



**Food and Agriculture  
Organization of the  
United Nations**



## Milan Urban Food Policy Pact Monitoring Framework

July 2018 version

**Indicator 34:** Existence of policies/programmes that address the reduction of GHG emissions in different parts of the food supply chain

MUFPP framework of actions' category: Food supply and distribution

*The indicator assesses the existence of policies/programmes that address the reduction of GHG emissions/ in different parts of the food supply chain (e.g. processing, storage, transport, packaging, retail, cooking, waste disposal etc.)*

### Overview table

MUFPP Work stream	Food supply and distribution
<b>MUFPP action</b>	<b>Assess the flows of food to and through cities</b> to ensure physical access to fresh, affordable foods in low-income or underserved neighbourhoods while addressing sustainable transportation and logistics planning to reduce carbon emissions with alternative fuels or means of transport.
<b>What the indicator measures</b>	The indicator assesses the existence of policies/programmes that address the reduction of GHG emissions/ in different parts of the food supply chain (e.g. processing, storage, transport, packaging, retail, cooking, waste disposal etc.)
<b>Which variables need to be measured / what data are needed</b>	Policy initiatives, research initiatives, practical initiatives (e.g. technical innovation; public engagement & behaviour change)
<b>Unit of measurement</b> (i.e. Percentages, averages, number, etc.)	This is an assessment of action that is being taken by the municipality and its partners to address reduction in GHG emissions. These could be actual GHG emission calculations or practical initiatives or clear policy guidelines and GHG reduction targets, etc.
<b>Unit(s) of Analysis</b> (i.e. people under 5 years old, etc.)	Metrics could include: <ul style="list-style-type: none"> <li>- Number (and types) of policies and regulations</li> <li>- Number of city partnerships formed to specifically address GHG emissions</li> <li>- Number and type of information and communication mechanisms and target groups</li> <li>- Number of research studies</li> <li>- Number of GHG emissions calculations relating to the food system (for example, impact of the last mile supplying system, total or specific food transport GHG emissions, organic waste related GHG emissions).</li> </ul>

	- Number of practical initiatives to support a low-carbon food system
<b>Possible sources of information of such data</b>	-Climate change or sustainability/resilience, or environmental departments; -Policy and planning department; -Universities and colleges; -Food governance structures; -Local food & climate change networks; -Environmental NGO's and campaigners; -Businesses
<b>Possible methods/tools for data-collection</b>	Policy documents, reports, research proposals, climate change campaigns, interviews with key stakeholders
<b>Expertise required</b>	Research, interviewing, data analysis
<b>Resources required/ estimated costs</b>	
<b>Specific observations</b>	Some cities may have been able to quantify, monitor and reduce food system related GHG emissions in certain areas of the food system. For most however, measurement and monitoring of GHG emissions in any single food business, let alone food sector, or indeed whole city food system, is difficult to do. As yet there is no one agreed way to do this. Most cities would need to hire specialist consultants at high cost. However, cities need to act and therefore need to understand how best to act, so any work that supports this intention is very important. The responsibility for making change happen has to be shared across many different actors. There may be overlaps with this and other indicators, so this one should focus on any important data gaps.
<b>Examples of application</b>	[FAO to add here a link to the experience you had in AGS/ESN looking for feasible ways to determine the impact of the last mile supplying system on GHG emissions]

## Rationale/evidence

The overall purpose of this area of work is to increase understanding of how to achieve targeted improvements in the food chain. Reducing fossil fuel-based energy consumption is essential to meet global commitments to reduce greenhouse gas emissions, a man-made contributor to climate change. Sustainable Development Goal (SDG) 12 is 'to ensure sustainable production and consumption patterns'<sup>1</sup>.

One regional analysis for Europe finds that food accounts for 31% of the EU-25's total GHG impacts, with a further 9% arising from the hotel and restaurants sector (European Commission, 2006)<sup>2</sup>.

