Date: **October 2008**

Author: **Center for Agricultural Policy**

Prosperity Initiative

Coconuts

Small-scale Review of Coconuts

PROSPERITY INITIATIVE ANALYTICS

Market Forces Reducing Poverty

Coconuts

Small-scale Review of Coconuts

Short analysis of the coconut sector as regards demand, competitiveness, impact and opportunities with the aim of helping to eradicate poverty in Vietnam through market forces

October 2008

Prepared by the Center for Agricultural Policy with Prosperity Initiative

Supported by: The Australian Agency for International Development (AusAID); The Swiss Agency for Development and Cooperation (SDC), Oxfam Hong Kong (OHK) and Oxfam America (OA).

Foreword

This is one of a group of studies carried out by staff from the Center for Agricultural Policy (CAP) of the Institute of Policy and Strategy for Agriculture and Rural Development (IPSARD), the think-tank associated with Viet Nam's Ministry of Agriculture and Rural Development (MARD, supported by managers from Prosperity Initiative (PI), a non-profit company which develops market sectors to create prosperity for large numbers of poor people in the Mekong Region.

PI and its partners find and develop sectors that can reduce poverty for hundreds of thousands of people. It works with public, private and development organisations across the Mekong Region to identify and implement viable and sustainable ways of developing and growing a sector to achieve a measurable impact on poverty.

One of PI's main activities is its National Market Leadership Programme (NMLP). Its principal initial project in 2008 under the NMLP has been with CAP and IPSARD. Given IPSARD's central role in rural policy development and its mandate to develop a commodity expert group, the NMLP's immediate priority has been to contribute to the development of appropriate skills and market knowledge in CAP-IPSARD. A group of staff from CAP has been working with a team of managers from PI since the beginning of 2008 and has been completing ten short sector studies during this first year. The work has also included contributing joint research on the coffee industry, and – arising out of one of the short studies – providing support to a continuing in-depth study by PI on the coconut industry. This joint work has been the context for technical skills development and capacity building of 9 staff from CAP-IPSARD during 2008.

The first set of the ten studies carried out by apprentice staff from CAP with supervisory input from managers from PI covered honey, bananas and groundnuts. The majority of the work in the studies was carried out by staff from CAP using both primary research in Vietnam and data from local and international secondary sources, with guidance and coaching from PI's managers. Samples of this work can be downloaded at http://www.prosperityinitiative.org/ and can be viewed both as examples of the output from the NMLP and as documents that may be of interest in their own right to researchers and others seeking information about particular sectors in Vietnam, in addition to agricultural and rural development in general. Further studies will be posted on PI's website in the future as its work with CAP develops. During this work carried out by CAP with support from PI, appropriate efforts have been made to ensure accuracy and to acknowledge secondary data sources; any error of omission or commission or any misattribution is accidental.

Chapter 1 – Introduction

1 Introduction | 2 Demand | 3 Competi-tiveness | 4 Impact | 5 Opport-unities | 6 Next Steps

- **PI / CAP approach to sector analysis**
- **Overview of the coconut sector**
- **Segments and study focus**

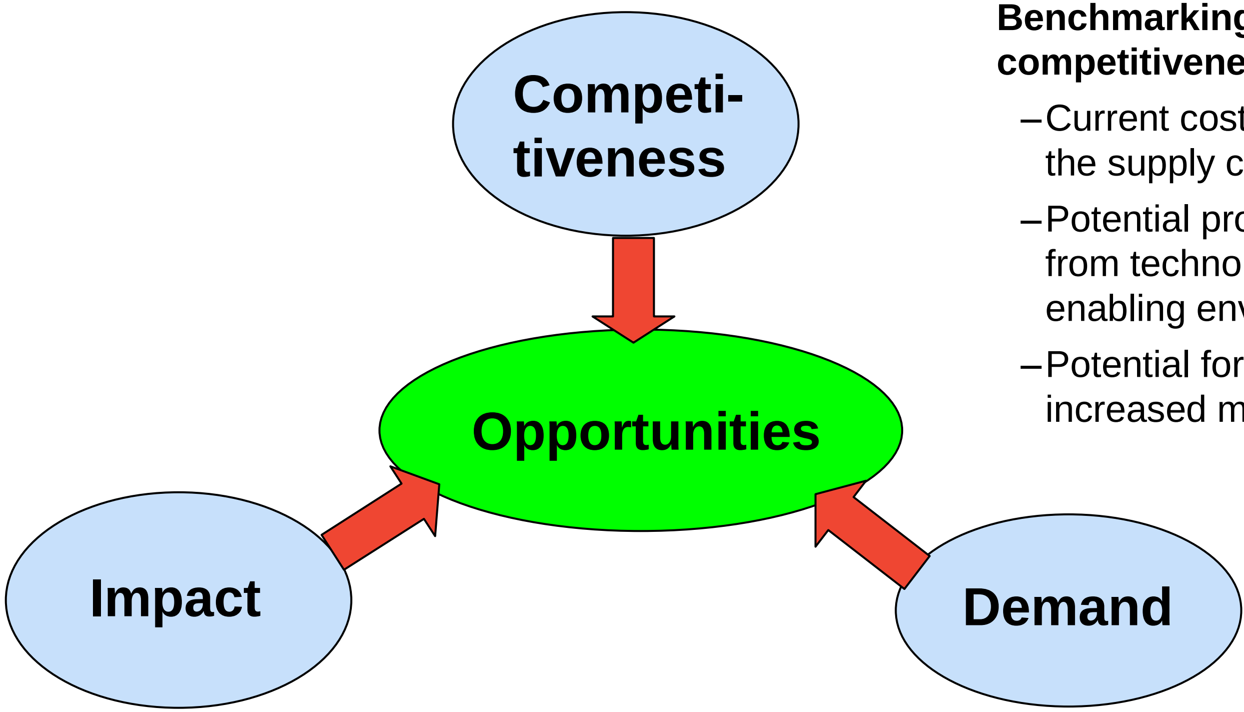
This is one of a series of small-scale studies carried out by the Center for Agricultural Policy* supported by Prosperity Initiative to identify opportunities to assist in eradicating poverty in rural Vietnam through market forces

While small in scope, these studies seeks to provide provisional answers to several questions:

- Is there likely to be sufficient future demand, i.e. a domestic or international market with the willingness and ability to spend on the relevant commodity?
- Are there international benchmarks to support the case for industry investment in Vietnam as against other countries?
- What other opportunities do there appear to be to enhance the competitiveness of the industry in favour of the target group of poorer people?
- How is development of the industry likely to benefit poor people in the rural areas of Vietnam?
- Why should a target poor group choose to make their livelihood from the commodity rather than an available alternative?
- Does the sector look sufficiently promising in terms of potential size and impact on rural poverty to merit more in-depth review/feasibility?
- If the sector presents opportunities for a reduction in poverty, are CAP and PI best placed to take this further or how should it otherwise be handled?

* The Center for Agricultural Policy (CAP) is a semi-autonomous center within the Institute of Policy and Strategy for Agricultural and Rural Development (IPSARD) within the Ministry of Agriculture and Rural Development (MARD) of the Government of Viet Nam

Achieving poverty reduction at scale through market forces requires an assessment of the demand and competitiveness in the sector with potential to have a positive impact on household incomes



Benchmarking and analysis of competitiveness

- Current costs of production along the supply chain
- Potential productivity gains, e.g. from technology, skills, sector-enabling environment, etc.
- Potential for market access and increased market share

Distribution of potential benefits

- Pro-poor economic impact
- Environmental impact
- Social implications

Understanding market dynamics

- Supply, demand, stocks and prices
- Market outlook
- Scale of production supportable by future demand

Chapter 1 – Introduction

1 Introduction	2 Demand	3 Competi-tiveness	4 Impact	5 Opport-unities	6 Next Steps

- **PI / CAP approach to sector analysis**
- **Overview of the coconut sector**
- **Segments and study focus**

Coconut description

- The Coconut Palm is a perennial plant (lasting about 40 – 60 years), and can be grown from its seed.
- There are almost 4,000 species distributed among 200 genera of coconuts in the world. The varieties of coconuts are divided into 2 main kinds: “Tall” and “Dwarf”.
- Coconuts are adaptable to many soil types, and can be grown inland provided there is adequate drainage and pH between 5.0 and 8.0, temperatures of 70º – 80ºF and high humidity.
- The time between planting and harvesting of a coconut varies from 3 to 5 years. Coconuts can be harvested continuously until the tree grows old and dies
- Several food uses or products exist for coconut, such as copra, oil, and water. They are said to be very good for the health and contain many vitamins such as: A, B1, B2, C …

The coconut can be divided into three main groups: Fresh coconut, Processed coconut and Others. Nearly all parts of the coconut palm and nut are useful so it can have significant economic value

Uses of coconuts

Fresh Coconut

The white, fleshy part of the seed is edible and used fresh or dry

Coconut water is used as a refreshing drink and is also used in isotonic sports drinks

Processed coconut

Copra: the dried endosperm or meat of coconut, commonly seen in cakes and candies.

Desiccated coconut: is the dried, white, particulate or shredded food product manufactured from freshly peeled coconut kernels. It's used in food (preserve, ice cream …)

Coconut oil: is extracted by passing shredded and heated copra through very powerful presses. Coconut oil is used in cooking, manufacturing, cosmetic and skin treatment

Others

The coir: is used in ropes, mats, brushes, caulking boats

The leaves: are used materials for baskets and roofing thatch

Palmwood: is applied in the production of furniture, handicraft and constuction

The husk and shells can be used for fuel and are a good source of charcoal

The roots: are used as a dye, a mouthwash, and a medicine for dysentery

Secondary and by-products are those which require one step of processing from the primary product (such as copra, oil coconut and desiccated coconut) to reach the desired end product. Examples include:

- **Coconut milk** is a sweet, milky white cooking base derived from the meat of a mature coconut
- **Coconut cream** is an infusion of shredded coconut and water. Coconut cream may also be made with milk instead of water to obtain a richer product
- **Coconut candy** is the candy made from coconut milk and coconut cream (for example as produced in Ben Tre Province, Vietnam)
- **Coconut water** is a natural product for drinking
- **Coconut oil** is commonly used in cooking and many other ways including as a medicine and in cosmetics, or as a direct replacement for diesel fuel and livestock feed.
- **Virgin coconut oil**: Virgin coconut oil is derived from fresh coconuts. It's very natural and used for food.

Cooking oil coconut

Coconut milk

Chapter 1 – Introduction

1 Introduction	2 Demand	3 Competi-tiveness	4 Impact	5 Opport-unities	6 Next Steps

- PI / CAP approach to sector analysis
- Overview of the coconut sector
- Segments and study focus

Segments and study focus

Copra

Coconut oil

Virgin coconut oil

Furniture

❖ This study starts with a brief outline of global developments in the coconut sector, and then examines in more detail what is happening in the coconut sector in Vietnam.

❖ It focuses on some of the main coconut-based products, namely:

- Coconuts
- Copra
- Coconut oil and copra meal
- Virgin coconut oil
- Desiccated coconut
- Other utilizations

Chapter 2 – Demand

1 Introduction	2 Demand	3 Competi-tiveness	4 Impact	5 Opport-unities	6 Next Steps

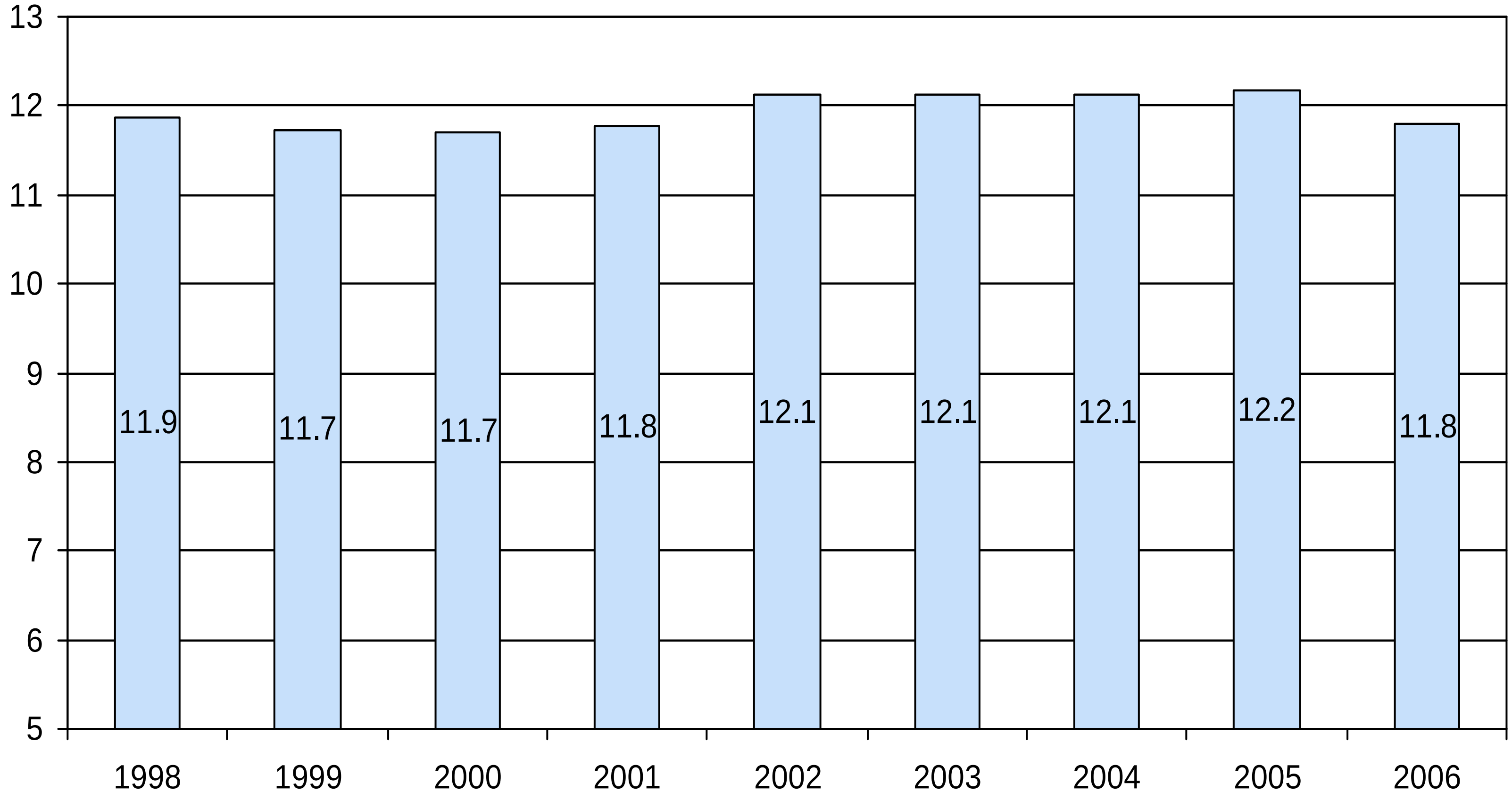
- **Overall global demand for coconuts**

  * Some major coconut products

  - Copra
  - Coconut oil (CNO) and copra meal
  - Virgin coconut oil (VCO)
  - Desiccated coconut (DC)
  - Other utilizations

The total global area under coconut cultivation was stable at around 12 million hectares during the period 1998 – 2006

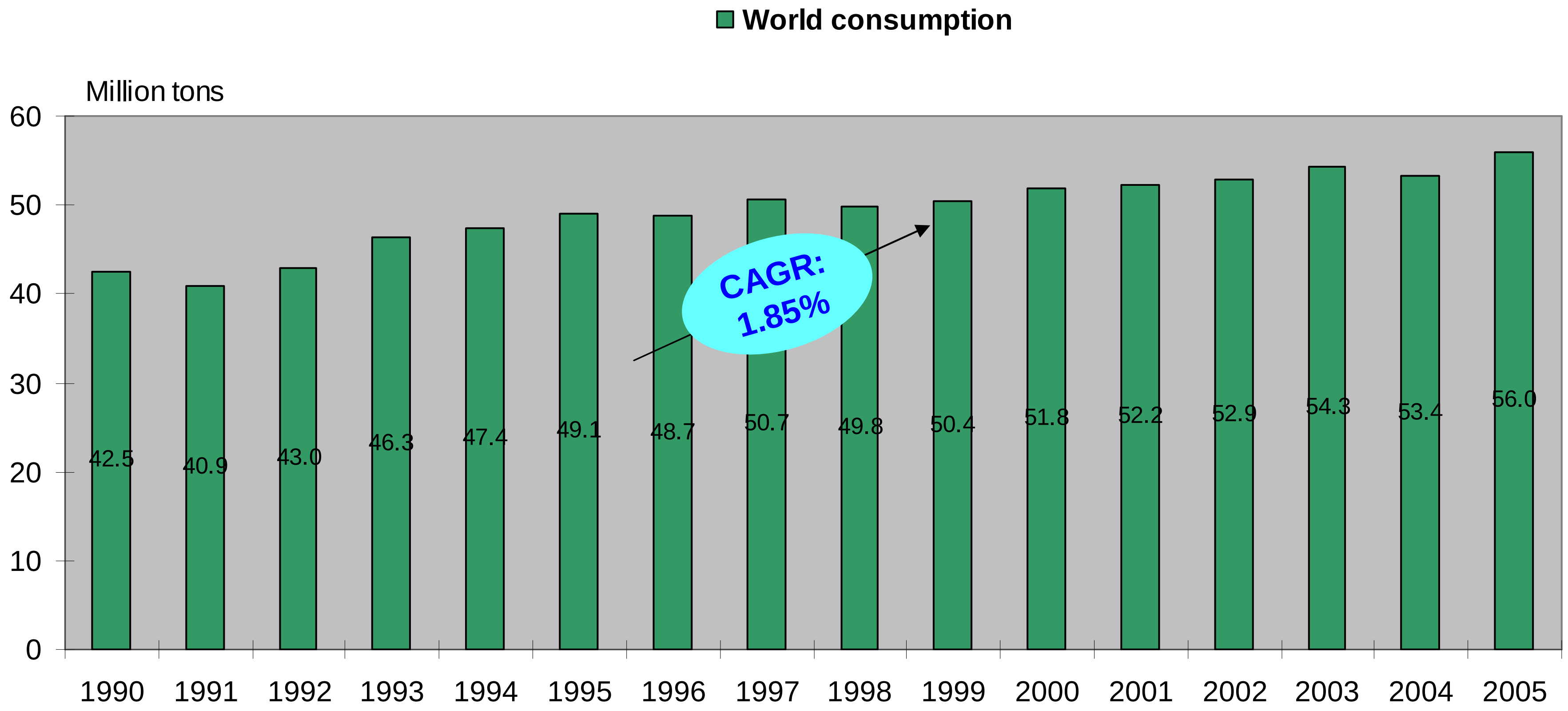
World coconut area in mn ha



About 87% of coconut lands are in the member countries of the Asian and Pacific Coconut Community (APCC). Indonesia and the Philippines account for 32.4% and 27.5% of the world coconut cultivation area.

Source: Coconut statistical yearbook 2006, APCC

World consumption of coconuts increased from 42.54 million tons in 1990 to over 56 million tons in 2005

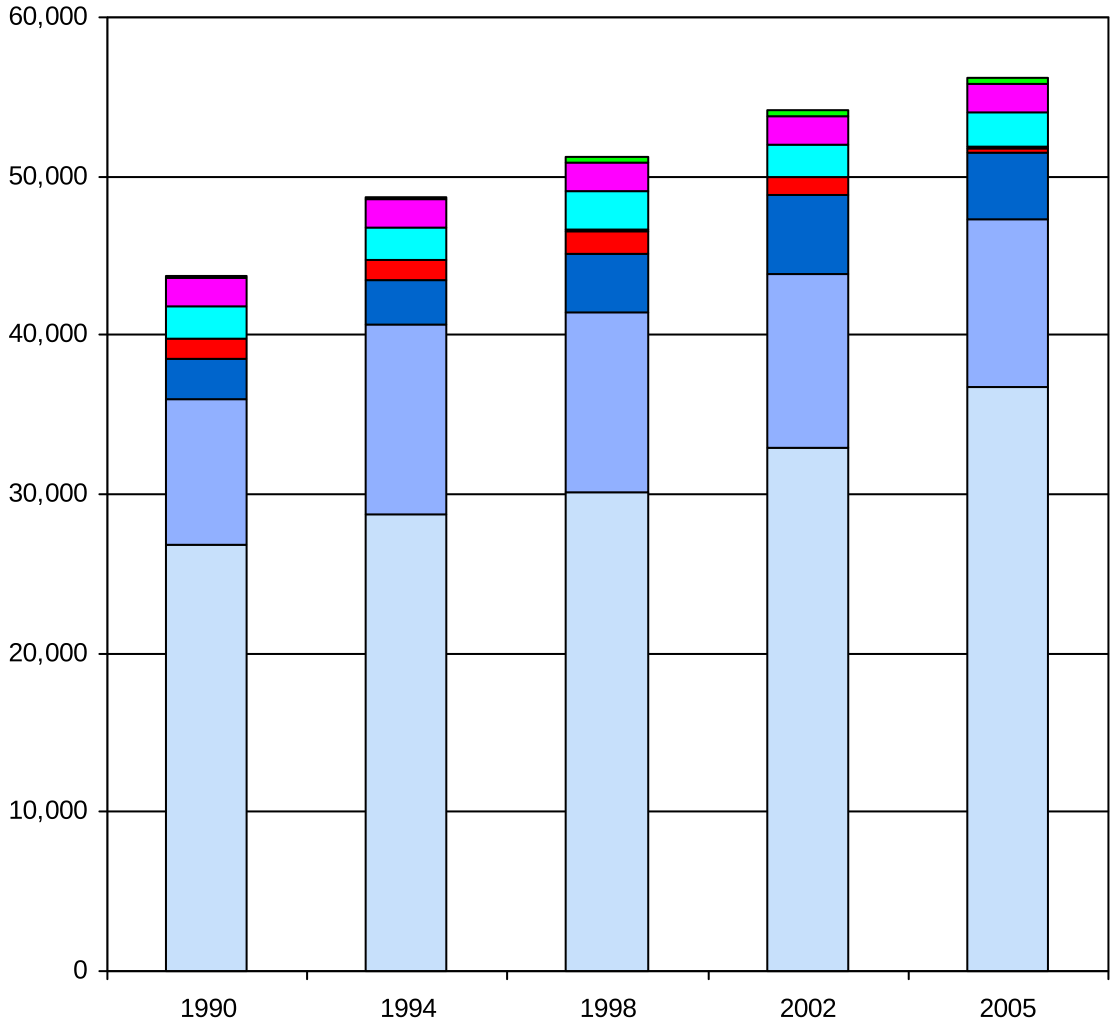


- ❖ Most of the world coconut production is consumed in the country of production ("domestic consumption"), and the quantity of imports and exports is insignificant.
- ❖ The Compound Annual Growth Rate (CAGR) of world coconut production and consumption since 1990 are the same at 1.85%.

Source: FAOSTAT

Coconut consumption in 2005 was highest in Southeast Asia, followed by South Asia and the Latin America & Caribbean regions

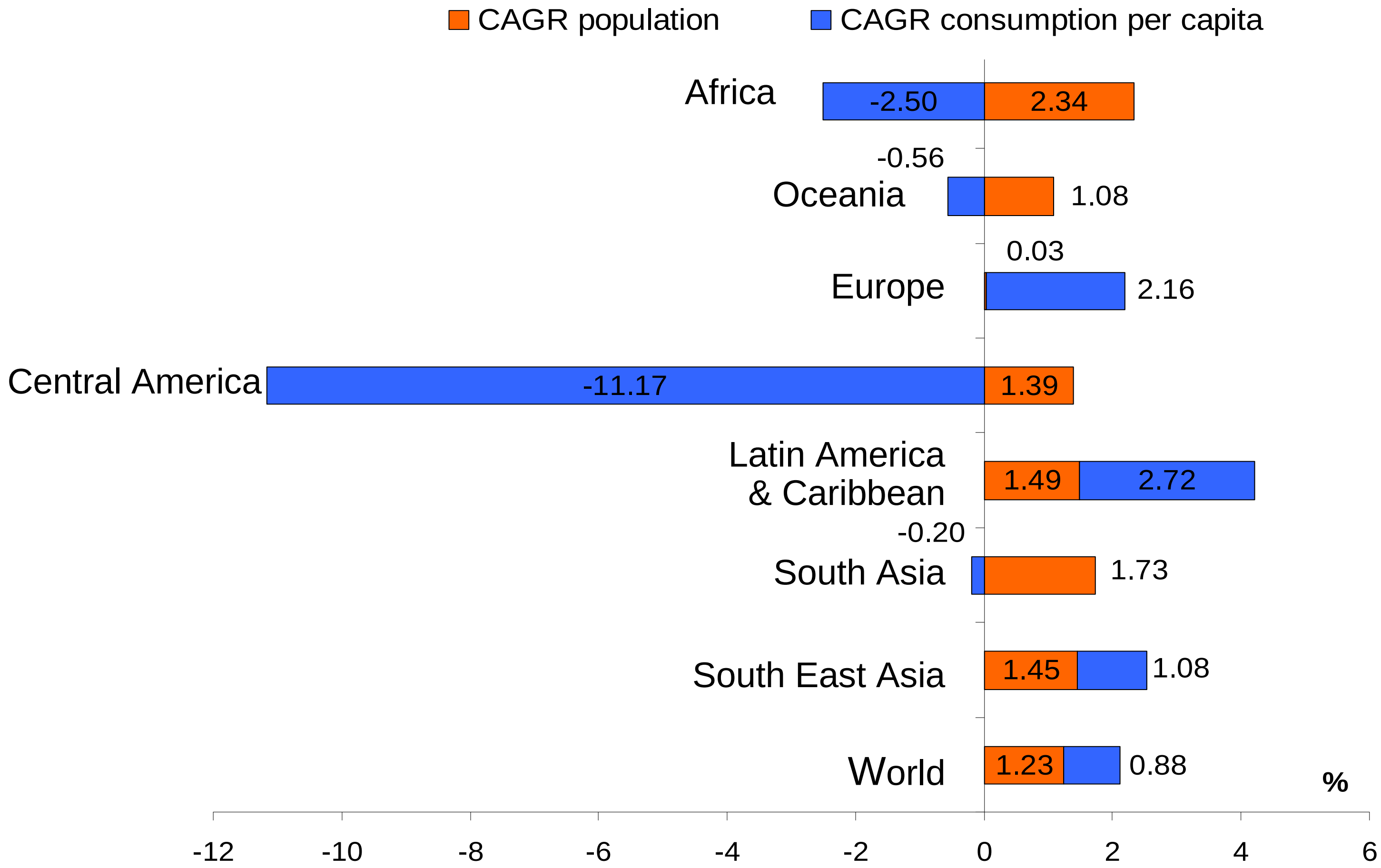
Coconut consumption by region in 1,000 tons



Source: FAOSTAT

Regions	CAGR (1990 - 2005)	Share in 2005 (%)
Others	7.97%	0.75
Africa	-0.11%	3.17
Oceania	0.59%	3.97
Europe	2.18%	0.06
Central America	-10.20%	0.43
Latin America & Caribbean	3.57%	7.50
South Asia	0.87%	18.69
South East Asia	2.14%	65.42
Global consumption	**1.85 %**	**100**

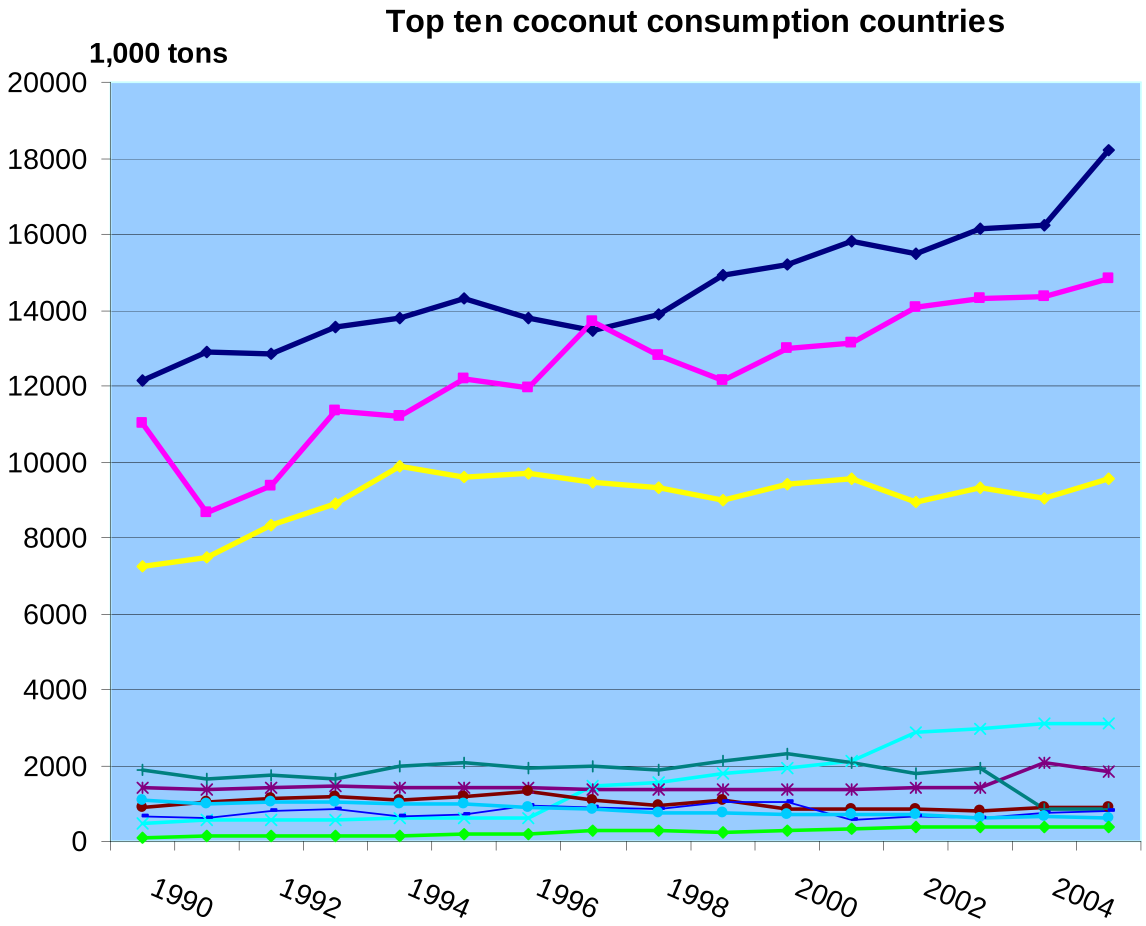
The main factors determining this increase in consumption were population and per capita consumption. These had differing impacts across different regions between 1995 and 2005



The main exception to the general increase in per capita consumption of coconuts has been Central America, where the CAGR was negative, with consumption decreasing to 242 tons in 2005 from 1,340 tons in 1995 for unclear reasons

Source: Calculated from FAOSTAT and World Bank data

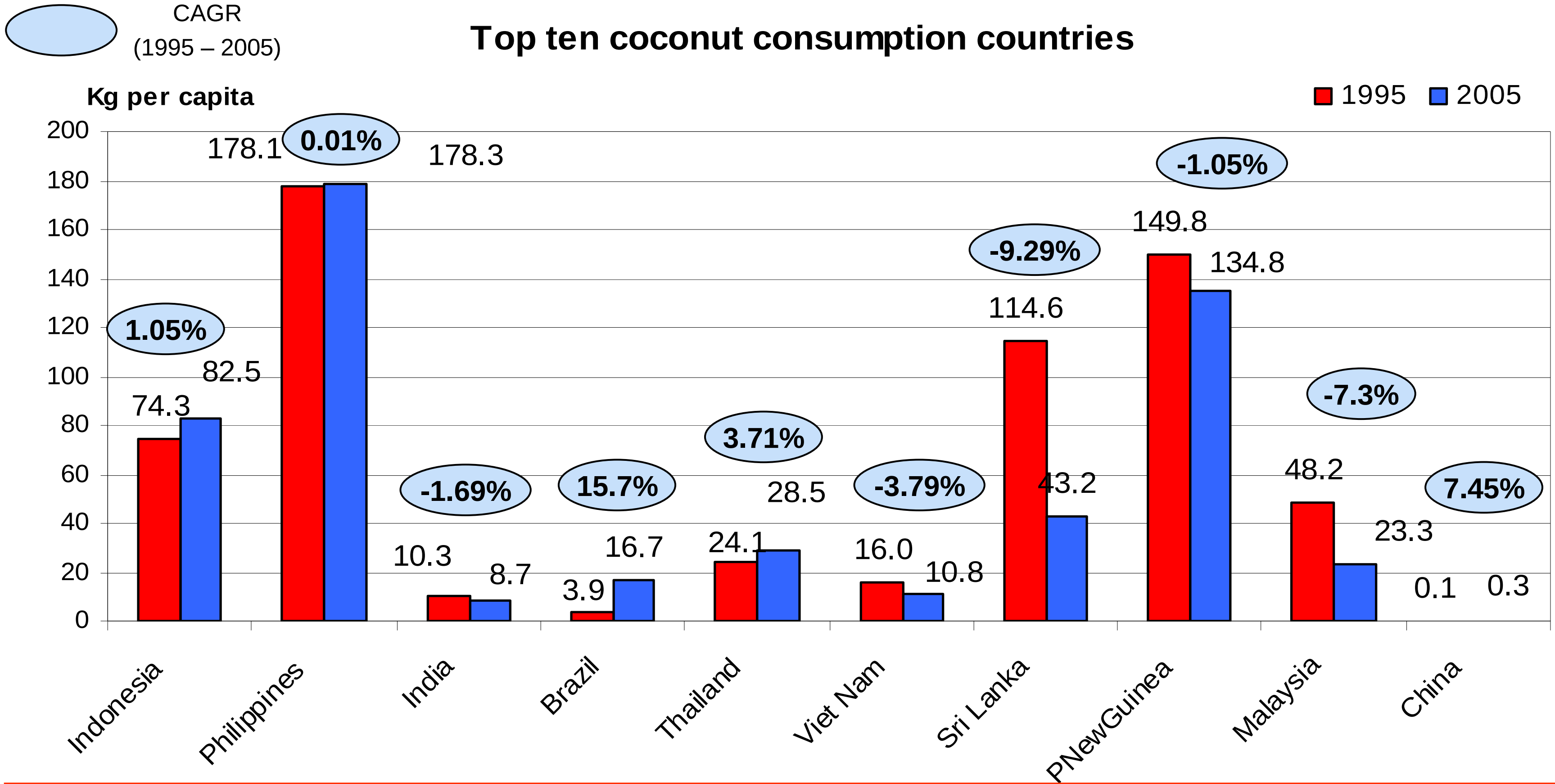
The top 10 coconut-consuming countries account for some 90% of world consumption. The 3 countries with the highest consumption are Indonesia, the Philippines and India, but Brazil and China have the highest growth rates



