



Australian Government
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Tamarind Value Chain Review





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Why Tamarind?

- It is a versatile fruit that can be value added into a number of different consumer products. The seeds, bark and stem have also been shown to have medicinal properties
- The demand for tamarind processed products exceeds supply in Port Vila. Similar unfulfilled demand has also been recently reported in India who are one of the biggest producers and exporters of tamarind in the world (El-Siddig, K. 2006)
- Tamarind has been grown in the Pacific since the 1700's but the value added commercial potential of tamarind has not been realised and there is a lack of awareness of the potential of tamarind at the village level
- There is Anecdotal evidence that the crop could be more profitable to farmers than Copra or Kava
- A skilled private sector processor/retailer is interested in developing the industry and building farmer capabilities to increase volumes.

Background

The Tamarind (*Tamarindus indica*) is an evergreen legume, endemic to the dry savannah of tropical Africa. It is now distributed all over the world and is one of the important tree legumes in tropical and sub-tropical countries. The tamarind tree produces its fruit in pods which consist of a brittle outer shell which encapsulates the pulp and enclosed seeds. Tamarind comes in two main varieties; sweet and sour. Sweet tamarind is harvested ripe and usually consumed fresh, while the sour tamarind is usually processed into a range of value added products (Joshua, D. and Dudhade, P. 2006.). Some of the most common products produced from Tamarind include juice, pulp, powder, chutney, pickles, sauces, sugar coated candies and tamarind kernel powder (TKP). TKP is an important sizing material for the jute and textile industry and tamarind seeds are gaining importance as a rich source of proteins and valuable amino acids.

India is the world largest producer of tamarind, it is estimated that 300,000 tons are produced annually. It is also an exporter of tamarind, mainly to Europe and Arab countries and lately to the United States where over 10,000 tons are exported annually (El-Siddig, K. 2006.) Thailand is the second largest producer with a record of 150,000 tons for the year 1995 with the majority of tamarind being the sweet variety (El-Siddig, K. 2006.). Mexico also produces tamarind commercially to a volume of approximately 29,600 tons per year, exporting small amounts to the US, Central and South America (Silva, R. 2006.). Other minor exporters are found in Costa Rica and Puerto Rico and Africa produces tamarind widely in small quantities for domestic consumption.

In Vanuatu, the tamarind tree is commonly known as Omae/Loli and has traditionally been used as a shade tree in the villages. Once established, the tree develops a large tap root which protects it from strong winds and cyclones, making it well suited to the region. It is also considered to be a suitable tree for inter-planting with other commercial forest species like Sandalwood and Whitewood. Mature plantings of tamarind have been identified throughout Vanuatu on the islands of Efate, Erromango, Aneityum, Malekula and Santo, however the commercial trade in tamarind pulp is predominantly limited to approximately 1000 easily accessible and established trees across the islands of Efate, Malekula and Santo.

The growers in these regions have suggested the trees start producing fruit from 3-4 years of age and reach peak production when they reach 10-15 years old. A typical established tree yields between 50-

100Kg of collectable fruit. This fruit is harvested during multiple picks over an 8-10 week period between September and November.

It has only been in recent years that tamarind has emerged as a commercial high value product that can be traded to a secondary processor (Kava Store) as a semi-processed pulp. The Kava Store is currently the only secondary processor of tamarind in Vanuatu and to help establish the industry they recently partnered with the Department of Forests and Agriculture to distribute more than 10,000 seedlings to interested farmers in Vanuatu. In 2010 the Kava Store recorded an annual production of 22 ton and is interested in significantly increasing this volume in the future.

