

# Addressing climate change through reduction of food loss and waste

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Prof Suzan Oelofse  
Research Group Leader: Waste for Development  
Cluster: Smart Places

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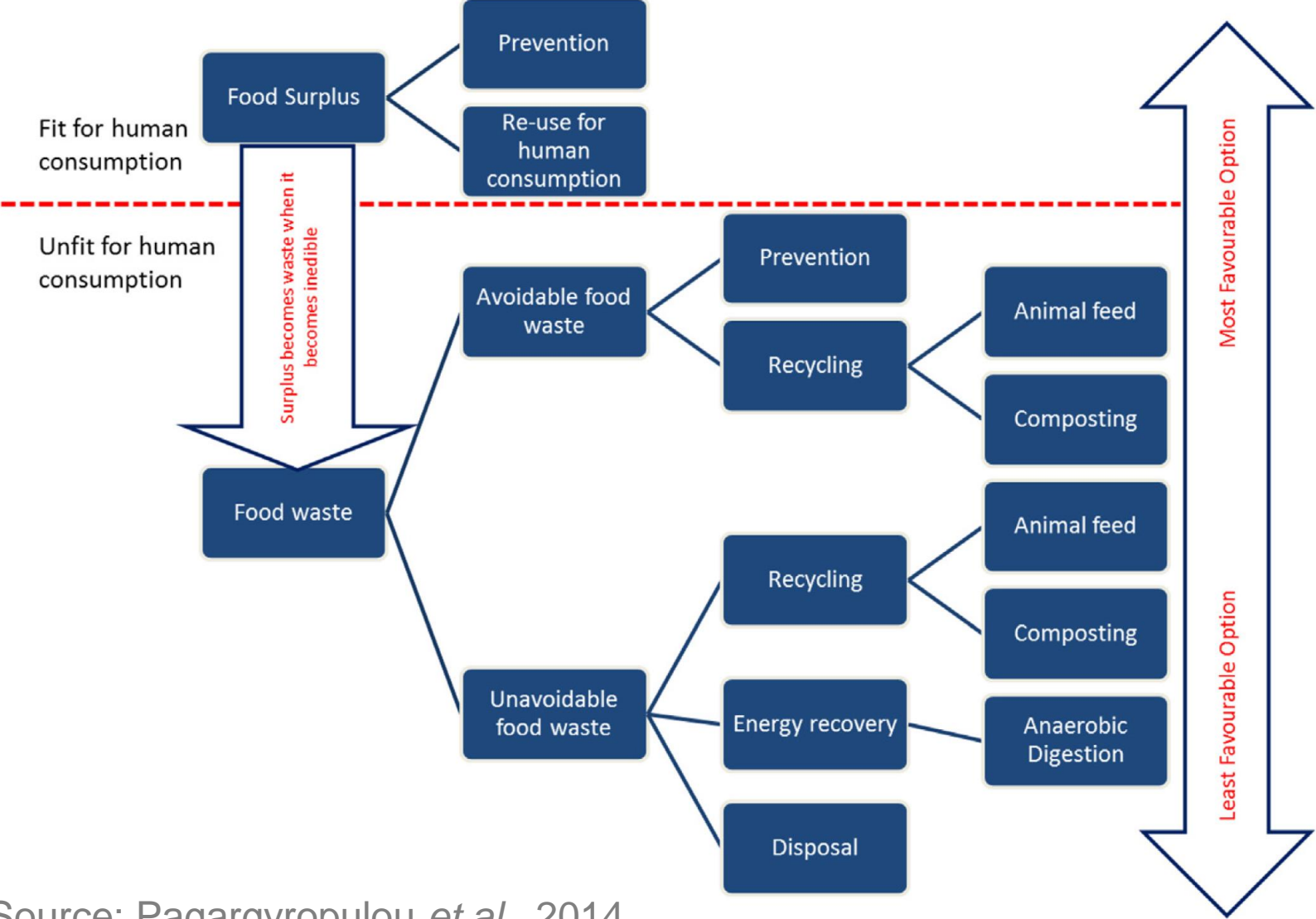
# Defining food waste

Food waste is any food, and inedible parts of food, removed from the food supply chain to be recovered or disposed (incl. composted, crops ploughed in/not harvested, anaerobic digestion, bio-energy production, co-generation, incineration, disposed to sewer, landfill or discarded to sea).