Country	Share in 2005 (%)	CAGR (%)
Indonesia	32.08	2.47
Philippines	26.14	2.00
India	16.81	1.86
Brazil	5.50	13.33
Thailand	3.23	1.70
Viet Nam	1.59	0.05
Sri Lanka	1.49	- 5.25
Papua New Guinea	1.40	1.42
Malaysia	1.04	-3.98
China	0.69	8.48
World	**100**	**1.85**

Source: USDA

The Philippines has the highest coconut consumption per capita of 178.34 kg in 2005



Although India and China are both in the top ten coconut-consuming countries, this reflects the sizes of their populations. Their per capita coconut consumption is relatively low at 8.7 kg and 0.3 kg respectively

Source: USDA
Note: It is understood that these figures include both coconuts consumed by the country's population and coconuts used for processing and subsequently exported

Chapter 2 – Demand

1 Introduction	**2 Demand**	3 Competi-tiveness	4 Impact	5 Opport-unities	6 Next Steps

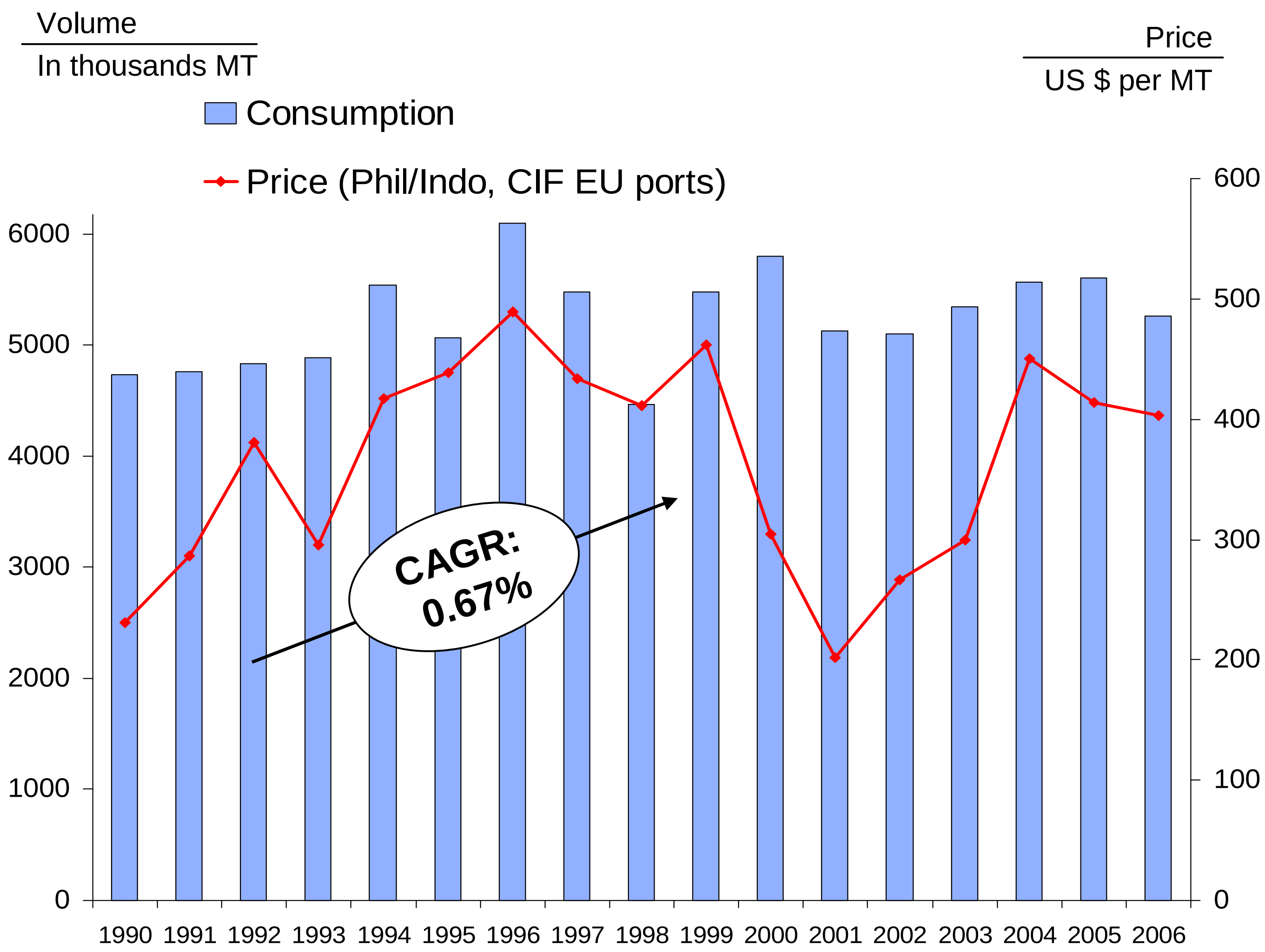
- **Overall global demand for coconuts**

*** Some major coconut products**

- **Copra**
- Coconut oil (CNO) and copra meal
- Virgin coconut oil (VCO)
- Desiccated coconut (DC)
- Other utilizations

Global copra domestic consumption has grown at 0.67% p.a. over the last 15 years and in 2006 totaled 5.264 million tonnes

Total annual domestic consumption of copra in 1990 – 2006



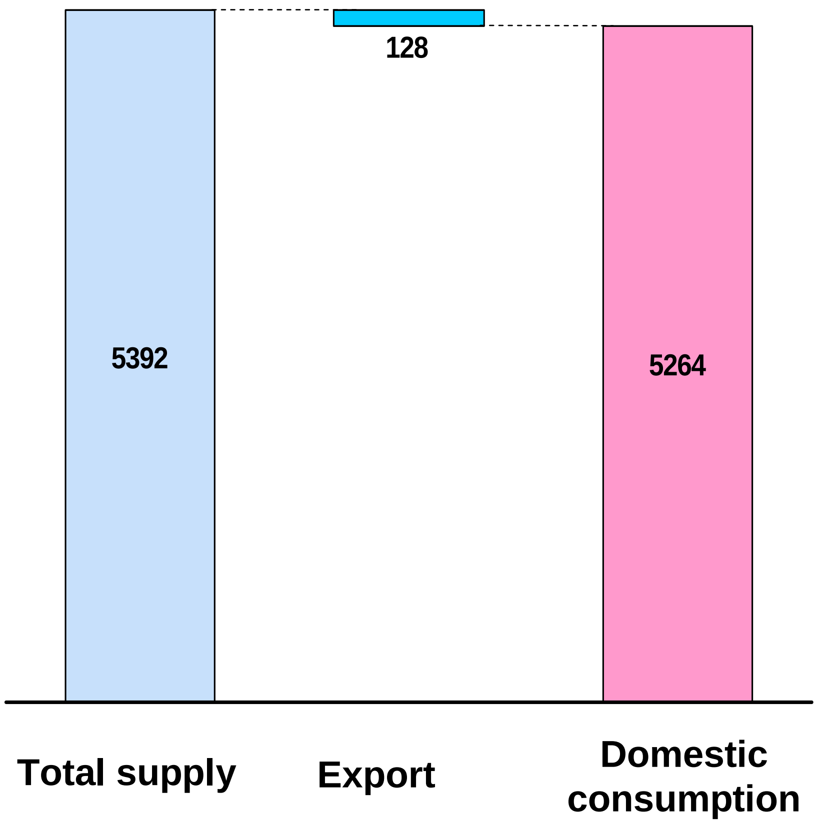
Source: USDA, UNCTAD

- Copra is material for extracting oil so most copra is consumed in producing countries as part of a primary process
- In general, copra consumption was quite stable from 1990 – 2006 although there were fluctuations in prices.

International trade in copra is quite small since major coconut-growing countries process their own production.

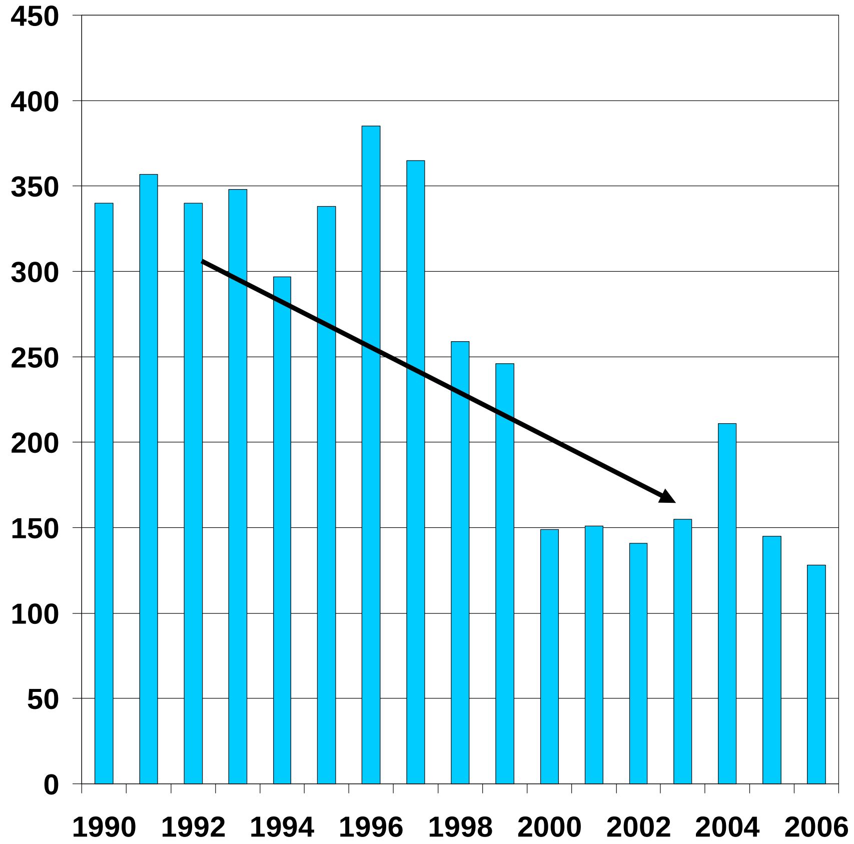
Total supply, export & dom. consumption in 2006

In thousand MT



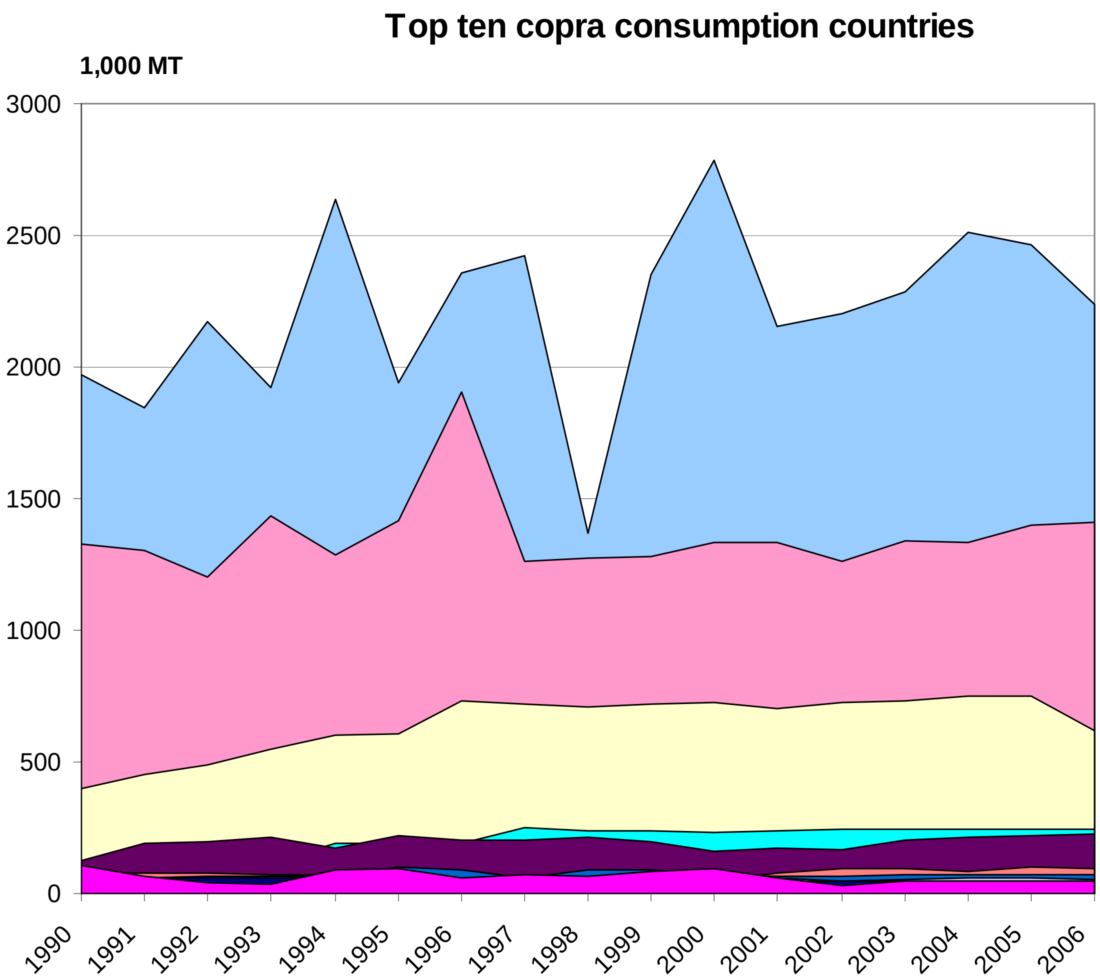
Total exported volume of copra*

In thousand MT



Source: USDA
* Note: The reasons for the large decline in copra exports in 2000 have not been fully explored as part of this study

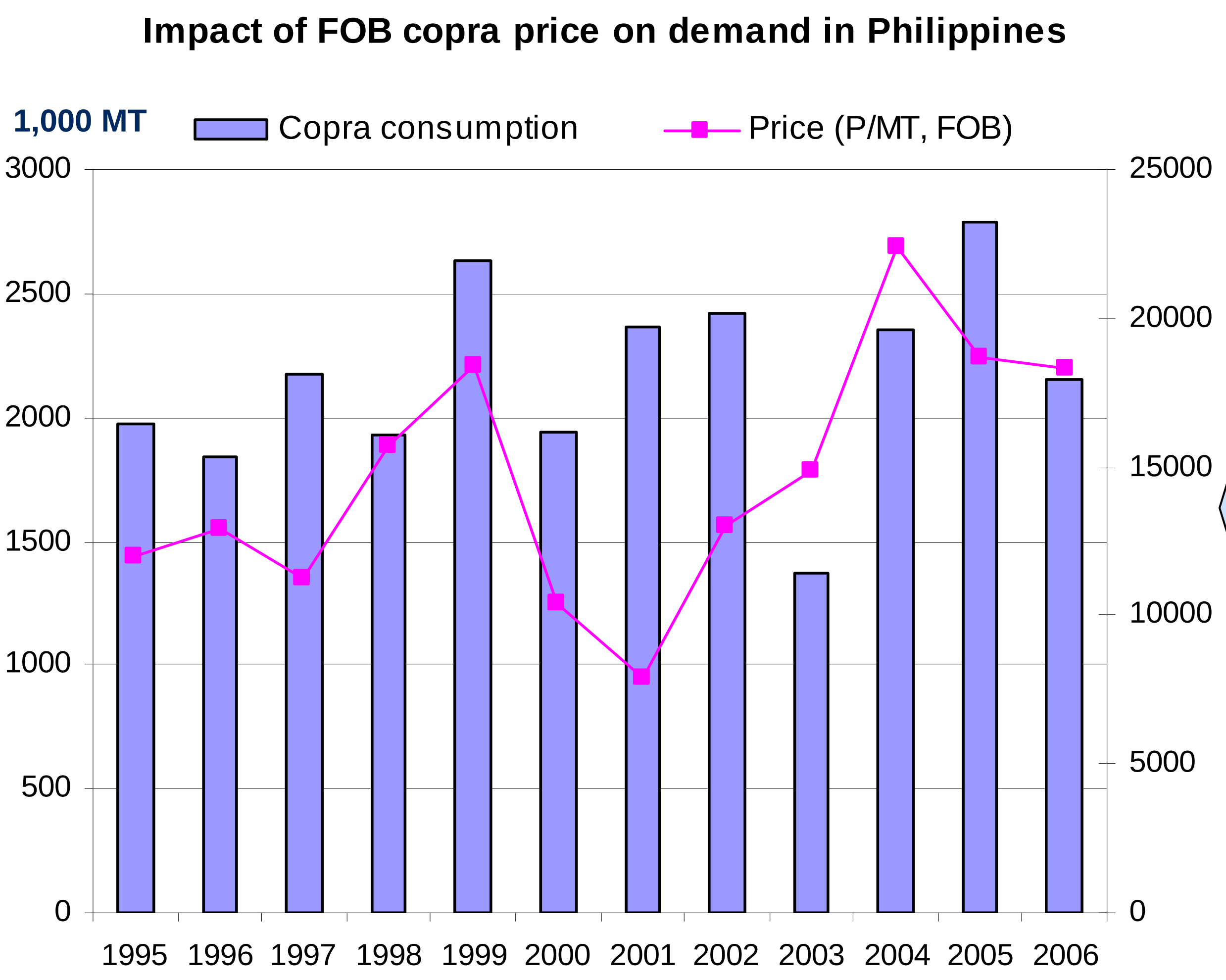
The top ten copra-consuming countries accounted for 96 % of total global consumption in 2006. Vietnam, India, and Mexico had the highest CAGR for copra consumption in the period 1990 – 2006



Country	Share in 2005 (%)	CAGR 1990 - 2005 (%)
Philippines	43.95	1.49
Indonesia	24.99	0.35
India	13.36	4.27
Vietnam	4.32	4.79
Mexico	3.91	3.81
Papua New Guinea	1.77	1.87
Thailand	1.32	0.57
Malaysia	1.02	0.88
Mozambique	0.89	0.63
Sri Lanka	0.84	-5.51
World	**100**	**1.14**

Source: USDA

The relationship between copra price and domestic demand in the Philippines (the highest consuming country) is unclear. From 1995-2006 the copra price fluctuated but increased overall by a CAGR of 3.9%, while consumption increased more slowly at 0.8%



In recent years, some coconut growing countries have begun to import copra. The Philippines routinely imports copra from Papua New Guinea and from the Solomon Islands to maintain throughput in their crushing plants.

Source: USDA , PCA

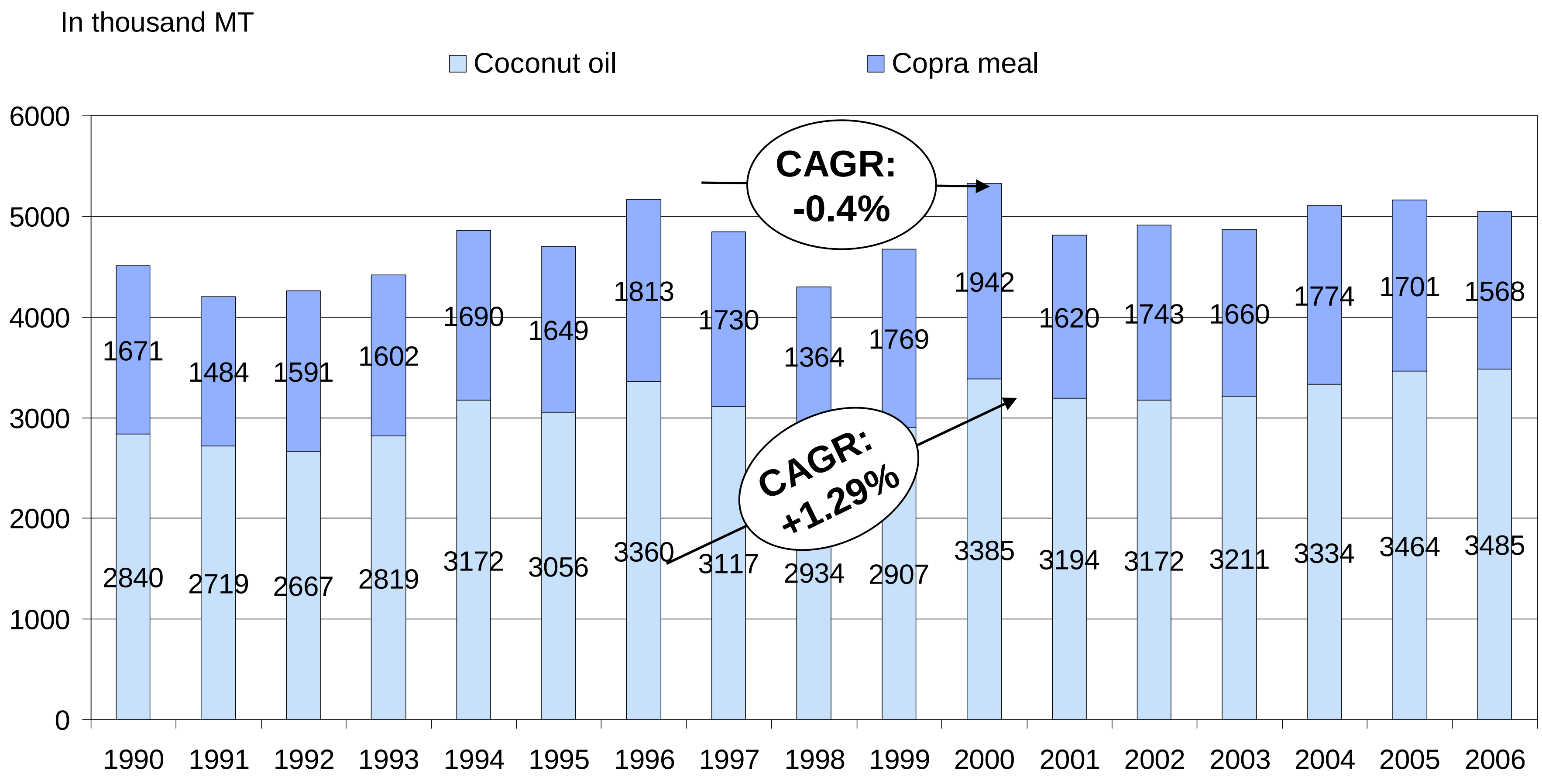
Chapter 2 – Demand

1 Introduction	**2 Demand**	3 Competi-tiveness	4 Impact	5 Opport-unities	6 Next Steps

- **Overall global demand for coconuts**
  - *** Some major coconut products**
    - Copra
    - **Coconut oil (CNO) and copra meal**
    - Virgin coconut oil (VCO)
    - Desiccated coconut (DC)
    - Other utilizations

Global CNO consumption increased from 2.840 million tonnes in 1990 to 3.485 million tonnes in 2006 – an average growth rate of 1.29% p.a., while copra meal consumption decreased from 1.671 to 1.563 million tonnes

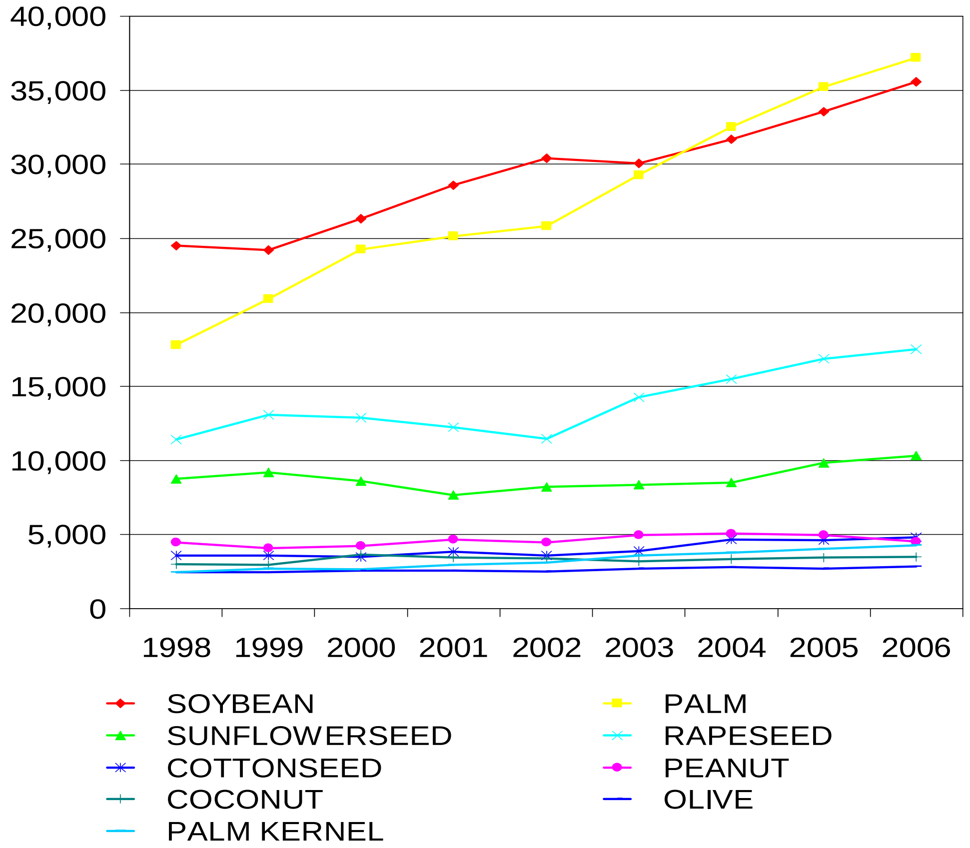
Global dom. Consumption of coconut oil & copra meal



Source: USDA
Note: Coconut oil and copra meal are considered together because they are products of the same extraction process

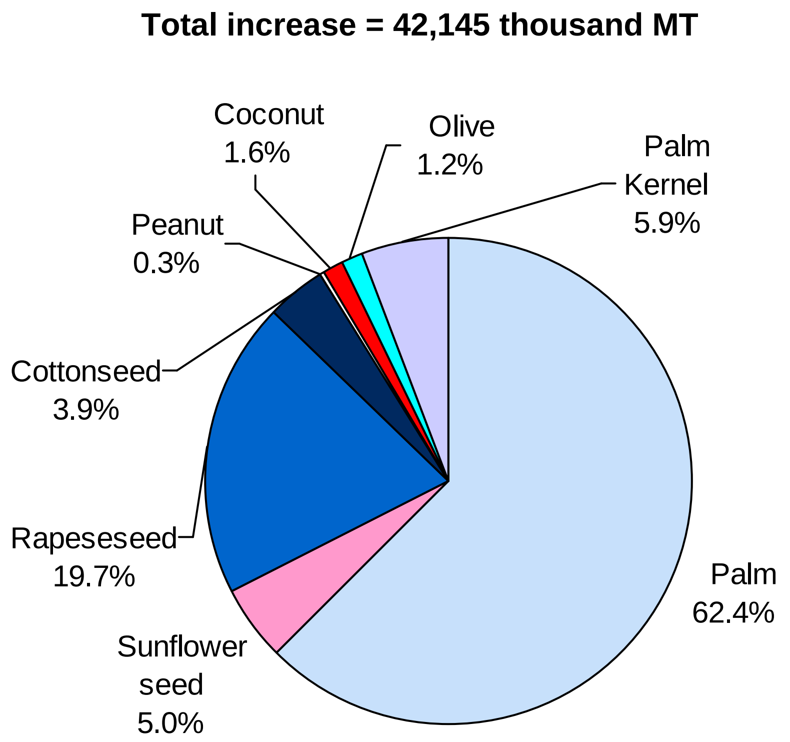
The importance of CNO in the total vegetable oil market has been declining: in 2007 CNO accounted for only a 3.7% share of this market, and only 1.6% of the total increase in vegetable oil consumption of 42 million tonnes during the period 1998-2006

Global consumption of main oils in thousand MT



Increase consumption between 1998 - 2006

Share of increase in percentage

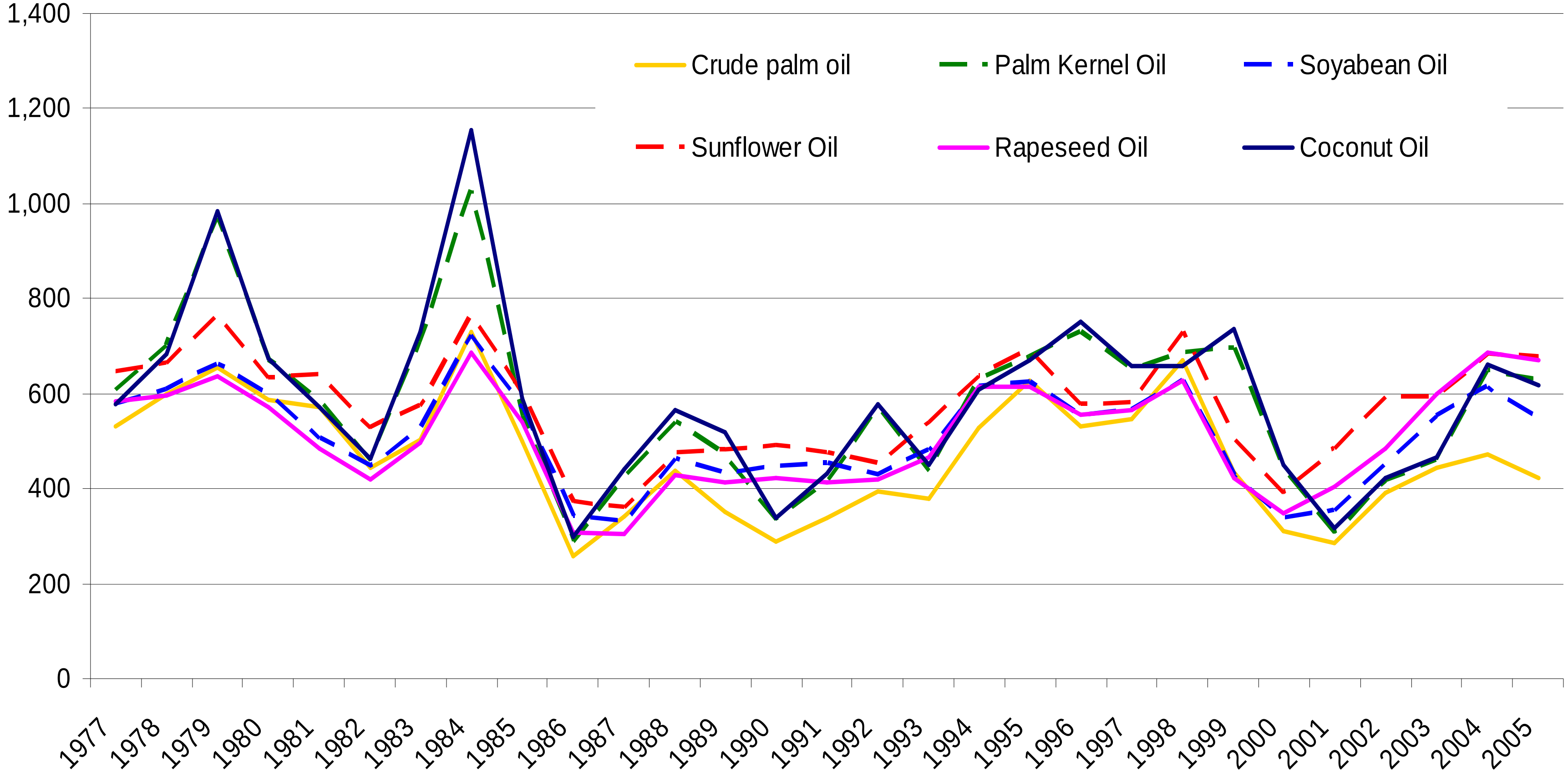


Source: USDA

CNO and its nearest substitute palm kernel oil typically trade at a discount compared to other oils. There has been a slight downward trend in CNO prices over the last 3 decades, although all oils have experienced considerable price volatility driven largely by supply fluctuations

