

IMPORTANCE OF THE FOOD COLD CHAIN

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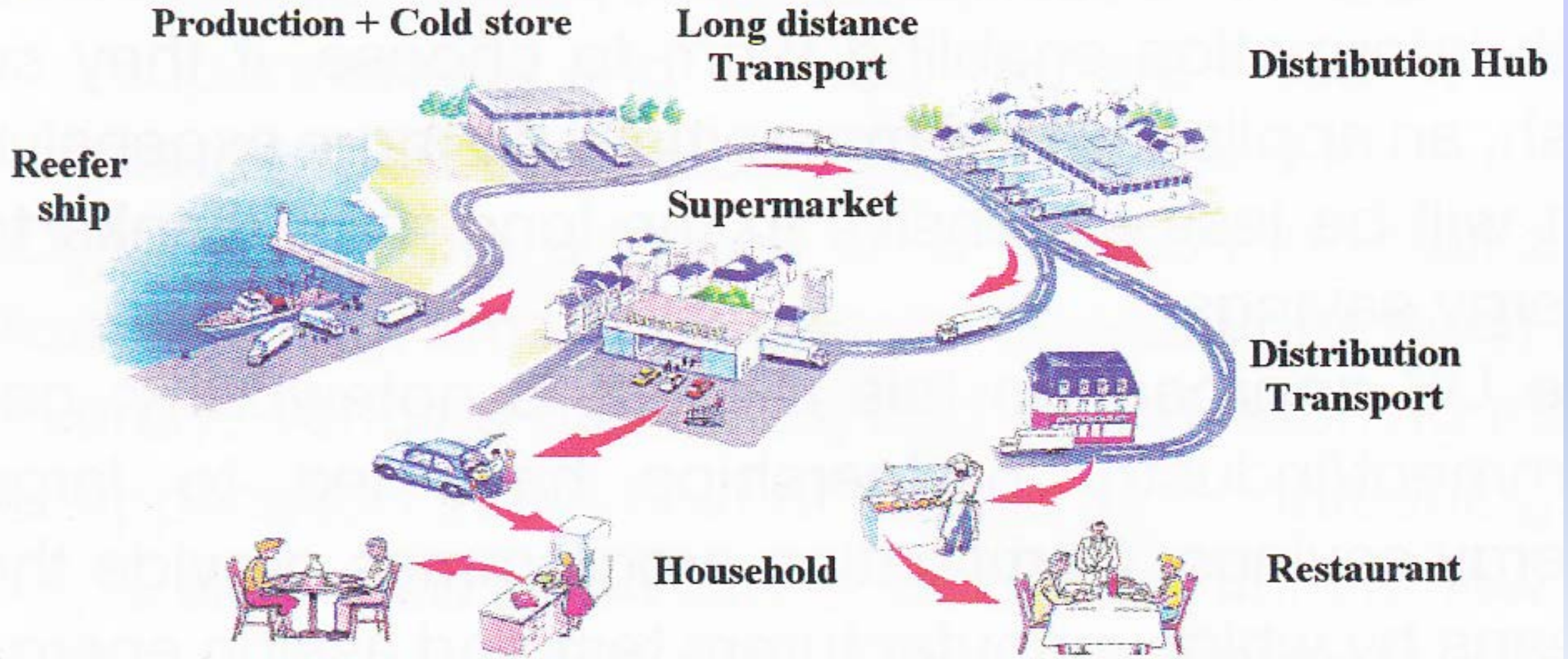
Outline

- 1) Need of a cold chain preserving food
- 2) The state of the art of the cold chain in developed and developing countries
- 3) The challenges

1/ Need of a cold chain preserving food

Each product has its own lifetime for sanitary, nutrition and organoleptic qualities depending on:

- the nature of the product (meat, fish and seafood, milk and dairy products, fruits and vegetables ...)
- the initial microbiological condition
- the temperature it is stored and transported. It is the same with many health products as well as plants and flowers.



2/ The state of the art of the cold chain in developed and developing countries

A few figures presented during the introduction of the conference
More in details

Year	Unit	2000	2015	2030	2050
Global population	Billion inhabitants	6.12	7.30	8.31	9.15
Population of developed countries*	Billion inhabitants	1.19	1.25	1.28	1.28
Population of developing countries**	Billion inhabitants	4.92	6.05	7.03	7.87
% of global population	%	80.5	82.9	84.6	86.0
Undernourishment ²	Billion inhabitants	0.86	0.61	0.44	

* More-developed regions¹ **Less-developed regions¹

	World population	Developed countries*	Developing countries**
Population in 2009 (billion inhabitants)1	6.83	1.23	5.60
Refrigerated storage capacity (m3/1000 inhabitants)11,12	52	200	19
Number of domestic refrigerators (/1000 inhabitants)11,13,14	172	627	70
Food losses*** (all products) (%) 9,15,16	25%	10%	28%
Losses of fruit & vegetables *** (%) 9,15-20	35%	15%	40%
Loss of perishable foods through a lack of refrigeration (%)15,16	20%	9%	23%

