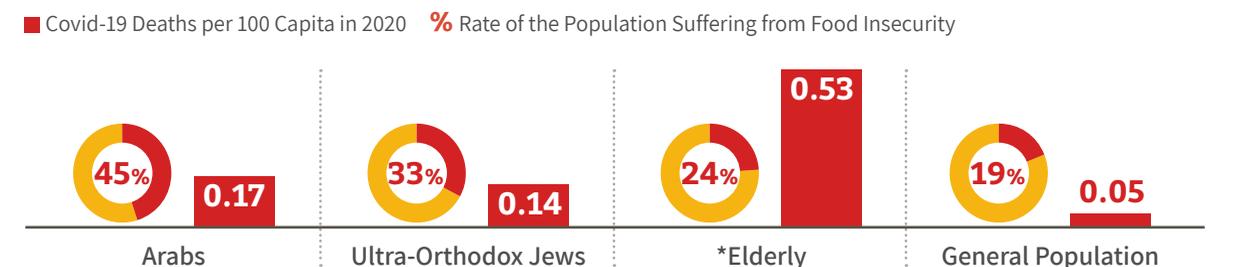
Overall, food waste in 2020 amounted to approximately 2.475 million tons, a decrease of about 1% compared to 2019. The value of wasted food in 2020 was about NIS 19.1 billion.

The Covid-19 pandemic does not affect everyone equally in terms of its effects on health and finances. From a health perspective, the populations who were most impacted in Israel were the elderly, ultra-orthodox Jews, and Arabs, who are also the populations that are characterized by relatively high rates of poverty and food insecurity.

In addition, certain industries were impacted more than others, such as food and hospitality services, tourism, arts and culture, commerce and retail, construction, and others. These fields typically employ low-wage service workers from low socioeconomic strata. On the other hand, fields that did not suffer as much economic damage and even expanded their activity (such as hi-tech, information and communications, and finance and insurance industries) typically pay high salaries, thereby intensifying the problem of food insecurity and gaps in the Israeli economy.

The state's plan of providing financial aid through Covid-19 grants did not reflect the inequitable damage caused by the pandemic, and therefore only brought about a partial solution. As a result, another 150 thousand people faced food insecurity in 2020, compared to 2019.

Covid-19 Impacted Sectors Characterized by High Rates of Food Insecurity



* "Elderly" refers to families in which the head of the household is over 65 if male and over 60 if female. Source: BDO estimates based on data from the National Insurance Institute, the Central Bureau of Statistics, and the Ministry of Health.

The Increase/Decrease in Each of the Following Sectors in 2020 Compared to 2019

Agriculture

2,500 dunams (about 625 acres) remained unharvested due to a lack of laborers and closure of the institutional sector

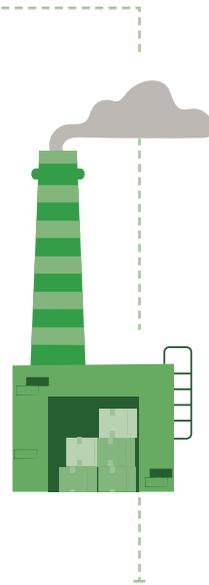
↑ 3%



Industry

At the beginning of the Corona crisis, food production factories were deemed essential and therefore continued to meet the demand for food

↑ 2%



Retail

Decrease in food loss due to the transition to online purchasing

↓ 4%



Institutional Sector

The closures and transition to deliveries resulted in a decrease of 40% in activity level which resulted in 46% reduction in food loss

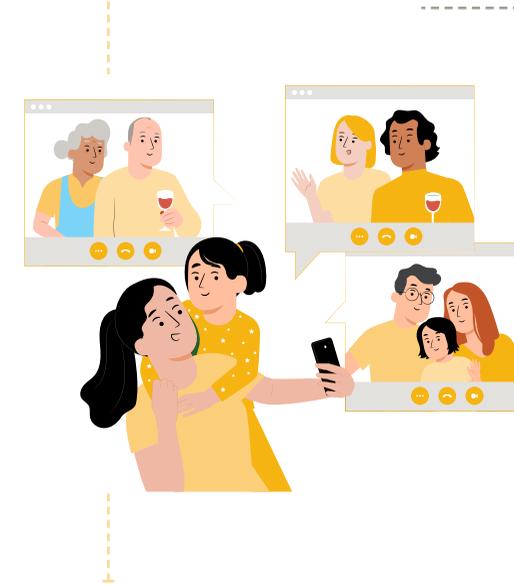
↓ 46%



Household Consumption

Change in consumption patterns from the shift in consumption in the institutional sector to the home sector

↑ 9%



The overall change in extent of food waste

The stagnation in the extent of the food loss is not due to the structural change of the food chain in the economy rather the opposing effects of the Covid-19 crisis on the Israeli economy

↓ 1%

Food Loss in 2020



Food Loss in 2019



Overall
2,475
Thousand Tons

Overall
2,498
Thousand Tons

Impact on Food Waste in Household and Institutional Consumption

In the household sector, food worth NIS 9 billion was thrown away, representing an increase of NIS 800 million compared to 2019. On the other hand, there was a decrease of approximately NIS 2.2 billion in food waste in institutional consumption, which constitutes a reduction of about 50% compared to the previous year.

In quantitative terms, food consumption per capita remained unchanged in 2020 compared to previous years. However, there was a decrease in food waste in both quantitative and monetary terms, due to a shift from food consumption outside the home (restaurants, hotels, events, etc.), which is characterized by high waste rates, to at-home food consumption.

The Institutional Consumption Sector

The Covid-19 crisis and the lockdowns imposed on the economy since March 2020 caused substantial damage to the institutional sector, which includes restaurants, hotels, event halls, workplaces, and educational institutions. This led to a decrease of around 40% in the scope of institutional activity.

Beginning in March 2020 it became prohibited to open event halls, aside from during two hiatuses: from the beginning of June to the start of July and for a short time in September, and then too, the number of people that could participate in each event was limited. The severe impact on event hall activity substantially reduced food consumption in the industry, and consequently there was a reduction in food waste as well.

Consumption and Waste in the Consumption Stage in 2019 and 2020

		Food Consumption		Food Waste	
		NIS Billion	Thousands of Tons	NIS Billion	Thousands of Tons
Household Consumption	2019	62	6,213	8.2	910
	2020	67	6,694	9.0	987
	% Change	+9%	+8%	+9%	+9%
Institutional Consumption	2019	14.2	807	3.9	240
	2020	7.3	494	1.8	130
	% Change	-48%	-40%	-54%	-46%
Total Food Consumption	2019	76	7,020	12.2	1,150
	2020	74	7,188	10.7	1,118
	% Change	-2%	+2%	-12%	-3%

Source: BDO estimates

The hospitality industry also suffered a significant blow as flights were banned and lockdowns were imposed, leading to a decrease of 64% in the number of nights booked in hotels, compared to 2019⁸. Following the Ministry of Health's guidelines, hotels changed the way they served food from buffet style to room service in prepackaged portions. This food serving method also affected food waste, because when food is made to order, food waste is lower compared to buffet service.

Due to the Covid-19 restrictions, many workplaces were closed or switched to working in "capsules" or working from home. Workplaces that were defined as essential kept operating, however the kitchens in these workplaces were closed or switched to preparing packaged take-away or grab-and-go foods. As a result, food waste in workplaces decreased by about 37%.

The restaurant industry experienced great uncertainty regarding its continued operation during the Covid-19 crisis. Many restrictions were placed on the industry, ranging from having to

shut down their operation completely to being open for takeout and delivery services only. During 2020, activity in the industry decreased by about 50% compared to 2019.

Overall, food waste in the institutional sector in 2020 stood at around 130 thousand tons, constituting a decrease of about 110 thousand tons. The value of wasted food in the institutional consumption sector stood at approximately NIS 1.8 billion.

The Household Consumption Sector

The Covid-19 crisis and lockdowns led to people staying in their homes for longer periods of time as a result of the restrictions on travel, the closing of educational institutions, the shift to working from home, closed restaurants and the shift to deliveries and the ban on flights out of Israel.

This resulted in a change in food consumption patterns: households consumed a more

8. Based on data from the Central Bureau of Statistics.

Decrease in Food Consumption and Waste in the Institutional Sector 2020 Compared to 2019

		Events	Hotels	Hospitals	Security Forces	Work Places	Education Institutions	Rest.	Total
Decrease in Food Consumption	2019	130	96	74	159	181	34	133	807
	2020	42	34	65	155	127	3	68	494
	% Change	-68%	-65%	-12%	-3%	-30%	-90%	-49%	-40%
Decrease in Food Waste	2019	55	36	24	48	52	6	19	240
	2020	16	13	19	41	33	1	9	132
	% Change	-39	-23	-5	-7	-19	-5	-10	-108

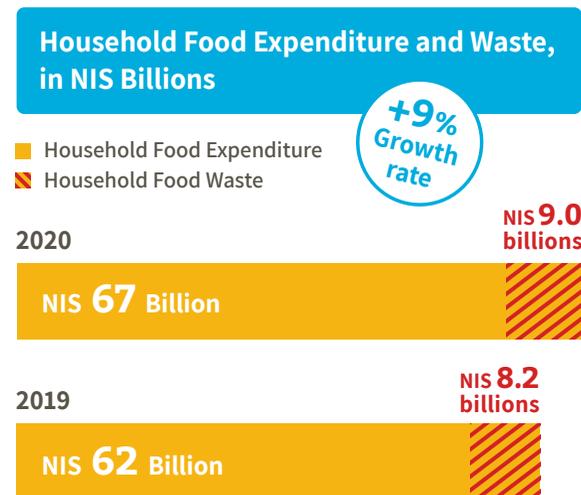
Source: BDO estimates

substantial share of their food basket at home rather than at restaurants workplaces, event halls, etc. This change in consumer behavior led to a decrease in waste in the entire consumption sector, as consumption shifted from the institutional to the household sector. In 2020, each household wasted about another NIS 300 over the course of the year, which was offset by the reduction in food consumption in the institutional sector, saving each household approximately NIS 800.

In 2020 household food consumption increased by about 9% compared to 2019⁹. Based on a consumer survey¹⁰ the Covid-19 crisis led to an increase in household consumption across all food categories compared to the period before the crisis. The categories in which consumption levels increased significantly during the crisis were fruit, vegetables, dairy, and breads.

Total food waste in the household sector in 2020 stood at approximately 900 thousand tons, constituting an increase of about 77 thousand tons compared to 2019. The value of wasted food in the household sector stood at approximately NIS 9 billion, meaning that each family threw away food valued at around NIS 3,600 over the course of

9. BDO analyses of Stornext data and data from the supermarket chains.
10. The Geocartography survey, March 2021, by Leket Israel and BDO.



Source: BDO analyses of data from the Central Bureau of Statistics and BDO estimates

the year. Based on the consumer survey, the main types of food wasted were vegetables, cooked food, and fruit. However, the survey results show that a large part of the public estimate that they wasted less food during the crisis compared to the period prior to the crises.

It should be noted that the increase in consumption in the household sector at the expense of the institutional sector contributed to the reduction in food waste, as consumption outside the home is characterized by higher waste rates. Food waste in institutional kitchens is an inevitable part of the economic activity of feeding many diners while providing a range of options that meets their preferences and taking into account inherent uncertainty factors.

Impact on Food Waste in the Retail Sector

Due to changes in consumption habits during the Covid-19 crisis, there was a decrease of 17 thousand tons of food waste in the retail sector. The value of wasted food in this sector in 2020 stood at NIS 4.3 billion.

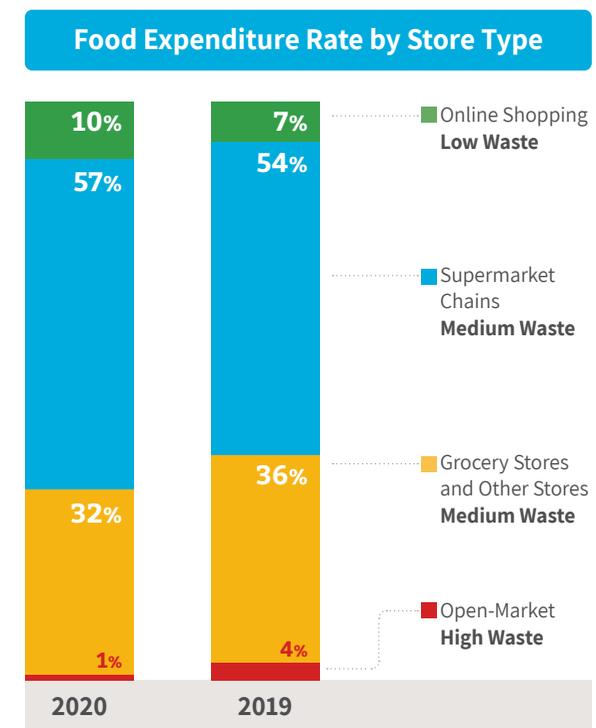
The retail sector was characterized by two main trends during the crisis: the closing of open markets and the shift to buying food in major supermarket chains or online.

The expansion of activity through direct shopping channels, where food goes directly from an E-fulfillment center to the end customer without going through a branch, further contributed to the decrease in waste rates, as well as a decrease in environmental emissions.

The shift from open market shopping to other shopping channels contributed to the reduction of waste in the retail sector.

Total food waste in the supermarket chains in 2020 stood at approximately 420 thousand tons, constituting a decrease of about 4% compared to 2019. This was the result of the public's shift from

open-market shopping, which is characterized by high waste rates, to online shopping, which is characterized by low waste rates. Total waste in the retail sector amounted to around NIS 4.3 billion.



Impact on Food Waste in the Agricultural Sector

As a result of the Covid-19 crisis there was an increase of approximately 20 thousand tons of food waste in the agricultural sector. In total, 640 thousand tons of agricultural produce was lost, valued at NIS 2.6 billion and constituting an annual increase of about 3% compared to 2019.

During the Covid-19 crisis, the agricultural industry was defined as essential for the economy and therefore continued to operate as usual. However, part of the agricultural industries suffered significant damage due to the first lockdown. The damage was mainly the result of the following¹¹:

11. "At the forefront of agriculture - a journal for policy, economy & marketing" The Ministry of Agriculture and Rural Development, Sep' 2020.

1. A shortage of labor - as a result of the ban on flights, 1,500 foreign workers scheduled to arrive in Israel during March and April were prevented from joining the agricultural industry. In addition, Palestinian workers were also prevented from entering the country due to the lockdown.

2. Closed export channels - the crisis affected maritime transport, which caused certain export channels to be shut down (most prominently, the export of vegetables).

3. The closing of the institutional sector - the closing of restaurants, hotels, and open markets affected food sales to this sector. These sales were diverted to the retail sector and efforts were made to sell agricultural produce online directly to the consumer. However, these efforts were not able to fully compensate for the loss.

Based on estimates of the Ministry of Agriculture, approximately 2,500 dunams (about 625 acres) of vegetables remained unpicked due to a lack of demand. As a result, food waste in the agricultural sector increased by about 3% in 2020 compared to 2019. In monetary terms, the value of the food waste increased even more due to the difficulty of selling premium products and the fact that export was severely affected at the height of the economic crisis. Total food waste in this sector stood at about 640 thousand tons, valued at about NIS 2.7 billion.

During 2020, Leket Israel worked to increase the scope of rescue activity in agricultural fields and rescued about 3 thousand tons of fresh produce more than the amount rescued in 2019. Total agricultural produce which would have otherwise been thrown away, but was rescued by Leket Israel in 2020, stood at about 18.5 thousand tons.

Food Waste in the Agricultural Sector			
	2019	2020	Growth %
Waste, thousands of tons	621	641	3%
Waste, NIS billions	2.4	2.7	8%



Food Waste and Rescue in the Retail and Distribution Sector

NIS 4.3 billion worth of food waste in the retail and distribution sector

17 thousand tons Decrease in food waste in 2020 in the retail sector compared to 2019

Food Waste and Rescue in the Retail and Distribution Sector ¹²

The Covid-19 crisis proved that it was possible to reduce food waste in the retail sector by changing consumer behavior. The crisis brought about a change in food purchasing habits that involved an increase in online shopping on the one hand and a decrease in open market shopping on the other. The closing of the open markets, which are characterized by high waste rates, and the shift to online shopping, which is characterized by low waste rates, contributed to reducing waste in this sector, despite the quantitative increase it saw. Food waste was reduced by 17 thousand tons in the retail sector in 2020 compared to 2019.

The volume of food sales in Israel in 2020 stood at about NIS 88 billion a year, sold to consumers through supermarkets, open markets, grocery stores, small retailers, and the institutional sector. The total loss in the retail and distribution sector stood at around 420 thousand tons of food, valued at approximately NIS 4.3 billion, which constitute about 5.5% of retail food sales. Of this, the amount of rescuable food was about 335 thousand tons, valued at approximately NIS 3.5 billion ¹³. In addition, the environmental cost of food

waste in the retail and distribution sector was approximately NIS 735 million ¹⁴.

The main causes of food waste in the retail and distribution sector are food that has reached or will soon reach its expiration date, food with aesthetic defects on the packaging or the product itself, and food damaged in the sales process. Food manufacturers, distributors, and retailers have a clear economic incentive to minimize food waste by managing their supply chain effectively, maintaining proper storage conditions, and planning their inventory.

Nevertheless, surplus food in the retail and distribution sector is inevitable, even when the distribution and sales systems are planned optimally. This is because retailers must ensure that a wide variety of food is available to their customers at all times, as consumers do not tolerate shortages of food items they desire. Hence, the potential loss to retailers due to the unavailability of food products is far greater than the cost of creating surpluses. In other words, food surpluses are an inherent part of the retail selling process.

12. For waste analysis purposes, this report refers to the retail and distribution sector as a single sector and includes waste occurring from the end of the production stage until the produce is sold to the consumer. This includes finished produce that goes to waste at the manufacturers' facilities, wholesale waste, returns from retailers to manufacturers, and food wasted by retailers.

13. The amount of rescuable food in the retail and distribution sector is based on BDO's model for the retail sector, which is based on data from the Central Bureau of Statistics and information from the leading supermarket chains.

14. The environmental cost is not included in the market price of the wasted food, meaning that the natural resources wasted due to food waste in this sector are excluded.

From an economic perspective, the fact that surplus food is wasted rather than rescued reflects a market failure. Therefore, one of the government's policy challenges is to create a system of incentives for rescuing these surpluses and getting them to those in need.

Naturally, the waste rate is higher for fresh produce and products with short shelf-lives, such as fruit, vegetables, bread, and baked goods.

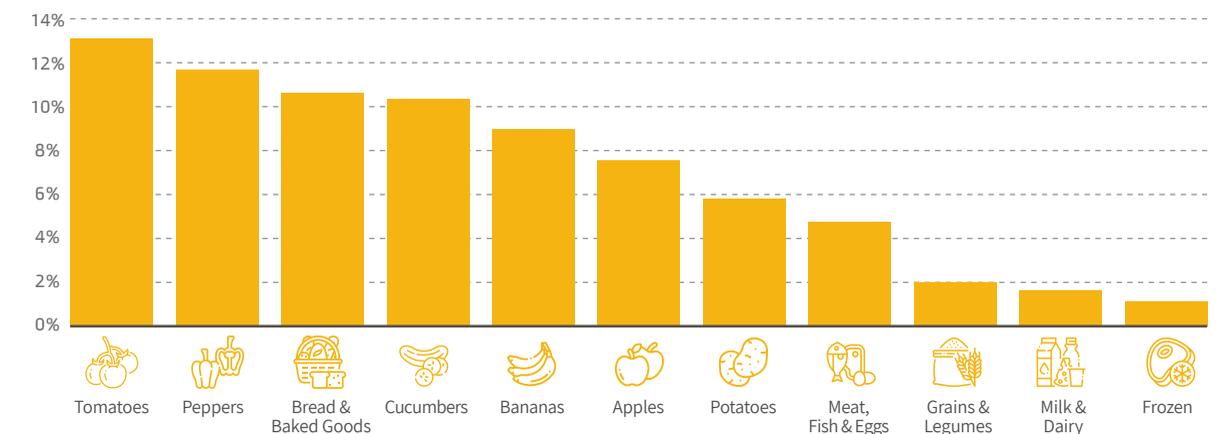
An international comparison shows that in routine years, the waste rate in the Israeli retail and distribution sector is similar to that accepted in the developed world, despite the potential for higher waste rates due to Israel's warmer climate. This is a testament to the relatively high standards of inventory management practiced by the Israeli retail and distribution sector. The rate of food waste in developing countries is higher, primarily

due to inadequate distribution, storage, and selling conditions.

