**"Can Producers' Share in the End Price Paid by Consumers be enhanced? Review of Orange Export SCM**

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**Abstract:**

*Orange growing Farmers often face challenges in getting their produce to market and getting a fair price for their produce. The supply chain of orange export is a complex and fragmented. The emergence of better supply chain practices can benefit orange exporters to overcome some of these challenges and improve the share of the end price that farmers receive. The critical challenges faced by the orange farmers are lower prices due to higher productions and lower demand, lack of bargaining power of orange farmers and at the same exporting oranges is costlier. Further the lack of infrastructure to support the export is main concern. The emergence of better supply chain practices can help benefit orange exporters to overcome some of the challenges which are: vertical integration, contract farming, sharing of information and use of latest and modern technologies for quality control and logistics. The future of the orange export using a proper supply chain is bright. With the continued development of better supply chain practices, farmers can expect to receive a fairer share of the end price paid by consumers. The orange export supply chain can be further developed by using new technologies, developing new markets as well as developing newer technologies for packaging and transportation to reduce cost and improvement in quality.*

**Key words**: Supply chain practices, vertical integration, contract farming, new agricultural technologies and new packaging technologies.

**1. Introduction:**

Oranges can be considered a most important agronomic commodity that is grown-up and happily consumed all over the world. In current centuries, there has been a rising interest in the exportation of oranges, as demand for this fruit has amplified in developed nations. However, the farmers of oranges in developing countries like India is frequently having a very small share of the end price paid by consumers. This is due to the number of different factors, including the high cost of farming, the low bargaining power of farmers, and the inefficiencies in the supply chain linked to the fruit orange.

The orange export supply chain is a complex and fragmented system. Orange growing Farmers often face challenges in getting their produce to the international market and getting a fair price for their produce. The emergence of better supply chain practices can benefit orange exporters to overcome some of these challenges and improve the share of the end price that farmers receive.

This paper reviews the various different literatures on orange exports and supply chain management (SCM) with a focus on enhancing the farmers' share in the end price paid by end customers. The paper commences by conferring the challenges faced by the orange producers in the developing countries. It then analyses the numerous different supply chain management practices linked in the region of Vidarbha where oranges are primarily grown and has a huge economic value. It should also be taken into consideration that the oranges from this region are hugely popular and has gained a **Geographical Indication (GI) Tag** over time. The best SCM Practices that can be used to progress the effectiveness and transparency of the orange exports supply chain in the region. The benefit of this is the world will be able to taste a better and fresher orange from the region and also the better fresh fruits would be able to gain a large increase in the economic values due to inflow of forex. Finally, the paper deliberates the part of Supply chain in supporting the development of sustainable orange exports for the farmers of the developing country.

**1.1 Supply Chain Management (SCM) Practices to Improve Producers' Share :**

Several SCM practices can be implemented to enhance the efficacy and transparency of the orange export supply chain, thereby increasing the producers' share.

These practices include:

* **Information sharing:** Sharing information between all the performers in the supply chain can help to improve coordination and reduce costs.
* **Traceability:** Traceability systems can help to ensure that the oranges are traced from the farm to the consumer, which can help to build trust and improve the bargaining power of producers.
* **Collaboration:** Collaboration between all the actors in the supply chain can help to identify and address common challenges and opportunities.
* **Sustainable practices:** Sustainable practices, such as water conservation and the use of organic fertilizers, can help to reduce costs and improve the quality of the oranges.

**1.2 Government Policies to Support Sustainable Orange Export Supply Chains**

Governments can play a role in supporting the development of sustainable orange export supply chains by:

* **Providing financial assistance:** Governments can provide financial assistance to producers to help them to adopt sustainable practices and improve their efficiency.
* **Regulating the market:** Governments can regulate the market to ensure that producers receive a fair price for their oranges.
* **Promoting research and development:** Governments can foster advancements in technology and supply chain management practices to enhance the efficacy & sustainability of the orange export supply chain, thereby increasing the overall share of profits received by orange growers.

The orange export supply chain is an intricate and demanding network. Several SCM strategies & government policies can be implemented to enhance its efficacy, transparency, and producer share. By adopting these measures, it is achievable to guarantee that orange producers in developing nations receive a just price for their oranges and that the orange export supply chain becomes more sustainable.

**1.3 Introduction to Nagpur Mandarin Oranges:**

The Vidarbha region of Maharashtra, India, is renowned for its cultivation of mandarin oranges, commonly known as Nagpur oranges. These sweet and juicy fruits have gained immense popularity not only within India but also across the globe, captivating the taste buds of consumers worldwide. Their distinctive flavor and aroma, attributed to the unique soil and agroclimatic conditions of the region, have established them as a prized delicacy.

