

**REPORT
2019**

FOOD WASTE AND RESCUE IN ISRAEL

The Economic, Social and Environmental Impact

In cooperation with
The Ministry of Environmental Protection

This report includes an expanded chapter on the environmental impact of food waste and rescue.

Writing and Editing:

|BDO

Acknowledgements

Leket Israel and the Ministry of Environmental Protection are grateful to the Ministry of Agriculture and Rural Development, the Ministry of Economy and Industry, the Central Bureau of Statistics, and the Volcani Institute for their fruitful cooperation, which made it possible for us to improve our databases and methodology.

Our thanks to the Ministry of Health, the Restaurant Association, Dan Hotels, Fattal Hotels, ISS Catering, The Association of Halls, Banquets, and Catering Halls in Israel, and R2M restaurants for their cooperation in the area of institutional catering.

We are also grateful to Shufersal, Tnuva, Machsenai Hashuk, the Food Manufacturers Association, the Federation of Israeli Chambers of Commerce Food, Beverages & Catering for their cooperation in the area of food loss in the retail and distribution sector.

To Prof. Ofira Ayalon and Efrat Elimelech from the University of Haifa and The Natural Step Israel for their cooperation in the area of food loss in the household consumption sector.

To Dr. Moshe Yanai, Hani Shamir, Roei Abudi and Lior Yeshayahu from the Central Bureau of Statistics and Prof. Meidad Kissinger from Ben-Gurion University of the Negev for their cooperation in in the area of quantifying the environmental effects of food production in Israel.

To Sophie DeBode for her contribution to the review of international policy tools for reducing food waste.

To Galit Cohen, Guy Samet, Yuval Lester, Assaf Yazdi and Daniella Zegman from the Ministry of Environmental Protection for their professional contribution to the chapter on the environmental impacts of food waste.

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This report is available on the Leket Israel website: www.leket.org/en

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Message from the Minister

Every year, 2.5 million tons of edible food are thrown away, which is roughly 35% of all the food produced in Israel. The inconceivable ease with which we discard good, edible food in Israel and throughout the Western world is a symptom of an extravagant consumer lifestyle and culture. This is an absurd reality in which money and resources are tossed out, even as we are confronting an economic and social crisis.

The phrase “food waste” encompasses the many irretrievably lost resources – land, water, energy, pesticides and fertilizers – that are invested in growing, producing, importing and marketing produce. Throughout the process, greenhouse gases and pollutants are also emitted. In the end, we need to invest tremendous economic resources to treat unnecessary waste.

Upon taking office as Minister of Environmental Protection, I set a goal of leading Israel’s waste treatment sector to compliance with OECD standards, reducing the amount of waste landfilled in Israel to 20%, while promoting a circular economy and policy tools for preventing

waste at source.

The problem of food loss is not unique to Israel; it is a global challenge. The UN sustainable development goals (SDG indices) include halving food waste by 2030.

This report reveals and clarifies the environmental issues associated with food waste and loss, and analyzes the economic costs arising from the phenomenon. It proves that we cannot ignore the environmental aspects of food waste. There is much to be done, and the time has come to devote resources, knowledge and policy tools to significantly reducing food waste in Israel. Reducing waste and rescuing food is win-win situation – benefiting the environment, the economy and society.

In addition to the requisite government action on the issue, it is important to note that the public can also act; as consumers, we can prevent waste. The next time we buy food, cook, and host, we should not only be concerned that “nothing should be lacking,” but also that “nothing should be wasted.”



Sincerely,
MK Gila Gamliel
Minister of Environmental Protection

Introduction

The National Food Waste and Rescue Report for 2019 is being published for the fifth consecutive year by Leket Israel, in partnership – for the first time – with Israel’s Ministry of Environmental Protection. The report is intended to serve as the foundation for public discourse on the problem of food waste, and as a tool for developing national policy measures to change how food waste and rescue are handled in Israel.

This report is based on data for 2019, prior to the COVID-19 crisis. However, economic data shows that the economic consequences of the crisis include increased unemployment and less disposable household income, which are likely to exacerbate food insecurity in Israel. This worrisome data highlights the importance of food rescue policy, as a socio-economic tool that facilitates both rescuing food for one-third of its cost, and substantially reducing the use of natural resources.

Estimates in the report reveal that in Israel in 2019, 2.5 billion tons of food, worth NIS 20.3 billion, was wasted, meaning that approximately 35% of domestic food production was lost. Of this amount, approximately 1.2 million tons, worth NIS 7.1 billion, was rescuable.

For the first time, the report includes a detailed model for estimating the environmental impact of food waste. The total environmental cost of food waste in Israel is NIS 3.2 billion, of which NIS 1.4 billion is the cost of natural resources (water and land); NIS 1 billion encompasses greenhouse gas and air pollutant emissions; and NIS 800 million is for waste treatment. Moreover, 6% of the greenhouse gases in Israel originate in food loss. Food waste

(including packaging) accounts for about 35% of the total urban waste in Israel.

This report is based on an economic model for the food industry developed by BDO. It includes comprehensive, detailed research on the extent of food waste of all types in Israel. Furthermore, the report reveals the potential for food rescue at each stage of the value chain in the food production process.

The findings presented herein indicate that food rescue is extremely beneficial from economic, social, and environmental perspectives. Every shekel invested in food rescue produces food with a direct value of NIS 3.6. If the environmental impact of food rescue is considered, the economic value of each shekel invested in food rescue creates NIS 4.2 in value for the national economy.

The problem of food waste is not limited to Israel; the extent of food waste in Israel is similar to that in other developed nations around the world. Many other countries have enacted legislation and developed national, multi-year goals and programs to encourage food rescue and to reduce waste. In October 2018, the Israeli Parliament passed the Food Donation Act, a first step towards developing a comprehensive national food-rescue plan.

It is our hope that this partnership will be an additional step towards encouraging the Israeli government to promote this issue and to advance an economic, social, and environmental solution to the problem of food waste in Israel.



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Uniqueness of Israeli Food Production and Consumption

465 thousand Israeli households suffer from food insecurity

Uniqueness of Israeli Food Production and Consumption

Food consumption is a basic human need and maintaining a balanced diet is essential to ensuring the health of the population as a whole, and for the physical and cognitive development of infants and children in particular. Therefore, food is far beyond a substantial component of a household's consumption basket. A shortage of food, or insufficient consumption of basic nutritional components, can cause potential health issues with a cost exceeding the food's market value, representing the cost of its production at all stages of the value chain.

Expenditures for food consumption represent approximately 17% of the average Israeli household's consumption basket, and approximately 20% of the consumption basket of households in the lowest two deciles of the population.

Israel is characterized by a rate of expenditure on food that is among the highest in the developed world, while 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. A 2019 report issued by the National Insurance Institute found that 18% of Israeli households suffer from food insecurity, equivalent to approximately 465,000 households 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. Expenditures for food consumption represent approximately 17% of the average Israeli household's consumption basket, and approximately 20% of the consumption basket of households in the lowest two deciles of the population.

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 (GHG) emissions which contribute 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

1. OECD, Poverty rate, 2019.

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

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

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: vegetables, fruits, legumes, dairy products, eggs, meat, fish, oils, etc. Concurrently, agricultural production has an inherently high level of uncertainty resulting from external factors including pests, weather, and disease.

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 four previous reports. This year's report also includes an expanded section on the environmental impacts as a result of food waste. The quantification of environmental impacts in the report relates to local inputs invested in cultivating and producing food, and the environmental impact of wasted food originating in Israel.



Landfill, Israel.



**Food Waste:
How Much Food is
Wasted in Israel?**

NIS 20.3 Billion

The value of food waste in Israel in 2019

Food Waste: How Much Food is Wasted in Israel?

Food waste estimates in Israel are based on a unique model of the value chain for domestic food production⁴. Estimated at approximately 2.5 billion tons, food waste in Israel constitutes 35% of overall domestic food production. This year, the agricultural sector in Israel recorded a 1.5% decrease in production, continuing a trend that began the previous year, when there was a 2.4% decrease in production.

Findings of the 2019 National Food Waste and Rescue Report reveal food waste at a level similar to the findings in the previous report (2018 Food

Waste and Rescue Report) - approximately 2.5 million tons of food waste. This was the combined result of an increase in household consumption, partially offset by the decrease in Israeli agricultural production.

The total amount of food waste, at all stages in the value chain, is equivalent to the loss of approximately NIS 670 per household in Israel, every month.

In monetary terms, about 18% of the value of food waste, equivalent to approximately NIS 3.7

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

Food Waste in Israel, Monthly Value (₪) per Household*							
Waste/household	Agriculture	Processing & Packaging	Industry	Retail & Distribution	Institution Consumption	Household Consumption	Total
Fruit & Vegetables	65	23	2	73	46	124	330
Grains & Legumes	2	1	2	20	42	86	154
Meat, Fish & Eggs	9	2	13	47	34	43	148
Milk & Dairy	4	1	1	5	6	22	38
Total	79	26	18	145	128	275	670

Source: BDO estimates

*The loss of NIS 670 per household per month reflects the loss throughout the value chain, which includes, among other things, the direct expenditure of households.

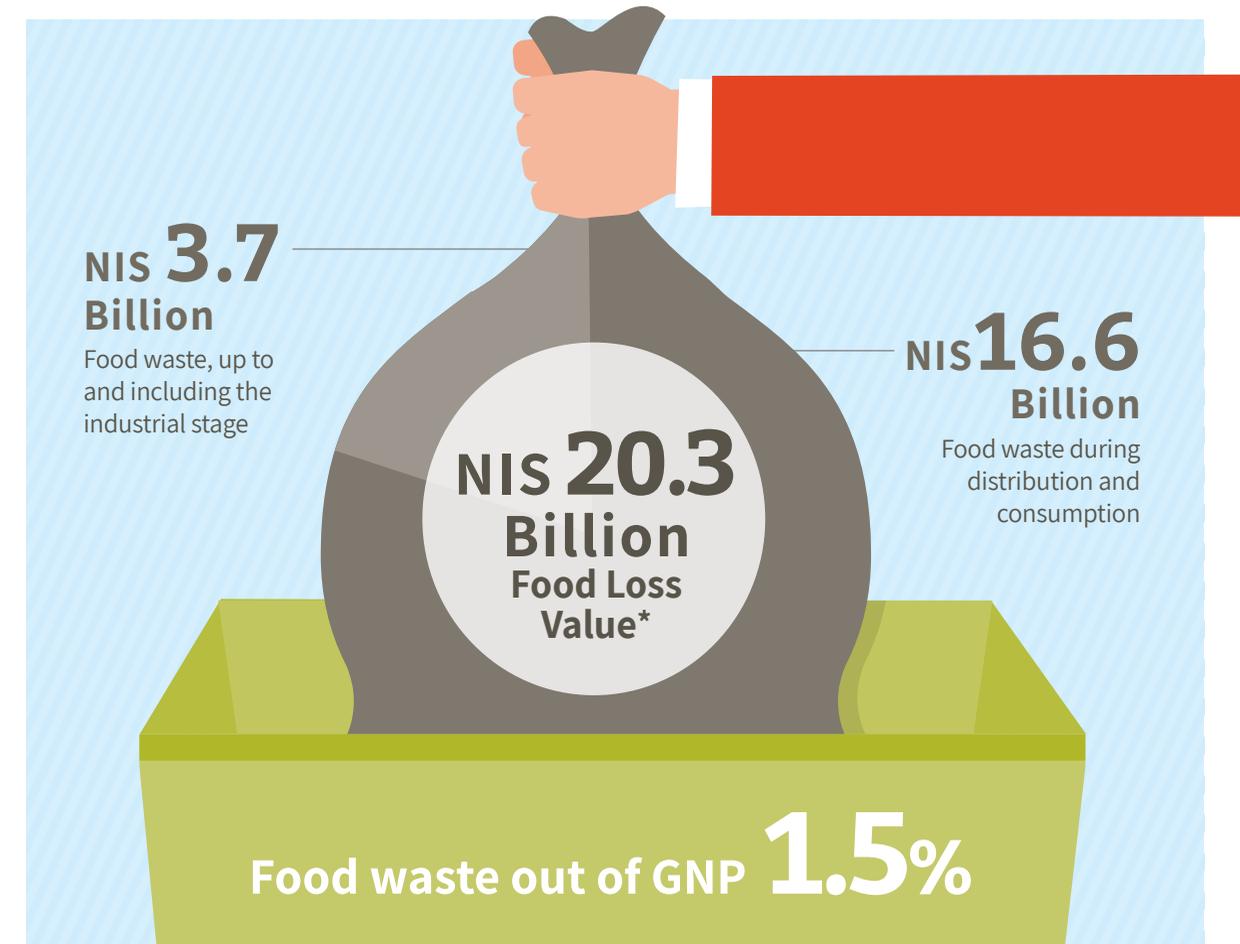
billion, occurs during various stages of production. This loss of NIS 3.7 billion in value represents approximately 13% of the total value of agricultural production in Israel. Nearly 82% of the waste's value, equivalent to approximately NIS 16.6 billion, occurs during the retail stages of distribution and consumption.

The value of agricultural commodities per ton increases as it progresses along the value chain of production, and as additional inputs are invested - including those required by sorting, processing, transport, distribution and retailing. Assessment of the value of waste in the early stages of production (growing, packaging and manufacturing) is based

on the wholesale prices paid to farmers. Waste during the later stages in the value chain is 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 includes analysis of data relevant to agricultural production, storage, import, export, industry, distribution, and a sample of consumption patterns of 50 types of food⁵. Processed produce included in the data is translated into 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.



Source: BDO estimates * Direct economic cost, not including emissions of greenhouse gases and air pollutants

Percentage of Food Waste at All Stages of the Value Chain (Million pounds)

Loss percentage figures were rounded for presentation purposes



*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.

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

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

There is great variance in the volume of food waste in the different categories of foods that

6. Dr. Ron Porat, 2015, 2016

Food waste is ordinarily divided into two stages of the food value chain:

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

2 From retailing and distribution to final loss at the consumer level (food waste in consumption).

were reviewed, as well as in each stage of the value chain in which the waste occurs. For each stage, we assess the waste as a percentage of the total production or consumption at that stage of the value chain. For example, 9% of the food produced by agriculture is wasted at this stage. Similarly, 16% of the food consumed during the consumption stage (institutional and household) is wasted.

Food Waste Estimate in Israel, by Weight (1,000 tons)						
	Agriculture	Processing & Packaging	Industry*	Retail & Distribution	Consumption	Total
Fruit & Vegetables	506	183	15	318	661	1,683
Grains & Legumes	23	13	19	50	293	398
Meat, Fish & Eggs	32	5	30	38	93	198
Milk & Dairy	60	8	19	29	103	219
Total	621	208	83	435	1,150	2,498

Source: BDO estimates

* The estimated food waste from industry does not include food that is recycled, primarily as animal feed.

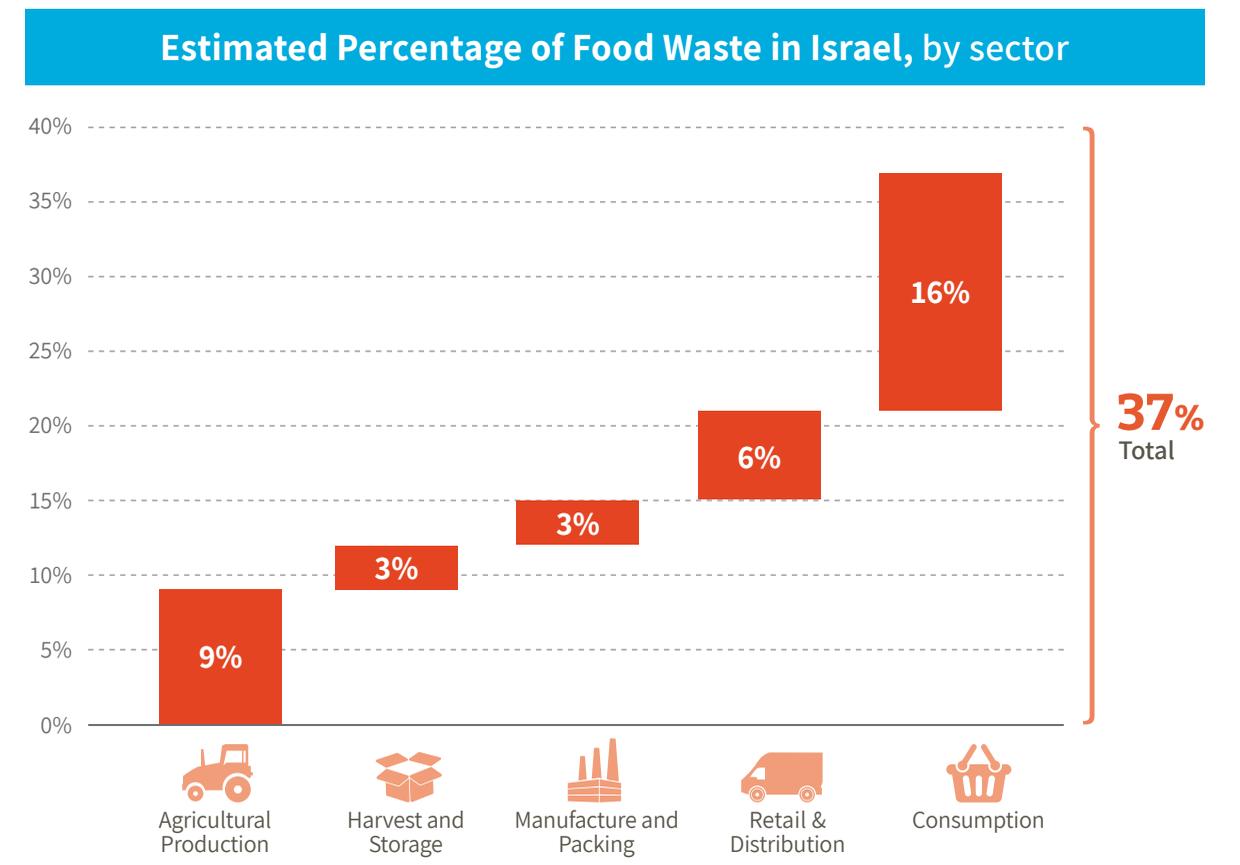
The large share of waste from fruit and vegetables in Israel stems both from their large share in domestic agricultural production, and from the high rate of waste (35%) during the value stages. The high rate of waste for fruit and vegetables is not exclusive to the Israeli economy. Compared to international data, Israel's rate of waste in this category is similar to that in Europe. Compared to the US, the rate of loss is even lower, but is composed of a lower rate of loss during the agricultural production and consumption stages, and greater waste in the intermediary stages⁷.

The economic value of food waste in Israel is estimated at approximately NIS 20.3 billion, constituting 1.5% of domestic production. Approximately 7% of this value originates in unnecessary waste of natural resources (land and

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

water). This is in addition to the unnecessary cost of GHG emissions and air pollutants at all stages of the value chain, as the result of cultivating and processing food that is not consumed, equivalent in value to NIS 1 billion, as well as a cost of approximately NIS 800 million for processing the food and packaging that is discarded. Thus, the total estimated cost of food waste, including the costs of wasted natural resources, GHG emissions, air pollution, and handling of waste is approximately NIS 22 billion.

Quantitatively speaking, approximately 55% of this waste is incurred during production, manufacturing and distribution, before the food reaches household or institutional consumers. In monetary terms, roughly 60% is wasted during household or institutional consumption.



Source: BDO estimates



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

NIS 3.2 billion The environmental cost of food waste in Israel

Environmental Impact and Cost of Food Waste/Loss

The food production process requires the use of diverse resources, including land, water, fertilizers, chemicals and energy. It is responsible for approximately one-fifth of all greenhouse gas (GHG) emissions worldwide⁸. Many of these resources are nonrenewable⁹, and their use runs the risk of impacting water, land and air quality, as well as harming global biodiversity.