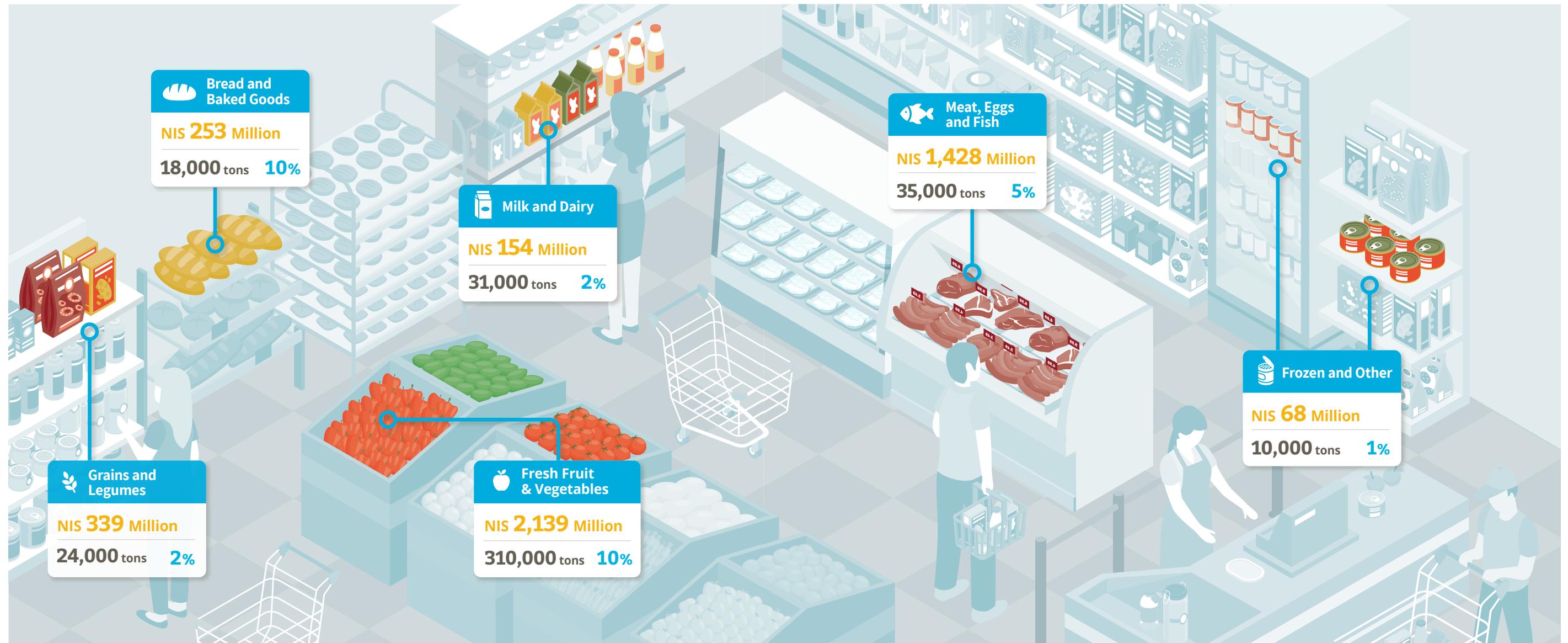
The investment food sellers made in establishing advanced logistical centers, online inventory management and demand planning systems, and keeping an unbroken cold chain have contributed to reducing the volume of waste in the retail and distribution sector.

Following the Covid-19 crisis in 2020, a change took place in consumption patterns, with a more substantial share of the food basket being bought from the major supermarket chains online and in grocery stores, rather than from open markets. This, together with the development of direct shopping channels, where the food is delivered directly from a an e-fulfillment center to the end customer without going through a branch, contributed to a reduction in waste rates as well as a potential reduction in environmental emissions.

Economic Waste in the Retail and Distribution Sector



Financial Loss in the Retail and Distribution Sector



Primary Causes of Waste

- Expiration Date
- Aesthetic Defects
- Damaged Food

Value of Loss

NIS 4.3 Billion

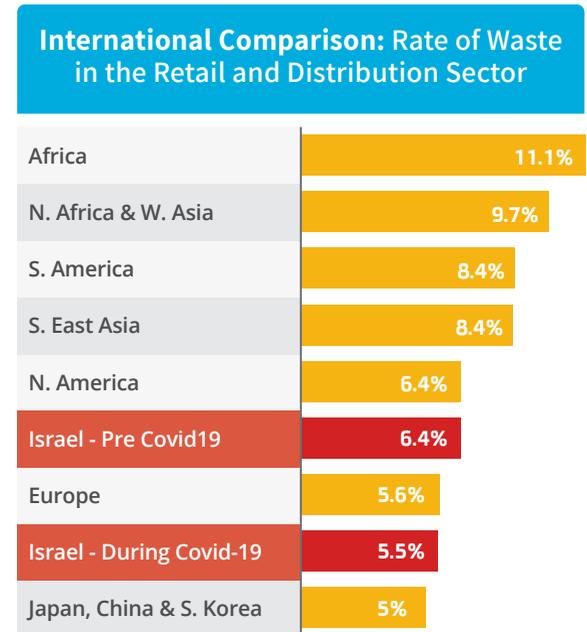
* Numbers are rounded for ease of presentation.

**The rate of the loss refers to the loss from the total production or consumption of the same food category at each stage in the value chain.

Online retail may be more environmentally friendly than traditional retail, in part due to the decrease in number of individual trips to various stores and consolidation of many items being delivered to multiple addresses in a single trip. A study conducted by the University of Washington and published in 2014¹⁵ found that if routes are planned efficiently, delivery services could potentially reduce up to 80% of carbon emissions produced by consumers travelling to stores.

Waste in the retail and distribution sector has high economic value as it includes all the previous investments made in growing, manufacturing, packaging, and transporting the food. This waste refers to food that was ready to be sold and consumed but was wasted before it reached the end consumer. Due to the characteristics of this waste, the vast majority of the food at this stage is rescuable. In fact, this sector holds about 55% of the rescue potential, valued at about NIS 3.5 billion out of the total rescue potential of NIS 6.4 billion in the economy. The increase in the rate of rescuable food waste in the retail sector (out of

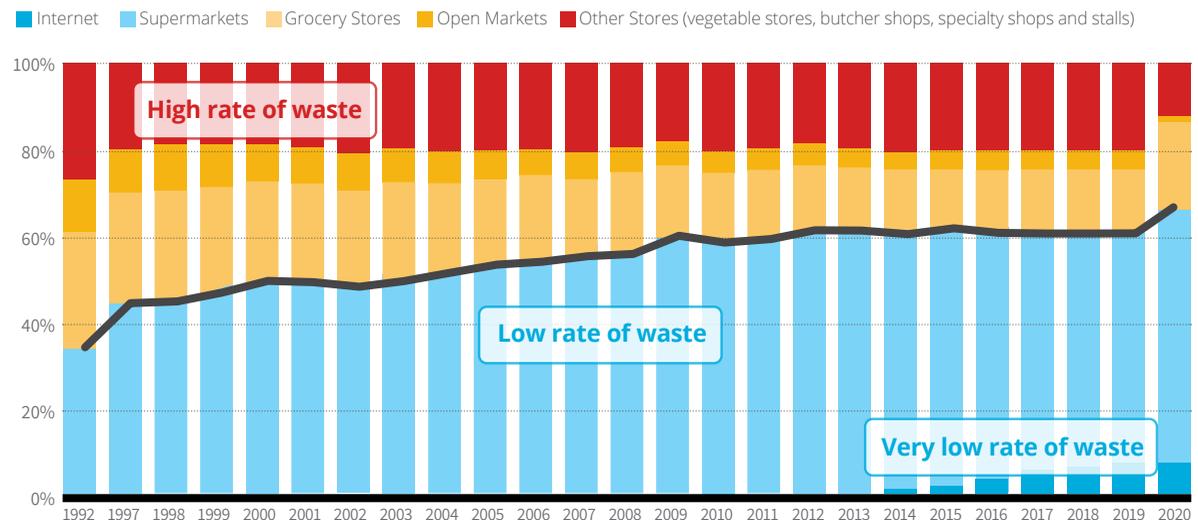
the total rescuable food waste in the economy) stems from the decrease in total rescuable food waste, resulting from the Covid-19 crisis and the shift to household consumption at the expense of institutional consumption.



Source: Food and Agriculture Organization (FAO) data, processed by BDO

15. Changing Retail Business Models and the Impact on CO2 Emissions from Transport: E-commerce Deliveries in Urban and Rural Areas

Consumers Transition to Purchasing in Stores with Lower Percentages of Waste



Source: CBS, analyzed by BDO

Food waste in the retail and distribution sector stems from three main factors

1 Short expiration dates

Food products by nature have a limited shelf life and inevitably, some products will reach their expiration date before they are sold. Food that has reached its expiration date can no longer be sold or distributed to the needy. Therefore, rescuing food in the retail and distribution sector requires incentives to facilitate inventory management that ensures food with a short expiration date is sold at a lower price or distributed to the needy before it expires. This type of inventory management is feasible, as the amount likely to be consumed can be statistically estimated and compared to the current inventory, allowing surpluses to be donated at an earlier stage and certainly before the food expires. Therefore, the food expiration classification policy should be reviewed and the meaning and differences between various symbols related to expiration dates should be explained to consumers.

2 Aesthetic defects in the product and defects in packaging

Aesthetic defects lower the market value of food products, but in most cases do not reflect damage to these products' nutritional value. When such food is wasted, this reflects a market failure, because while the market value of the defective product is low, the nutritional value it holds for the needy is completely intact.

3 Damaged food

Damage caused to food in the logistical process is a relatively minor cause of food waste. Damage can be caused in various stages of the retail and distribution process and includes broken eggs, spilt products, fruit and vegetables that have fallen or been damaged, leftovers from butcher shops and deli departments, etc. This food cannot be rescued, but its volume is relatively small as maximal efforts have been made to limit it.

Rescue Activity in the Retail and Distribution Sector

Retailers and food manufacturers work to reduce waste and rescue food based on economic considerations. Food waste is reduced in several ways:

- 1. Discounts on surpluses**
When products are about to expire or their packaging has defects, retailers sometimes offer them at a discount.
- 2. Food donation**
This is done in a centralized and coordinated manner, based on agreements with food rescue non-profit

organizations or in other cases, as local initiatives in supermarket branches. Food manufacturers are also involved in food rescue activities. Some contract with non-profit organizations and donate production surpluses and food that is about to expire. In addition, products with aesthetic defects or defective packaging detected in the factory are sold in various secondary markets if the food is still safe and fit for human consumption.



Food Waste and Food Rescue in Institutional Consumption

46% decrease in food waste in the institutional sector in 2020 compared to the previous year

130 thousand tons Total food waste in the institutional sector

Food Waste and Food Rescue in Institutional Consumption

During the Covid-19 crisis, households consumed a greater share of their food basket at home, at the expense of consuming food outside of the home. This was because most of the activity in the institutional sector was shut down or operating in a limited format (hotels and restaurants were closed, events were canceled, etc.). In this way, the Covid-19 crisis led to a change in household consumption habits that contributed to a reduction in food waste in 2020.

The reduction in consumption in event halls and hotels, which is characterized by high waste rates of around 38%, and the forced shift to at-home consumption, which is characterized by lower waste rates¹⁶ of about 13%, contributed to a decrease in food waste in the institutional sector of about 110 thousand tons in 2020 compared to 2019.

Based on the 2020 Food Waste Report¹⁷, each day, on average, about a million people ate one meal per day outside their homes, totaling at around 426 million meals eaten outside the home over the course of the year, equaling about

16. Despite a lower rate of loss in households compared to the institutional sector, the large number of households combined with a high (daily) consumption frequency leads to a higher amount of waste in households.

17. The BDO model for food waste in the institutional sector is based on data from the Central Bureau of Statistics, the Restaurant Association, the Event Hall, Event Garden & Catering Business Owners Association in Israel as well as information from the security forces.

500 thousand tons of food. Expenditure on food bought and consumed outside the home in 2020 was NIS 7.3 billion.

Total food waste in the institutional sector amounted to about 130 thousand tons, constituting a decrease of approximately 46% compared to 2019. The cost of the waste was about NIS 1.8 billion for the year, in addition to an environmental cost of around NIS 130 million¹⁸.

Total food waste in the institutional sector amounted to about 130 thousand tons, constituting a decrease of approximately 46% compared to 2019

About a third of the waste in institutional meals is rescuable, meaning that about 44 thousand tons of food can be rescued a year at a total value of approximately NIS 600 million, which is the equivalent of about 38 million meals per year on average.

18. The environmental cost not included in the market price of the wasted food, i.e. the natural resources wasted due to food waste in this sector.

Regularly, approximately 20% of the food consumed in Israel is served through institutional catering activity: meals served at factories, workplaces, the security forces (the military, police stations, and prisons), in hotels, catering halls, restaurants, schools, hospitals, etc.¹⁹ This sector, where many diners are gathered together in one location, holds the greatest potential for food rescue.

Food waste in institutional kitchens is an inevitable part of the economic activity of feeding a large number of diners and ensuring that the supply and variety of food meet their preferences, while taking into account inherent uncertainty factors.

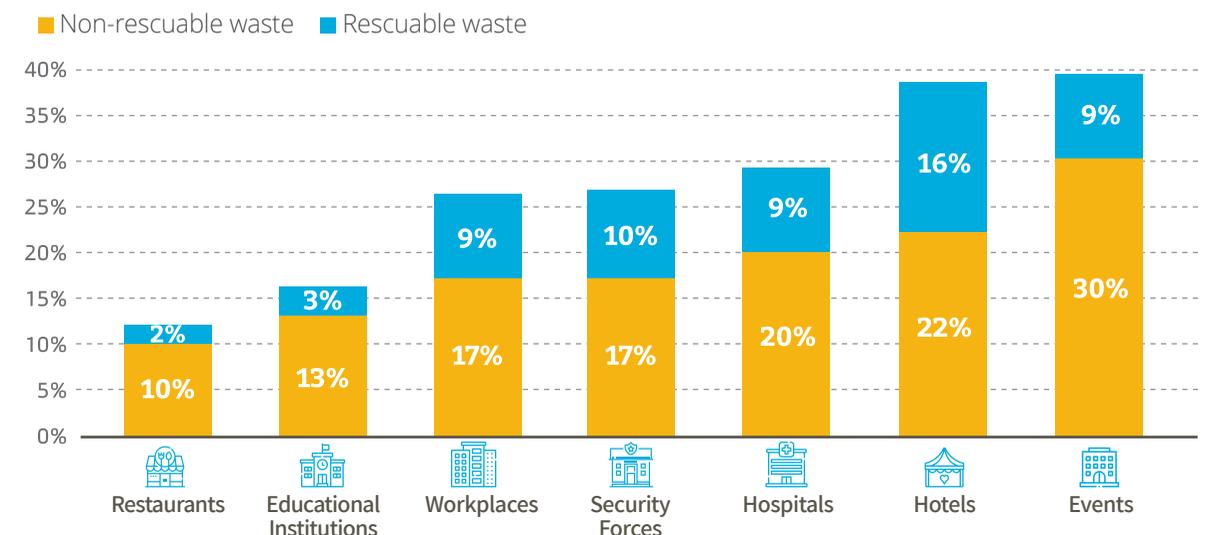
In recent years, most institutional kitchens have transitioned to being operated by external

companies with a high level of expertise in the field that work to maximize efficiency and reduce waste. However, in the catering field, plans cannot be made based on averages alone; enough food must also be provided on days when consumption is below average. This means catering companies need to factor in risks stemming from variance and not rely solely on statistical averages.

The analysis in the report shows that in general, waste tends to be higher in kitchens with a higher level of uncertainty regarding the number of diners. For example, at open IDF bases and workplaces, where there are accessible alternatives, food waste is higher than in schools and prisons, where there is less uncertainty regarding the number of meals that will be served.

19. The model weighs the average weight of a meal in each of the industries, based on its characteristics.

Rate of Food Waste by Category of Institutional Consumption



In addition, the more varied the menu, the greater the amount of waste due to the uncertainty regarding diner preferences. Accordingly, the level of waste is higher at events and in hotels, which offer a wider variety of food options compared to workplaces, military bases, and police stations.

The way the food is served and who is paying for it also influence food waste. In restaurants, for example, where food is prepared only after it is ordered, there is less waste compared to buffet services, where food is prepared in advance. In other words, when consumers pay only according to their actual consumption

there is less waste compared to the all-inclusive consumption method.

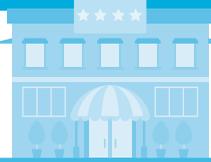
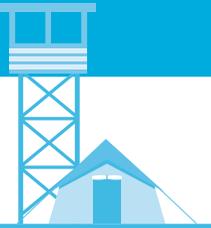
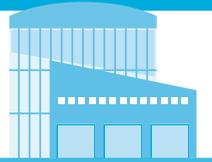
In this context, due to the Covid-19 crisis and social distancing, restaurants were forced to operate mainly through delivery and takeaway services, workplace cafeterias were closed, and workplaces that kept operating used the grab & go method, where workers took packaged food and did not eat in one centralized place. In addition, hotels changed the way they served food, from buffet service to room service in prepackaged portions. These changes also contributed to the reduction in food waste.

The total amount of rescuable food in the institutional sector in 2020 is estimated at approximately NIS 570 million. The decrease in the amount compared to 2019 was caused by the effects of the Covid-19 crisis, which led to most of the activity in the institutional sector being shut down or greatly limited in scope. About half of the rescuable waste was in the security force bases and in events, where it is estimated that about 22 thousand tons of food valued at about NIS 280 million could have been rescued in 2020. Hotels, workplaces, and hospitals are also important rescue sources, from each of which

food at a value of NIS 45–120 million could have been rescued in 2020. In the restaurant category the annual rescuable waste is valued at NIS 60 million. However, due to geographical dispersion and the lack of a critical mass, rescuing food from restaurants is generally not financially viable.

The high return on investment for food rescue in the institutional sector stems from the relatively high value of rescued meals, as well as the relatively low logistical cost of collecting food from large kitchens located in relative proximity to one another that are concentrated in city centers and industrial zones.

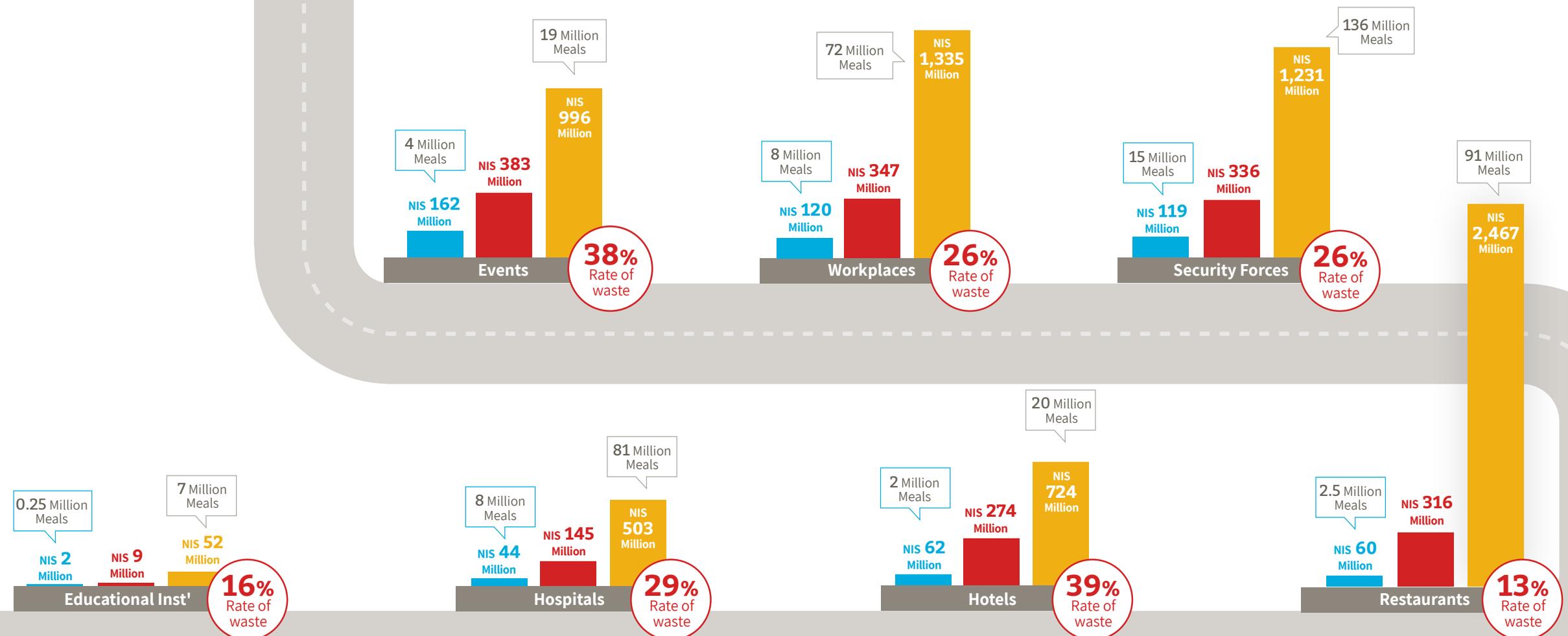
Estimated Food Waste in Institutional Consumption

	 Events	 Hotels	 Hospitals	 Security Forces	 Workplaces	 Educational Institutions	 Restaurants	Total
Relevant Population (Thousand people)*	47	34	168	223	301	39	250	1,062
Meals Served (yearly) (Million meals)	19	20	81	136	72	7	91	426
Food Consumed (yearly) (Thousand tons)	42	34	65	155	127	3	68	494
Annual Waste (Thousand tons)	16	13	19	41	33	1	9	132
Rate of Waste (%)	38%	39%	29%	26%	26%	16%	13%	26%
Rescuable Waste (Thousand tons)	7	3	6	15	11	0	2	44

Estimated based on the number of relevant workdays in each category and distinguishing between various populations within a given category.

