Annex 1. Grouping of world regions

Countries included in world regions 1-3 – Medium/High-income countries.

Region 1: Europe		
Albania	France	Netherlands
Armenia	Georgia	Norway
Austria	Germany	Poland
Azerbaijan	Greece	Portugal
Belarus	Hungary	Romania
Belgium	Iceland	Russian Federation
Bosnia and Herzegovina	Ireland	Serbia
Bulgaria	Italy	Slovakia
Croatia	Latvia	Slovenia
Cyprus	Lithuania	Spain
Czech Republic	Luxemburg	Sweden
Denmark	Macedonia	Switzerland
Estonia	Moldova	Ukraine
Finland	Montenegro	United Kingdom

Region 2: USA, Canada, Oceania	Region 3: Industrialized Asia
Australia	Japan
Canada	China
New Zealand	South Korea
United States of America	

Countries included in world regions 4-7 – Low-income countries.

Region 4 sub-Saharan Africa		Region 5 North Africa, West and Central Asia	Region 6 South and Southeast Asia	Region 7 Latin America
Angola	Liberia	Algeria	Afghanistan	Argentina
Benin	Malawi	Egypt	Bangladesh	Belize
Botswana	Mali	Iraq	Bhutan	Bolivia
Burkina Faso	Mauritania	Israel	Cambodia	Brazil
Burundi	Mozambique	Jordan	India	Chile
Cameroon	Namibia	Kazakhstan	Indonesia	Colombia
Central African Rep	Niger	Kuwait	Iran	Costa Rica
Chad	Nigeria	Kyrgyzstan	Laos	Cuba
Congo-Brazzaville	Rwanda	Lebanon	Malaysia	Dominican Rep
Congo-Kinshasa	Senegal	Libya	Myanmar	Ecuador
Cote d'Ivoire	Sierra Leone	Mongolia	Nepal	El Salvador
Equatorial Guinea	Somalia	Morocco	Pakistan	Guatemala
Eritrea	South Africa	Oman	Philippines	Guyana
Ethiopia	Sudan	Saudi Arabia	Sri Lanka	Haiti
Gabon	Swaziland	Syria	Thailand	Honduras
Gambia	Tanzania	Tajikistan	Vietnam	Jamaica
Ghana	Togo	Tunisia		Mexico
Guinea	Uganda	Turkey		Nicaragua
Guinea-Bissau	Zambia	Turkmenistan		Panama
Kenya	Zimbabwe	Utd Arab Emirates		Paraguay
Lesotho		Uzbekistan		Peru
		Yemen		Suriname
				Uruguay
				Venezuela

Annex 2. Commodity groups

The different commodities addressed are grouped according to FAOSTAT's Food Balance Sheets (http://www.fao.org/corp/statistics/en/):

1. Cereals (excluding beer): wheat, rice (milled), barley, maize, rye, oats, millet, sorghum, other cereals.
2. Roots and Tubers: potatoes, sweet potatoes, cassava, yams, other roots.
3. Oilseeds and Pulses (including nuts): soybeans, groundnuts (shelled), sunflower seeds, rape and mustard seed, cottonseed, coconuts (incl. copra), sesame seed, palm kernels, olives, other oil crops.
4. Fruit and Vegetables (including bananas): oranges and mandarins, lemons and limes, grapefruit, other citrus, bananas, plantains, apples (excl. cider), pineapples, dates, grapes (excl. wine), other fruit, tomatoes, onions, other vegetables.
5. Meat: bovine meat, mutton/goat meat, pig meat, poultry meat, other meat, offals.
6. Fish and seafood: freshwater fish, demersal fish, pelagic fish, other marine fish, crustaceans, other mollusk, cephalopods, other aquatic products, aquatic mammal meat, other aquatic animals, aquatic plants.
7. Dairy products: milk.