The environmental cost of food waste in Israel in 2019 is estimated at approximately NIS 3.2 billion, including NIS 1.4 billion for unnecessary use of natural resources, NIS 1 billion for GHG and air pollutant emissions, and NIS 800 million in direct costs for waste collection and processing. Food waste (including packaging) in all segments, except for agriculture, produces 1.9 million tons of municipal waste, which constitutes approximately 35% of all municipal waste in Israel.

Despite the negative environmental impacts of growing and producing food, agriculture is not perceived as a source of pollution, and environmental taxes and fees are generally not imposed on agriculture because the positive external impact of food consumption is higher than its negative external impact. Many developed countries even subsidize production and consumption either directly or indirectly.

However, when food is wasted – produced but not consumed – the full environmental impact remains, from its cultivation and production as well as its disposal and treatment as waste; all this without anyone deriving positive benefit from its consumption. Therefore, a net damage to the environment is attributable to food waste.

This report is the first to examine the environmental impact of food waste and loss in Israel. It focuses on the environmental impact of GHG and air pollutant emissions in Israel in 2019, along the entire length of the value chain for food production, consumption and disposal. It encompasses the waste of natural resources (water and land) as a result of this loss, as well as the impact caused by the need to treat it as waste. The external costs of GHG and air pollutant emissions were quantified using the methodology of United Nations Food and Agriculture Organization (FAO)¹⁰. 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 underestimated, and only provides the foundation for a more comprehensive assessment of the environmental cost of food waste and loss in coming years.

8. <http://www.fao.org/economic/ess/environment/data/emission-shares/en/>

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

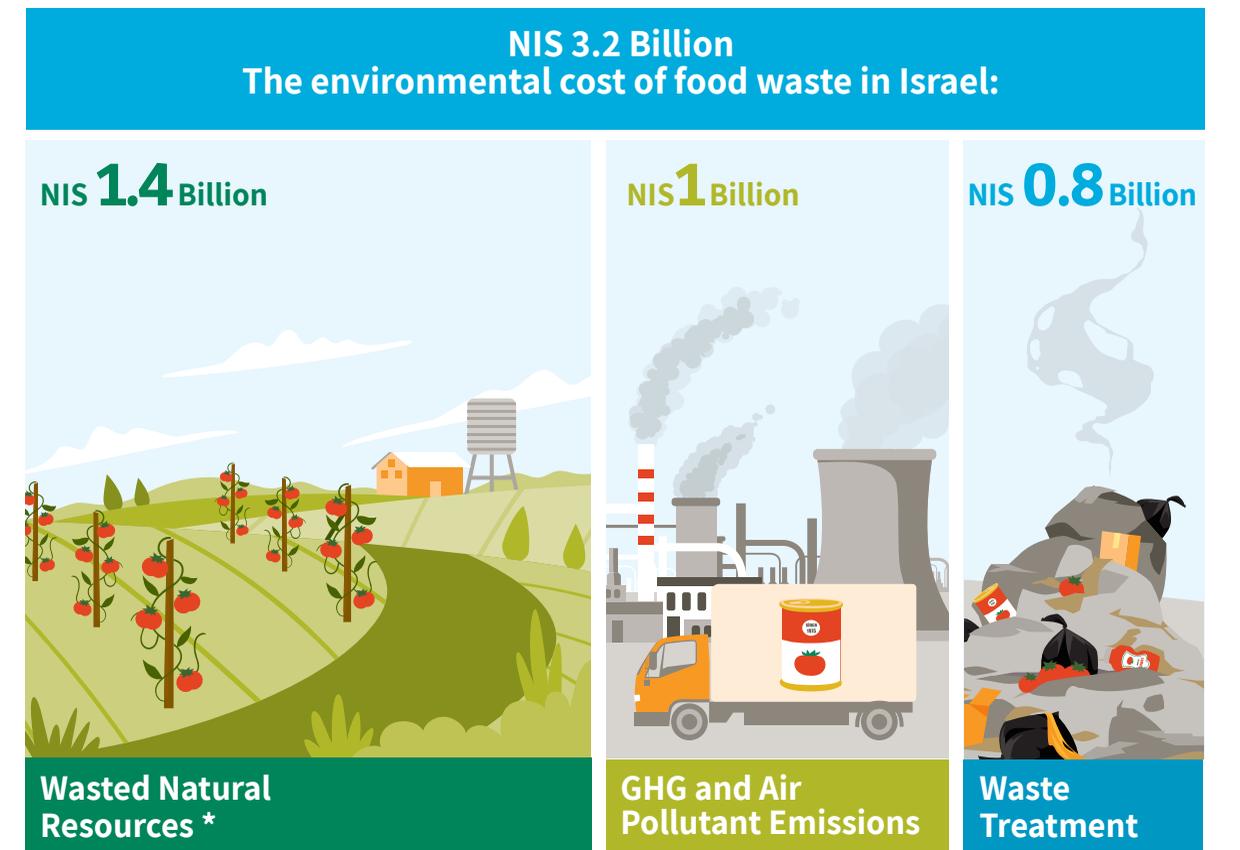
10. FAO, Food Waste Footprint Full Cost Accounting, 2014.

It is important to note that the quantifications of environmental impact presented in this report include only those occurring within the geographical boundaries of the State of Israel. Natural resources invested in cultivating food beyond Israel's borders, as well as emissions from cultivation and production processes abroad are not factored here in this report. A relatively large percentage of some food categories 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 report.

6% of GHG emissions in Israel result from food waste

The environmental impact of food production at all stages (production, processing, marketing, consumption and disposal) originates in energy consumption and resource utilization, which vary by crop type. These costs are in addition to the economic and environmental cost of treating food waste and discarded packaging.

Additional resources that were irreparably lost alongside the food wasted in Israel in 2019 include: 1,260 million kWh of electricity, a quantity sufficient to manufacture all computers, electronic and electric devices in Israel for one year; 70,000 tons of fuel, which could power 160,000 cars for one year; 180 million cubic meters of fresh water, enough to fill 56,000 Olympic swimming pools, plus 190 million cubic meters of wastewater; one million dunams of agricultural land, equivalent to 20 times the area of Tel Aviv; 200 thousand tons of waste (packaging, industrial waste etc.); and



* The cost of wasted natural resources is internalized at the direct cost of NIS 20.3 billion from food loss

50,000 tons of fertilizer, as well as 3,000 tons of ammonia emissions from livestock each year.

Together, these contributed to the emission of 5 million tons of GHG in Israel in 2019 as a result of food waste, which constitutes approximately 6% of the total GHGs emissions in the country. In the Paris Agreement, signed at the United Nations Climate Change Conference in December 2015, the Government of Israel set a national objective for reducing GHG emissions¹¹. The target was set at 7.7 CO₂e (ton of CO₂ equivalents) per capita by 2030, with an intermediary target of 8.8 CO₂e per capita by 2025. In order to achieve these targets, the Israeli Government also decided, in the same declaration, that by 2030 there would

be a 17% reduction in the use of electricity, and a 20% decrease in travel by private cars; moreover, 17% of all electricity would be generated using renewable energy sources. Reducing the amount of food waste in Israel would also assist the national effort to meet the targets for reducing GHG emissions.

Water expended and lost as a result of food waste would fill:
56,000 Olympic swimming pools

11. Israel Govt. Decision No. 542 on Sept. 20, 2015, reduction of Greenhouse Gas Emissions and Energy Efficiency, https://www.gov.il/he/departments/policies/2015_dec542 [Hebrew].

Environmental Costs of Food Waste 2019, By Cost Driver, in NIS billions				
Cost Driver	Wasted Resources	Emissions Cost	Waste Treatment Cost	Natural Resources Cost (Land and Water)
Waste	1.9 million tons municipal waste 0.8 million tons agricultural waste	0.4	0.8	-
Electricity generation (not including electricity for water desalination & purification)	1,260 Million kWh	0.2	-	-
Emissions from animal sources	3,000 tons ammonia	0.2	-	-
Fuel combustion	70 thousand tons	0.1	-	-
Water	180 million m ³ fresh water 190 million m ³ treated waste water	0.06	-	0.6
Fertilizer use	50 thousand tons	0.025	-	-
Land use	1 million dunams agricultural land			0.8
Total		1.0	0.8	1.4
Total environmental cost, 2019		NIS 3.2 Billion		

Source: BDO

In an arid country like Israel, water is a valuable, limited resource. The 180 million cubic meters of fresh water that were irreplaceably expended and lost as a result of food waste would fill 56,000 Olympic swimming pools, or provide enough water for every resident of the country to shower every day for an entire year, or approximately 4 billion showers. In terms of costs, the water lost together with discarded food is worth approximately NIS 650 million to the Israeli economy.

Land is another limited, valuable resource in Israel. The one million dunams of agricultural land used to grow food that was discarded represents a value of approximately NIS 0.8 billion.

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 the accompanying waste of natural resources and polluting emissions; it also includes treatment after disposal. Treating food waste after it is discarded, and transferring it to landfills results in additional environmental impacts. It is known that 34% of the composition of household waste in Israel consists of organic matter originating in food¹². Therefore, discarded food increases the total amount of waste to be treated and, absent waste separation, impedes the ability to recycle other materials found in household waste.

Most of the waste discarded in Israel is transferred to landfills, which has many negative environmental impacts. Landfills require large land areas, thereby contributing to the depletion of land resources in Israel. Moreover, a variety of air pollutants are

emitted when transporting waste to landfill sites far from the center of the country. Not only do landfills emit GHG, they also have the potential to contaminate adjacent land and water resources, when environmentally-harmful substances percolate into water and soil layers¹³.

The amount of municipal waste produced in Israel each year is estimated at approximately 5.6 million tons¹⁴, while the quantity of food waste was approximately 2.5 million tons in 2019. Of this, approximately 1.7 million tons of food waste¹⁵ requires end facility treatment. To this, add approximately 200,000 tons of waste from food packaging for a total of 1.9 million tons of food and packaging waste, approximately one-third of the waste in Israel that requires treatment. In order to treat such a quantity of waste, approximately 190,000 compacting garbage trucks¹⁶ would be required for collection and removal, equivalent to 520 trucks filled with waste, every day for an entire year.

This quantity of waste requiring treatment necessitates the allocation of significant resources, including economic and statutory support for sorting and end solutions. The cost of waste treatment consists 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 treatment itself, depending on the type of treatment, and landfill fees. The direct annual cost for treating food waste and associated packaging in Israel¹⁷ is NIS 0.8 billion. This is compounded by the external costs of GHG and air pollutant emissions from waste treatment, estimated at NIS 0.4 billion. The total direct external economic cost for treating waste originating from food loss in Israel in 2019 was approximately NIS 1.2 billion.

12. According to which composition survey 2013 conducted by the Israel Ministry of Environmental Protection (MoEP)

13. The costs of water and land pollution were not quantified in this report.

14. Estimates by MoEP, 2018.

15. Approximately 830 million tons of food waste to the agricultural stage remains in the field, and generally does not require any further treatment.

16. A compacting garbage truck with a 10-ton capacity.

17. Not including food waste from agriculture.

55% of the environmental impact resulting from food loss is caused by consumer waste

The environmental impact relating to agricultural produce is quantified for the product's entire lifecycle, including cultivation, 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 along the value chain when discarded; the impact of concluding its lifecycle as waste; and the impact of previous stages (if any).

Food wasted at the consumption stage is responsible for approximately 55% of the environmental impact/cost of food waste.

18. the consumption stage includes both household and institutional consumption.

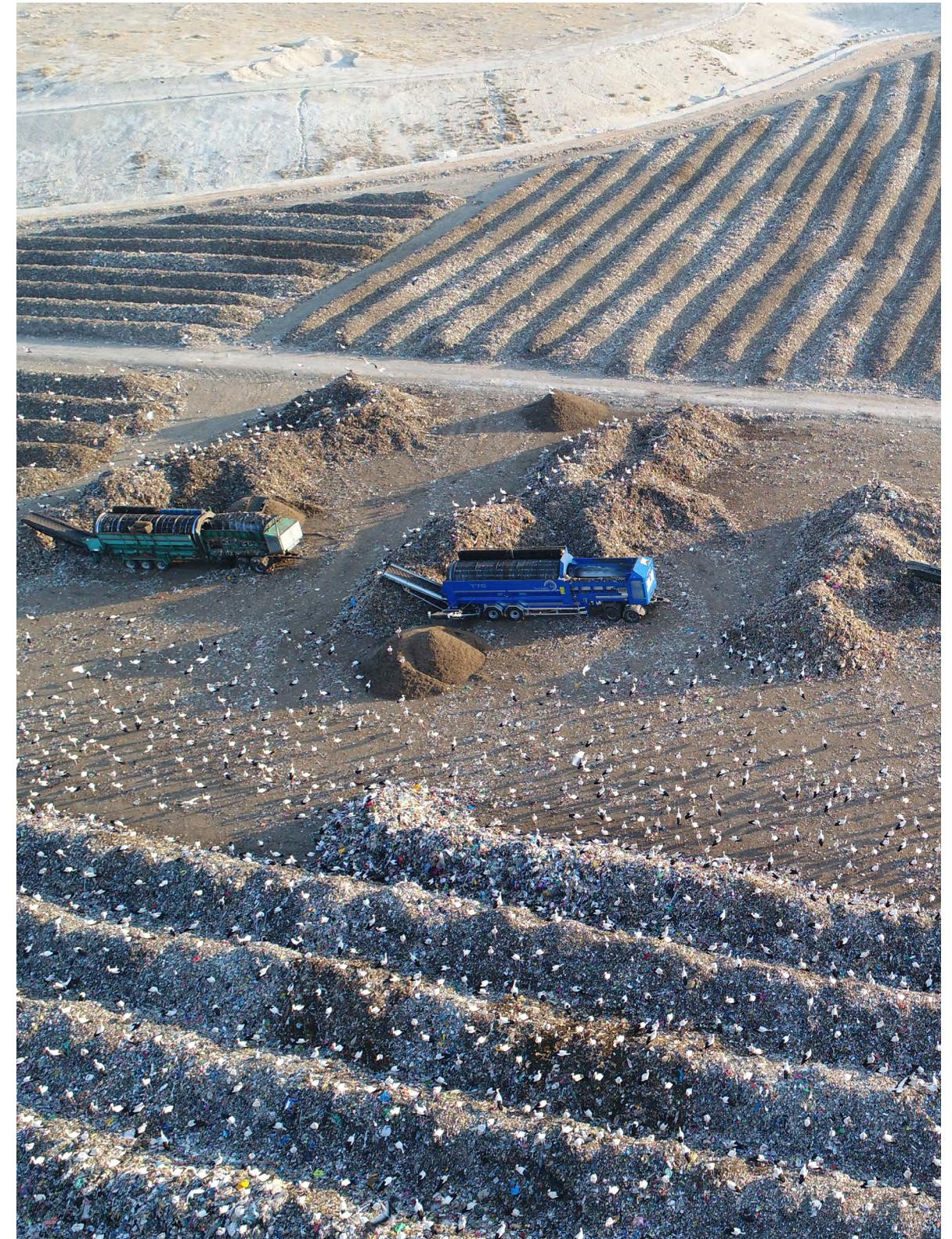
Consumer food waste includes all of the cumulative environmental impact from its cultivation, transport, processing and distribution prior to reaching the consumer. In 2019, food worth NIS 12 billion, and weighing 1.2 million tons (including packaging), was discarded during the consumption stage¹⁸. In addition to the cost of the food waste itself, there is the unnecessary economic cost of waste treatment, totaling approximately NIS 0.6 billion. Consumers pay this price indirectly, through municipal fees, in addition to GHG and air pollutant emissions with an impact and cost of approximately NIS 0.5 billion.

Examining the environmental impact of food waste by stage at which the impact was created shows that origin of more than 60% of the impact is attributable to the agricultural stage, because the costs associated with food discarded at later stages - processing, distribution and consumption - also includes costs from prior stages.

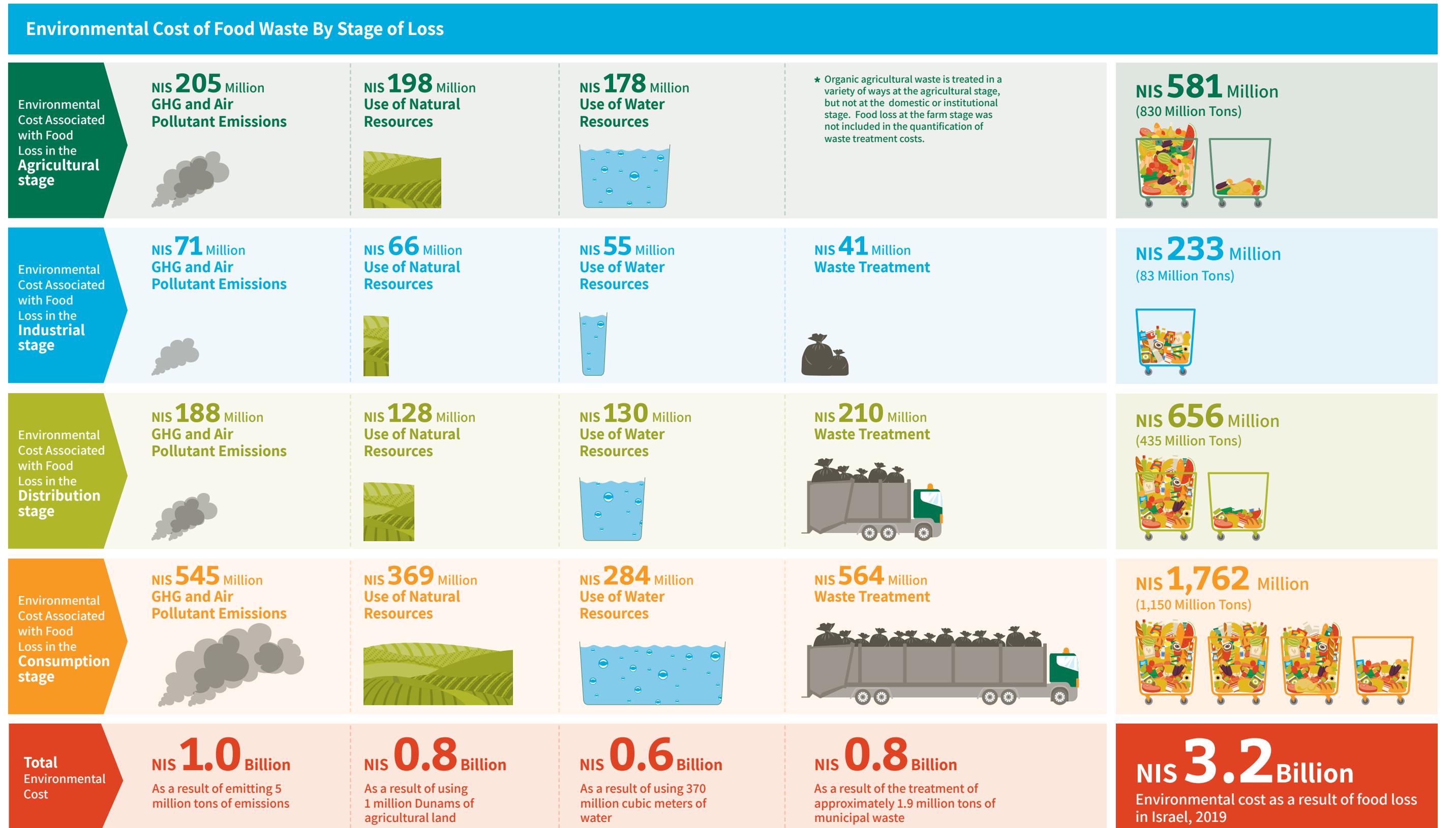
Environmental Costs of Israel's Food Waste in 2019					
By Stage of Food Loss, in NIS millions					
	Agriculture*	Processing	Distribution	Consumption**	Total
Fruit & Vegetables	355	22	384	894	1,654
Grains & Legumes	65	52	67	374	557
Milk & Dairy	69	35	52	196	351
Meat, Fish & Eggs	93	124	154	298	669
Total	581	233	656	1,762	3,232
Percentage of Total	18%	7%	20%	55%	100%

*The agricultural segment also includes losses from the Processing and Packaging segment.