Vegetable oil prices, 1977 - 2005

Price: CIF Rotterdam in current US$ per ton

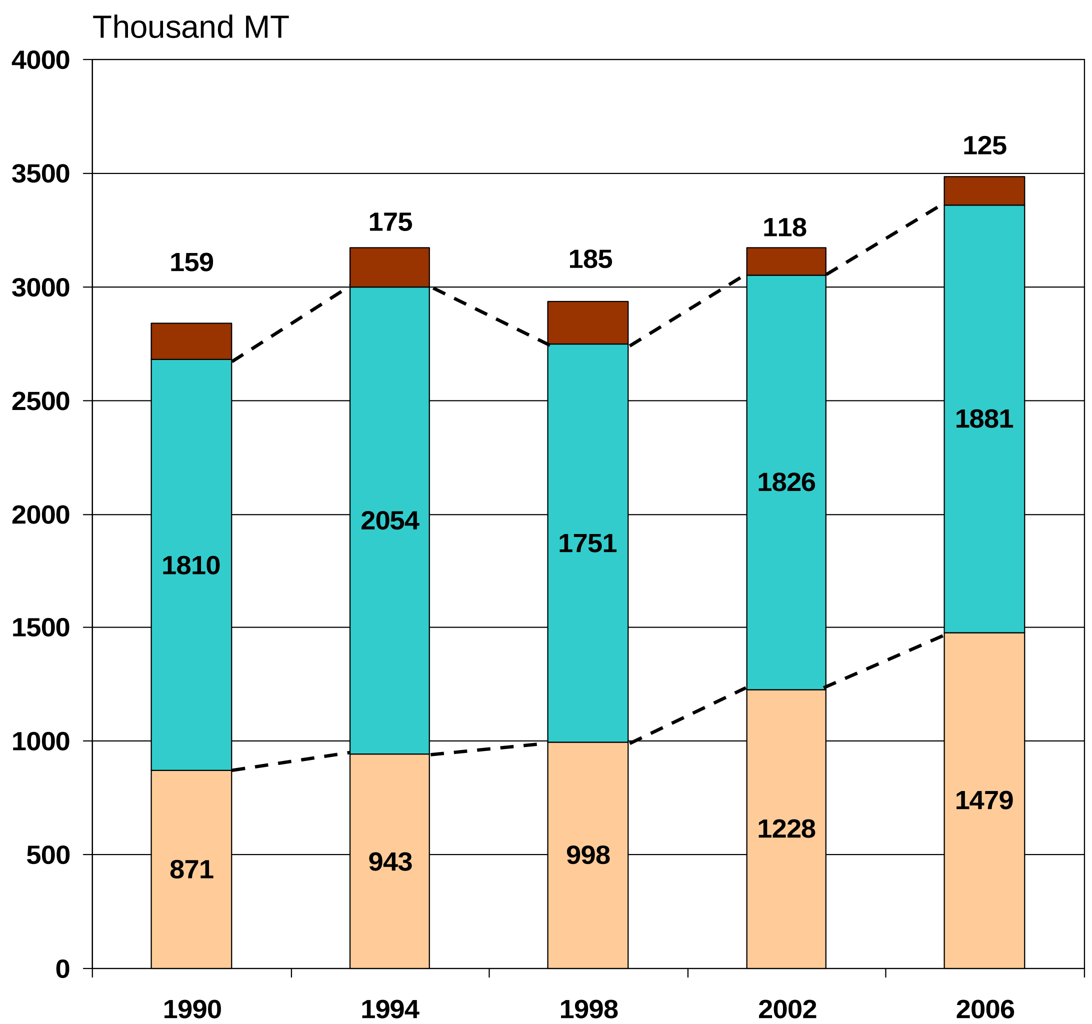


Source: Oil World

1 Introd-uction | 2 Demand | 3 Competi-tiveness | 4 Impact | 5 Opport-unities | 6 Next Steps

supported by PROSPERITY INITIATIVE

CNO is used for industry, food use and feed waste. Industrial use is increasing the fastest at 3.4% p.a., while food use is quite stable but has the biggest share in CNO consumption (54% in 2006). Feed waste is a small (3.6% in 2006) and decreasing (-1.5% p.a.) part of the market



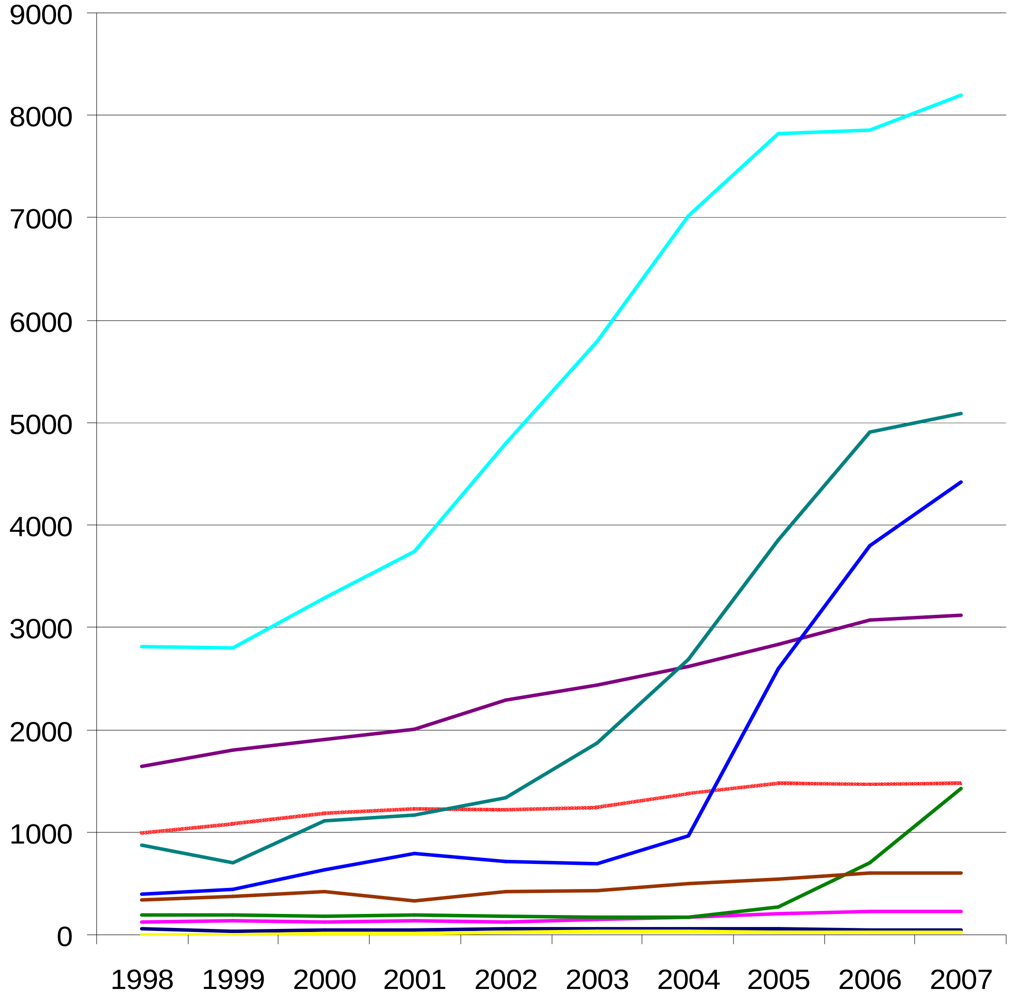
Source: USDA

	CAGR '90 – '06	Share in 2006
Feed Waste Dom. Cons.	-1.49%	3.59%
Food Use Dom. Cons.	0.24%	53.97%
Industrial Dom. Cons.	3.36%	42.44%

Recently, demand for CNO has been driven not only by food uses but also by the oleochemical and biofuel industries. This demand is primary based on the chemical properties of coconut oil.

Over the last decade, coconut usage for industrial purpose has remained quite flat while its counterpart palm kernel oil has been on a rising trend

Industrial domestic consumption of vegetable oil in '000 MT



	CAGR '98 – '07	Share in 2007
Oil, Coconut	4.54%	6.04%
Oil, Cottonseed	7.55%	0.94%
Oil, Olive	-0.43%	0.21%
Oil, Palm	12.65%	33.25%
Oil, Palm Kernel	7.34%	12.64%
Oil, Peanut	21.10%	0.11%
Oil, Rapeseed	21.72%	20.65%
Oil, Soybean	30.74%	17.93%
Oil, Soybean (Local)	24.87%	5.78%
Oil, Sunflowerseed	6.43%	2.45%

Source: USDA

supported by PROSPERITY INITIATIVE

In the oleochemical industry, CNO faces high competition from palm kernel oil which has similar ingredients structure and is also a main source of lauric fatty acid (C12) which is said to have health benefits

Fatty Acid Compositions of Palm Oil Products, Soy Oil and Coconut Oil

Fatty Acids	Weight Percentage						
	Palm Oil	Palm Olein	Palm Stearin	Palm Kernel Oil	Palm Kernel Olein	Coconut Oil	Soy Oil
C6:0				0.3	0.4	0.2	
C8:0				4.4	5.4	8.0	
C10:0				3.7	3.9	7.0	
C12:0	0.2	0.2	0.3	48.3	41.5	48.2	
C14:0	1.1	1.0	1.3	15.6	11.8	18.0	
C16:0	44.0	39.8	55.0	7.8	8.4	8.5	6.5
C18:0	4.5	4.4	5.1	2.0	2.4	2.3	4.2
C18:1	39.2	42.5	29.5	15.1	22.8	5.7	28.0
C18:2	10.1	11.2	7.4	2.7	3.3	2.1	52.6
Others	0.8	0.9	0.7	0.1	0.1		8.0
Iodine Value	53.3	58.4	35.5	17.8	25.5	9.5	133.0

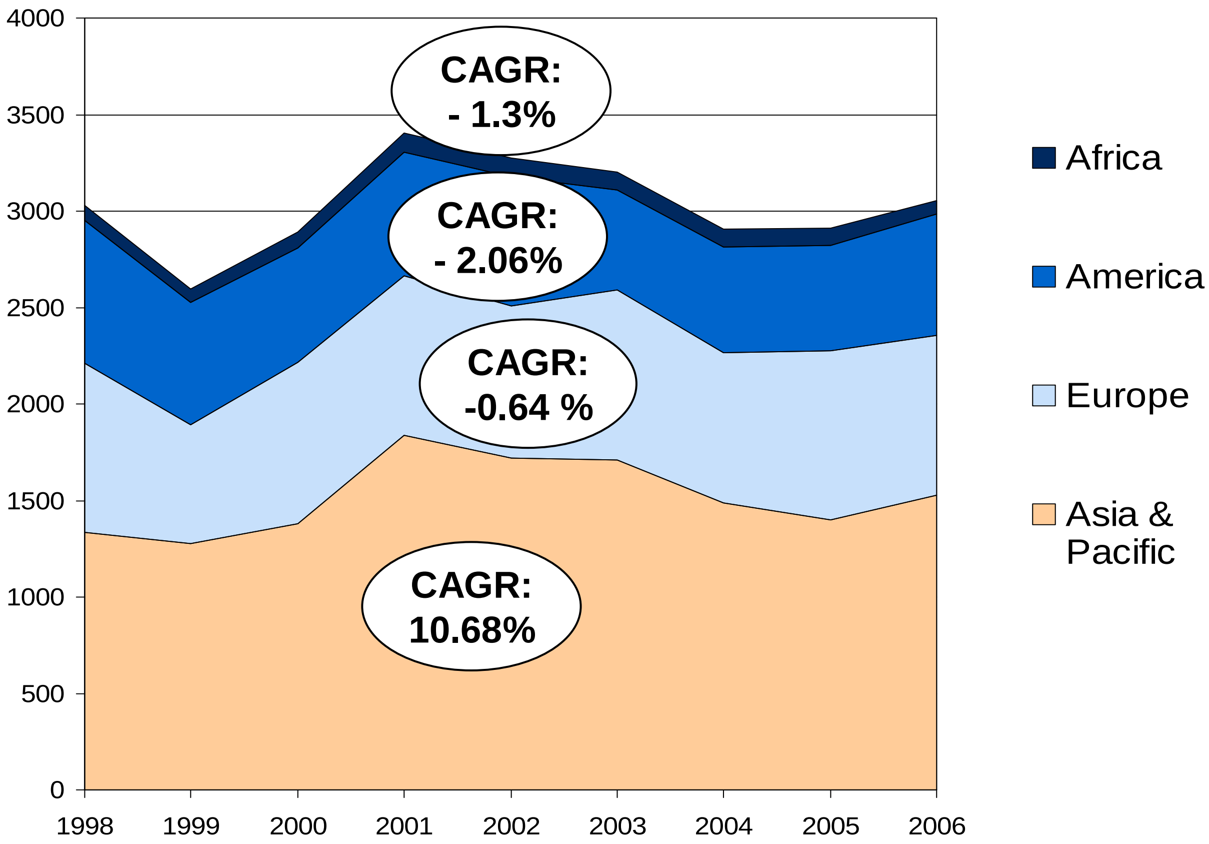
The palm tree also has a competitive advantage over the coconut tree as fruits from palm oil produce two distinctive oils: Palm oil provides mainly C16 and C18 oil and Palm kernel oil provides C12 and C14 oil.

Source: Salmiah Ahmad, 2000

Asia & Pacific is the biggest consuming region of CNO accounting for over 40% in 2006 with a growth rate of 10.7% p.a. in 1998 – 2006

CNO consumption by region

In thousand MT



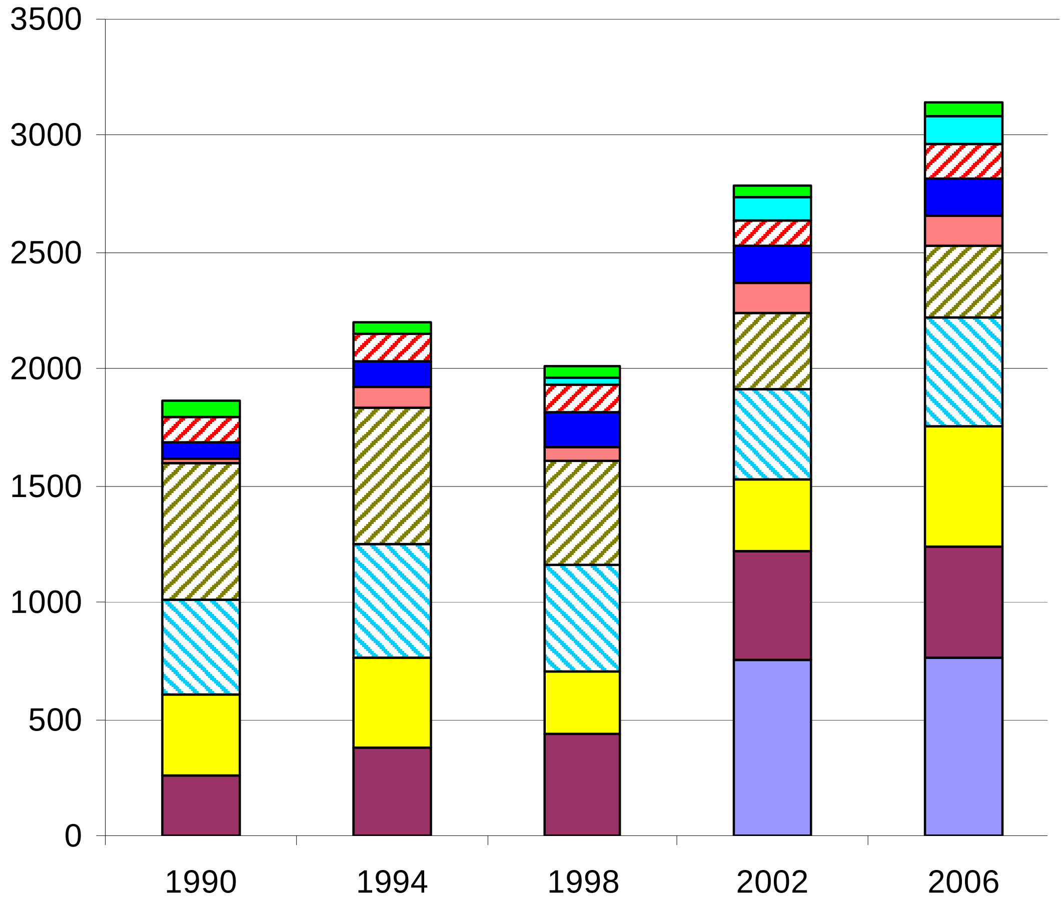
In 2006 the Asia & Pacific Region gained over 40% of the total market share of CNO consumption

Consumption of coconut oil in Africa, America and Europe decreased from 1998 to 2006 (with CAGRs of -1.3%, -2.06 and -0.64% respectively.

Source: Coconut Statistical yearbook 2006, APCC

In consumption, EU27 has maintained its position as the biggest consumer of CNO followed by some Asia/Pacific countries and USA, but the highest growth rates have been in Russia, Vietnam, and China

Top 10 countries of CNO consumption in '000 MT

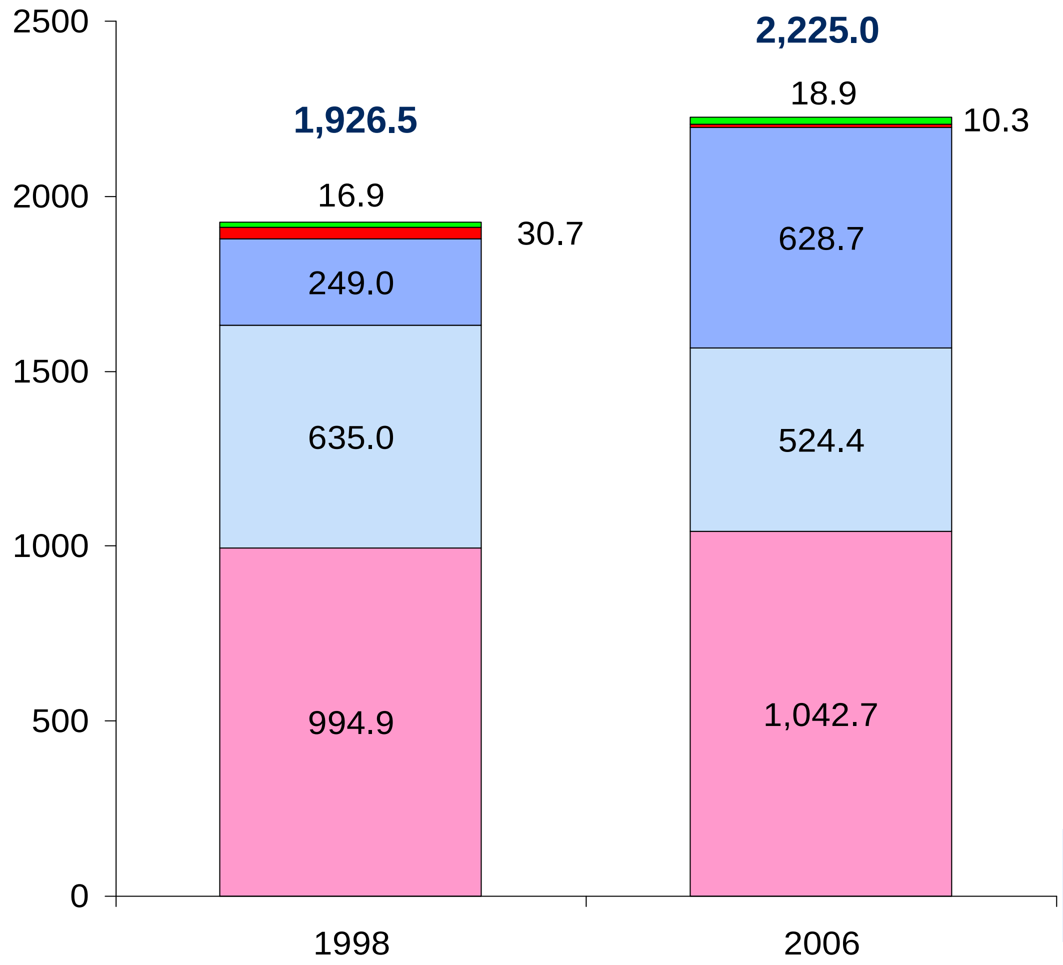


Country	Share in 2006 (%)	CAGR (1990–2006) (%)
Japan	1.72	-1.13
Russia	3.44	22.28*
Mexico	4.42	2.3
Vietnam	4.39	4.82
China	3.82	12.57
Indonesia	8.6	-4.1
United States	13.4	0.86
Philippines	14.95	2.55
India	13.45	3.9
EU-27	22.01	0.75*

Source: USDA, CAGR of EU 27 (1999 – 2006) & Russia (1998 – 2006)
* Note: EU figures for 1990, 1994 and 1998 not obtainable owing to problems with aggregating data from various European countries

EU is also the largest destination for CNO imports, accounting for 1.043 million tonnes in 2006 or just over 46% of global imports, although its recent growth rate is slower than other regions

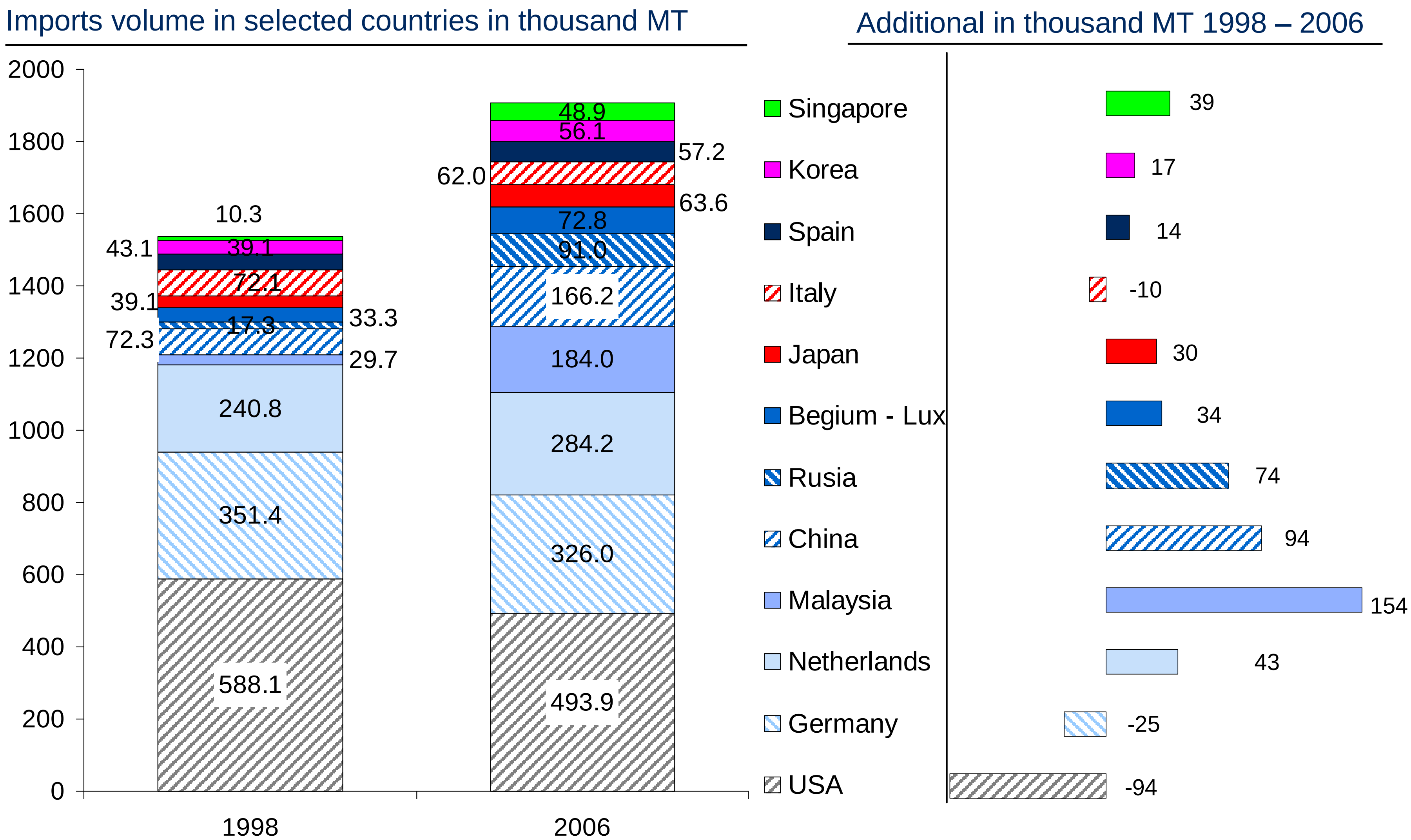
Imports of coconut oil in thousand MT



	•2006 •Share	•CAGR '98-'06
Pacific	•0.85%	•1.45%
Africa	•0.46%	•-12.75%
Asia	•28.26%	•12.27%
America	•23.57%	•-2.36%
EU	•46.86%	•0.59%
• Total		**•1.82%**

Source: Coconut statistical yearbook 2006, APCC

The top 12 importing countries account for 86% of total CNO imports. It is these countries which have been driving growth in imports although the volume imported by the two largest countries (USA and Germany) has been falling

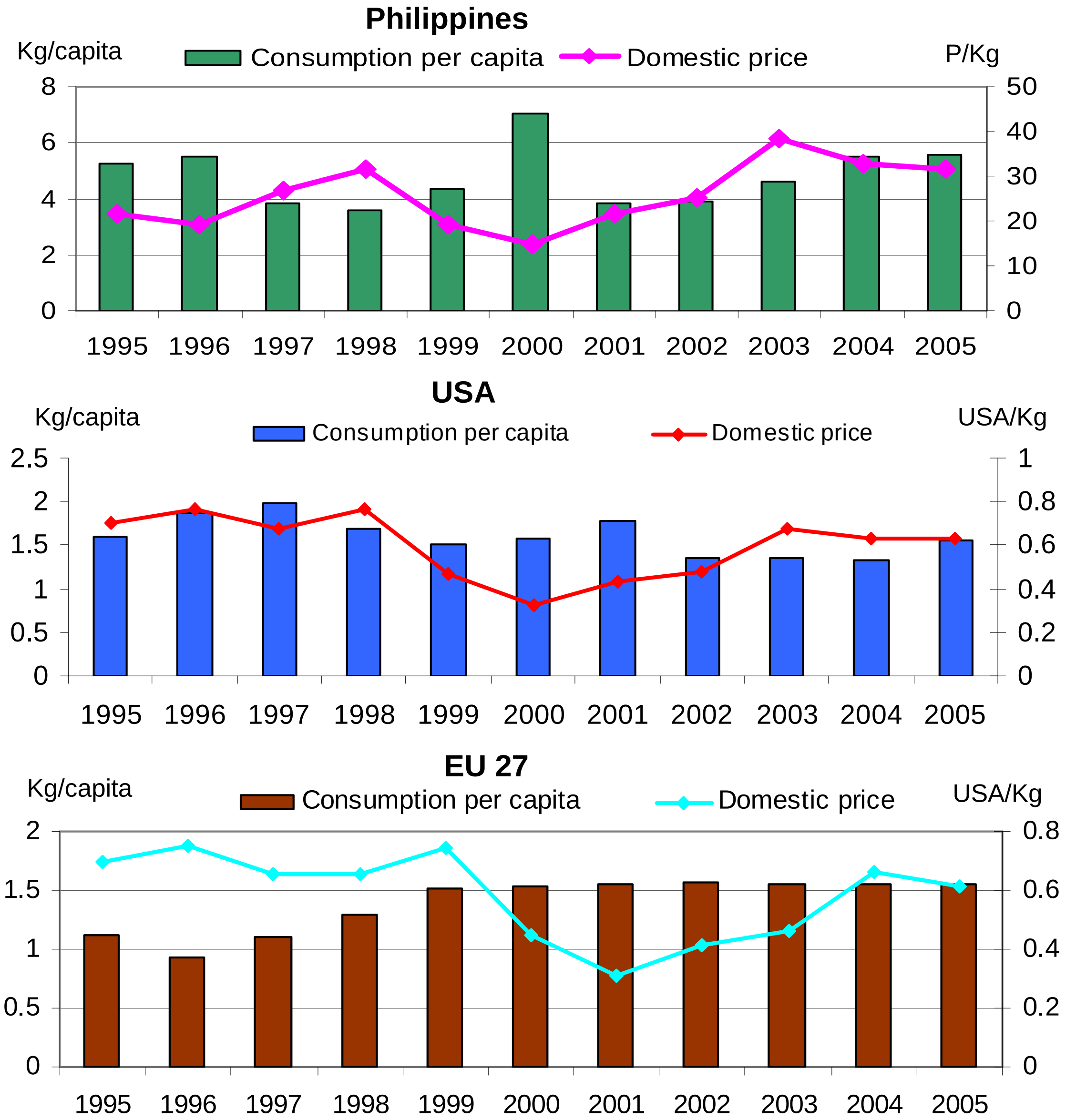


Source: Coconut statistical yearbook 2006, APCC

In some key CNO consuming countries, price appears to have a relatively strong impact on demand

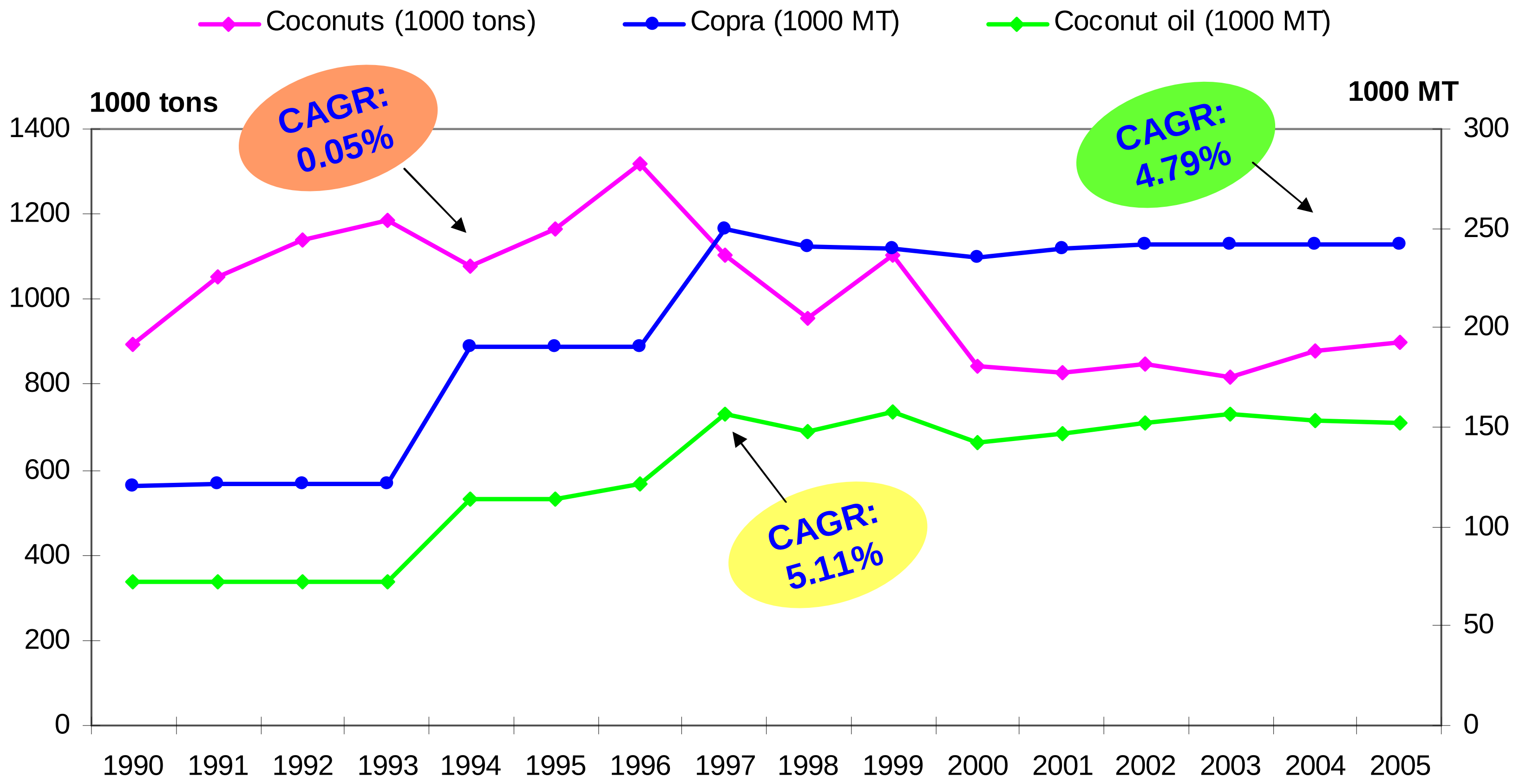
Country/ Region	CAGR of Price	CAGR of cons. per capita
Philippines	2.63 %	0.35%
EU27	-0.90 %	2.78 %
USA	-0.73%	0.23 %

In selected importing and consuming countries/regions, the price of coconut oil appears to be inversely related to consumption, i.e. when the price goes up, consumption of coconut oil quickly goes down. However, this needs to be reviewed in more depth before clear conclusions can be drawn



Source: http://pca.da.gov.ph/sstories

Consumption of CNO and copra in Vietnam grew rapidly in the 1990s, but has tailed off over the last few years while consumption of coconuts has dropped



Source: FAOSTAT, USDA
Note: The figures for production and imports from APCC and USDA are different

Chapter 2 – Demand

1 Introduction	2 Demand	3 Competi-tiveness	4 Impact	5 Opport-unities	6 Next Steps

- **Overall global demand for coconuts**

  *** Some major coconut products**

  - Copra
  - Coconut oil (CNO) and copra meal
  - **Virgin coconut oil (VCO)**
  - Desiccated coconut (DC)
  - Other utilizations

Virgin coconut oil (VCO)

What is VCO?