Annual Summary: Wasted Food In the Institutional Sector Based on Cost of Food

■ Rescuable Waste ■ Total Waste ■ Market Size



*The rate of the loss refers to the loss from the total production or consumption of the same food category at each stage in the value chain.



Food Waste in the Household Consumption Sector

NIS 9 billion worth of food waste in household consumption

NIS 3,600 worth of annual food waste per household in Israel

Food Waste in the Household Consumption Sector

In 2020, following the Covid-19 crisis and the imposed lockdowns, household members stayed at home for longer periods of time. This led to changes in food consumption patterns, so that households now consumed a more substantial share of their food basket at home rather than at restaurants, workplaces, events, etc. Due to this increase in at-home consumption, the average household wasted about another NIS 300 in 2020 compared to 2019.

In 2020, household food consumption increased by about 9% compared to 2019²⁰. Accordingly,

20. BDO's analyses of Stornext and data from the supermarket chains.

household food waste in Israel amounted to approximately 990 thousand tons²¹, valued at about NIS 9 billion. Beyond this direct cost, the environmental cost due to food waste in the household consumption sector stands at about NIS 1 billion²².

21. Based on the food value chain model developed by BDO, using weighted data from the Central Bureau of Statistics for 2019, a national survey of the composition of household garbage conducted by the Ministry of Environmental Protection for 2012-13, the findings of a Geocartography survey conducted in January 2019, and a study on household garbage in Israel conducted by Dr. Ofira Ayalon and Efrat Elimelech, "What gets measured gets managed: A new method of measuring household food waste." Waste Management, 76 (2018): 68-81.

22. The environmental cost not included in the market price of the wasted food, i.e. the natural resources wasted due to food waste in this sector.

Household Food Waste, NIS per month

	Monthly Expenditure on Food	Monthly Food Waste	% Waste
Fruit & Vegetables	595	137	23%
Grains & Legumes	675	93	14%
Meat, Eggs & Fish	605	47	8%
Milk & Dairy Products	355	23	7%
Total	2,230	300	13%

The average household in Israel wastes about 13% of its food expenditure, meaning the average family in Israel in 2020 wasted food valued at about NIS 3,600, or the equivalent of the food consumed in a month and a half. On a monthly basis, the average household's financial loss due to food waste was NIS 300, with NIS 137 resulting from wasted fruit and vegetables, NIS 93 from wasted grains and legumes, NIS 47 from wasted meat, fish, and eggs, and NIS 23 from wasted milk and dairy products.



The main causes of household food waste: preparing too much food and food expiration

Household food waste is caused by the combination of consumer habits, the culture of abundance, and the way the food is stored and kept fresh at home. Household food waste in 2020 was approximately NIS 9 billion annually.

The main causes of household food waste are²³:

1. Preparing Too Much Food

Preparing more than is needed, generally food that was cooked or prepared unnecessarily and was not consumed, often due to overbuying.

2. Expired Food

Food that expires before being fully consumed. It should be noted that expired food is connected to overbuying. The desire to have a variety of available food options, combined with the uncertainty

23. Based on findings of the Geocartography survey conducted in March 2021 by Leket Israel and BDO.

surrounding the amount of food that will actually be consumed by the household members, creates a situation in which some of the food that was bought expires before it is consumed.

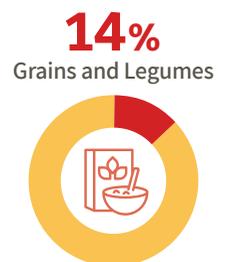
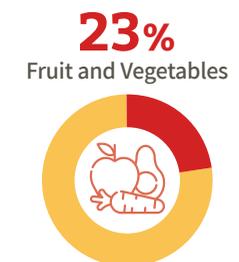
3. Overbuying

Buying more food than is consumed, thereby increasing food waste. Staying home for long periods of time due to the Covid-19 crisis and the uncertainty surrounding the situation led to an increase in household food consumption.

Other causes of food waste in household consumption include damaged or spilled food and food that was not prepared or cooked properly.

Household food waste is not unique to Israel, and waste rates in Israel are comparable to those in other developed countries. In Israel, as in other western countries, the highest waste rate is in the fruit and vegetables category, with 23% of the fruit and vegetables bought in Israel going to waste, compared to 28% in the United States and 19% in Europe. The relatively high waste rate for fruit and vegetables primarily stems from their short shelf life and the fact that households do not take measures to ensure optimal storage conditions.

Households Annually Discard



In regards to meat, fish, and dairy products, the waste rate is lower and stands at approximately 8%. The lower waste rate for these products stems, among other things, from the fact that it is possible to extend their shelf life by freezing them, and because these products are more expensive per unit of weight, which creates an incentive for households not to waste them as much. The waste rate for these products is similar to that in Europe, and lower than that in the United States.

In the grains and legumes category, the waste rate is approximately 14%. This waste rate is the result of combining waste rates of products with a short shelf life such as bread and baked goods, and products with a relatively long shelf life, such as raw grains and legumes.

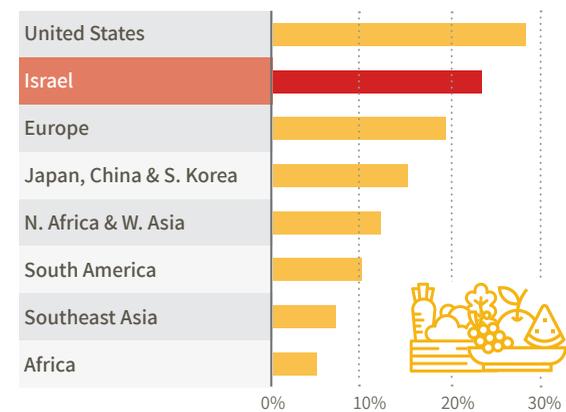
NIS 6,815
 the overall impact of food waste on cost of living in the household annually

In Israel, where household food expenditure is relatively high by international standards²⁴, food waste is one of the factors that contributes to high cost of living. Food waste effects the cost of living due to overspending on food and by driving the cost of food up. The overall impact on cost of living is an additional NIS 6,815 per household annually.

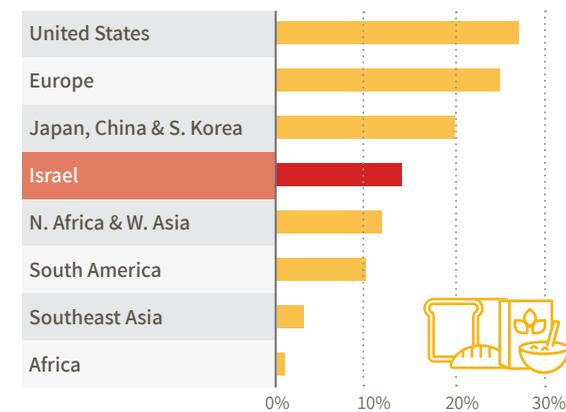
24. Global Food Security Index, The Economist, 2018

International Comparison: Rate of Household Food Waste

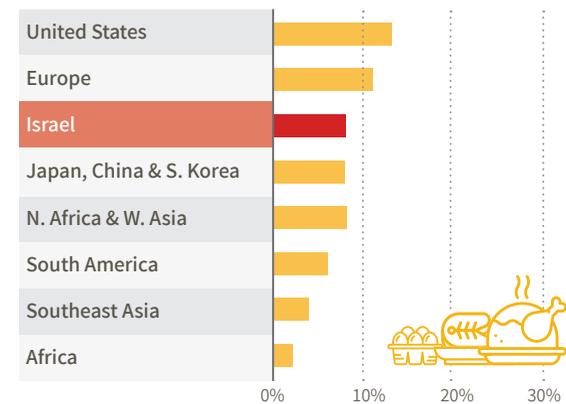
Fruit and Vegetables



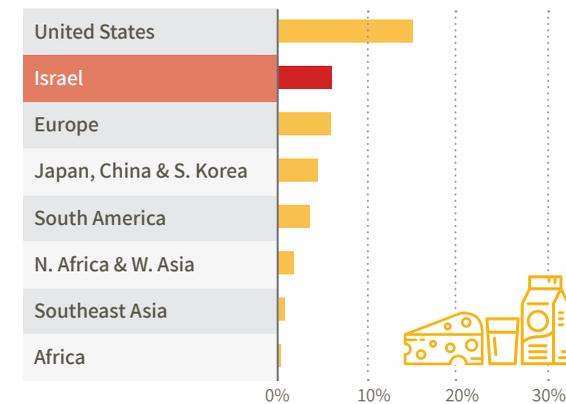
Grains and Legumes



Meat, Eggs and Fish



Milk and Dairy Products



Cost of living – Overspending: Food bought and thrown away as waste constitutes a direct household cost. On average, the direct monthly loss (excluding external costs²⁵) due to food waste stands at NIS 300 per household, and accordingly, the annual loss stands at NIS 3,600 per household. The costs of collecting and disposing the waste in a landfill are ultimately passed onto consumers in the form of increased municipal property taxes and fees, leading to an additional annual cost of NIS 200 per household.

Cost of living – Higher Food Prices: As a result of the Covid-19 crisis, production and sales costs increased, mainly in the fruit and vegetable category, due to a rise in transportation costs and a decrease in harvesting efficiency and packaging due to social distancing requirements and a shortage of laborers. The effect of the crisis was expressed in a rise of about 4.4% in fruit and vegetable prices in 2020. On the other hand, food prices excluding fruit and vegetables went down by about 0.6%, and food prices in total remained virtually unchanged, with an increase of 0.3% compared to 2019. In addition to a household's direct surplus expenditure on food

that was bought but not consumed, cost of living is affected by food waste throughout all stages of the value chain prior to household consumption. In economic terms, the cost of food reflects the total cost of production and sales at all stages of the value chain: growing, production, packaging, transport, and sales. Therefore, the price of food in supermarkets incorporates the value of food waste in the retail sector. Similarly, wholesale food prices reflect food waste in the agricultural and industrial sectors. Ultimately, the cost of waste at all stages of the value chain is passed on to the consumer, leading to an additional annual cost of NIS 2,800 due to an 11% increase in food prices.

Cost of living – Environmental impact of GHG and air pollutant emissions: The environmental impact caused by food waste has an indirect effect on the cost of living. Air pollutant emissions negatively affect human health and the environment, a cost the economy bears as a whole, mainly in the form of health expenditures. External costs resulting from these negative environmental influences, which reflect the monetary value of societal wellbeing lost due to pollutant emission²⁶, were calculated and estimated at around NIS 1.3 billion for the Israeli economy in 2020, about NIS 215 per household.

25.External costs not included: the cost of clearing and burying the food waste, the cost of greenhouse gas and air pollutant emissions, and the increase in wholesale prices due to food waste in agriculture and industry.23. IPCC, 2014: Climate Change 2014: Synthesis Report

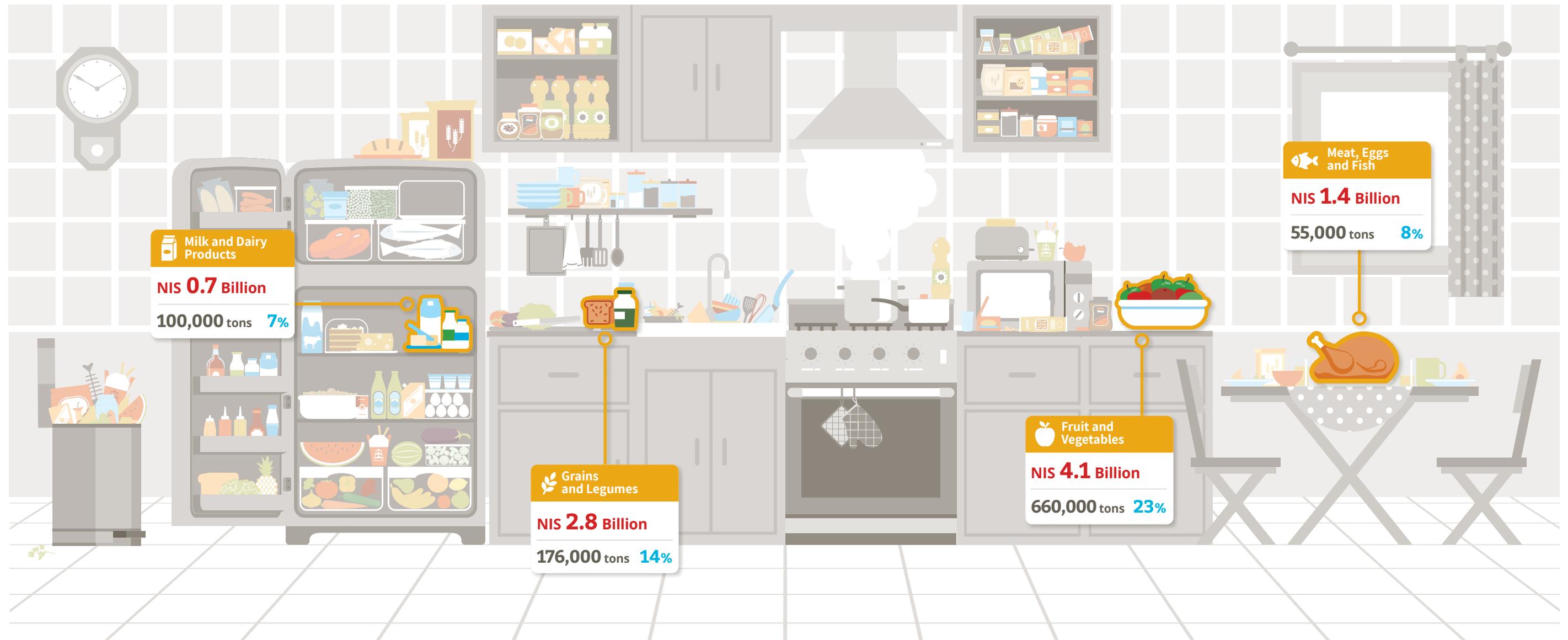
26.The Green Book: Estimating and measuring environmental costs, The Ministry of Environmental Protection, 2020.

Rate of Household Food Waste for Selected Products



Source: BDO estimates

Household Food Waste in Israel Per Year



Primary Causes of Waste

- 1** Surplus preparation of food
- 2** Expired food
- 3** Damaged or spilled food
- 4** Poor preparation/cooking
- 5** Excess purchasing

Value of Loss

NIS 9 Billion

** The rate of the loss refers to the loss from the total production or consumption of the same food category at each stage in the value chain.

Food Waste: Impact on the Cost of Living		
	Annual cost per household	Impact on the cost of food
Cost of food discarded at home	NIS 3,600	-
Cost of collection and landfill disposal for discarded food	NIS 200	-
Impact of GHG and Air Pollutants	NIS 215	-
Increase in the retail price due to food loss in the market sector	NIS 1,600	6%
Increase in the wholesale price due to food loss in the production sector	NIS 1,200	5%
Total	NIS 6,815	11%

Beyond the direct impact on the cost of living, other external costs are incurred due to food waste, its transport, and landfill disposal, stemming from the indirect impact of waste transportation, fuel combustion, and the environmental damage caused by greenhouse gas emissions measured in this report. Likewise, there are other effects, such as road congestion and soil contamination, which are not included in the estimated environmental cost presented in this report.

When organic waste is buried in landfills, it decomposes and emits methane, which is a greenhouse gas with a global warming potential (GWP) 84 times greater in the short term (20 years) and 28 times greater in the long term (100 years) than that of carbon dioxide ²⁷.

According to findings of the 2020 National Food Waste and Rescue Report, 990 thousand tons of household food waste were transported to landfills, requiring sanitation trucks to make about another 315 thousand trips throughout the year and

thereby increasing air pollution, road congestion, noise, and the risk of accidents. Therefore, beyond the NIS 9 billion in household food waste and the NIS 0.6 billion it cost to dispose of it, the economy incurred additional external costs due to the effects of traffic congestion and the resulting impact on the environment.

Lessons from Around the World – Measures to Reduce Household Food Waste

In recent years, various countries have been making efforts to reduce household food waste on several levels. These include increasing consumer awareness of food waste, educating consumers on how to prevent food waste, using technology to reduce waste, and more (for more on food waste reduction activities during the Covid-19 crisis, see Chapter 12). Following are a number of selected cases from around the world demonstrating the efforts made to reduce household food waste:

The German Ministry of Agriculture set up the “Too Good for the Bin” website with the aim of encouraging consumers to reduce household food waste. When the Covid-19 crisis erupted, the Ministry announced that there was no fear of food shortages in Germany so as not to alarm the public. Simultaneously, it ran a campaign online and on social media titled “Just Buy What You Need,” which featured German celebrities. The Ministry also suggested ways of reducing household food waste by using shopping lists and storing food properly at home.

In 2013, the British Waste and Resources Action Programme (WRAP) launched the “Love Food Hate Waste” campaign to raise awareness regarding the importance of reducing food waste and to help people take action on the issue. The project included digital publications and community events such as cooking classes. As part of the

27. IPCC, 2014: Climate Change 2014: Synthesis Report

project, a dedicated website was created offering information on how to reduce food waste. Topics included, for example, calibrating refrigerators to optimal temperatures, the importance of preparing a shopping list, etc.

The WRAP examined the effects of its campaign in west London over a six-month period, from October 2012 to March 2013. At the end of the period, the quantity of food waste dropped by 14%, from 2.6 kg per household in the week prior to the campaign, to 2.2 kg per household in the week following the campaign. A cost-benefit analysis revealed that every £1.00 invested in the campaign resulted in an £8.00 reduction in food waste.

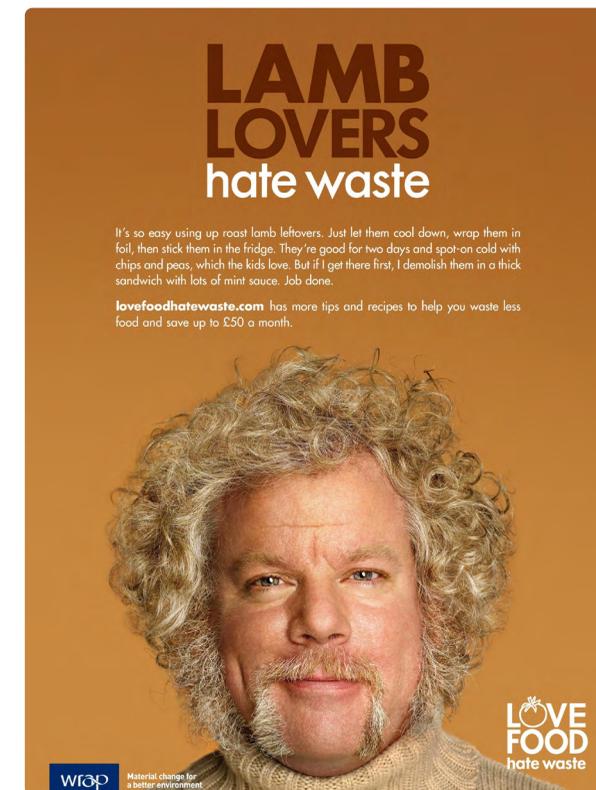
In Israel, the Postharvest Science of Fresh Produce Department at the Volcani Center published guidelines for consumers on how to preserve fruit and vegetables at home ²⁸.

28. Preservation of fruits and vegetables in the consumer's home, the Ministry of Agriculture and Rural Development.

Technology provides another means towards reducing food waste. **In the Netherlands, a study was conducted on the optimal temperatures for extending the shelf life of various food products. By changing the storage temperatures,** the researchers were able to extend the products' shelf life significantly.

A third way to reduce household waste is through taxation. Many countries use the “Pay as You Throw” method. These include the United States and Canada ²⁹, Austria, Germany, Spain, Japan and others. In this system, households pay the municipality or waste collection agency based on the amount of their unsorted waste. This method encourages households to recycle and reduce food waste, which constitutes a significant share of household waste.

29. In the United States and Canada, the “Pay As You Throw” method is implemented locally in various states or provinces. The leading states using this method in the US are Washington, Oregon, Minnesota, Wisconsin, and New Hampshire. In Canada, the method is implemented in Manitoba, Ontario, Alberta, British Columbia, Saskatchewan, and elsewhere.



Posters from the Love Food - Hate Waste project campaign. Photo: WRAP



**Food Waste:
How Much Food
Can Be Rescued?**

NIS 6.4 billion worth of food is rescuable

Food Waste: How Much Food Can Be Rescued?

The amount of rescuable food decreased in 2020, mainly due to the Covid-19 pandemic that led to a transition from institutional consumption, which holds rescue potential, to household consumption, where none of the food waste is rescuable. In addition, there was an increase in waste in the agricultural sector, which has a lot of rescue potential, and therefore rescuable waste in this sector also increased. This increase was offset by the decrease in waste in the retail sector, and accordingly a decrease in the volume of rescuable waste.

Approximately 35% of food produced in Israel is lost or wasted during the production, distribution, and consumption stages, totaling at approximately 2.5 million tons annually. The direct cost of food waste in Israel is NIS 19.1 billion, which constitutes 1.4% of the GNP. When taking into account the cost of greenhouse gas and air pollutant emissions resulting from food waste, the total cost of food waste amounts to approximately NIS 21 billion. Of this, about 50% is rescuable food fit for human consumption.

