



## A glance at the world

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*This column comprises notes and info not subjected to peer-review focusing on waste management issues in different corners of the world. Its aim is to open a window onto the solid waste management situation in any given country, major city or significant geographic area that may be of interest to the scientific and technical community.*

### An overview on food loss and food waste research in the Arab world

The Arab world consists of 22 countries (Algeria, Bahrain, Comoros, Djibouti, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Mauritania, Morocco, Oman, Palestine, Qatar, Saudi Arabia, Somalia, Sudan, Syria, Tunisia, United Arab Emirates and Yemen) located in the Middle East, Near East and North Africa, with a total population of around 420 million. Rough estimates of food loss and food waste (FLW) in Arab countries are about 44% at the pre-consumption supply chain level and about 34% at consumption level (HLPE, 2014) amounting annually to 210 kg per capita as compared to 95–115 kg per person per year in Europe and North America (Gustavsson et al., 2011). Such high levels of FLW are remarkably alarming, especially that they increase the dependency on imports as natural resources necessary for food production are scarce across the Arab region.

In view of the region's limited natural resources, high dependency on food imports (up to 50% of its needs to meet their nutritional requirements, low agricultural productivity and rapid population growth, such levels of food waste are certainly not only uneconomical but in fact detrimental to both the environment and the region's food security. Furthermore, the current situation in most Arab countries is aggravated by recent conflicts, resulting in more than 32 million people in Syria, Yemen, Iraq, Sudan, West Bank and Gaza Strip unable to meet their basic food needs, let alone the cases of millions of undocumented people in Libya, Mauritania, and Somalia who are food insecure. These people cannot be offered better food security if the amount and mode of food wastage is not documented and explained – tasks that require funding as well as experts willing to work in conflict zones and locals who know the necessary languages and dialects and are trained in proper data collection.

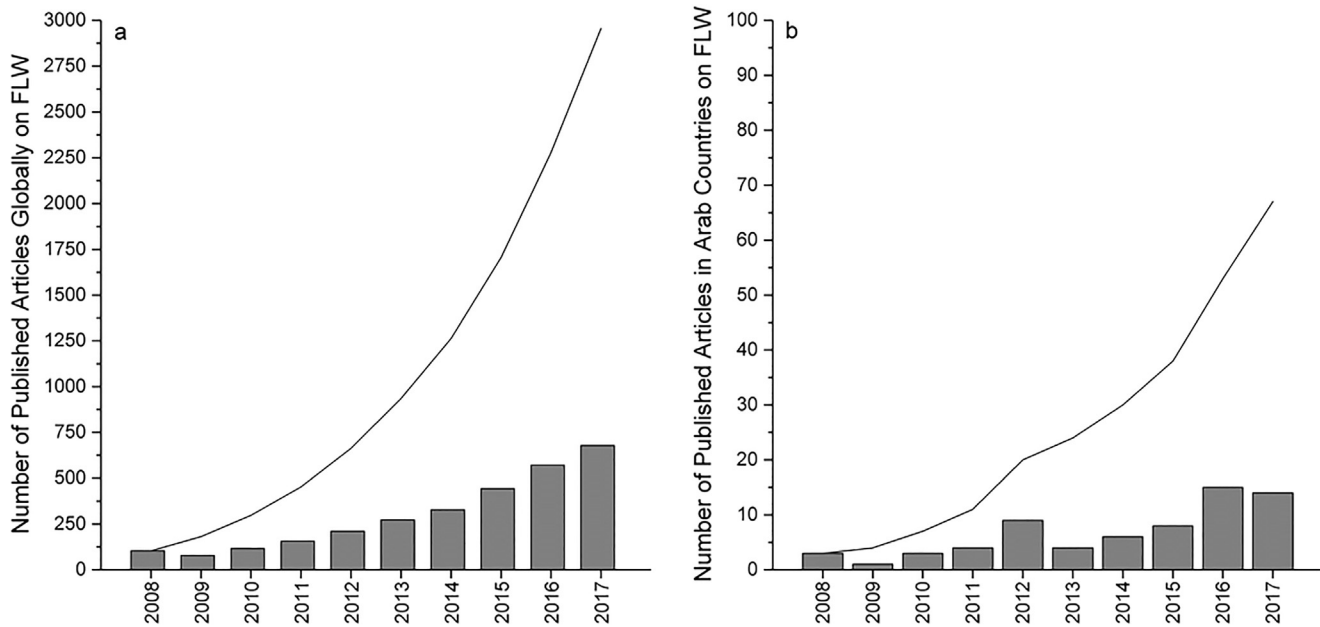
Data on FLW in most Arab countries is limited or nonexistent. Following a search of 12 different databases targeting scientific journal articles and conference papers published in Arabic, English or French, only 24 relevant scripts from the region could be identified. Ten out of the 22 Arab countries do not have one single research article on FLW. Among these 10 countries, four are the smallest in the Arab world, having populations that range from 800,000 to 2.3 million (Bahrain, Comoros, Djibouti, and Qatar) whilst the rest are either poor countries with very low per capita GDP and low literacy rates (Mauritania, Somalia, and Sudan) or countries that have suffered and continue to suffer from protracted conflicts (Libya, Syria, and

