



Climate change: melting glaciers, diminishing water resources, trapped sunrays increase global warming



REDUCING FOOD LOSSES AND PROMOTING CLIMATE ACTION IN DEVELOPING COUNTRIES THROUGH SUSTAINABLE FOOD COLD CHAIN SYSTEMS

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Introduction

This paper draws on two policy briefs jointly developed by FAO and IIR in 2014 for the cold chain development as an integral element of improving the efficiency of the food system and reducing food losses and waste. It gives an overview of the cold chain in these regions and emphasizes on what is needed from both governments and private sector to address the cold chain development challenges.

Context

Food loss and waste (FLW) reduction is increasingly seen as a relevant and potentially effective policy option towards global food security, environmental protection and improvement of the performance of food systems. At the same time, the levels of FLW remain very high in SSA and NENA countries, particularly for perishable products such as fruit and vegetable, fish, meat, and dairy. FAO estimated the yearly food losses in SSA at roughly 25-30 percent for animal products and 40-50% for roots, tubers and fruits and vegetables (FAO, 2011). The same source estimated the levels of food losses in NENA at 55% of fruits and vegetables, 22% of meats, 30% of fish and seafood, and 20% of dairy. This is mainly due to managerial and technical limitations in harvesting techniques, storage, transportation, and processing, cooling facilities, infrastructure, packaging and marketing systems.

The lack of a reliable and sufficient cold chain is a major contributor to FLW in these countries. Indeed, a sufficient and efficient cold chain infrastructure is critical not only to reducing FLW, but also to market access, food safety and food security in these regions. According to IIR (2009 b), if developing countries could acquire the same level of refrigerated equipment as that in industrialized countries, over 200 million tonnes of perishable foods would be preserved, this being roughly 14% of the consumption in 2009, and roughly 25% of the current consumption in these countries (IME, 2014).

Developing cold chain system and improving their management would contribute not only to reducing these losses, but also to improving the technical and operational efficiency of the food chains towards increased market access, income generation for smallholders and nutrition and food security in these region. It is also conducive to proper climate action (adaptation, mitigation) addressing some climate change challenges and thus contributing to strengthen the entire food chain and improve the competitiveness and food security for the benefit of all food chain actors and other stakeholders. The paper gives an overview of challenges and solutions relating to sustainable food and cold chain systems in these regions. Therefore, the cold chain development, in a sustainable manner, is quite an imperative in achieving food and nutrition security in SSA and NENA.

State of the Cold Chain in the SSA and the NENA

The cold chain is currently very insufficiently used or non-existent in most sub-sectors in sub-Saharan Africa, except for some export-oriented industries considered as profitable (FAO/IIR, 2014). According to IARW's data (2012) the cold storage capacity per capita is very low in SSA (< 10 litres/capita in most of the countries). This capacity seems higher in NENA countries where the cold chain capacity and utilization is greater for the export market compared to the domestic one, as for SSA countries (table 1). Data in this table demonstrate that the cold storage capacity in both the regions lags behind the capacity of developed economies such as Germany and USA.

The relative advance of the cold chain in the export market is mainly due to the predominance of smallholder farmers in these regions, who largely use traditional marketing system for their production, with a non-continue cold chain when it does exist.

Table 1: Cold-storage capacity per capita in some SSA and NENA countries compared with Germany and USA.

Region/Country		Capacity (litres/capita in urban areas)	Year of estimate
Sub-Saharan Africa	Ethiopia	2	2012
	Tanzania	2	2012
	Namibia	5.1	2012
Near East and North Africa	Algeria	66	2011
	Morocco	53	2011
	Saudi Arabia	88	2006
Germany		262	2010
USA		344	2010

Source: IARW (2012), FAO (2012) and population data from FAOSTAT

The Constraints

The cold chain development in SSA and NENA countries, often faced with major challenges related to : i) the access to energy ii) maintenance (shortages of qualified staff and spare parts); iii) poor logistics; iv) poor organisation and implementation of standard-compliance monitoring; v) the relatively small volume of commercialized products and poor organisation of the production.

The Opportunities

Despite these challenges, economic and demographic trends in these regions, growing middle class and increasing urbanization offer significant opportunities to achieve more rapidly the "critical mass" needed for the cold chain market development. Indeed, the regional production of perishable foodstuffs, around 158 and 373 million tonnes in 2010, respectively for the SSA and the NENA, is expected to increase significantly during the current decade at a rate reaching even exceeding the growth of the previous one, which was ranging between 3.7 and 5.2% per year.

Policy Implications

A real commitment to supporting cold chain development, both from governments and the private sector, is critical to meeting challenges and priority needs of refrigeration in the food sector. Some key strategic aspects should be taken into consideration.