In terms of food rescue, the central component is unconsumed edible food (fit for consumption with nutritional value and health benefits). There are various reasons why waste occurs in each value stage of the production chain. The common

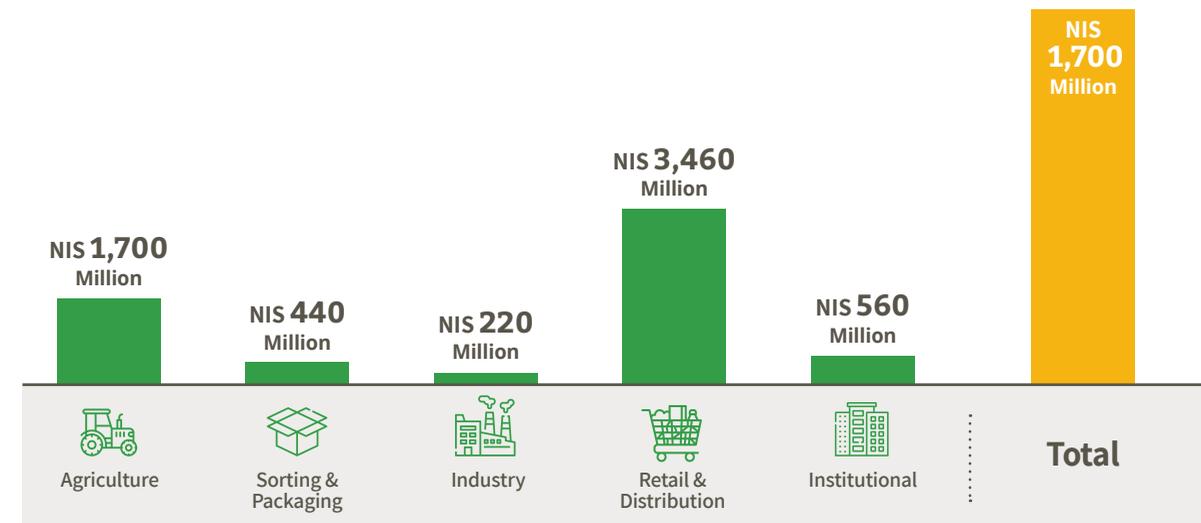
denominator is the lack of economic viability for food producers (farmers, manufacturers, retailers, etc.) to invest additional resources in the next stages of production and distribution.

The value of rescuable food is approx' NIS 6.4 billion, with wasted food increasing in value as it progresses through each stage of the value chain and more resources are invested in raising, producing, packaging, and transporting it

Reducing food waste, whether by preventing waste production or rescuing surpluses, is a top global priority. The estimated amount of rescuable food is derived from a value chain model designed specifically for the food industry. Every type of wasted food at each stage of the value chain was analyzed and classified as rescuable or un-rescuable (unfit for consumption).

It is important to note that when food is classified as rescuable this does not take into account the economic viability of rescuing the food, but refers to the safety of its consumption and the technical capability of using the wasted food to feed people.

Value of Rescuable Food in the Food Chain (In NIS millions, rounded for ease of presentation)



Source: BDO estimates



A Leket Israel truck collecting surplus produce from a farmer's fields. Credit: Leket Israel

The value of rescuable food is approximately NIS 6.4 billion, with wasted food increasing in value as it progresses through each stage of the value chain and more resources are invested in raising, producing, packaging, and transporting it. The table below demonstrates that most of the wasted value is concentrated in the retail and distribution sector, as the food wasted in this sector is ready to be sold and consumed but goes to waste before it reaches the end consumer.

According to estimates, under economically viable conditions and given the appropriate resources, roughly 50% of food waste is rescuable and can be used to feed needy populations suffering from food insecurity. Furthermore, rescuing 50% of the food currently being wasted would save the Israeli economy approximately 200 million cubic meters of water, the production of over 600 million kWh,

37 thousand tons of fuel, and the use of significant land resources.

In the current report, household food waste is not classified as rescuable. There are various approaches to the issue of food waste in household consumption. Western culture is based on consumerism and overabundance and it seems consumers derive benefit and joy not only from consuming food, but also from having a variety of available options, even to the point of excess. From an economic perspective, as long as consumers pay full price for the products they purchase, there is no justification for restricting their consumption. However, food production entails the use of natural resources and has an environmental impact, and these external costs are not reflected in the price consumers pay for food. Therefore, there is justification for taking action

to encourage the reduction of food waste. This could be done for example, through government-sponsored campaigns, as has been implemented in several Western countries, in order to raise

public awareness regarding the external impact of producing food that is left unconsumed, including wasting the consumers' financial resources and damaging the environment.

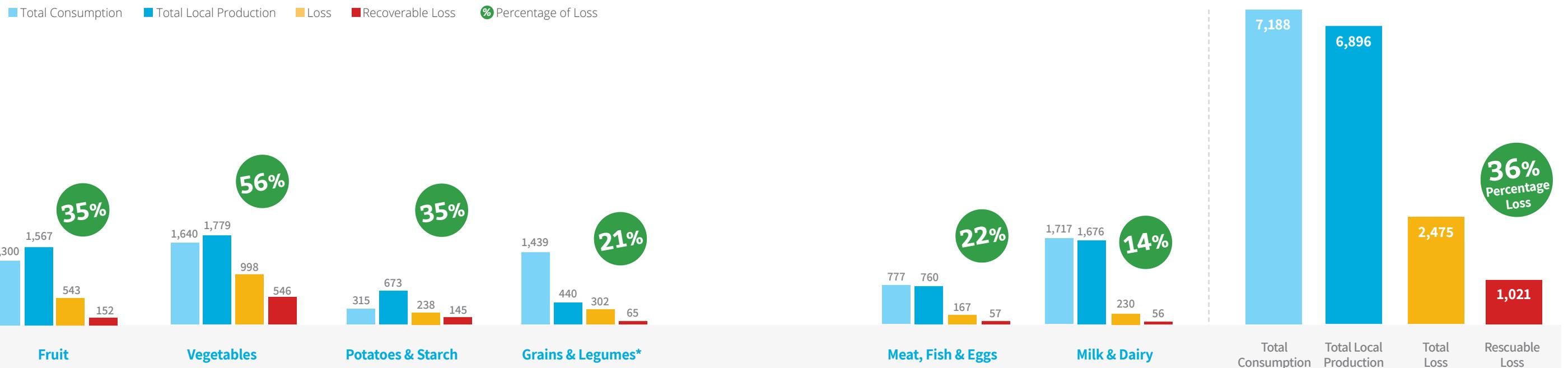
Rescuable Food

- ✓ Pre-harvested edible agricultural produce
- ✓ Aesthetically flawed agricultural produce
- ✓ Agricultural produce not sold in wholesale markets
- ✓ Unsold food surplus in markets/stores
- ✓ Surplus prepared food from catering, industrial kitchens & restaurants
- ✓ Packaged food with damaged packaging or misshaped
- ✓ Food nearing its sell-by date that will not be sold

Food Waste Unfit for Human Consumption

- ✗ Sick livestock or carcasses
- ✗ Diseased food
- ✗ Damaged or contaminated food (beyond aesthetic defects)
- ✗ Spoiled food
- ✗ Production leftovers (peels, seeds, skin, fat)
- ✗ Food already served and left unconsumed

Estimated Rescuable Food in Israel, Throughout the Value Chain, in Thousands of Tons



* Grains & legumes waste was calculated based on consumption as most grains are not produced in Israel.

Source: BDO estimates



**Food Security: How
Much Food is Required
to Close the Food
Security Gap in Israel?**

18.7% of households in Israel are food insecure

NIS 3.9 Billion The value of food required to complete food security in Israel

Food Security: How Much Food is Required to Close the Food Security Gap in Israel?

The Covid-19 crisis exacerbated the problem of food insecurity in Israel and around the world. The damage was twofold: on the one hand, households had less available income due to layoffs, workers being forced to take unpaid leave, and the self-employed having to stop their activity or completely go out of business. On the other hand, feeding programs in educational institutions were impacted by the lockdowns and fewer school hours, in addition to soup kitchens having to reduce their activity due to health restrictions.

The Covid-19 crisis is an inequitable pandemic from both a health and an economic perspective. The populations whose health has been most impacted in Israel are the elderly, ultra-orthodox Jews, and Arabs, also the populations characterized

by the highest rates of poverty and food insecurity.

In addition, certain industries were impacted more than others, such as food and hospitality services, tourism, art and culture, retail, and construction. These industries are characterized by low-wage service workers, whereas the industries that were not impacted as much and even grew as a result of the crisis (such as hi-tech, information and communications, and financial and insurance sectors) are characterized by high-salaried employees. This impact tends to aggravate the problems of food insecurity and inequality in the Israeli economy.

According to analyses of estimates based on the National Insurance Institute's report published in January 2021, the rate of food-insecure households in 2020 stood at 18.7%. Furthermore, according to this report, the Gini inequality index in Israel went up by about 8% before the financial support was given by the government, and went down by about 0.1% compared to 2019 after the financial support was received. Income inequality is one of the central challenges facing the Israeli economy and food insecurity is one of its byproducts.

The effect of the Covid-19 crisis on the problem of food insecurity is not unique to Israel. The pandemic increased food insecurity in almost every country around the world due to the impact on household incomes and the disruption of food

supply chain. Covid-19 had a devastating impact on global hunger and poverty, especially on the poorest and most vulnerable populations.

Food insecurity is highly correlated with financial crises. Since 2014 and until the pandemic erupted, the rate of food insecurity in the United States was declining, with 10.5% of Americans being classified as living with food insecurity in 2019. Based on surveys conducted by the United States Census Bureau, 2020 saw a significant rise of over 30% in the rate of food-insecure households due to the effects of Covid-19.

According to the definitions of the World Health Organization, which the National Insurance Institute in Israel also relies on, food security is based on three key pillars:

- 1 Food Availability** having a consistent supply of food in sufficient quantities.
- 2 Food Access** having enough resources to obtain sufficient amounts of foods.
- 3 Food Use** having adequate water and sanitation conditions and knowing how to use food properly.

A comparison of data regarding inequality and poverty reveals that in the United States, where similarly to Israel, inequality and poverty levels are among the highest in the developed world, the level of food security, paradoxically, is also among the highest. This seems to be the result of a public awareness that has been cultivated over many years regarding the problem of food insecurity, as is expressed in programs such as SNAP (Supplemental Nutrition Assistance Program, aka food stamps), which ensure that populations in need get adequate food. Likewise, the United States is a pioneer of the food bank system for rescuing food surpluses and distributing them to populations in need, and is a world leader in establishing policies that remove obstacles to the donation of wasted food.

Income inequality is one of the central challenges facing the Israeli economy and food insecurity is one of its byproducts

Economic and Health Status of Population Groups Following Covid-19 Crisis

	Deaths per Hundred Capita, 2020	Population Living with Food Insecurity
Arabs	45%	0.17
Ultra-Orthodox Jews	33%	0.14
Elderly	*24%	0.53
General Population	18.7%	0.05

Source: USDA and Global Food Security Index *Israel's rank in the OECD

30. Food Security Survey 2016: Main Socioeconomic Findings, National Insurance Institute

Israel's Ranking in Inequality and Food Insecurity Indexes

	Israel	OECD Average	Israel's OECD Ranking
Inequality (Gini Index)	0.36	0.31	4
Poverty Rate	18.7%	11%	1



Despite similar inequality and poverty rates in Israel, in a routine year the rate of food expenditure for personal consumption is among the highest in the OECD and stands at approximately 17%, 2.5 higher compared to the United States. Therefore, a policy for rescuing food and distributing it to underprivileged populations would be a particularly effective welfare policy in Israel, where food is a major part of a household's expenditure.

The definition of food security is subjective. To examine whether food rescue would be an effective policy for increasing food security in Israel, the report used Chernichovsky and Regev's methodology, which defines normative food expenditure as the level of a household's food expenditure that remains constant even when the household's income increases.

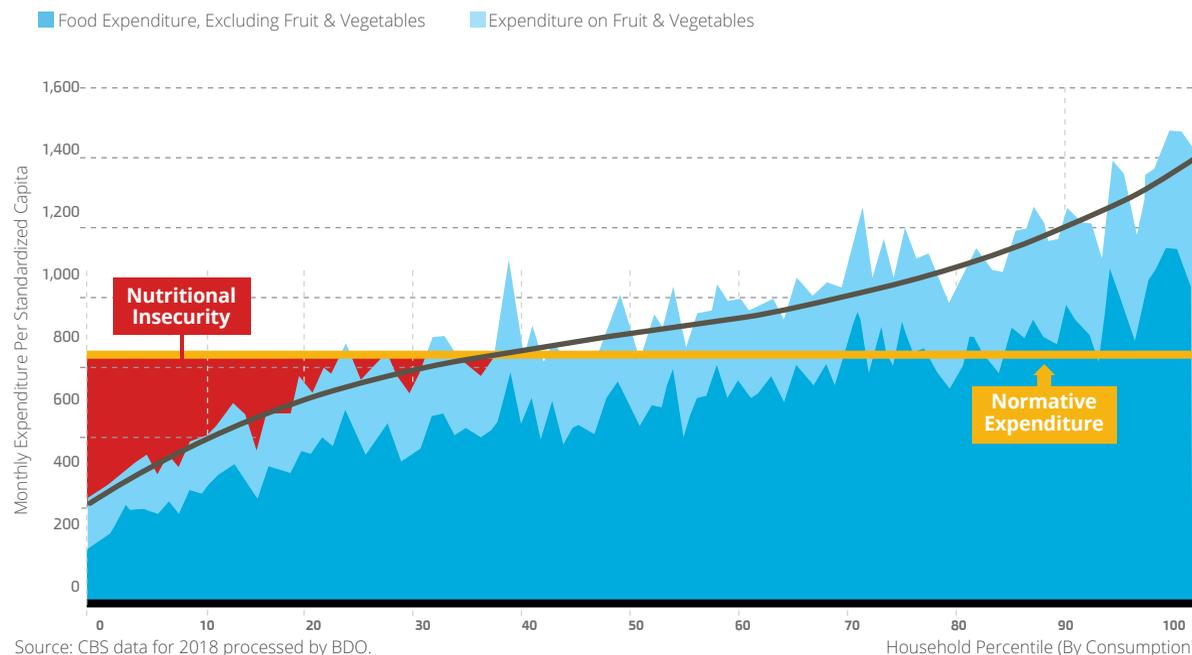
31. Patterns of Expenditure on Food in Israel, Taub Center, 2014.

To examine normative food expenditure, food expenditure in the lowest percentiles was compared to the normative levels. The analysis in this chapter shows that for the two lowest percentiles (in terms of standard consumption per capita), food expenditure was roughly half that of the normative level.

The volume of food required to bridge the gap between the actual consumption levels of food insecure populations and the normative consumption level (i.e. the average consumption of the second to fifth percentiles), is valued at approximately NIS 3.9 billion. The cost of eliminating this food expenditure gap for populations that are highly food insecure (about 9% of Israeli households) is estimated at approximately NIS 2.7 billion, and about another NIS 1.2 billion are required to close the gap for moderately food insecure populations.

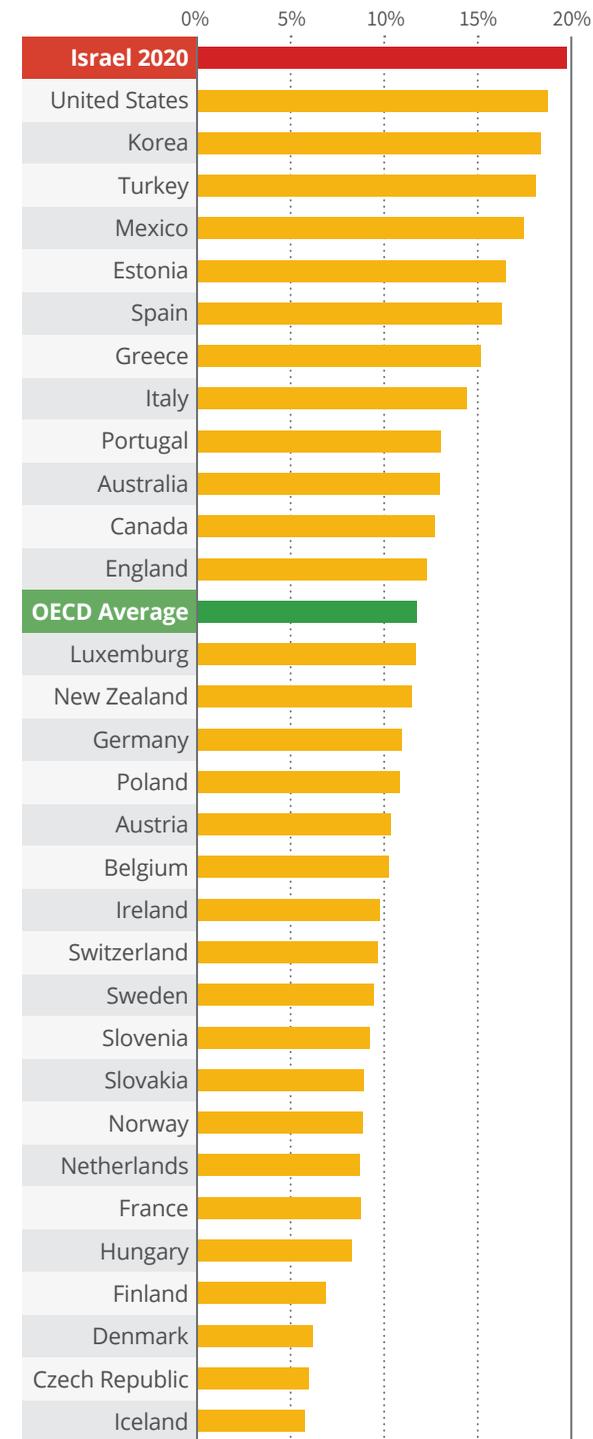
32. Excluding dining out, alcoholic beverages and carbonated beverages.

Per Capita Food Expenditure in Israel to Normative Expenditure Percentile Distribution



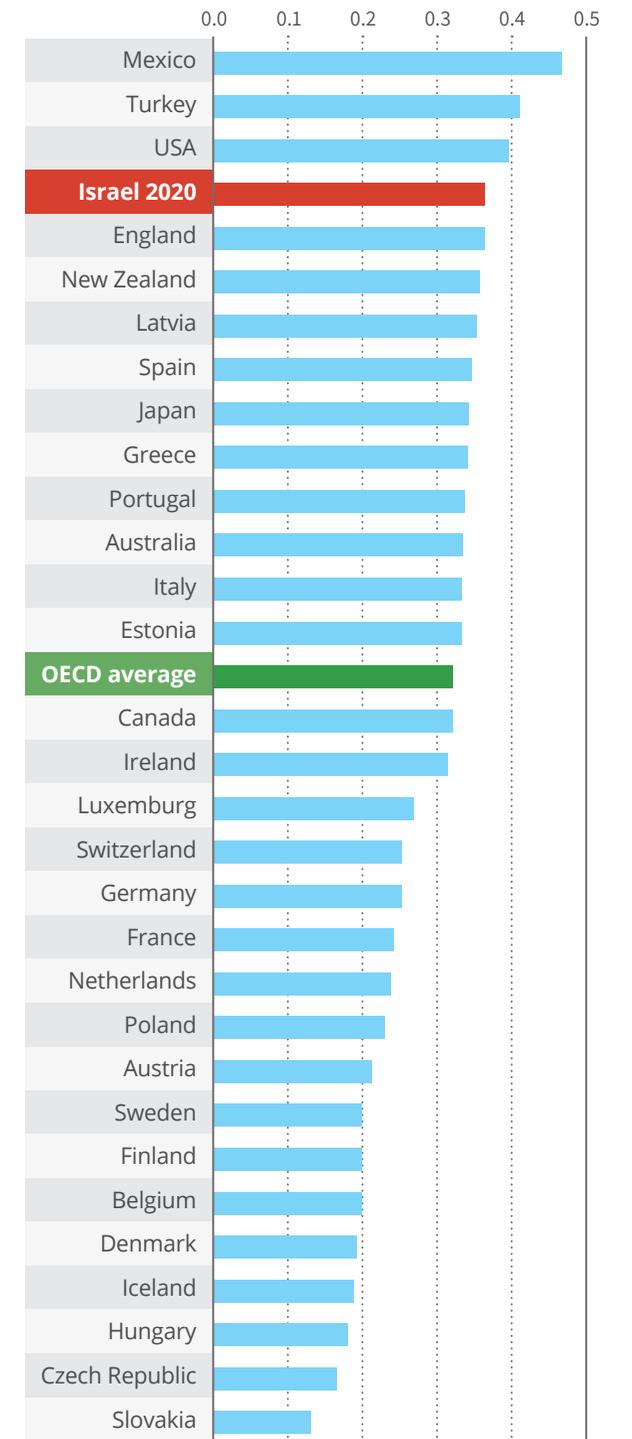
Source: CBS data for 2018 processed by BDO.

