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Short Agri-Food Supply Chains: A proposal in a Food Bank

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Abstract. Many communities are interested in acquiring healthy food without pesticides and chemical preservatives. At the same time, they want to protect local production and cultural characteristics. In this sense, the academy starts to discuss a change in food supply chains and called of Short Agri-Food Chains. These networks have proven to be a reliable substitute for conventional supply chains creating empowerment from family farmers. The present study investigated the role of food banks' on the structural basis of short food supply chains. The results pointed out that food banks may be an important instrument for consolidating these supply chains contributing to the development of Family Farm and Small producer.

Keywords: Agri-Food Chains · Family Farm · Food Bank · Logistics

1 Introduction

Food supply chains suffer from a high number of wastes and losses between farm to fork. Around 30% of the food produced in the world is wasted or lost mainly due to the logistics process [1,2]. Therefore, the efficiency alongside supply chain management is fundamental as a source of social well-being, reduction of the use of natural resources, and to increase food access [3].

Contrary to the common belief the agri-food networks are lead by Family Farms [4,5,6,7,8] that are negatively affected by the global supply chains [4,9,10,11,2,12,13]. These supply chains usually raise the product price to consumers due to intermediaries' agents but reduce profitability to small producers.

On the other hand, studies point out a new paradigm of global consumption, where consumers have preferred healthy foods, produced locally, with their own cultural characteristics and guaranteeing social justice [4,9,10,11,2,12,13].

Currently, one alternative to this scenery is the Alternative Food Networks - AFN which is an option to the traditional agri-food system. The AFNs have as

characteristics the development of local initiatives, use of local input, and low production scale with a focus on quality, to the detriment of high productivity [14].

It is in this context that emerges the Short Food Supply Chain - SFSC concept. A model substitute for conventional supply chain where foods reflect the characteristics of "local", "natural", "healthy" and "reliable" [15].

According to [16] Short Agri-Food Chains, they are specific chains of agricultural products intended for human consumption. The authors reveal that these chains excel in proximity between producers and consumers. Far beyond the spatial aspect, but a connection that allows interactivity so that both know each other's purposes and needs

The aim of this study is to demonstrate the role of Food Bank as a catalyst for the model of Short Agri-Food Chains. To this end, we chose to conduct field research through a case study with the Itanhaém Food Banks, located on the southern coast of the state of São Paulo.

2 Background

2.1 Food Bank

Food Banks are intended to combat hunger and food insecurity [17]. They have physical structures that aim to capture, select and distribute free foodstuff that would be wasted throughout the production chain [18]. These entities may be public or private, under the management of civil society organizations of social interest, non-profit organizations [19].

The Food Bank originated in 1967 in the United States in Phoenix city, through the initiative of volunteers who requested donations of foodstuffs, which would be discarded by supermarkets and industry. Initially, the donations were intended to prepare meals for those in need. However, the volume of donations was exceeding the capacity to prepare meals, starting to be stored and distributed to philanthropic organizations [20].

In Brazil, the National System of Food and Nutrition Security aims to guarantee the Human Right to Adequate Food. For this purpose, the government articulates public policy at the three levels of government: federal, state, municipality, through different sectors and civil society, with a view to promoting Food and Nutrition Security and combating hunger. These actions are operationalized through public food and nutrition security equipment. Public Equipment is structures aimed at serving and supporting citizens in nutritional vulnerability [19].

The first movements of Food Bank in Brazil emerged from the initiative of the Social Trade Service - SESC, with the urban harvesting program in 1997. Later in 2000, the first Food Bank was inaugurated in the city of Rio de Janeiro [20].

Therefore, Food Banks are important arrangements for promoting food security in Brazilian municipalities, aiming to eradicate hunger.

2.2 Short Agri-Food Chains

Sustainable agri-food systems play a key role in combating malnutrition [21]. However, the Short Supply Chains have proved to be an option for traditional supply chains as well as an alternative to AF's sustainability. They can nullify two problems faced by farmers: the increase of the production cost; and the new global trend of consumption, with a strong call for healthy eating, based on sustainable production, aiming at food security [16].

Moreover, Short Supply Chains propose a direct relationship between the producer and consumer, reducing the number of intermediaries and the distance between the producer and the final consumer [14].

The small farmers are the main benefit of short supply chains, the obtaining of fairer recipes. The relationship between producer and consumer is the main characteristic of the SFSC, and, therefore, contribute to the economic development of the locations where they are inserted, besides providing the autonomy of producers [15].