* More-developed regions¹ ** Less-developed regions¹

*** The loss rate comprises post-harvest losses, i.e. during processing, storage, transport and retail sale. It does not include final losses at consumer level for several reasons:

- these final losses are particularly difficult to evaluate, although a US study¹⁸ has demonstrated that such losses are about 14% in the USA;
- the value of final losses depends far less than post-harvest losses on the refrigerated equipment available in industrialized countries that are well-equipped: waste accounts for a major amount of losses; Kader¹⁷ considers that final losses are slightly higher in developed than in developing countries.

Capacity of cold storage warehouses by world region.

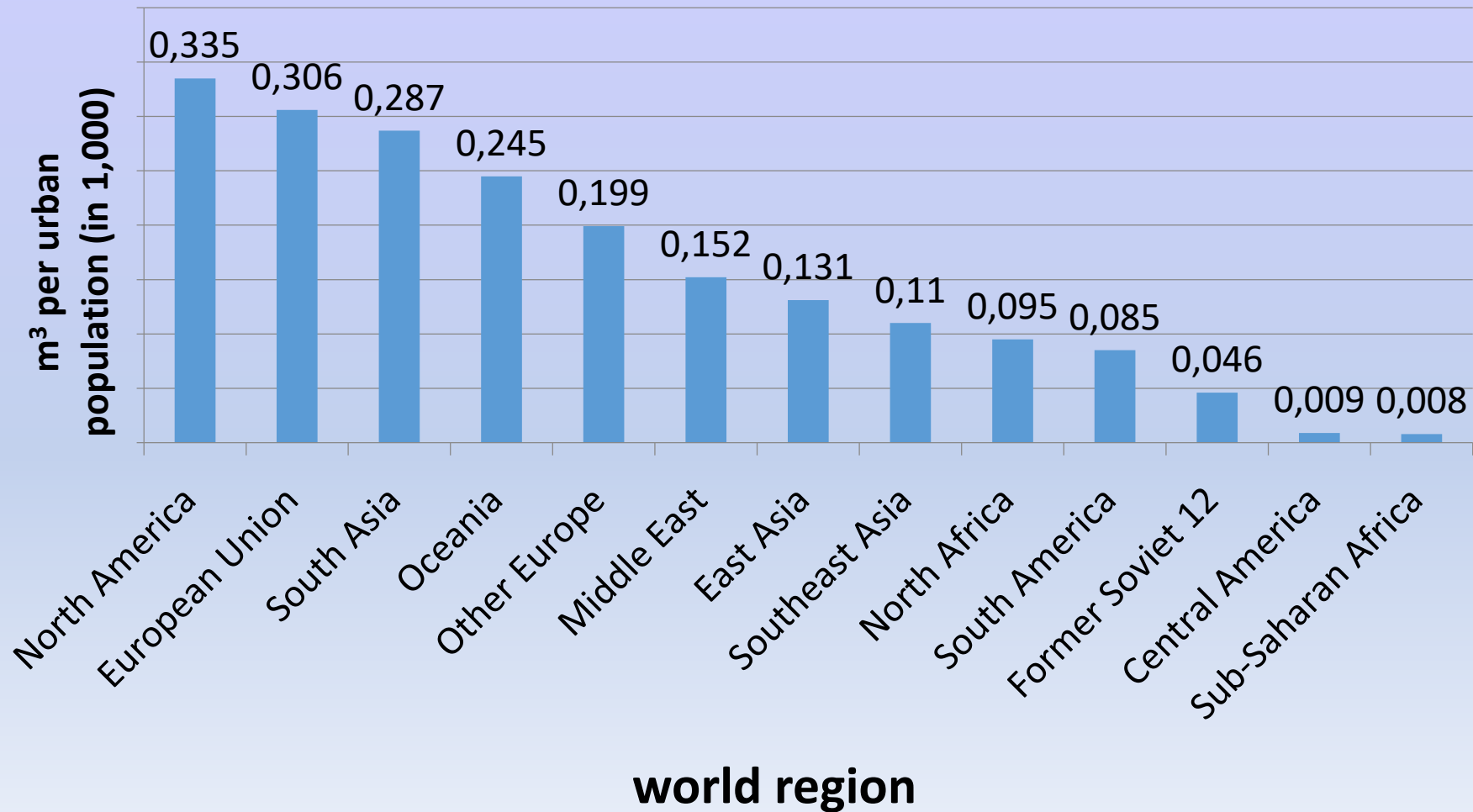


TABLE 1 Comparison of the cold storage capacity per capita in selected sub-Saharan African countries

	Ethiopia	United Republic of Tanzania	Namibia	South Africa
Capacity (litres/capita in urban areas)	2	2	5.1	15

Source: IARW, 2012.