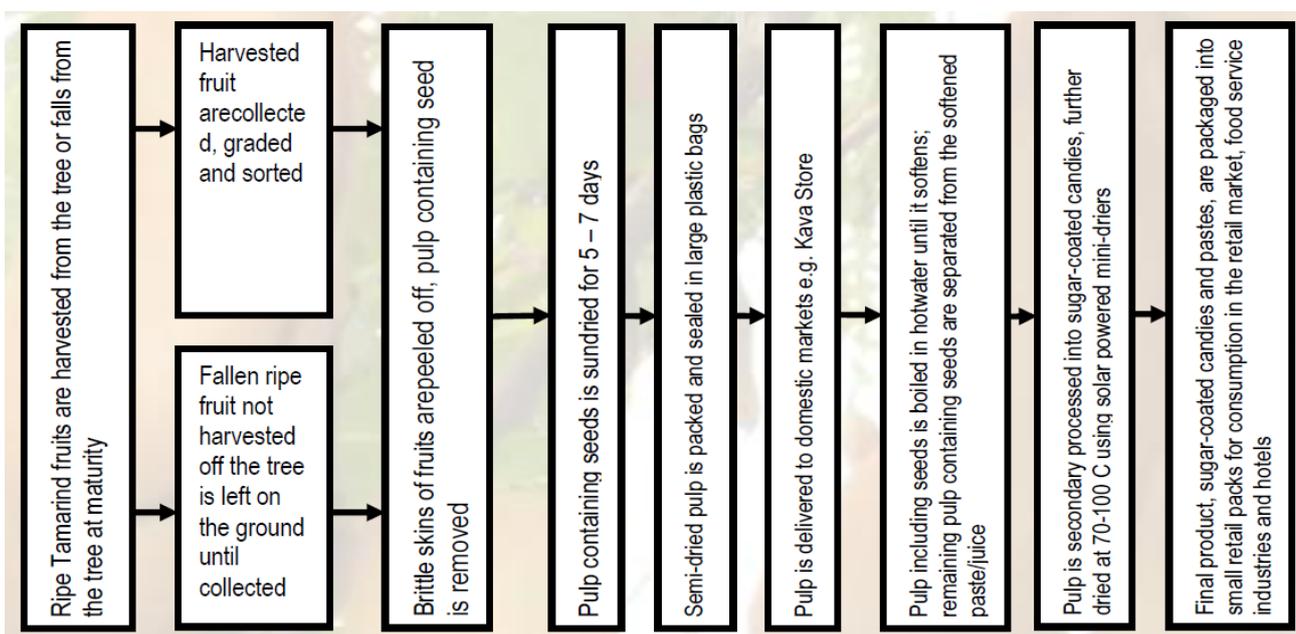
The existing product range from the Kava Store is limited to 3 products; tamarind candies, sweetened tamarind paste balls and some tamarind mixed with dried mango. If supply can be increased they have plans to extend the product range to beverages, food service products and possibly pharmaceuticals. The existing value added products have been achieving prices of 3,000 Vatu per Kg in the domestic market which converts back to around 300 Vatu per Kg for the semi dried product supplied by the growers.

