

## Marketing System of Mangoes in India

Sarada Gopalakrishnan

Institute of Technology and Management, Chennai, Tamil Nadu, India

**Abstract:** Mangoes account for approximately half of all tropical fruits produced worldwide. India is the largest mango producer, accounting for about half of the global mango production. But, less than five per cent of the produced mangoes are processed and mango pulp is the main export product both in terms of volume and value. Contract system is the major marketing system in the supply of mangoes because (1) Producers usually avoid the marketing of fruit by themselves as they do not want to be involved in the complication of the marketing system, (2) They do not want to take risk of price and income variation due to perishability, qualities and seasonality and (3) Lack of knowledge of marketing. This paper attempts to study about the type of marketing systems existing at present in India and suggestions to realise higher value for the produce.

**Key words:** Mango • Production • Consumption • Marketing Channels in India

### INTRODUCTION

*“A luscious taste and aroma from India arrives at last!”* [1]. Indian mangoes made headlines when the first legal shipment of Indian mangoes to the US in decades landed at Kennedy Airport, probably the most eagerly anticipated fruit delivery ever. India is the largest producer and consumer of mangoes and Indian mangoes are known for their taste and aroma throughout the world. In several cultures, the fruit and leaves are ritually used as floral decorations at weddings, public celebrations and religious ceremonies. Mango motifs and paisleys are widely used in different Indian embroidery styles and are found in Kashmiri shawls, Kanchipuram silk sarees etc. Moreover, mango is a rich source of prebiotic dietary fibre, Vitamin C constituting 36 mg (43%), Folate (Vitamin B9) constituting 43 µg (11%), Vitamin B6 with 0.12 mg (9%), Vitamin A with 54 µg (7%) as per the USDA Nutrient database. The energy value per 100 g (3.50 oz) is 250 KJ (60 Kcal). The mango is an effective inhibitor in Laboratory models of prostate and skin cancers. In the IT world Windows phone 7.5 is code named “mango”. Mangoes in the name of cricketers, actresses and politicians are also doing rounds.

**Objectives:** The main objectives of the study are:

- To analyse the production and consumption of mango in India and in the world.

- To analyse different marketing channels in the supply of mango in India.
- To identify constraints and difficulties faced in marketing system of mangoes.
- To suggest some measures in improving the existing marketing system of mangoes.

Secondary data on area, production and productivity of mangoes over the years from various sources have been collected. Averages, percentages and trend analysis have been applied wherever necessary.

**Mango Production Scenario in India:** During 2010-11 India had an area of 2.4 million ha under mango with a production of 16 million tonnes [2] and productivity of 6.71 t/ha. The important mango producing states are Andhra Pradesh, Uttar Pradesh, Karnataka, Bihar, Gujarat, Maharashtra, Tamil Nadu, West Bengal, Kerala and Orissa. Some of the popular varieties are Neelum, Bangalora, Alphonso, Rumani, Banganapalli, Kalepad, Peter, Sendhura, Jahangir, Mulgoa, Himayuddin, Mallika, Amrapali, Salem, Sindhu, Dashehari, Langra, Fajli and Totapuri.

The commercial varieties grown in India are as follows [3]:

**North India:** Dashehari, Langra, S.B. Chausa, Lucknow Safeda, Ratol Gaurjeet, Bombay Green and Khasul Khas.

**South India:** Neelum, Banglora, Mulgoa, Suvaranarekha, Banganapalli, Rumani, Rasपुरi and Badami.

**East India:** Malda, Fazli, Himsagar, Kishenbhog, Gulabkhas and Jardalu.

**West India:** Alphonso, Pairi, Malkurad, Kesar, Rajapuri and Jamadar.

India is the largest mango producer, accounting for about 50% of the global mango production. From the Table 1, it can be noted that in 2010-11, total mango production in India was more than 16 million tonnes. Most of the mangoes produced in India are consumed domestically and less than 5% of the produced mangoes are processed and mango pulp is the main export product both in terms of volume and value. It accounts for about 20% of the processed fruits and vegetables exported from India [4]. The export of fruits and vegetables from India amounted to 50 US \$ billion in 1990 and to 70 US \$ billion in 2000 and in 2009 it was more than 160 US \$ billion.

Fig. 1 shows the area and production of mangoes in India over the years. From the graph, it can be inferred that, after 1999-2000, there has been a slight increase in the area. Though production has increased to some extent, there was a dip production in 2008-09. Moreover, overall productivity has been in a decreasing trend in India (Fig. 2). It could also be noted that mango production as percent share of the total fruits is continuously declining (Table 1).