VCO is produced using fresh coconut kernel.

The main difference between VCO and coconut oil is the source:

- Coconut oil comes from copra. The oil derived from copra must be refined, bleached and deodorized to be fit for human consumption.

- VCO is produced from fresh coconuts. There is no need for refining, bleaching or deodorizing of VCO.

Major uses of VCO:

- As a hair conditioner
- As body oil or moisturizing lotion
- As carrier oil for aromatherapy and massage oils
- As a functional food
- As a cooking oil

The Philippines is a major producer of VCO, largely for domestic consumption; other producers include Samoa, Indonesia and Thailand

Philippines VCO Production and Export

Quantity	Local consumption (MT)	Export (MT)	Export Value (USD)	(%) Export
2001	2,006	1.8	19,810	0.09
2002	18,980	19.1	91,618	0.10
2003	82,987	113	406,580	0.14
2004	299,823	177	553,500	0.06
2005	363.525	475	1,612,323	0.13

- Production of VCO in the Philippines has increased dramatically. It is largely consumed domestically
- Although exports account for less than 1% of total use, they increased very rapidly with a CAGR of 300% from 2001 to 2005.

Source: PCA-MDD

United States is the largest VCO consumption country and imports 94% of VCO exports from the Philippines. The EU and other countries in Asia/Pacific have become new destinations for Philippines VCO in recent years

Market demand of Philippines VCO

Country	2005	Share in 2005 (%)
USA	446	93.90
EU	12	2.53
Asia	14	2.95
Others	3	0.62
Total	475	100.00

Source: PCA-MDD

Price:

- VCO retails for between USD3.00-5.00 per litre
- Philippines VCO export price has been averaging <USD3,000 MT in 2008

Market driven:

- Consumer demand for:
  - Cooking oil
  - Cosmetic products
  - Functional food
  - Organic products
- Growing acceptance of herbal/natural medicine in some markets
- Growing awareness of the value of food and nutrition in preventing diseases
- Increasing interest in natural products for food uses and beauty products.

Chapter 2 – Demand

1 Introduction	2 Demand	3 Competi-tiveness	4 Impact	5 Opport-unities	6 Next Steps

- **Overall global demand for coconuts**

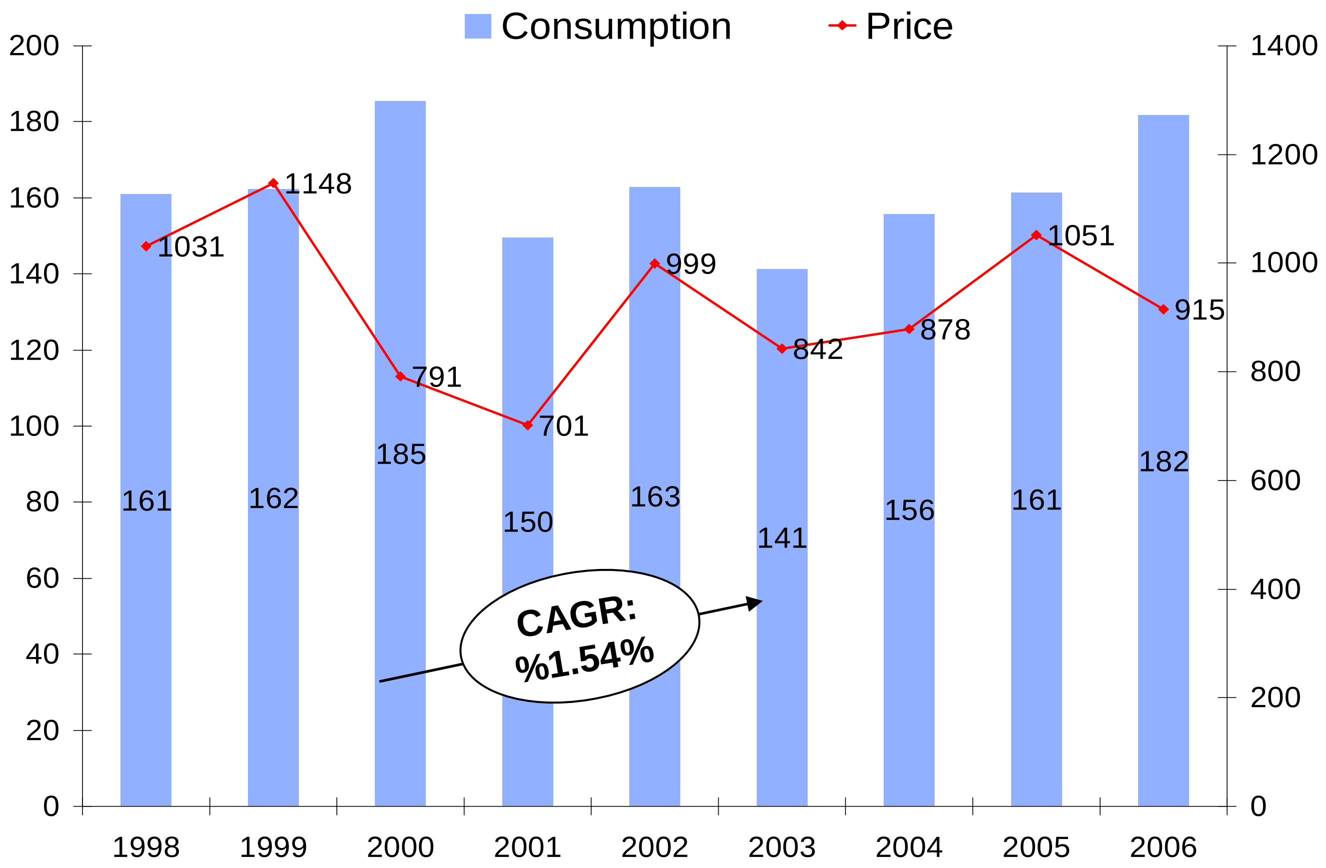
  *** Some major coconut products**

  - Copra
  - Coconut oil (CNO) and copra meal
  - Virgin coconut oil (VCO)
  - **Desiccated coconut (DC)**
  - Other utilizations

Global consumption of DC grew at 1.54% p.a. in the period 1998 – 2006, and total consumption in 2006 was 182,000 tonnes

Global DC consumption in thousand MT

Price: FOB Sri Lanka in US$ per MT



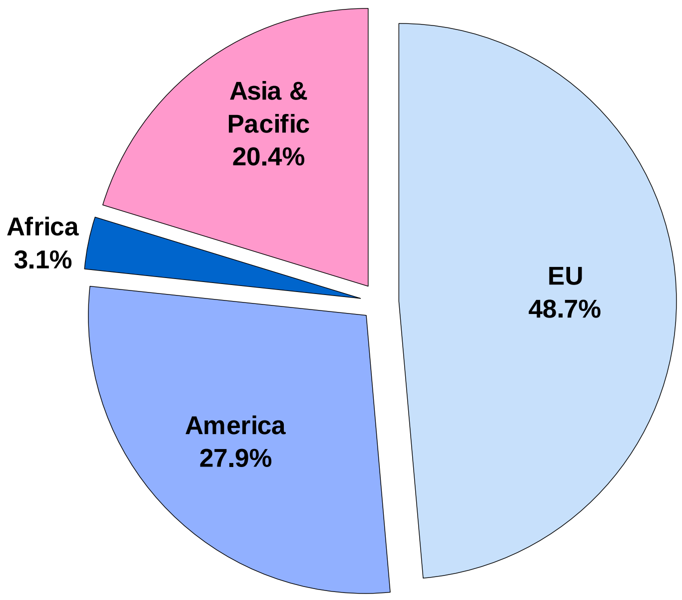
Source: Coconut Statistical yearbook 2006, APCC

Main reasons for increase in DC:

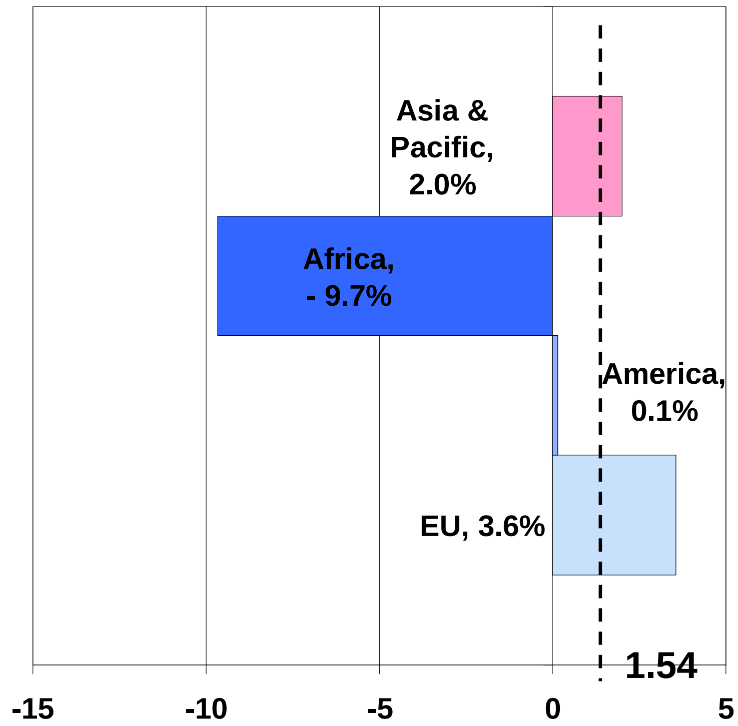
- Because about 60 – 80% of global DC production is used in the bakery and confectionery industries, global DC consumption depends on bakery demand in the industries and their associated food safety requirements
- DC prices have reduce lightly from 1998 to 2006 affecting the increase in DC demand.

Europe is the biggest consuming region of DC, followed by America and Asia & Pacific. In 2006 the EU's consumption of 88,558 tonnes accounted for 48.7% of the total with a CAGR of over 3.6% p.a. from 1998 to 2006

Share of DC consumption in 2006



CAGR of DC consumption from 1998 to 2006



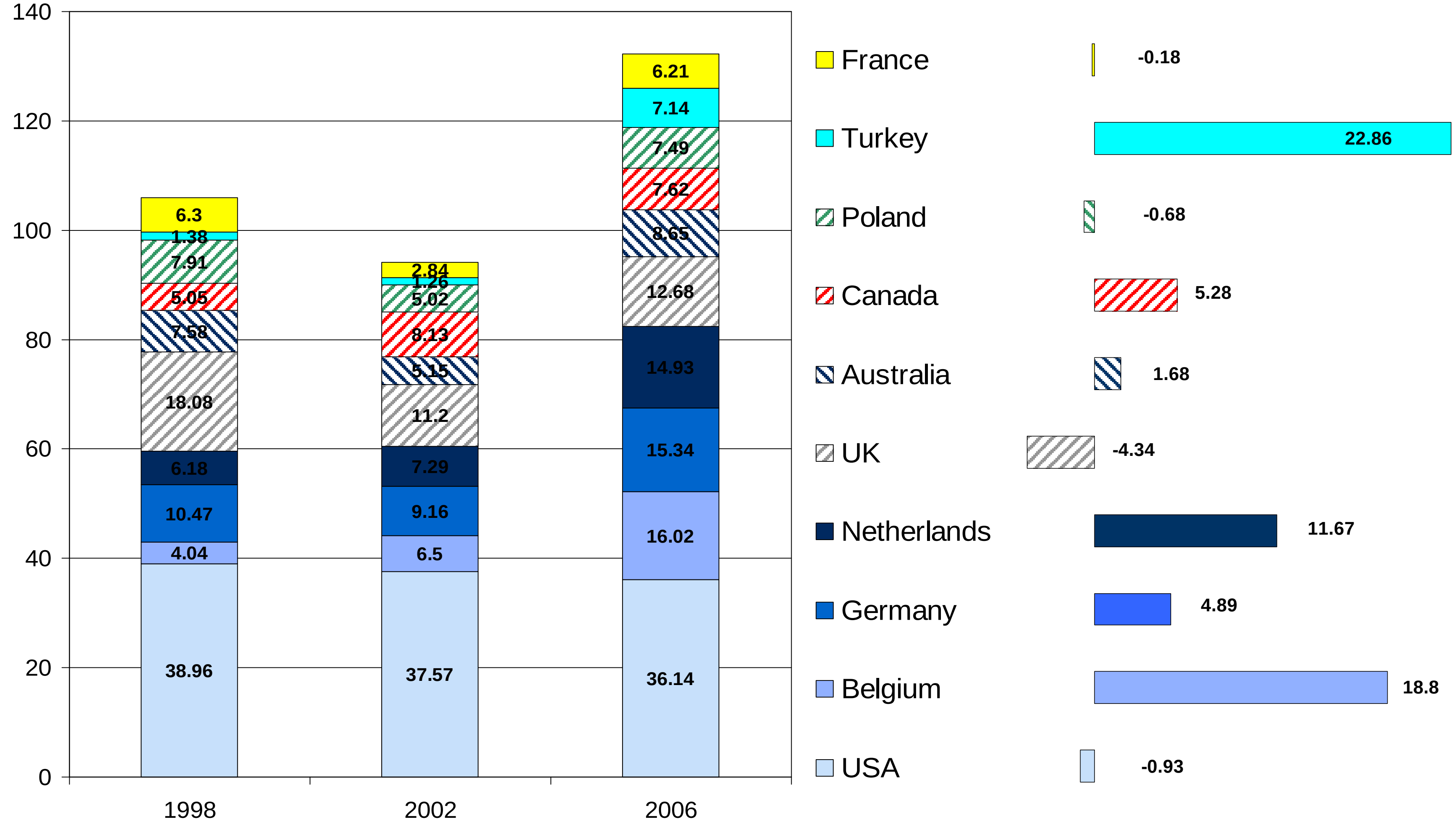
- In Europe: The U.K. consumed the highest quantity of DC, namely 12,884 tonnes in 2006 which represented 14.5% of Europe's total consumption of 88,558 tonnes and 7% of global consumption
- In the Americas: the USA consumed 36,141tonnes in 2006, accounting for 71.4% of the Americas' total and 19.9% of global consumption

Source: Coconut Statistical yearbook 2006, APCC

The top ten DC consuming countries accounted for ~73% of the total in 2006. Belgium, Netherlands and Turkey had the highest CAGR from 1998 – 2006 (although these figures include transshipments)

DC consumption in selected countries in thousand MT

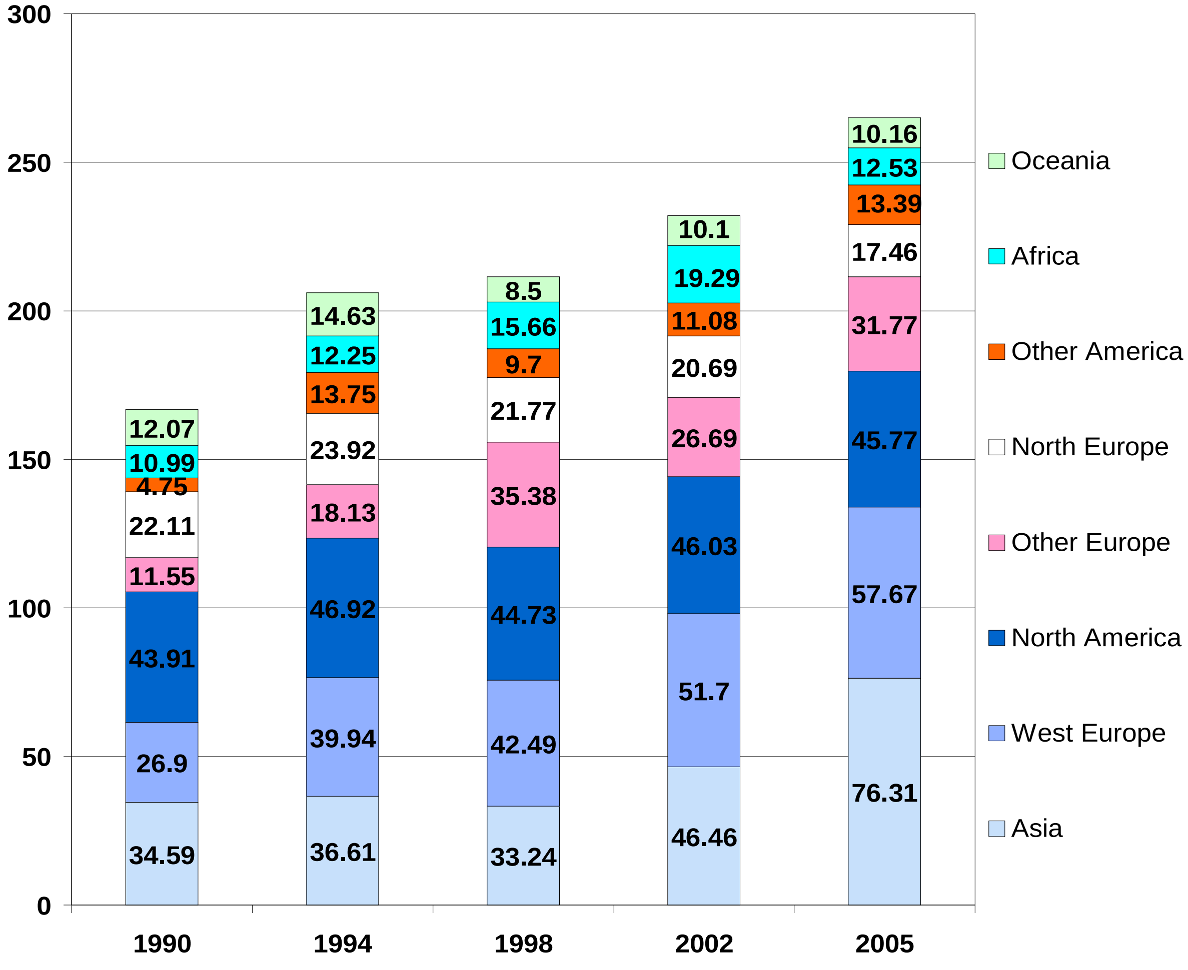
CAGR 1998 – 2006 in percent



Source: Coconut Statistical yearbook 2006, APCC

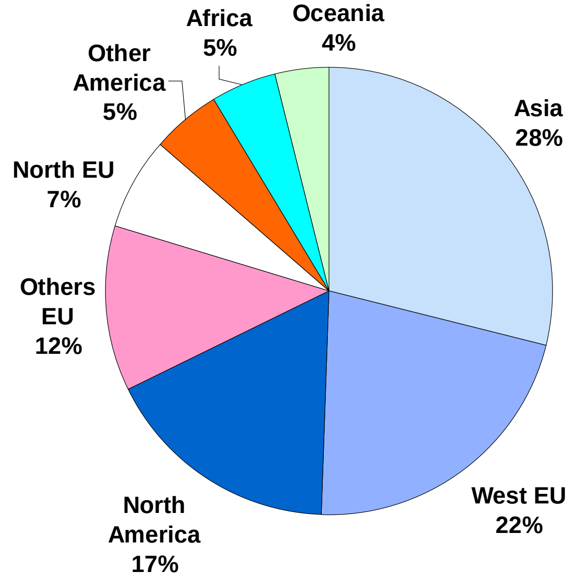
The volume of imported DC has increased from 168,580 tonnes in 1990 to 265,380 tonnes in 2005 with a CAGR of 3.08%

DC imports by region in thousand tonnes



Source: FAOSTAT, Overview the desiccated coconut sector - ACIAR

Share in 2005



The main importers, the USA and EU, account for 57.5% of the total. In 2005, USA imported 38,530 tonnes of DC, which at 14.5% of total global imports makes it the biggest consuming country of DC in the world

Chapter 2 – Demand

1 Introduction | 2 Demand | 3 Competi-tiveness | 4 Impact | 5 Opport-unities | 6 Next Steps

- **Demand for coconut**

  *** Some major coconut products**

  - Coconuts
  - Copra
  - Coconut oil (CNO) and copra meal
  - Virgin coconut oil (VCO)
  - Desiccated coconut (DC)
  - **Other utilizations**

Other utilizations of coconut – Overview

In addition to the various uses of the coconut fruits, all other parts of the coconut can be manufactured into commercial products, including the coir and leaves. The coconut palm wood also has many potential uses such as:

- Construction
- Furniture
- Handicrafts
- Charcoal
- Fibre
- Chemicals

- **Supply of Coconut Wood:**

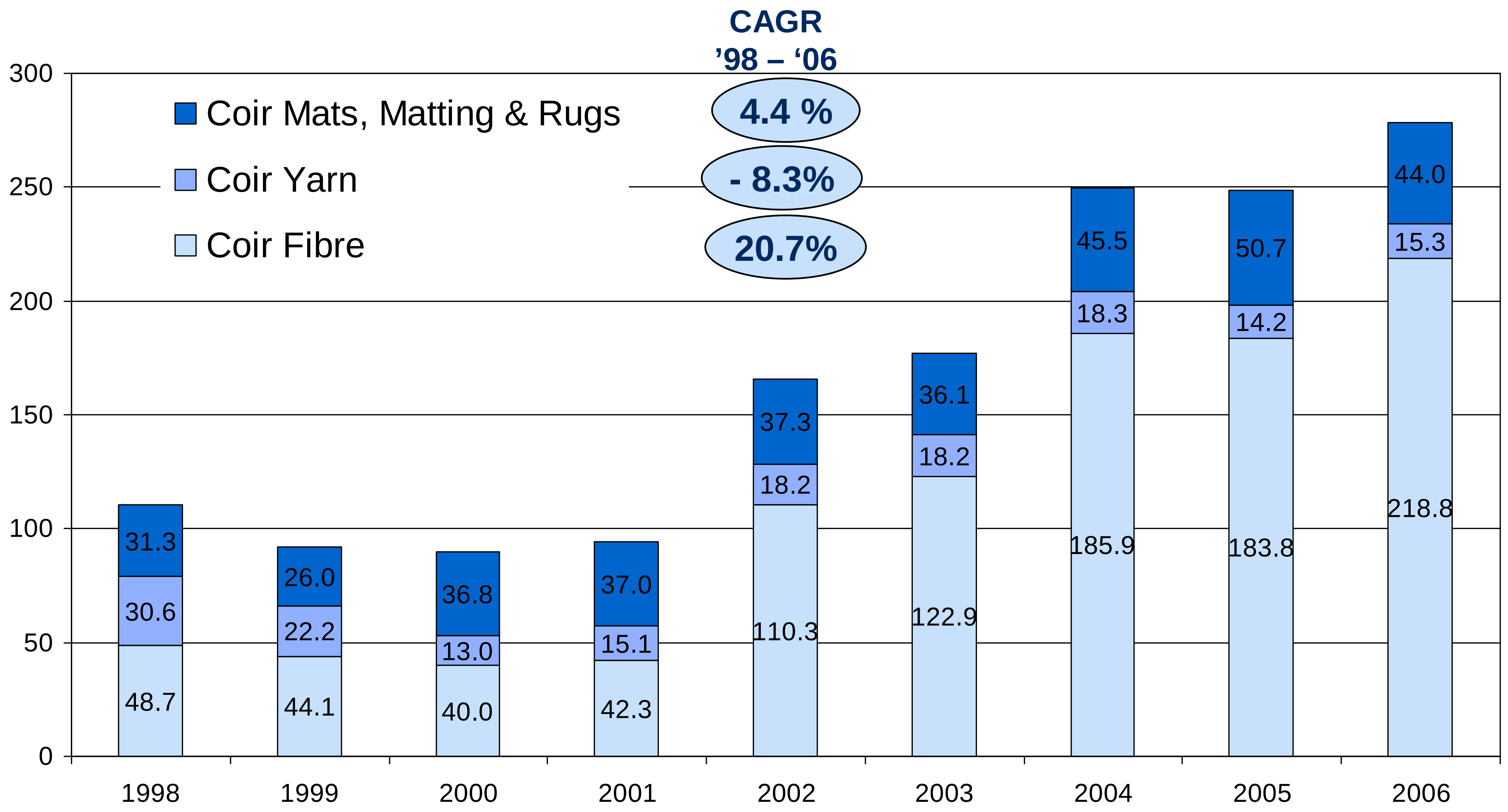
Indonesia, the Philippines and some Asia/Pacific countries where there are large areas with senile palms available to be cut up and processed into coconut wood products

- **Demand for Coconut Wood:**

The demand for coconut wood has increased for housing, construction, furniture, novelties, etc., for both domestic and export markets. Europe and the North American countries are good destinations for coconut wood furniture and other small and inexpensive novelty items considering its attractive clear-grained appearance and durability.

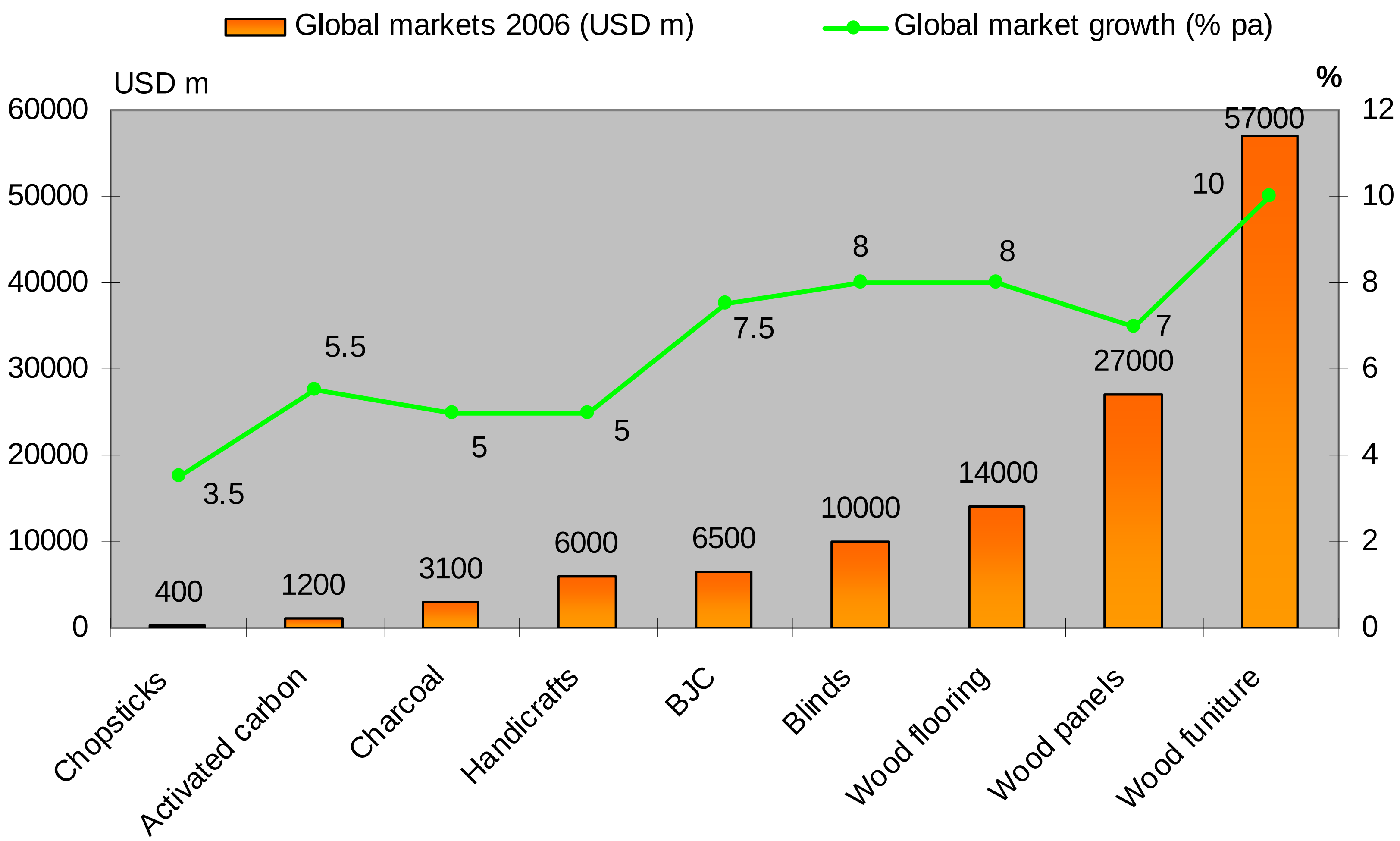
Among coir-based products, the demand for imported fibre has increased rapidly to 218,800 tonnes in 2006, or 20.7% p.a. since 1996. EU is the main markets for those products

Total import of selected coir-based coconut products in thousand MT



Source: Coconut Statistical Yearbook 2006, APCC

In the furniture and flooring markets, products based on coconut wood compete with many woods and other materials, but this market has been growing rapidly



Source: Mekong Bamboo, PI, BJC: Builders' Joinery and Carpentry Products

Supply conditions may also favour an increase in demand for coconut wood

Coconut wood has considerable potential in the future because:

- In Asia the availability of preferred tropical hardwood has declined dramatically in recent years, especially in areas with high population density
- The extensive amounts of senile and unproductive coconut trees in the Asia/Pacific region will have to be cut and replaced by younger and high-yielding varieties thus releasing huge volumes of raw materials for use
- Coconut wood processing technologies and appropriate machinery and equipment have been developed to enable efficient commercial operation for coconut wood use
- There are also significant prospects for income and employment generation to be derived from increased utilization of coconut wood.