** In the consumption segment, emissions due to use of water, electricity and gas were not included.



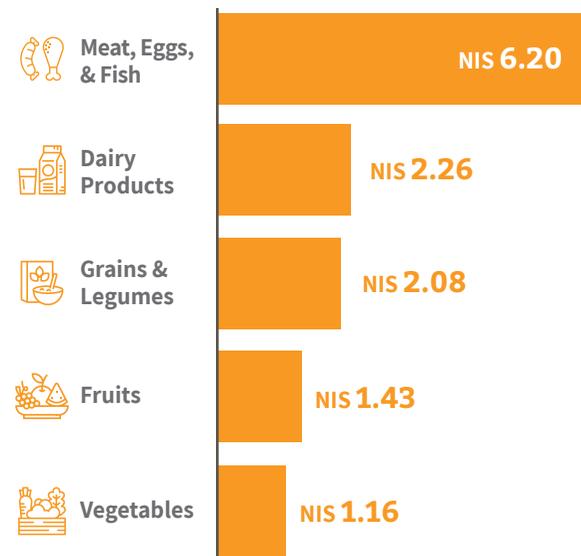
Compost site in Israel. Photo: Eyal Yaffe



Animal-based food products have the greatest negative environmental impact

Examining the impact that different categories of food have on the environment shows that animal-based food products have the greatest environmental impact. Meat/eggs/fish that are wasted during the agricultural stage impose an environmental cost of NIS 4.6 per kilogram on the economy, as the result of air pollutant and GHG emissions. If they are discarded at the consumption stage, the cost increases to NIS 6.2 per kilogram. Dairy products discarded at the agricultural stage impose an environmental cost of NIS 1.5 per kilogram on the economy, which increases to NIS 2.3 per kilogram if they are discarded during household consumption. Fruit and vegetables left as waste in the field have an environmental cost of NIS 0.9 per kilogram, which is nearly doubled when discarded by the consumer.

Environmental Cost of 1 kg of Wasted Food during the Consumption Stage, in Israel 2019 (NIS)



Source: BDO

International comparison – GHG emissions from food waste

According to FAO assessments, the amount of food wasted globally is approximately 2.5 billion tons per year and the total amount of GHG emitted as a result of unconsumed food at all stages of cultivation and production is approximately 3.3 billion tons, in addition to the emissions created when the food is discarded and treated as waste¹⁹.

The FAO estimates that the global cost of GHG emissions (GHGs) from food waste is approximately \$394 billion per year. This cost is dependent on both local conditions and the specific type of agricultural product.

The international comparison presented in the FAO study and the graph below show that when food waste occurs at early stages in the value chain – agriculture, processing and packaging – the level of GHG emissions per capita from the cultivation and production of unconsumed food is similar in all regions (100-200 kg GHGs per capita). Conversely, there are significant differences between regions in emissions per capita at later stages in the value chain, processing, distribution and consumption (100-700 kg GHGs per capita).

It is clear that the gap in GHG emissions between moderate- and high-income regions, such as Europe and North America, and low-income regions, such as Africa and Southeast Asia, results from differences in the amount of food wasted at each stage in the value chain, different

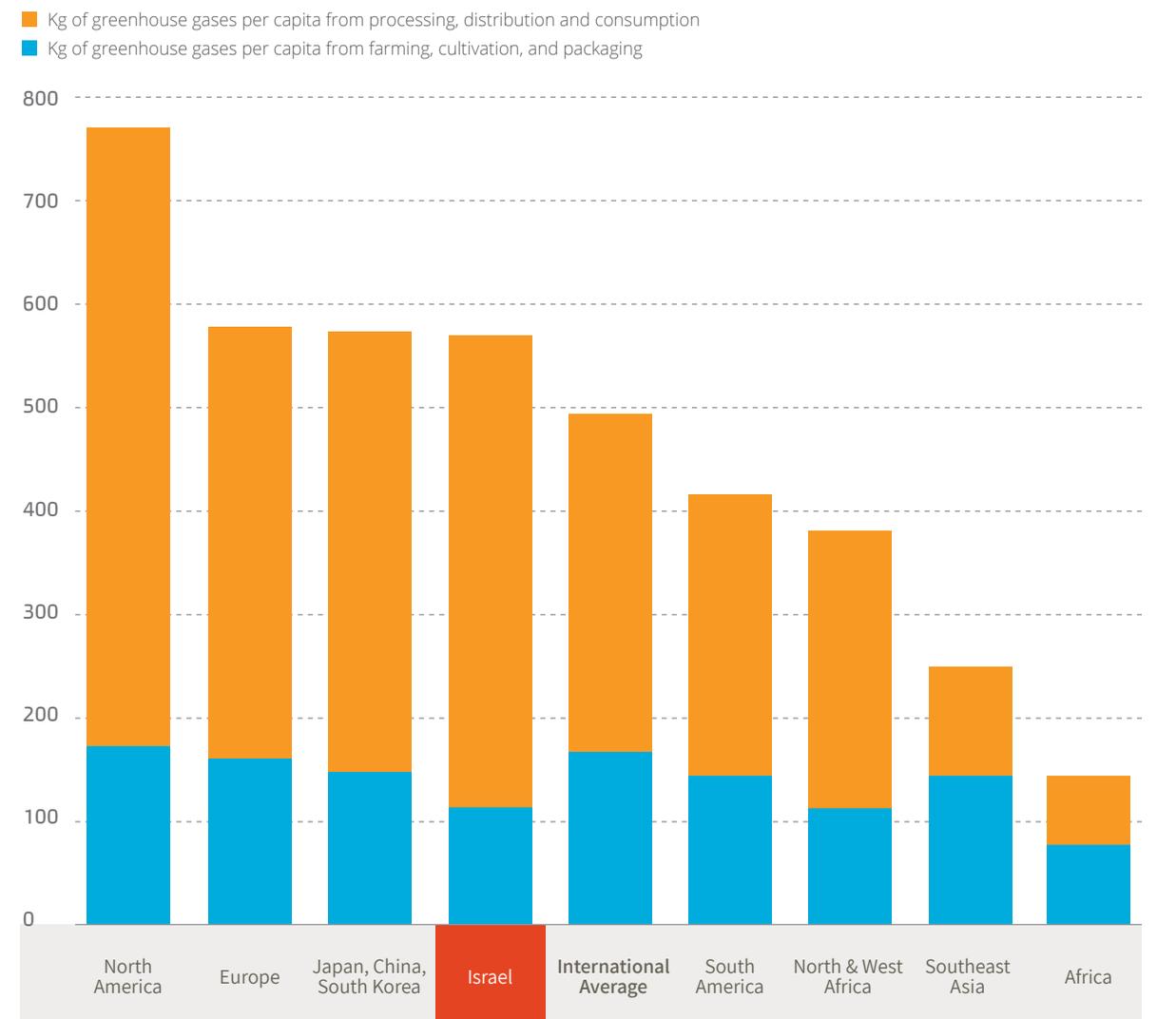
19. Because the FAO study did not quantify air pollutants resulting from producing and discarding food, comparison presented below includes only GHG emissions resulting from food waste.

dietary habits (the consumption of animal-based food yields a higher rate of GHG emissions), and different agricultural cultivation methods (industrial agriculture emits more GHG).

In Israel, 5 million tons of GHG are emitted as a result of cultivating and producing unconsumed food, which represents approximately 6% of the

GHG emissions each year. Most food wasted in Israel occurs during the consumption stage. Animal-based food products are on the menu of most households in Israel and the industrial agricultural methods are prevalent. As a result, the GHG emissions per capita are higher than the global average, and are on a scale similar to Europe.

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



Source: FAO and BDO analysis



Food Waste and Rescue in the Retail and Distribution Sector

NIS 4.5 billion worth of food waste in the retail and distribution sector

50% About half of the rescuable food, by value, is in this sector

Food Waste and Rescue in the Retail and Distribution Sector ²⁰

The volume of food sales in Israel is about NIS 81 billion a year, marketed to consumers in supermarkets, open markets, grocery stores, small retailers and the institutional sector. The total loss in the retail and distribution sector is about 440,000 tons of food, valued at approximately NIS 4.5 billion, which constitutes about 6% of retail food sales. Of this amount, the value of the rescuable food is approximately NIS 3.6 billion ²¹. Moreover, the environmental cost of food waste in the Retail and Distribution Sector is approximately NIS 400 million ²².

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 in the packaging or product, and food damaged in the marketing process. Food manufacturers, distributors, and retailers have a clear economic incentive to minimize food waste by effectively managing the supply chain, maintaining proper storage conditions, and planning inventory.

Nevertheless, surplus food in the retail and distribution sector is inevitable, even with optimal planning of the distribution and marketing systems. This is because retailers are required to ensure a wide, varied and available food supply at all times. Food consumers will not tolerate a shortage of the food items they seek, so the potentially loss caused to retailers due to unavailability of food products is far higher than the cost of creating surpluses. In other words, excess food is an inherent part of the retail sale process.

From an economic perspective, the fact that excess food is discarded rather than rescued represents a market failure, and therefore one of the government's policy challenges is to create a system of incentives that will save these surpluses and transfer them to the populations in need.

Naturally, the rate of loss is higher for fresh products and short shelf-life products, such as fruit, vegetables, bread and baked goods.

Compared to international data, Israel's rate of waste in the retail and distribution sector is similar

to the accepted level in the developed world, despite the potential for higher losses because of Israel's warmer climate. This is evidence that the retail and distribution sector in Israel manage their inventories according to a relatively high standard. The percentage of food waste in developing countries is higher, primarily due to the poor conditions during distribution, storage and marketing.

Food marketers' investment in establishing advanced logistical centers, online inventory and demand management systems, and keeping an unbroken cold chain have contributed to reducing the volume of loss in the retail and distribution sectors.

Simultaneously, changes in consumer preferences have increased the volume of food purchased

from the large retail chains, and the transition from open markets to indoor, air-conditioned retail and distribution channels also has contributed to a reduction in waste. Moreover, research shows that the transition to large stores with a high volume of activity also contributes to waste reduction. Even more recently, there is nascent trend towards purchasing food on the internet. The development of direct purchase channels, in which food is transported directly to the end customer from a dedicated e-fulfillment center, bypassing the retail branch, may provide an additional contribution to a reduction in food waste levels in the future, as well as a potential reduction in GHG emissions.

Online retail may be more environmentally friendly than physical retail, in part because of the decrease in the number of individual trips required

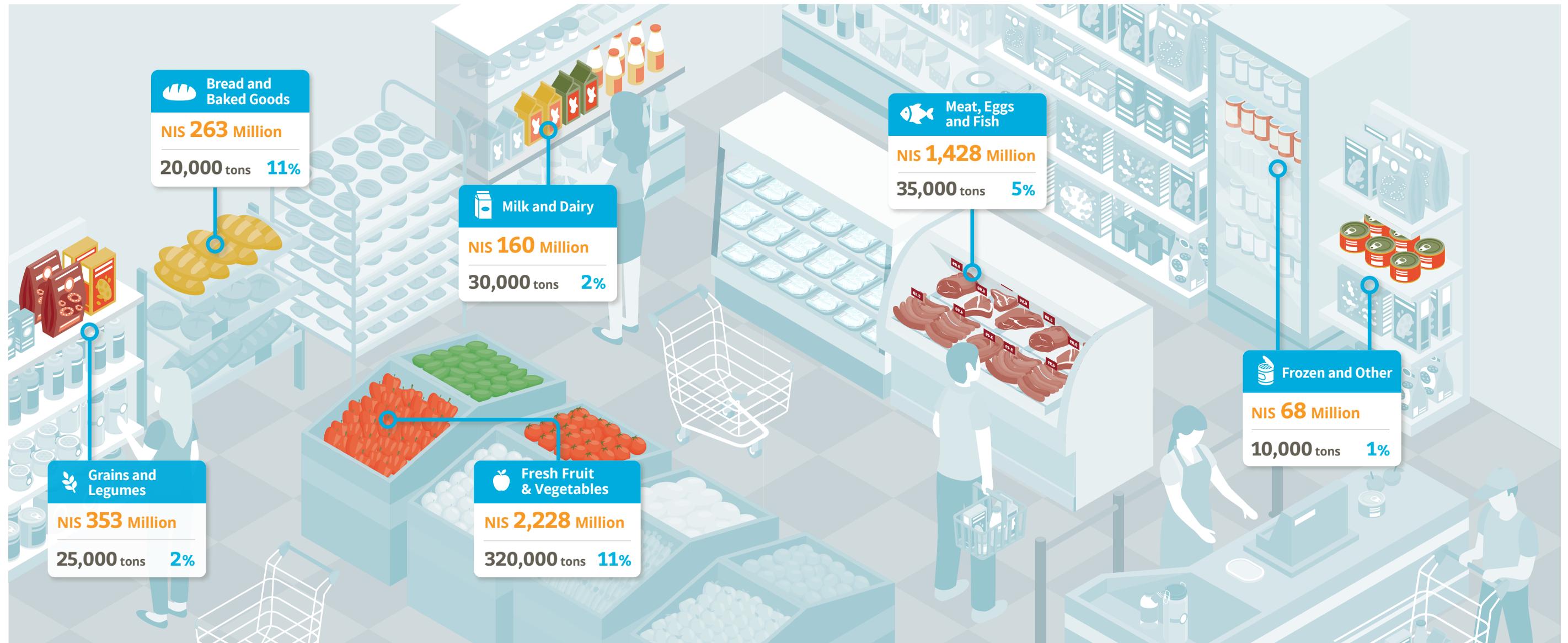


20. For purposes of analyzing food waste, this report relates to "Retail and Distribution" as a single sector that includes losses incurred from the end of the production stage to the sale to the consumer: any loss of finished products that are ready for marketing by the manufacturers, wholesale loss, returns from retailers to manufacturers and loss in retailers. These constitute the loss in the Retail and Distribution sector.

21. The quantity of food rescuable from the Retail and Distribution Sector is based on the BDO model for the Distribution Sector, which uses data from CBS and information received from leading supermarket chains.

22. The environmental cost is not included in the market price of the wasted food - meaning that the natural resources discard as result of food waste in this segment are excluded.

Financial Loss in the Retail and Distribution Sector



Primary Causes of Waste



Expiration Date



Aesthetic Defects



Damaged Food

Value of Loss

NIS 4.5 Billion

* Numbers are rounded for ease of presentation.

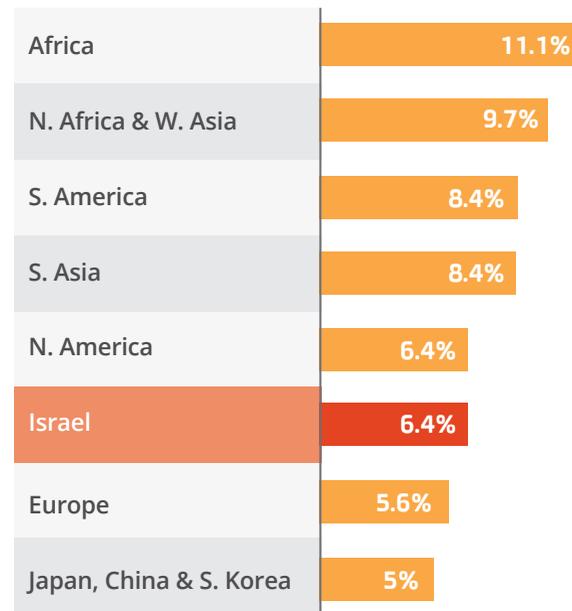
**The rate of the loss refers to the loss from the total production or consumption of the same food category at each stage in the value chain.

to various stores, and because many items are consolidated and delivered to multiple addresses in a single trip. A University of Washington²³ study from 2014 showed that if routes are planned efficiently, delivery service has the potential to save up to 80% of the carbon emissions produced by consumers travelling to stores.

Waste in the retail and distribution sector has a high economic value because it includes the entire previous investment in growth, manufacturing, packaging and transportation. It is food that is ready for marketing and consumption that is wasted before reaching the end consumer. In addition, due to the characteristics of waste at this stage, the vast majority of the food at this stage is rescuable, whose loss can be prevented. As a result, this sector constitutes about 50% of the potential for rescue in monetary value, about NIS 3.6 billion, out of total potential for rescue worth NIS 7.1 billion to the economy.

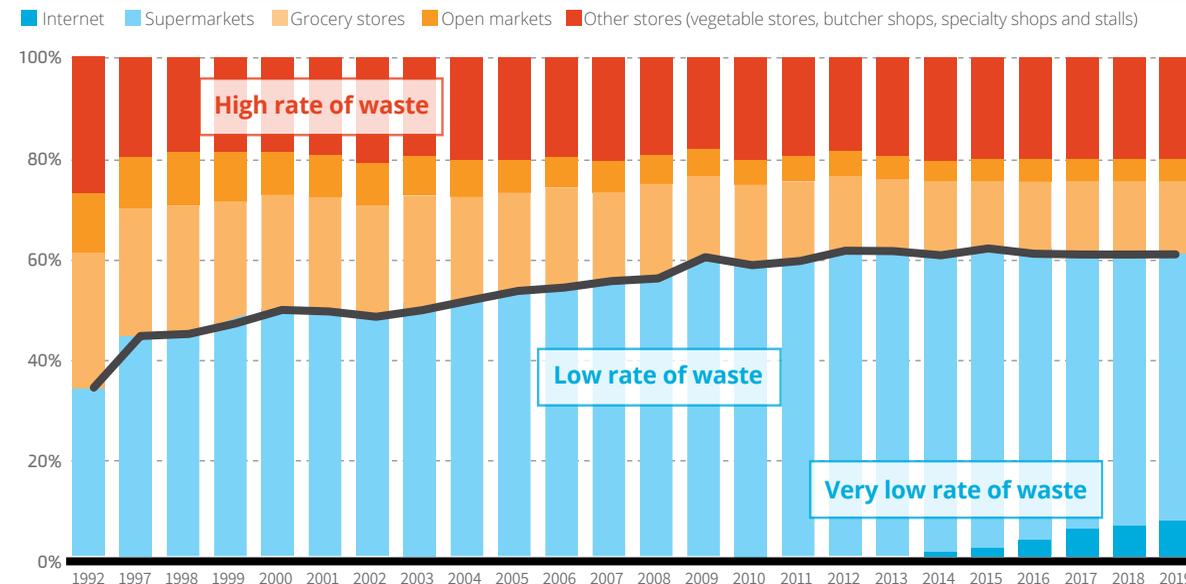
23. http://depts.washington.edu/sclctr/sites/default/files/research_publications/PacTrans-Changing+Retail_Business_Models.pdf

International Comparison: Rate of Waste in the Retail and Distribution Sector



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

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, therefore, it is inevitable that some products will reach their expiration date before being 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 creating incentives that will facilitate inventory management to ensure that short-dated food is sold at a lower price or distributed to the needy before it reaches its expiration date. Such inventory management is workable, now that it is possible to estimate statistically the amount likely to be consumed, compare it to current inventory, and donate any surplus at an earlier stage, and certainly before the food reaches its expiration date. In addition, a review of food expiration classification policy is required, as well as greater explanation to help consumers understand the differences between the various markings related to expiration dates.
- ### 2. Aesthetic defects in the product and defects in packaging

Aesthetic defects damage the market value of food products, but in most cases does not represent an impairment of the nutritional value of such products. Loss of this food reflects a market failure since the defective food products maintain full nutritional value for the needy, despite its low market price. Some retailers handle this problem, for example, by selling products that have aesthetically defective packaging at a reduced price.
- ### 3. Damaged food

Food damaged during logistical processes is a relatively minor cause of food waste. Damage can be caused at various stages in the retail and distribution process. Damaged food includes broken eggs, spilled products, fallen or damaged fruit and vegetables, remains in butcher shops and delis, etc. This food is not rescuable, but the amount is relatively small, because maximal efforts are made to reduce damage and waste.