(Source: Ostergen et al, 2014)



# Defining food waste and surplus food

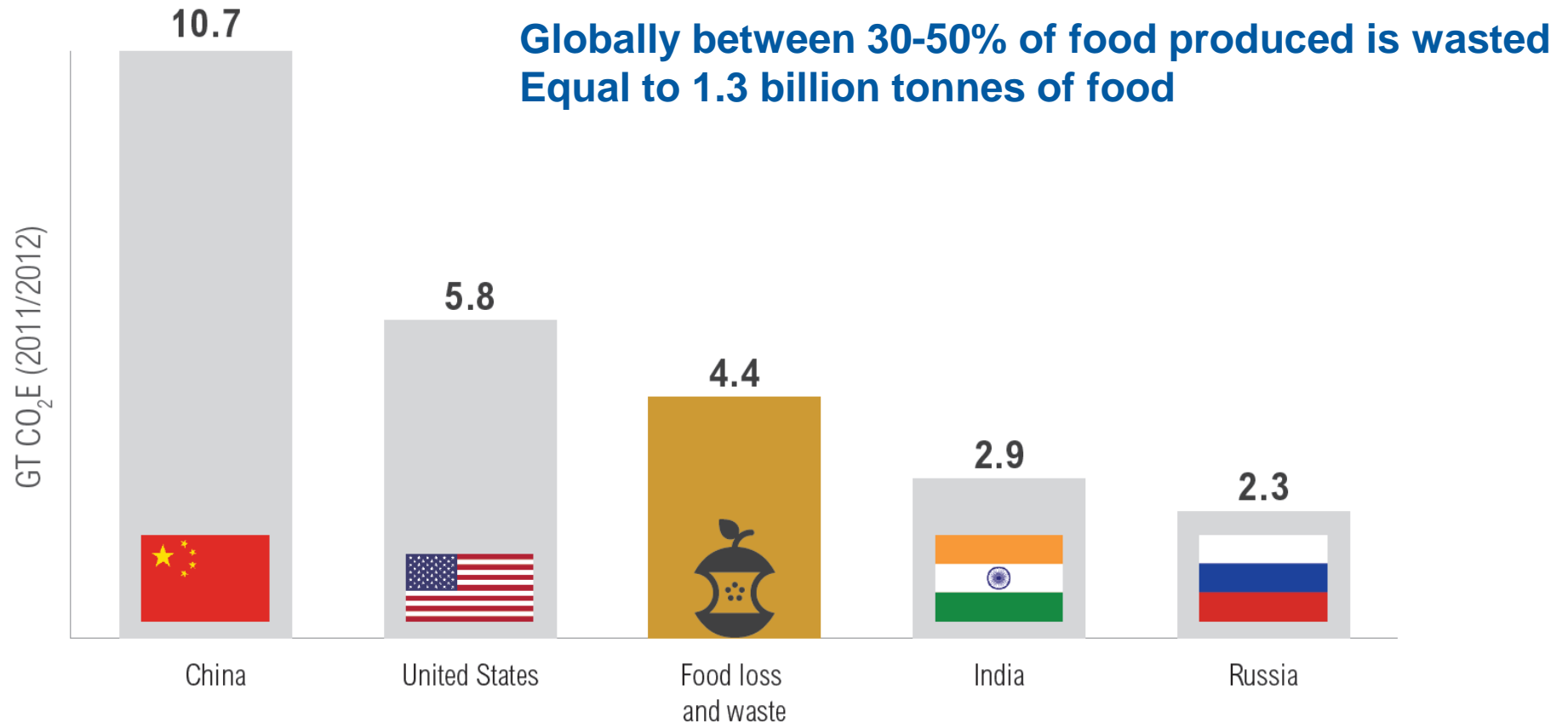


Source: Pagargyropulou *et al.*, 2014

# Food waste and climate change

- By 2050 food production must increase by 70% to meet demand
- CO<sub>2</sub> emission equivalents range between 2.8t – 4.14t of per tonne of food produced (throughout the supply chain)
- A third of food produced for human consumption is wasted globally ~1.3 billion tonnes per year
- Food is treated as a disposable commodity
  - Large scale urbanisation has accelerated demand and expanded the commercial agriculture sector
  - Dietary transitions to more diverse and resource-intensive foods
  - Globalisation and global trade drive increase of processed foods, supermarkets and international competition
- Increased production will likely increase wastage
- Almost one in seven people globally are estimated to be undernourished

