

Urban food planning and city logistics for food products: *New solutions for the last food mile*

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At global level, the population is increasingly concentrating in the cities. In Europe, around 75% of the population lives in urban areas and it is foreseen to increase up to 80 % by 2020 (EEA, 2010). At the same time, the quality of life in the cities is declining due to limited access to available goods and resources and due to increasing urban pollution that includes worsening air quality, excess waste, noise, and lack of greenery (EEA, 2010). Cities are thus globally competing to make their urban areas attractive to live and to invest in, by assuring resources, services and goods to the communities.

Urban freight transport, otherwise defined as *city logistics*, plays a vital role in sustaining modern urban communities, but it is also recognized for its more unsustainable impacts, such as its negative effects on air quality and traffic (Quack, 2008; Dablanc, 2010). In fact road transportation, almost the sole mode of transportation for urban deliveries, is the most polluting mode per unit of distance traveled (Rodrigue et al., 2010). The small scale distribution of goods in an urban environment, identified as “last mile logistics”, is one of the most important yet problematic aspects of the supply chain, due to the high atomization of receivers and their increasing requirements (e.g. frequent deliveries, narrowed time-window). The result is a lack of efficiency on the urban freight movement, which has direct consequence in increasing air pollution.

Among the variety of goods distribution schemes, food logistics chain presents additional and specific constraints, especially for those goods that require cold chain technology. Other constraints, such as short lead time and distinct handling procedures, further affect the efficiency of the supply chain. These particular aspects, associated with a growing demand for food expressed by the urban population, prove that urban environmental sustainability is affected by the way the food is distributed, and food transport directly restricts urban food accessibility. It appears that linkages between *food* and *urban freight transportation* in modern communities become more and more relevant and articulated. Thus, this scenario entails an urgent need to promote new policies on urban freight transport and food distribution as part of “urban food planning” issues.

In order to achieve a more complete picture of the impacts of food circulation at the urban level, this contribution focuses on the “last food mile” mechanisms, defined as the physical distribution of food to urban food outlets during the last part of the supply chain and it suggests to identify specific policies to improve the supply chain efficiency by optimizing the food delivery systems at the urban level.

Urban food planning

The existing food supply system has recently incurred in critical disruptions such as food prices surge of 2007-08 and climate change effects, and the consequences of the global food crisis strongly affected – and still affect – consumers in city environments, where food access and food security have been seriously threaten.

This lead to focus on remodeling the food production and distribution systems, towards more sustainable food system including sustainable production and distribution issues, all along the food supply chain. In this scenario, cities appear as key actors leading the transition process (Morgan, 2009) addressing a variety of problems related to urban food provisioning and interconnected with health, transport, land use and local economic development.

The evolution of urban food strategies becomes object of growing interest by public authorities and the multifunctional character of the agri-food system is now viewed and valued in more strategic terms because it is deeply related with burgeoning public health costs, exploiting natural resources and influencing local economic development, for example (Morgan & Sonnino, 2010). Food systems are inextricably linked to other community systems, including transport, land use, and waste management, but these interconnections are still mistreated and organic data and information are missing. *Urban food planning* is a field of research that is now rapidly growing.

The main scope of food planners is to understand the role of cities as food policy actors and their real and potential impacts on the regional economy (see for example the Policy Guide on Community and Regional Food Planning, produced in 2007 by the American Planning (APA), and the Association the Association of European Schools of Planning (AESOP), which in 2009 decided to establish a new thematic group about Sustainable Food Planning). It deals with the development of integrated approaches to food policy and with the definition of analytical tools to assess opportunities and barriers of innovative food provisioning projects (Sonnino, 2010).

Among the variety of issues addressed by urban food strategies, one of the most controversial issues relates to the need of developing an urban food transport system on a social, economical, and environmental sound basis. Although the governmental interest as well as the research effort in the fields of food system sustainability and urban freight transport increased over the last years, there are only few experiments in practice which aims at making food transport in urban areas more sustainable.