Rescue operations in the retail and distribution sector

Retailers and food manufacturers are working to reduce loss and rescue food due to economic considerations. Surplus food can be donated in several ways:

1. Selling surpluses at reduced prices

When there are products that have short expiration dates or are damaged, retailers sometimes offer them at a reduced price. Economically, the transfer of these products to the needy at reduced prices the fear of decreased sales.

2. Contribution of food

Centralized and coordinated on the basis of agreements with food rescue initiatives and/or as a local initiative on the branch level.

Food producers are also involved in food rescue:

Some food manufacturers contract with NPOs and donate food with short expiration dates or production surpluses. In addition, products with defective packaging or an aesthetic defect in the product are sold in various secondary markets, if the flaws are detected in the factory, and the food is still safe and fit for human consumption.



Food Waste and Food Rescue in Institutional Consumption

79 thousand tons of rescuable food with a total value of NIS 1.3 billion.

20% of the food consumed in Israel is served by institutional catering operations

Food Waste and Food Rescue in Institutional Consumption

Approximately 20% of the food consumed in Israel is served in institutional catering operations: meals served at factories, workplaces, security forces (Israel Defense Forces [IDF] bases, police stations, prisons), hotels, catering halls, restaurants, schools, hospitals, etc ²⁴. This sector, in which many diners are gathered together in one location, has the greatest potential for food rescue.

According to BDO estimates, on an average day in 2019²⁵ approximately 2 million people ate one meal outside the home, equivalent to 690 million meals annually. Approximately 800,000 tons of food is used to prepare these meals.

The value of food used in meals eaten by consumers outside of their homes is estimated to be NIS 14 billion annually, equivalent to approximately 17% of the total expenditure for food in Israel, and approximately 11% of the food consumed in quantitative terms.

The total food wasted in the institutional sector amounts to 240,000 tons annually, representing 30% of institutional food consumption, at a cost of approximately NIS 3.9 billion annually, in addition to an environmental cost of approximately NIS 230 million ²⁶.

24. In the model, each of these categories is weighted according to the characteristics of the meal it serves.

25. The BDO model for food waste in the Institutional Sector, based on data from CBS and information received from the Association of Banquet Hall, Event Garden and Catering Hall Owners in Israel and from the security forces.

26. The environmental cost is not included in the market price of the wasted food – meaning that the natural resources that were discarded as the result of food waste in this segment are not included

27. The BDO model for food waste in the Institutional Sector, based on data from CBS and information received from the restaurant association, and the association of banquet hall, event garden and catering owners in Israel and from the security forces.

Approximately one-third of institutional meals that are wasted are rescuable²⁷, meaning that it would be possible to save approximately 79,000 tons of food annually, with a total value of approximately NIS 1.3 billion each year, equivalent to approximately 70 million meals.

Food waste in institutional kitchens is an inevitable part of the economic planning of meals for a large number of patrons in communal settings, while guaranteeing that the supply and variety meet the requirements of many diverse patrons, and taking into account the inherent elements of uncertainty as well.

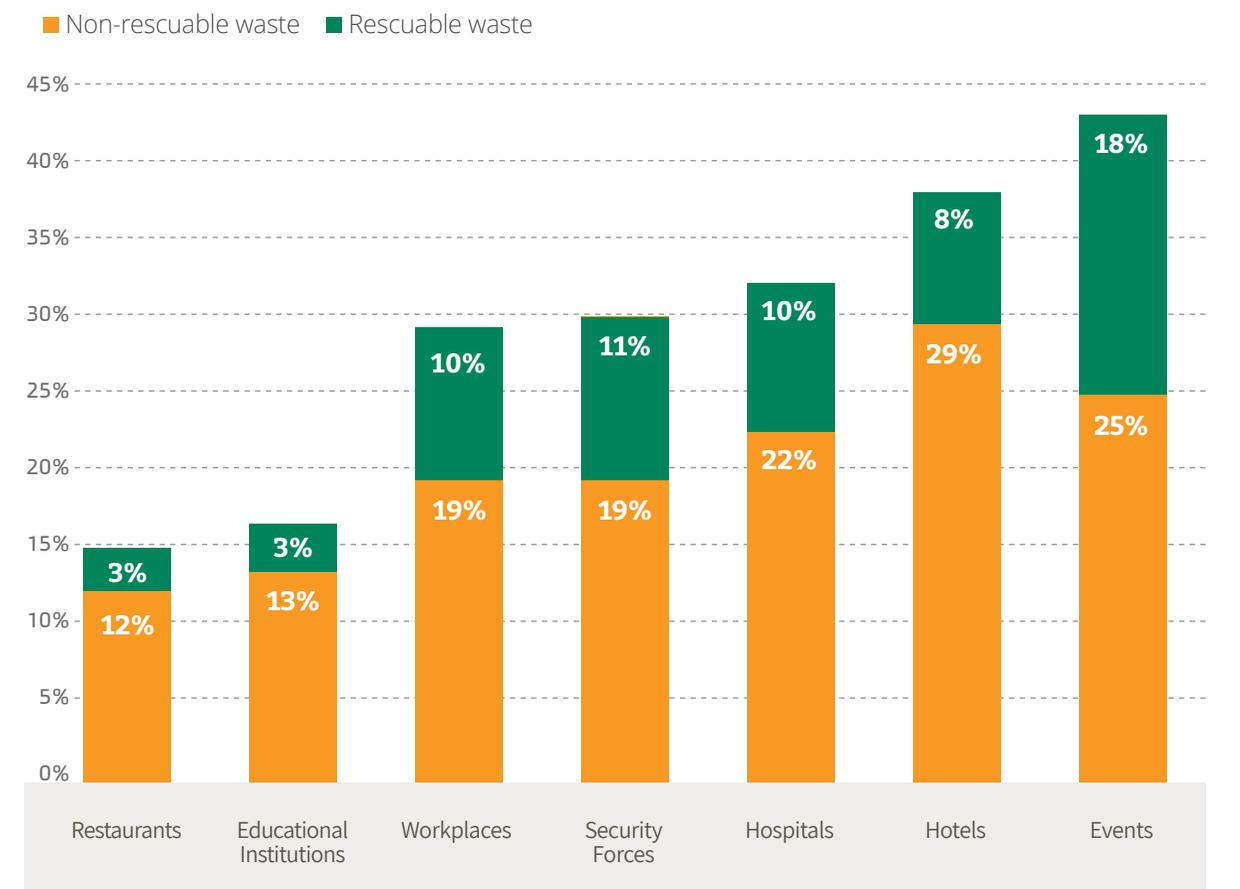
The value of food used in meals eaten by consumers outside of their homes is estimated to be NIS 14 billion annually, equivalent to approximately 17% of the total expenditure for food in Israel

In recent years, most institutional kitchens are operated by external companies with a high level of expertise in the field. Those companies strive for maximal economic efficiency and reduction of

waste. Despite this, catering cannot be planned on the basis of averages alone; it must provide sufficient food for non-average days as well. This means that catering companies must allow for sufficient margins to accommodate the risk of variance, rather than relying solely on statistical averages.

The analysis in the report shows that, as a general rule, a kitchen characterized by a higher level of uncertainty regarding the number of patrons can be expected to produce a higher level of waste. For example, at open IDF bases and workplaces, where there are accessible alternatives, the food waste will be higher than in schools and prisons,

Rate of Food Waste by Category of Institutional Consumption



where there is less uncertainty about the number of meals to be served.

In addition, the more varied the menu, the greater the amount of waste that can be expected due to the uncertainty regarding which choices patrons will prefer. Accordingly, a higher level of waste can be expected at events and in hotels, where a wide variety of choices are offered, rather than workplaces, IDF bases and police stations.

The style of service and who pays for it can also

influence the amount of waste. In restaurants, for example, where food is prepared only after it is ordered, less waste is expected than at a buffet where food must be prepared in advance. In situations where the consumer pays only for what is eaten, the amount of waste will be lower than it is in restaurants that charge an all-inclusive price.

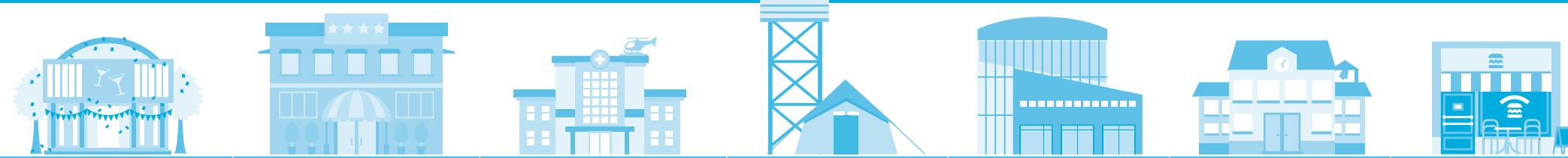
The total amount of food that can be rescued from the institutional sector is valued at approximately NIS 1.3 billion. Approximately half of this amount

is from events, from which it is likely possible to rescue approximately 23,000 tons of food, with a monetary value of NIS 0.5 billion, annually. Hotels, IDF bases and workplaces are other important focal points for food rescue, and it is likely that approximately NIS 140-190 million worth of food can be rescued annually from each of these sources. The value of rescuable food from restaurants is similar; approximately NIS 130 million, but the broader geographical distribution and the lack of a critical mass in any single location

generally reduces the economic feasibility of rescuing food from restaurants.

The high return on investment for food rescue in the institutional sector is a consequence of the relatively high value of the rescued product, combined with the relatively low logistical costs of collecting food from large kitchens with dense geographic distribution, concentrated in city centers and industrial areas.

Estimated Food Waste in Institutional Consumption



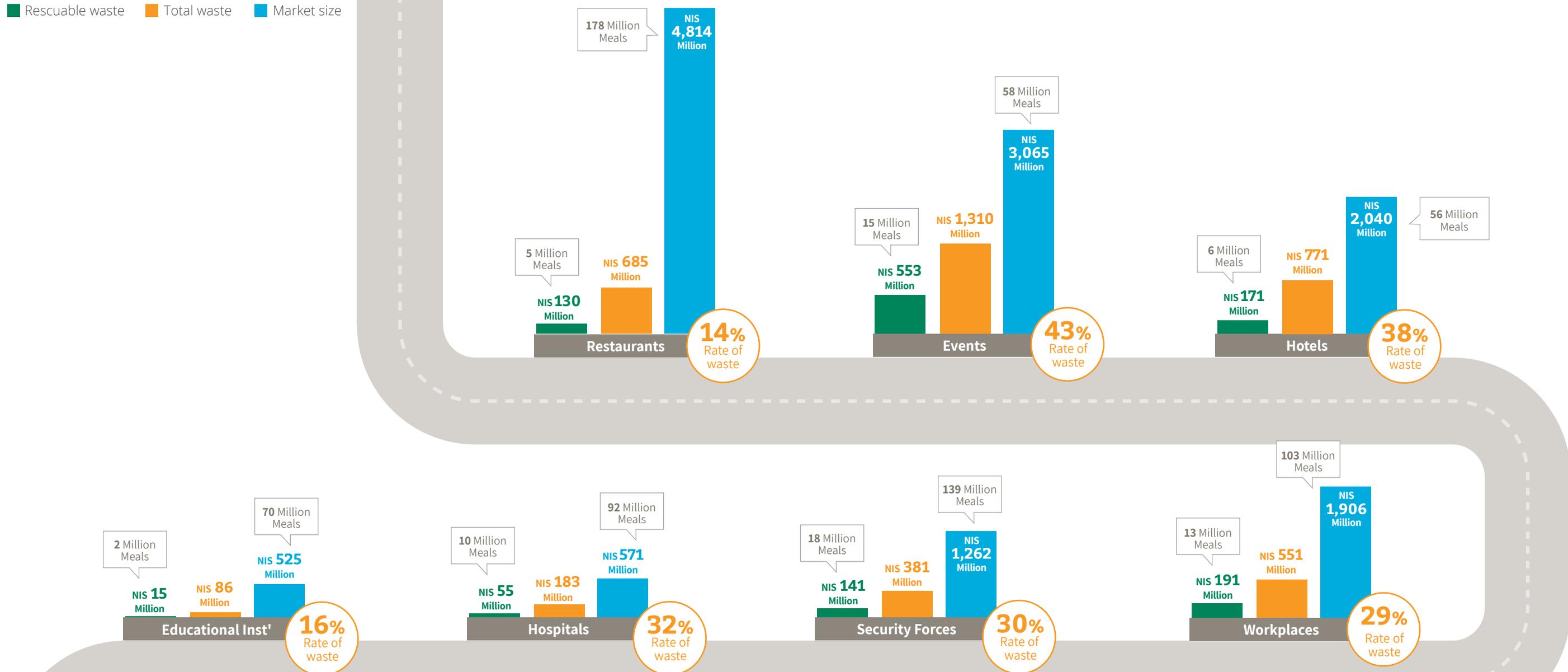
	Events	Hotels	Hospitals	Security Forces	Workplaces	Educational Institutions	Restaurants	Total
Relevant population (Thousand people)*	145	95	190	229	430	388	488	1,964
Meals served (yearly) (Million meals)	58	56	92	139	103	70	178	696
Food consumed (yearly) (Thousand tons)	130	96	74	159	181	34	133	807
Annual waste (Thousand tons)	55	36	24	48	52	6	19	240
Rate of Waste (%)	43%	38%	32%	30%	29%	16%	14%	30%
Rescuable waste (Thousand tons)	23	8	7	18	18	1	4	79

* The figure is based on the number of workdays relevant to each category. The estimate also distinguishes between different populations within each category.

**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.

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 8.2 billion worth of food is wasted by Israeli households

NIS 900 million The environmental cost of household food waste

Food Waste in the Household Consumption Sector

In Israel, expenditures on household food consumption is a central component of each household's monthly expenses, and averages approximately NIS 2,000 per month per household (not including alcohol, soft drinks, and meals eaten

outside of the home), which is about 17% of a household's total expenditures.

Findings of the 2019 National Food Waste and Rescue Report reveal that Israeli households wasted approximately 910,000 tons of food²⁸,

28. Based on 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, and research 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.

Household Food Waste, NIS per month			
	Monthly expenditure on food	Monthly food waste	% Waste
Fruit & Vegetables	540	124	23%
Grains & Legumes	625	86	14%
Meat, Eggs & Fish	555	43	8%
Milk & Dairy Products	330	22	7%
Total	2,050	275	13%

worth approximately NIS 8.2 billion. In addition to this direct cost, the environmental cost of food waste in the household sector is approximately NIS 0.9 billion²⁹.

This waste accounts for approximately 13% of an average Israeli household's total expenditure on food. This means that Israeli households discard food valued at NIS 3,300 each year (equivalent to one-and-a-half months of a household's food consumption). On a monthly basis, a household's financial loss from food waste is NIS 275 (not including the cost from other stages in the value chain). Of the loss, fruit and vegetables account for NIS 124, grains and legumes account for NIS 86, meat, eggs and fish account for NIS 43, and milk and dairy account for NIS 22.

29. The environmental cost is not included in the market price of the wasted food – meaning that the natural resources that were discarded as the result of food waste in this segment are excluded.



Primary causes of household food waste – Surplus preparation and expired food

Food waste during household consumption is caused by a combination of consumer habits and a culture of abundance. It is also influenced by how food is stored and kept fresh. The value of the food wasted by households is approximately NIS 8.2 billion per year.

The main factors causing food waste in household consumption are:³⁰

1. Surplus preparation of food Preparing more than is needed, usually excess food that is cooked or prepared unnecessarily and not consumed.

2. Expired food Food that reaches its expiration date before being fully consumed. It should be noted that food reaching expiration before being consumed is related to excess purchasing. The desire to vary types of food, combined with uncertainty about the amount that will be consumed in the household, combine to create a situation in which some of the food purchased expires before it is consumed.

3. Damaged or spilled food Food that has spoiled due to poor storage, poor cooking or human error.

Other causes of food waste in household consumption are poor preparation or cooking, and excessive purchasing.

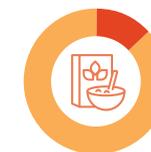
30. Household Food Waste survey of 500 households, representative of the Israeli population, conducted by Leket Israel and BDO, with the assistance of Geocartography Research Institute, in January 2019.

Households Annually Discard

23%
Fruit and Vegetables



14%
Grains and Legumes



Food waste during household consumption is not unique to Israel, and the rates of loss in Israel are comparable to other developed countries. The highest percentage of waste in Israel, as in other western countries, is from fruit and vegetables, with 23% of fruit and vegetables purchased in Israel being discarded, compared to 28% in the US and 19% in Europe. The relatively high rate of loss for fruit and vegetables is primarily due to their short shelf life and a households' failure to adhere to optimal storage conditions.

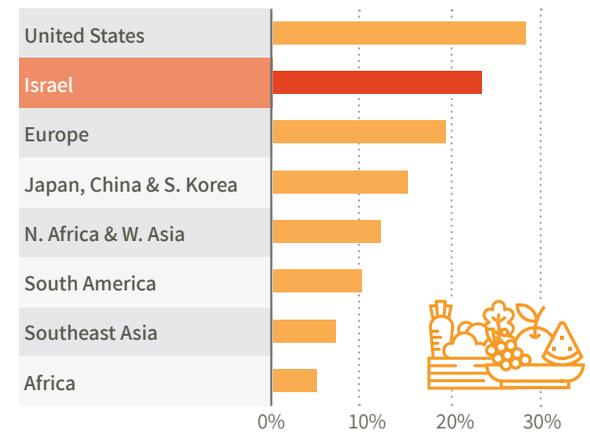
The rate of loss for meat, fish and dairy products

is lower and stands at approximately 8%, in part because these products are more expensive per unit of weight, which creates a higher economic incentive for reducing loss. The rate of loss for these products is similar to that of Europe, and lower than the rate in the US.

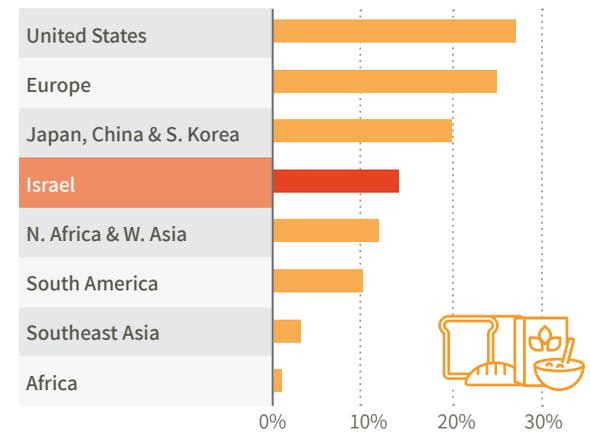
For grains and legumes, the rate of loss is approximately 14%, while it stems from the combined result of the short shelf life of products like bread and pastries, and the relatively long shelf life of raw grains and legumes.