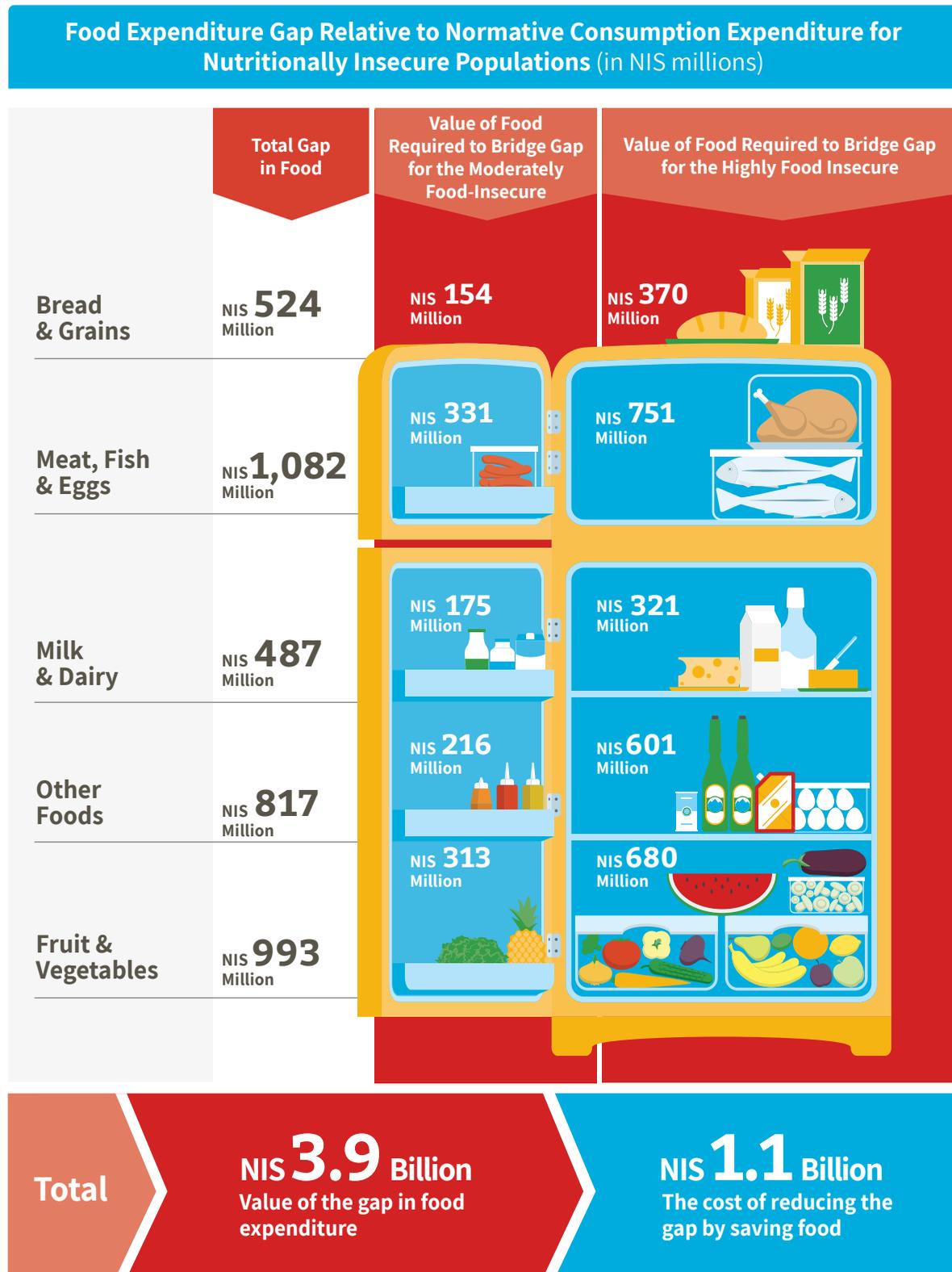
Poverty Rates, International Comparison 2019 / 2020



Source: Economist 2018 Global Food Security Index

Inequality (Gini Index) International Comparison 2019 / 2020





The rescue of approximately 600 thousand tons of wasted food each year, which constitute about 25% of overall food waste in Israel, would enable the food expenditure gap in Israel to be closed. According to the estimates presented in this report, it would cost about NIS 1.1 billion to rescue food valued at about NIS 3.9 billion, which is the total gap between the food expenditure

of insecure populations and the normative food expenditure level. At the same time, it would save about 95 million cubic meters of water, 300 million kWh of electricity, thousands of tons of fuel, about NIS 320 million as a result of reducing greenhouse gas and air pollutant emissions, and another NIS 200 million as a result of reducing waste treatment costs.



Volunteers at the Leket Israel Logistics Center, Credit: Leket Israel



**Food Rescue:
Potential Savings
for the National
Economy**

NIS 5.8 billion savings potential for the national economy

25% of wasted food rescued would enable the food expenditure gap in Israel to be closed completely

Food Rescue: Potential Savings for the National Economy

Rescuing around 600 thousand tons of wasted food annually, which constitute around 25% of food waste in Israel, would enable the food insecurity gap between the general population's normative food expenditure and that of those suffering from food insecurity to be entirely closed. According to BDO and Leket Israel estimates, the current rescue multiplier is 3.6, and when taking into account greenhouse gas and air pollutant emissions as well as waste treatment costs, the rescue multiplier rises to 4.2. This means that every shekel spent on food rescue saves food worth NIS 3.6 or NIS 4.2, respectively. Based on these multipliers, it would cost only NIS 1.1 billion to rescue food worth NIS 3.9 billion³³. This NIS 3.9 billion cost equals the value of the entire food expenditure gap that exists between the food-insecure population's consumption level and the normative consumption level.

Food rescue bridges the food insecurity gap while cutting the costs by 72% and provides significant social and environmental benefits

33. The cost of the nutritional gap of households living with food insecurity was calculated on the basis of the Chernichovsky and Regev report on food insecurity (Patterns of Food Expenditure in Israel, Taub Center, 2014), together with the CBS Household Expenditure Survey.

Without food rescue, an annual cost of NIS 3.9 billion in financial aid would be required to close this gap completely. Hence, food rescue is clearly preferable to the alternatives of government stipends, donations, subsidies or financial aid for the needy as a means of bridging the food insecurity gap. Food rescue makes it possible to reach the same social goal at the significantly lower cost of approximately NIS 1.1 billion annually. In other words, food rescue bridges the food insecurity gap while cutting costs by 72% and provides significant social and environmental benefits.

The problem of food insecurity is not only expressed in the amount of money spent on food, but also in the types of food consumed. An analysis of the average consumption basket of those who are food insecure compared to the average basket of the food-secure population reveals that the food insecurity often goes along with spending little on fruit, vegetables, meat, and fish, which have high nutritional value.

Thus for example, the gap in expenditure for highly nutritious food such as meat, poultry, fish, and fresh fruit and vegetables ranges from 55% to 70% of the normative expenditure, while the gap for other products, such as potatoes, bread and pita, is lower, and ranges from 15% to 25%.

Food Rescue: Summary of Estimated Savings to the National Economy (NIS millions/year)

Percentage of Rescued Food from Food Waste	1.5% (currently)	5%	10%	25%
Rescued Food (in thousand tons)	40	120	240	600
Food Rescued: Potential Share of the Nutritional Gap for Food Insecure Populations	7%	20%	40%	100%
Value of Rescued Food	60	850	1,750	3,900
Cost of Food Rescue	60	240	490	1080
Savings to National Economy (before external factors)	140	610	1,260	2,820
Social and Environmental Contribution (FAO)	200	600	1,200	3,000
Total Savings to National Economy from Food Rescue	340	1,210	2,460	5,820

Source: BDO estimates

According to principles of economic theory, income in the form of goods is less preferable than income in the form of money, because it deprives the recipient of the freedom to allocate resources according to their full range of needs. Therefore, in principle, the general tendency is to prefer monetary support over the direct provision of products. This economic principle is also known as "subsidize people, not products." However, in the case of food rescue, the unique set of circumstances present a clear economic advantage to supporting the needy with products over money. This stems from the specific characteristics involved in transforming waste into food, i.e. that every shekel invested in food rescue generates a direct economic return of 360%. Moreover, taking into consideration the environmental impact of greenhouse gas emissions, air pollutants, and waste treatment, the return on investment for the economy rises to 420%.

Food insecurity often goes along with spending little on fruit, vegetables, meat, and fish, which have high nutritional value

In this context, it should be noted that those suffering from food insecurity also suffer from financial insecurity, expressed in consumption gaps for other basic necessities (housing, health, education, etc.). It is likely that food rescue would enable these households to effectively allocate some of their increased disposable income towards the consumption of other goods. From a social perspective, these households view consumption of such products as prerequisites for ensuring their financial security.

Therefore, beyond the direct value of the rescued food distributed to them, they also benefit from having more resources available for purchasing other goods and services.

In the case of food rescue, the unique set of circumstances present a clear economic advantage to supporting the needy with products over money. This stems from the specific characteristics involved in transforming waste into food, i.e. that every shekel invested in food rescue generates a direct economic return of 360%. Moreover, taking into consideration the environmental impact of greenhouse gas emissions, air pollutants, and waste treatment, the return on investment for the economy rises to 420%

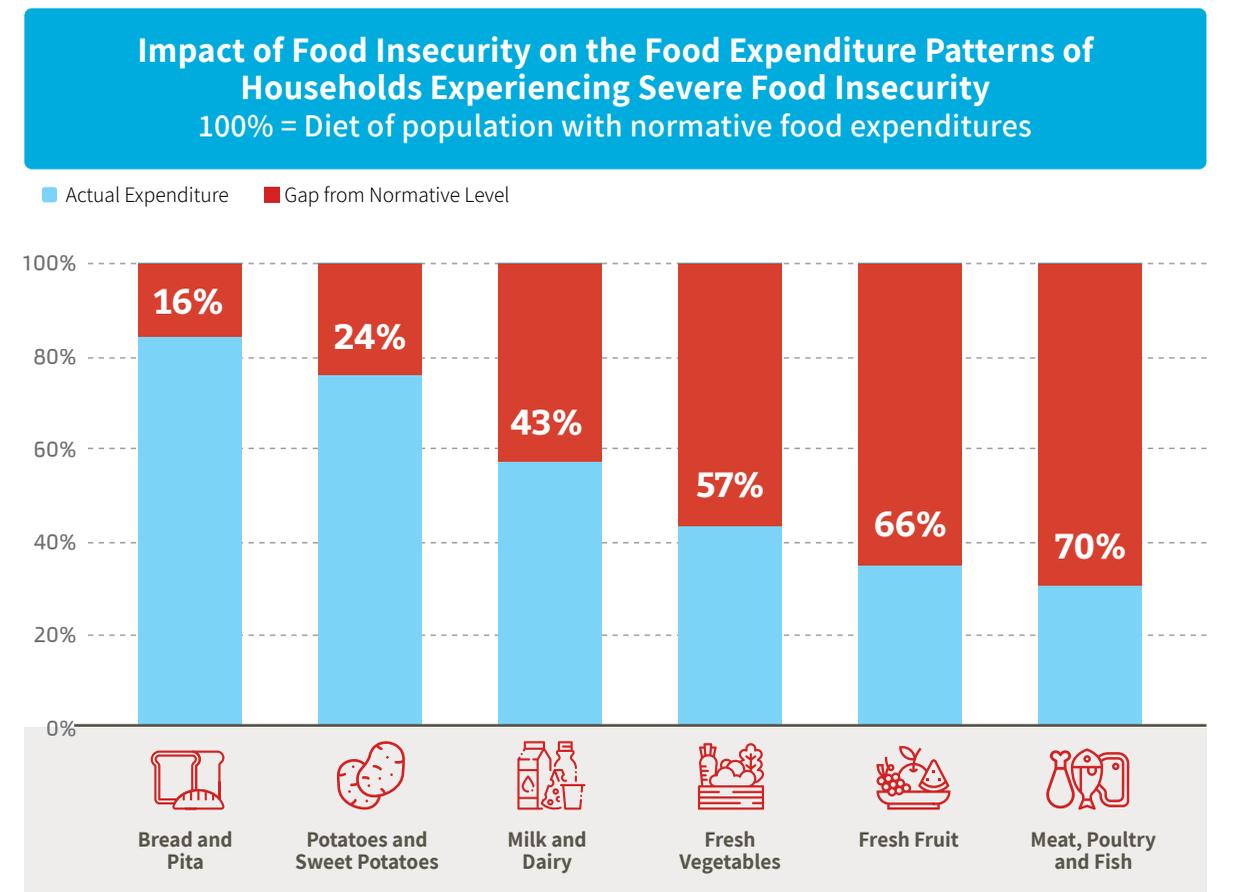
In September 2015, in the context of the Sustainable Development Goals, the United Nations and United States government adopted the national goal of reducing food waste by 50%

34. Seventeen global Sustainable Development Goals adopted by the UN General Assembly in 2015.

within fifteen years. Analysis of the data in this report shows that achieving even less than half of that goal, and donating the rescued food to approximately 465 thousand households suffering from food insecurity in Israel, would fully close the gap between their food intake and the normative level. In terms of the national economy, this would mean annual savings of about NIS 2.8 billion, bridging the gap between the value of the rescued food and the cost of rescuing it. This is before taking into account the added benefits resulting from the reduction of poverty and inequality in the economy and before factoring in the external benefits to the environment.

It should be emphasized that the incremental implementation of the 50% national food waste reduction goal over a fifteen-year period is not expected to reduce the volume of agricultural production in Israel intended for local consumption compared to the current situation, but only to slow down the growth rate of local food production.

In terms of the national economy, this would mean annual savings of about NIS 2.8 billion, bridging the gap between the value of the rescued food and the cost of rescuing it



Source: BDO analysis and Survey of Household Expenses, CBS



**The
Environmental
Impact and Cost of
Food Waste and Loss**

NIS 3.4 billion
The environmental cost
of food waste in Israel

The Environmental Impact and Cost of Food Waste and Loss

The restrictions imposed due to the Covid-19 crisis and the change in consumer behavior led to a decrease in total food waste, which reduced the environmental impact caused by food waste by about NIS 100 million. Most of the decrease occurred in the retail and consumption sectors, where waste volume decreased in the retail sector due to the transition from open market shopping to supermarket chain and online shopping, and decreased in the consumption sector due to the shift from institutional consumption to household consumption. On the other hand, there was an increase in environmental costs per ton of air pollutant and greenhouse gas emissions³⁵ of about NIS 300 million, leading to an overall increase of about NIS 200 million in environmental costs.

In addition, households made fewer shopping trips, as these were replaced by food delivery services, which slightly lowered the overall mileage and the consequent emissions. At the same time, the institutional market changed the way it served food, switching from buffet service to pre-packaged food that consumers pick up and consume elsewhere, which led to an increase in the amount of packaging material. However, these

changes have relatively little impact in relation to the overall environmental cost.

The food production process requires various resources, including land, water, fertilizers, chemicals, and energy. It accounts for approximately one fifth of all greenhouse gas emissions worldwide³⁶. Many of these resources are nonrenewable³⁷, and their use runs the risk of adversely affecting water, land, and air quality, as well as global biodiversity.

The environmental cost of food waste in Israel in 2020 is estimated at approximately NIS 3.4 billion, out of which NIS 1.35 billion are due to the unnecessary use of natural resources, NIS 1.27 billion are due to greenhouse gas and air pollutant emissions, and NIS 800 million is the direct cost of waste collection and processing³⁸. Food waste (including packaging) in all segments other than agriculture produced 1.9 million tons of municipal waste, which constitutes approximately 34% of all municipal waste in Israel.

Despite the negative environmental impacts of growing and producing food, agriculture is not perceived to be a polluting industry and environmental taxes and fees are generally not imposed on it. This is because the positive external

35. Based on external cost values in The Green Book 2020, the Ministry of Environmental Protection.

36. Food and Agriculture Statistics, fao.org

37. Cut Waste, GROW PROFIT. How to reduce and manage food waste, leading to increased profitability and environmental sustainability, 2012.

38. The data were rounded for convenience of presentation

impact of consuming the food is greater than the negative external impact of producing it. Many developed countries even subsidize production and consumption either directly or indirectly.

However, when food is wasted, in other words produced but not consumed, there remains the full environmental impact from growing, producing, and disposing the food, as well as treating the resulting waste, without anyone deriving any positive benefit from its consumption. Therefore, food waste is pure damage to the environment.

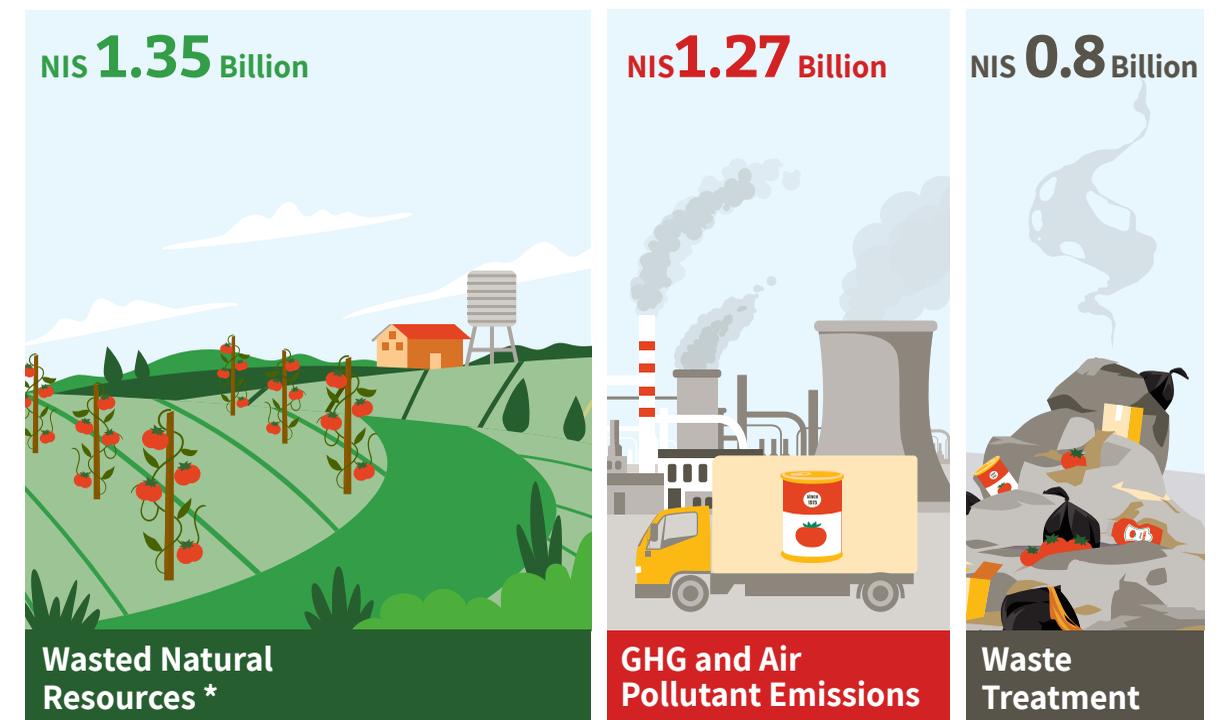
In recent years, the problem of food waste is gaining recognition around the world. To support the global effort, the United Nations and its Food and Agriculture Organization (FAO) have been working on instituting a uniform international index

for estimating the volume of global food waste. In addition, in 2019 the United Nations launched a new report³⁹ emphasizing the importance of examining the environmental contexts of food waste in addition to the socioeconomic ones. According to the report, using the life cycle assessment (LCA) approach to food waste and treatment may assist in developing a policy for reducing food waste.

A policy to reduce food waste could include a variety of measures that would lead to a reduction in food surpluses at the source, encourage the rescue of surplus food, and promote the use of composting and anaerobic digestion rather than disposing of waste in landfills. Numerous countries are using various policy tools to reduce food waste.

39. "Waste Not, Want Not: Reducing Food Loss and Waste in N. America through Life Cycle-Based Approaches". United Nations Environment Programme, 2019.

NIS 3.2 Billion The Environmental Cost of Food Waste in Israel:



* The cost of wasted natural resources is internalized at a market cost of about NIS 19.1 billion from food waste.

This report presents a study of the environmental impact of food waste and loss in Israel. The examination in this chapter focuses on the environmental impact in 2020 caused by greenhouse gas and air pollutants emitted as wasted food was produced, consumed, and discarded, the natural resources (water and land) that were lost as a result of this waste, and the environmental impact resulting from the need to treat this waste. The external costs of greenhouse gas and air pollutant emissions were quantified according to the FAO's methodology⁴⁰. The external environmental impacts on land and water quality as well as damage to biodiversity were not examined at this stage. Therefore, the estimated environmental cost of food loss and waste in Israel presented in this chapter is an

underestimation and provides a foundation for assessing the environmental cost of food waste and loss in Israel in the upcoming years.

It is important to note that **the environmental impacts quantified and presented in this chapter include only those that occurred within the geographical boundaries of the State of Israel**. Natural resources invested in growing food outside of Israel and the emissions from the growing and production processes were not included in this report. A relatively large part of certain foods that are consumed in Israel, such as grains and meat products, are imported. Therefore, the environmental impact of food consumed and discarded in Israel is greater than the total environmental impact quantified in this chapter.