Annex 3. Additional references for quantifying food losses/waste

NB.: Conversion factor determines the part of the agricultural product that is edible.
Allocation factor determines the part of the agricultural produce that is allocated for human consumption.
LIC: low-income countries; MHIC: medium/high income countries; FBS: food balance sheets.

Cereals:
*Conversion factors: w*heat, rye = 0.78; maize, millet, sorghum =0.79 (LIC), =0.69 (MHIC); rice = 1; oats, barley, other cereals = 0.78. Source: Wirsenius (2000)

Allocation factors for losses during agricultural production and postharvest handling and storage:
Europe = 0.35; NA&Oce = 0.50; Ind. Asia = 0.60; SSA = 0.75; NA,WA&CA = 0.60; S&SE Asia = 0.67; LA = 0.40.

Roots and tubers:
Proportion of roots and tubers utilized fresh:
Assumed average proportion of cassava utilized fresh in SSA = 50%. Source: Westby (2002). In LA = 20%. Source: Brabet (1998).

Assumed average proportion of potato utilized fresh in Europe and NA&Oce = 27%. Source: USDA (2010b). In NA,WA&CA = 81%. Source: Potatoes South Africa (2010). In S&SE Asia = 90%. Source: Pendey (2009) and Keijbets (2008). In Ind. Asia = 85%. Source: Keijbets (2008) and FAOSTAT (2010a).

Conversion factors: Peeling by hand = 0.74; Industrial peeling = 0.90. Source: UNICEF (1990), Mattsson (2001).

Oil crops and pulses:
Allocation factors: SSA = 0.63; NA,WA&CA = 0.12; S&SE Asia = 0.63; LA = 0.12 ; Europe = 0.20; NA&Oce = 0.17; Ind. Asia = 0.24. Source: FAOSTAT (2010d)

Fruit and vegetables:
Proportion of fruit and vegetables utilized fresh:
Assumed average proportion of fruit & vegetables utilized fresh in SSA = 99%. Source: Mungai (2000). In NA,WA&CA = 50%. Source: Guajardo (2008). In S&SE Asia = 95%. Source: FAO (undated). In LA = 50%. Source: Guajardo (2008). In Europe and NA&Oce = 40%. Source: USDA (2010c). In Ind. Asia = 96%. Source: Cheng (2008)

Conversion factors: peeling by hand = 0.8; industrial peeling = 0.75; mean = 0.77. Source: own investigation and UNIDO (2004c)

Fish and seafood:
Proportion of fish and seafood utilized fresh:
Assumed average proportion of fish and seafood utilized fresh in LIC = 60%; in MHIC = 4 %. Source: FAO (2009)

Conversion factor: Average conversion factor for fish and seafood = 0.5. Source: FAO (1989).

Annex 4. Weight percentages of food losses and waste (in percentage of what enters each step)

Estimated/assumed waste percentages for each commodity group in each step of the FSC for **Europe incl. Russia**.

	Agricultural production	Postharvest handling and storage	Processing and packaging	Distribution: Supermarket Retail	Consumption
Cereals	2%	4%	0.5%, 10%	2%	25%
Roots and tubers	20%	9%	15%	7%	17%
Oilseeds and pulses	10%	1%	5%	1%	4%
Fruits and vegetables	20%	5%	2%	10%	19%
Meat	3.1%	0.7%	5%	4%	11%
Fish and seafood	9.4%	0.5%	6%	9%	11%
Milk	3.5%	0.5%	1.2%	0.5%	7%

Estimated/assumed waste percentages for each commodity group in each step of the FSC for **North America and Oceania**.

	Agricultural production	Postharvest handling and storage	Processing and packaging	Distribution: Supermarket Retail	Consumption
Cereals	2%	2%	0.5%, 10%	2%	27%
Roots and tubers	20%	10%	15%	7%	30%
Oilseeds and pulses	12%	0%	5%	1%	4%
Fruits and vegetables	20%	4%	2%	12%	28%
Meat	3.5%	1.0%	5%	4%	11%
Fish and seafood	12%	0.5%	6%	9%	33%
Milk	3.5%	0.5%	1.2%	0.5%	15%

Estimated/assumed waste percentages for each commodity group in each step of the FSC for **Industrialized Asia**.