2.3 Family Farm in Brazil

The legal definition of Family Agriculture is contained in Decree No. 9,064 [22]. In order to be framed as a family farmer, the producer must develop his practices in rural areas. What characterizes the family agriculture of the non-family is the fact that its management is shared between family members and agricultural production activities are the main source of income of the family [23].

Regarding the profile of Family Agriculture in Brazil, data from the Brazilian Institute of Geography and Statistics - IBGE [24] indicate that of the 5.07 million rural establishments located in 351.2 million hectares, The Family Farm accounts for 3.9 million establishments (77%), which together occupy a total area of 80.9 million hectares, i.e. 23% of the country's agricultural area.

3 Methods

To meet the objectives of this work, we opted for an exploratory and descriptive methodological approach. The study was developed in the municipality of Itanhaém (SP) through field research with the Association of Rural Producers of the Rio Branco Hydrographic Watershed, Artisanal Fishermen, Aquaculture and Indigenous Peoples of Itanhaém and Region - AMIBRA, composed of 52 family farmers and the Itanhaém Food Bank.

For data collection, a semi-structured questionnaire was applied in order to quantify the volume of food purchase, food type, main suppliers (farmers), logistics flow (receipt and distribution), recipients, related to the operations of 2018. The study population comprises family farmers from the AMIBRA farmers association and Itanhaém Food Bank. The collected data was compiled into an electronic database of the Microsoft Excel program®. From there it was possible to structure and understand a model of Short Agri-Food Chains.

4 Result and Discussion

The Itanhaém Food Bank is responsible for operationalizing Food and Nutrition Security - SAN programs in the municipality through the Food Acquisition Program - PAA. Created in 2007, the Itanhaém Food Bank is the result of the agreement between the Municipality of Itanhaém and the Federal Government.

In 2019, BRL 300,000.00 from the Ministry of Social Development was contributed, which ensured the socioeconomic inclusion of family farmers in the municipality, registered as suppliers of the Food Acquisition Program. Together the farmers provided more than 90 tonnes of food to the municipality's program, which were transferred to ten entities registered with the Municipal Social Assistance Council - CMAS (Fig. 1) including about 2,500 families.

PRODUCT	Social Assistance Entities										TOTAL (kg)
	1	2	3	4	5	6	7	8	9	10	
Zucchini Girl/organic	150.00	141.70	160.00	150.00	750.00	141.70	141.70	141.70	150.00	299.92	2,226.72
Hydroponic lettuce	500.00	480.00	550.00	500.00	2,400.00	500.00	600.00	600.00	480.00	793.84	7,403.84
Banana Silver	2,800.00	2,600.00	2,800.00	2,600.00	15,852.09	2,600.00	3,000.00	2,800.00	2,600.00	3,000.00	40,652.09
Sweet Potato	173.54	190.00	200.00	175.00	900.00	230.00	234.92	173.54	150.00	300.00	2,727.00
Zucchini	270.00	260.00	300.00	300.00	1,350.00	350.00	413.98	258.52	260.00	300.00	4,062.50
Cabbage	180.00	180.00	200.00	160.00	800.00	220.00	230.91	159.09	170.00	200.00	2,500.00
Organic Cabbage	400.00	360.00	450.00	360.00	1,800.00	450.00	500.00	450.00	360.00	478.96	5,608.96
Cassava Vacuum s/bark	580.00	600.00	600.00	600.00	3,330.89	650.00	700.00	650.00	580.00	800.00	9,090.89
Passion Fruit Azedo	310.00	350.00	320.00	310.00	1,650.00	450.00	458.60	309.81	310.00	400.00	4,868.41
Palmito Pupunha Peeled	200.00	200.00	200.00	200.00	1,000.00	250.00	401.10	194.44	200.00	210.00	3,055.54
Palmito Pupunha/organic	169.97	169.97	169.97	169.97	1,175.91	169.97	225.26	169.97	169.97	169.97	2,760.93
Fish	225.25	225.26	225.97	225.26	1,983.49	225.26	225.26	225.26	225.26	225.26	4,011.53
Tahitian Lemon	150.00	131.66	150.00	150.00	700.00	131.66	131.66	131.65	140.00	252.34	2,068.97
	6,108.76	5,888.59	6,325.94	5,900.23	33,692.38	6,368.59	7,263.39	6,263.98	5,795.23	7,430.29	91,037.38

Fig. 1: Entities benefited from the PAA in 2019. Source: Adapted Itanhaém Food Bank

As shown in Figure 1, about 95% of the food purchased was hortifrúti, especially banana (40 t), the most produced item due to the characteristics of the region. The remaining 5% was intended for the purchase of fish, offered by fishermen from Itanhaém city.