The Paris Agreement in December 2015 is the first truly global effort to reduce emissions. To date, 160 UNFCCC parties have made voluntary pledges to reduce emissions up to 2030, including China, the US and the European Union (on behalf of the EU nations)<sup>3</sup>.

The impacts of climate change will present challenges to achieve many of the Sustainable Development Goals (SDGs). For example, climate change undermines progress made towards zero hunger and climate variability raises the risk of disruptions to food supply and distribution. "To achieve SDG2 and effectively respond to climate change, we require a transformation of our agriculture sectors and food

<sup>1</sup> Sustainable Development Goals and indicators <https://unstats.un.org/sdgs/tierIII-indicators/>

<sup>2</sup> What are the best opportunities for reducing GHG emissions in the food system (including in the food chain)? Tara Garnett, 2010, Food Climate Research Network [https://www.fcrn.org.uk/sites/default/files/Food\\_Policy.pdf](https://www.fcrn.org.uk/sites/default/files/Food_Policy.pdf)

<sup>3</sup> United Nations Climate Change: Paris Agreement 2015 [http://unfccc.int/paris\\_agreement/items/9485.php](http://unfccc.int/paris_agreement/items/9485.php)

systems,” (José Graziano da Silva, Director-General of the Food and Agriculture Organization of the United Nations (FAO))<sup>4</sup>.

At a city and city region level there is now much more discussion about how to build a low carbon food economy or food system. However it’s an area of great complexity and there are many unanswered questions that relate specifically to impacts and methodologies for measurements.

Food flow analysis may provide information on where improvements are needed: GHG emissions or food loss and waste volumes generated in different parts of the food chain (e.g. production, processing, storage, transport, packaging, retail, cooking, waste disposal etc.). Food flow analysis can also provide information on the number of jobs generated at different parts of the food chain, opportunities for increased local food business, or on the extent to which local consumption is covered by regional production versus food imports from outside the region<sup>5</sup>.

Local governments, through policy and investment in practical programmes, can support social, technological and organisational innovation in processing, distribution, logistics and trading activities to facilitate the transition to a sustainable and resilient food system. (See Indicator 35: *Presence of a development plan to strengthen resilience and efficiency of local food supply chains logistics*). For example, municipalities can apply closed cycles principles of material and energy to the food system from a circular economy and bio-economy perspective. Many of these food chain improvements are covered under other indicators (e.g. food production, number of food jobs, food markets providing fresh fruits and vegetables, waste recovery).

This indicator should therefore focus on areas not covered by other indicators. Each city should consider this question: *To what extent do other indicators already cover areas related to targeted improvements in the food chain and what is still missing?* The issue of GHG emissions may well be one that is missing, and should be addressed in some way, even if not entirely satisfactory.

## Glossary/concepts/definitions used

### What can cities do to address the reduction of GHG emissions in different parts of the food supply chain?

The C40 Food Systems Network sets out how through policy and practical initiatives, cities can use their own powers to facilitate transformation in the following ways:

- Food Procurement and Sustainable Diets: Addressing purchases that are controlled by the municipality, for example procurement of food for schools, hospitals and elderly homes.
- Food Production: Promoting and strengthening urban and peri-urban food production to support short food chains, reduce building energy demand (cooling and heating) in the production process and mitigate the urban heat island effect.
- Food Supply and Distribution: Developing sustainable food transportation and logistics by improving alternative fuels or means of transport; enhancing farmer’s markets, informal markets, retail and wholesale markets; and strengthening the food supply chain to withstand disruptive events such as natural disasters.