In a growing number of cities as San Francisco, New York, London, policy makers are thus setting a variety of measures to better integrate food issues in the urban policy agenda, and, together with the community and supply chain actors, they are implementing innovative projects dealing with provisioning and distributing food. Most of these urban food strategies include significant connections with city logistics and freight transport issues, in order: (i) to reduce the air pollution; (ii) to contribute to the enhancement of food access and quality in urban environment; (iii) to improve the resources efficiency and cost effectiveness of the transportation of goods, taking into account the external costs.

In Europe, local policies on food planning are still isolated cases, addressing single issues as direct-sale from small producers or public procurement of sustainable food. In the Mediterranean area, it is worth to point out the case of Pisa, Italy, where an administrative body officially recognized in the urban planning agenda the significance of food to health, well-being and local economy. In 2011, the District of Pisa created a political space to discuss about food related issues, where the University of Pisa, the civil society, the producers, the retailers and other food system actors work together to the definition of the *Piano del cibo*.

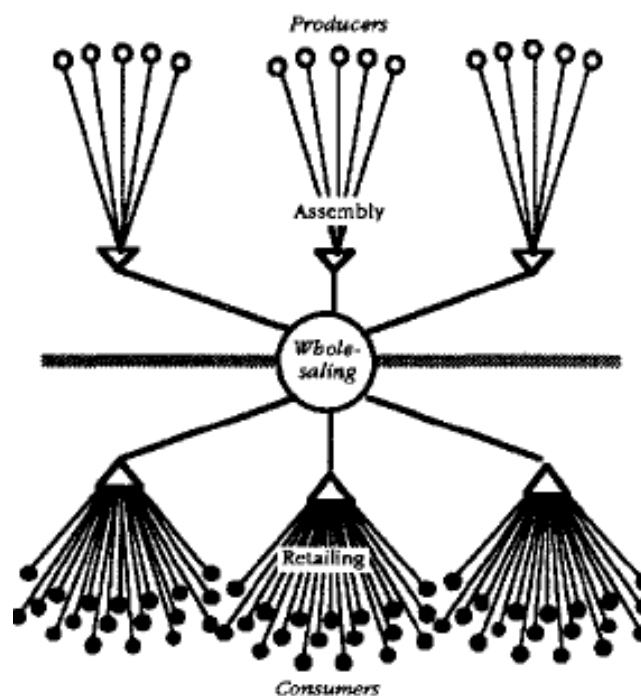
The challenge for municipal governments is to become food chain innovators by facilitating access to food by consumers and creating conditions to ensure investments needed to increase sustainable food supply at city level under hygienic, healthy and environmentally sound conditions (UN-FAO, 2010).

The urban food distribution system

The urban food supply chain is a complex system of activities, functions and relations where the actors influence in a mutual way their decisions, and where the local and regional infrastructure, facilities and laws determine the supply chain performance. Economic, social, legal, societal and nutritional factors weight on the decision process of urban players, modifying market conditions and price definition processes.

This is evident for the urban food transport system, which includes all formal and informal activities distributing food within an urban area: wholesale, intra-urban transport and retailing (formal-informal and traditional-modern retailing, restaurants, street food, etc.). The food flows coincide with the market routes between wholesalers and retailers, caterers and food businesses at city level, as showed in the simplified diagram Fig. 1. The representation illustrates the role of the wholesale trading system enabling farmers and suppliers to sell in small quantities and purchasing by traders and wholesalers to be made in bulk. Each linkage originates a set of transport operations within the urban area, in order to connect a wide range of players in the food chain (processors, importers, agents, distribution centers, etc.).

Figure 1
The urban food distribution process, simplified representation



Source: Tracey, 1994

The main players of the urban food supply can be grouped into three categories, according to the functions they play (Aragrande, 2001):

- *Wholesalers.* Produce and food products wholesale markets are commercial and logistic nodes in the food supply chain. The operators generally are producers, assemblers, importers, wholesalers, processors and service providers (credit, storage, information and extension);
- *Urban transport actors.* A variety of actors realize the last part of transport and delivery service in the urban area, connecting wholesale (or distribution center or processors site) to retail sectors. They are carriers, shippers, third party logistics providers, suppliers, producers, customers, i.e. food services owners and retailers ;
- *Retailers and food services.* There is a wide and complex range of food businesses in the urban environment, with different types of business, service, products. The receivers of food products and fruit and vegetables are traditional/modern distribution outlets, alternative markets and flea markets, restaurants, hotels, cafés, institutional and company cafeterias.