The income of the 52 farmers was around BRL 5,679.00 (1,750 kg/month) where the lowest income was BRL 2,000.00 (454 kg/month) and the highest, BRL 6,500.00 (2,600 kg/month).

Another source of acquisition is food from "urban collection". Products without commercial value, but that retain their nutritional characteristics, which are donated by local retailers to Itanhaém Food Bank. About two tons per month of hortifrúti food are received, selected, packaged, stored and subsequently destined for the "Capillarity Project" (Fig. 2).

The "Capillarity Project" serves people in a state of social and nutritional vulnerability, who are informally referred to Itanhaém Food Bank through the Social Care Reference Center - CRAS, Health Secretary (sick with diabetes, can-



Fig. 2: Capillarity Project. Source: Authors

cer, HIV) and other entities that are not registered by CMAS. Once routed, these families are registered in the project and become benefited from food baskets.

Given its logistical functional ability (reception, selection, storage, and distribution), the Food Bank can be presented as an important instrument for consolidating the Short Agri-Food Chains, contributing to the development of Family Farm and social rise of the small producer [9,16,15].

In the specific case of Itanhaém Food Bank, its logistics structure ensures the development of a model of Short Chains, as can be observed in Figure 3.

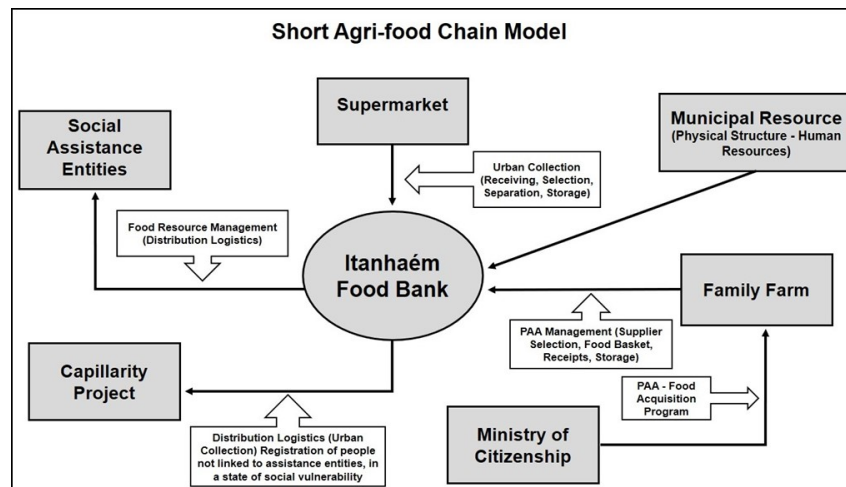


Fig. 3: Structure of a Short Agri-Food Chain. Source: Authors

The Short Chain model elaborated in Figure 3 presents Itanhaém Food Bank as the main articulator of the logistics activities of this chain. However, three activities gain greater prominence, supplier management, food acquisition, storage, and distribution. In addition, it accounts for dimensions of economic, environmental and social sustainability [25].

Two operations are performed in this model presented. In the management of the PAA, the Itanhaém Food Bank is responsible for defining food purchase items, considering the specificities of local agricultural culture, as well as the productive potential of farmers, in addition to the receipt, storage and shipment of food acquired for registered entities.

In the Operation Capillarity Project, Itanhaém Food Bank is responsible for maintaining the agreement with donor companies. In addition, it manages the logistics functions of the project such as receiving donated foods, selection, and separation of products, the composition of baskets, storage and distribution for registered families that are withdrawn from the bank itself.

5 Final Considerations

In order to present the Food Bank as a proposal of Short Agri-Food Chains, it can be concluded that the Itanhaém Food Bank in its attributions, develops the main activities that make up the premises of Short Agri-Food Chains.

In this model Itanhaém, the Bank is the only intermediate agent, allowing a direct connection between the field and the table, and therefore, fairer revenues for farmers. Moreover, institutional sale to the PAA is an opportunity for market diversification for Family Farm.

In view of this, the Food Banks can be a viable alternative for structuring Short Chains in small locations, ensuring the socio-economic empowerment of the small farmer, in addition to the economic development of the local community.

However, the limitations of this study were not to answer whether the model is feasible for chains that serve other markets. Considering that this model addressed (Fig. 3) is exclusively linked to government acquisition. The next studies could be based on Short Agri-Food Chains based on the structure of a Food Bank is feasible for other marketing channels.

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