	Agricultural production	Postharvest handling and storage	Processing and packaging	Distribution	Consumption
Cereals	2%	10%	0.5%, 10%	2%	20%
Roots and tubers	20%	7%	15%	9%	10%
Oilseeds and pulses	6%	3%	5%	1%	4%
Fruits and vegetables	10%	8%	2%	8%	15%
Meat	2.9%	0.6%	5%	6%	8%
Fish and seafood	15%	2%	6%	11%	8%
Milk	3.5%	1%	1.2%	0.5%	5%

Estimated/assumed waste percentages for each commodity group in each step of the FSC for **sub-Saharan Africa**.

	Agricultural Production	Postharvest handling and storage	Processing and packaging	Distribution	Consumption
Cereals	6%	8%	3.5%	2%	1%
Roots and tubers	14%	18%	15%	5%	2%
Oilseeds an pulses	12%	8%	8%	2%	1%
Fruits and vegetables	10%	9%	25%	17%	5%
Meat	15%	0.7%	5%	7%	2%
Fish and seafood	5.7%	6%	9%	15%	2%
Milk	6%	11%	0.1%	10%	0.1%

Estimated/assumed waste percentages for each commodity group in each step of the FSC for **North Africa, West and Central Asia**.

	Agricultural production	Postharvest handling and storage	Processing and packaging	Distribution	Consumption
Cereals	6%	8%	2%, 7%	4%	12%
Roots and tubers	6%	10%	12%	4%	6%
Oilseeds and pulses	15%	6%	8%	2%	2%
Fruits and vegetables	17%	10%	20%	15%	12%
Meat	6.6%	0.2%	5%	5%	8%
Fish and seafood	6.6%	5%	9%	10%	4%
Milk	3.5%	6%	2%	8%	2%

Estimated/assumed waste percentages for each commodity group in each step of the FSC for **South and Southeast Asia**.

	Agricultural production	Postharvest handling and storage	Processing and packaging	Distribution	Consumption
Cereals	6%	7%	3.5%	2%	3%
Roots and tubers	6%	19%	10%	11%	3%
Oilseeds and pulses	7%	12%	8%	2%	1%
Fruits and vegetables	15%	9%	25%	10%	7%
Meat	5.1%	0.3%	5%	7%	4%
Fish and seafood	8.2%	6%	9%	15%	2%
Milk	3.5%	6%	2%	10%	1%

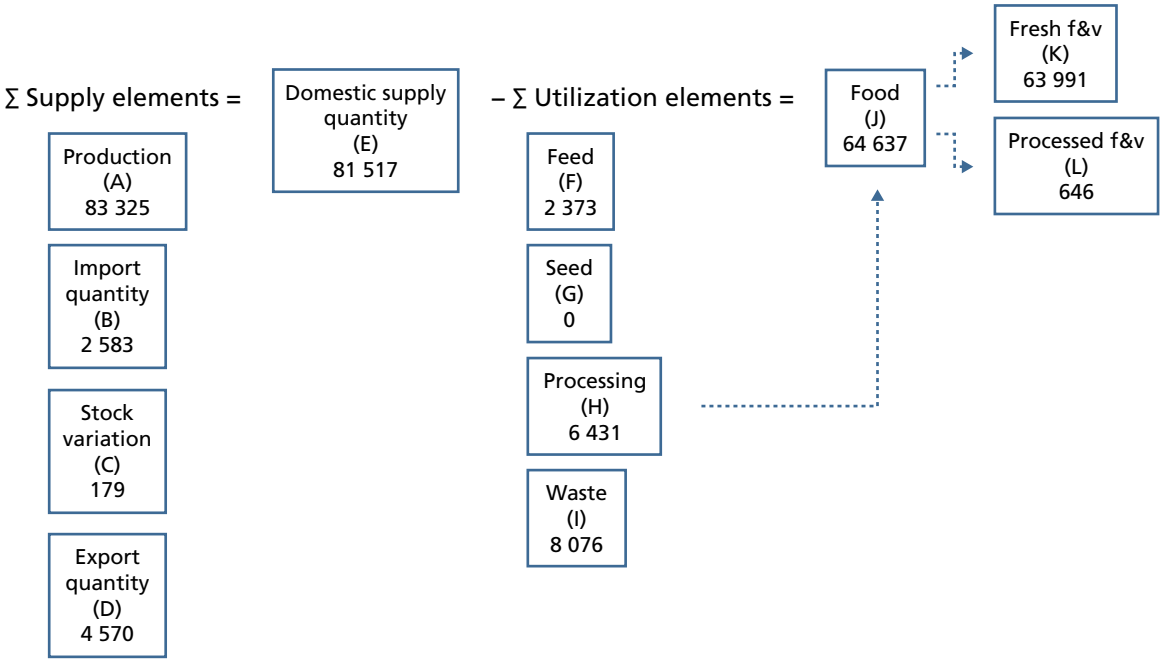
Estimated/assumed waste percentages for each commodity group in each step of the FSC for **Latin America**.