Despite this simplified representation, the food supply and distribution chains are very articulated, in fact there are some actors which play different role at different phases, i.e. the wholesaler who delivers the goods to the customer, or the shopkeeper who pick up the foodstuffs in his own. To better understand how the food transport systems works we present the Italian scenario, issue by the Ph.D. study in 2011¹.

The “Last Food Mile” in Italian cities

According to the our research, in Italian cities, the “last food mile” for independent retailers and food services is characterized by small scale distribution of goods. Shop keepers ask for high frequency and express deliveries of limited number of parcels, in a narrowed time-window. It emerged that food deliveries are usually informal logistics activities, most of them directly operated by food suppliers, producers and shop owners, with limited delivery consolidation measures. Moreover the fragmentation of the receivers represents a crucial issue, in fact food outlets are dispersed in the whole urban area.

In terms of transportation performance, this businesses atomization entails the use of a large number of commercial vehicles operating below their maximum carrying capacity, with high incidence of empty runs. Most urban food deliveries are operated by old diesel vehicles, e.g. small trucks and vans, which usually consume large quantities of fossil fuel, and also generates the release of higher quantities of pollutant emissions (CO₂, PM, VOCs and NO_x), compared to the gasoline engine vehicles of the same category.

¹ Urban food planning, city logistics and sustainability: the role of the wholesale produce market. The cases of Parma and Bologna food hubs (Morganti, 2011).

Consequently the existing inefficiencies in the selected food transportation systems strongly contribute to urban air pollution. Thus, fostering vehicles renovation as well as promoting urban freight consolidation measures are highly recommended at the local and regional level.

Concerning the consolidating measures, a successful solution seems to enhance the role of the existing wholesale produce markets by improving the logistics services and the delivery operations which are offered within this facility and by renewing the aggregation functions which have historically been part of it. In fact the wholesale produce market already plays a relevant role due to its specific skills in managing perishable goods flows. According to Morgan & Morley (2010) it is possible to relate and enlarge the role of the wholesale market to the *Food Hubs*, intended as (existing) supply chain intermediaries playing a new or renewed role in the urban food provisioning system.

Food hub organizational model focuses on including environmental and social criteria, associated to the sustainable food systems, to the market management procedures. Three core components characterized the Food Hub, such as:

1. Aggregation, distribution and wholesale;
2. Active coordination;
3. Permanent facilities together with additional logistics, marketing and communication services.

Example of Food Hubs can be found in the US (Regional Food Hub policy), in Italy (Parma Ecocity project) and in the UK where a growing number of wholesale market are fostering the logistics services provide to the supply chain operators and to the community.

Conclusion

Urban food provisioning and distribution are crucial issues in our modern civilization. The unprecedented pace of urbanization and its effects on cities sustainability make it urgent for local administration to develop urban policies oriented to redesign the food chain on the base of new types of social, economic and environmental relationships amongst food producers, retailers and consumers, within the *urban food planning* perspective.

In particular, the “last food mile” distribution scheme needs to be improved and supported by the public sector policies, in order to reduce the air pollution impact it generates at local level. The food transport system in urban environments presents inefficiencies and a lack of coordination. In fact the final delivery is the least efficient part of the supply chain due to the high atomization of receivers and to their increasing requirements by greater constraints in terms of service, as time schedule and number of deliveries.

Food hubs are an opportunity to enhance the urban food distribution system sustainability, fostering the consolidation and aggregation of food parcel deliveries to the food outlets in the urban area. By renewing the role of the local wholesale produce market through innovative logistic service, it is possible to offer an effective solution both in terms of sustainability, through reduced environmental impact and road traffic, as well as in terms of improved suppliers' competitiveness, by reducing costs and improve efficiency to reach the final users.

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