**Mango Production Scenario in the World:** Mangoes account for approximately half of all tropical fruits produced worldwide. The aggregate production of the top 10 countries is responsible for roughly 80% of worldwide production. India tops the list of countries producing mango in terms of area and production and in terms of value (Fig. 3). But in terms of export by per unit value, India is far behind France, China, EU and other countries (Fig. 4). Major mango importing countries from India are UAE, Bangladesh, UK, South America, Kuwait, Qatar,

Bahrain, Nepal, USA, Oman, Singapore etc. and the foreign exchange earned from such exports amounts to about Rs: 2005 millions in 2009-10.

Large markets for fresh produce are the EU, North-America and Asia. Literature shows that India has more than 1000 to 6000 mango varieties growing, but productivity here is low when compared with countries like Brazil, Indonesia, Pakistan, Mexico, Bangladesh and China. The average world yield of mango is 25 t/ha [5] when compared with India's average yield of 6 t/ha. The national average productivity is as low as 5.5 t/ha while Uttar Pradesh which tops the list produces more than 12 t/ha in 2009 [6]. There is a potential to increase mango exports to many countries, with strong demand for mango products in the Middle East and Europe.

### Marketing System in the Supply of Mango

**Traditional Mango Fruit Marketing Channel:** The traditional mango fruit marketing channel is shown in Fig. 5. The number of players in the marketing channel is more and the mango grower's share in consumer's rupee is less in India. In case of mango, because of its perishability and seasonality, mango growers do not want to take the risk of marketing and so contract marketing system is popular prevalently.

**Contract Marketing System:** "Contract farming can be defined as an agreement between farmers and processing and/or marketing firms for the production and supply of agricultural products under forward agreements, frequently at predetermined prices. The arrangement also invariably involves the purchaser in providing a degree of production support through, for example, the supply of inputs and the provision of technical advice. The basis of such arrangements is a commitment on the part of the farmer to provide a specific commodity in quantities and at quality standards determined by the purchaser and a commitment on the part of the company to support the farmer's production and to purchase the commodity" [7].