International Comparison: Rate of Household Food Waste

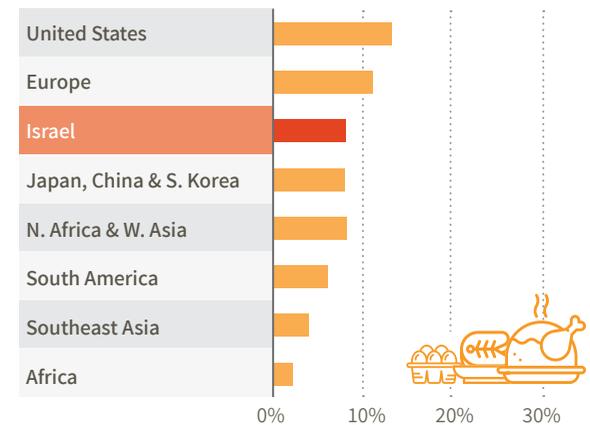
Fruit and Vegetables



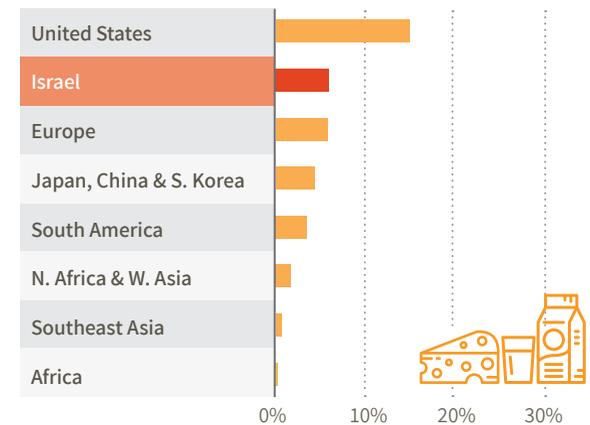
Grains and Legumes



Meat, Eggs and Fish



Milk and Dairy Products



Rate of Household Food Waste for Selected Products



Source: BDO estimates

NIS 6,575
Overall effect of food waste on the cost of living per household annually

In Israel, where expenditure on food is relatively high by international standards³¹, food waste contributes to the high cost of living. Such waste impacts the cost of living by leading to excessive expenditures for food while also having an effect on food prices. The overall impact on the cost of living is an additional NIS 6,575 per household annually.

Cost of Living – Surplus expenditure: Food purchased and discarded as waste directly influences the cost to a household. On average, the direct month loss (not including external costs³²) from discarded food was determined to be NIS 275 per household, for an annual loss of NIS 3,300 per household. The costs of waste collection and landfill disposal ultimately come from the consumers' pockets as well, in the form

of municipal property taxes and fees, adding an additional NIS 200 expenditure per household to dispose of food waste.

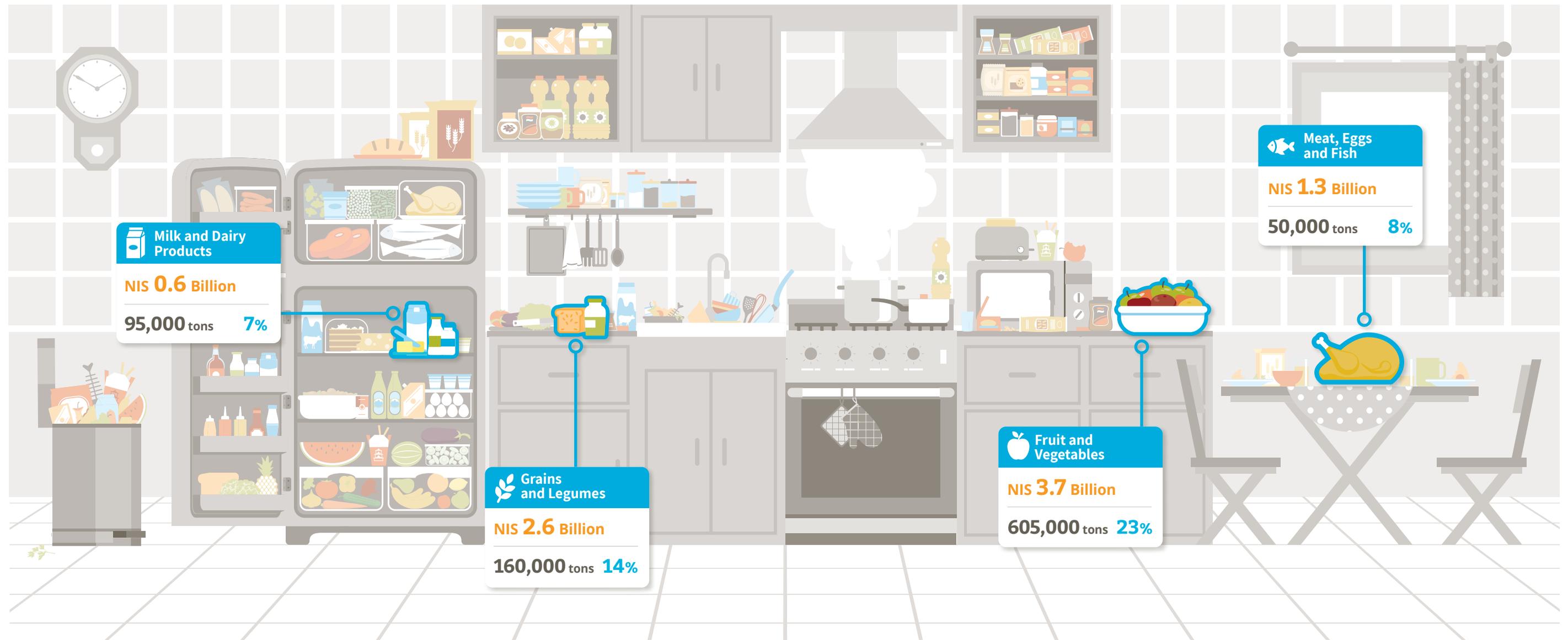
Cost of Living – Higher food prices: In addition to a households' direct surplus expenditure for food purchased but not consumed, food wasted during all stages of the value chain prior to household consumption influences the cost of living. In economic terms, the cost of food reflects total production and sales costs at all stages of the value chain: growing, production, packaging, transport and marketing. Therefore, the price of food in supermarkets incorporates the value of food waste in the retail sector. Similarly, the price of wholesale food reflects its loss in the agricultural and industrial sectors. Ultimately, the cost of waste at all stages of the value chain is passed on to the consumer, causing an additional annual cost of NIS 2,900, in the form of an 11% increase in food prices.

Cost of Living – Environmental impact of GHG and air pollutant emissions: The environmental impact that accompanies food waste indirectly affects the cost of living. The emission of pollutants

31. Economist Global Food Security Index, 2018

32. External costs that were not included: the cost of collecting food waste and transporting it to landfill, the cost of GHG and air pollutant emissions, the increase in retail price due to food waste in supermarket chains and the increase in wholesale price due to waste in agriculture and industry.

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 8.2 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.

into the air has negative external impact on human health and the environment, the cost of which is borne by the economy as a whole, mainly as health expenditures. In order to take these into account and reflect their impact, external costs resulting from these negative environmental impacts were calculated. These external costs reflect the monetary value of the loss of societal welfare from the emission of pollutants³³. These environmental impacts are estimated at NIS 1 billion for the Israeli economy in 2019, which is NIS 175 per household on average.

Beyond the direct impact on cost of living and cost of disposal to landfills, other external costs are incurred by the public for the transport of waste, fuel combustion, road congestion, environmental damage caused by GHG emissions, and soil contamination. When organic waste is buried in landfills, it decomposes and emits methane gas, a

33. MoEP, The Green Book: Estimating and Measuring External Costs of Air Pollution and Greenhouse Gas Emissions, 2020.

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

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 3,300	-
Cost of collection and landfill disposal for discarded food	NIS 200	-
Impact of GHG and Air Pollutants	NIS 175	-
Increase in the retail price due to food loss in the market sector	NIS 1,700	6%
Increase in the wholesale price due to food loss in the production sector	NIS 1,200	5%
Total	NIS 6,575	11%

GHG whose global warming potential (GWP) is 84 times greater than that of carbon dioxide, in the short term (20 years), and 28 times in the long term (100 years³⁴).

According to findings of the 2019 National Food Waste and Rescue Report, 910,000 tons of household food waste in Israel was disposed of in landfills, causing 290,000 additional trips per year by sanitation trucks, thereby increasing air pollution, road congestion, noise and the risk of accidents. Therefore, beyond the NIS 8.2 billion value of household food waste itself and NIS 0.5 billion for its disposal, additional external costs are also incurred due to the effects of traffic congestion and resulting impacts to the environment.



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

Various countries have undertaken efforts to reduce household food waste. These efforts are being made on several levels, including: increasing consumer awareness of food waste, education to prevent food loss, the use of technology to reduce waste, taxation and more.

In 2013, the British Food Rescue Organization - WRAP: Waste and Resources Action Programme began the “Love Food Hate Waste” project, a campaign to raise awareness about the importance of reducing food loss and helping people take action on the issue. The project included digital publications and community events, such as cooking classes. As part of the project, a dedicated website was created, containing information to help facilitate the reduction of food waste. Topics included, for example, calibrating refrigerators to optimal temperatures, the importance of preparing a shopping list, etc.

WRAP examined the effects of its project in west

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

In Israel, the Postharvest Science of Fresh Produce Department at the Volcani Institute has published guidelines on the preservation of fruit and vegetables for households³⁵.

Technological means provide another path towards reducing food waste. In the Netherlands, research was conducted on optimal temperatures for extending the shelf life of various food

products. By changing the storage temperatures, researchers were able to significantly extend the shelf life of the products.

An additional way to reduce household waste is through taxation. In many countries, what's known as the “Pay as You Throw” method has been employed. Countries currently implementing this method include the US, Canada³⁶, Austria, Germany, Spain, Japan and others. Through this method, the fee each household pays to the municipality or waste collection agency depends on the amount of unsorted waste it discards. As a result, the “Pay as You Throw” method encourages both recycling and reduction in food waste, since food accounts for a significant portion of the household's waste volume.

35. https://www.moag.gov.il/subject/the_food_we_eat/Storage_Guidelines_For_Fruits_Vegetables/Pages/Storage_Guidelines_consumer.aspx

36. In the US and Canada, Pay As You Throw is implemented on the local level, in several states/provinces. In the United States, it is practiced in Washington, Oregon, Wisconsin and New Hampshire. In Canada, the system is used 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 7.1 billion
worth of food
is rescuable

Food Waste: How Much Food Can Be Rescued?

Approximately 35% of food produced in Israel is lost or wasted during the production, distribution and consumption stages, totaling approximately 2.5 million tons annually. The direct cost of the food waste is NIS 20.3 billion, equivalent to 1.5% of the GNP. When taking into account the cost of GHG and air pollutant emissions resulting from food waste, the total cost of this waste amounts to approximately NIS 22 billion, while about half is rescuable and fit for human consumption.

In terms of food rescue, the most important component is edible foods (fit for consumption with nutritional and health benefits) that do not reach the consumer. There are various reasons for loss in each of the stages of the food value chain. The common denominator is lack of economic viability for food producers (i.e. farmers, manufacturers, distributors, etc.) to invest additional resources in the more advanced stages of production and distribution.

Reducing food waste, either by prevention or by rescuing surplus, is a primary public objective and a top priority on the international agenda. The estimated amount of food fit for rescue is derived from the value chain model designed specifically for the food industry. Every type of food and its loss, at each stage of the value chain, was analyzed and classified as rescuable or un-

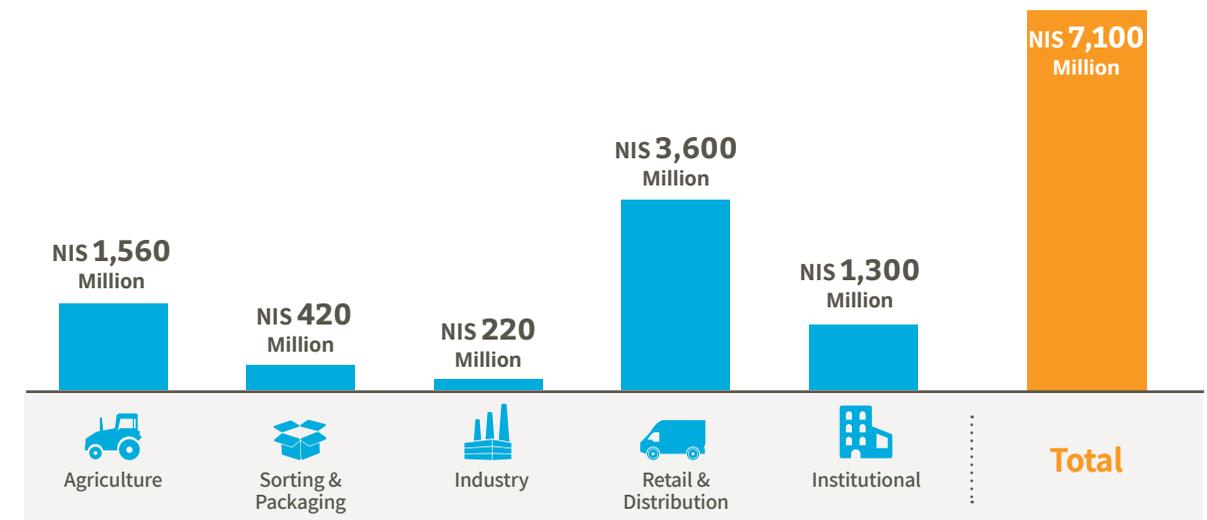
rescuable (unfit for consumption).

It is important to note that classification of rescuable foods does not address economic viability of rescue, but rather considers food safety and the logistical ability to use the surplus food to feed people.

Most of the value of food waste is concentrated in the retail and distribution sector, because the food lost during these stages is ready for marketing and consumption, meaning that it is being discarded before reaching the final consumer.

The value of rescuable food is approximately NIS 7.1 billion, with the value of the loss increasing at each stage along the length of the value chain, as more resources have been invested in raising, producing, packaging and transporting the food that is then wasted. Most of the value of food waste is concentrated in the retail and distribution sector, because the food lost during these stages is ready for marketing and consumption, meaning that it is being discarded before reaching the final consumer.

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



Source: BDO estimates



Dining hall at Ariel Sharon Training Base (Ir Habadim) which donates prepared food to Leket Israel. Photo credit: Ariel Sharon Training Base.

According to our estimate, roughly 50% of food waste is rescuable and can, given economic viability and appropriate resources, be used to feed needy populations suffering from food insecurity. Furthermore, rescuing 50% of currently wasted food would save the Israeli economy approximately 200 million cubic meters of water, production of over 600 million kWh, 35,000 tons of fuel, and significant land resources.

Food waste during household consumption was not classified as rescuable. There are various approaches to the issue of food waste in household consumption. Western culture is based on a notion of consumerism and prosperity, in which consumers extract benefit and enjoyment, not only from food consumption,

but also from having a range of selections and even excess. Economically, as long as consumers pay the full amount for purchased products, there is no justification for restricting consumption. The problem is that food production entails the use of natural resources and has an environmental impact, and these external costs are not calculated in the price paid by consumers for food. We did not examine these aspects, however, these circumstances might justify actions to encourage food rescue and recovery — perhaps with government-sponsored public relations campaigns, as has been implemented in several western countries—to raise public awareness regarding the external impact of producing food that is left unconsumed.

Rescuable Food

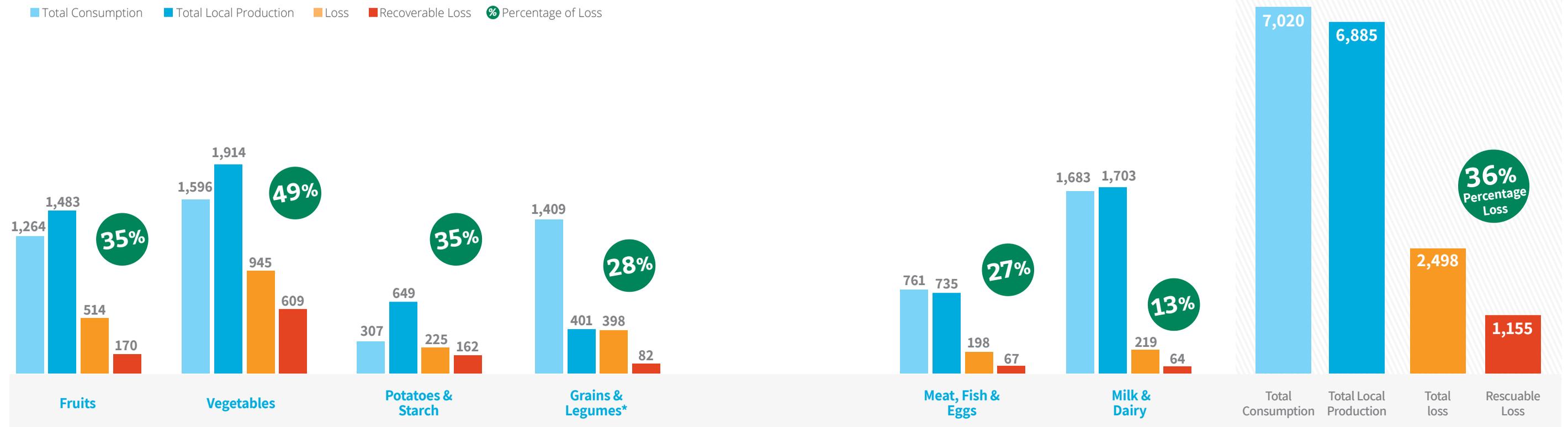
- ✓ Pre-harvested edible agricultural produce
- ✓ Aesthetically flawed agricultural produce
- ✓ Agricultural produce not sold in wholesale markets
- ✓ Unsold food surplus in markets/stores
- ✓ Surplus prepared food from catering, industrial kitchens & restaurants
- ✓ Packaged food with damaged packaging 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 Amounts of Rescuable Food in Israel (1000 tons)

■ Total Consumption ■ Total Local Production ■ Loss ■ Recoverable Loss ● Percentage of Loss



*Waste of grains and legumes was calculated as a percentage of consumption because the majority of grains are imported to Israel.
 **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 Rescue:
Integrating Economic,
Environmental, and
Social Contributions**

50% of wasted food is rescuable, and if it was rescued, it would reduce GHG emissions in Israel by 3%



“Food rescue” is a winning strategy to prevent excess waste, create more food without using additional land and water resources, and prevent waste generated by food production, thereby helping to reduce GHG and air pollutant emissions.

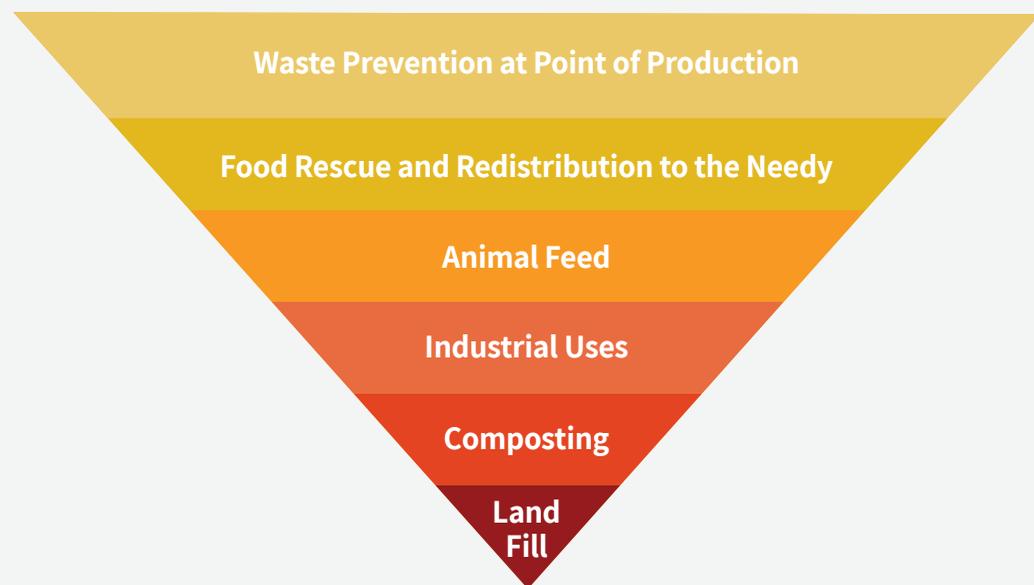
Food Rescue: Integrating Economic, Environmental, and Social Contributions

Food waste is an international phenomenon; it is not unique to the Israeli economy and exists on a similar scale in all Western economies. According to estimates by the Food and Agriculture Organization of the United Nations (FAO), approximately one-third of all food produced worldwide, in quantitative terms, is wasted. This is equivalent to approximately one-quarter of the total caloric value.