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<sup>4</sup> Climate Action Priority for Food Security and Zero Hunger; UNFCCC

<https://cop23.unfccc.int/news/climate-action-priority-for-food-security-and-zero-hunger>

<sup>5</sup> City Region Food System assessment toolkit <http://www.fao.org/in-action/food-for-cities-programme/toolkit/introduction/en/>

- Food Waste: Raising awareness of and promoting the food waste “pyramid” – reducing of food loss and waste, facilitating food recovery for people and animals, and improving collection of waste for biogas or fertilizers.<sup>6</sup>

### Evidence of policies/programmes that address the reduction of GHG emissions

There are a number of approaches that could be used as proxy indicators or as evidence that action has been taken:

#### Public procurement as a vehicle for driving GHG emission reductions; City of Malmo

By 2020, the City of Malmo in Sweden aims to be climate neutral and by 2030 the whole municipality aims to run on 100% renewable energy. Greenhouse gas emissions relating to food shall decrease by 40 % by 2020, compared to the 2002 levels. Malmo’s goal is to serve 100% organic food in all of its public catering services by 2020 as part of the strategy for achieving GHG reduction targets. The city is using an Eat S.M.A.R.T. model to help get the balance between eating healthily and decreasing the impact on the environment<sup>7</sup>.



#### Understanding city emissions better

The City of Bristol, UK has used national emissions data from which to calculate a more detailed breakdown of percentage contributions to total city CO2 emissions by sector; and also to calculate specific municipality contributions<sup>8</sup>.

#### Urban food production & circular economy initiatives

There are many well-known examples of urban micro-businesses or community initiatives that are based on circular economy principles and based in or near to urban centres:

- Mushrooms production using recycled coffee grounds as a growing medium
- Vehicles run on recycled vegetable oil from catering establishments
- Reduction of methane from land-fill sites by reducing the amount of wasted edible food through redistribution, or composting of food waste material.

### Preparations

The team responsible for monitoring this indicator should agree on:

1. Scope and parameters of the assessment
2. Most useful and feasible metrics (useful to discuss these with the municipality and any key stakeholders, ideally in a roundtable situation)

<sup>6</sup> C40 The Food Systems Network and EAT <http://www.eatforum.org/programmes/>

<sup>7</sup> Policy for sustainable development and food; the City of Malmö  
[http://malmo.se/download/18.d8bc6b31373089f7d9800018573/Foodpolicy\\_Malmo.pdf](http://malmo.se/download/18.d8bc6b31373089f7d9800018573/Foodpolicy_Malmo.pdf)

<sup>8</sup> Our resilient future: a framework for climate and energy security, City of Bristol, 2015  
[https://bristol.citizenspace.com/city-directors-department/climate-and-energy-framework/supporting\\_documents/OurResilientFuture\\_v2.pdf](https://bristol.citizenspace.com/city-directors-department/climate-and-energy-framework/supporting_documents/OurResilientFuture_v2.pdf)

3. Type of data disaggregation and categories that will be used (linked to above discussions)
4. Data collection method (analysis of records or interviews)
5. If interviews are to be used, questions have to be designed. Training of interviewers may be needed.

## Sampling

N/A

## Data collection and data disaggregation

This is an assessment of policy and action that is being taken by the municipality and its partners to address reduction in GHG emissions. These could be actual GHG emission calculations or practical initiatives or clear policy guidelines and GHG reduction targets, etc.

An initial roundtable discussion with key stakeholders would help to inform the scope of this assessment and agree possible metrics. The breadth of the assessment is important to agree. What are the policy priorities and where should the focus be? What are the main gaps in related data from other indicators?

Metrics could include, for example:

- Number (and types) of GHG-related policies and regulations
- Number of city partnerships formed to specifically address GHG emissions
- Number and type of GHG or climate change-related information, communication mechanisms and main target groups
- Number of food system GHG research studies
- Number of food system GHG emissions calculations
- Number of practical initiatives to support a low-carbon food system within local neighbourhoods, or start up support for new low carbon food enterprises
- Etc.

Follow up interviews may be needed with leaders of GHG reduction initiatives. It will be important to note level of involvement or support provided by the municipality in each case.

## Data analysis/calculation of the indicator

An analysis of exiting policy and action could be presented as a brief report or presentation, ideally with recommendations for addressing gaps in data and new development needs.