Process Flow & Industry Structure

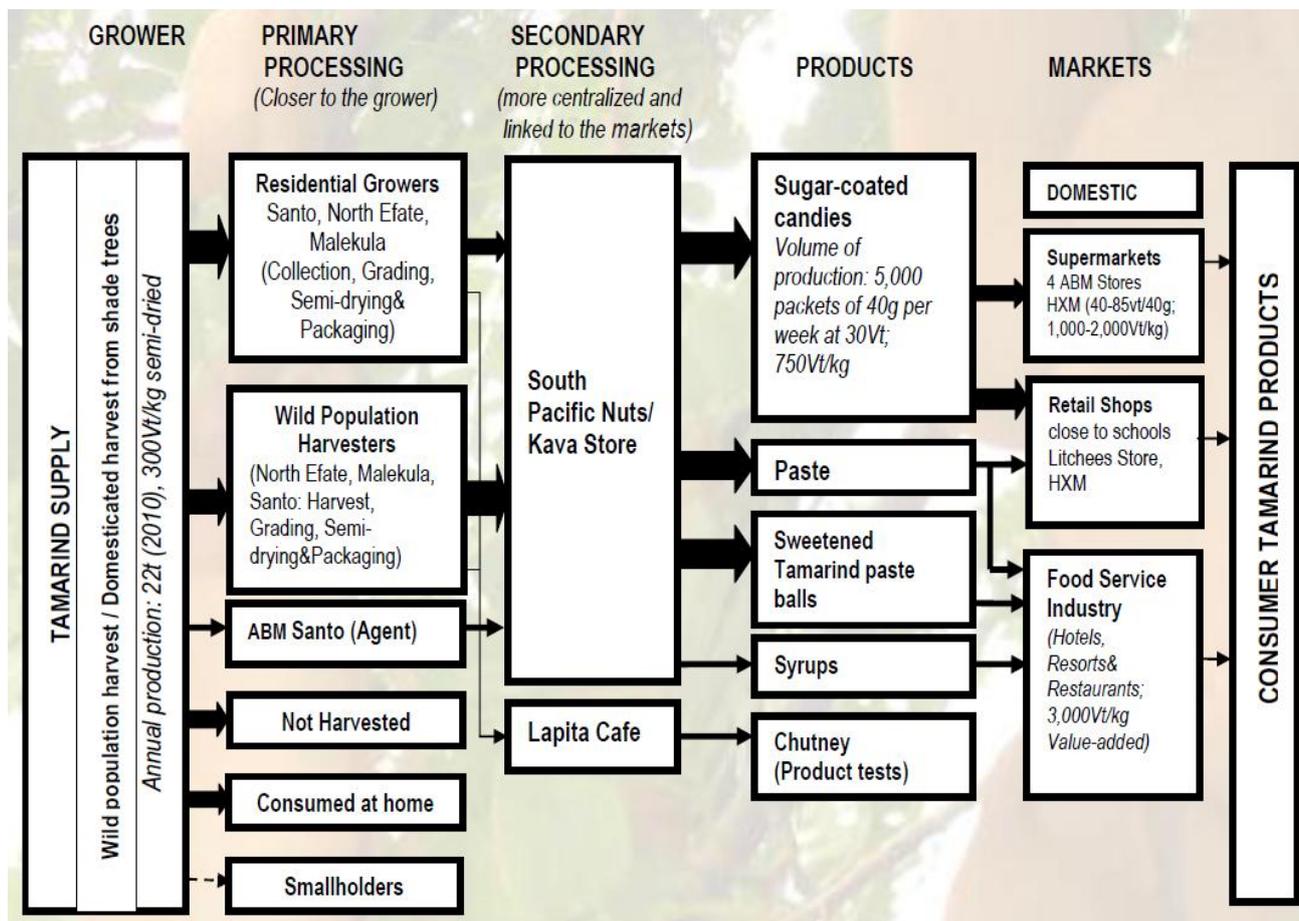
The following production process is followed during the tamarind harvest season;

1. Harvest tamarind pods
2. Peel off the brittle skin
3. Sundry and turn for 5 sunny days
4. Pack into large plastic bags
5. Deliver to buyer (Kava Store), quality check and weigh before payment
6. Processor (Kava Store) cooks the semi-dried tamarind in large saucepans of boiling water
7. Separate pods from the remaining juice/paste
8. Sugar coat pods 75% tamarind: 25% sugar and mix paste with sugar 50:50 and make flat balls from the paste
9. Dry both products at 70-80C in a solar drier
10. Package into small retail packs

Process Flow Map



Industry Wide Chain Map for Vanuatu



Priority Consumer Markets

The Kava Store is experiencing high domestic demand for products such as confectionery candies and pastes from the retail and food service sectors. The high volume of tourists into Port Vila by air and sea is one of the market drivers feeding this demand, however locals and particularly school kids seems to drive demand in certain stores depending on their location.

It is also understood that world demand for Tamarind is strong with reports from India that low supply is causing prices to rise in 2011 (Deccan Herald). This suggests that export opportunities are not out of reach and markets such as New Caledonia and parts of Asia could be explored once capability increases and product quality improves.

In addition to the food and beverage industry the processed pulp may also have pharmaceutical applications which need to be understood in more detail.

Preliminary Value Chain Research

A pilot value chain study was conducted in Vanuatu in 2011. The approach was to use questionnaires, informal interviews and observations from ‘walking the chain’ to collect information on the whole industry from primary production through to market segments and final consumers.

Once the information was collected and analysed, a workshop was held at Mangaliliy village, North West Efate and all the key industry stakeholders were invited. The purpose of the workshop was to present the findings of the study, seek feedback on the information and collectively prioritise interventions to progress the development of the tamarind industry in Vanuatu.