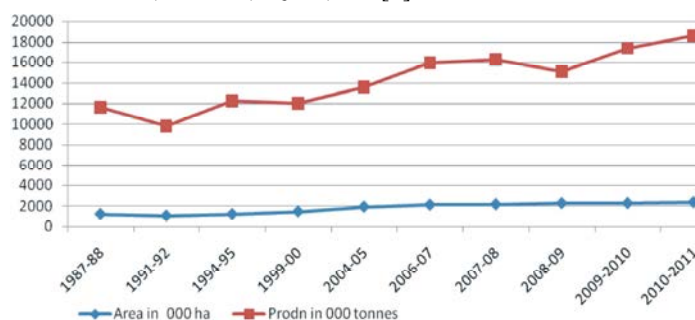


Fig. 1: Area and Production of mangoes in India over the years

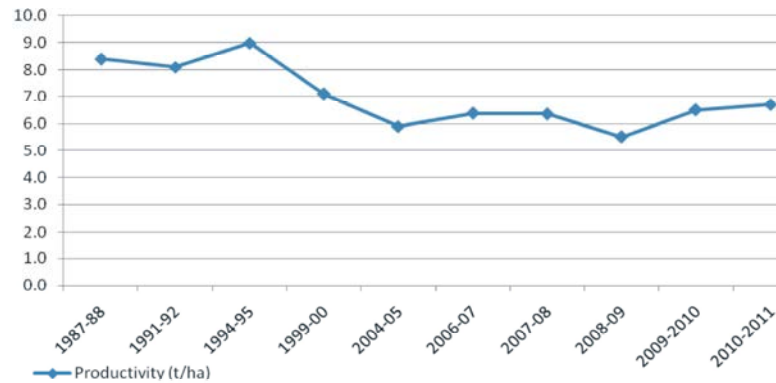


Fig. 2: Mango productivity in India over the years

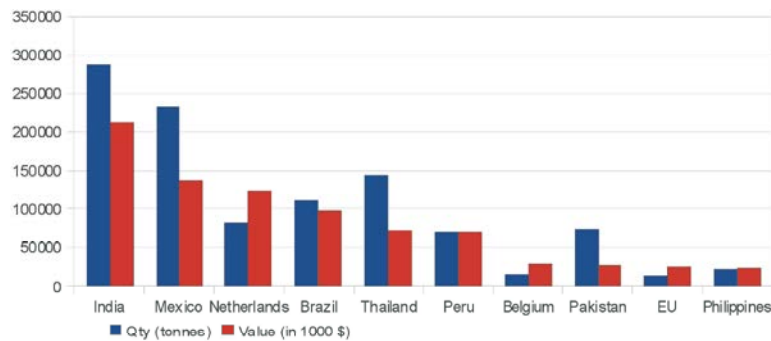


Fig. 3: Top Exporting Countries - Mango, mangosteen and Guavas - 2009

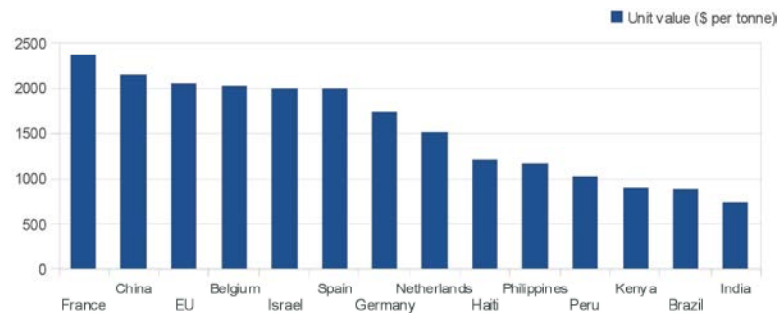


Fig. 4: Top Exporting Countries - Mango, Mangosteen and Guavas (in terms of per unit value) - 2009

Table 1: Area, production and productivity of mangoes in India

Year	Area ('000 ha)		Production ('000 MT)		Productivity (t/ha)
	Mango	% share of total fruits	Mango	% share of total fruits	
1987-88	1233	44	10350	37	8.4
1991-92	1078	38	8715	30	8.1
1994-95	1228	29	10993	29	9.0
1999-00	1487	37	10503	23	7.1
2004-05	1962	41	11605	26	5.9
2006-07	2154	39	13734	23	6.4
2007-08	2201	37	13997	21	6.4
2008-09	2309	38	12750	20	5.5
2009-10	2312	37	15027	19	6.5
2010-11	2410	36	16168	18	6.7

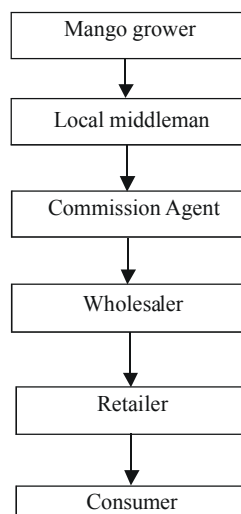


Fig. 5: Traditional mango marketing channel

A contract is simply an institutional construct that outlines the mutually agreed upon rules (and expectations) of how the fundamental element, such as the allocation of value (or the distribution of gains from trade), the allocation of risk (when value is subject to uncertainty) and the allocation of decision rights, will be addressed in the transaction relationships among the contractor and contractees [8, 9, 10]. Contractual arrangements are becoming increasingly important for improving the effectiveness and efficiencies of agricultural supply chains [11, 8, 12].

Three major contracts exist [13]:

- **Market specification contract:** Agreement between buyer and seller to provide a market for the product (output). The seller has influence on the product and marketing activities.
- **Production-management contract:** Characterized through more control by the buyer compared to the market specification contract. The buyer influences the production management by inspecting the production process and influencing the input use.
- **Resource providing contract:** Allows the buyer to provide a market outlet for the product, supervise the production and supply key inputs.

**Contract System in Mango Orchards:** Mango fruit is highly perishable in nature and there is also market price fluctuation due to the seasonal concentration of fruit in the market. Therefore, it needs careful handling, quick transport, sound packaging and timeliness of all

operations if good prices are to be realised. In practice, agricultural contracts vary significantly in terms of written or oral [14] type of contractual arrangement such as fixed wage, fixed rental, or sharecropping [15], duration of contract, time of entry into contract and so on.

**Type of Contract:** In case of mango orchard contracting system, most contracts are only verbal and relational in nature and are being executed based on a relationship of trust between the farmers and contractors. Literature survey shows that more than 90% of the contracts were reported to be verbal in nature. The pre harvest contractors are dominant players in the mango market chain across the country [16]. Mango farmers usually avoid taking risk in mango production and marketing.