While the older average age of coconut trees in some countries may position them better for the supply of coconut wood than Vietnam, the size and recent growth rate of the furniture market in particular still makes it potentially attractive

3. Competitiveness

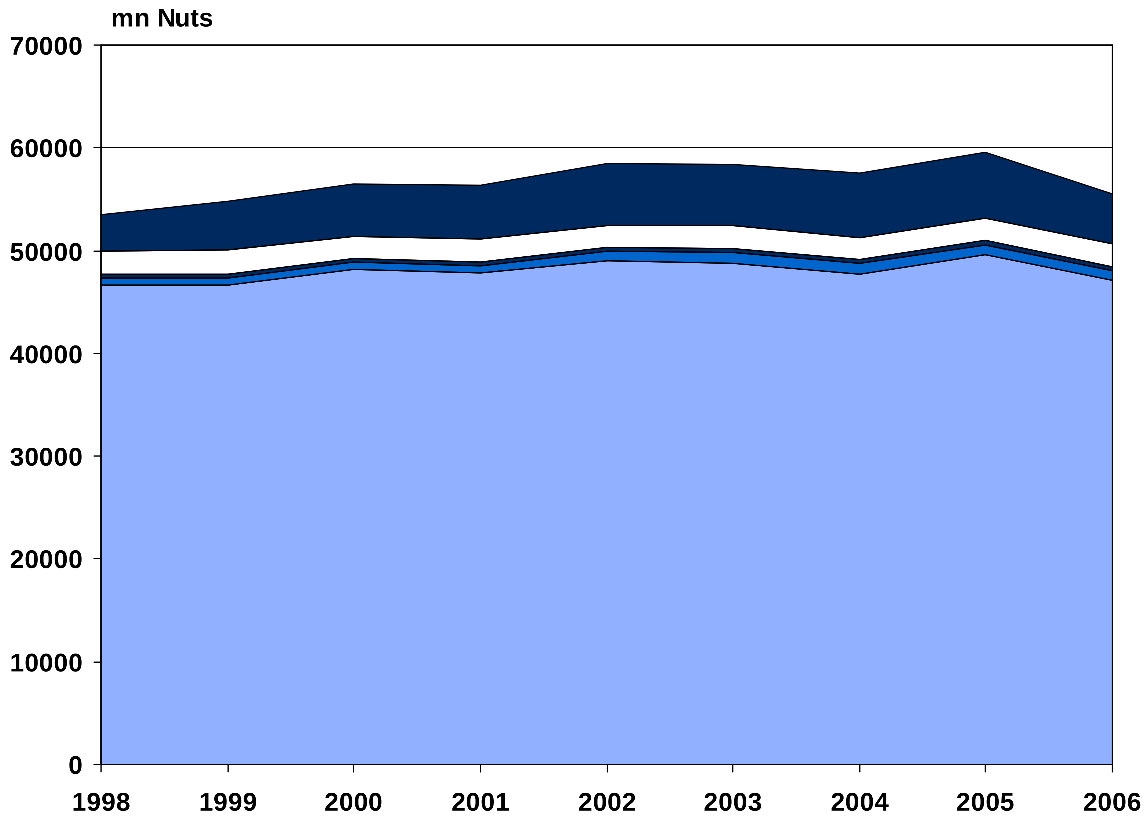
1 Introduction → 2 Demand → **3 Competi-tiveness** → 4 Impact → 5 Opport-unities → 6 Next Steps

- **Global supply chain**
- **Some major coconut products**
- **Local supply chain**
- **Competitiveness of Vietnam in international coconut market**

Selected countries of APCC – the largest coconut-producing region in the world

World production of coconuts in 2006 in "nut equivalent" was around 55,569 million nuts. APCC countries are the largest coconut producers with ~85% of total production, although this figure is barely growing

Production of Coconuts in nut equivalent

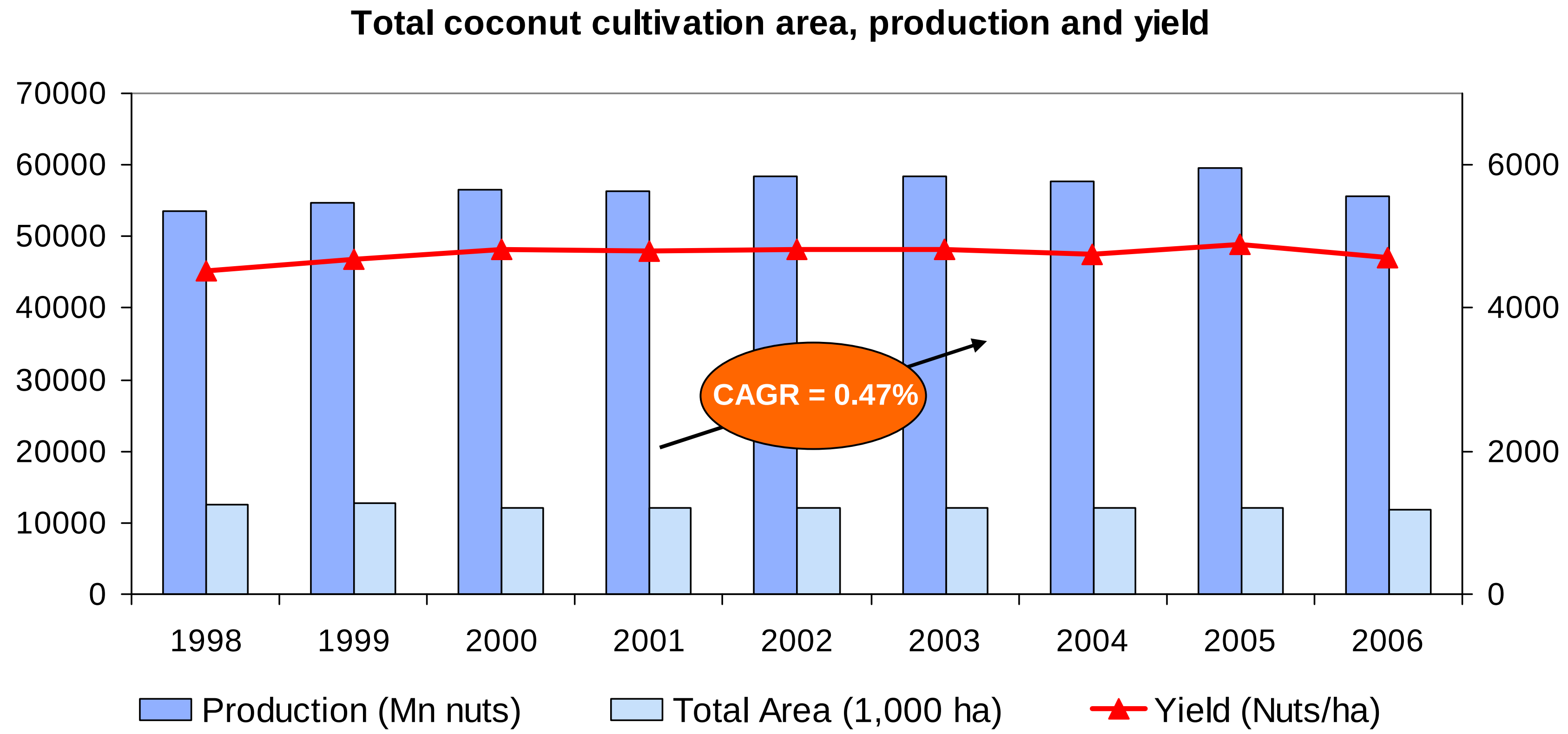


Regions	CAGR (1998 - 2006) (%)	Share in 2006 (%)
America	4.05	8.80
Africa	-0.39	4.02
Other countries of Pacific	2.19	0.66
Others countries of Asia	4.78	1.84
APCC countries	0.11	84.68
World	**0.47**	**100**

APCC includes 14 countries: F.S Micronesia, Fiji, India, Indonesia, Kiribati, Malaysia, Marshall Islands, Papua New Guinea, Philippines, Samoa, Solomon Islands, Sri Lanka, Thailand, Vanuatu, Vietnam

Source: Coconut statistical year book 2006 APCC

In the decade to 2006, the total global coconut cultivation area decreased by around 0.83% p.a., while production and yield increased steadily

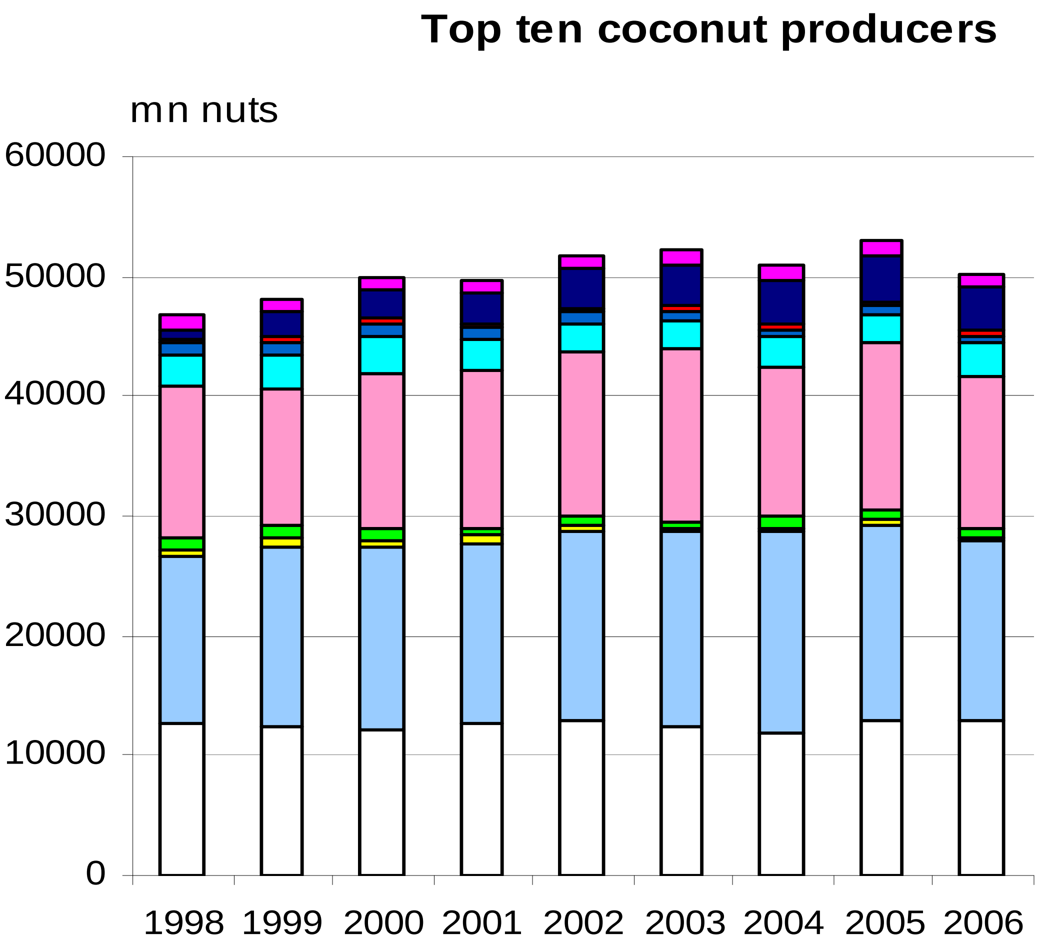


Total area has gone down to 11.7 million hectares in 2006 from 12.5 million hectares in 1998 because of senility, diseases, and weather, urbanization, and a switch to other more profitable crops.

Despite the reduction in total cultivation area, production has been increasing lightly with a CAGR of 0.47% owing to a gradual increase in yield per hectare.

Source: Coconut statistical year book 2006 APCC

The top 10 coconut-producing countries account for about 90% of world production; most of them are in the APCC region, but their growth rates differ

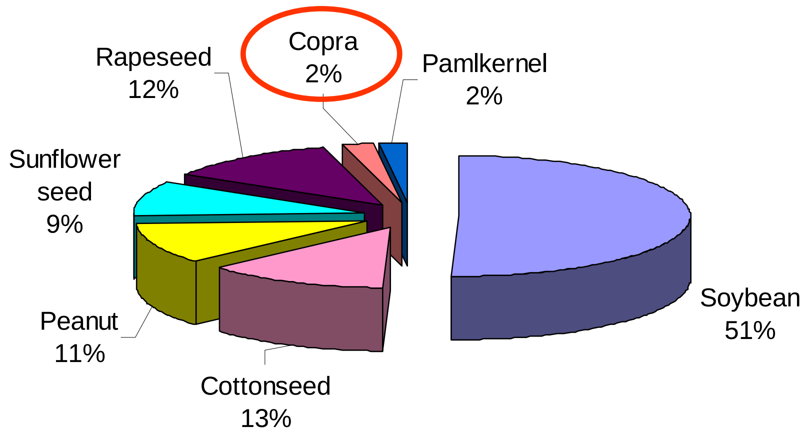


	Share in 2006 (%)	CAGR (%)
Thailand	2.25	1.19
Brazil	6.27	19.91
Myanmar	0.81	5.84
Vietnam	1.23	-5.98
Sri Lanka	5.01	1.24
Philippines	22.67	-0.2
Papua New Guinea	1.46	-0.68
Malaysia	0.72	-4.88
Indonesia	26.96	0.95
India	23.09	0.11
World	**100**	**0.47**

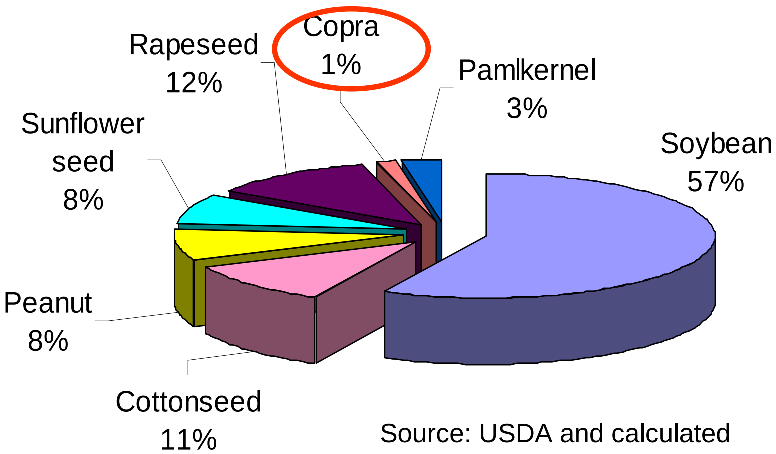
Source: Coconut statistical year book 2006 APCC

Coconut production accounts for a very small part of the total world oilseed market and its share has fallen from 2% in 1996 to 1% in 2006

Share of world production of oilseeds in 1996



Share of world production of oilseeds in 2006



Source: USDA and calculated

- Coconut has grown at a slower pace than other oilseeds because, as a perennial crop, its production area cannot readily be reduced area in times of excess and expanded in times of shortfall.
- For production of biodiesel, coconut oil is not competitive with other oils, especially palm oil. Palm oil is a far more efficient producer of oil in volume terms per hectare than other oils – at 6,000 litres/ha compared to coconut oil's productivity of 2,800 litres/ha.
- For edible oil, soybean and sunflower oils are promoted for consumption as poly-unsaturated oils as a healthier alternative to coconut.

Oilseeds	Share in 2006 (%)	CAGR (%)
Soybean	57.32	4.82
Cottonseed	11.06	2.36
Peanut	7.99	2.27
Sunflower seed	7.72	2.61
Rapeseed	11.82	4.49
Coconut	1.34	0.53
Pam kernel	2.74	7.39
Total	100	4.03

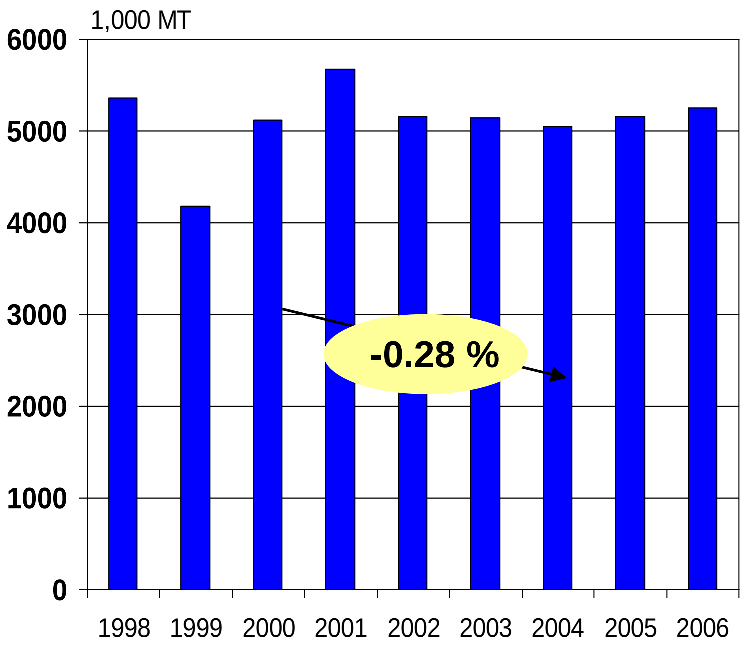
3. Competitiveness

1 Introduction	2 Demand	3 Competi-tiveness	4 Impact	5 Opport-unities	6 Next Steps

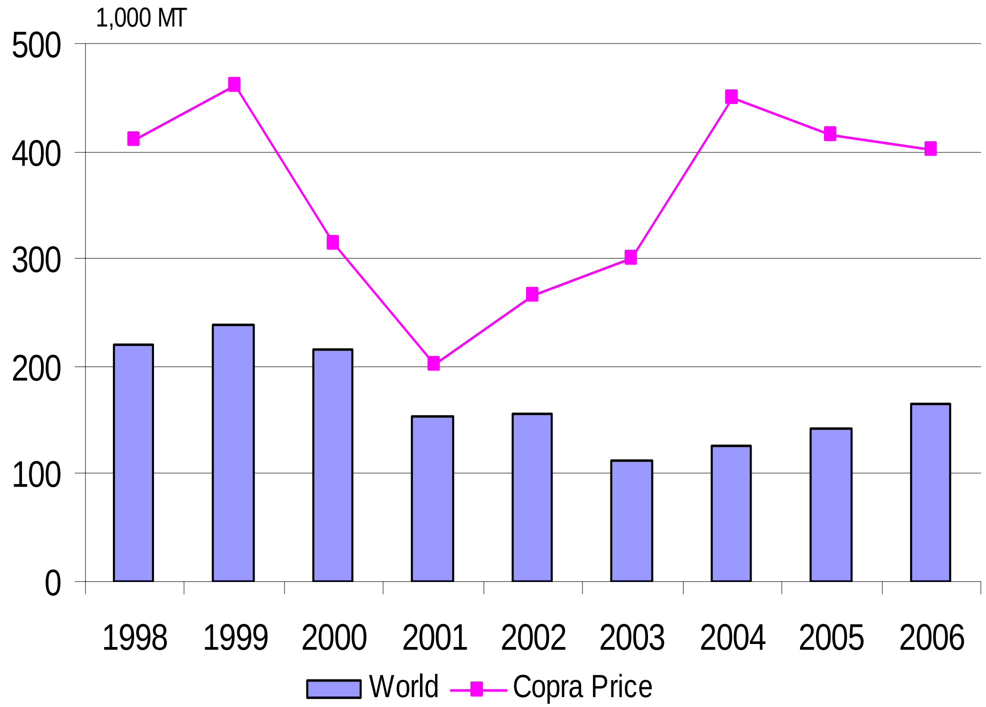
- **Global supply chain**
- **Some major coconut products**
  - o Copra
  - o Coconut oil (CNO) and meal
  - o Desiccated coconut (DC)
- **Local supply chain**
- **Competitiveness of Vietnam in international coconut market**

World production of copra has decreased slightly since 1998. APCC countries are the leaders in production accounting for 90% of the global total

World production of copra



World exports of copra and copra price

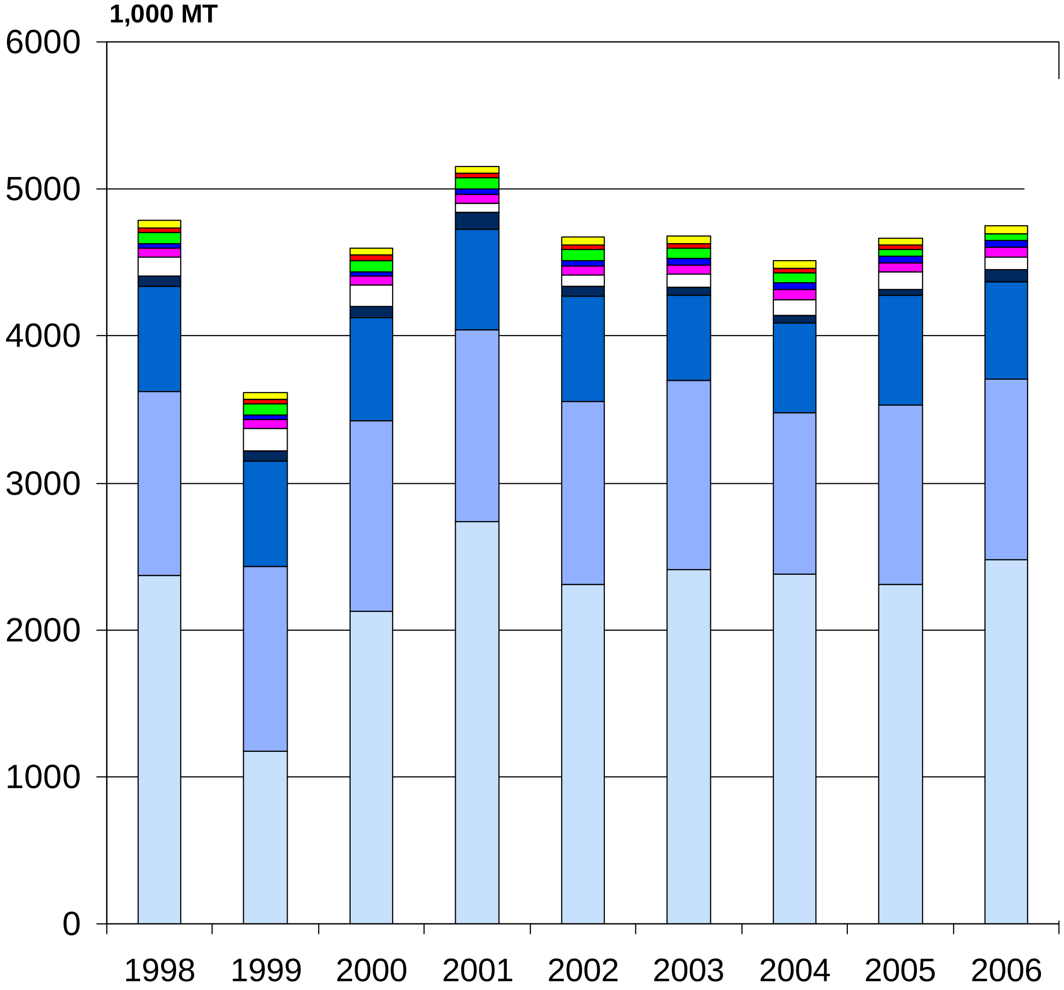


- Exports of copra account for only a small part of total copra production and the volume appears to be affected by the export price
- Copra can used for crushing oil, for copra meal, and for export. Some producers like to produce coconut oil and copra meal from copra or DC as an alternative to exporting copra, because of its higher value

Source: Coconut statistical year book 2006, APCC

The Philippines, Indonesia, and India are the largest producers of copra accounting for 83% of world production

Top ten copra production countries

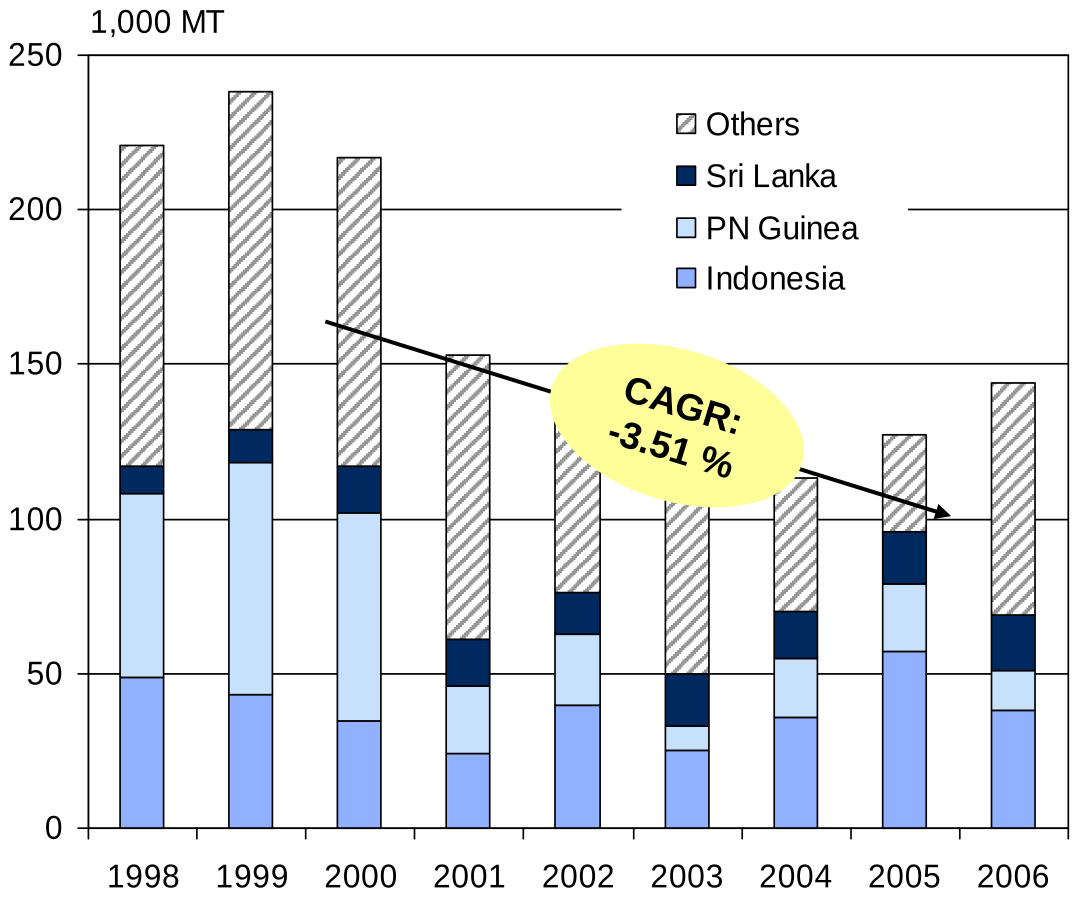


Countries	CAGR (%)	Share in 2006 (%)
Malaysia	0.25	0.97
Tanzania	0.00	0.57
Mozambique	-6.08	0.88
Ivory Coast	3.57	0.86
Thailand	1.18	1.28
PN Guinea	-4.47	1.64
Sri Lanka	1.66	1.54
India	-0.94	12.69
Indonesia	-019	23.46
Philippines	0.53	47.14
World	**-0.28**	**100**

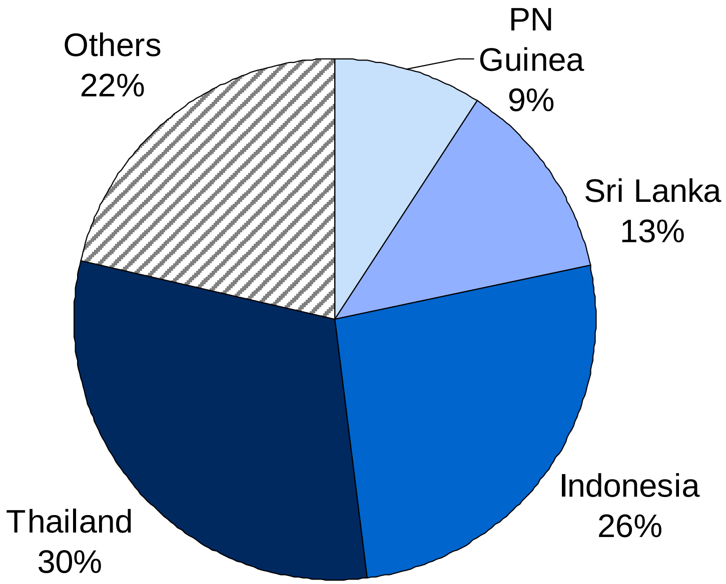
Source: Coconut statistical year book 2006, APCC

Copra export has been decreasing at a CAGR of -3.51% since 1998 with Thailand emerging as the largest single exporter

CNO production of Philippines and Indonesia



Share of world copra export in 2006



In 2006, Thailand began exporting copra and became a leading exporter

Source: Coconut statistical year book 2006, APCC

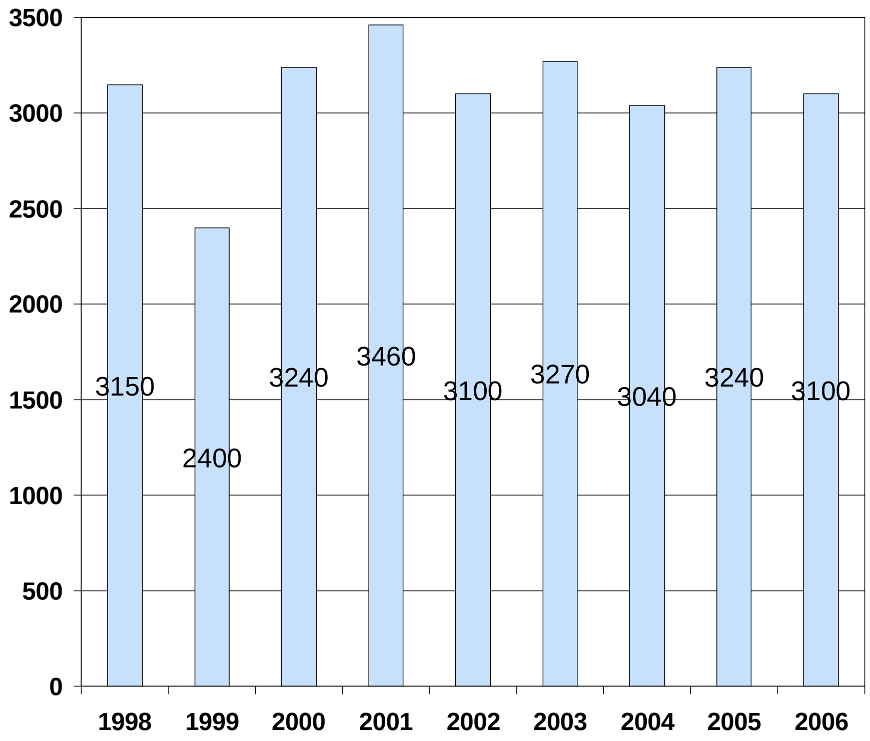
3. Competitiveness

1 Introduction	2 Demand	**3 Competi-tiveness**	4 Impact	5 Opport-unities	6 Next Steps

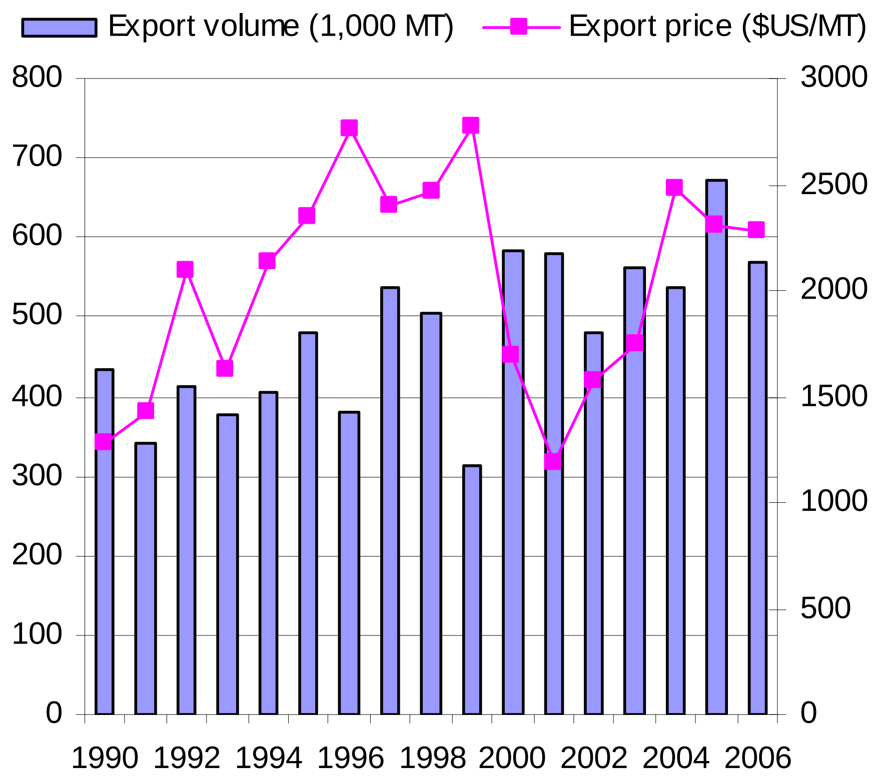
- **Global supply chain**
- **Some major coconut products**
    - o Copra
    - o Coconut oil (CNO) and meal
    - o Desiccated coconut (DC)
- **Local supply chain**
- **Competitiveness of Vietnam in international coconut market**

World coconut oil production remained at more or less the same level from 1998 to 2006, although exports have increased slightly

World CNO production in '000 MT



Exports of CNO and it's price

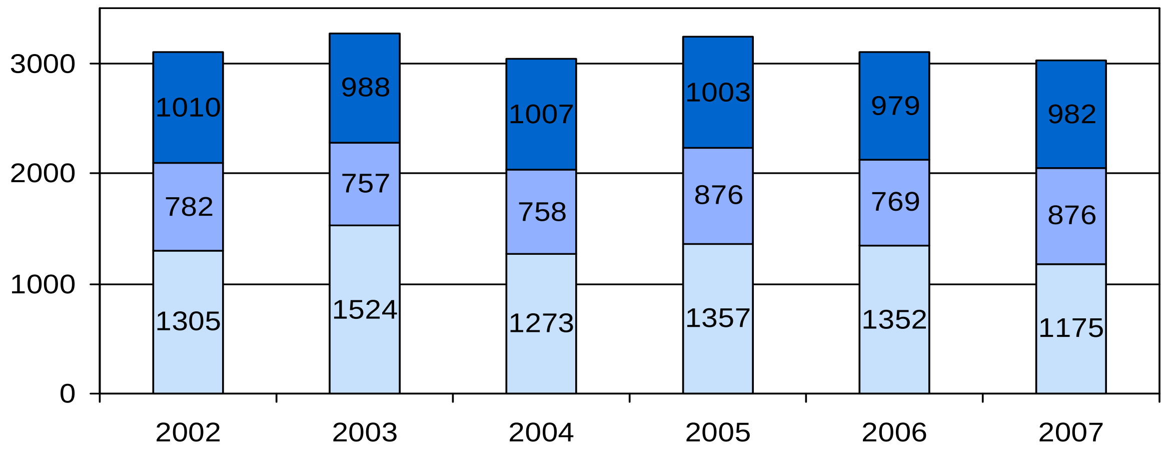


Exports of CNO accounted for 69.2% of CNO production in 2006 and have been increasing in recent years even though the export price has fluctuated and declined

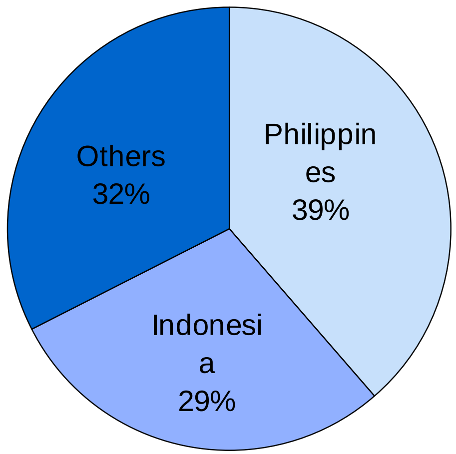
Source: USDA and APCC

The Philippines and Indonesia are the key producers and exporters of CNO

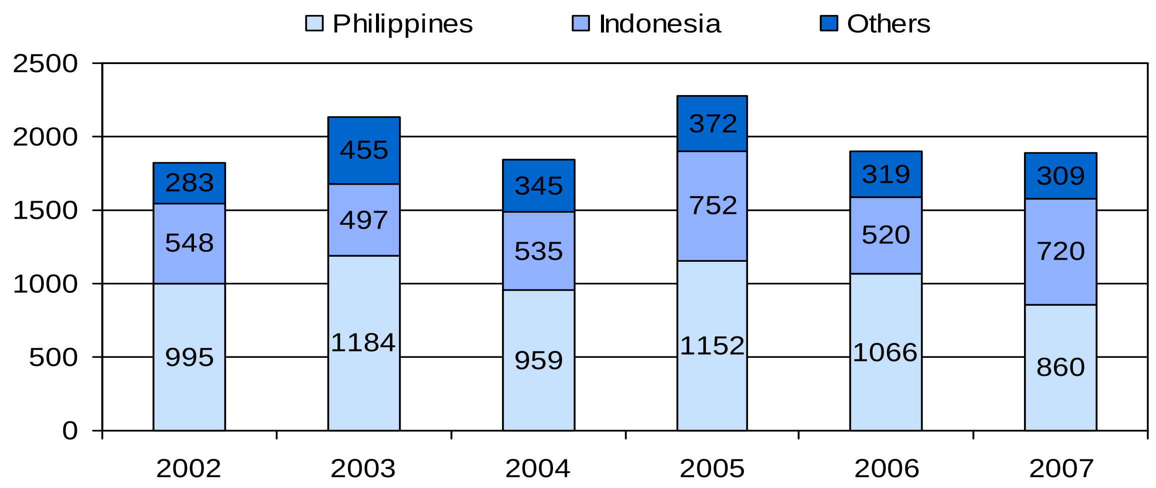
CNO production of Philippines, Indonesia in 1,000 MT

