



Fresh food systems in small island economies of the South Pacific

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Abstract

This study analyzes to what extent small islands in the South Pacific are integrated into global food systems; it shows which different fresh fruits and vegetables are sold, which retail formats are offering which specific assortments, and which supply chains are established. In the small island economies, distance, transport costs, and market volume are much more important than in larger countries of the Global South. Direct marketing for local products is dominating, fresh products which can be transported by using ship-freight-container with lower transport costs are broadly available and the supply with long-distance air-freight imports is very limited due to high transport costs. These products are only sold in areas with high-income households who can afford to buy them. In small and distant economies, the globalization of food systems finds its limits.

Zusammenfassung

Die Studie untersucht, inwieweit kleine Inseln im Südpazifik in globale Food-Systeme integriert sind. Aufgezeigt werden die verkauften frischen Früchte- und Gemüsesorten und das Sortiment in unterschiedlichen Einzelhandelsbetriebsformen. Zudem wird illustriert, welche verschiedenen Liefersysteme bestehen. Entfernung, Transportkosten und Marktvolumen weisen in kleinen Inseln noch einen wesentlich stärkeren Einfluss auf als in größeren Ländern des Globalen Südens. Es dominiert der Direktvertrieb von lokalen Produkten und importierte Frischprodukte, die kostengünstig per Schiffsfracht-Containern transportiert werden können, sind weit verfügbar, aber das Angebot von teuren Luftfracht-Importwaren ist beschränkt. Diese werden nur in den Gebieten mit Haushalten mit hohem Einkommen angeboten, die es sich leisten können, teure Produkte zu kaufen. Die Globalisierung von Food-Systemen findet ihre Grenzen in kleinen abgelegenen Ökonomien.

Keywords small island economies, food systems, assortments, retail formats, supply chains

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1. Introduction and general framework

Fresh food systems can be defined as the interrelation between agricultural production, distribution, retailing, and consumption. During the last decades, these food systems have faced rapid and fundamental changes. Until the end of the 20th century, spatial proximity between production and consumption played an important role due to the perishability of these agricultural products, especially for fresh fruits and vegetables. The classical Thünen-Model (Thünen 1826; Kulke 2017: 64 f.) describes the spatial distribution of agricultural production and identifies the importance of distance and transport costs for the cultivation of different products; therefore, the production of perishable high-value products is located close to the markets. New transportation and communication technologies have strongly reduced costs of transportation and transaction and induced changes in the spatial distribution of the production of these goods. Refrigerated containers and air-freight have opened the possibility to transport perishable products over long distances to consumers (Schmied 2018: 237 f.). New communication media like e-mail and the Internet have facilitated communication between the locations of production and consumption. These new conditions encouraged both, the development of cluster like structures specialized in certain agricultural products¹ (Dannenberg and Follmann 2023: 125), and the development of global commodity chains for agricultural products from the Global South to the Global North (Dannenberg 2020; Dannenberg and Kulke 2014; Tamasy and Revilla Diez 2013). Highlands of tropical countries near the equator have optimal climatic conditions for the year-round production of fruits, vegetables, and flowers. Some regions in Kenya, Ethiopia, Columbia, or Ecuador are the most important production areas of fruits and vegetables for the North American and European Market today. In addition, these developments have been supported by changes in consumer behavior (Ermann and Pütz 2020). Today, consumers in the Global North expect to be supplied with the whole assortment of fresh fruits and vegetables throughout the year, including wintertime, when fruits and vegetables can't be produced in the North.

Why now a study of the South Pacific islands in this context²? The Pacific islands are facing very specific challenges in the context of the globalization of agricultural production (Stringer and Le Heron 2008). Their climatic conditions of tropical lowlands allow year-round production of domestic fresh fruits and

vegetables (Goldberg 2018: 77 f.; Schmied 2018: 65 f.). However, the assortment is limited to specific fruits like bananas, mango, papaya, pineapple, avocado, melon, and pumpkin and vegetables such as breadfruit, taro, yams, tapioca or sweet potatoes and the diversification potentials are limited. An increase in income with new consumer preferences and the necessity for a more nutritious supply (according to the Sustainable Development Goals of the United Nations, e.g., SDG 3 "good health and well-being" or SDG 12 "responsible consumption and production") could generate the need for the import of other fresh fruits and vegetables. But the market volumes are limited, dependent on the small number of inhabitants, and distances to countries with diversified agricultural production, like New Zealand or Australia, are long, and transport costs are high, because of the few flight and ship connections. Under the conditions of transport distances, costs, and market volume, this study tries to give first answers to three questions: First, which fresh fruits and vegetables are sold; second, which retail formats offer which specific assortments of fresh fruits and vegetables; and third, which delivery systems and supply chains are established.