	Agricultural production	Postharvest handling and storage	Processing and packaging	Distribution	Consumption at household level
Cereals	6%	4%	2%, 7%	4%	10%
Roots and tubers	14%	14%	12%	3%	4%
Oilseeds and pulses	6%	3%	8%	2%	2%
Fruits and vegetables	20%	10%	20%	12%	10%
Meat	5.3%	1.1%	5%	5%	6%
Fish and seafood	5.7%	5%	9%	10%	4%
Milk	3.5%	6%	2%	8%	4%

Annex 5. Example of calculations of food losses and waste

Example: Calculations on losses and waste of fruit and vegetables (F&V) in SSA. The figure below shows the mass flow of total F&V (1000 tons), as presented in the 2007 FBSs for SSA.

Figure 10. Mass flow of total F&V (1000 tons) as presented in the 2007 FBSs for SSA



A+B+C-D=E-(F+G+H+I) = J=K+L

Waste percentage in each step of the FSC:
Agricultural production = 10%
Postharvest handling and storage = 9%
Processing and packaging = 25%
Distribution (fresh F&V) = 17%
Distribution (processed F&V) = 10%
Consumption (fresh F&V) = 5%
Consumption (processed F&V) = 1%

Calculations on primary equivalent F&V losses and waste in each step of the FSC:
Agricultural production: (0.1/(1-0.1))*83 325 = 9 258 = 9.3 mn tonnes
Postharvest handling and storage: 0.09*83 325 = 7 817 = 7.8 mn tonnes
Processing and packaging = 0.25*(646+6 431) = 1 769 = 1.8 mn tonnes
Distribution (fresh F&V): 0.17*63 991 = 10 878 = 11 mn tonnes
Distribution (processed F&V): 0.1*(646+6 431-1 769) = 531 = 0.5 mn tonnes
Consumption (fresh F&V): 0.05*(63 991-10 878) = 2 656 = 2.7 mn tonnes
Consumption (processed F&V): 0.01*(646+6 431-1 769-531) = 48 = 0.05 mn tonnes
Conversion factors: peeling by hand = 0.8; industrial peeling = 0.75; mean = 0.77

Calculations on edible F&V losses and waste in each step of the FSC:
Agricultural production: 9 258*0.77 = 7 129 = 7.1 mn tonnes
Postharvest handling and storage: 7 817*0.77 = 6 019 = 6.0 mn tonnes
Processing and packaging: 1 769*0.75 = 1 327 = 1.3 mn tonnes
Distribution: (10 878*0.8)+(531*0.75) = 9 101 = 9.1 mn tonnes
Consumption: (2 656*0.8)+(48*0.75) = 2 161 = 2.1 mn tonnes

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