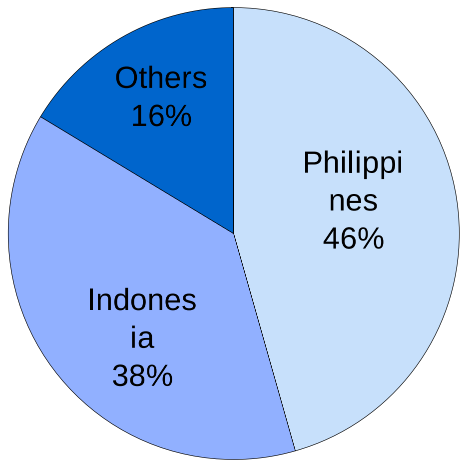


Share in 2007



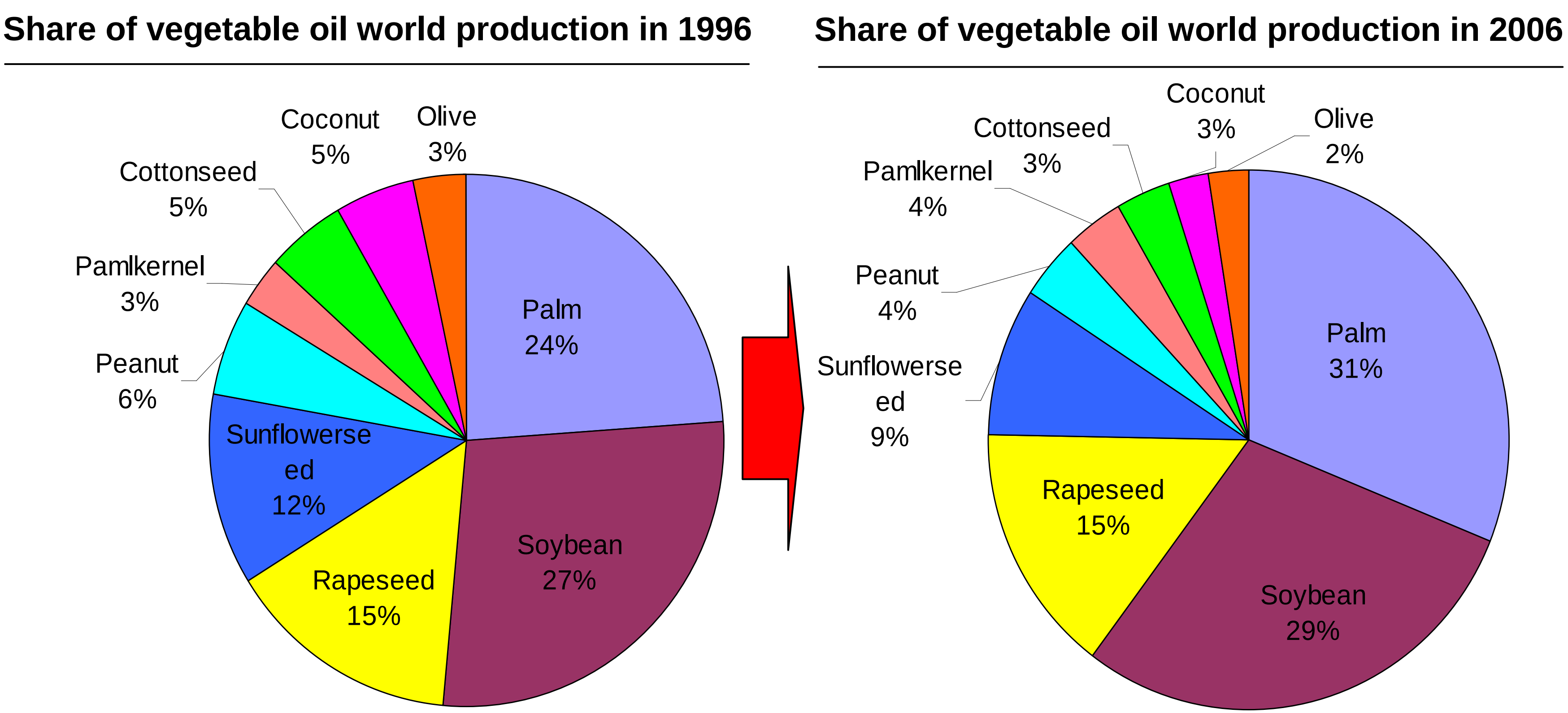
CNO exports of Philippines, Indonesia in 1,000 MT





Source: APCC and team calculations

CNO's share of the global vegetable oil market has fallen from 5% in 1996 to 3% in 2006. Palm and soybean oil now dominate the market.

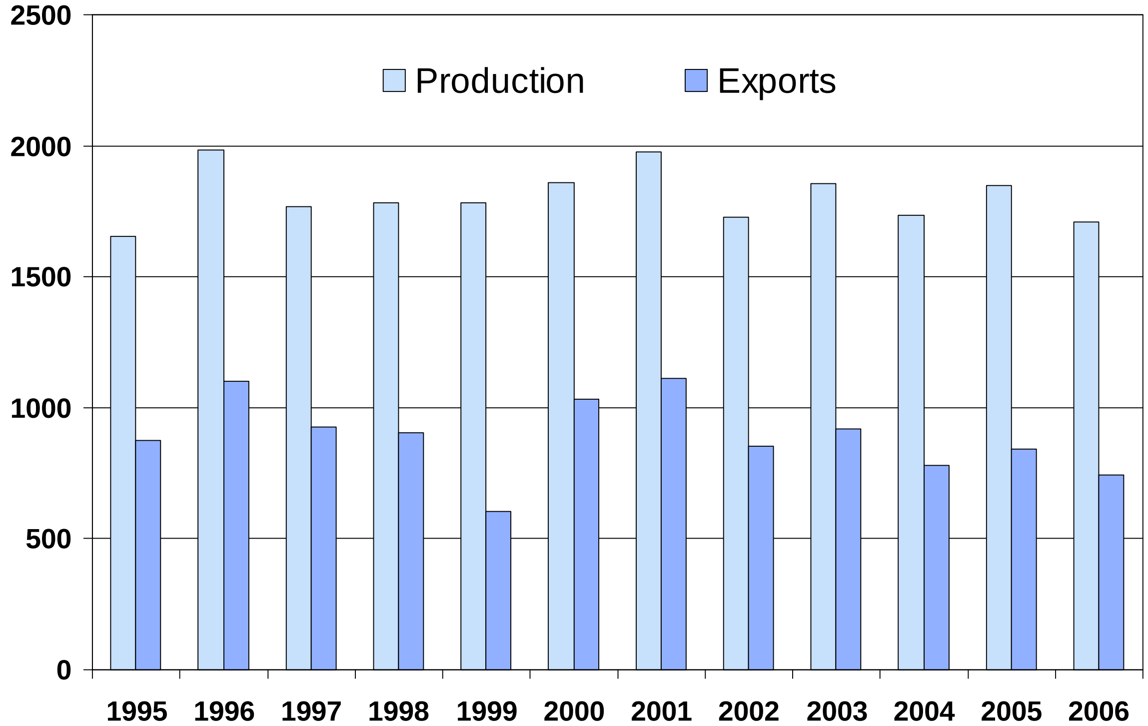


- Recently, an increasing demand for CNO has been seen not only for food uses but also in the oleochemical and bio-fuel industries
- In this market, coconut oil competes largely with palm kernel oil (PKO) since both oils have a similar chemical composition.

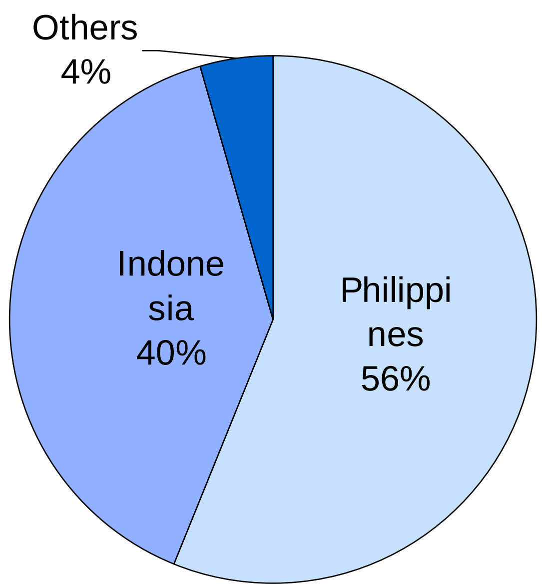
Source: USDA and calculated

Copra meal is a by-product of extracting oil from copra, and is used as an ingredient for animal feeds

World copra meal production & exports in 1,000 MT



Exports share in 2006



- **In 2006 the Philippines was the largest supplier of copra meal to the international market, with exports of 490,000 tonnes**
- **Indonesia was the second largest supplier, exporting 290,000 tonnes**

Source: USDA and APCC

3. Competitiveness

1 Introduction	2 Demand	**3 Competi-tiveness**	4 Impact	5 Opport-unities	6 Next Steps

- **Global supply chain**
- **Some major coconut products**

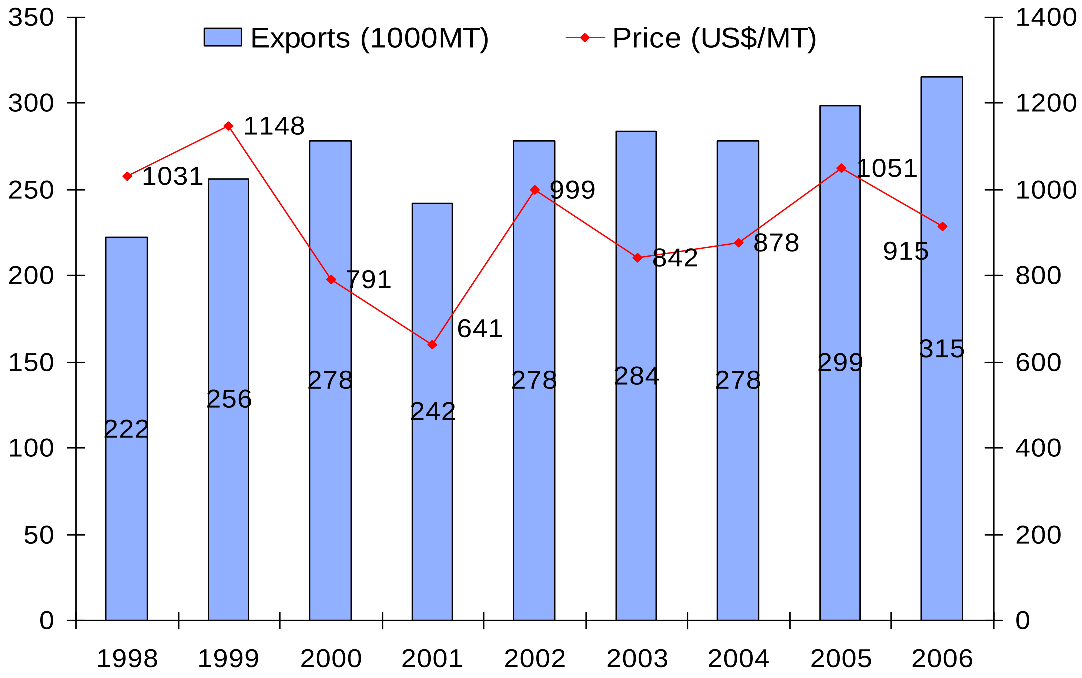
  Copra

  Coconut oil (CNO) and copra meal

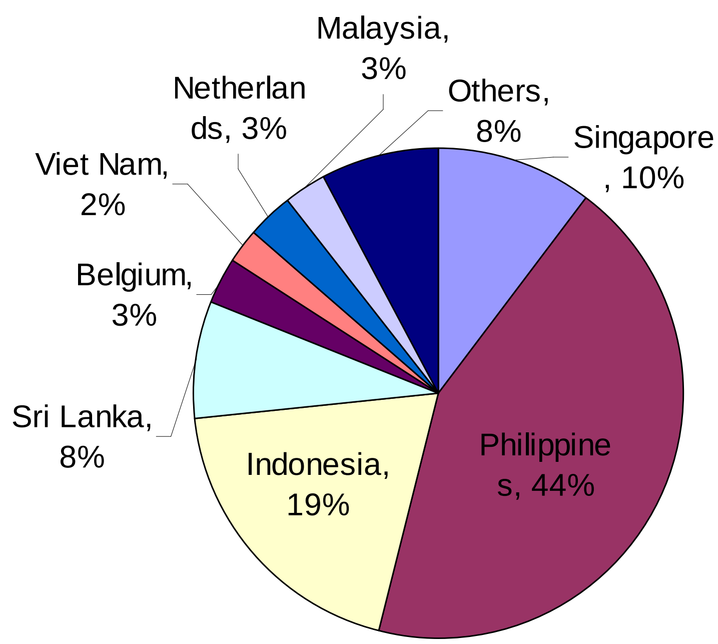
  Desiccated coconut
- **Local supply chain**
- **Competitiveness of Vietnam in international coconut market**

World exports of DC in 2006 amounted to 315,000 tonnes, and grew at 4.5% (CAGR) from 1998 to 2006

Global DC exports and their average prices



DC export share by country in 2006



- The Philippines and Indonesia have long been played the dominant role in the DC market, accounting for some 44% and 19% of the global DC market respectively.
- Other countries such as Sri Lanka (and Singapore, presumably as a transshipment/ processing country) have also emerged as important DC suppliers in recent years.

Source: Coconut statistical year book 2006, APCC

DC appears to generate more value than other coconut products, as illustrated by figures from the Philippines

Coconut conversion table and its value from 1,000 nuts

Categories	1,000 whole nuts (in MT) (1)	Intl Price in 2006 (USD/MT) (2)	Value (USD) (3) = (1)*(2)
Husked nut	0.800	93	74
Copra	0.191	443	85
Coconut oil	0.120	544	65
Copra cake meal	0.050	73	4
Desiccated coconut	0.124	1,020	126

If exporting husked coconuts, the exporter loses the profit from the shell which can be made into charcoal, or activated carbon

Source: Coconut statistical year book 2006, APCC

3. Competitiveness

1 Introduction	2 Demand	**3 Competi-tiveness**	4 Impact	5 Opport-unities	6 Next Steps

- **Global supply chain**
- **Some major coconut products**
- **Local supply chain**
  - Copra
  - Coconut oil (CNO) and meal
  - Desiccated coconut (DC)
- **Competitiveness of Vietnam in international coconut market**

Coconuts are grown mainly in the south of Vietnam

Major coconut cultivars in Viet Nam

Tall coconuts for processing:

Ta coconut

Dâu coconut

Giây coconut

Bung coconut

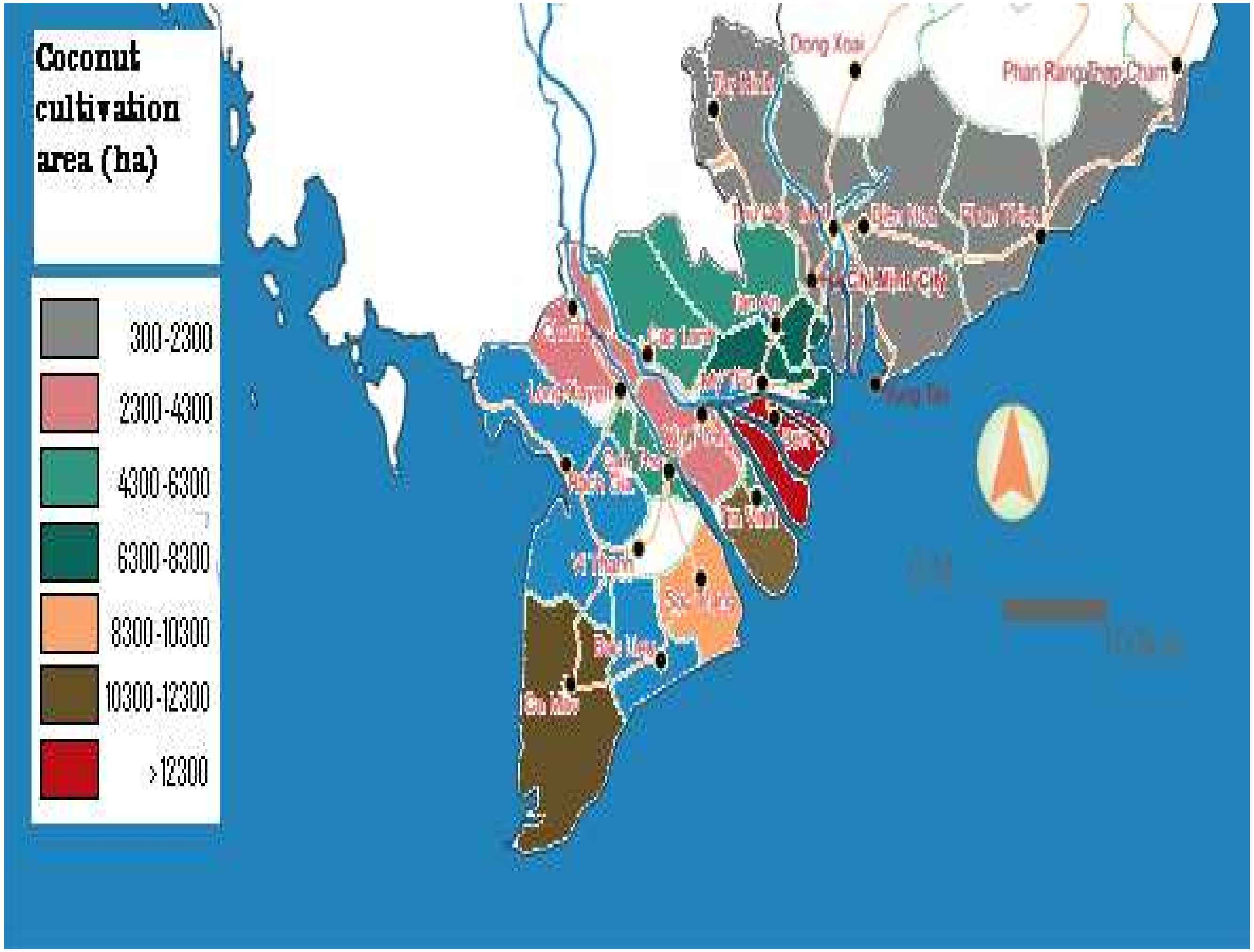
Sáp (Makapuno)

Dwarf coconuts for drinking:

Xiêm coconut

Dứa coconut

Tam quan coconut



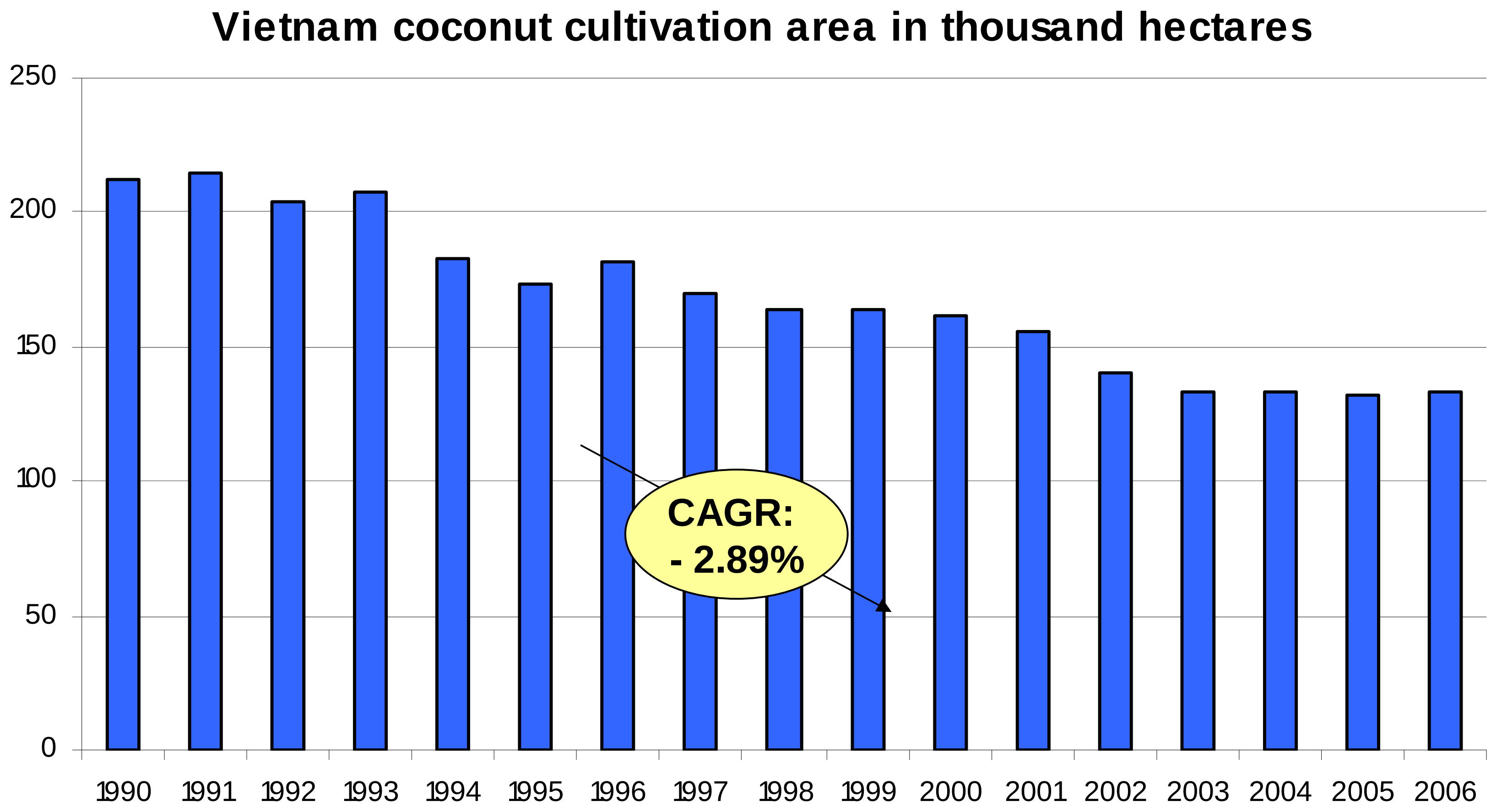
The areas of the country that cultivate coconuts are mainly in the Mekong River Delta (13 provinces), which account for 69% of total coconut cultivation area

Province	Area (ha) 2006	Production (1,000 nuts)	Percent of Area (%)
Ben Tre	37,400	224,400	28.18
Ca Mau	12,000	54,000	9.04
Can Tho	9,850	44,325	7.42
Tra Vinh	9,780	48,900	7.37
Kien Giang	8,000	40,000	6.02
Binh Dinh	7,000	35,000	5.27
Tien Giang	6,900	34,500	5.20
Bac Lieu	6,300	28,350	4.74
Quang Ngai	6,200	31,000	4.67
Dong Thap	6,100	30.500	4.60
Phu Yen	4,800	21,600	3.62
Long An	4,500	22,500	3.40
Vinh Long	4,200	21,000	3.17
Others	9,670	33,425	7.28
Whole country	132,700	681,000	100.00

- Ben Tre Province in the Mekong River Delta has the largest planted area of coconuts in Vietnam accounting for 28.2% of the country's total coconut cultivation area
- In most recent years, the prices of coconut have been increasing so the area devoted to coconut cultivation in Ben Tre has been recovering
- Ben Tre People's Committee is planning to increase cultivation over the next few years

Source: Coconut statistical year book 2006, APCC

The total planted area of coconuts in Vietnam has decreased over the last 15 years at a compound rate of -2.9% p.a.

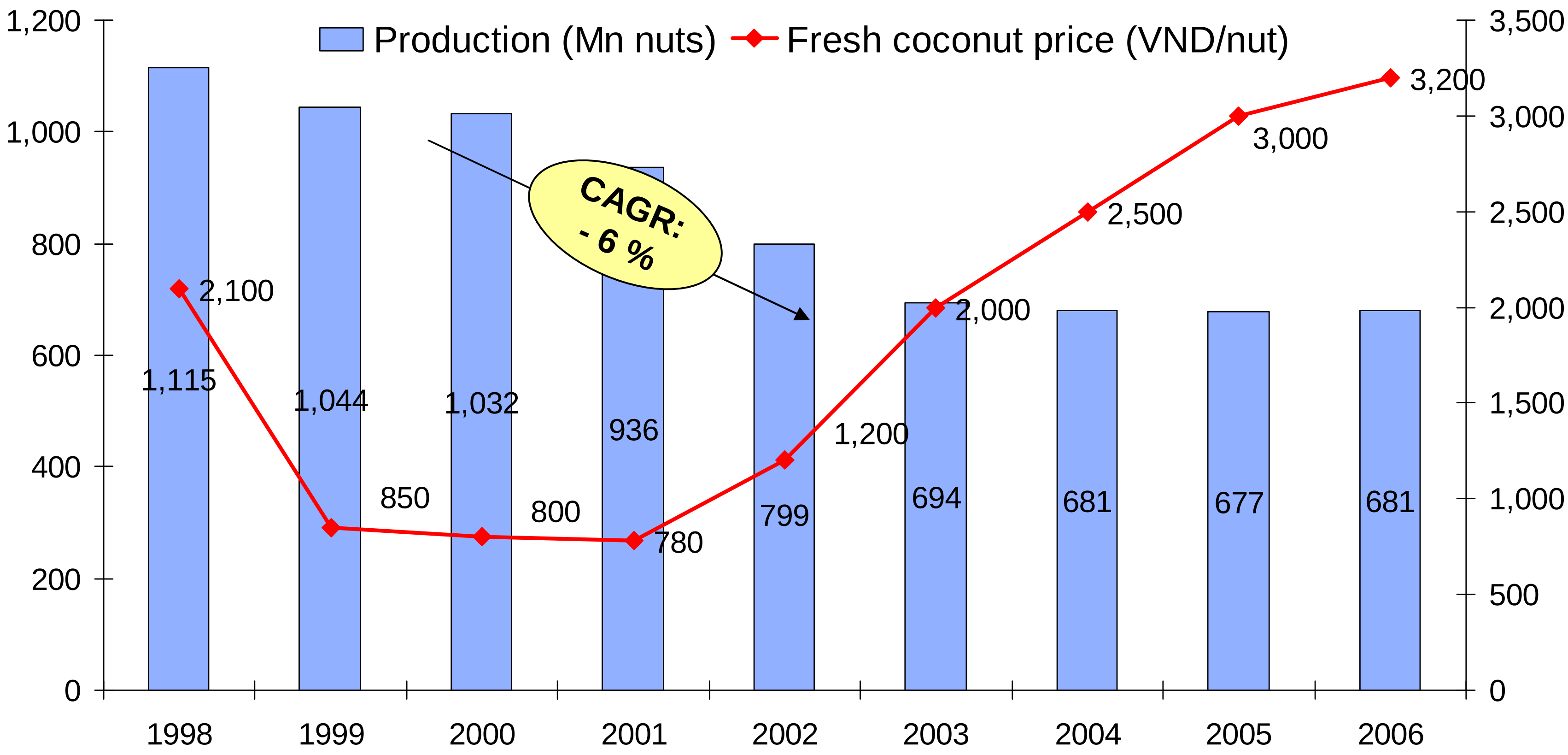


- **While there have been many reasons for this decrease – including better alternative crops, disease and pests – the most important cause appears to have been a sudden drop in the coconut price which led farmers to cut down trees to plant other crops**

Source: GSO

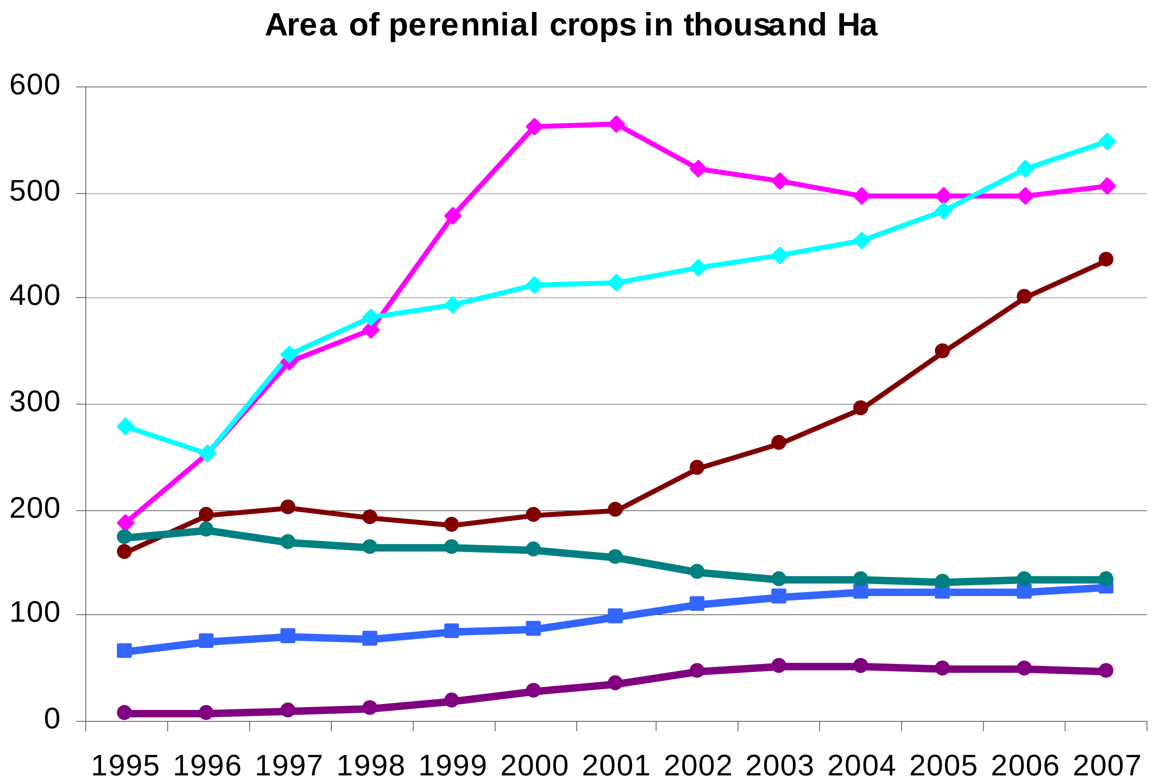
While coconut production has declined owing to low prices and the consequent reduction of coconut cultivation area, since 2002 production has been stable as the price of coconut has climbed again

Vietnam coconut production and fresh coconut price



Source: Coconut statistical year book 2006, APCC

In recent years, the total area in Vietnam for coconut cultivation has dropped, but increased for other perennials; the key causes are the fluctuation in coconut prices over the last 10 years and the rising price of other perennials