Key findings from the initial grower surveys:

- Most of the tamarind trees were found in residential areas and used for their shade (64%), 29% growing as a wild population and only 7% as small scale immature production crops.
- When asked about the factors that were holding back the growth of the tamarind industry in Vanuatu, the three most common factors mentioned were: lack of market information, lack of awareness by relevant government institutions about the potential of the tamarind, and lack of recommended silvicultural practices.
- All the interviewed growers were involved in a very basic, primary level of processing of tamarind and none of them have ever received any training/extension/advice by any entity either governmental or private.
- A lack of proper processing skills to meet the required standards was found to be the biggest problem facing the industry.

Opportunities in Research for Development

As a result of the initial value chain study and industry workshop the key researchable issues to facilitate the development of the tamarind industry were identified as;

1. Understanding the markets and potential tamarind products through consumer and customer research
2. Refine primary and secondary processing methods at the farmer and processor level
3. Strengthen the tamarind industry by connecting smallholder farmers to the market opportunities
4. Develop suitable silvicultural methods for tamarind in Vanuatu

References

#	Title	Author	Year	Publication	Comments
1	A sour feeling as tamarind prices soar	Gayathri V Raj Mysore	2011	The Deccan Herald, India	This article describes the market situation for tamarind at the beginning of 2011, outlining high demand and the reasons for decreased supply.
2	Analysis of Economical Characteristics of Value Chains of Three	Joshua N Daniel	2006	The International Centre for	This is a research report about understanding the value chains of amla (<i>Emblca officinalis</i>), tamarind (<i>Tamarindus</i>)

	Underutilized Fruits of India			Underutilized Crops	<i>indica</i>) and kokum (<i>Garcinia indica</i>).
3	Sensory properties and consumer acceptance of sweet tamarind varieties grown in Thailand	Chintana Oupadissakoon	2010	Society of Chemical Industry	This research provides a foundation for further sensory and consumer research on sweet tamarind varieties by providing the initial data on the sensory properties of sweet tamarind, a lexicon that can be used for future research, and information on the consumer acceptance of tamarind varieties.
4	Antidiabetic effect of aqueous extract of seed of <i>Tamarindus indica</i> in streptozotocin-induced diabetic rats	R. Maiti	2004	Journal of Ethnopharmacology	The aim of this present work is to find out the chemical basis of aqueous extract of seed of <i>Tamarindus indica</i> Linn. for the management of insulin-dependent diabetes mellitus and to reflect the enzyme activities related to blood glucose level modified by this extract.
5	Antimicrobial activity of <i>Tamarindus indica</i> Linn	JH Doughari	2006	Tropical Journal of Pharmaceutical Research	The antimicrobial activities of extracts of the stem, bark and leaves were evaluated against some common gram negative and gram positive bacteria and fungi. The study also investigated the chemical constituents of the plant and the effect of temperature and pH on its antimicrobial activity.
6	Hidden economies, future options: trade in non-timber forest products in eastern Indonesia	A.B. Cunningham	2011	ACIAR Technical Reports	This report uncovers the 'hidden economy' of informal-sector producers and traders on a few non-common crops in Indonesia. This study not only provides insight into the diversity of plant products in trade, but also the fortitude, resilience and local knowledge of the people who process and /or sell them.
7	Fruits for the Future 1 Revised edition Tamarind <i>Tamarindus indica</i> L.	K. El-Siddig	2006	Southampton Centre for Underutilised Crops	This is a revised monograph detailing all aspects of tamarind from an original version in 2000, details have been corrected, adjusted and updated. The aim of it, it's to become an instrument that promotes the enhanced production, processing and marketing of tamarind.
8	Diagnostico de la Cadena del Sistema Productivo Tamarindo (<i>Tamarindus indica</i> L.) en el Estado de Colima	R. Silva	2006	Universidad de Colima, Mexico	This report describes the productive system of tamarind in Colima, Mexico. Colima is the state in Mexico that produces most of the tamarind in this country. The information was collected via interviews, field trips and forums. All the information was reviewed by a multidisciplinary team of people to make sure it is as accurate as possible.