40. FAO, Food Waste Footprint Full Cost Accounting, 2014.

Environmental Costs of Food Waste 2020, By Cost Driver, in NIS billions

Cost Driver	Wasted Resources	Emissions Cost	Waste Treatment Cost	Natural Resources Cost (Land and Water)
Waste	1.8 million tons municipal waste 0.9 million tons agricultural waste	0.5	0.8	-
Electricity Generation <small>not including electricity for water desalination & purification</small>	1,230 Million kWh	0.2	-	-
Emissions from Animal Sources	3,000 tons ammonia	0.3	-	-
Fuel Combustion	70 thousand tons	0.1	-	-
Water	180 million m ³ fresh water 210 million m ³ treated waste water	0.1	-	0.6
Fertilizer Use	50 thousand tons	0.03	-	-
Land Use	1 million dunams agricultural land			0.75
Total		1.27	0.8	1.35
Total Environmental Cost, 2020		NIS 3.4 Billion		

Source: BDO

6% of GHG emissions in Israel result from food waste

The environmental impact of food production at all stages (production, processing, sales, consumption, and disposal) results from the use of energy and resources, and these vary according to the crop type. These costs are added to the economic and environmental cost of treating the food and packaging waste.

Additional resources that were lost along with the food wasted in Israel in 2020 include 1,230 million kWh of electricity, a quantity sufficient to manufacture all the computers and electronic and electric devices in Israel in one year; 70 thousand tons of fuel, which is enough to fuel about 160 thousand cars for one year; 180 million cubic meters of freshwater - enough to fill 56 thousand Olympic swimming pools, as well as 210 million cubic meters of wastewater; and one million dunams of agricultural land - 20 times the area of Tel Aviv. In addition, 200 thousand tons of waste (packaging, industrial waste, etc.) were created, 50 thousand tons of fertilizer were used, and livestock emitted 3 thousand tons of ammonia over the course of the year.

Together, these contributed to 5 million tons of greenhouse gas emissions resulting from food waste in Israel in 2020, constituting approximately 6% of total greenhouse gas emissions in the country. In Government Decision No. 171 dated July 25, 2021 on the topic of transitioning to a low-carbon economy⁴¹, the Israeli government set an updated national goal of reducing greenhouse gas emissions by 27% by 2030 and by 85% by 2050 compared to greenhouse gas emissions in 2015. To achieve these goals, in that same decision

41. Government Decision No. 171 In gov.il

the Israeli government also set sectorial targets to reduce greenhouse gas emissions and make energy consumption more efficient. These included "reducing greenhouse gas emissions caused by solid waste by at least 47% by 2030 compared to emissions measured in 2015," "reduce greenhouse gas emissions from municipal waste by at least 92% by 2050 compared to emissions measured in 2015, which stood at 5.5 million tons a year," and "a 71% reduction in the volume of landfilled municipal waste by 2030 compared to the amount of municipal waste landfilled in 2018, which stood at 4.5 million tons a year." Reducing the amount of food waste in Israel would assist the national effort to meet the targets of reducing greenhouse gas emissions and the amount of municipal waste landfilled.

Water expended and lost as a result of food waste would fill:

56,000 Olympic swimming pools

In an arid country such as Israel, water is a valuable and limited resource. The 180 million cubic meters of freshwater lost as a result of food waste could fill 56 thousand Olympic swimming pools, or alternatively, raise the water level in the Sea of Galilee by over 1 meter, or provide enough water for about 3.5 million residents for an entire year⁴². An examination of the water costs wasted along with the food reveals that the lost water cost the Israeli economy approximately NIS 600 million.

Land is another limited and valuable resource in Israel. The one million dunams (1,000 square kilometers) of agricultural land used to grow wasted food is valued at approximately NIS 800 million.

42. Based on household water consumption.

Food waste constitutes approximately a third of the total household waste produced in Israel

The environmental impact of food waste stems not only from excess food production and consumption patterns that involve the wasting of natural resources and air pollution, but also from the way food is treated once it is discarded. Treating food waste once it is discarded and in particular, transferring it to landfills, cause additional environmental impacts. It's known that 34% of household waste in Israel consists of organic matter originating in food⁴³. Thus, food waste increases the total amount of waste that needs to be treated, and when unsorted, makes it difficult to recycle other materials found in household waste.

43. Based on a waste composition survey conducted by the Ministry of Environmental Protection in 2013.

Most of the waste in Israel is landfilled, and this has many negative environmental impacts. Landfills require large areas of land and thereby contribute to the depletion of land resources in Israel. In addition, a variety of air pollutants and greenhouse gases are emitted when waste is transported to distant landfill sites around the country. Moreover, landfills can potentially contaminate adjacent land and water resources due to environmentally harmful substances seeping through layers of water and soil⁴⁴.

The amount of municipal waste produced in Israel each year is estimated at approximately 5.6 million tons⁴⁵. Food waste in Israel in 2020 was estimated at around 2.5 million tons, out of which about 1.6 million tons⁴⁶ required end facility treatment (as part of the municipal waste treated in Israel). Added to this were approximately 200 thousand tons of waste from food packaging, leading to a total of 1.8 million tons of food and packaging waste, which constituted about a third of the

44. Water and land contamination costs were not quantified in this report.

45. Estimated by the Ministry of Environmental Protection for 2018.

46. About 850 million tons were from the agricultural stage where food remained in the field and generally did not require any further treatment.

Environmental Costs of Israel's Food Waste in 2020
By Stage of Food Loss, in NIS millions

	Agriculture*	Processing	Distribution	Consumption**	Total
Fruit & Vegetables	383	25	403	895	1,706
Grains & Legumes	141	81	100	217	509
Milk & Dairy	103	45	63	259	470
Meat, Fish & Eggs	121	147	168	266	702
Total	748	297	735	1,637	3,417
Percentage of Total	22%	9%	21%	48%	100%

* The agricultural stage also includes waste and losses from the processing and packaging stage.

** Emissions due to the use of water, electricity, and gas were not included in the consumption stage.

Source: BDO

waste in Israel and required treatment. Treating this amount of waste required approximately 180 thousand compacting garbage trucks⁴⁷, which is the equivalent of 495 loaded trucks operating every day for an entire year.

The volume of waste requiring treatment necessitates the allocation of significant resources, including economic and statutory support for sorting and end solutions. Waste treatment costs consist of several factors, including the costs associated with waste storage, collection, and removal, sorting and transit facilities, and transportation, as well as the cost of the treatment itself, depending on the type of treatment required and landfilling fees. The direct annual cost for treating food waste and associated packaging⁴⁸ in Israel stands at NIS 800 million (based on waste treatment cost estimates conducted by the Ministry of Environmental Protection, Waste Policy 2030). In addition, the external costs of greenhouse gas and air pollutant emissions caused by treating the waste stands at NIS 500 million. The total direct external economic cost for treating waste resulting from food loss in Israel in 2020 stands at approximately NIS 1.3 billion.

47. Compacting garbage trucks with a 10-ton capacity.

48. Not including food waste from agriculture.

50% of the environmental impact resulting from food loss is caused by consumer waste

The environmental impact related to agricultural produce is quantified in regard to the product's entire lifecycle, including production, post-harvest handling, storage, processing, distribution, consumption, and disposal. The further along a product is in its lifecycle when it is wasted or discarded, the greater its environmental impact. This is because the environmental footprint of food waste stems from three different components: impacts resulting from the stage of the value chain

when the product is discarded; impacts stemming from the product ending up as waste; and impacts stemming from previous stages of the value chain (if there are any).

Food wasted at the consumption stage accounts for approximately 50% of the environmental cost of food waste. Consumer food waste includes all the cumulative environmental impact resulting from its production, transport, processing, and distribution prior to reaching the consumer. In 2020, food worth NIS 10.5 billion and weighing 1.2 million tons (including packaging) was discarded during the consumption stage⁴⁹. In addition to the cost of the food waste itself, there was the unnecessary cost of waste treatment, which consumers paid indirectly through municipal fees totaling at around NIS 500 million, and environmental damage of around NIS 700 million was caused due to greenhouse gas and air pollutant emissions.

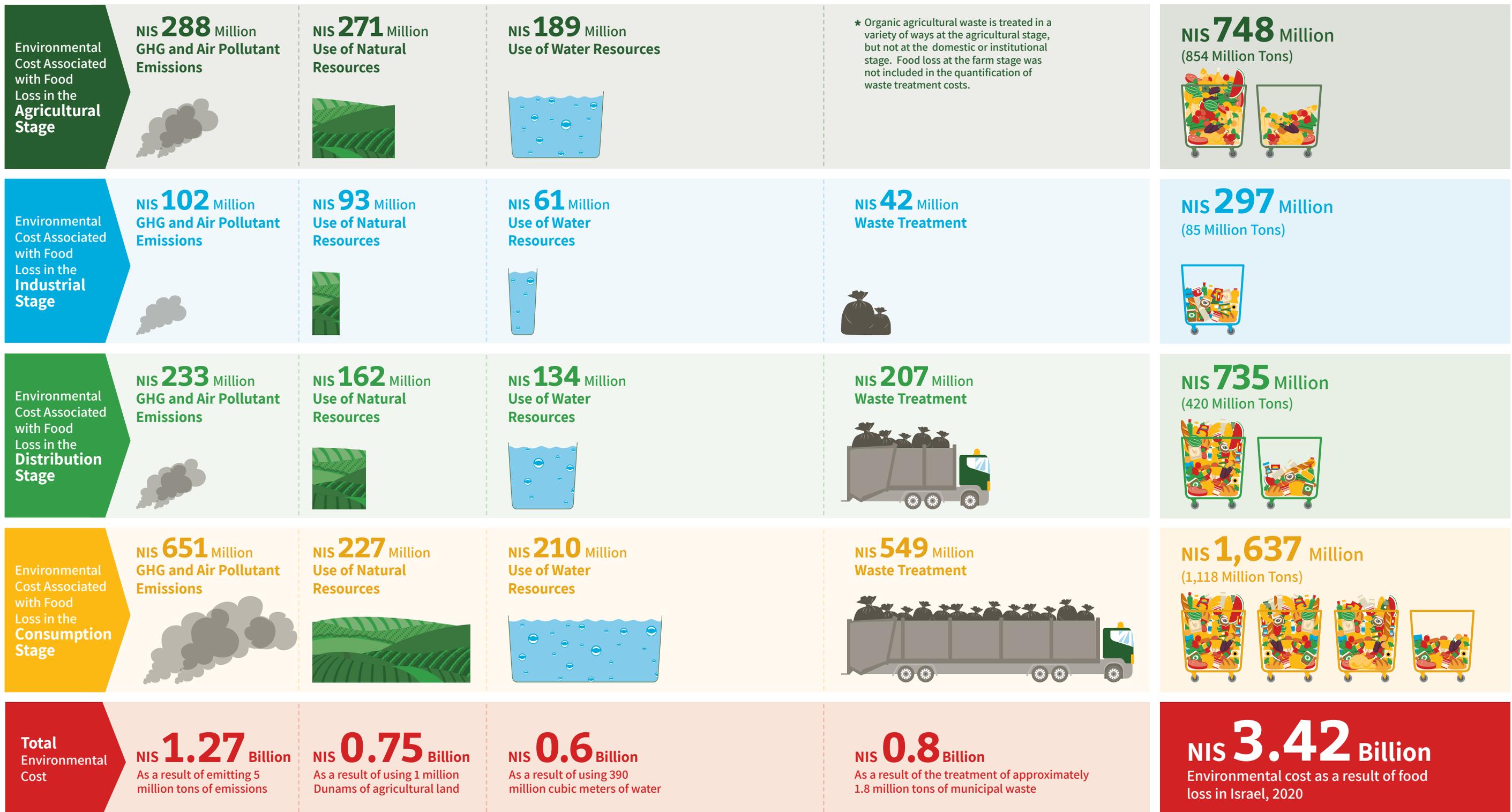
In 2020, following the Covid-19 crisis and the lockdowns that ensued, households' shopping trip mileage decreased. At the same time, the amount of food delivered to homes increased. The assumption is that food delivery travel routes make fuel use more efficient in the consumption sector, and accordingly, less fuel was consumed by households in 2020, thereby reducing the pollution resulting from shopping trips in this sector.

At the same time, during the lockdown months, there was an increase in the volume of food packaging due to food deliveries from retail chains and restaurants.

An examination of the environmental impact of food waste according to the stage at which the waste was created reveals that around 60% of the impact is attributable to the agricultural stage. This is because the costs associated with food discarded at later stages - processing, distribution and consumption - include costs resulting from the impacts of prior stages.

49. The consumption stage includes household and institutional consumption.

Environmental Cost of Food Waste by Stage of Loss



Animal-based food products have the greatest negative environmental impact

An examination of the different food product categories reveals that animal-based food products have the greatest environmental impact. Environmental cost factors vary between different types of foods. For wasted meat, eggs, and fish, about half of the environmental cost stems from the loss of natural resources. For dairy products, most of the cost is due to greenhouse gas emissions and air pollutants, while for fruit and vegetables, the cost is evenly distributed between the cost of waste treatment, the loss of natural resources, and greenhouse gas emissions and air pollutants.

International comparison: GHG emissions caused by food waste ⁵⁰

According to FAO assessments, the amount of food wasted globally is approximately 2.5 billion tons per year. The total amount of greenhouse gases emitted as a result of growing and producing unconsumed food was estimated by the FAO at approximately 3.3 billion tons. This amount includes greenhouse gas emissions from every stage of the food growing and production stages, as well as the emissions caused by food being discarded and treated as waste ⁵¹.

The FAO estimates the global cost of greenhouse gas emissions from food waste at approximately \$394 billion a year ⁵². This cost depends on local conditions and varies according to the specific type of agricultural product.

The international comparison presented in the FAO study and the graph below show that the level of greenhouse gas emissions per capita resulting from growing and producing unconsumed food is relatively similar in various regions around the world (100-200 kg of greenhouse gases per capita) when food waste occurs at the early stages of the value chain, i.e., during the agricultural, processing, and packaging stages. On the other hand, there are significant differences between various regions in emissions per capita at the later stages of the value chain – i.e. processing, distribution and consumption (100-700 kg of greenhouse gases per capita).

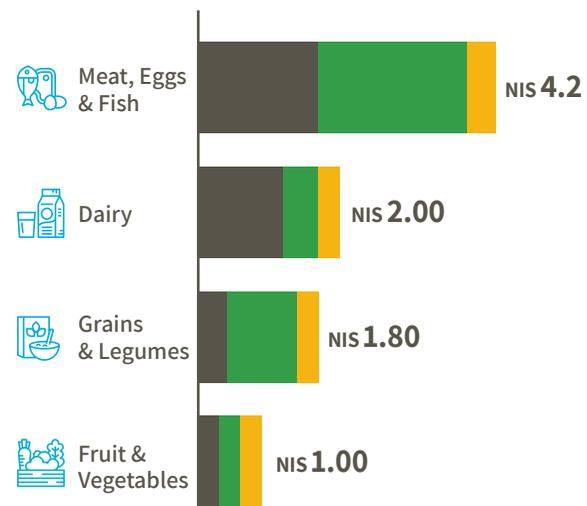
50. Based on data from previous years (pre-Covid-19) as official data on how the crisis affected food waste in 2020 has not yet been published.

51. As the FAO study did not quantify air pollutants resulting from the production and discarding of food, the comparison presented below includes only greenhouse gas emissions caused by food waste.

52. Estimated by the FAO in 2014.

Cumulative Environmental Cost per Kilogram of Wasted Food in Israel in 2020, in NIS

■ GHG and Air Pollutant Emissions ■ Wasted Natural Resources ■ Waste Treatment



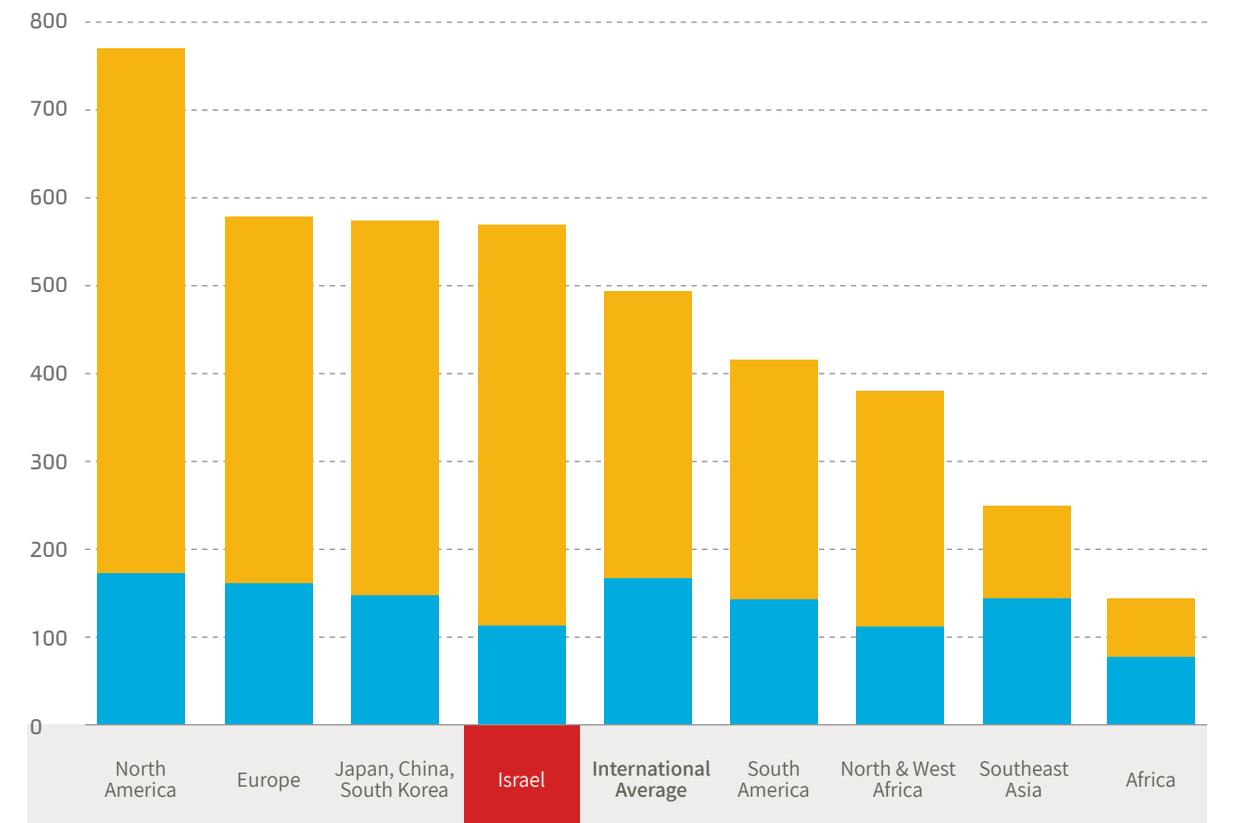
Source: BDO

Apparently, the gaps in greenhouse gas emissions between moderate and high-income regions such as Europe and North America, and low-income regions such as Africa and South East Asia, stem from differences in the amount of food wasted at each stage in the value chain, different dietary habits (the consumption of animal products leads to more greenhouse gas emissions), and different agricultural cultivation methods (industrial agriculture emits more greenhouse gases).

In Israel, 5 million tons of greenhouse gases are emitted as a result of growing and producing unconsumed food, constituting approximately 6% of greenhouse gas emission in the country each year. Most of the food waste occurs during the consumption stage. Animal products are part of the diet of most households and the agricultural methods are industrialized. As a result, greenhouse gas emissions per capita are higher than the global average and are on par with the European average.

GHG Emissions from Food Waste, by Geographical Region, Kg Per Capita

■ Kg of greenhouse gases per capita from processing, distribution and consumption ■ Kg of greenhouse gases per capita from farming, cultivation, and packaging



Source: FAO and BDO analysis



**Food Rescue:
Integrating Economic,
Environmental, and
Social Contributions**

1 Million Tons rescuable food in Israel, 2020



The rise in food waste and the widening of the food insecurity gap that occurred due to the pandemic reinforce the national need to use food rescue as a central national policy tool.

Food Rescue: Integrating Economic, Environmental, and Social Contributions

In 2020, there were 1 million tons of rescuable food in Israel. The rise in food waste and the widening of the food insecurity gap that occurred due to the pandemic reinforce the national need to use food rescue as a central national policy tool.

During the Covid-19 crisis, the national need to use rescuable food as a policy tool for closing the food insecurity gap became even clearer. As the need to provide food for food-insecure populations increased during the crisis, food waste increased in the agricultural and household sectors due to the lockdowns. Rescuing this food could have helped mitigate the problem of food insecurity in Israel.

Food waste is an international phenomenon. It is not unique to the Israeli economy and exists on a similar scale in all Western countries. The United Nation's Food and Agriculture Organization (FAO) estimates that, in quantitative terms, approximately one third of all the food produced worldwide is wasted, which translates into approximately one quarter in terms of the total caloric value.

The Food Recovery Hierarchy set forth in the European Union's directive on food waste sets priorities for the treatment of unconsumed food. This hierarchy clearly prioritizes food waste prevention and using wasted food to feed underprivileged populations.

Many policy measures exist to address the needs of underprivileged populations and to

help alleviate the problem of food insecurity. The most commonly used methods in Israel include donations, subsidies, stipends, and financial aid. Food rescue is unique in that it makes it possible to help those in need at a low budgetary and economic cost: instead of having to finance the full cost of buying food, only the cost of food rescue needs to be financed.