2. Methodological approach

The following results are based on empirical investigations in February and March 2023 on the islands Viti Levu (Fiji), Tongatapu (Tonga), Upolu (Samoa), and Efate (Vanuatu). These islands are the most populated of the four national states, are linked by international flight and ship connections, and are the locations of the national capitals, which are the largest urban areas of the respective states (Table 1). During the research visit, a mixed-methods approach was realized. It covers first photo documentation of the exterior and interior form of the retail units and their assortment, second a quantitative registration of all offered fresh fruits and vegetables (including prices and origin) in the visited retail formats (26 food stores and 30 food stalls/markets), and third, qualitative interviews with relevant actors (6 persons from the management of supermarkets, 30 persons running food-stalls, 4 experts). The photo documentation and the registration of the products allowed answering the questions about the available assortment (1) and the supply in different retail formats (2). The interviews gave insights into the supply chains (3) and made it possible to develop a typology of them.

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Table 1 Characteristics of the islands. Source: GDP per capita (PPP for 2020) (World Bank 2021), area and altitude (Goruma 2023), inhabitants (for middle 2022) (DSW 2022)

<p>Fiji: 11.450 US\$ GDP per capita (Island Viti Levu: 10.429 sqkm, altitude up to 1324 m, app. 580.000 inhabitants, in Suva more than 200.000 inhabitants)</p> <p>Tonga: 7.260 US\$ GDP per capita (Island Tongatapu: 260 sqkm, altitude up to 20 m, app. 74.000 inhabitants, in Nuku Alofa app. 36.000 inhabitants)</p> <p>Samoa: 6.300 US\$ GDP per capita (Island Upolu: 1.125 sqkm, altitude up to 1.113 m, 143.000 inhabitants, in Apia app. 37.000 inhabitants)</p> <p>Vanuatu: 3.220 US\$ GDP per capita (Island Efate: 899 sqkm, altitude up to 647 m, app. 66.000 inhabitants, in Port Vila app. 50.000 inhabitants)</p>
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3. Results

(1) Looking at the assortment of articles, a clear distinction can be made between three different types of products, which are mainly determined by distance and transport costs (Table 2). Type 1 consists of locally cultivated products, which are produced all over the islands and are available at reasonable prices. They are mainly sold at food stalls located directly next to agricultural production or at nearby markets, which both keep transport costs low. Type 2 consists of imported products that are more durable and can be transported by ship in refrigerator containers. Ship transportation is relatively inexpensive, so they can be sold at fair prices. Usually these products are coming from New Zealand and Australia. The prices at the four different islands and national states are very similar, which allows to calculate average prices for the most important container-import products (average prices per kilogram in € in all four islands): apple (3.65), orange (3.47), lemon (5.95), potato (2.08), onion (1.99), carrot (2.62), garlic (3.55), and cabbage (3.87). These products are sold in most supermarkets and are also partly found at food stalls in markets. Type 3 consists of products that can only be transported by air-freight due to their perishability. Most of these products are coming from New Zealand and Australia, with which direct flight connections are

available; in Fiji, with additional direct flights to California, some are coming from there.