**1.3.1 Nutritional Powerhouse**

Mandarin oranges (**Citrus reticulata)** is a rich source of vital vitamins & minerals, including vitamin C, A, B, and phosphorus. Vitamin C, a potent antioxidant, plays a crucial role in boosting immunity, promoting collagen synthesis, and enhancing iron absorption. Vitamin A contributes to healthy vision, while vitamin B complex aids in energy production and cell metabolism. Phosphorus, on the other hand, is essential for bone health and muscle function.

**1.3.2 Culinary Versatility**

Mandarin oranges are incredibly versatile, consumed fresh or in the form of juice, syrup, jam, and marmalade. Their refreshing tartness and sweetness make them a popular ingredient in salads, desserts, and beverages. Mandarin orange peel, a valuable byproduct, is used to extract essential oil and citric acid, both of which have wide-ranging applications in the food, pharmaceutical, and cosmetic industries.

**1.3.3 Historical Significance**

The cultivation of mandarin oranges in Vidarbha dates back centuries, with historical records indicating their presence in the region as early as the 19th century. Over time, the Nagpur orange has emerged as a symbol of the region's agricultural heritage and a significant contributor to its happiness and prosperity.

**1.3.4 Economic Impact**

The citrus industry in the Vidarbha region generates substantial revenue, contributing to the overall economic growth and prosperity of the area. Mandarin orange cultivation provides employment opportunities for numerous individuals involved in its planting, harvesting, processing, packaging, and transportation.

**1.3.5 Environmental Benefits**

**Cultivation of mandarin oranges plays a crucial role in preserving ecological balance.** Citrus trees aid in soil conservation by preventing erosion and replenishing the soil with nutrients. Additionally, they function as natural air purifiers by absorbing carbon dioxide & liberating oxygen.

**1.3.6 Sustainable Practices**

Mandarin orange farmers in Vidarbha are embracing eco-friendly agricultural practices to reduce their environmental footprint & safeguard the long-term sustainability of mandarin orange cultivation. These practices encompass integrated pest management strategies, water-saving techniques, and organic fertilization methods.

**2. Objective:**

1. To identify the simplest distribution channel for international trade of Orange export.
2. To identify the challenges of the orange growers to deal with the international trade.
3. To explore the best possible suggestions to the problems of the orange exporting farmers.

**3. Literature Review:**

**3.1 (Hazem S. Kassem, 2021)** investigated the factors influencing smallholder orange farmers in Taiba, Al-Bustan, and West Nubaria.to comply with GlobalGAP standards. GLOBALGAP is a collection of globally recognized standards for farming practices that promote food safety, quality, and sustainability.

The study used a survey to collect data from 249 smallholder orange farmers in the region. The survey results were analyzed using factor analysis to identify the key factors influencing compliance with GlobalGAP standards.Personal and economic factors factors included the farmer's age, education level, experience, and financial resources.Awareness and information factors included the farmer's knowledge of GlobalGAP standards, access to information about the standards, and the availability of training programs.Institutional support factors factors included the government's support for GlobalGAP, the availability of financial assistance, and the presence of extension services.Infrastructure factors factors included the availability of water, electricity, and roads.The study found that the most important factor influencing compliance with GlobalGAP standards was institutional support factors. The study highlights the crucial role of government agencies and other stakeholders in fostering the implementation of GlobalGAP standards among smallholder farmers. Furthermore, the research revealed that individual and financial factors, awareness and knowledge factors, and infrastructure features also significantly impacted compliance with GlobalGAP standards. These findings underscore the need for a holistic approach to promote the implementation of GlobalGAP standards by smallholder farmers.

**3.2 Marcos Fava Neves (2013)** observed decline of orange juice consumed in the worldwide marketplaces. The most significant drop among 10 largest consumers was seen in Japan. Although an overall decline was noticed in it increase in emerging markets were noticed. The flavor of fresh Oranges opinions out as the maximum extensively used up product amongst the fruit-based drinks prepared for drinking.

**3.3** The study by **(Noche, 2022)** presents a comprehensive investigation into the utilization of system dynamics modeling as a strategic tool for enhancing the sustainability of the orange supply chain in Jordan. With a focus on reducing pre-harvest loss, increasing the number of workers, and improving farmer profits, this research serves as a significant contribution to the evolving field of sustainable supply chain management. System dynamics modeling serves as the central methodology in this research, offering a dynamic and holistic perspective of the complex interactions within the orange supply chain. The model encompasses various critical components, including orange trees, workers, harvesters, packinghouses, retailers, and consumers. By integrating these elements, the study conducts a series of simulations to evaluate diverse scenarios, ultimately unveiling pivotal factors for enhancing the supply chain's sustainability.