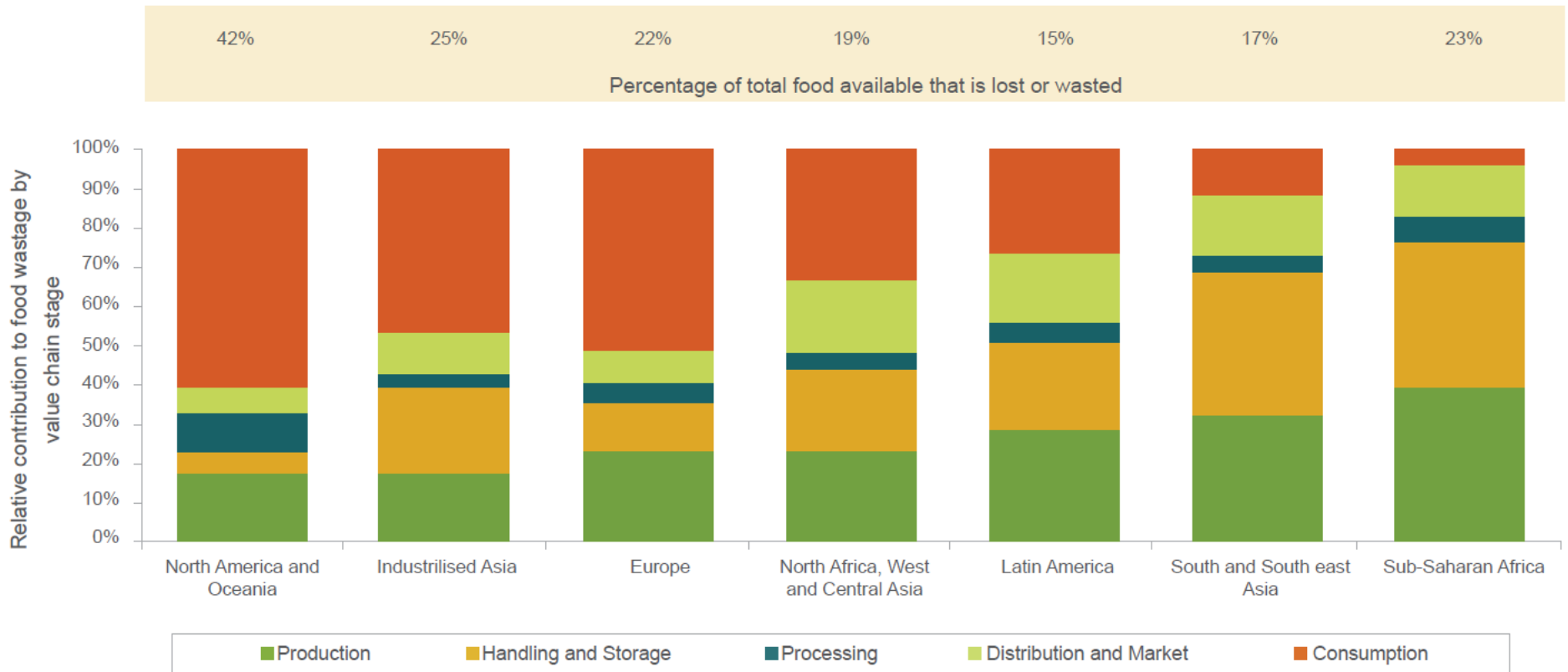
# GHG emissions and waste



Note: Figures reflect all six anthropogenic greenhouse gas emissions, including those from land use, land-use change, and forestry (LULUCF). Country data is for 2012 while the food loss and waste data is for 2011 (the most recent data available). To avoid double counting, the