This North-South supply chain between agricultural clusters in advanced economies and developing markets is quite often established during the supermarketization process in the Global South (Kulke and Suwala 2016). The products are very expensive because of the high costs of air transport (Hummels and Schaur 2010) (according to the interviews, up to \$3 US per kilogram). The average prices of some of the most popular products are in Fiji (prices per kilogram in €): grapes (9.35), nectarine (10.76), tomato (9.42), Paprika (10.48), and mushrooms (17.50). For sales of these products, a strong influence of the market size and especially of the share of households with higher income can be observed. This observation is consistent with the results of studies analyzing the spatial expansion of modern retail formats; at the beginning of the expansion process they are to be found only in high-income areas (Kulke and Suwala 2016; Sonntag and Kulke 2021). In Fiji, with almost approximately 580.000 inhabitants on the island of Viti Levu, and from them around 200.000 living in the capital Suva (with a modern economy of manufacturing and services), a sufficient number of inhabitants gains high incomes which allows them to purchase these products. In Tongatapu (Tonga), with a small population (approximately 74.000 people), a high share of subsistence agriculture, and no direct flights to New Zealand or Australia, these products are not available. On the island of Upolu (Samoa, approx. 143.000 inhabitants), and in the capital Port Vila of Vanuatu (approx. 50.000 inhabitants), only a few stores are offering these products, addressing mainly expats.

Table 2 Transport specific differentiation of fresh fruits and vegetables. Source: own elaboration

<p>Type 1 Local products: e.g. Banana, Mango, Papaya, Avocado, Melon, Pumpkin, Guava, Coconut, Eggplant; Yams, Manioc, Breadfruit, Taro, Sweet-Potato, Cucumber, Ginger, Paro, Uto, Korela, Paw Paw, Rou Rou</p> <p>Type 2 Ship-freight container imported products: Apple, Orange, Lemon; Potato, Onion, Garlic, Carrot, Cabbage</p> <p>Type 3 Air-freight imported products: e.g. Grapes, Peaches, Nectarine, Cherry, Kiwi, Berry, Plums; Paprika, Corn, Tomato, Asparagus, Salad, Mushrooms, Sugar-Beans, Broccoli, Cauliflower, Celery, Spices (Parsley, Thyme, Dill)</p>

(2) The assortment of fresh fruits and vegetable is very different in the retail formats (Table 3, Fig. 1). Food stalls in rural areas only sell those products, that are produced by the farmers running this business; the diversity of the assortment at the single stalls is very limited. Food stalls in markets in the towns are mainly offering a limited number of local products, sometimes supplemented by container import products. Most of the small self-service stores only have very limited supply of container import products; they are mainly offering an assortment of products, which complements the needs of the agricultural population with articles that they are not able to produce on their own (e.g. salt, sugar, oil, noodles, spices, shampoo, soap, detergents). In urban areas they sometimes sell local products too, but not in rural areas where these products are locally available. Local supermarkets are larger and mostly located in urban areas; their assortment of container import and local products is usually less than ten different sorts. The most diversified assortment of fresh fruits and vegetables is offered by internationalized supermarkets, which are only located in larger urban areas with high-income households. They provide local, container import and

expensive air-freight import goods with more than 30 different, and almost up to 100 sorts.

(3) According to the supply chains three major types can be identified (Fig. 2-4). In all countries, direct marketing of the farmers still plays a very important role (Fig. 2). This is especially true for local food stalls and market food stalls. Their supply is dominated by a specific form of an agricultural family business: Some members of the family are responsible for the agricultural production, one or two (in most cases women) are running the local food stalls or are transporting (sometimes by own vehicles, sometimes by public busses) the articles to markets and selling them there and some members contribute to the family income by non-agricultural jobs. Only in regions with larger distances between the areas of agricultural production and the urban markets (e.g. in Fiji), middlemen fulfill the function of intermediaries (Sonntag and Kulke 2021). In this case additional actors – the market traders – either get their products from middlemen or farmers; the relation to these suppliers is a very often established for longer time and based on mutual trust (Bernzen 2014).

Table 3 Size, assortment (no. of different fresh fruits and vegetables) and location of food-retailing formats. Source: own elaboration

	Size	Assortment (No. of articles)	Location
Local food stalls	small	few local products (<10)	main streets in rural areas
Market food stalls	small	local products partly supplemented with imported articles (3–20)	centers of towns
Self-service store	200–500 sqm	few container-import products (<5)	rural and urban areas
Local supermarket	400–1500 sqm	few local and imported articles (<10)	urban areas
Internationalized supermarket	800–4000 sqm	broad assortment of local and imported products	high-income urban areas



Fig. 1 Assortments in a local food stall in Tonga (1); in a market food stall in Samoa (2); in a self-service store in Samoa (3); in a local supermarket in Vanuatu (4); in an internationalized supermarket in Fiji (5). Photo credit: author 2023