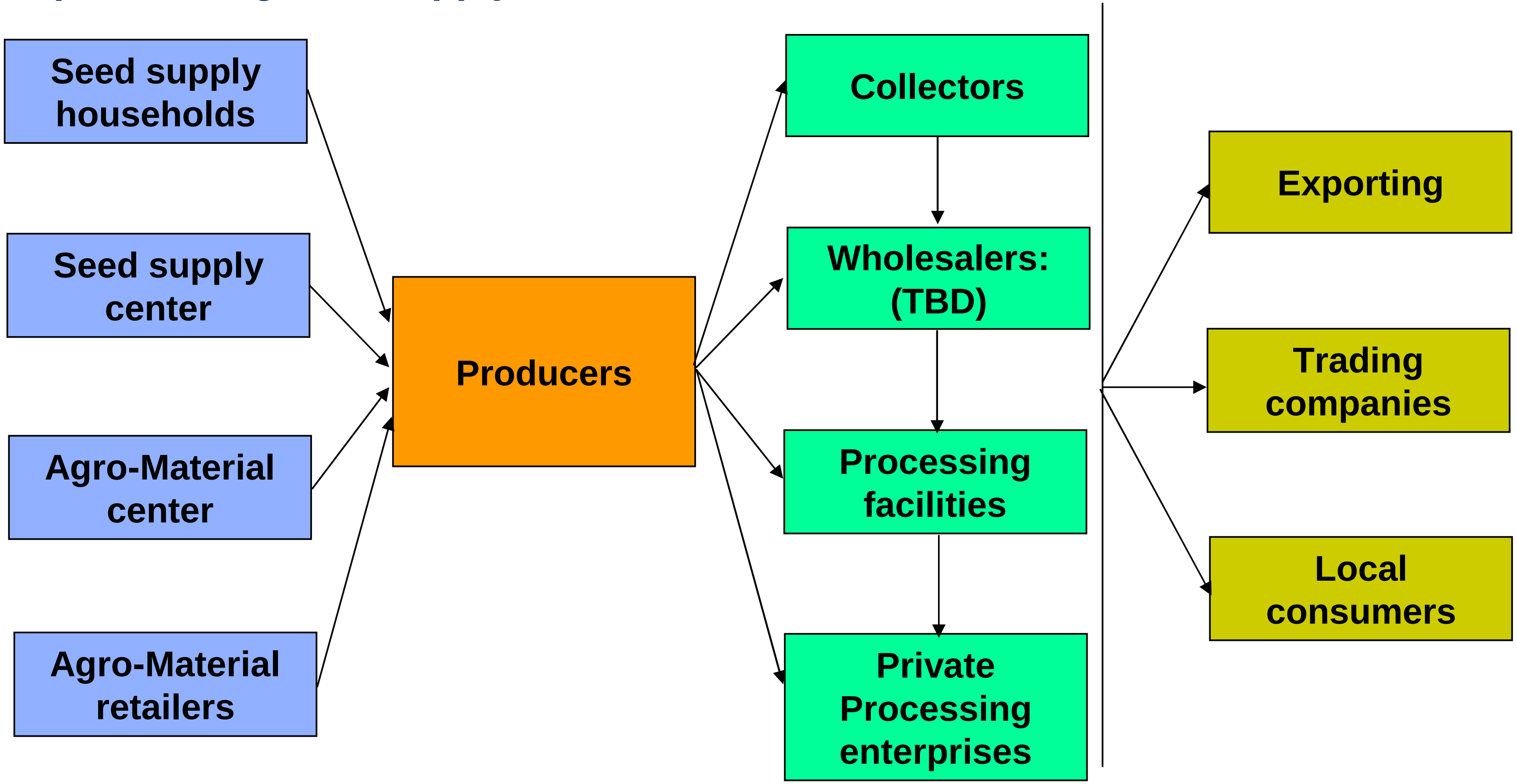


Crops	CAGR (%)
Tea	5.42
Coffee	8.69
Rubber	5.83
Pepper	17.38
Cashew	8.78
Coconut	-2.07

Not only the occurrence of specialized crop zones with high value such as cashew, sesame, groundnut and other fruit crops, but also the change in crop structure have had a strong impact on the coconut cultivation area

Sources: GSO Vietnam and calculated

A simplified diagram can illustrate the flow of Vietnamese coconut inputs and outputs through the supply chain

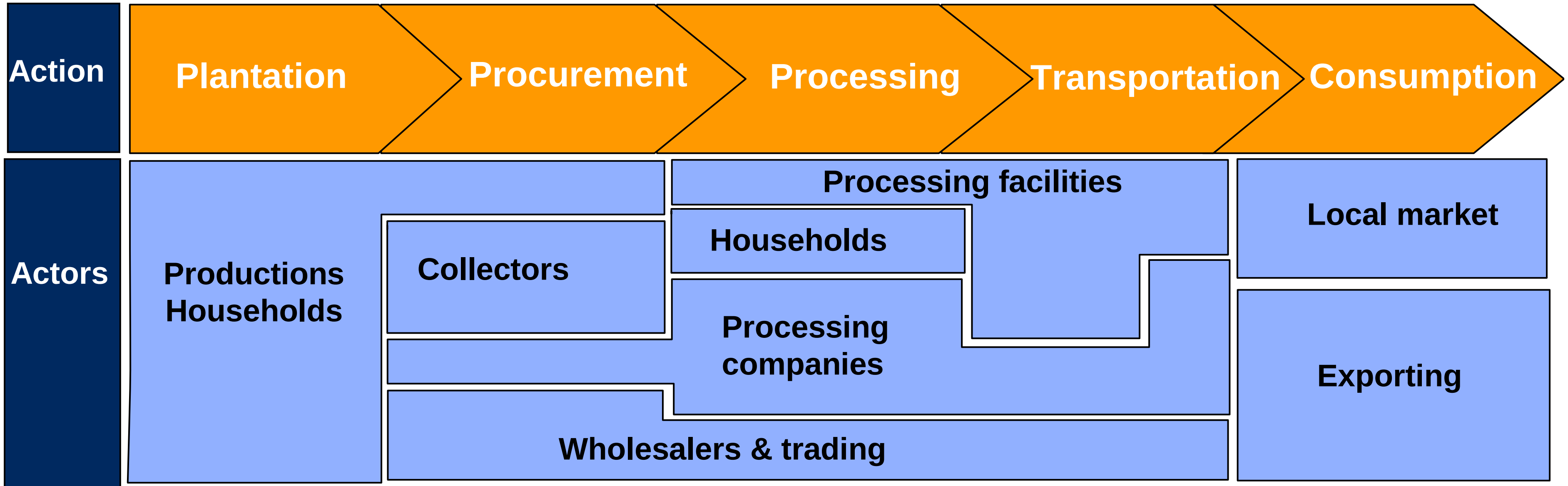


In general after harvesting, the producers will sell there nuts to the collectors or sell directly to wholesalers/processing facilities. The wholesalers also collect nuts from collectors then move to private processing enterprises or export directly

Summary of the activities in the coconut supply chain in Vietnam

	Plantation	Procurement	Processing
Inputs	- Seedlings - Fertilizers - Chemicals	- Fruits	- Fruits - Shells - DC - Dippers - Milk
Activities	- Planting - Caring	- Transporting and selling fruits	- Producing DC, candy, shell charcoal, burned coal, handicraft products, etc. - Selling dried fruits
Outputs	Fruits	Fruits	DC, candy, shell charcoal, burn coal, handicraft products, etc.
Actors	- Production households - Hired workers	- Production household - Hired workers - Collectors/wholesalers - Processing facilities - Processing companies	- Processing facilities - Processing companies - Households

The coconut supply chain in Ben Tre Province …



Plantation

- 84% of growers are directly involved in production, 16% (being large-scaled producers) hire workers.
- 75% of harvested products are sold to collectors/ wholesalers while the remaining 25% are sold to processors

Procurement

- After being procured, some coconut fruits are sold directly to the procurement ships from China and Thailand, as well as to major processors.
- The traders sell 62% of the output procured to processors and the remaining 38% directly to procuring foreign ships

Processing

- Coconut fruit can be used as a fresh coconut or processed into products like fresh copra, coconut oil, coconut shell dipper, charcoal, fiber thread, candy, handicraft items, etc

Transportation

- Over 65% of small processors sell their product at home, while the other 35% transport on their own by simple means like bicycles, motorbikes, trolleys, or even on their backs
- The producing facilities and traders transport products by trucks, junks, trains or ferry.

Consumption

- Export: The foreign invested and local enterprises export the products directly or through intermediaries to China, Malaysia, Japan, Sri Lanka, Korea, etc.
- Local market: The products are sold to major traders in the cities, candy producers and consumers inside and outside the province (25 million fruits), etc.

Source: Team data collection and analysis

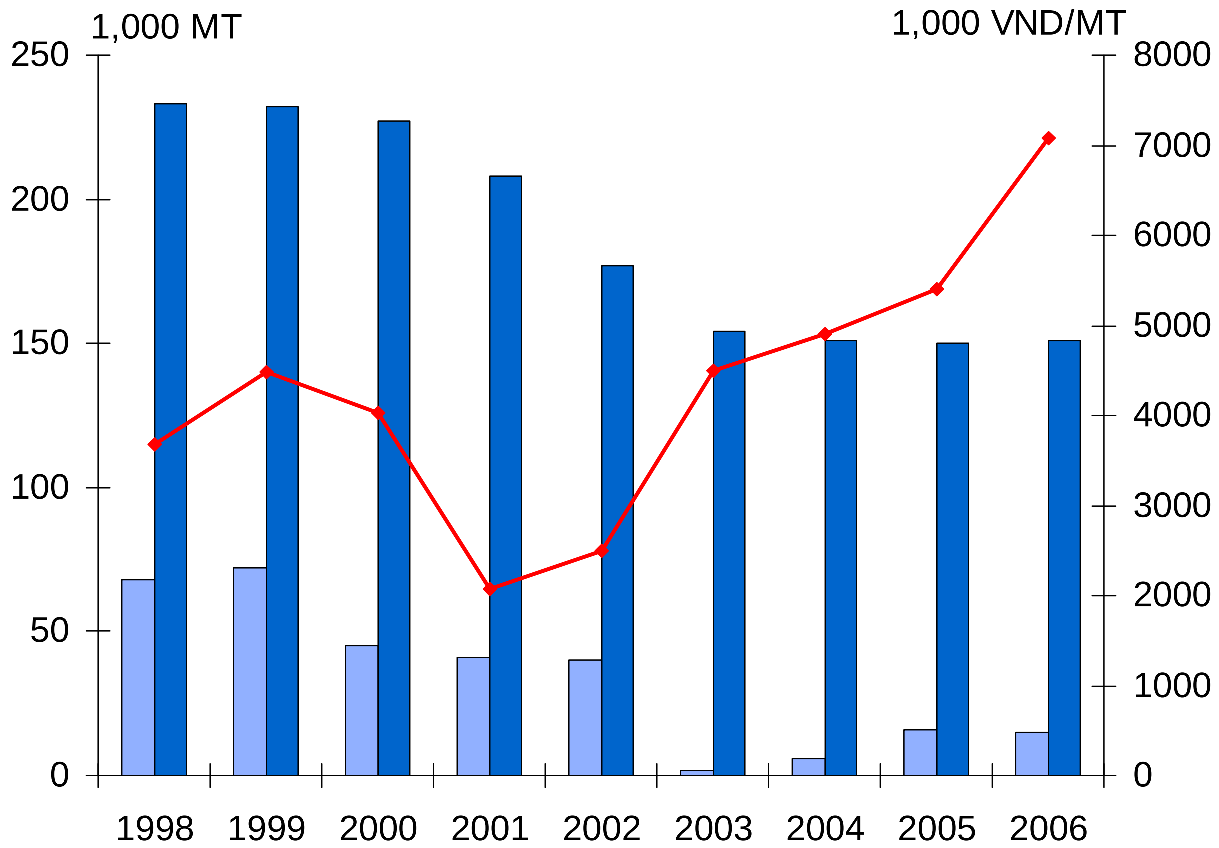
3. Competitiveness

1 Introduction	2 Demand	3 Competi-tiveness	4 Impact	5 Opport-unities	6 Next Steps

- **Global supply chain**
- **Some major coconut products**
- **Local supply chain**
  - Copra
  - Coconut oil (CNO) and copra
  - Desiccated coconut (DC)
- **Competitiveness of Vietnam in international coconut market**

Copra production accounts for only a small part of “copra equivalent”, and this has decreased dramatically from 68,000 tonnes in 1998 to 15,000 in 2006

Copra equivalent vs. copra production



Categories	CAGR (%)
Production	-17.22
Copra equivalent	-5.28
Local Copra price	8.52

The remains of copra equivalent are used for fresh coconut or other industries which are more efficient than for the oil industry, such as DC or candy

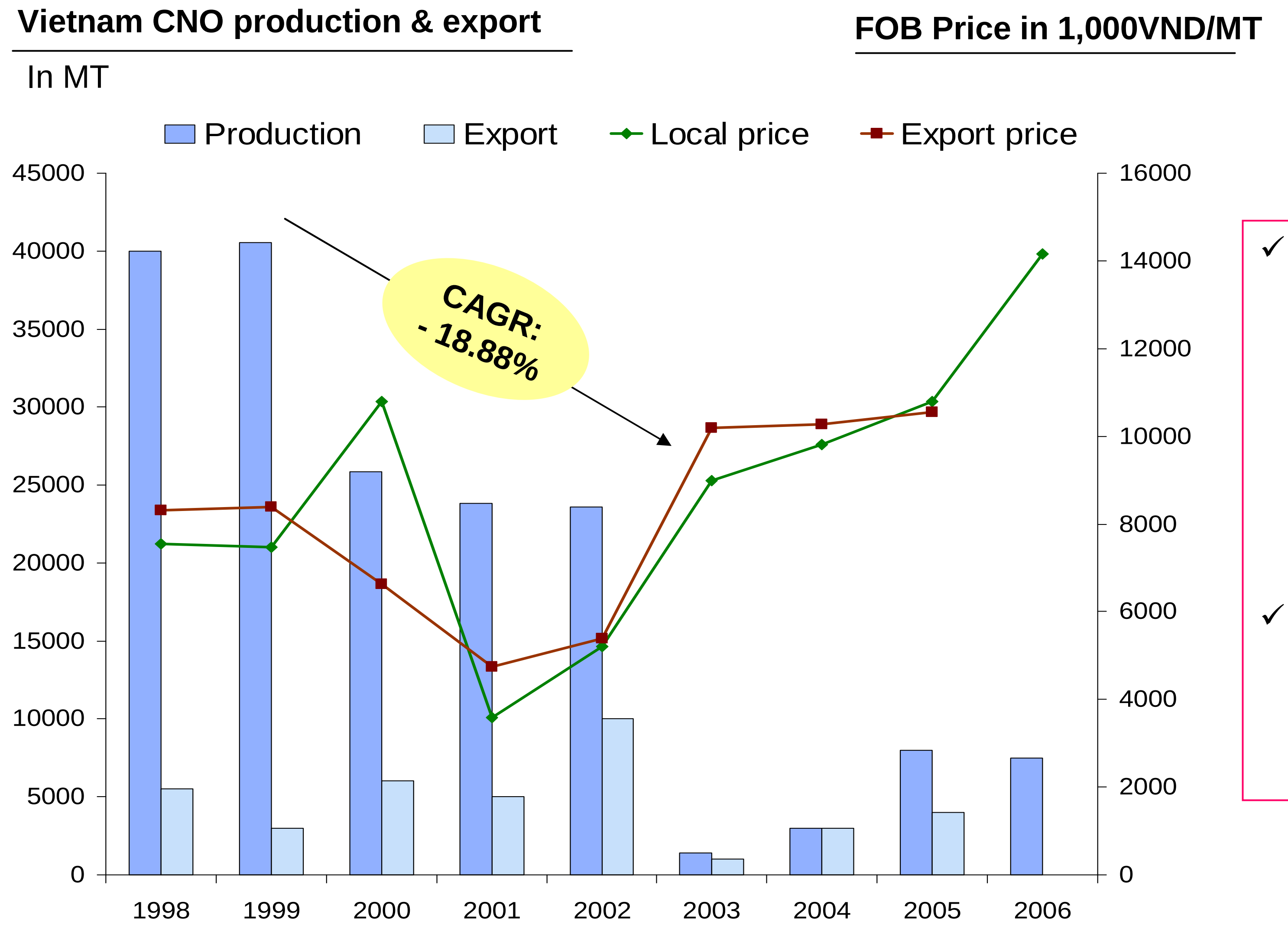
Source: Coconut statistical year book 2006, APCC

3. Competitiveness

1 Introduction	2 Demand	3 Competi-tiveness	4 Impact	5 Opport-unities	6 Next Steps

- **Global supply chain**
- **Some major coconut products**
- **Local supply chain**
  - Copra
  - Coconut oil (CNO) and meal
  - Desiccated coconut (DC)
- **Competitiveness of Vietnam in international coconut market**

CNO production and export have also been declining in Vietnam. In 2006 the export price was lower than the local price so no CNO was exported



Source: Coconut statistical year book 2006, APCC

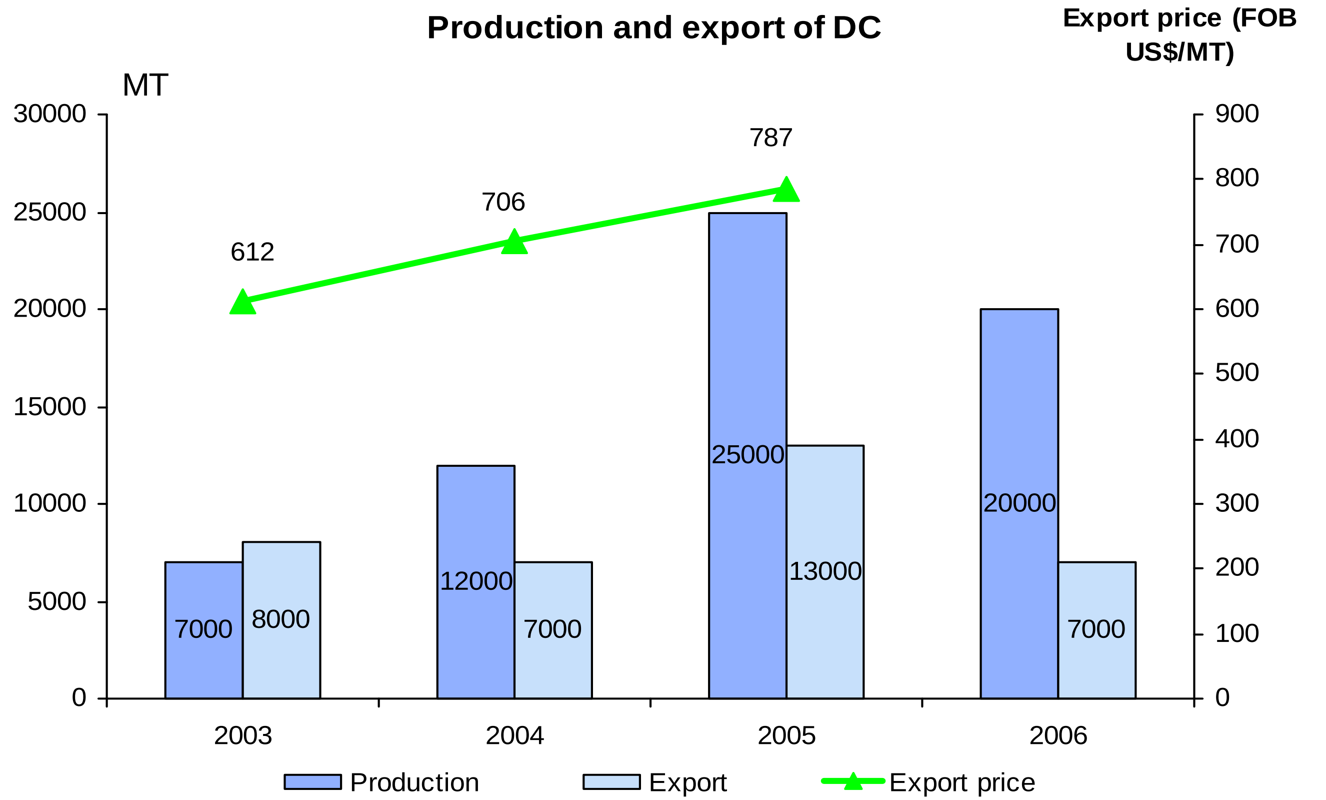
- ✓ In the domestic market, the decrease in CNO production was affected by increases in income and by other substitute vegetable oils
- ✓ The CAGR of CNO production from 1998 to 2006 was -18.88%

3. Competitiveness

1 Introduction	2 Demand	3 Competi-tiveness	4 Impact	5 Opport-unities	6 Next Steps

- **Global supply chain**
- **Some major coconut products**
- **Local supply chain**
  - Copra
  - Coconut oil (CNO) and meal
  - Desiccated coconut (DC)
- **Competitiveness of Vietnam in international coconut market**

DC was produced in Vietnam a last few years ago and production have been increasing both volume and price.



- It takes 7.5 nuts to produce 1kg of coconut oil but only 2.5 nuts to produce 1kg of DC
- The price of DC is over 1,000 USD/ton (2008) while coconut oil is about 600 USD/ton.

The DC export market of Vietnam is mainly China and some Middle Eastern countries

Source: Coconut statistical year book 2006, APCC and FAOSTAT, field trip

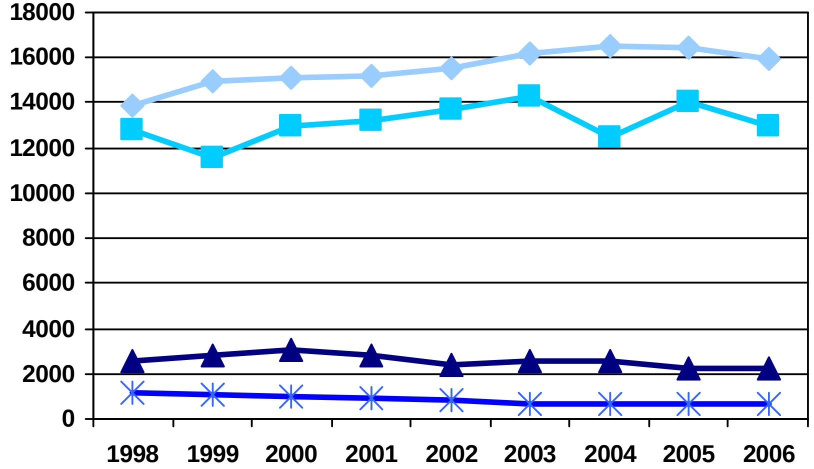
3. Competitiveness

1 Introduction	2 Demand	**3 Competi-tiveness**	4 Impact	5 Opport-unities	6 Next Steps

- Global supply chain
- Local supply chain
- **Competitiveness of Vietnam in international coconut market**
  - Copra
  - Coconut oil (CNO) and meal
  - Desiccated coconut (DC)
  - Study on coconut competitive advantage of Vietnam

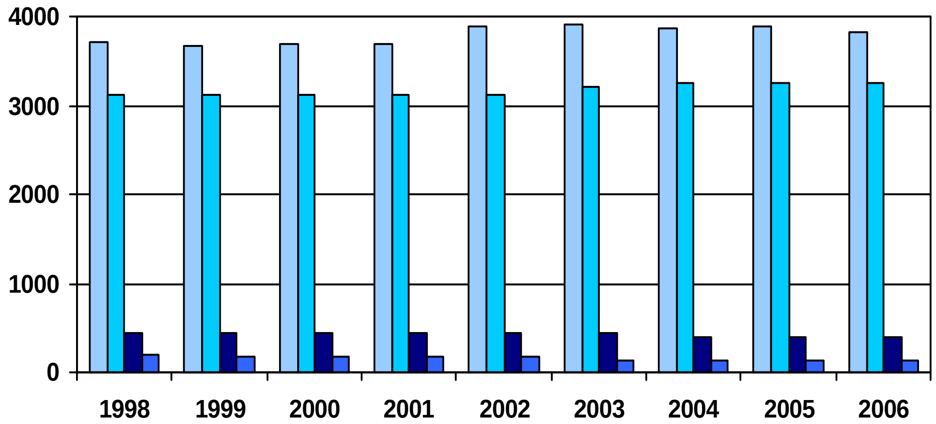
Both the production and cultivation area of coconuts in Vietnam are low compared to its main Asian competitors

Production of coconus in nut equivalent of some APCC countries



	2006		
	Area (1,000 ha)	Production (mn nuts)	Productivity (nuts/ha)
Indonesia	3,311	12,966	4,000
Philippines	3,817	15,934	4.200
Sri Lanka	395	2,215	5,600
Vietnam	132	681	5,200

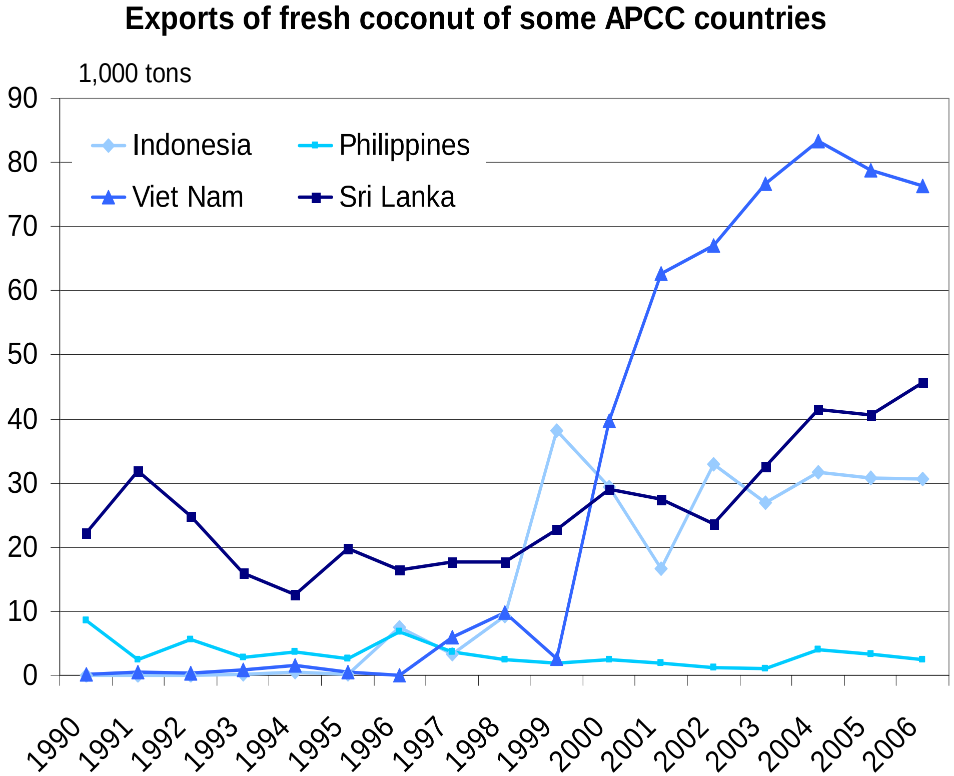
Coconut cultivation area of some APCC countries



Although Vietnam has the lowest production levels and area of the four Asian countries shown here, its average yield is higher than both Indonesia and the Philippines

Source: Coconut statistical year book 2006, APCC

Vietnam has dramatically increased its export of fresh coconuts which now account for around 21% of world coconut exports



Vietnam

- **In 2006, Vietnam exported 76 thousand tons of fresh coconuts**
- **Most of Vietnam's coconuts are exported to China or Thailand**

Exports of fresh coconuts (US$/ton)

country	World price (FOB Philippines) US$/ton	Domestic price Vietnam US$/ton
2000	304	52
2001	324	50
2002	319	77
2003	204	-
2004	179	150
2005	231	190
2006	250	200

The reasons that Vietnam has become the leading exporter of coconuts include:

-While the domestic price of coconuts is rising, it has not yet caught up with the China coconut import price, so a large quantity of Vietnam's coconuts are exported, especially to China and Thailand

-The CNO industry has been declining; the domestic copra price has been increasing while oil industry profits have been lower over the last 10 years so people prefer to export rather than process nuts

Source: FAOSTAT

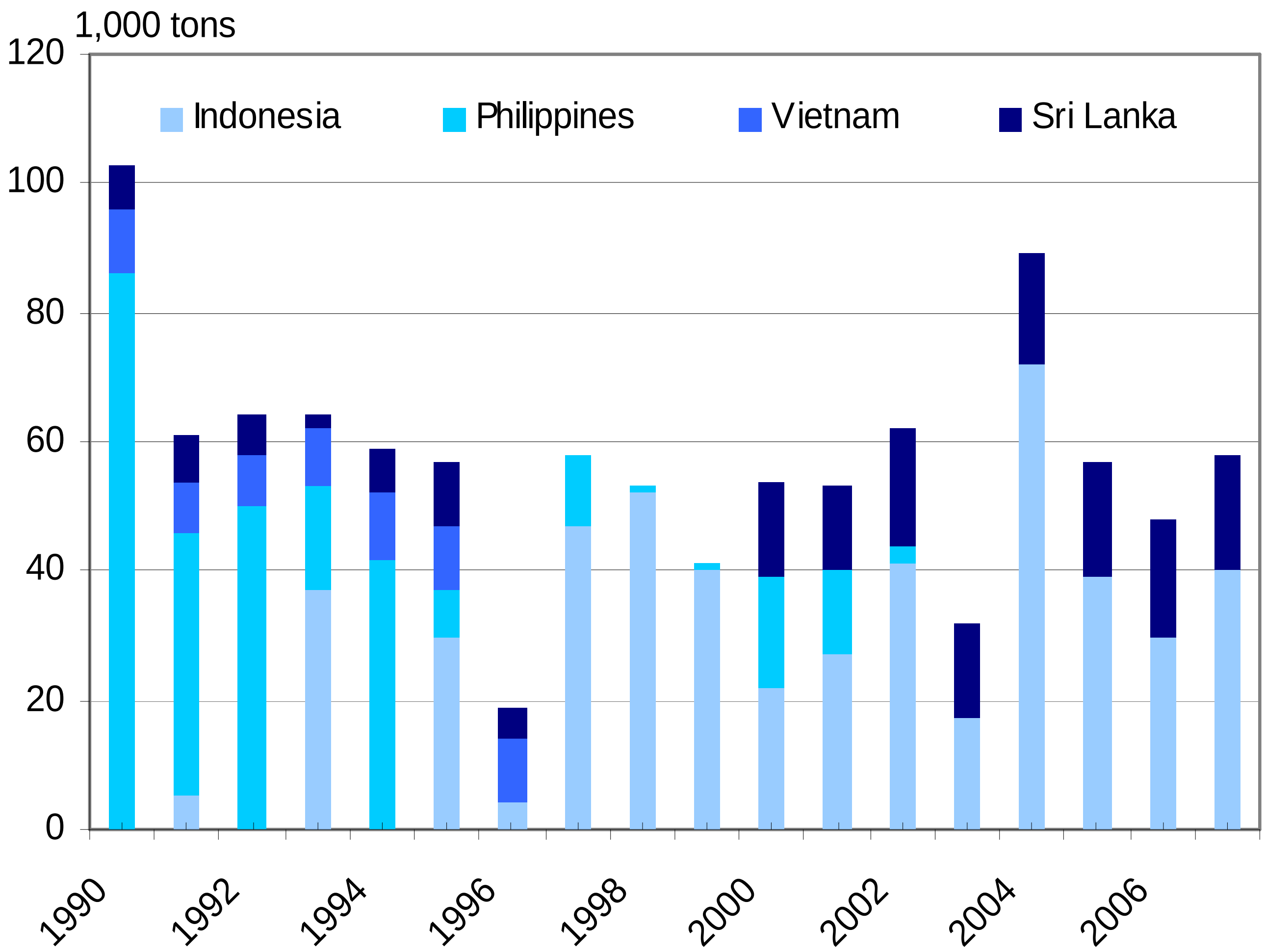
3. Competitiveness

1 Introduction	2 Demand	3 Competi-tiveness	4 Impact	5 Opport-unities	6 Next Steps

- Global supply chain
- Local supply chain
- Competitiveness of Vietnam in international coconut market
  - Copra
  - Coconut oil (CNO) and meal
  - Desiccated coconut (DC)
  - Study on coconut competitive advantage of Vietnam

While Indonesia and Sri Lanka have increased their exports of copra, Vietnam and Philippines have nearly ceased exporting

Copra export of Vietnam and other countries

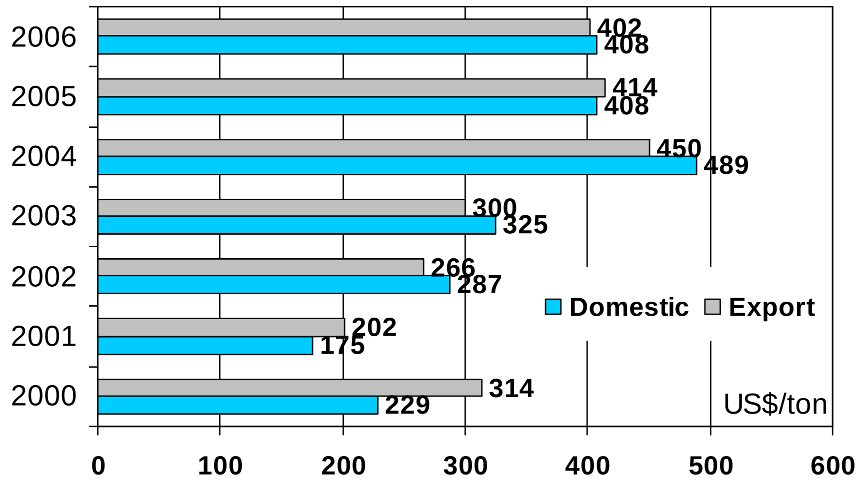


- Philippines uses most of their own copra and imports copra to extract coconut oil and by-products for value added
- Vietnam's copra production has declined, with coconuts being used to produce DC for more value added

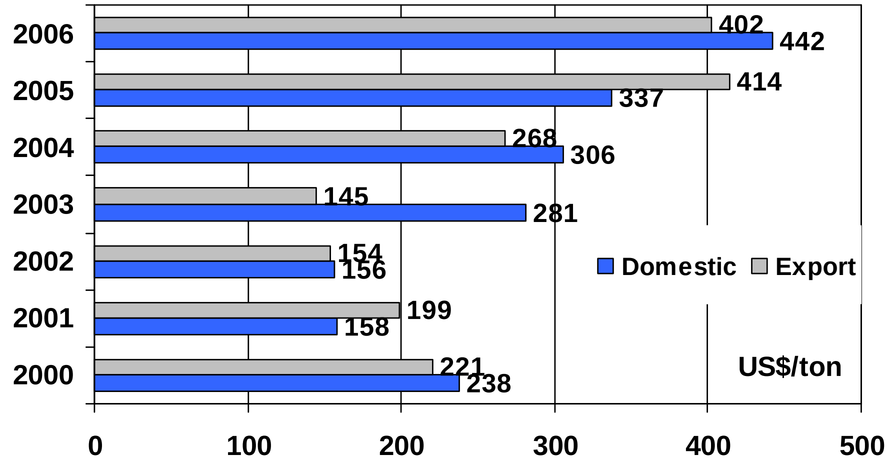
Source: USDA

In case of the Philippines and Vietnam, the domestic price of copra is higher than the export price and the two countries have reduced copra exports