**Duration of Contract:** The duration of pre-harvest contracts is mostly decided on the basis of mutual understanding between a tree owner (producer) and a contractor. Generally, the contracts are done for short duration, usually for only one production season. They contract out their orchards either at pre-flowering or post flowering stages. In general, the pre-harvest contractor contacts the growers 3-4 months before the harvest season and sets up a contract, based on the flowering of the orchard. As the risk of mango production at the pre flowering stage is comparatively higher than at the post flowering stage, the majority of contractors take orchards on contract after the mango flowering. Most orchards have more than one mango varieties, which enables the contractors to realize the benefit of extended harvesting period. A minimum lump-sum amount of the total pre-decided contract value is paid at the time of contracting, in cash. The remaining amount is paid in cash normally without interest as per mutual agreement, either after the harvest is complete or during harvesting period in instalments.

**Factors Affecting Contracts in Mango Orchards:** Agricultural production contracts depend on number of factors related to (i) Producer and Contractor characteristics (ii) Production characteristics and (iii) Contract arrangement attributes [17, 14, 10]. With regard to contract, management related variables, payment terms and documentation, contract enforcement mechanism and contract pricing and duration are the factors that most likely affect the mango contracting.

In a study [18], it was reported that, of the 83 mango contractors surveyed, most (almost 77) have contracted for only one mango orchard while only 6 contractors have

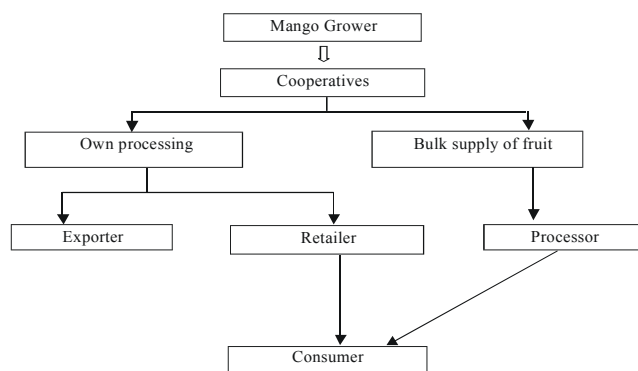


Fig. 6: Marketing Channel for Mango pulp through Cooperatives (modified from [20])

agreements with more than one orchard ranging between two and four. The average orchard area is 2 hectares and the average number of mango trees per contractor is 271. The density of mango trees at contracted orchards is 131 mango trees per hectare, on an average. The average contract price per hectare of mango orchard is Rs: 46365 while per tree it is Rs: 355 for a production season, which is primarily decided on the basis of area of orchard, number of trees, age of trees and variety of mango trees.

#### Reasons for Using Contractors:

- Producers usually avoid the marketing of fruit as they do not want to be involved in the complication of the marketing system.
- They do not want to take risk of price and income variation due to perishability, qualities and seasonality.
- Lack of knowledge of marketing.

Results of various studies indicate that three aspects of contract management i.e. payment terms, documentation, contract enforcement mechanism and contract pricing and duration are influenced by a number of socio-demographic factors of contractors, orchard owners and orchard related factors. Orchard owner's entrepreneurial ability, goodwill and reputation play an important role in contract design and management.

**Cooperative Marketing System:** In Tamil Nadu, in 2007 four cooperatives of fruits and vegetable growers existed. There are 385 fruit processing units in Tamil Nadu out of which 80% are small industries with an average capacity of 5.5 tonnes per day and the remaining units are medium scale with an average capacity of 80 tonnes per day [19]. Marketing channel for mango pulp through Co-operatives is shown in Fig. 6.

Aharam Traditional Crop Producers Company Limited is a farmers' owned organization. The 600 producers are organized in 40 Self Help Groups at village level. The SHG's are in direct contact with the Federation of Mango Farmers, which are organized at regional level. The producer.

Company Aharam acts as umbrella organization. The vision is to increase and sustain rural incomes by empowering the members through the coordination of Community Based Organisations and offering services which increase the opportunity to add value along the chain [21].

#### Other Marketing Systems

**Online Marketing:** On line spot trading has been introduced by Safal National Exchange (SNX) for Tothapuri mangoes in Krishnagiri district of Tamil Nadu. SNX, by a joint venture between National Dairy Development Board and Multi - Commodity Exchange of India (MCX) are carrying out on the spot electronic trading of mangoes in Krishnagiri and Pochampalli districts of Tamil Nadu.