Rescuing food and distributing it to underprivileged populations increases economic productivity while simultaneously reduces inequality

In the socioeconomic discourse in Israel and around the world there is an ongoing dispute between those who advocate prioritizing growth ("increasing the pie") and those who believe the reduction of inequality should be prioritized as a main goal.

Food rescue is unique because it is a policy tool that inherently integrates both of these approaches. Rescuing food and distributing it to underprivileged populations increases economic productivity while simultaneously reducing inequality.

The importance of rescuing food stems from three main benefits

1. The Economic Benefit

Food waste is detrimental to economic productivity because of the production and labor inputs that are irretrievably lost. Food rescue means converting waste with zero or negative value into a product that has economic value, and the fact that rescued food retains its full nutritional value, explain how food rescue contributes to increasing productivity in the economy.

2. The Social Benefit

The cost of food waste throughout the entire value chain, from growing and production through distribution, sales, and consumption, is ultimately passed onto the consumer and affects the cost of living in Israel. Therefore, food rescue contributes to closing gaps in society and lowering the cost of living, and reduces food insecurity among underprivileged populations.

3. The Environmental Benefit

During the growing, production, distribution, and sales processes, about 35% of the volume of local food production is lost and turns into waste or surpluses. When that happens, all of the resources required to cultivate and produce the food are irretrievably lost. These include land, water, fertilizers, chemicals, and energy. Some food production also requires animal feed and uses resources to grow and produce it. Many of

the resources used by the food industry are non-renewable and their use adversely affects water, soil, air, and biodiversity. Furthermore, agriculture causes air pollution as a result of energy and fuel consumption.

Food Rescue Benefits		
	Food Production	Food Rescue
Product	 Nutritional Foods	 Nutritional Foods*
Nutritional Value	100%	100%
Land Use	Yes 	Negligible 
Water Use	Yes 	Negligible 
Greenhouse Gas Emissions During Production	Yes 	None
Use of Fertilizers and Pesticides	Yes 	None
Logistics, Distribution and Transportation Costs	Yes 	Yes 

However, the environmental impact of food waste is not only the result of excessive food production. It is also caused by food waste treatment, as most food waste is transferred to landfills. Landfilling damages the soil and contributes to climate change due to methane emissions produced by the decomposition of organic waste. Moreover, approximately one third of household waste consists of organic waste originating in food. Therefore, discarded food increases the volume of waste requiring treatment and affects the quality of other recyclable materials found in household waste. Food rescue maximizes the use of the resources already invested in producing the food and prevents the need to use additional environmental and other resources.

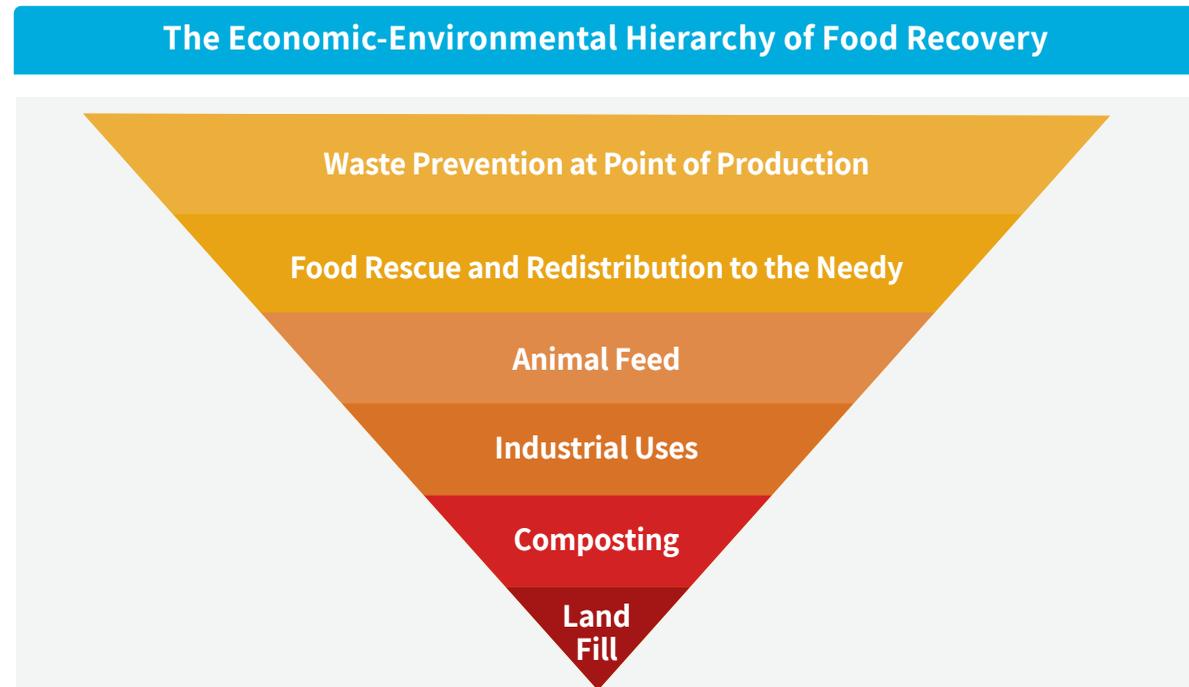
The combination of these three characteristics of food rescue call for appropriate policy tools that reflect these benefits.

One million tons, which is about half of the total amount of wasted food, is rescuable. Rescuing it would prevent about 2.5% of greenhouse gas emissions in Israel⁵³.

53. Out of a total of 80 million tons of greenhouse gas emissions in Israel annually.

The majority of food rescue in Israel and abroad is carried out by nonprofit organizations (NPOs) that are supported by donations. However, even if funding for food rescue is derived from donations, the main foundation of food rescue activity is not primarily philanthropic or charitable, but an alternative economic method of food production that is clearly beneficial to the national economy, above and beyond its important contribution to reducing social inequality.

The main foundation of food rescue activity is not primarily philanthropic or charitable, but an alternative economic method of food production that is clearly beneficial to the national economy, above and beyond its important contribution to reducing social inequality



Source: EPA

The direct cost of food rescue averages at approximately NIS 1.4 for every kilogram of food. The direct value of rescued food is NIS 5.1 per kilogram, yielding a multiplier effect of 3.6. In other words, every NIS 1 invested by NPOs in food rescue provides income in the form of products worth NIS 3.6 for underprivileged people. Food rescue in Israel is still in its infancy and there seems to be potential for expanding the activity, utilizing economies of scale to reduce the cost of food rescue, and raising the value of rescued products. However, for reasons of conservatism, the assessments here are based on the current cost structure.

In terms of benefit to the national economy, it is also necessary to consider the positive environmental contributions of food rescue [see Chapter 7]. The environmental benefit of reducing greenhouse gas and air pollutant emissions as

well as waste treatment stands at about NIS 0.8 per kilogram, yielding a multiplier effect of 4.2. In other words, when incorporating greenhouse gas and air pollutant emissions as well as waste treatment [see Chapter 7], every NIS 1 invested in food rescue generates a value of NIS 4.2 for the national economy.

The volume of food waste in Israel is not unique and is similar to that in comparable developed economies around the world. However, unlike many other countries that have developed legislation, national policies, and multi-year targets to encourage food rescue and reduce food waste, in Israel there is still no national policy for dealing with this issue.

In recent years some initial steps have been taken in regards to regulation and incentives [for additional information on government initiatives, see Chapter 12].

Food Rescue Feasibility Assessment Food Cost / Benefit / NIS per Kg						
	Rescued Food Value*	Environmental Social Contribution (FAO)	Total Value to the National Economy	Rescue Cost	Gain from Food Rescue	Multiplier Value of Rescued Food/ Rescue Cost
Benefit to National Economy – Excluding External Factors	NIS 5.1	Not Included	NIS 5.1	NIS 1.4	NIS 3.7	3.6
Benefit to National Economy – Including External Factors	NIS 5.1	NIS 0.8	NIS 5.9	NIS 1.4	NIS 4.5	4.2

* Market price of an alternative product with the same nutritional value.

Source: BDO estimates



**Policy Tools for
Reducing Food Waste
and Loss, in Israel
and Around the World**



Governments implemented extraordinary measures to help those hurt by the Covid-19 crisis

Policy Tools for Reducing Food Waste and Loss, in Israel and Around the World

The spreading of the coronavirus led to significant disruptions to supply chains and production systems around the world. This hindered the availability of food while also causing economic damage due to many workplaces having to shut down. In addition, traditional systems for ensuring food security were impacted, such as educational institutions that feed pupils and soup kitchens that were closed, and more. Because of this, many countries saw an increase in the number of food-insecure households, leading them to implement special measures to help companies, organizations, and households get through the crisis.

Many countries implemented special measures to help companies, organizations, and households get through the crisis.

These policy measures included subsidies for food-insecure populations, transferring emergency grants and budgets to food banks and food rescue organizations, recognizing food banks as an essential service, providing special subsidies to farmers, expanding meals-for-students initiatives in various ways, establishing and expanding initiatives to supply food to the homes of the elderly and self-isolating, and more.

Following is a detailed overview of the policy tools used in response to the Covid-19 crisis in countries around the world:



Government Subsidies and Budgets

 **The European Union** authorized its members to make use of the Private Storage Aid program under which the European Union pays the storage costs instead of the manufacturers for a limited period of 2 - 6 months. In addition, the European Union relaxed the regulations on competition – for example, it allows dairy companies to plan dairy production together ⁵⁴.

In addition, the European Institute of Innovation and Technology allocated \$7 million for various agricultural projects with an aim to deal with the effects of Covid-19 on the supply chain and to reduce food waste by around 40% ⁵⁵. These included anti-viral coating on vegetables and smart pricing systems for foods in supermarkets.

54. The European Commission - Coronavirus- Commission announces exceptional measures to support the agri-food sector

55. Food ingredients first - EIT Food spearheads US\$7m funding to fast-track innovation amid COVID-19



In the United States, the federal government invested around US \$24 billion to support farmers who were impacted by the crisis. It created the Farmers to Families Food Box Program, which buys food from farmers and delivers food boxes to food banks and NPOs. The program's budget until January 2021 stood at around US \$8.5 billion. As part of the program, food banks distributed 132 million packages, constituting about 3.3 billion meals ⁵⁶.

The ongoing annual federal budget for food banks stands at about US \$650 million. In 2020, an additional US \$850 million was approved as emergency aid for dealing with the crisis, with US \$600 million exclusively designated for buying food, and another US \$873 million for purchasing food products and transferring them to food banks ⁵⁷.

Due to schools closing as a result of the crisis, children who received free or lower-priced meals at school stopped receiving them. In response, the government issued P-EBT cards for buying food for children. About 3.7 million children enjoyed the benefit at a total value of around US \$1.4 billion ⁵⁸.

The Covid-19 crisis led to disruptions in the food supply chain between farmers, industry, and consumers. Consequently, the United States Department of Agriculture (USDA) authorized states to declare certain areas as "disaster zones" once the crisis had led to logistical difficulties in supplying food to them. The declaration enabled the USDA to transfer food packages from its inventories to residents, regardless of criteria such as level of income, etc. Disaster zones were declared in 21 states throughout the United States and food was provided to over seven million people who were severely harmed by the crisis. In addition, the USDA set up an online portal with tips for consumers on how to prevent food waste

56. US Department of Agriculture: USDA Announces Coronavirus Food Assistance Program, USDA Announces Continuation of the Farmers to Families Food Box Program, Fifth Round of Food Purchases

57. US Congress: The Emergency Food Assistance Program - Background and Funding, US Department of Agriculture: USDA Announces Coronavirus Food Assistance Program

58. California Department of Social Services: pandemic EBT 1.0 outcomes report, US Department of Agriculture: State Guidance on Coronavirus P-EBT, Find Meals for Kids When Schools are Closed

59. US Department of Agriculture, Disaster Household Distribution



In the United Kingdom, to facilitate cooperation between businesses with food surpluses and populations in need of these food surpluses, the government provided an emergency grant of about £5 million to the WRAP's resource foundation to rescue food surpluses ⁶⁰.

After schools had closed in the United Kingdom, pupils who routinely received free meals at school continued to receive them from the school via takeaway or delivery. The government also acted to reimburse schools for the additional costs incurred by delivering the meals. If a school did not supply meals, any eligible child could get a £15 weekly voucher to buy food at the supermarket ⁶¹.

Likewise, the British government allocated a budget of £16 million to assist food banks and NPOs in helping people who suffer from food insecurity. In addition, it strengthened the social security net for people who were severely impacted by the crisis at a total of £6.5 billion, by increasing the number of installments and extending the credit limits, which helped about 5 million vulnerable households. Likewise, the government allocated £170 million for helping families in need pay their bills and buy food in the winter months, which were transferred through the local authorities. For the summer months, the government allocated about £220 million, an amount expected to help about 50 thousand children.

Additionally, the British government relaxed its regulations and allowed potatoes that were intended for the institutional market to be sold to the private market to prevent waste and loss. It also relaxed the scope of European Union competition rules and enabled dairy manufacturers to cooperate along the supply chain. The government enabled the dairy industry to use the European Union storage practice in an aim to stabilize and balance product markets ⁶².

60. WRAP Organisation

61. United Kingdom Government - Coronavirus (COVID-19) free school meals additional costs: guidance

62. United Kingdom Government - New winter package to provide further support for children and families, COVID-19 and food supply: Government Response to the Committee's First Report Sixth Special Report, The British Parliament - COVID-19 and food supply

Likewise, the British government recognized food banks to be an essential service, which enabled them to keep operating during the lockdowns. It also transferred funds to various countries in Britain to help those suffering from food insecurity: about £7.8 million were invested in food packages for those struggling to buy food in Northern Ireland and about £70 million were invested in preventing food insecurity in Scotland. Among other things, the Scottish Welfare Fund's budget was more than doubled to £45 million. In addition, £63 million were transferred to local authorities as emergency aid for supplying food and essential products to residents in need ⁶³.

63. The Trussell Trust food bank - The impact of Covid-19 on food banks in the Trussell Trust network

 **In France**, the government passed legislation in February 2020, the purpose of which was to obligate food suppliers and the major catering companies to reduce their food waste by 50% by 2025. Smaller suppliers were obligated to meet this deadline by 2030. Similarly, the government created a new “no-food-waste” food label to encourage consumers to purchase food from companies that act to reduce food waste ⁶⁴.

In April 2020 the French Parliament passed a law raising the tax return ceiling (75%) for 2020–2021 on donations to food banks from €522 to €1000 in an aim to encourage individuals and companies to donate to food banks, whose needs have grown significantly as a result of the coronavirus crisis ⁶⁵.

In September 2020, the French government launched a program enabling eligible students to receive a scholarship for purchasing one meal a day at the price of €1 (instead of €3.30 per meal) in one of the restaurants or cafeterias operated by the Crous organization in universities and student dorms. Since January 2021, the program

64. The French Government - LAW n° 2020-105 of February 10, 2020 on the fight against waste and the circular economy

65. Banque Alimentaire food bank - Tax incentive for donations

has been expanded to offer two meals at the price of €1 to all students, in an aim to help the student population, which was severely impacted by the Covid-19 crisis ⁶⁶.

As a result of the travel restrictions and the reliance on foreign workers, there was a shortage of working hands in agriculture, which could have increased food waste in agriculture (as there would have been no one to harvest the produce). In response, France began encouraging the unemployed to work in agriculture by enabling them to continue to receive unemployment benefits in addition to their salaries from working in agricultural production.

The French government and European Union announced that the FEAD program's budget for 2021–2027 designated for France was going to be increased by about 48%. The FEAD program is operated by the European Union, which allocates special budgets to countries with an aim to help needy populations with food, housing, etc. The total budget allocated to France is expected to reach €870 million, out of which €87 million are to be financed by the French government ⁶⁷.

66. Publication in Euro News: Emmanuel Macron promises students one euro lockdown meals and a quick return to classes; Publication in The Mayor - French students can now claim meals for one euro

67. The European Commission - Fund for European Aid to the Most Deprived (FEAD), European Food Bank Federation

 **In Italy**, the government transferred a budget of €400 million in the form of vouchers for those struggling to buy food. The vouchers were distributed to the needy through the local authorities in Italy ⁶⁸. At the local level, the local authorities acted to get food delivered to NPOs: for example, when schools were closed, the Village Council of Milan acted to donate food from school kitchens to NPOs. In addition, the Council mediated between restaurants that were forced to shut down and NPOs to get food to the needy.

68. Publication in The Local - Coronavirus: The financial help available in Italy and how to claim it

 **In Australia**, the government transferred budgetary support at a total of AUD \$16 million to three food rescue organizations so food could be rescued and given to those in need ⁶⁸.

The Covid-19 crisis impacted the export of agricultural produce – many farmers were not able to sell their produce due to the lockdown. At the same time, the limited number of flights led to a rise in the cost of aerial transport, rendering it economically unfeasible for some, so that many farmers had to destroy their produce. To deal with the problem and prevent the produce from being destroyed, the Australian government decided to share the international aerial transport costs and thereby lower the costs for exporters.

68. Publication in ProBono Australia - Morrison government offers \$100M boost to community sector

 **In Canada**, the government transferred a total of CAD \$200 million in two installments (CAD \$100 million each) to food rescue organizations, food banks, and charities through a dedicated food security fund. In addition, the government initiated a five-year program at a total budget of CAD \$50 million for buying cooling equipment, kitchenware, appliances, building community gardens, and storing and distributing food to NPOs in local communities. All of this was done as part of Canada's national food program.

In addition, the government initiated another program at a budget of CAD \$50 million, called the Surplus Food Rescue Program. As part of the program, food surpluses are bought at cost, undergo shelf-life-extension processing (if necessary), and then are distributed to food banks and aid organizations. Another CAD \$25 million was allocated as aid in the “Feeding the North” program, which helps the needy in the northern and remote parts of Canada ⁶⁹.

69. Canadian Government - Emergency Food Security Fund, Government of Canada joins Food Banks Canada in improving food security for rural and northern communities

Likewise, the Canadian government transferred a budget of about CAD \$350 million to support community organizations helping the needy during the pandemic, with over 7,100 projects having been funded to date (as of the time of writing this report) ⁷⁰.

The government also transferred grants of CAD \$2,000 to citizens whose income was impacted due to the Covid-19 crisis and grants of CAD \$600 to citizens with disabilities - in recognition of the additional costs imposed on them due to the crisis. Simultaneously, the provincial governments transferred grants to their residents. For example, the Province of British Columbia transferred grants of CAD \$500 - \$1,000 to every resident, depending on their family status and income ⁷¹.

70. Canadian Prime Minister's Office - Prime Minister announces additional support for food banks and local food organizations

71. Canadian Government - Canada Emergency Response Benefit (CERB), One-time payment to persons with disabilities Government of the Province of British Columbia - COVID-19 support for individuals and families

NPO Involvement

 **In Britain**, The Felix Project food rescue organization has tripled the amount of food it rescues and now distributes about 1.9 million meals each month. The organization also collaborated with restaurants to rescue food and transfer it to the homeless and medical professionals. In addition, it created the “London Food Alliance” together with two of the largest food banks in London, City Harvest and FareShare. Under this collaboration, London was divided into regions, with each organization being responsible for several regions, while coordinating and cooperating with the other two in distributing the food ⁷².

72. The Felix Project and the Fare Share food rescue organizations.

The WRAP organization set up a special online portal to help connect suppliers and farmers with food surpluses to food rescue organizations that can distribute the food to the needy. In addition, there is an information portal on how to store and transport food intended for rescue and other information about food rescue ⁷³. Similarly, the Zero Waste Scotland organization launched an online portal to connect food suppliers and farmers with food surpluses in Scotland to NPOs and organizations that needed it ⁷⁴.

73. WRAP

74. Zero Waste Scotland - Supporting Scotland's food and drink businesses

 **In France**, the Linkee food rescue organization began distributing rescued food baskets and meals to students in need who were severely impacted by the crisis. The organization set up a food basket distribution center in Paris, and later on food basket distribution centers were opened in several universities in France. Since October 2020, the organization has distributed over 350 thousand meals and currently distributes about 25 thousand meals a day ⁷⁵. In addition, Linkee in collaboration with four other NPOs, set up the Raliment collective, which collects unsold food surpluses and cooks them in three dedicated kitchens. The collective has distributed about 60 thousand meals to the needy ⁷⁶.

75. Publication in VICE – Students Are Starving in France; Chefs Are Trying to Help, Linkee - Review of Linkee's actions during the Covid-19 crisis (1/4)

76. Linkee - Review of Linkee's actions during the Covid-19 crisis (3/4)

 **In Canada**, when the crisis erupted, a number of Daily Bread and North York Harvest food banks were closed, forcing the other food banks that continued operating to absorb those whose needs were unmet. In collaboration

with the City of Toronto, new food bank points were opened to maintain the food banks' former geographical reach and even expand it beyond the number of points that existed prior to the crisis ⁷⁷.

77. The Daily Bread food bank - Risks and Challenges Faced by Food Bank Clients During COVID-19, Food Banks Canada – A Snapshot of Food Banks in Canada and the Covid-19 Crisis

 **In the United States**, the City Harvest food rescue organization opened 29 emergency centers for distributing food to the needy in the City of New York in neighborhoods at high risk for food insecurity, whose residents also suffered more from Covid-19 infections. The organization rescued and distributed about 57 thousand tons of food between March 2020 and January 2021, more than double the amount it had rescued during the same period in 2019 ⁷⁸.