Yemen). Only 12 Arab countries have published on FLW with Iraq standing out as the most productive with 9 publications on the matter. The majority of the scientific literature focused on household generated waste and its composition whilst only a few investigated FLW along other parts of the food supply value chain including the retail and hospitality industry in the Arab world. It is worthy to mention that no attention has been given to other parts of the supply chain, such as transportation, storage or processing. Few of the identified studies have tapped into the drivers of food wastage or the consumers' attitudinal and behavioural aspects associated with food waste generation. Moreover, only seven quantitative studies have been conducted in the Arab region investigating the amount of food wasted at the household level (Iraq, Oman, United Arab Emirates and West Bank and Gaza Strip) whilst merely three have looked into food waste generated by the hospitality industry (Saudi Arabia, Egypt and Jordan).

Our investigation points to interesting trends in food wastage and suggests areas of interest to be further elucidated. For example, in rich and stable Arab countries, significant waste is generated during social and religious occasions especially during the fasting month of Ramadan when food waste is the highest; 30–50% of the food prepared ends up in landfills.

Although interest in FLW research has been increasing steadily and at a very fast rate globally, going up from around 100 papers in 2008 to nearly 700 papers in 2017 – a seven-fold increase in the past decade, in comparison to only 44% increase for all subject areas together (Fig. 1a), FLW research in the Arab world shows fluctuating productivity from one year to another and continues to represent a very small proportion of the world's overall outcome of 2.5 percent as evident in Fig. 1b. This deficiency in research productivity on FLW in the Arab world is attributed to several possible factors that are not mutually exclusive, such as lack of interest in the subject matter among local scientists; the small number of local scientists in the field of food loss and food waste; lack of funding and governmental support; and/or difficulties in carrying out such research in the Arab world as a result of war and cultural and religious barriers.

In the meantime, there is an increased awareness regarding the threats of climate change and sustainability on the food supply base. This acknowledgment has unleashed various initiatives and efforts by non-governmental associations such as 'awareness campaigns' and 'food banks' whose main objective is to mitigate food waste by collecting unserved food and channeling it to needy people. Table 1 provides a summary of the efforts and ongoing projects in Arab countries which mainly focus on food waste reduction or



**Fig. 1.** Bar chart showing the number of publications per year during the last decade on 'food loss' and 'food waste' globally (a) and (b) in Arab countries. '\_\_\_\_\_' shows the cumulative number of publications over the past 10 years. Source: Scopus (May 2018), Document Type: Journal and review articles, Search strategy: "Food Loss" OR "Food Waste" in title and abstract field.

**Table 1**

Summary of ongoing projects and initiatives across the Arab world targeting food waste reduction and raising awareness.

Ongoing project/Initiative	Goal	Country	Year of implementation
Regional Food Bank Network	Raise awareness about food waste Collect and distribute unserved foods from hotels, restaurants and catering services Fight hunger and food waste by managing food losses and waste	Egypt	2006
		Iraq	2011
		Kingdom of Saudi Arabia	2011
		Syria	2011
		Tunisia	2011
		Jordan	2012
		Lebanon	2012
		Mauritania	2012
		Sudan	2012
		Algeria	2013
		Palestine (West Bank & Gaza Strip)	2014
		Bahrain	2015
		Somalia	2015
		United Arab Emirates	2017
FoodBlessed	Hunger relief initiative, links food donors to food recipients	Lebanon	2012
Save Food	Global initiative on food losses and waste reduction	Global	2013
Action plan to reduce food losses and waste in Kingdom of Saudi Arabia	Reduce food waste	Kingdom of Saudi Arabia	2014
MED-3R initiative (Euro-Mediterranean strategic platform for sustainable waste management)	Encourage restaurants and customers to use take-away leftover boxes/bags	Jordan, Lebanon and Tunisia	2014
Technical cooperation program	Capacity building for food loss reduction	Egypt, Lebanon and Jordan	2014
Food waste reduction strategy	Reduce food waste	Morocco	2015
Regional food loss and waste reduction network		Regional (Near East & North Africa)	2015
Food losses and waste reduction and value chain development for food security	Control links of production chain to reduce food waste and thus decrease the import of food products	Egypt and Tunisia	2016
Heafz al-Na 'amah	Initiative to redirect unserved/surplus food from banquets and buffets at hotels, weddings and homes to the less fortunate	United Arab Emirates	2016

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