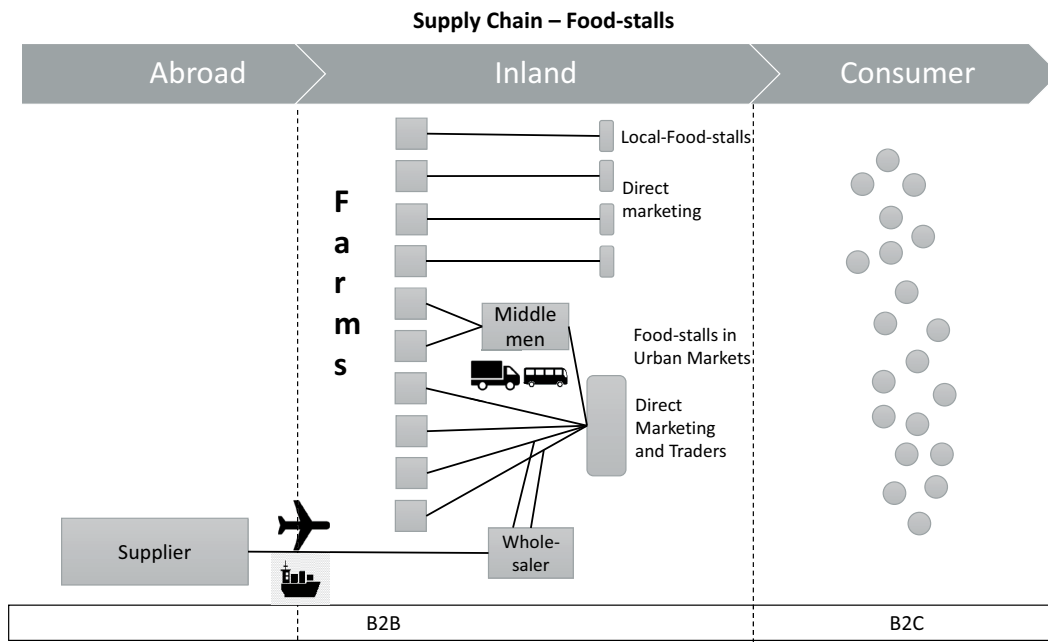


Fig. 2 Supply chain – food stalls. Source: own elaboratio

Self-service stores get their limited supply of fresh fruits and vegetables either from local farmers and middlemen or from wholesalers delivering mainly container imports (Fig. 3). The supply system of local supermarkets is quite similar; they get their limited assortment from farmers or wholesalers. Internationalized supermarkets are practicing a diversified delivery system (Fig. 4). They often have direct contacts with suppliers abroad for air-freight imports; container imports are coming directly from suppliers

abroad or from local wholesalers; and in most cases, the local products are delivered by farmers. Both, local supermarkets and internationalized supermarkets are sometimes practicing a symbiosis with local farmers and open them the possibility (by providing space next to the door of the store) to sell their products next to the store. With this strategy, they are broadening their assortment without the risk of costs for non-sold products.