1) A better integration of the cold chain development in agricultural and food-security development strategies

The development of refrigeration logistics should be an essential element in overall strategies for agricultural development and food and nutritional safety as Food losses increase price differences between producers and consumers.

2) Elaborating and coordinating multi-sectorial and multi-stakeholders strategies

The cold chain development must be the result of shared vision and convergent objectives between public and private actors, and should take into consideration agriculture, logistics, research, technology and other sectors.

Coordinating the activities of multiple actors is essential and has been an obstacle to cold chain development. In this regard, developing the cold chain must be guided by a master plan, which should be integrated in multi-sector and multi-stakeholder development strategies that foster interprofessional cooperation, public-private- and private-private partnerships.

3) Adapting intervention strategies to products specifics and to geographic and socio-economic conditions

The nature and impact of constraints to cold chain development differ according to products (meat, fruit and vegetables, fish and sea food, milk and dairy products...) and regions (the climate, electric grids, transportation infrastructures, distance from markets, purchasing power, economic and social organization, food habits, etc.)

If the main characteristics of an efficient cold chain are similar everywhere, developmental strategies and pathways should be adapted to this diversity and to the actual capacities of private and public stakeholders for change and implementation.

Regional or bilateral dialogue among the region's countries and between SSA and NENA' regions, is also recommended in order to share experiences and good practices conducive to the cold chain development. Regional organizations and UN agencies, especially FAO, can play a role in this regard.

4) Engaging in serious preliminary studies prior to any refrigeration investment project

Choosing between different types of equipment represents alone a sufficiently important energetic and economic issue, which justify a serious study for decision-making. Therefore, feasibility studies are essential before any investment project, and must take into account the conditions of the product supply chain, and its opportunities and weaknesses for development.

Recommendations

❖ For Governments and other public authorities:

Governance

- A strategic development plan of cold chain should be elaborated and implemented in partnership with the private sector; this plan should be consistent with other sectorial development plans such as: agriculture, infrastructures, agro-industry, distribution, training, etc.
- Regulations and quality standards should be defined, enforced and monitored in relation with food safety and environmental protection.

Training and R&D

- Professional training structures in all concerned sectors should be supported, particularly those related to logistics, refrigeration maintenance, engineering and application.
- R&D efforts responding to the specific needs and assets of SSA and NENA regions should be supported. For instance, conducting research conducive to a wide use of renewable energy, such as cooling with solar energy, could provide better access to an off-grid and affordable energy, meeting the needs of small scale producers and SMEs.

Investment

- Crucial infrastructures and related services (electricity, transports, market places...) for the effective implementation and efficiency of the cold chain should be upgraded.
- An incentive investment code should be elaborated and applied in order to promote investment and capacity building in cold chain processes and technologies for the food sector (support to building-plot purchase, private-public partnerships, etc.).

❖ For the private sector:

- The emergence of professional organisations around the cold chain and active participation in their operation should be supported. These organizations can serve to enable access to technologies/knowledge, finance and equipment, as well as facilitate the dialogue and coordination necessary for effective cold chain development.
- Participation in professional training within companies, awareness-raising and further education in companies should be offered and actively supported.

References

FAO & IIF/IIR. 2014. *Developing the cold chain in the food sector in Sub-Saharan Africa. Policy brief 2*, by D. Dramé, D. Njie, X. Meignien. Rome. Language: French

FAO. 2014. *Developing the Cold Chain for Agriculture in the Near East and North Africa (NENA).Policy brief*, by E. Yahia, J. Smolak. FAO/RNE, Cairo, Egypt.

FAO & IIF/IIR. 2014. *Report of the regional workshop on the use of the cold chain in the development of agriculture and agribusiness in sub-Saharan Africa* ,4-6 June 2012, Yaoundé, Cameroon.

FAO. 2012. *Proceedings: Expert Consultation Meeting on the Status and Challenges of the Cold Chain for Food Handling in the Middle East and North Africa (MENA)*

FAO. 2011. *Global food losses and food waste, Extent, Causes and Prevention*, by J. Gustavsson, C. Cederberg, U. Sonesson, R. van Otterdijk and A. Meybeck.

IARW. 2012. *Global cold storage capacity report*, International Association of Refrigerate Warehouses (IARW).

Institution of mechanical engineers (IME). 2014. *A tank of cold: cleantech leapfrog to a more food secure world.*

IIR.2009b. *The Role of Refrigeration in Worldwide Nutrition* (5th Informatory Note on refrigeration and food, June 2009), International Institute of Refrigeration.