If there are useful quantifiable figures for GHG emissions or even GHG reductions for specific sectors within the food system, they should be included and help to inform recommendations.

## References and links to reports/tools

### Policy

#### Policy for sustainable development and food; the City of Malmö

[http://malmo.se/download/18.d8bc6b31373089f7d9800018573/Foodpolicy\\_Malmo.pdf](http://malmo.se/download/18.d8bc6b31373089f7d9800018573/Foodpolicy_Malmo.pdf)

#### Sustainable food procurement in the city of Malmö

Gunilla Andersson, Environment department City of Malmö, October 2010

[http://www.foodlinkscommunity.net/fileadmin/documents\\_organicresearch/foodlinks/publications/andersson-2012-malmoe.pdf](http://www.foodlinkscommunity.net/fileadmin/documents_organicresearch/foodlinks/publications/andersson-2012-malmoe.pdf)

## Tools for GHG calculations

There are many methodologies, most of which have their critics, and none of which is yet seen as the solution.

**Life Cycle Assessment (LCA):** Life cycle assessment determines the environmental impacts of products, processes or services, through production, usage, and disposal. It is a well-used approach in relation to measuring CO<sub>2</sub> emissions or climate change impacts, mainly by academics. It also tends to be very costly.

**‘Methodological guidelines for calculating climate change related indicators of urban/regional food production and consumption:** monitoring impacts of urban and peri-urban agriculture (UPA) and forestry on climate change mitigation and adaptation’. (Sukkel and Dubbeling, Nov 2014; RUAF Foundation)

This methodology provides measurement and quantification methods to design different urban/regional food production and consumption scenarios and to assess the hypothesis that increased urban and peri-urban agriculture and resource recycling will reduce the food (transport) related emissions, food kilometres and related energy use.

<http://www.ruaf.org/publications/guideline-3-methodological-guidelines-calculating-climate-change-related-indicators>

See further also: <http://www.ruaf.org/projects/monitoring-impacts-urban-agriculture-climate-change-adaptation-and-mitigation-cities>. This project implemented the following activities:

- **Design of a draft monitoring framework** with clear indicators and simple yet robust tools for the monitoring of the impacts of Urban and Peri-urban Agriculture and Forestry (UPAF) on climate change adaptation; mitigation and developmental benefits.
- **Field testing of the draft monitoring framework** in UPAF projects in 4 cities: Kesbewa (Sri Lanka), Rosario (Argentina), Kathmandu (Nepal) and Bobo Dioulassou (Burkina Faso) (field testing in the latter two cities was funded by the UN-HABITAT -Cities and Climate Change programme).
- In two cities (Kesbewa and Rosario): **the design of alternative scenarios for the development of urban food systems** in that city, and the calculation of expected impacts of each scenario (food-miles, emissions and energy use), as a basis for local decision making and planning.
- Facilitation of the **integration of UPAF as a component of the city and provincial climate change and urban development strategies** and securing adequate follow-up actions amongst others by training local researchers and local government staff on UPAF models, their inclusion in climate change programmes and the monitoring of their impacts.

For a report on Rosario. Calculations of GHG emissions comparing local versus more distant food production and various means of food transport:

<http://www.ruaf.org/sites/default/files/Consumo%20de%20combustible%20y%20emision%20de%20CO2%20comparando%20la%20produccion%20y%20transporte%20de%20vegetales%20hacia%20la%20ciudad%20de%20Rosario%20con%20una%20produccion%20local.pdf>

## Food flow analysis approaches

**City Region Food System Toolkit:** <http://www.fao.org/in-action/food-for-cities-programme/toolkit/introduction/en/>

## Last mile logistics

FAO is testing an approach on “the last mile logistics and related GHG emissions, for example using wholesale markets as entry point. Many wholesale markets have good data on products and buyers (and their businesses). In this case, one can calculate the average routes from wholesaler to retailers and their associated GHG.