Note: Data are for 2012, except for South Africa, for which 2008 data are shown.

TABLE 2 Production of perishable foodstuffs in sub-Saharan Africa in 2010, and average annual growth in production in 2000–2010

	Fruits	Vegetables	Roots and tubers	Meat	Milk	Fish (capture and aquaculture)	Total production and average rate
Production (thousand tonnes/year)	72 063	33 802	225 494	11 332	24 000	6 140	372 831
Annual growth 2000–2010 (%)	3.8%	3.7%	3.6%	3.8%	4.6%	11.9%	5.2%

Source: FAO, 2013.

Refrigerated transport

2 main categories:

- refrigerated vehicles: 4 millions (2015)
- refrigerated containers: 1,2 Millions (2015)

Vehicles:

1/450 inhabitants in Europe

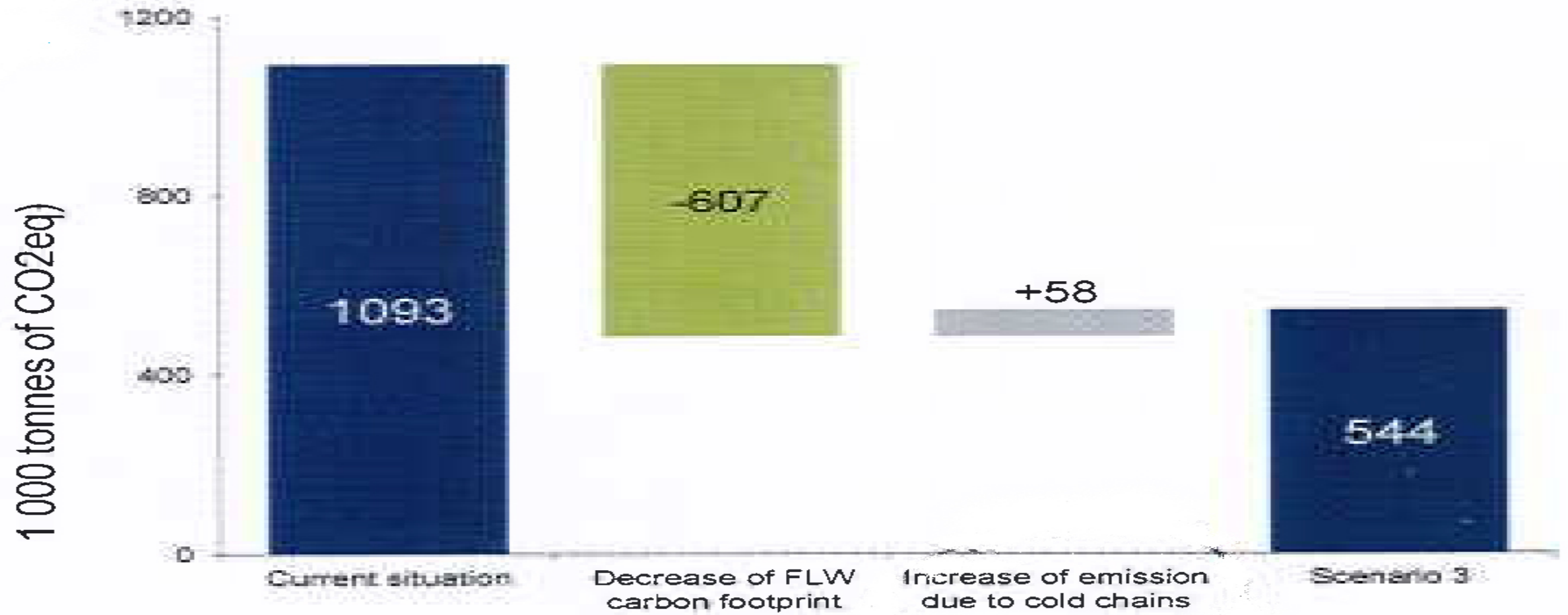
1/13 000 inhabitants in China (2011)

1/ 150 000 inhabitants in India (2014)

Same for domestic refrigeration: 627 vs 70/1000 inhabitants, developed vs developing countries

3/ The challenges

- Increasing the food supply if same level developing / developed countries:
+15% (+250 Millions tons) and the more you preserve the food, the more you produce market growth stimulating increases in production
- Better health
- Reducing the carbon footprint:
 - Electricity consumption (efficiency / renewables)
 - Phase out of HCFCs
 - Phase down of HFCs



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Actions

- European research projects:
FRISBEE, Cool Save, Supersmart ...
- The IIR Working Group on the cold chain in hot climates
- The IIR Conferences and Workshops (New Zealand, Tunisia, Dubai, China ...)
- Partnerships with CIHEAM, FAO
- A global alliance FAO-IIR-UNEP with other IGOs and the private sector
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