The Food Recovery Hierarchy set out in the EU's directive on food waste sets priorities for the treatment of food that was not consumed. This hierarchy gives clear priority to the prevention of food waste and the repurposing of unconsumed food for use by underprivileged populations.

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

The Economic-Environmental Hierarchy of Food Recovery



Source: EPA

help alleviate the problem of food insecurity. The most commonly used methods in Israel include donations, subsidies, allocations and allowances. The uniqueness of food rescue stems from its ability to help those in need at a low budgetary and economic cost. Instead of financing the full cost of food purchases, it is only necessary to finance the cost of its rescue.

In socioeconomic discourse, there is a prevalent disagreement, both in Israel and abroad, between proponents of prioritizing growth (“increasing the pie”) and proponents of prioritizing reduction of inequality.

Food rescue is unique because it is a policy tool that inherently integrates both approaches. Rescuing food and transferring it to underprivileged populations for their consumption increases economic productivity while simultaneously reduces inequality.

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Food rescue is unique because it is a policy tool that inherently integrates both approaches. Rescuing food and transferring it to underprivileged populations for their consumption increases economic productivity while simultaneously reduces inequality.

The importance of rescuing food stems from three central advantages:

1. Economic Benefit

Food waste is detrimental to economic productivity because of the production and labor inputs that are irretrievably lost. Food rescue transfers food that would otherwise be lost to underprivileged populations for their consumption, thereby converting waste with zero or negative value into a product of economic value, without the need to invest additional production inputs. Rescued food retains its full nutritional value, but the cost of rescue is lower than the cost of production and transportation, meaning that food rescue contributes to increasing production and productivity in the economy.

2. Social Benefit

The cost of food waste, along the entire value chain from food cultivation and production through distribution, marketing and consumption, are ultimately passed onto the consumer, and affect the cost of living in Israel. Therefore, the rescue and provision of surplus food contributes to closing gaps in society and lowering the cost of living. Moreover, food rescue helps reduce food insecurity in the underprivileged populace.

3. Environmental Benefit

During the cultivation, production, distribution and marketing processes, about 35% of local, Israeli food production, by volume, is lost and becomes waste or surplus. When that happens, all of the resources required to cultivate and produce it are irreversibly lost. This includes land, water,

fertilizers, chemicals and energy. Some food production also requires animal feed, and thus involves the resources needed to cultivate and produce the feed. Many of the resources used by the food industry are non-renewable, and their utilization has an impact on global water, soil, air, and biodiversity. Furthermore, agriculture causes air pollution, as a result of energy and fuel consumption.

However, the environmental impact of food waste is not solely the result of excess food production; a portion is caused by the treatment of food waste after it is discarded, because most food waste is transferred to landfills. Landfilling contributes to climate change because of the methane emissions produced by the decomposition of organic waste, and it also damages the soil. Approximately one-third of household waste consists of organic waste originating in food.

Nearly 50% of wasted food, equivalent to 1.2 million tons, is rescuable and its rescue could reduce GHG emissions in Israel by 3%³⁷.

Therefore, discarded food increases the total amount of waste requiring treatment and also affects the quality of other recyclable materials found in household waste. Food rescue maximizes the utilization of resources already invested in food production, and thereby prevents the need to use additional environmental and other resources.

The combination of these three characteristics of food rescue creates a unique opportunity that requires the formation of an appropriate policy to reflect such benefits.

Nearly 50% of wasted food, equivalent to 1.2 million tons, is rescuable and its rescue could reduce GHG emissions in Israel by 3%³⁷.

37. Out of a total of 80 tons of GHG emitted in Israel annually.

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

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 

* May be aesthetically flawed

The direct cost of food rescue averages approximately NIS 1.4 for every kilogram of food. The direct value of the rescued food is NIS 5.1 per kilogram, yielding a multiplier effect of 3.6. Therefore, each NIS 1.0 invested by NPOs in food rescue provides NIS 3.6 worth of food for underprivileged people. Food rescue in Israel is still in its infancy, so there is enormous potential for expansion, utilizing economies of scale to reduce the cost of food rescue, and/or raise the value of rescued products. However, for reasons of conservatism, we have based our assessments on the current cost structure.

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

In terms of benefit to the national economy, it is also necessary to consider the positive environmental contributions of food rescue [see Chapter 3]. The environmental benefit of reducing GHG and air pollutant emissions, and waste treatment, are worth approximately NIS 0.8 per kilogram, yielding a multiplier effect of 4.2. Incorporating the costs for GHG and air pollutant emissions, and waste treatment [see Chapter 3] in the calculation increases the multiplier so that every NIS 1.0 invested in food rescue generates NIS 4.2 for the national economy.

The volume of food waste in Israel is not unique, and is similar to the amounts in comparable developed economies. However, unlike many other countries that have developed legislation, national policies and multi-year targets to encourage food rescue and decrease food waste, Israel still lacks a national policy regarding these issues.

Despite this, some initial steps have been taken in Israel in recent years, in terms of both 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

Source: BDO estimates * Market price of alternative product with similar nutritional value.



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

NIS 4.8 billion potential savings for the national economy from food rescue

20% Rescuing 500,000 tons or 20% of food waste could close the food insecurity gap in Israel

Food Rescue: Potential Savings for the National Economy

Rescuing 500,000 tons of lost food, which constitutes 20% of the annual food waste in Israel, would facilitate in reducing the food insecurity gap between the general population's normative expenditure and those suffering from food insecurity. According to BDO and Leket Israel estimates, the current rescue multiplier is 3.6; if GHG, air pollutant emissions, and waste treatment costs are included, the rescue multiplier increases to 4.2. This means that every shekel spent on food rescue saves food worth NIS 3.6 or NIS 4.2, respectively.

Food rescue alleviates food insecurity at a 72% cost savings, and also provides significant social and environmental benefits.

Based on these multipliers, the cost of rescuing NIS 3.2 billion worth of food³⁸ would be only NIS 880 million. This is equivalent to the full value of the gap in spending on food consumption by the population suffering from food insecurity in relation to the normative level of consumption.

38. 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 3.2 billion of financial support would be required to fully address this gap. Therefore, food rescue is clearly preferable to the alternative of attempting to bridge the food insecurity gap by means of allocations, donations, subsidies or other methods of support for the needy. Food rescue makes it possible to reach the same social goal at a significantly lower cost, approximately NIS 880 million annually. Specifically, food rescue alleviates food insecurity at a 72% cost savings, and also provides significant social and environmental benefits.

The problem of food insecurity is not expressed only by the amount of money expended on food purchases; it also affects the types of food consumed. Analysis of the average consumption basket expenditures by the portion of the population experiencing food insecurity, compared to those not experiencing food insecurity, reveals that food insecurity is accompanied by low expenditures particularly for fruits, vegetables, meat and fish, which have high nutritional values.

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

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

Percentage of Rescued Food from Food Waste	1% (currently)	5%	10%	20%
Recovered Food (in thousand tons)	30	120	250	500
Food Rescued Share of Food Insecurity Gap	6%	25%	50%	100%
Value of Rescued Food	150	820	1,710	3,200
Cost of Food Rescue	40	220	470	880
Savings to National Economy (before external factors)	110	600	1,240	2,320
Environmental-Social Contribution (FAO)	150	600	1,250	2,500
Total Value of Food Rescue to National Economy (\$ millions)	260	1,200	2,490	4,820

Source: BDO estimates

products, like potatoes, bread and pita, is lower, from 15% to 25%.

Economic principles dictate that income in goods is an inferior alternative to monetary income, because it deprives those receiving support the freedom to allocate resources according to their full range of needs. Therefore, in principle, the general tendency is to provide monetary support over the direct provision of products. This economic principle is also summarized as "Subsidize people, not products."

Food insecurity is accompanied by low expenditures particularly for fruits, vegetables, meat and fish, which have high nutritional values.

However, food rescue offers a unique set of circumstances in which there is a clear economic preference for supporting the needy with products over money. This advantage stems from the specific characteristics involved in transforming waste into food (i.e., that every shekel invested in food rescue generates a direct economic value 3.6 higher than the cost). Moreover, taking into consideration the environmental impact of GHG, air pollutant emissions, and waste treatment, the benefit to the economy increases further to 4.2 times its cost.

In this context, it should be noted that those suffering from food insecurity also suffer from financial insecurity, evident in consumption gaps of other basic necessities (housing, health, education, etc.). It is reasonable to assume that food rescue would enable households to then choose to allocate some of the effective

increase in their disposable income to consuming 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 to purchase other goods and services.

In September 2015, the United Nations and US government, in the context of sustainable development (SDG) goals³⁹, established a national

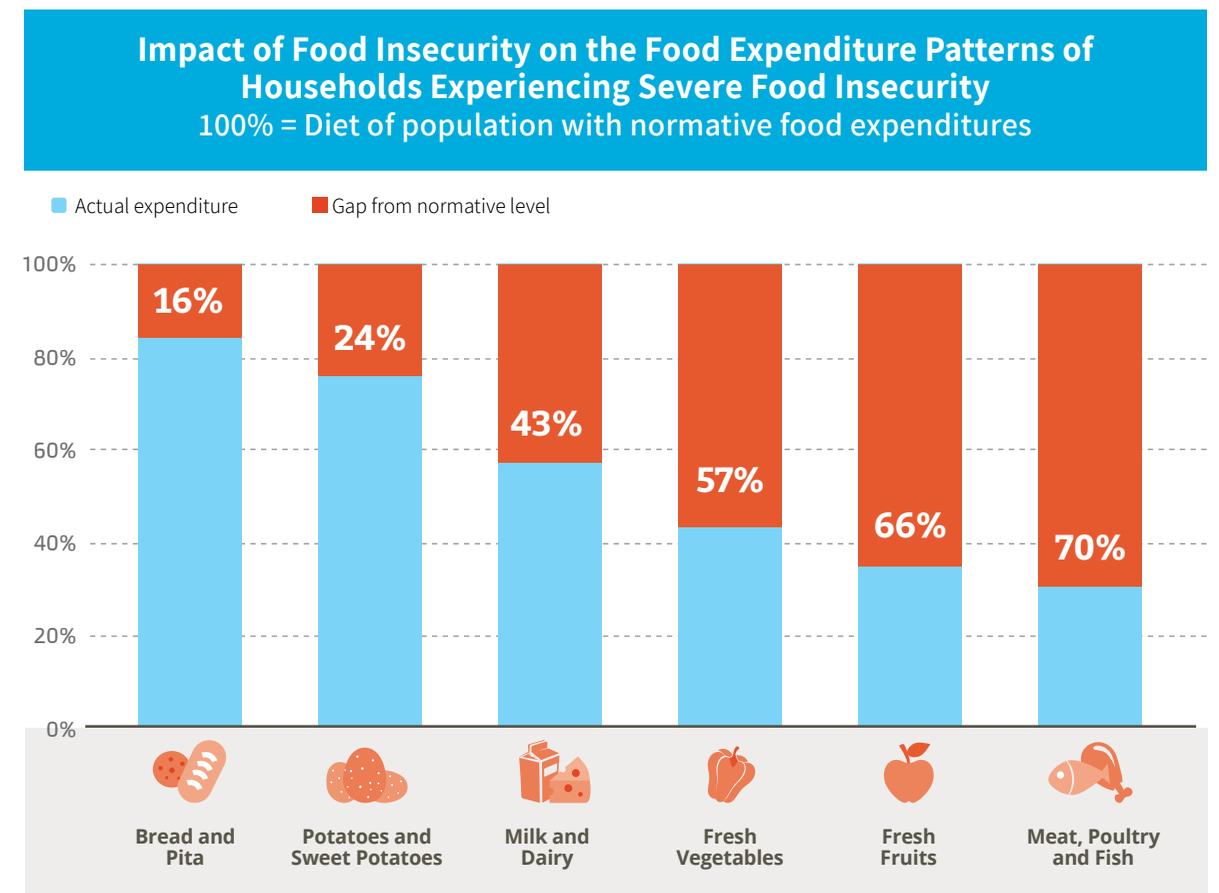
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39. 17 global Sustainable Development Goals adopted by the UN General Assembly in 2015.

food waste reduction goal of 50% within fifteen years. Analysis of the data in this report shows that rescuing even less than half of that goal, and contributing it to the approximately 465,000 households suffering from food insecurity in Israel, would provide enough food equivalent to fully cover the gap in their food intake compared to the normative level. For the national economy, such efforts would generate a value of NIS 2.3 billion annually, bridging the gap between the value of rescued food and food rescue costs. This is even before considering the added benefits to the national economy from reducing poverty and inequality, and before factoring in the external environmental benefits.

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

For the national economy, such efforts would generate a value of NIS 2.3 billion annually, bridging the gap between the value of rescued food and food rescue costs.



Source: BDO analysis and Survey of Household Expenses, CBS



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

17% The food consumption percentage of each household's total expenditure in Israel, one of the highest percentages among the OECD countries

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

According to Organization for Economic Cooperation and Development (OECD) data on the extent of poverty after taxes and allocations (with the poverty line defined as 50% of median disposable income), Israel's situation has declined in comparison to last year. Among OECD member countries, Israel has the highest poverty rate. Conversely, the National Insurance Institute Poverty Report contends that poverty among Israeli families decreased from 18.4% in 2017 to 18% in 2018. This gap is apparently the result of using a different scale for weighing and presenting the benefit of household size.

OECD data shows that Israel remains among the countries suffering from a high level of inequality, according to the Gini Index of Inequality. Israel

Israel's Rank in Inequality and Food Security			
	Israel	OECD Average	OECD Index*
Gini Index (inequality)	0.34	0.31	7
Poverty Rate	17.9%	11%	1
Food Security Index	79	78	16
(%) Food Expenditure to PCE	17%	14%	6

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

is in seventh place for inequality, following Mexico, Turkey, US, UK, New Zealand and Latvia. Inequality in distribution of income is one of the greatest challenges facing the Israeli economy, and food insecurity is one of the consequences of income inequality.

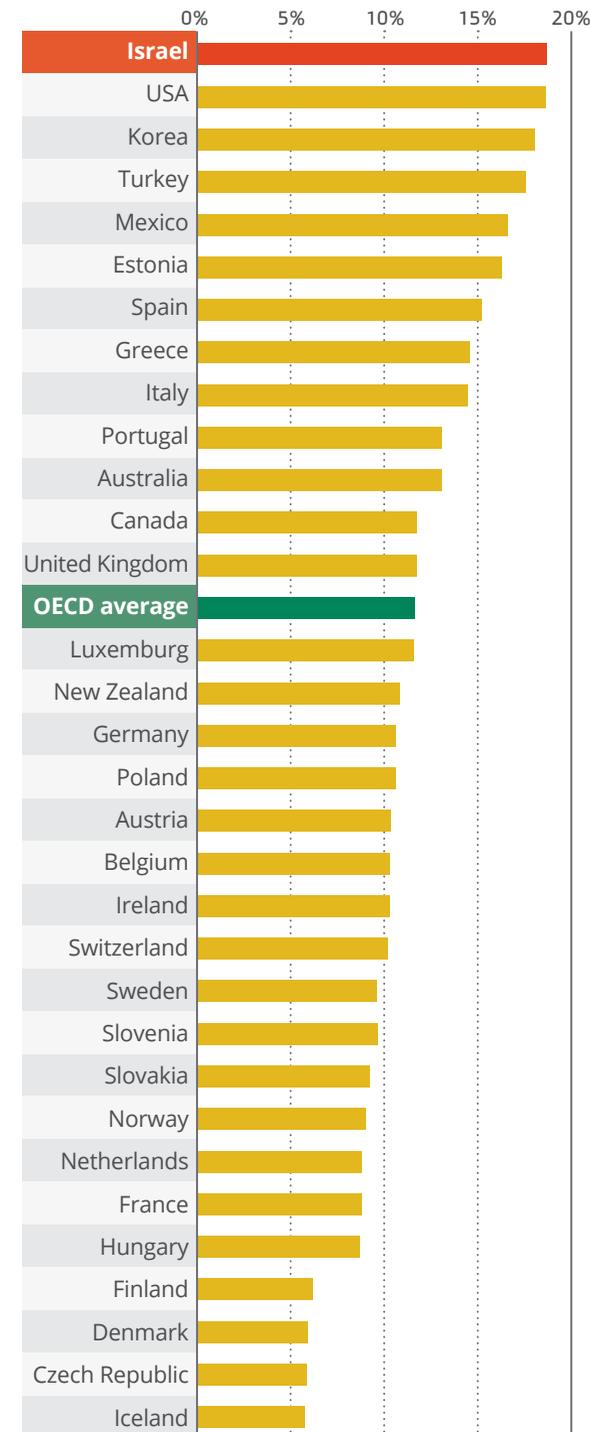
Using the Food Security Index as a basis for comparison, Israel dropped in rank among OECD countries because Belgium, Japan and New Zealand have improved their food security score. For food consumption as a share of expenditures, Israel moved down one place due to a slight decrease in food's share of consumption in Poland.

Relying on World Health Organization definitions, also used by the National Insurance Institute of Israel (NII), food security is based on three key pillars:

- 1 Food Availability:** Sufficient quantities of food available on a consistent basis
- 2 Food Access:** Sufficient resources to obtain appropriate foods for a nutritious diet
- 3 Food Use:** Adequate water and sanitation; family's awareness about the proper use of food

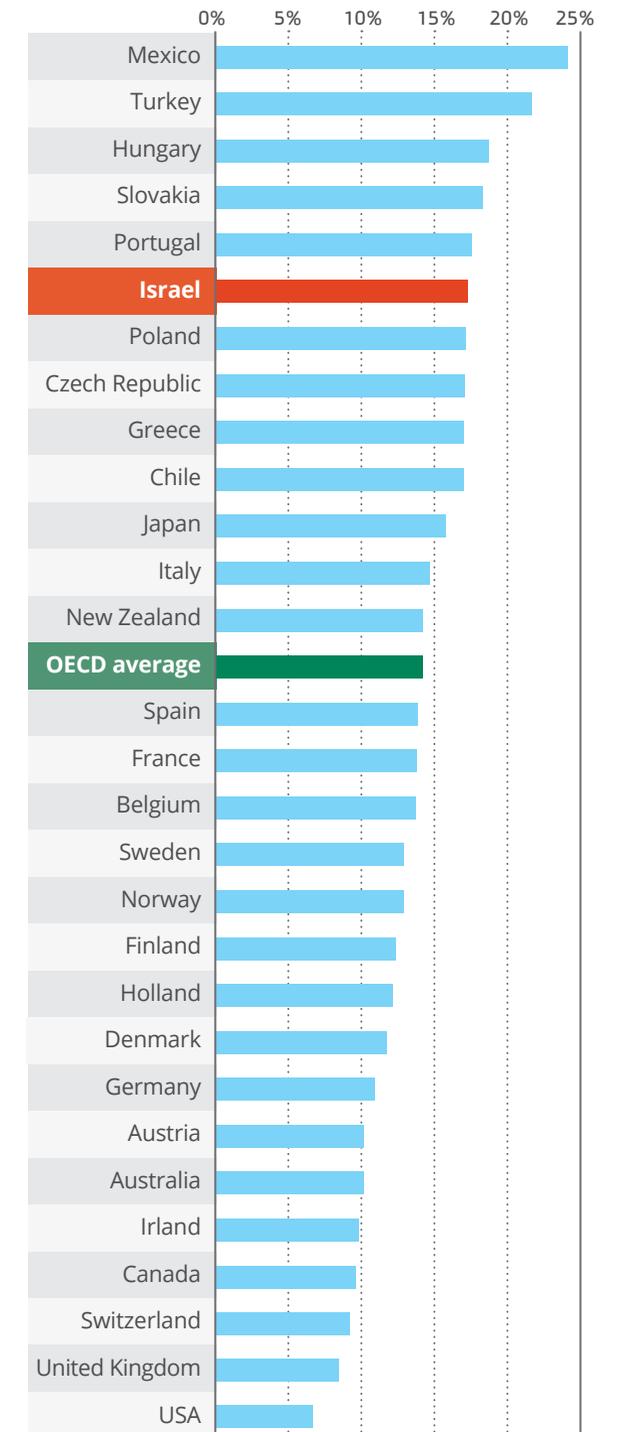
Using these criteria, which are primarily subjective, the NII estimates⁴⁰ that approximately 18% of Israel's population suffers from food insecurity; of this number, 8.8% are in severe food insecurity, and an additional 9% in moderate or mild food insecurity.