**3.4** The research paper by **(Garnevska, 2018)** offers a comprehensive examination of the citrus value chain in Pakistan. **This paper examines the key findings and contributions of the study, focusing on the construction of the value chain, the actors involved, the flows of goods and information, and the challenges and opportunities facing the industry. Siddique and Garnevska's study investigates the intricate structure of citrus value chain in Pakistan. The value chain encompasses various actors engaged in the production, distribution, and marketing of citrus fruits. These actors include citrus cultivators, pre-harvest contractors, exporters, commission agents, traders, and retailers. The involvement of such a diverse range of participants underscores the complexity of the citrus value chain, and the paper serves as a valuable resource for comprehending its multifaceted nature.**

**3.5 (Roy, 2022)** the significant study was backed up by NABARD and INSPIRE (institute of pioneering insightful research and edutech pvt. ltd). The authorin the research paper provides a comprehensive understanding of India's agriculture and food exports, outlining the opportunities and challenges that the nation faces. The findings offer valuable insights for policymakers, researchers, and stakeholders, guiding the development of strategies and policies aimed at further promoting India's agricultural and food exports on the global stage. In a dynamic and competitive global market, addressing the challenges and capitalizing on opportunities is paramount for India's agricultural success. Investing in research and development is essential to enhance agricultural practices, product quality, and value-added processing. Negotiating favorable trade agreements can create opportunities for Indian exports and remove trade barriers. Promoting the branding of Indian agricultural products can differentiate them in international markets, fostering trust and recognition.

**3.6 (Andi Putrianisa Nurfadilah, 2017) in her paper begins by** discussing the production of pomelo orange. The pomelo orange supply chain involves numerous actors, each playing a crucial role in bringing this citrus fruit to consumers. Pomelo orange cultivation falls under the responsibility of farmers, who nurture the trees and ensure their optimal growth. Collectors gather the mature pomelo oranges from the farmers' fields, initiating the journey towards the marketplace. Packers meticulously package the pomelo oranges for transportation, ensuring their protection during transit. Transporters, the backbone of the supply chain, efficiently convey the pomelo oranges to designated markets. Wholesalers, the intermediaries between producers and retailers, purchase the pomelo oranges in bulk and distribute them to retailers for sale to consumers. Retailers serve as the final link in the supply chain, making the pomelo oranges readily accessible to the end consumers. However, the pomelo orange supply chain faces several challenges that hinder its smooth operation. The lack of adequate roads and transportation infrastructure poses a significant obstacle, making it difficult to transport the pomelo oranges from farms to markets, particularly in regions like Java. The absence of proper cold storage facilities along the supply chain limits the preservation of the pomelo oranges' freshness, potentially leading to spoilage and loss of value. Furthermore, a lack of coordination among the various actors involved in the supply chain can result in inefficiencies, delays, and unnecessary losses. Addressing these challenges is crucial to ensuring a robust and sustainable pomelo orange supply chain that delivers high-quality pomelo oranges to consumers.

**4. Theoretical Foundation and Ideation Development**

**4.1 Distribution Channels of oranges from Farmer to Buyer in International trade**

**Information:**

More Dominant Distribution Channel

Less Dominant Distribution Channel

**FARMER OF ORANGES**

TRADER / EXPORTER

**IMPORTER**

TRADITIONAL MARKET

TRADER

Figure 1**Distribution Channels of oranges from Farmer to Buyer in International trade**

**Efficient distribution channels are crucial for effective supply chain management in orange exports, and can enhance farmers' share of revenue.**

As we can observe, the farmer who produced the oranges due to lack of knowledge doesn’t have direct contact with the importer in the international market. It goes from channel to channel, and the distribution channel consist of various different traders settled at the different stages of the distribution channel. The process of distribution channels consist of various different steps before it reaches the importer in the international market.

Distribution of the proper channel where the farmer produces the goods and hands them over directly to the importer. Should be the most considerable channel . But, the fact is that this crucial flow of distribution channel which cuts of the middle person reducing the supply chain management cost is a less dominant distribution channel.

In this structure, it lessens the burden on the farmer. Once the goods are produced, a fair amount is given to the farmer. In the next distribution, the duty of the local traders’ is to supply the goods carefully to the regional traders and further to the big market traders, as well as to the exporter areas.