**Farmer Owned Producer Company:** In Tamil Nadu, there are 10 cluster level Precision Farmers' Associations and one Ltd. company in the name of 'Dharmapuri Precision Farmers Agro Services Ltd.' owned by 180 farmers as share holders. Apart from the technical empowerment, economic empowerment and social empowerment, this development is a commercial empowerment for the farmers, a farmer becoming CEO of a Limited Company. The firm is planning to establish a wholesale Mega Farmers Market and create its own market for the produces.

**Corporate Farming:** Jain Irrigation systems Ltd and Reliance India Ltd are joining hands with mango growers

in select states. Retail giants like Reliance, ITC, Aditya Birla group, Godrej, Bharati group, Adani group, Future group are coming out with their own retail outlets like Big Bazar, Food Bazar, Reliance Fresh, Choupal fresh, Namdhari's fresh, Maagritaa, Safal, Field fresh, Dole etc.

### Constraints in Marketing of Mangoes

**Harvesting and Post Harvest Practices:** The method of harvesting in mango is by hand picking, harvesting by climbing on the tree, harvesting with a notched stick having a pouch. Accidental falling of fruits, results in bruising and cracking of fruits and losses are estimated to a maximum of 15 % in mango.

- Numerous intermediaries in the marketing channel
- High level of wastage accounting to 20 to 40% (High cumulative wastages across the supply chain (i) Mango - 22% (ii) Banana - 30% (iii) Pineapple - 20 % (iv) Guava - 16 %
- Lack of transparency in prices, availability, demand and customer preferences etc.
- Poor infrastructure - storage, packaging, transportation, cold chain etc.
- Poor linkage in the marketing channel.

### Suggestions:

- At the farm level, value addition can be obtained through post harvest handling, grading and packaging. These activities reduce the loss of the mango fruit and increase the quality of the product in the market.
- Grading the fruit is necessary for a better outlook and maintains the quality of the product. Mangoes can be graded by selecting superior quality, sorting by weight, size and removing fruits with defects. It is essential to follow the preventing measures at every level right from the farmers, private traders, operators, processors and marketers.
- Government support system in obtaining quality certifications will help to gain market access. In the food sector, there are three important generic quality assurance systems. These are Good Agricultural Practices (GAP), Hazard Analysis and Critical Control Points and International Organization for Standardization. Producers generally agree that market access will undoubtedly be increased by HACCP, but they have several difficulties to adopt it [22]. To obtain certification like Euro GAP, farmers may pool the produce and meet the minimum requirement for export.

- Form farmer owned federations like “Tamil Nadu Mango Growers’ Federation” TAMAFED like in Tamil Nadu to deal with all issues regarding mango production. This will facilitate better team work among the farmers so as to face the various challenges in supply chain management.
- Try trading mangoes online in select mango growing states or for select varieties.
- Farmer owned post harvest complex in select mango belts with Government support may be made available and functional.
- Exclusive mango packing facility and a mango consolidation business unit (these units need not own mango trees but could pack fruits for mango growers each year).
- Promote programmes like “Mango Mission -2012” on select mango growing belts with realistic targets.
- Focus on marketable fresh and processed premium varieties during peak season.
- Promoting activities like mango pulp making, pickle making and other mango products like armature powder during off season.
- Involving SHGs in post harvest and processing activities.
- Building capability among mango growers and processors to meet market demand (Food safety, Quality, Environmental and Social Responsibility standards).
- Strengthening linkages between mango growers and processors with high value markets (domestic and International markets).
- India has good potential for export of mango pulp. Certification like HACCP will help to realise high value.
- Coordination of research on demand forecasting, targeting on select countries for export and strengthening the mango supply chain will help. Index may be developed for In-transit ripening and staged ripening at some point along the supply chain. Country based export programmes may be developed.
- Creation of market linkages with retail giants will be a “win-win” situation for both the players.
- Focus on Supply Chain Management. Supply chain umbrella include activities like (i) Purchasing (ii) Quality control (iii) Demand and Supply planning (iv) Material or Inventory (v) Order processing (vi) Production planning, Scheduling and Control (vii) Warehousing /distribution and (viii) Customer service.

- Branding Indian mangoes. Indian mangoes are known for their taste and aroma. Building brand image and campaigning for Indian mangoes will help in export of mangoes.