Poverty Rate: International Comparison 2019



Source: Economist 2018 Global Food Security Index

Food Consumption as a Share of Household Expenditure 2019



According to The Economist's Global Food Security Index 2019, Israel is ranked 16th in food insecurity among member states of the OECD. Among OECD countries, Israel is ranked 6th in household expenditure on food.

Comparison of inequality and poverty data reveals that the US and Israel have similarly high inequality and poverty levels, however food security in the US is paradoxically among the second highest in the developed world, after Ireland. It seems that the high measure of food security in the US, despite high general inequality, is the result of many years of public awareness about the problem of food insecurity, evident in programs like SNAP: Supplemental Nutrition Assistance Program (food stamps) that ensure adequate food provisions for the needy. Furthermore, the US is a pioneer in supporting food banks' efforts to recover surplus food and distribute it to underprivileged populations, and also a world leader in establishing policies to remove obstacles for food waste and reuse.

Despite similar inequality and poverty rates in Israel and the US, food expenses' share in the Personal Consumption Expenditure (PCE) in Israel is among the highest countries in the OECD, measured at 17%, 2.5 times the rate in the US. Therefore, a policy of food rescue and distribution to the underprivileged populace would be an especially

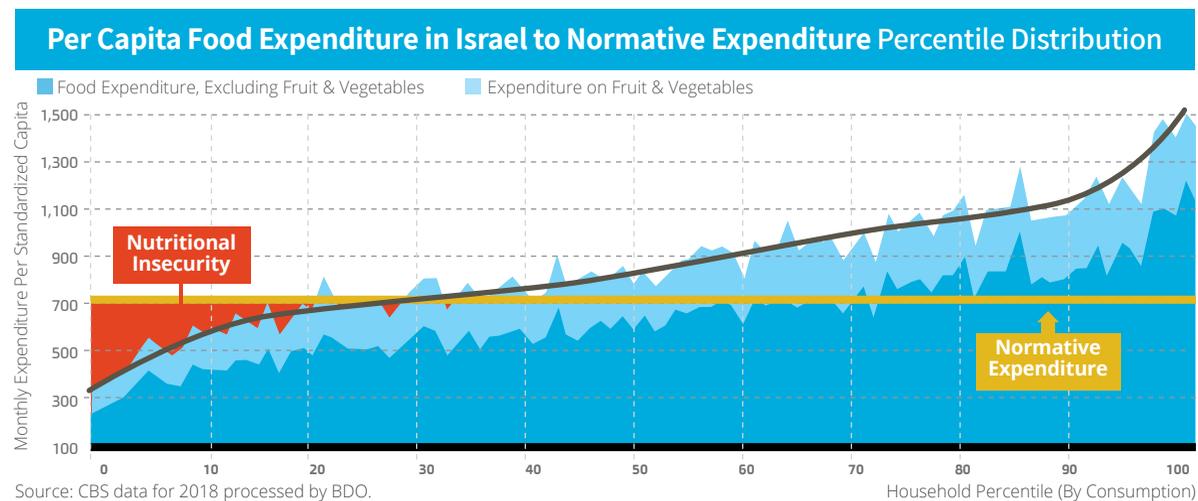
effective welfare policy in Israel, where a significant portion of household expenditure is allocated to food.

The definition of food security is subjective. In order to examine food rescue effectiveness as a policy measure to increase food security in Israel, the report used the methodology of Chernichovsky and Regev⁴¹ which defines normative food expenditure as a measure of a household's expenditure basket that remains constant even with an increase in household income.

To examine normative food expenditure⁴², we compared expenditure on food of the lowest percentiles relative to normative levels. It should be noted that this calculation does not include the impact of the Covid-19 pandemic on the problem of food insecurity [see chapter 11]. The analysis in this chapter shows that the two lowest percentiles (in terms of standard per capita consumption), food expenditure was roughly half that of the normative level.

The volume of food required to bridge the gap between actual food consumption of the food insecure population and the normative consumption level (average levels of second-to-fifth percentiles), is valued at approximately NIS 3.2 billion. The cost of eliminating this food expenditure gap relative to normative levels for the severely nutrition-deprived population (9% of

40. Food Security Survey 2016: Main Socioeconomic Findings, National Insurance Institute
 41. Patterns of Expenditure on Food in Israel, Taub Center, 2014.
 42. Excluding dining out, alcoholic beverages and carbonated beverages.

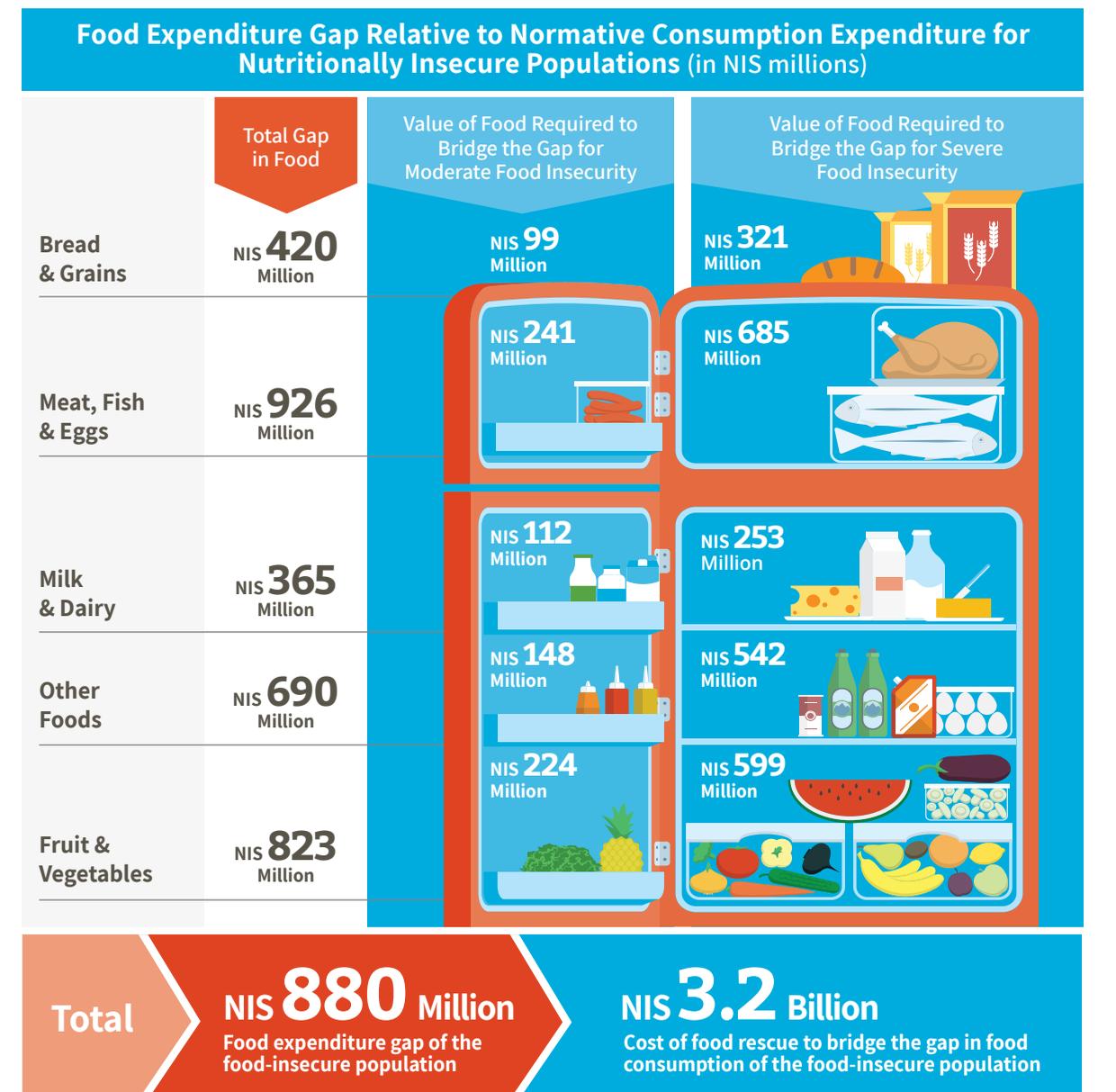


Source: CBS data for 2018 processed by BDO.

Israeli households) is estimated at NIS 2.4 billion, with an additional NIS 0.8 billion required to assist populations experiencing moderate nutritional insecurity.

The rescue of 500,000 tons of wasted food each year, constituting 20% of overall food waste in Israel, would enable the closing of the gap in expenditure on food in Israel relative to the normative expenditure. According to the assessment in this report, an

estimated NIS 880 billion would enable the rescue of food worth NIS 3.2 billion, equivalent to the entire value of the gap between the food consumption expenditure of food insecure populations and normative expenditure levels. At the same time, it will save about 80 million cubic meters of water, 250 million kWh of electricity, several thousand tons of fuel, about NIS 220 million as a result of reducing GHG and air pollutant emissions, and another NIS 160 million by reducing waste treatment costs.



Source: BDO estimates



Impact of the Covid-19 Pandemic on Food Insecurity in Israel



Food insecurity is an existing problem in Israel, and is expected to become more severe as the result of the Coronavirus crisis and its economic impact

Impact of the Covid-19 Pandemic on Food Insecurity in Israel

This Food Waste and Rescue in Israel report refers to data from 2019. However, because we are in the midst of an international health and economic crisis that is expected to impact, among other things, the depth and extent of food insecurity in Israel, we consider it appropriate to relate to the Coronavirus crisis, which highlights the importance of implementing the policy recommendations [listed in chapter 13].

The Coronavirus crisis reached Israel in late February 2020, and its impact on the economy intensified in March, when restrictions were imposed on economic activity. These restrictions included closing open-air markets and the institutional sector (restaurants, hotels, catering halls, etc.) as well as disruptions in the production, supply and distribution chains in Israel and around the world.

As a result of the Coronavirus crisis, it is reasonable to expect an increase in the number of households impacted by food insecurity due to the economic damage incurred by households that have not previously experienced food insecurity. In addition, the crisis is expected to deepen food insecurity among families who were already experiencing food insecurity before it began.

According to a special analysis conducted by the Bank of Israel⁴³ in June 2020, approximately 80% of Israeli households in deciles 1-4 expend in excess of 90% of their net monetary income on consumables, exposing these households to an immediate drop in their standard of living if their income is reduced by the impact of the Coronavirus crisis.

The Civil Resilience Report⁴⁴ examining the period of the Coronavirus crisis and published by CBS in July 2020, identified a decline in the economic and nutritional situation of Israeli citizens, in comparison to the two previous reports published in May 2020. Approximately 21% of the respondents (representing approximately 1.2 million people) testified to a decrease in their food security and that they, or a member of their household, had reduced the amount of food or number of meals they have consumed during the week of the survey, in comparison to 14% (approximately 780,000 people) in the previous report. Moreover, 41% of the respondents (representing approximately 2.3 million people), had indicated that their economic situation and that of their family experienced a decline as a result of the Coronavirus crisis. Furthermore, only 11% of the respondents thought that their economic

43. Research Department Special Analysis: An analysis of the adverse impact on households' employment due to the coronavirus, <https://www.boi.org.il/en/NewsAndPublications/PressReleases/Pages/7-6-2020.aspx>

44. Civil Resilience During the Coronavirus Crisis, https://www.cbs.gov.il/he/mediarelease/DocLib/2020/225/19_20_225b.pdf

situation would improve in the coming 12 months, whereas 28% anticipate their economic situation will become more difficult.

Israel maintains the highest poverty rate among OECD countries and is also ranked 16th in terms of food insecurity, according to The *Economist's* poverty index for 2019 [for more information, see chapter 10]. This means that food insecurity is an existing problem in Israel pre-pandemic; while it will likely worsen as a result of the Coronavirus crisis and its economic impact.

According to BDO estimates, the Coronavirus crisis will cause an additional 145,000 people, who were not previously experiencing food security, to become food insecure; it will also exacerbate and deepen food insecurity among approximately 1.87 million people who were already experiencing food insecurity before the crisis began. From an economic perspective, the value of food insecurity gap, which stood at NIS 3.2 billion prior to the crisis, will increase by approximately NIS 420 million. This impact underscores the importance of food rescue, which can help minimize economic damage experienced by underprivileged families

who were financially harmed by the crisis.

At the same time, food rescue provides an alternative to conventional food production that requires extensive use of natural resources, and thereby negatively impacts the environment. This alternative reduces the consumption of most resources necessary for food production during a crisis period, along with reducing most of the associated negative environmental impacts, as well as preventing food from being discarded and treated as waste. Therefore, food rescue, in addition to minimizing the economic damage resulting from a crisis, will also minimize the environmental cost imposed on the Israeli economy as a result of food production that is lost, or not consumed.

Given the fact that the majority of food loss occurs in the retail and distribution sector, and the household consumption sector, where consumption has not changed during the crisis, we believe that the findings in the 2019 report on Food Waste and Rescue in Israel remain valid despite the crisis.



Chairs and tables at a closed restaurant



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



Analyzing the environmental context of surplus food: an important part of developing policies to reduce waste

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

In recent years, there has been a growing awareness and recognition of the global problem of food waste. In order to assist the international effort, the UN and its Food and Agriculture Organization (FAO) are working to implement a uniform international standard for estimating the extent of food waste worldwide. Moreover, in 2019, the United Nations published a new report⁴⁵ that emphasizes the importance of examining the environmental context of food waste, in addition to the economic and social impacts. The report contends that using the life cycle assessment (LCA) approach to food waste and treatment could assist the development of policy for reducing food waste.

Policy to reduce food waste should include a variety of measures that will lead to a reduction in food surpluses at its source, encourage the rescue of surplus food, as well as incentivizing the use of composting and anaerobic digestion rather than treating waste via landfills. Nations around the world are making use of a variety of policy tools in order to reduce food waste.

A survey conducted across 26 OECD countries that examined the tools they use to reduce food waste found that approximately 42% of the countries have set a national goal to reduce food loss and waste, and promoted legislation towards achieving

that goal. In addition, approximately 58% of the countries are utilizing economic incentives such as tax benefits; 81% are using outreach campaigns and education to increase consumer awareness in connection with food waste reduction; 60% are promoting research and development on subjects related to reducing food waste; and approximately 30% support the activities of NPOs working to reduce food waste.

The principal policy tools used by countries around the world include:



Target to reduce food waste in 50% by 2030



- In September 2015, the **US** Federal Government declared a national goal of reducing food waste in 50% by 2030.
- In March 2017, the European Parliament set a voluntary target for reducing food waste in the **European Union** (EU) by 30% by 2025, and in 50% by 2030. Accordingly, many countries within the EU committed themselves to meeting this

45. <https://wedocs.unep.org/bitstream/handle/20.500.11822/27688/WasteNot.pdf?sequence=1&isAllowed=y>

goal, including **Spain, Italy, Greece, France, Belgium, Germany, Hungary, Poland, Sweden, and England.**

- In 2017, the **Australian** Government set a target to reduce the amount of food waste the country produces in 50% by 2030.



Legislation - Food rescue



- The Bill Emerson Good Samaritan Food Donation Act to protect those involved in food rescue from litigation was enacted in the **US** in 1996. Similar legislation was passed in **Israel** in October 2018.
- In May 2019, the **Japanese** parliament passed The Food Loss Act, which requires the national government to determine policies concerning food waste and loss, including among other measures, educating consumers and businesses. The law also mandates steps that must be taken to facilitate the operation of food rescue organizations.
- In February 2016, **France** became the first country in the world to prohibit supermarkets from discarding food. The law requires all supermarkets and grocery stores with an area in excess of 400 square meters to donate surplus food to food banks rather than discarding or destroying it. Following in France's footsteps, **Italy, Poland, Switzerland** and the **Czech Republic** have passed similar legislation which has led to a reduction in food waste and supermarket chains and increasing donations to food rescue organizations, each in its own territory.
- In 2018, legislation was introduced in the **US** State of Missouri, requiring the state's largest businesses to donate their surplus food; every business with a sales turnover exceeding \$5 million per year would be required to donate 10% of its surplus food to NPOs.

- Since 2015, **US** Federal law permits a tax deduction for food donations to NPOs and underprivileged populations (in accordance with the Good Samaritan Food Donation Act). There is also local legislation in many places including the US States of Oregon and Washington.
- In the **US**, the State of Oregon enacted legislation granting farmers a tax credit for donating surplus produce that remains in the field after harvesting, equivalent to 10% of the market value of the donated produce.
- In **Mexico**, the law provides corporations and individuals a tax credit for food donations, up to 7% of their total taxable income.



Legislation - Expiration dates



- In 2017, **Spain** enacted a law requiring uniform expiration date markings.
- In July 2019, a bill was introduced to set uniform standards for food expiration labels in the **US**, in order to prevent waste of food that is still edible.
- Since 2019, **Denmark** allows sale of products after their expiration date, if it does not pose a health hazard.



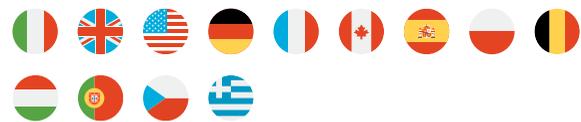
Legislation - Waste management



- The **Canadian** Environmental Protection Act, enacted in 1999, requires the development and implementation of food waste management programs as part of the urban waste management of the country's municipal authorities.

- Since 2013, **South Korea** has implemented a policy of requiring households to pay for the amount of food they throw away. As a result, the country reduced the amount of food wasted by 10% in four years.
- **France**: Since January 1, 2016, catering services and restaurants that serve more than 150 customers per day are required to avoid discarding food and choose an ecological method of disposal such as: food rescue, composting and/or anaerobic digestion, if their food waste exceeds more than 10 tons annually. Catering services and restaurants that do not comply are liable to be fined €75,000.
- In 2019, the **Czech Republic** launched a pilot project collecting separated food waste from households, for the purpose of converting it into fertilizer, and, in the future, for the production of biogas as an energy source. This contributes to reducing the amount of household waste that is sent to landfills.

Economic Incentives - Tax benefits



- In 2016, **Italy** enacted a law granting tax credits for food donations. Italy also uses tax credits as incentives for processing food waste by composting or biogas energy production.
- Other countries that grant tax credits for food donations are the **UK, US, Germany, France, Canada, Spain, Poland, Belgium, Hungary, Portugal, Czech Republic and Greece.**



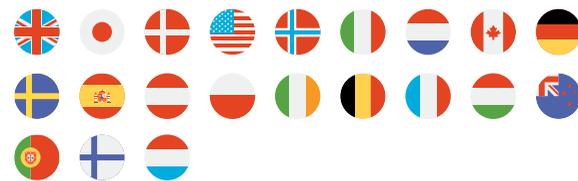
Economic Incentives - Support for reducing waste at the source



- The **UK** Department for Environment, Food & Rural Affairs finances a £18 million fund to support projects for streamlining the use of resources in order to redirect, reduce, and better manage waste, especially food waste.
- In **Scotland**, the Waste Prevention Implementation Fund offers grants to businesses that implement measurement and waste reduction initiatives.
- From 2010 to 2014, the **Dutch** Ministry of Economic Affairs invested €3.15 million in research on preventing and reducing food loss and waste.