The Community Alliance with Family Farmers (CAFF), which usually operates to strengthen local farming communities and lobbies for legislation promoting environmental sustainability, began helping farmers in California who were only selling their produce to the institutional market to sell their produce directly to consumers, in an aim to reduce food waste and the economic loss to farmers. In addition, the organization helps with logistical coordination between farmers to facilitate the supply and donation of agricultural produce ⁷⁹.

As campuses were closed in March 2020, students set up the FarmLink Project that expanded its reach throughout the entire United States. As part of the project, volunteers collect and harvest agricultural produce and provide it to food banks and those in need. The project has rescued over 5,000 tons of food to date ⁸⁰.

78. City Harvest – Feeding NYC in the wake of a pandemic, One Year of Feeding New Yorkers During the COVID-19 Pandemic, publication in The New York Times - Facing Food Insecurity on the Front Lines

79. Food Tank - 23 Organizations Eliminating Food Waste During COVID-19

80. US Department of Agriculture: Three Key Messages from the First International Day of Awareness of Food Loss and Waste, The FarmLink organization



Aid from the Business Sector in Coping with the Covid-19 Crisis



In the United Kingdom, the Compass Group, which sells food to the institutional market, created a food rescue network in response to the crisis and provides food to food banks and charities. The company has donated over 25 tons of food, or about 60 thousand meals ⁸¹.

The Tesco retail chain in collaboration with the NPO Hubbub ran a pilot program lasting six weeks to reduce the waste of food bought online. When calculated for the year, the pilot program led to a reduction of 76 kg of food waste and a savings of about £900 on food purchases per household. The company plans to expand the pilot to cover the rest of the United Kingdom, calling it "The Tesco Food Waste Challenge" ⁸².

In addition, with the closing of the institutional market due to the various restrictions, the UK Federation of Wholesale Distributors established the Food2Care portal to help old-age homes and other entities that had difficulty finding food suppliers, based on area code and geographical location. This enabled the efficient delivery of food that had no way of being sold ⁸³.

81. Compass Group

82. The Grocer: Tesco launches new campaign to help consumers slash food waste

83. UK Federation of Wholesale Distributors



In Italy, in May 2020 the NaturaSi retail chain in collaboration with the Legambiente environmental organization launched a pilot for selling "ugly vegetables" under the slogan "CosìPerNatura" ("Like this by Nature") at a 50% discount in 500 of its branches to reduce food waste. In one month the company sold 795 tons of fruit and vegetables, and following the success of the pilot the company expects to sell 2,500–3,000 tons a year ⁸⁴.

84. Forbes - Ugly But Tasty: Italy's Project Against Food Waste, LaStampa



In Canada, the Covid-19 crisis and the decrease in the number of customers led businesses in the food industry to supply local food banks with storage and freezing facilities, thereby increasing the capacity for food rescue, and even donated vehicles for delivering food baskets to those in need ⁸⁵.

85. Food Banks Canada – A Snapshot of Food Banks in Canada and the Covid-19 Crisis



In France, Danone purchased strawberries and other fruit from farmers that had no demand for their produce, and came out with a special edition of yogurt called "Solidarity Gariguettes 2020" together with food retailer Carrefour ⁸⁶.

Likewise, dairy manufacturer LSDH in collaboration with packaging manufacturers committed to donating a million liters of milk to food banks throughout the country, with the milk production plant donating the milk and packaging services and the packaging manufacturers donating the cartons. The company estimated that about 2 million citizens would benefit from the donation ⁸⁷.

86. Danone

87. European Food Bank Federation



In the United States, the Walt Disney Company has been donating food surpluses from its two American theme parks as part of the Disney Harvest Program. The program collects and distributes about 2.4 million meals a year from the two parks to the Second Harvest food rescue organization. After the theme parks were closed, the company donated the remaining food surpluses to Second Harvest ⁸⁸.

The Kroger retail chain entered into a collaboration with local dairies for donating milk surpluses

88. The Take Out, Disney World donates its extra food after shutting down park

originally intended for the institutional market. The dairies donated about 750 thousand liters of surplus milk while Kroger donated processing and packaging services and distributed the milk to food banks⁸⁹.

Retail chain Publix launched a program for purchasing about 160 thousand liters of surplus milk and about 125 tons of surplus agricultural produce from farmers impacted by the crisis and transferring the food to food banks. In addition to this program, the company has donated US \$2 million to food banks in the southeast region of the United States⁹⁰.

As its branches were closed, McDonald's and its franchises donated meals and food all over the world:

- **In the United States**, over 4,000 tons of food worth about US \$12 million were donated to food banks throughout the country.
- **In the United Kingdom**, over 300 tons of food and about 100 thousand liters of milk were donated to food banks. In addition, the company donated 79 tons of food or about 188 thousand meals to the FareShare food rescue organization.
- **In Canada**, about 115 tons of food were donated to local food banks.
- **In Australia**, in response to the Covid-19 crisis, the company and its local suppliers donated food surpluses to the Australian food bank FoodBank, a partnership that has resulted in regular donations of surplus food to the food bank⁹¹.
- **In Russia**, the company donated over half a million meals to ambulance workers through its Drive-Thru infrastructure. In addition, the company donated food to hospitals and meals to volunteers providing care for the elderly.

89. Supermarket News, Kroger expands Dairy Rescue Program to redirect surplus milk

90. Supermarket News, Publix purchases produce, milk from farmers impacted by pandemic

91. McDonalds



Students living at hunger's edge, receive food aid in Paris. Credit: Andrea Mantovani for *The New York Times*



Developments in Israel Regarding Food Waste and Loss during the Covid-19 Crisis

In Israel, the economic impact and restrictions led to a rise in the number of food-insecure households, to which the state responded in several ways. During the first lockdown, budgets from the Ministry of Welfare and Social Affairs were allocated for providing food baskets to those in need, and the government tripled the budget for food baskets during the Tishrei holidays, Passover, and one other holiday during the year. In August 2020, the government approved a budget of NIS 700 million for food-security grants. The money was given to eligible recipients in the form of food vouchers, based on whether they were entitled to pay discounted municipal fees. In addition to all of the above, grants were given to the self-employed, unemployment benefits were extended for those who were financially impacted by the crisis, those in self-isolation were sent food baskets, and more.

Leket Israel

Leket Israel is the largest food rescue organization in Israel. Each year the organization rescues thousands of tons of surplus agricultural produce and millions of meals to feed thousands of Israelis in need throughout the country. To this end, the organization carries out a wide range of food rescue activities, including harvesting fresh produce from farms, collecting agricultural produce from fields and packing houses, and rescuing cooked nutritious meals from hotels, corporate cafeterias, IDF army bases and more.

Leket Israel's Food Rescue Activity During the Covid-19 Crisis:

As the coronavirus spread, Leket Israel found itself facing major changes in operations. The donations of cooked food stopped abruptly, and at the same time, the needy population was prevented from coming to soup kitchens due to health guidelines and the fear of leaving their homes and being

exposed to the virus. On the other hand, donations of agricultural produce increased significantly, as farmers who were meant to sell their produce to hotels, restaurants, and open markets were left with no ability to do so. At the same time, many volunteers on whom the organization relied canceled their arrival. All of this was accompanied by a sharp increase in public demand for aid, which came from both local authorities and private entities.

Out of an understanding that the reality with which the organization was dealing had changed radically, and so as not to cause harm to the people in need who depended on it, **the organization immediately adapted its operations to the new reality:**

- The organization bought and distributed about a million cooked meals directly to the homes of those it supports (mainly elderly people). This required a completely different logistic setup than the one the organization was used to working with, because instead of rescuing food the organization had to purchase food, and instead of distributing it to distribution centers the organization's volunteers went from door to door delivering perishable food under very complex working conditions. This was in addition to distributing over 1.4 million rescued meals.
- Leket Israel rescued and distributed over 18.5 thousand tons of agricultural produce.
- The retail value of the food that was distributed (purchased + rescued) was about NIS 160 million.
- The organization worked with around 330 institutions that reached out for help (local authorities, NPOs, and organizations, as opposed to around 200 in routine times). At the height of the period, deliveries were made to about 250 thousand people in need weekly.
- The organization brought seven catering companies back to work after they had put their employees on unpaid leave.
- The organization did not put its employees on unpaid leave.
- Leket Israel relied solely on philanthropy to fund its activities.

Among the needy populations who receive rescued food, there is no consistent access to healthy food and little knowledge or awareness about nutrition and its impact on health.

Leket Israel is considered an international leader in all matters related to rescuing vegetables, fruit, and cooked food.

Leket Israel serves as a hub of knowledge and an example for food rescue organizations around the world and is recognized by the Global Foodbanking Network (GFN) as Israel's national food rescue organization.

Joseph Gitler, Founder and Chairman of Leket Israel, serves as a member of GFN's Executive Committee and the organization's representatives participate in GFN conferences.

Home Front Command and the National Emergency Management Authority

At the start of the crisis, the Home Front Command (HFC) together with the National Emergency Management Authority (NEMA) set up the citizen aid center, a unified operations room with representatives from dozens of aid organizations, local authorities, and government ministries. Having all of these aid organizations and entities concentrated in one room allowed for quick solutions to emerge. The center received the various needs from the different organizations and helped coordinate between them in providing mutual help. In addition, the center helps the various organizations by allocating security forces and Home Front Command resources to support the efforts.



Leket Israel employees delivering meals to an old age home at the height of the Covid-19 crisis. Credit: Leket Israel

The HFC and NEMA provided about 6.2 million food baskets to the needy (most of them during the first wave) with the help of over ten thousand soldiers. During the first wave, the food baskets mainly consisted of chilled food, whereas in the second wave they mainly consisted of dry food. Added to this was financial support at a scope of around NIS 130 million for buying food through local authorities. In addition, the HFC and NEMA provided 2,000 soldiers in manpower for the logistical centers of NPOs and commercial companies in order to meet the required volume of food that needed to be supplied.

The Ministry of Agriculture and Rural Development

Due to the political crisis and the fact that a budget was not approved for the Ministry's activity, it was difficult to execute work plans and activities to promote policies for reducing food waste and the waste of fresh produce. The Ministry of Agriculture and Rural Development formerly led an inter-ministerial process with the goal of formulating a policy to reduce food waste and the depreciation of fresh produce, with an emphasis on vegetables and fruit.

The Ministry operated in several ways to reduce food waste, including by:

- Developing packaging to extend shelf life and reduce food loss throughout the supply chain.
- Setting quality standards for agricultural produce - produce standardization.
- Operating an educational program in collaboration with the Ministry of Education to encourage smart consumption of fruit and vegetables in the school system.
- Researching the problem of food waste and proposing solutions to prevent waste during the selling process of fruit and vegetables in Israel.
- Initiating a pilot program to examine the feasibility of transferring surplus produce to the needy.
- Formulating marketing strategies to encourage the selling and buying of "ugly" fruit and vegetables.

- Publishing guidelines by the Department of Postharvest Storage of Fresh Produce at the Volcani Institute on the proper storage of fruit and vegetables in Israeli households.
- Publishing guidelines for proper storage of fruit and vegetables for wholesalers and retailers.
- Encouraging the establishment of farmers' markets.

Collaborative Initiative with Leket Israel:

The Ministry of Agriculture conducted a collaborative initiative with Leket Israel as part of which Bedouin workers were employed in harvesting activities. Leket Israel trucks transported the harvested crops from the fields to its Logistics Center, where the produce was sorted, packed, and transported by the organization's trucks to ten distribution centers in six Bedouin communities.

In addition, a Bedouin dietician working on behalf of Leket Israel ran Nutrition for Life workshops adapted to Bedouin culture. Each workshop consisted of four sessions during which the participants were taught the principles of eating healthy on a limited budget and exposed to content related to personal and family conduct. Reports from the field indicate that participants gained a sense of personal empowerment from acquiring these tools and knowledge.

The Ministry of Environmental Protection

The Ministry of Environmental Protection takes measures to reduce food waste and loss. Following are the key actions it took over the past two years:

- The Ministry led the State of Israel in preparing for the United Nation's Food Systems Summit that took place in September 2021. The summit aimed to promote sustainable, healthy, and equitable food systems according to the United Nation's Sustainable Development Goals. In this context, the Ministry held broad dialogues with government ministries, civilian bodies, academia, farmers, food industrialists, and more. The outcome of these discussions was a roadmap

- and the ministers' statements can be seen on the United Nations website ⁹²
- In October 2021, the government approved a 100-step plan for dealing with the climate crisis. The plan includes a chapter on food systems that specifically addresses the issue of reducing food waste and loss.
- The Ministry's new waste strategy, published in January 2021, addresses among other things, waste reduction at the source, including food waste. The Ministry is currently formulating a plan to implement its strategy.
- In November 2020, the Ministry together with Leket Israel published the National Food Waste Report for 2019. For the first time, the report included a chapter on the environment.
- A policy paper on food waste in Israel - characteristics, causes, and recommendations for affecting systemic change - prepared by The Natural Step (TNS) organization with the support of the Ministry was published.
- The Ministry funded a series of public workshops throughout the country on how to reduce household food waste. The workshops took place during 2020 in Ashdod, Nazareth, Tel Aviv-Jaffa, Basmat Tab'un, Jisr az-Zarqa and were led by TNS Israel in collaboration with the local authorities.
- Every year in March, there is a Food Waste Reduction Day in Israel, thanks to the initiative of TNS Israel.

The Ministry of Labor, Social Affairs, and Social Services

In 2017, the National Food Security Initiative was launched in cooperation with Leket Israel and Eshel Jerusalem-Colel Chabad. Under the initiative, benefit cards worth NIS 500 were distributed to around 11 thousand families suffering from severe food insecurity. The pilot program was launched in February 2017 in 36 municipalities around the country, at a total cost of approximately NIS 65 million annually. When a family is accepted into the

program, the Ministry of Labor, Social Affairs, and Social Services issues a card loaded with NIS 500 each month via Eshel Jerusalem-Colel Chabad. The card can be used for purchasing food products worth NIS 250 (not including tobacco and alcohol) in select supermarkets and local stores, and buying rescued vegetables, fruit, and dry foods (that are delivered to the families' homes) with the other NIS 250 (NIS 180 for fruit and vegetables and NIS 70 for dry foods).

In July 2018, the Ministry of Labor, Welfare, and Social Services published a research ⁹³ report examining the effectiveness of the National Food Security Initiative. Of the 968 families involved in the study, about 150 families benefited from increased food security, with some 70 families moving from severe food insecurity to moderate food insecurity and about 80 families no longer experiencing food insecurity.

The authors of the study noted that the scope of assistance is relatively low and therefore many families continue to suffer from food insecurity. Approximately 61% of the families used the resources that became available to consume food rather than other goods and services. This reveals that the current level of assistance is insufficient to relieve them of food insecurity. During the Covid-19 crisis, the collaboration with Leket Israel for providing rescued fresh produce stopped and was partially re-established in May 2021.

The Government Companies Authority

In January 2019, the Government Companies Authority instructed government companies to discuss plans for creating social value. The Authority published a corporate social responsibility toolkit for government companies, which included information on rescuing food from catering companies and donating it to the needy. This was the result of the joint activity of the Yedid Association, Leket Israel, and the Government Companies Authority and based on the

93. National Food Security Initiative: Evaluation Study, Ministry of Labor, Social Affairs and Social Services, 2018

92. <https://summitdialogues.org/country/israel>

understanding that when a government company donates its surplus, this draws the management's attention to wasted resources that usually go unnoticed, thereby facilitating self-improvement and the streamlining of operations. **In May 2019, the Government Companies Authority sent the boards of government companies a list of collaborations with government ministries on "Shared Value" projects and instructed them to discuss them.**

Legislative Proposal: The Distribution of Surplus Unsold Food Fit for Human Consumption, 5769-2019

In 2019, Legislative Proposal: The Distribution of Surplus Unsold Food Fit for Human Consumption, sponsored by MK Michal Rozin was presented to the Knesset for a preliminary discussion. This proposal requires food suppliers to contract with food rescue organizations to distribute unsold food fit for human consumption to the needy. It also regulates the conditions for transferring the food surpluses to their destination.

Under this proposal, the food supplier and the food rescue organization would not be held civilly

or criminally liable for damage caused due to the distribution of surplus food.

A similar law has been in place in France since 2016, requiring all supermarkets with a sales area exceeding 400 square meters to donate surplus food to food banks instead of discarding or destroying it. Italy, Poland, Switzerland, and the Czech Republic have enacted similar laws, which have led to a reduction in food waste in supermarkets chains and increased donations to local food rescue organizations. Likewise, in 2018, in Missouri in the United States, a legislative proposal was raised requiring big businesses in the state to donate their food surpluses.

The Food Donation Act

In October 2018, the Knesset approved the Food Donation Act in a third reading. The purpose of the law is to shield the entire food donation chain, from the food donors to the NPO, its employees, and its volunteers, from liability for damage that may be caused by the donated food, provided they meet food safety standards and the provisions of the law.



Sorting of agricultural produce in Leket Israel's Logistics Center. Photo :Leket Israel



Policy Recommendations for Reducing Food Waste and Encouraging Food Rescue



The Covid-19 crisis and the climate crisis heighten the need to formulate a national policy to encourage waste reduction and food

Policy Recommendations for Reducing Food Waste and Encouraging Food Rescue

The 2020 National Food Waste and Rescue Report, similar to preceding reports, demonstrates the significant economic, social, and environmental benefits of food rescue. The increase in food waste and the widening of the food-insecurity gap that occurred during the year of the pandemic reinforce the need to use food rescue as one of the national policy tools.

Economically

This is a clear case of market failure. At market prices, rescuing food is not economically viable. However, when taking into account the true value

and nutritional benefits, food rescue becomes highly worthwhile.

Socially

Rescuing food and donating it to those in need would reduce inequality and increase the food security of the country's residents.

Environmentally

This effort would save many energy, water, land, and chemical resources, and would reduce greenhouse gas and air pollutant emissions as well as the amount of waste sent to landfills.

Recommendations for policy measures necessary to reduce food waste and encourage food rescue in Israel

1 Set a National Food Rescue Goal

The goal would be to reduce food waste by 50% by the year 2030, in accordance with principles laid out by the UN.

Setting a national goal will place the issue on the national agenda, and more importantly will create

governmental commitment to act towards the realization of this objective. In addition to setting a goal, it is necessary to establish measurement and monitoring tools to facilitate ongoing review of compliance with the goal.

2 Develop a National Plan for Food Rescue

The plan should address food waste and rescue at all stages of the value chain and include the necessary operational, budgetary, and regulatory conditions and incentives for gradually achieving the national food waste reduction and rescue goal.

Implementing the plan would require the significant involvement of government ministries and it should be coordinated by the Prime Minister's Office or the Council for Food Security. For example:

The Ministry of Environmental Protection would examine, among other things, policy tools for reducing food waste and promoting food rescue as a means for meeting emission targets in the fields of waste, industry, and agriculture.

Tools could include paying for commercial waste, a mechanism for pricing the carbon created by landfilling and burning waste, new regulation regarding expiration dates (in collaboration with the Ministry of Economy), and more.

The Ministry of Agriculture and the Ministry of Economy would review an incentive and reimbursement policy for compensating farmers, growers, and manufacturers who donate food instead of destroying it.

The Ministry of Welfare and Social Security would examine the possibility of financially supporting food waste reduction and food rescue projects and activities. These types of projects would enable the Ministry to support broader sections of underprivileged populations without having to allocate additional budgets.

The Ministry of Justice would look into the development of legal instruments to support food rescue and prevent food from being destroyed and examine the issue of reduction at the source. Legal instruments would include the legislation of laws encouraging/obligating public bodies to donate surpluses, creating shelf-life extension protocols, etc.

The Ministry of Education would develop educational tools and programs beginning from preschool that encourage the prevention of food waste and food rescue and teach pupils about the environment and sustainable practices, with an emphasis on food and food rescue.

The Procurement Administration would examine the possibility of obligating private entities participating in government tenders for providing services to the state, that have rescuable food sources (not only in the food industry), to engage with recognized food rescue NPOs as a prerequisite for entering into contract. Likewise, the possibility should be examined (together with the Government Companies Authority) of obligating state-funded bodies that operate a kitchen feeding over 1,000 people a day (either directly or through a subcontractor) to engage with a recognized food rescue NPO as a condition for receiving a budget from the government (including security service providers, school catering operations, government companies, etc.).

3 Addressing Food Rescue & Security in Preparing the Economy for Crises & Pandemics

As part of the conclusions derived from the Covid-19 crisis, an examination should be conducted to see how a policy that addresses food rescue, food security, school food programs, and agricultural business continuity in times of crisis and emergency can be integrated into the national emergency plan. This should include a consideration of how best to

use the abilities, infrastructures, knowledge, and experience of the public, private, and other sectors, which include logistical centers, warehouses, transportation vehicles, geographical reach, distribution points, knowledge of the consumers, capabilities on the ground, and so on, as well as how to synchronize them.

4 Examining How Current Regulation Contributes to Food Waste

Articles of legislation currently exist, which contribute to the destruction and loss of nutritious and edible food. A comprehensive examination of the existing law in Israel is required to be

amended in a way which will prevent food waste and encourage food rescue through a system of incentives that will lead to the rescue of surpluses and distribution to those in need.