food loss and waste emissions figure should not be added to the country figures.

Source: 2017 Champions 12.3

# Food loss by region and stage of the supply chain



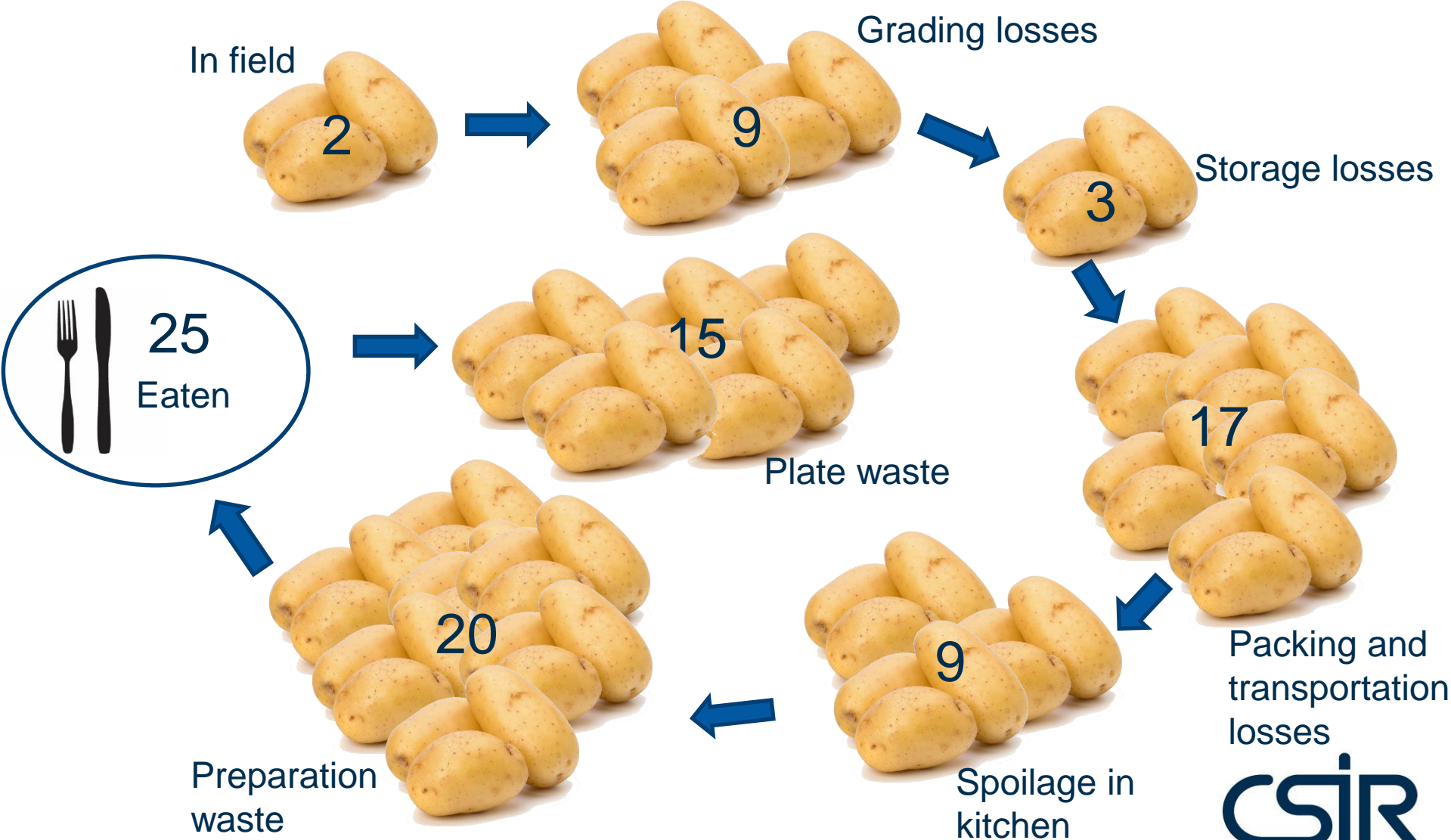
Source: Lipinski et al. (2013). World Resources Institute (WRI) analysis based on data in Global Food Losses and Food Waste (FAO 2011).