Education and Awareness



- In May 2019, the **UK** food rescue organization WRAP: Waste and Resources Action Programme launched a campaign entitled "Guardians of Grub," that provides tools for reducing food waste to food service professionals working in the full range of establishments, from Michelin-rated restaurants through local pubs. Through this program professionals receive, among other things, training, posters and a calculator for calculating food waste in order to reduce food waste through simple changes in how they purchase, prepare and serve food. Similarly, on March 17, 2020, WRAP published a "Road

Map" guide for farmers that provides them with tools and guidance for measuring excess produce during cultivation so they may assess the amount of food waste in their produce, and act accordingly in order to manage and reduce food losses.

- In October 2019, **Japan** declared that October 30 each year will be a day dedicated to increasing awareness about reducing food waste in Japan.
- The **Danish** government launched an educational campaign for consumers regarding food labeling. In this context, in February 2019 leaders of the food industry committed to changing the wording on labels to read "Often good after" in order to remind consumers that food can be safe to consume even after the date defined as "Best before," and helping them to decide for themselves regarding whether or not to consume the product after the "Best before" date.
- In October 2018, the **US** Department of Agriculture (USDA), Environmental Protection Agency (EPA) and the Food and Drug Administration (FDA) pledged to work together in order to meet the goal of reducing food waste by 50% by 2030. In connection with this partnership, they agreed to coordinate activities including consumer education, training regarding food labeling, food safety and more.
- In 2017, **Norway** published a guidebook on preventing food waste in the household sector. The book provides guidelines for proper food storage and recipes for using leftover surplus food. It is also available online in a digital format.

Italy, the Netherlands, Canada, Germany, Sweden, Spain, Austria, Poland, Ireland, Belgium, France, Hungary, New Zealand, Portugal, Finland, and Luxemburg also use educational and awareness activities to promote the reduction and prevention of food waste.



Research and Development



- In June 2020, the environmental organization World Wide Fund for Nature and the British organization WRAP published an article concerning steps that should be taken to accelerate progress on reducing food waste in the **European Union**. The article addresses previous plans adopted by the EU for developing technology to measure food waste and tools for taking action. Further, the article addresses activities that require political consideration such as agricultural policy planning, regulation, developing a national strategy for reducing food waste, and the need of transition into a cyclical economy in the production and consumption of food.
- In February 2019, **Germany** launched a strategy for reducing food waste, which includes research on the development of smart food packaging that will use color markings to signify foods before their expiry date.
- In March 2018, the Ministry of the Environment in **Poland** launched a three-year program to research food waste. The study focused on determining where in the value chain food waste is being created, and how it can best be reduced.
- In **Australia**, the Fight Food Waste Cooperative Research Center has been operating since 2018, backed by government funding. The center's purpose is to find ways to reduce food waste.
- In September 2017, the **USDA** published research on new technologies to extend the shelf life of a variety of food products.
- **Denmark, Italy, the Netherlands, Canada, Sweden, Spain, Norway, Ireland, Hungary, Austria and Japan** are also supporting research and development focused on preventing and reducing food waste.



Support for NPOs



- In May 2019, the **UK** allocated £4 million in subsidies to support four NPOs involved in food rescue.
- In 2017, **Australia** committed to budgeting Australian \$1.3 million to support food rescue organizations as part of a joint campaign to utilize food more efficiently.
- In **Italy**, Buon Fine Coop, a food rescue organization, is supported by the local government.

- In **Denmark**, the government-supported organization Stop Wasting Food Movement has led to a significant reduction in the amount of food waste across the country.
- **Switzerland** supports the food rescue and redistribution organization Fondation Partage.
- In **Portugal**, the government supports Zero Desperdicio, a food rescue organization, as well as the Food Support Network, which collects food surpluses and redistributes them as school lunches.
- In **Poland**, the Federation of Food Banks is financed by the government. Simultaneously, since 2019, monies from fines paid by retailers in Poland who discard food are transferred to food rescue organizations.



Stop Wasting Food Movement Awareness Event, Photographer: Constanze Tillmann Messe Düsseldorf



Assistance for Dealing with Food Waste During the Coronavirus Crisis

The Coronavirus crisis and the resultant restrictions placed on economic activity led to the closure of the institutional sector (restaurants, hotels, banquet halls, etc.), disruptions in production, supply and distribution chains in Israel and around the world, and exacerbated the problem of food insecurity.

 **In the US**, in order to deal with food inventories made unmarketable by the crisis, the US administration undertook efforts to purchase fresh produce, milk and meat worth \$3 billion from farmers whose sales relied on the institutional sector, and transfer these products to food aid organizations that provide food to underprivileged populations.

 **In France**, as a result of travel restrictions and reliance on foreign workers, there was a shortage of farm labor, which has the potential to increase food waste in the agricultural sector (due to a lack of workers needed to harvest produce). In response, France encourages the unemployed to work in agriculture, while allowing them to continue receiving unemployment payments, in addition to their salary from their work in agricultural production.

 **In Australia**, as in many countries around the world, the Coronavirus crisis and the closure of borders had a damaging impact on produce exports. Many farmers could not sell their produce due to the closures. At the same time, the reduction in the number of flights led to an increase in air cargo prices, making it uneconomical for some farmers, and thereby forcing many of them to destroy their agricultural produce. In order to deal with this problem and prevent the destruction of

produce, the Government of Australia decided to share in the costs of international air transport to help reduce the cost of export.

In order to address the economic downturn following the crisis and household food waste, the Australian Fight Food Waste Cooperative Research Center plans to launch a social media campaign offering tips on how to save money by reducing food waste at home.

 **In the UK**, to facilitate cooperation between businesses with food surpluses and the populations in need of these surpluses, the government has transferred an emergency food rescue grant to the WRAP resource fund to rescue approximately £5 million in food surpluses.

 **In Italy**, due to the closure of schools, the City of Milan has been working to donate food products from school kitchens to NPOs. In addition, the municipality mediated between restaurants that had to be closed and organizations that transfer food to the needy.

 **In Israel**, in order to cope with the increase in the number of households living with food insecurity due to the economic damage caused by the crisis, the government approved a budget of NIS 700 million for food security grants in August 2020, but the distribution mechanism has not yet been finalized.

In addition, the Israeli government tripled the budget for food baskets distributed in proximity to the Passover and Fall holidays, as well as during the year. This was in addition to general aid grants and the extension of entitlement to unemployment benefits for those who have been financially affected by the crisis.

Moreover, during the first lockdown period in Israel, budgets in the Ministry of Welfare were reallocated for food basket distribution to the needy.



Developments in Israel Regarding Food Waste

In recent years, increasing public awareness of the importance of food rescue has been accompanied by some initial first steps taken in the public and governmental realm to encourage these efforts. The most significant and foundational of these steps was approval of Israel's Food Donation Act.

In October 2018, the Israeli Parliament approved the Food Donation Act in its third reading.

The purpose of the law is to protect everyone involved in the food donation chain: from food donors to NPOs' employees and volunteers – all of whom must meet food safety standards – from liability for damages that might be caused by the food they donate. The law is designed to encourage food rescue.

Leket Israel

Leket Israel is the largest food rescue organization in Israel. Each year, it rescues thousands of tons of surplus agricultural produce and millions of meals to benefit hundreds of thousands of needy people throughout the country. To this end, the organization carries out a wide range of activities to rescue food including picking fresh produce on farms, collecting agricultural produce from fields and packing houses, and rescuing nutritious surplus prepared meals from a variety of sources. In 2019, Leket Israel rescued approximately 2.2 million surplus meals from IDF bases, hotels, catering companies, corporate cafeterias, and restaurants, as well as some 15,700 tons of agricultural produce collectively worth NIS 209 million. Working through its network of 200 partner NPOs throughout the State of Israel, the surplus food benefits 175,000 needy people every week. Leket Israel trains its partner NPOs in food safety standards of practice and requires them to comply with strict guidelines on the subject, while also helping them acquire appropriate infrastructure to assist in their compliance with the guidelines.

Among the needy populations that receive rescued food, most lack consistent access to healthy food as well as knowledge or awareness about nutrition and its impact on health. To help address this problem, the organization's nutritionists conducted 85 workshops in 2019 in which underprivileged groups learned how to ensure healthy nutrition on a limited budget.

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Leket Israel serves as an umbrella organization with extensive knowledge and experience, and as an example for food rescue organizations around the world. The Global Foodbanking Network (GFN) recognizes Leket Israel as Israel's national food rescue organization.

Joseph Gitler, Chairman of Leket Israel, serves as a member of the GFN Executive Committee while representatives of Leket Israel also participate in GFN conferences. Representatives of food banks from around the world come to learn about the activities of Leket Israel which considered as an international leader in rescuing fruit, vegetables and cooked food.

Ministry of Environmental Protection

- Israel's Ministry of Environmental Protection (MoEP) is currently formulating a waste strategy, which is expected to address reduction of waste at the source, including food waste. In the meantime, and as part of this strategy, the present report examining the environmental consequences of food waste and rescue is being published as a joint venture between MoEP and Leket Israel.
- Over the past year, the MoEP has supported

a series of workshops for the general public on reducing food waste in households. These workshops were held around in the country, including: Ashdod, Nazareth, Tel Aviv-Yafo, Basmat-Tivon, Jasser a-Zarqa, and were conducted by The Natural Step (TNS) Israel in cooperation with the municipalities where they took place. The MoEP is also providing support in the preparation of a national policy document on reducing food waste by TNS.

- Since 2016, the joint educational program on "sustainability" developed by MoEP and the Ministry of Education has included a component dealing with reducing food waste. Approximately 100,000 students are exposed to this program every year.

Israel's Ministry of Environmental Protection (MoEP) is currently formulating a waste strategy, which is expected to address reduction of waste at the source, including food waste

- MoEP, in collaboration with the Social Economic Academy, conducted two research projects, one examining the potential for reducing food waste in supermarket chains and the other for cutting waste resulting from expiration dates (2015-16). As a result of this research, the standard for labeling food packages in Israel was re-examined, and several options for improving and making the labels clearer to consumers.
- The "Green Badge" for cafes and restaurants was launched in 2016, in a collaboration between the MoEP, the City of Tel Aviv-Jaffa and the Israel Standards Institute. One of the requirements for getting the badge includes efforts at reducing food waste.
- MoEP was a strategic partner in a third-sector work process about reducing food waste, led by TNS Israel. As part of this process, key courses of action were identified and a voluntary agreement was launched to reduce food waste in organizations, businesses and local authorities. MoEP, the Ministry of Agriculture and Rural

Development, and the Ministry of Economy all expressed support for the voluntary agreement.

• In March 2017, the Ministry of Agriculture and Rural Development, together with TNS and the Manna Center Program for Food Safety & Security at Tel Aviv University, held a "Hackathon" on reducing food loss and waste. The event was organized with a focus on two challenges: the first dealt with the issue of reducing food waste in the agricultural sector, and the second focused on consumer behavior and the possibilities for reducing food waste while shopping, at home and in institutional catering. More than 150 entrepreneurs and mentors participated in the hackathon. At its conclusion, two winning projects were announced, and they received support for further development.

• In 2011, the MoEP launched an annual educational campaign "Let's Think Green," with the aim of leading a change in the Israeli public's perceptions and behavior regarding the environment. Based on the strategy, "everyone benefits from a green life," the campaign presented the economic and environmental benefits of proper environmental behavior, and offered the public a series of actions that can help families save money. One of the main points the campaign addressed was responsible food shopping and preventing waste as a result of over-buying.

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. In this framework, electronic benefit transfer cards worth NIS 500 are distributed to more than 10,800 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 the purchase of vegetables, fruit and dry foods from food rescue (delivered to the families' homes) worth an additional NIS 250 (NIS 180 for fruit and vegetables and NIS 70 for dry foods).

In 2017, the National Food Security Initiative was launched. In this framework, electronic benefit transfer cards worth NIS 500 are distributed to more than 10,800 families suffering from severe food insecurity.

In July 2018, the Ministry of Labor, Welfare and Social Services published a research report⁴⁶ 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. Approximately 80 families no longer experience 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 made available by the donations for food consumption, rather than consuming other goods and services. This reveals that the current level of assistance is insufficient to relieve them of food insecurity.

As of August 2020, the initiative is operating to help families who have already started receiving the service. Funding has been budgeted through the end of 2020.

Ministry of Agriculture and Rural Development

The Ministry of Agriculture and Rural Development is leading an inter-ministerial process with the goal of formulating policy to reduce food waste and the depreciation of fresh produce, with an emphasis on vegetables and fruit.

The Ministry has introduced several measures to reduce food waste, including:

- Work on packaging to extend shelf life and reduce food loss along the supply chain.
- Quality standards for agricultural produce; standardization of produce.
- Operating an educational program in partnership 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 marketing 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 sale and purchase of “ugly” fruit and vegetables.
- Publication of guidelines by the Institute of Postharvest and Food Storage 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.

Initiatives in cooperation with Leket Israel

In addition, the Ministry of Agriculture is conducting a joint venture with Leket Israel in which Bedouin workers are employed for harvesting. The field coordinator handles all aspects of harvesting activity, and a dedicated vehicle transports the harvesters to the harvest site and then back to their home communities. It is worth emphasizing that the workers receive a fair salary and social benefits. Leket Israel transports the harvested crops from the fields to its logistics center, where the produce is sorted, packed, and sent via the organization's trucks to ten distribution centers in six Bedouin communities.

In addition, a Bedouin dietician, working on behalf of Leket Israel, runs “Nutrition for Life” workshops

adapted to Bedouin culture. Each workshop consists of four sessions with content emphasizing proper nutrition and the importance of healthy eating on a limited budget. This is combined with content related to personal and family conduct. Reports from the field attest to the personal empowerment that accompanies the participants' acquisition of knowledge and tools.

Government Companies Authority

In January 2019, the Government Companies Authority instructed government companies to discuss plans for creating social value. The Authority published a set of tools for corporate social responsibility to be used by government companies, including information on donating food from catering companies to the needy. This was the result of joint activity of the Yedid Association, Leket Israel and the Government Companies Authority, based on the 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 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 “Distribution of Surplus, Unsold Food Suitable for Human Consumption, 5769-2019”

In 2019, a bill concerning the “Distribution of surplus, unsold food suitable for human consumption,” sponsored by MK Michal Rozin was presented to the Knesset for preliminary discussion. This bill would require food suppliers to contract with food rescue organizations for distribution of unsold food that is fit for human consumption. The law would also regulate the conditions for the transfer of surplus food to their destination.

Under this proposal, the food supplier and the food rescue organization could 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, which requires all supermarkets with a sales area exceeding 400 square meters to donate its surplus food to food banks, instead of discarding or destroying it. Italy, Poland, Switzerland and the Czech Republic have established enacted similar laws, which have led to a reduction in food waste in supermarkets chains and increased donations to local food rescue organizations.

Legislation of Tax Benefits for Donating Surplus Food⁴⁷

In 2017, MKs Merav Ben-Ari, Roy Folkman and Ayelet Nahmias-Verbin proposed legislation that would grant a tax credit for food donations worth 50% of the value of the donation.

The purpose of the bill is to encourage manufacturers, marketers, importers, and others working in the food industry, and growers of agricultural produce and animal-based food products, to donate food, including surplus food, to NPOs that distribute food for free to those experiencing food insecurity, by offering a tax credit.

Similar laws already exist in other countries, including France, Italy, and the US. In France, a law granting tax credits equal to 60% of the value of the donation for food donations was passed in 1988. In the United States, a federal tax credit is granted for charitable donations, with a larger credit for food donations.

In 2016, a similar law granting tax credits for food donations was enacted in Italy. The law defines the essence of food waste and surplus food; sets the hierarchy for food recovery; clarifies the types of foods that can be donated (such as incorrectly-labeled food, food products that have been confiscated by public authorities and are safe for human consumption, etc.); clarifies the situation of charitable NPOs that distribute food regularly; and simplifies and amends the regulations regarding food donation.

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

47. Amendment to Income Tax Ordinance (Credit for Food Rescue) 5778-2017



**Policy Recommendations
to Reduce Food Waste
and Encourage Food
Rescue Rescue**



In Israel, as in other countries around the world, efforts are being made to reduce food waste and encourage food rescue. However, thus far, no government policy has been established to promote the issue.

Policy Recommendations to Reduce Food Waste and Encourage Food Rescue

The 2019 National Food Waste and Rescue Report, similar to preceding reports, demonstrates the significant economic, social and environmental benefits of food rescue.

- **Economic:** From an economic perspective, the fact that excess food is discarded rather than rescued represents a market failure. At market prices, it is not worthwhile to who to rescue food. However, taking into account alternative values

and nutritional benefits makes food rescue highly beneficial economically.

- **Social:** The rescue and provision of surplus food to those in need reduces social gaps and prevents food insecurity in weaker, underprivileged populations.
- **Environmental:** Waste reduction reduces pollutant levels, GHG emissions, use of finite land and water resources, and the quantity 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**
Aiming to reduce food waste by 50% by the year 2030, as specified by the UN - 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 at all stages of the value chain and include the necessary operational, budgetary, and regulatory conditions and incentives to gradually achieve the national food rescue goal.

- 3 **Examine the Option of Payment for Commercial Waste**
There is currently a voluntary mechanism that allows local authorities to charge businesses a special fee for the collection of commercial waste⁴⁸. It is recommended to make this mechanism binding on all Israeli authorities. Towards this end, criteria must be established to regulate the amount all businesses are charged for commercial waste collection, so an economic incentive is created to reduce waste disposal in general, and, in particular, food waste from industry, retailers, restaurants, hotels, banquet halls, etc. Any business that is the source of the organic waste will be required to bear the cost of its treatment. Such fees will create an incentive for the food industry, food distributors and caterers to donate surplus food rather than discarding it.
- 4 **Examine Possibilities for Governmental Support of Efforts that Reduce Food Waste / Encourage Food Rescue**
Support activities and initiatives for reducing food waste / encouraging food rescue, the purpose of which is to help people internalize the environmental benefits of reducing food waste and rescuing food.
- 5 **Reevaluate Expiration Dates**
Examine the need to update standards for determining expiration dates of various food products, while adhering to public health standards, and preventing food waste. Such efforts should also explore how expiration dates can be presented more clearly to consumers.
- 6 **Require Food Rescue in all Governmental and Government-financed Institutions**
Examine the possibility of requiring state-funded bodies with kitchens catering to 1,000 or more patrons daily (directly or through a subcontractor) to contract with approved food rescue NPOs as a condition for government support (including defense agencies, school catering programs, government companies, etc.).
- 7 **Require Food Rescue as a Condition for Private Businesses to Participate in Government Tenders**
Examine the possibility of requiring private entities that participate in government tenders to supply services to the State (not only from the food sector), and who have sources of rescuable food, to collaborate with registered food rescue NPOs as a pre-requisite for contracting with the State.
- 8 **Examine the Contribution of Existing Regulations to Food Waste**
There are items in current legislation that contribute to the destruction and loss of good food that is nutritious and edible. A comprehensive examination of the relevant existing law in Israel is necessary so that amendments can be made to prevent food waste through a system of incentives that encourages food rescue and provision to underprivileged population groups.

48. Based on the principle that the polluter pays, according to uniform criteria for "excess waste" as defined by the Ministry of the Interior.