## CONCLUSIONS

India, by nature has the potential to produce high quality mangoes and at the same time there exists demand for Indian mangoes in the international market, too. But what is lacking is the link between demand and supply in the marketing side and good post harvest practices in the production side. In today's market structure, in order to realise more prices, there is a need to shift from mere "marketing" to "supply chain management". In the supply chain, growers, contractors, traders, processors, exporters and supermarket owners are the important stakeholders, involved in successful trading of mangoes. There is a need to proactively manage the two way movement and coordination of goods, services, information and funds to exploit the potential that is already available for the Indian mangoes in domestic and International market.

## REFERENCES

1. Newspaper, "The New York Times", May 2, 2007.
2. Wwww.fao.org FAO Statistics division, FAOSTAT.
3. Cabi, 2008. "Mango commodity chain study: Knowledge gap and use of ICTs in the chain in India", Ref: fr/capk/dr60007/1109, September, 2008.
4. Http://mofpi.nic.in/ Statistics division, Ministry of Food Processing Industry, GOI.
5. Saucó, V.G., 1993. "The Situation of Mango Culture in the World", *Acta Horticulture*, Fourth International Mango Symposium, Miami, USA, 341: 31-41.
6. Biswas, B.C. and Kumar Lalit, 2011. "Revolution in mango production - Success stories of some farmers", Fertilizer Marketing News, March, New Delhi.
7. Eaton, C. and A.W. Shepherd, 2011. "Contract farming: Partnerships for growth", Food and Agriculture Organisation, Rome, ISBN: 9251045933.
8. Sykuta, M. and J. Parcell, 2003. "Contract Structure and Design in Identity-Preserved Soybean production", *Review of Agricultural Economics*, 25(2): 332-350.
9. Haperen, Paul Van *et al.*, 2009. "Fair Tamil Mangoes – Analyze the mango chain to enable the import of Fair-trade mangoes from Tamil Nadu", Project by Resilience Foundation, Project ID, pp: 518.
10. Paulson, N.D., A.L. Katchova and S.H. Lence, 2010. "An Empirical Analysis of the Determinants of Marketing Contract Structures for Corn and Soybeans", *Journal of Agricultural and Food Industrial Organization*, 8: 1-23.
11. Tsoulouhas, T. and T. Vukina, 1999. "Integrator Contracts with Many Agents and Bankruptcy", *American Journal of Agricultural Economics*, 81: 61-74.
12. Vavra, P., 2009. "Role, Usage and Motivation for Contracting in Agriculture", OECD Food, Agriculture and Fisheries Working Papers, No. 16, OECD Publishing. DOI: 10.1787/225036745705.
13. Hobbs, J.E., 1996. "A transaction cost approach to supply chain management", *Supply Chain Management*, 1(2): 15-27, MCB University Press.
14. Guo, Hongdong and R.W. Jolly, 2008. "Contractual arrangements and enforcement in transition agriculture: Theory and evidence from China", *Food Policy*, 33: 570-575.
15. Eswaran, M. and A. Kotwal, 1985. "A Theory of Contractual Structure in Agriculture", *The American Economic Review*, 75(3): 352-367.
16. Sudha, M. and F. Kruijssen, 2008. "Varietal differences in the supply chain of two mango varieties in South India", *Acta Horticulture*, pp: 379-386.
17. Khushk, Ali Muhammed and Smith E.D. Laurence, 1996. "A preliminary analysis of the marketing of mango in Sindh Province, Pakistan", *Pakistan Development Review*, Autumn.
18. Ali, Jabir and Kumar Sushil, 2011. "Understanding the contractual arrangements in the mango value chain", Symposium ID 273, Paper prepared for presentation at the 21<sup>st</sup> Annual IFAMA World Forum and Symposium on the road to 2050: Sustainability as a Business Opportunity, Frankfurt, Germany During June 20-23, 2011.
19. Melba, E. Jesmine, 2012. "Economics of mango production in Thirunelveli District", *Indian Streams Research Journal*, February, 2(1): 1-4.

20. Muthuvelayutham, Haperen, Paul Van *et al.*, 2009. "Fair Tamil Mangoes - Analyze the mango chain to enable the import of Fair-trade mangoes from Tamil Nadu", Project by Resilience Foundation, Project ID, pp: 518.
21. Aharam, 2009. <http://ccd.org.in/node/12>.
22. Mehta, R. and J. George, 2003. " Institutional and Legal Framework of Food Safety Regulations in India", New Delhi as seen in Haperen, Paul Van *et al.*, 2009. "Fair Tamil Mangoes - Analyze the mango chain to enable the import of Fair-trade mangoes from Tamil Nadu", Project by Resilience Foundation, Project ID, pp: 518.