# Estimated waste percentage for each commodity group in each step of the food supply chain for sub-Saharan Africa

Commodity group	Agricultural production	Post harvest handling and storage	Processing and packaging	Distribution	Consumer	Total
Cereals	6.0%	8.0%	3.5%	2.0%	1.0%	20.5%
Roots and Tubers	14.0%	18.0%	15.0%	5.0%	2.0%	54.0%
Oil seeds & Pulses	12.0%	8.0%	8.0%	2.0%	1.0%	31.0%
Fruits and Vegetables	10.0%	9.0%	25.0%	17.0%	5.0%	66.0%
Meat	15.0%	0.7%	5.0%	7.0%	2.0%	29.7%
Fish and Seafood	5.7%	6.0%	9.0%	15.0%	2.0%	37.7%
Milk	6.0%	11.0%	0.1%	10.0%	0.1%	27.2%



# Supply chain losses & waste: 100 potatoes Field to Hotel



# Per capita food waste by consumers

- Europe and North America
  - 95 – 115 kg/year
- Sub-Saharan Africa and South/Southeast Asia
  - 6 – 11 kg / year
- Food waste from households in Ekurhuleni RSA
  - 3% of MSW = 25 198 tonnes/annum
  - 8 kg/capita/annum
- Food waste from households in Johannesburg RSA
  - 7% of MSW = 51 462 tonnes/annum
  - 12 kg/capita/annum

Source: Gustavsson et al, 2011; Oelofse et al, 2018

# What are the impacts of wasting different food commodities?<sup>2,13</sup>

South Africa

**Energy and climate impacts:** addressing waste in the production of cereals and meat offers the greatest potential gains.

**Volume:** 44% of food waste from fruit and vegetables.

**Financial loss:** fruit and vegetables – R22 billion; meat – R17 billion; fish – R7,8 billion.

**Health and nutrition:** food wasted includes nutrient-dense fruits and vegetables and lean protein, such as fish and eggs.

**Water utilisation:** addressing the production and distribution of meat is a high priority in terms of water provision impacts.



# Food waste drivers along the supply chain



- **Weather** - drought, floods, hail, wind, heat waves, cold spells
- **In-field harvesting losses** - damage
- **Poor demand forecasting** – info not shared along the supply chain
- **Not harvested** – plough back into field
- **Planted too much**
- **Out-grades / quality losses**
- **Grading errors**
- **By-catch**



# Food waste drivers along the supply chain



- **Losses in process** – machine failures, annual maintenance runs
- **Rejected input** – unsuitable for production
- **Ingredient not used in time**
- **Logistics failures** – cool/cold chain not maintained
- **Over-demanding quality specifications**
- **Minimum life on receipt too stringent**
- **Labelling errors**
- **‘Off-spec’ production** – poor product formulation