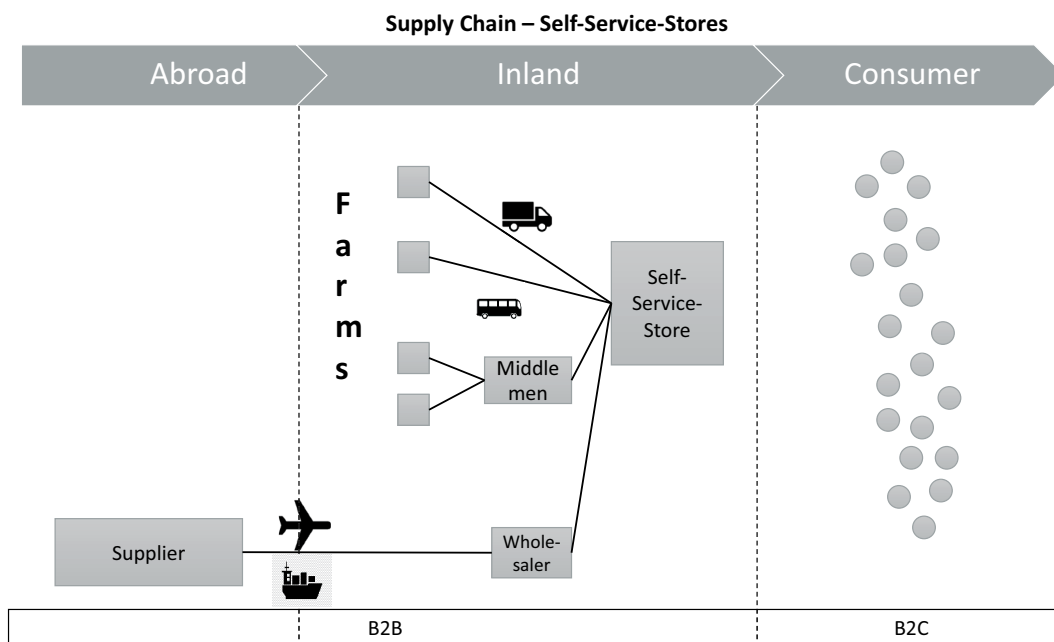


Fig 3 Supply chain – self-service stores. Source: own elaboration

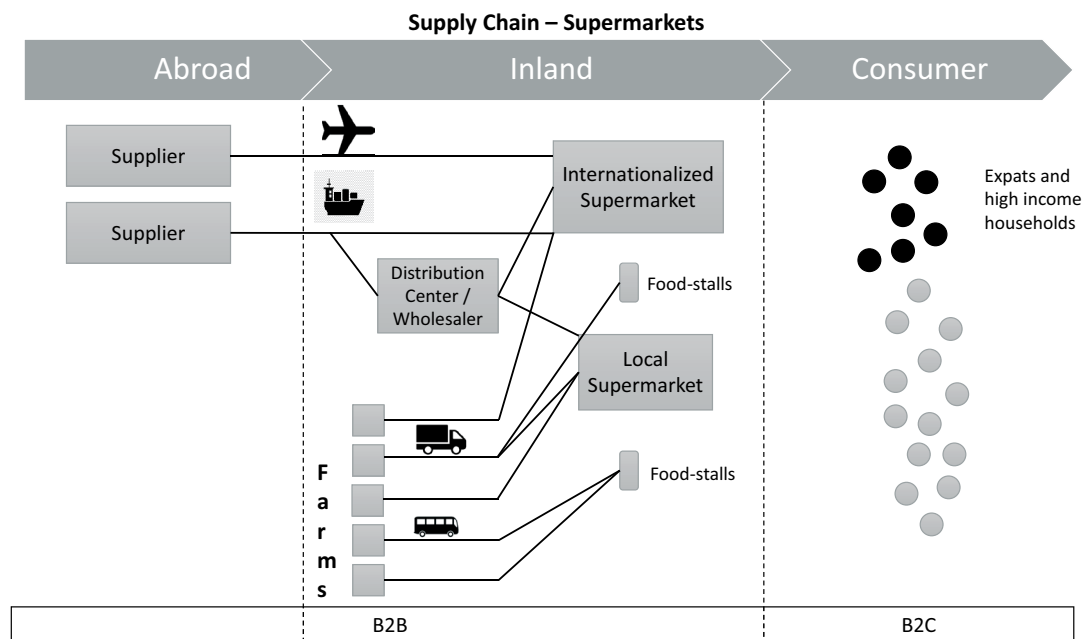


Fig 4 Supply chain – supermarkets. Source: own elaboration

4. Conclusion

Distance, transport costs, and market volume have a much larger importance in the small island economies than in larger countries of the Global South. Because of the short distances between local agricultural production and consumers, direct marketing is still dominating, while the role of middlemen is limited; this is very different in larger countries (Sonntag and Kulke 2021). Long-distance container imports with lower transport costs are broadly available and are in most cases distributed by wholesalers. The supply of long-distance air-freight imports is very limited due to high transport costs and the few high-income households who can afford to buy them. Corresponding to this, internationalized supermarkets can only be found in urban agglomerations with a sufficient number of people with high incomes. These results show that the globalization of food systems finds its limits in small and distant economies.

Notes

- ¹ Like the apple production in the “Altes Land” in Germany or the tomato-production in Almeria in Spain.
- ² This case study is part of a larger research project on the development of fresh food systems in countries of the Global South under different context conditions.

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