In the above-mentioned structure, where we see farmers directly contacting the exporter’s areas as well as the big market, this opportunity provides a fair as well as a high price for the goods. It also comes with the backdrop that the farmer must have proper transportation facilities. A farmer needs to have a well-maintained vehicle and a driver partner. With proper navigation information, add a firm contract with the export companies as well. As well as a fixed marketplace where only locally produced goods are allowed to be sold.

**5. Challenges faced by the different Orange producing farmers in developing countries:**

The producers of oranges in developing countries face a number of challenges, including:

* **High charge of production:** The charge of production of oranges is high in developing countries due to aspects such as low harvests, inept use of inputs, and high labor prices.
* **Low negotiating power:** Orange farmers in developing nations face limited bargaining power due to their small-scale operations and the lack of diverse market options.
* **Inefficiencies in the supply chain:** The orange SCM frequently suffers from inefficiencies, leading to excessive transportation expenses, product spoilage, and financial losses.
* **Lack of infrastructure:** Farmers often lack access to the infrastructure they need to export their oranges, such as cold storage facilities and transportation.
* **Lack of Information about the new or unexplored Global Market and rise in global demand for Oranges:** the producers are having inadequate knowledge wherein they can directly sell their quality farm produced oranges in global markets at a higher price available in the International Market.

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Figure 2Nagpur Oranges turns Sour. | Source : https://timesofindia.indiatimes.com/city/nagpur/nagpur-orange-turns-sour-for-bangladesh-traders/articleshowprint/87724204.cms

Beyond the factors mentioned earlier, other potential influences on smallholder farmers' adherence to food safety standards include:

* Market competition intensity
* Consumer demand for high-quality, safe food products
* Accessibility of organic and sustainable farming methods
* Farmers' openness to adopting new technologies
* The relative significance of these factors may vary depending on the specific context. Further research is necessary to gain a deeper understanding of the elements influencing smallholder farmers' compliance with food safety standards in various settings.

**6. Implication &Limitations:**

**6.1 How the emergence of better supply chain practices can benefit orange exporters?**

The emergence of better supply chain practices can help benefit orange exporters to overcome some of the challenges that Orange growing farmers face. These practices include:

* **Vertical integration:** Vertical integration can occur when the Farmer tries to controls all or most of the stages in the supply chain, from production to distribution. This can help to improve efficiency and reduce costs. Here the process can be followed by the means of a single farmer or a group of farmers forming an FPO (Farmer produce organization e.g AMUL milk Corporative)
* **Contract farming:** Contract farming offers farmers a secure market for their produce, allowing them to plan ahead and invest in their operations more effectively. This can be particularly beneficial for orange growers, who often face fluctuating market prices. In cases where buyers refuse to purchase the agreed-upon amount of produce, governmental support policies should be in place to protect farmers from financial losses. These policies could include subsidies, price guarantees, or alternative market opportunities. By providing such support, governments can foster a sense of security among farmers and encourage them to continue producing essential crops like oranges.
* **Information sharing:** Open and transparent communication between various participants in the supply chain can enhance efficiency and minimize costs. (e.g: MarketMirchi is a nice platform which is free of cost service and is developed by the students of IIT Bombay to provide a better market place where in buyers across the globes can contact the Indian Farmers freely)
* **Technology:** The use of technology can help to improve traceability (tracking facility), quality control, and logistics. New modern Era sciences has progress in the manner where the real time shelf-life monitoring of the natural vegetables and fruits’ can be determined with the help of sensors. And the use of such sensors can widely promote the traceability of the oranges to their maximum. (Roque Torres-Sánchez, 2020).
* **Search of New Market Places:** New Market places should be searched, re-searched & explored from time to time working on the demand factor across the globe. Where in the the farmers will have the better opportunities and the better bargaining power.

**6.2 Limitation:**

The above discussed study is suggested different factors and the current scenario of limited to the region and areas of Vidarbha from Maharashtra in India which is the house for premium mandarin Oranges known across India.

**7. Conclusion :**

The Crop of mandarin oranges that come from the region of Vidarbha has huge potential can be exported to a large extent across the world where in if better market alternatives are found and the farmers are provided with the proper knowledge of the potential of their crop along with supporting infrastructure.

The following are some of the ways in which the orange export supply chain can be further developed:

* The use of new technology can help to improve traceability and transparency in the supply chain.
* The development of new markets for oranges can help to increase demand and improve prices.
* The development of new technologies for packaging and transportation can help to reduce costs and improve the quality of oranges.

The future of the orange export using a proper supply chain is bright. With the continued development of better supply chain practices, farmers can expect to receive a fairer share of the end price paid by consumers.

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