# Food waste drivers along the supply chain

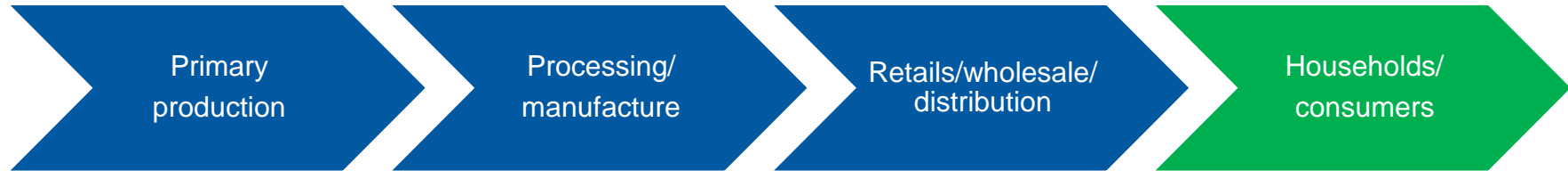


- **Not sold / used in time**
- **Poor stock rotation in-store/depot**
- **Failure of ordering systems – over delivery**
- **Demand forecasting failures – ordered too much**
- **Damaged product / spillages**
- **Cold chain failures / temperature abuse**
- **Product recalls / range resets**
- **Failure to distribute edible food surplus**
- **Retail over-stocking**
- **Over-demanding quality specifications**

# Retail Food Waste



# Food waste drivers along the supply chain



- **Poor portioning** – Preparing too much, serving too much
- **Poor stock control in-house** – not used in time
- **Bought too much** – impulse buying, promotional offers
- **Cooking disasters** – burnt, too much salt, wrong ingredients used, etc.
- **Inability to use leftovers**
- **Fussy eating** – allergies, picky eaters
- **Misunderstanding of on-pack labels** - date labelling
- **Pack sizes not suited to household size**
- **Lifestyle influences**



# Restaurant waste





# Household food waste



# Household food waste – Kimberley (n=100)

- 3 most wasted fruits



42%



20%



8%

- 3 most wasted vegies



27%



17%



13%

(Cronje et al, 2018)

# Fight climate change by preventing food waste

- Plan ahead
  - Do market research before you produce
  - Produce what is in demand, and short supply in a coordinated way to reduce surplus and increase income potential
  - Do proper stock control – throughout value chain including at household level
  - Use, and stick to, shopping lists when buying food
  - Plan meals and portion sizes according to the number and age of consumers
- Optimise harvesting schedules and techniques
- Introduce the cold chain asap and maintain it throughout the value chain
- Optimise storage to increase shelf life
- Shorter value chains reduce wastage
- Optimise stock rotation and control systems

# Fight climate change by preventing food waste

- Preserve or donate surplus food
- Be creative with surplus and left-over food
- Blend, bake or boil – use wilting, browning or imperfect produce to make sweet smoothies, bread, jams, sauces or soup stock...
- Check the kitchen cupboards before going shopping
- Don't go grocery shopping on an empty stomach
- Spread the word – awareness is the first step to prevention

# Conclusions

- Food waste is a global concern
- Food losses and waste occur at all stages of the value chain
- Reducing food waste will reduce climate impacts
- Shorter value chains will reduce wastage and impacts on the climate
- Food waste reduction can contribute to global food security without increasing production especially if surplus food is better managed
- Improved planning at all stages of the value chain will reduce food wastage
- Household food waste can be minimised through proper guidance:
  - Interpretation of date labelling
  - Proper food storage
  - Meal planning and portion sizes
  - Use of left-overs

# Thank You

Prof Suzan Oelofse

Research Group Leader: Waste for Development

Cluster: Smart Places

E-mail: [soelofse@csir.co.za](mailto:soelofse@csir.co.za)

[www.csir.co.za](http://www.csir.co.za)