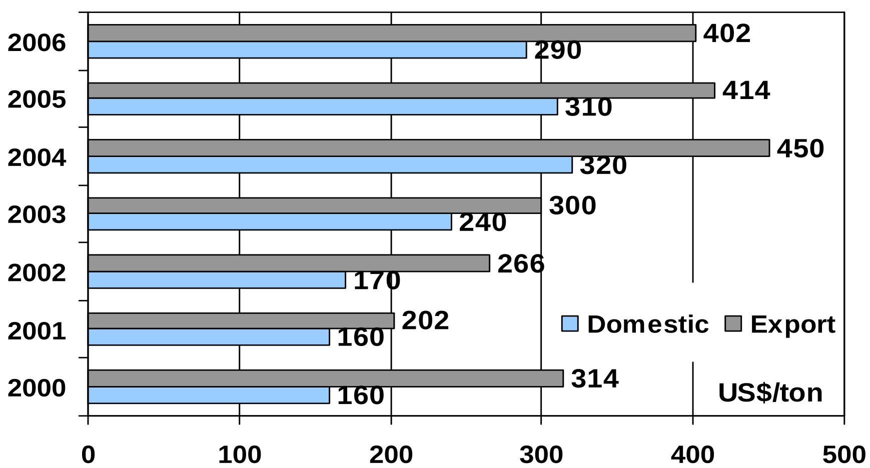
Philippines: Domestic price vs Export price of copra



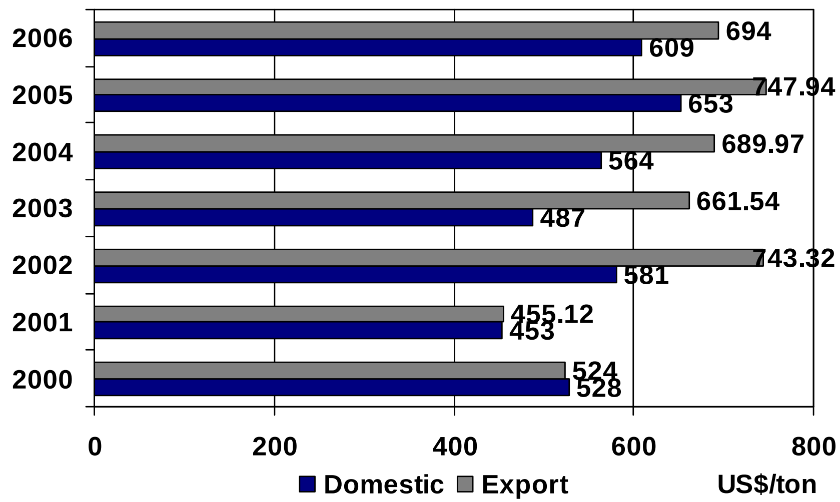
Vietnam Domestic price VS Export price of copra



Indonesia: Domestic price VS Export price of copra



Sri Lanka :Domestic price VS Export price of copra



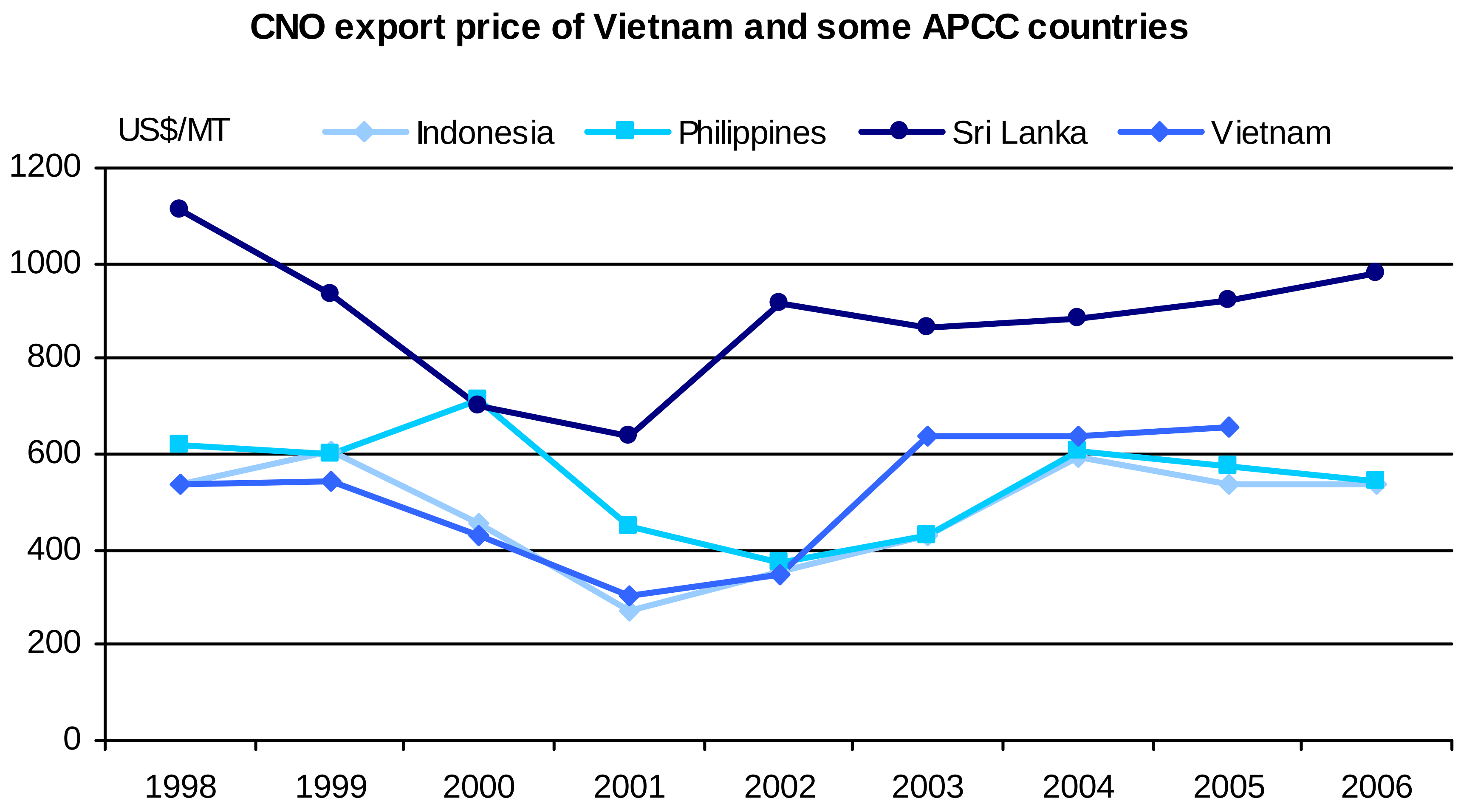
Source: Coconut statistical yearbook, APCC and USDA

3. Competitiveness

1 Introduction	2 Demand	3 Competi-tiveness	4 Impact	5 Opport-unities	6 Next Steps

- Global supply chain
- Local supply chain
- Competitiveness of Vietnam in international coconut market
  - Copra
  - Coconut oil (CNO) and meal
  - Desiccated coconut (DC)
  - Study on coconut competitive advantage of Vietnam

Vietnam CNO has declined mainly because that it export price is lower than the DC export price, although it is higher than some other APCC countries



Source: USDA

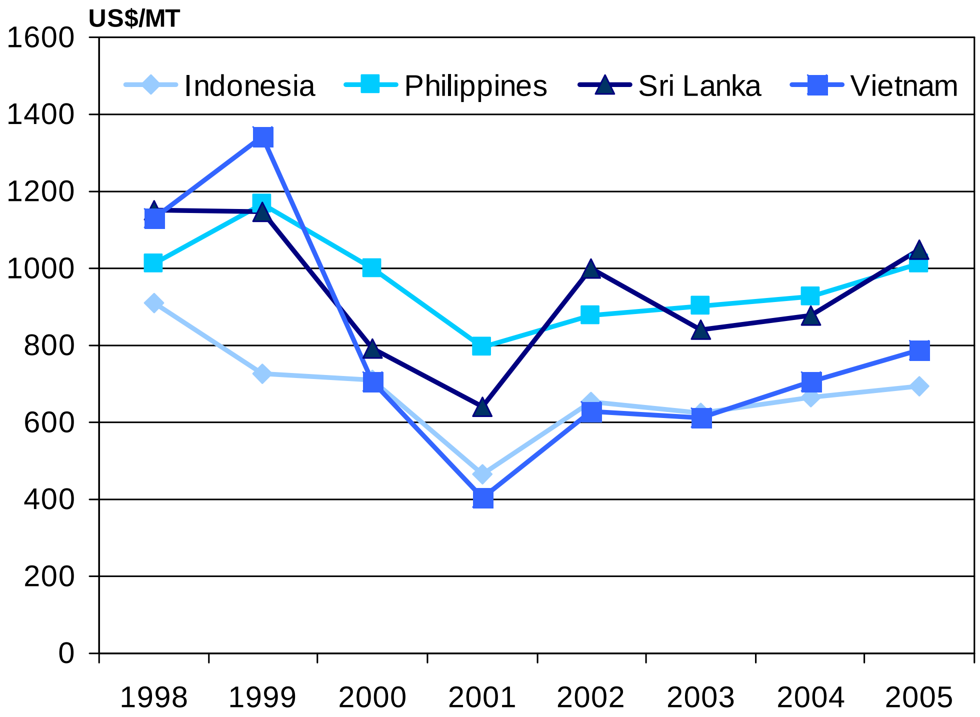
3. Competitiveness

1 Introduction	2 Demand	3 Competi-tiveness	4 Impact	5 Opport-unities	6 Next Steps

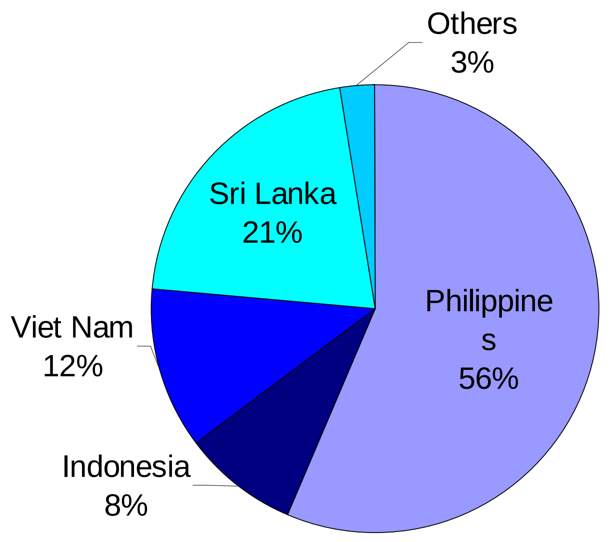
- Global supply chain
- Local supply chain
- Competitiveness of Vietnam in international coconut market
  - Copra
  - Coconut oil (CNO) and meal
  - Desiccated coconut (DC)
  - Study on coconut competitive advantage of Vietnam

The DC export price fell from 1998 to 2001 but has partly recovered, although Vietnam's DC price is generally lower than other leading APCC countries

DC export price of Vietnam and other APCC countries



Marketshare for DC imported by China, 2005

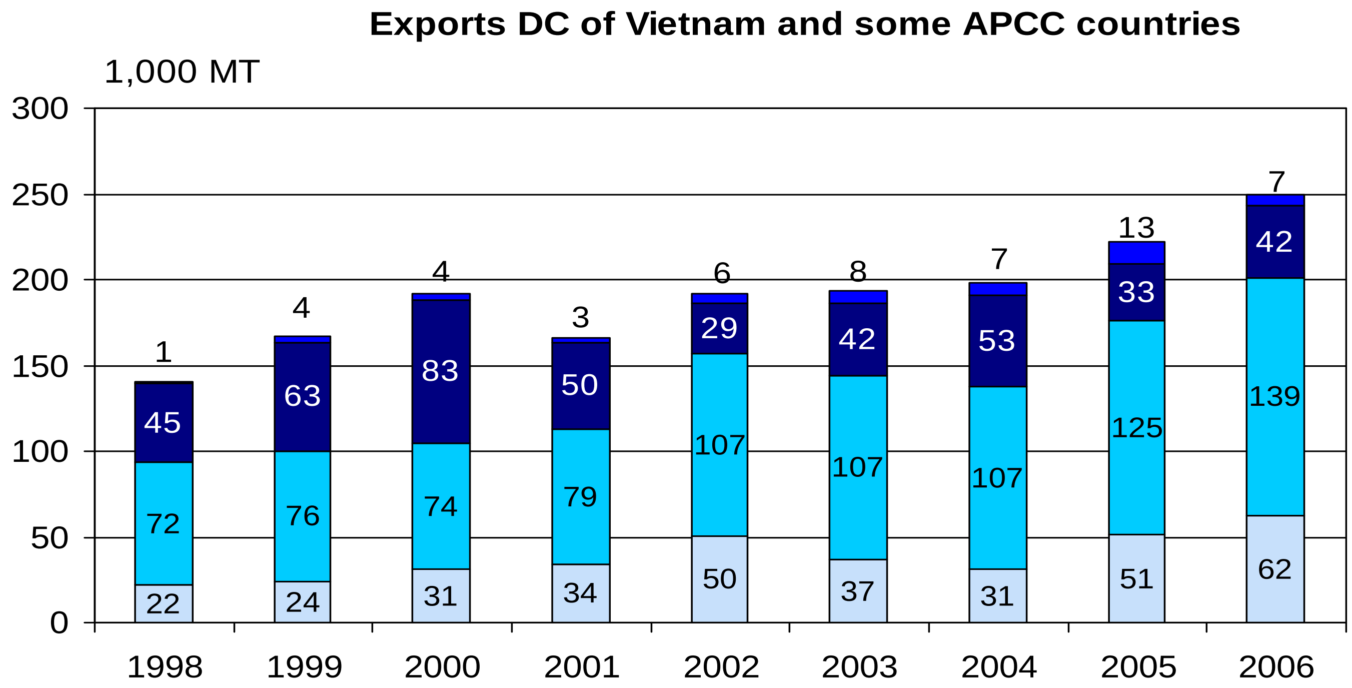


In theory its lower price should offer Vietnam the opportunity to be competitive with others countries in exporting DC …

… but the Philippines appears to be a strong competitor for Vietnam and other Asian countries in exporting DC to China

Source: Coconut statistical yearbook 2006, APCC and http://www.trademap.org

Indonesia, Philippines, and Vietnam have all increased their exports of DC over the last decade, while Sri Lanka's have declined slightly



Country	CAGR (%)
Vietnam	27.54
Sri Lanka	-0.86
Philippines	8.57
Indonesia	2.22

In general, DC exports of Vietnam have grown strongly year-on-year. However, exports in 2006 were only 63% of those of 2005 because of the increase in material prices which had an impact on both production and exports

Source: APCC and FAO stat

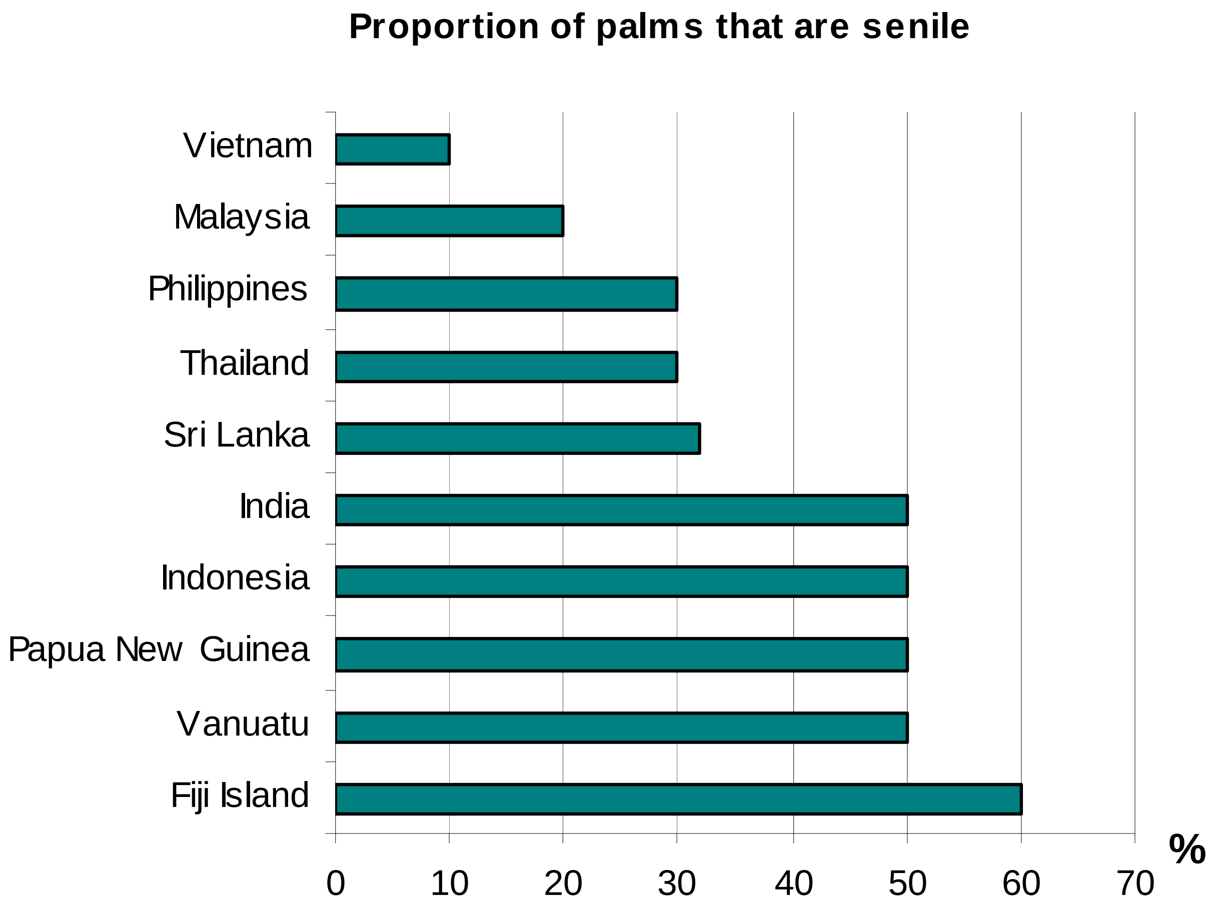
3. Competitiveness

1 Introduction | 2 Demand | **3 Competi-tiveness** | 4 Impact | 5 Opport-unities | 6 Next Steps

- Global supply chain
- Local supply chain
- Competitiveness of Vietnam in international coconut market
  - Copra
  - Coconut oil (CNO) and meal
  - Desiccated coconut (DC)
  - Study on coconut competitive advantage of Vietnam

The profile of Vietnam's coconuts is relatively young, while in many coconut-producing countries in the Asia-Pacific Region, a significant proportion of trees are senile or at an age when production has begun to decline

Coconut trees of 60 years and older are reaching senility

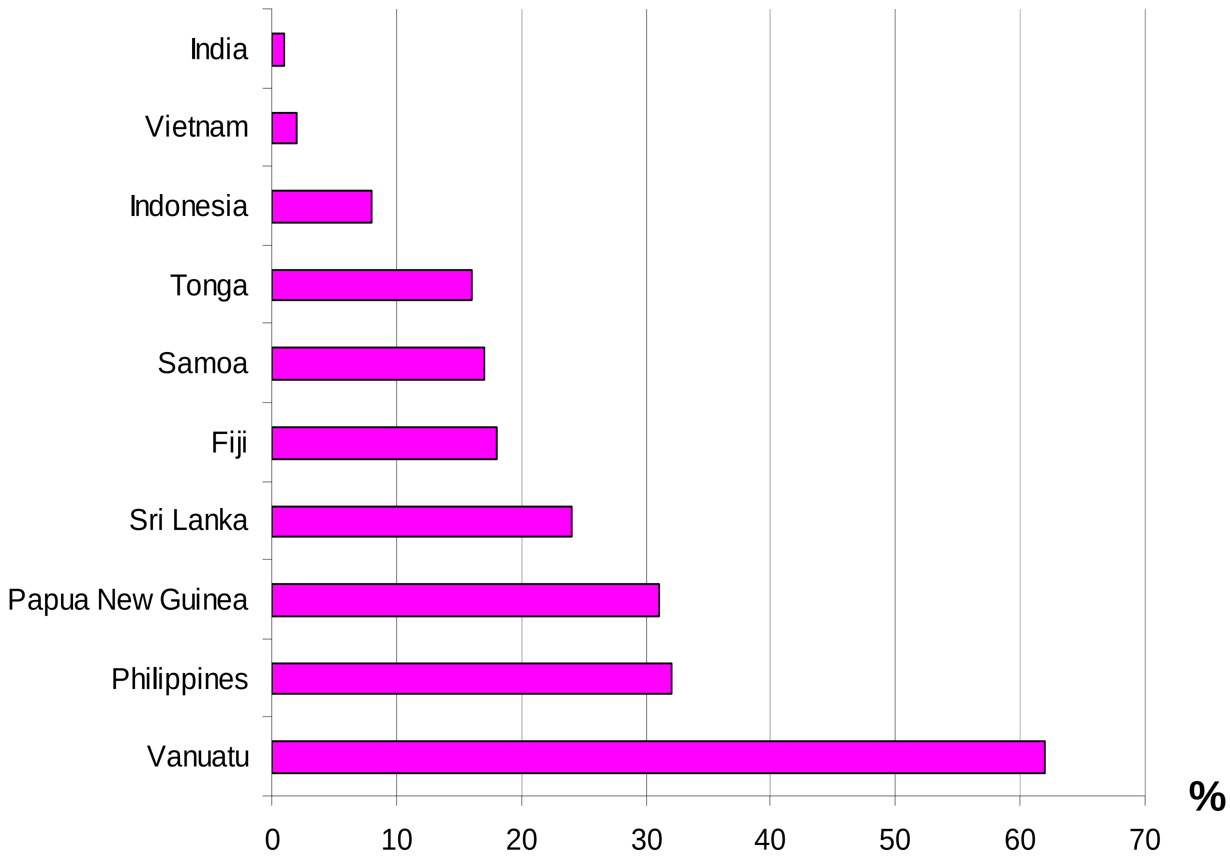


Since nearly 65% of the area under coconut in Vietnam has been planted since 1983, the majority of the palms are relatively young. This means that the coconut yield of Vietnam is higher than most other countries and may even increased in the future

Source: Arancon

The proportion of arable land under coconut cultivation in Vietnam is only about 5%, which is small in comparison with the Philippines, Indonesia, and Sri Lanka as well as the Pacific Islands

Coconut areas as a proportion of arable and permanent cropland



The area from which coconuts is harvested represents over 30% of the reported arable and permanent cropland of some countries including the Philippines and Papua New Guinea, although Vanuatu is the highest at over 60% of cropland

Source: FAO 20007

By exporting raw coconuts instead of using them for processing, Viet Nam may be losing the opportunity to earn substantial profits, since other countries are likely to be buying these coconuts to produce higher value-added products

International: Average prices of coconut products in 2006

Before processing cost	Selling price after processing
• Whole nut: 250 US$/1,000 nuts • Copra: 402 US$/MT • Coconut Fibre : 285 US$/MT • Charcoal : 260 US$/MT	• Coconut oil: 667 US$/MT • Desiccated Coconut : 915 US$/MT • Coconut Milk (Powder): 2,680 US$/MT • Twist Coconut Fibre : US$ 588/MT • Coir rope: 915 US$/MT • Active Carbon 1,140 US$ /MT

- Viet Nam has a choice between exporting lower-value raw coconuts or higher value-added processed coconut products.
- If raw coconut prices remain high because of demand from China and Thailand, some local companies and foreign investors will face significant shortages of raw coconuts for processing.

Source: Coconut statistical yearbook 2006, APCC

A comparison between the export taxes on coconuts product of the Philippines and Vietnam suggests that taxes may have played a role in the relative industry configurations

Items	Export Tax	
	Philippines	Vietnam
Copra	6 %	No export tax on all coconut products
Coconut Oil	4 %	
Desiccated Coconut	4 %	
Coconut Milk Powder	4 %	
Charcoal	4 %	
Activated Coal	4 %	
Coir mat/Rug	4 %	

- To provide incentives for the development of the coconut industry development, all coconut products are free of tax in Vietnam. This may present a good opportunity for Vietnam coconut enterprises to compete with others in export markets

Source: Team, collected from many sources

Vietnam faces a number of obstacles in its competition with other coconut exporting countries

- An estimated 100 million nuts are sold by Vietnam to China per year. This may have provided Chinese producers doing value-added processing with economies of scale and first-mover advantage in their own markets
- The largest DC plant in Ben Tre is a joint venture between Sri Lanka and Vietnam, which is used to manufacture DC product for European and Middle Eastern markets. However, it has experienced some difficulties because of the lack of raw material supplies and the high price for coconuts which may have an impact on its plans for the longer term
- Relative movements in the currencies of Vietnam and its main competitors for the Chinese market (particularly the Philippines, Indonesia and Thailand) have recently improved the competitive advantage of local producers, but this is not reliable
- In recent years prices for the coconut raw materials have increased, but the price for some value-added products such as DC has stabilized or declined
- New value-added production may have a negative impact on raw material prices as it comes on line, because the market is thin and because of weak backward linkages. Government policy has not always co-ordinated the two stages in the chain of production very effectively, e.g. licensing for new plant may not be coordinated with the planting of new sources of raw materials. There are two main planning agencies involved in this, the Departments of Agriculture and Industry.

Source: Team collected from many sources

Vietnam has a diverse coconut genetic base with potential varieties for specific uses such as the Ta, Dau and Bung Talls for production which provides some advantage over its competitors in certain areas

Coconut conversion table

Coconut products (1,000 nuts)	White meat (kg)	Copra (kg)	Desiccated (kg)	Charcoal (kg)
Philippines	360	191	120	50
Sri Lanka	-	173	125	51
Vietnam	300 - 350	222	122 - 143	83.3

The general quality of Vietnam's coconuts is better than those of other countries. 1,000 nuts from Vietnam can make more white meat, desiccated and charcoal compared with the Philippines and Sri Lanka.

Husk (number)	1 Ton Coir Fibre
Philippines	3,348
Sri Lanka	7,875
Vietnam	3,600

Vietnam's coconuts are better than those of other countries because:

- Coconut trees are well adapted to the soil and weather conditions in Vietnam.
- The average age of Vietnam's coconut trees is younger.

Source: PCA, Coconut statistical year book 2006, APCC and field trip

In general, coconut cultivation in the Philippines has more favourable conditions and more positive outcomes than the industry in Vietnam, including larger farm sizes and higher per capita income (in 2002)

Vietnamese

- ***Average farm size: 0.34 ha***
- ***Educational level: 50% Primary, 34% secondary***
- **Average coconut household income**: 147 US$/ha/year.
- ***Coconut Yield***: 45 nuts/tree/yr
- ***Farmers practising intercropping***: 42%
  Intercropping with banana and cocoa
- ***Farmers rising livestock: 35.1%***

Philippines

- ***Average farm size: 2.75 ha***
- ***Educational level: 58% Primary, 31% secondary***
- **Average coconut household income** : 184 US$/ha/year.
- ***Coconut Yield***: 52 nuts/tree/yr
- ***Farmers practising intercropping***: 56.3%
  Intercropping with Coffee, papaya, pineapple
- ***Farmers raising livestock: 65.6%***

Source: Poverty reduction in coconut growing communities

4. Impact

1 Introduction | 2 Demand | 3 Competi-tiveness | **4 Impact** | 5 Opport-unities | 6 Next Steps

- **The coconut industry and poverty in Vietnam**
- **Background to the province and coconut industry in Ben Tre**
- **Economic impacts**
    - Economic impact distributions
    - Benchmarking cost & benefits of coconut to other crops
- **Environmental impacts**
- **Social impacts**

Poverty statistics show that households growing coconuts were better off than the norm for all rural households in 2004-2006 and that their situation improved

	2004			2006		
	Poverty Headcount (%)	Poverty gap (%)*	Observations	Poverty Headcount (%)	Poverty gap (%)	Observations
All Rural HHs	25.02	6.12	6,939	20.18	4.9	6,882
Coconut growers	15.78	2.89	543	10.22	1.72	544

- ✓Between 2004 to 2006 the poverty headcount for all rural households and for those specifically growing coconuts reduced: from 25.02% to 20.18% for all rural households and from 15.78% to 10.22% for coconut growers
- ✓The poverty gap* similarly reduced, but the poverty gap for coconut growers decreased more quickly than for all rural households
- ✓Both the poverty headcount and the poverty gap for coconut growers were lower than for all rural households in the two years 2004 and 2006.

- The Poverty Gap is a measure of the average distance of the population of poor people below a formally defined poverty line. The poverty gap can be used to represent the theoretical transfer required to bring the whole of the poor population up to the poverty line. Change in poverty gap provides a more effective structural measure of the change in economic status of a population of poor people.

Source: Calculated from VHLSS data, GSO

Although the number of statistical observations was limited, coconut-growing households were better off in 2004-2006 than non-coconut-growing households in all areas of Vietnam apart from the Red River Delta

All Rural Households

Region	2004			2006		
	Poverty headcount (%)	Poverty gap (%)	Observations	Poverty headcount (%)	Poverty gap (%)	Observations
Red River Delta	14.96	2.63	1,524	10.96	1.87	1,521
North Central Coast	36.42	9.31	849	31.75	8.53	852
South Central Coast	24.97	6.72	594	17.08	3.62	585
South East	10.94	2.42	666	9.88	2.61	645
Mekong River Delta	18.13	3.50	1,488	11.75	2.06	1,473

Coconut-growing Households

Region	2004			2006		
	Poverty headcount (%)	Poverty gap (%)	Observations	Poverty headcount (%)	Poverty gap (%)	Observations
Red River Delta	18.73	3.36	24	8.27	0.90	23
North Central Coast	31.67	6.14	48	12.71	2.72	45
South Central Coast	19.78	3.23	92	14.05	2.19	70
South East	3.43	0.19	42	3.95	0.26	44
Mekong River Delta	11.15	2.24	322	10.26	1.73	345

Source: Calculated from VHLSS data, GSO

Certain segments of coconut-growing households also appear to have become richer slightly faster than non-coconut households from 2004 to 2006

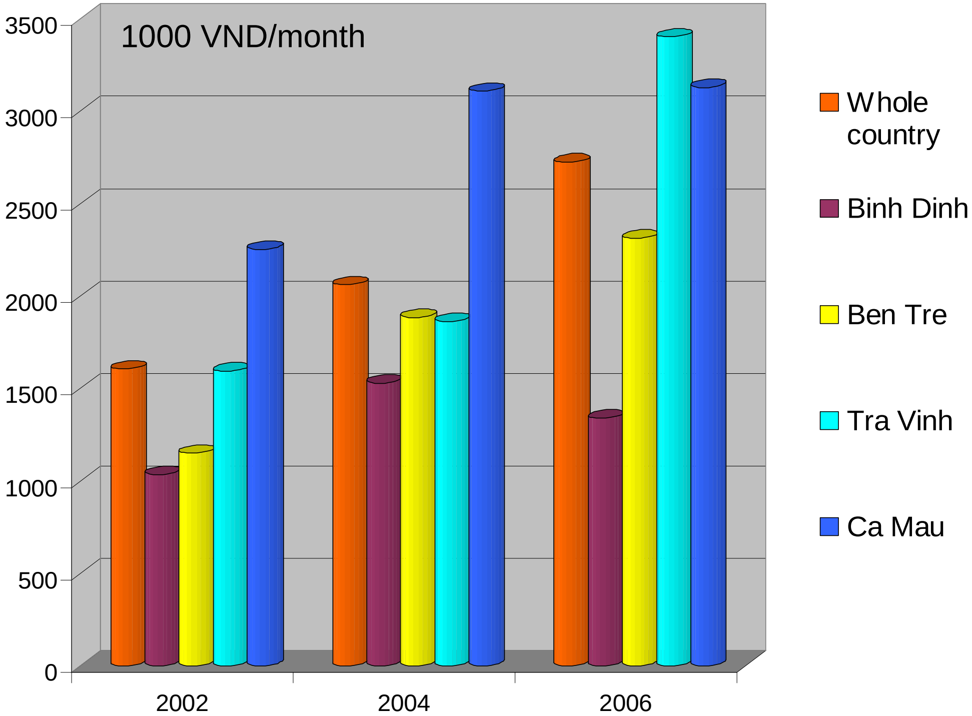
Quintiles*	2004		2006	
	Coconut growers (%)	All Rural HHs (%)	Coconut growers (%)	All Rural HHs (%)
1	16.26	25.62	13.36	25.32
2	27.56	24.47	28.12	24.73
3	26.47	22.84	24.40	22.11
4	22.18	18.93	22.82	18.18
5	7.51	8.14	11.29	9.67
Total	100.0	100.0	100.0	100.0

Key: Quintiles divide households (HHs) by their living standards according to expenditure per capita where 1 = Poorest and 5 = Richest

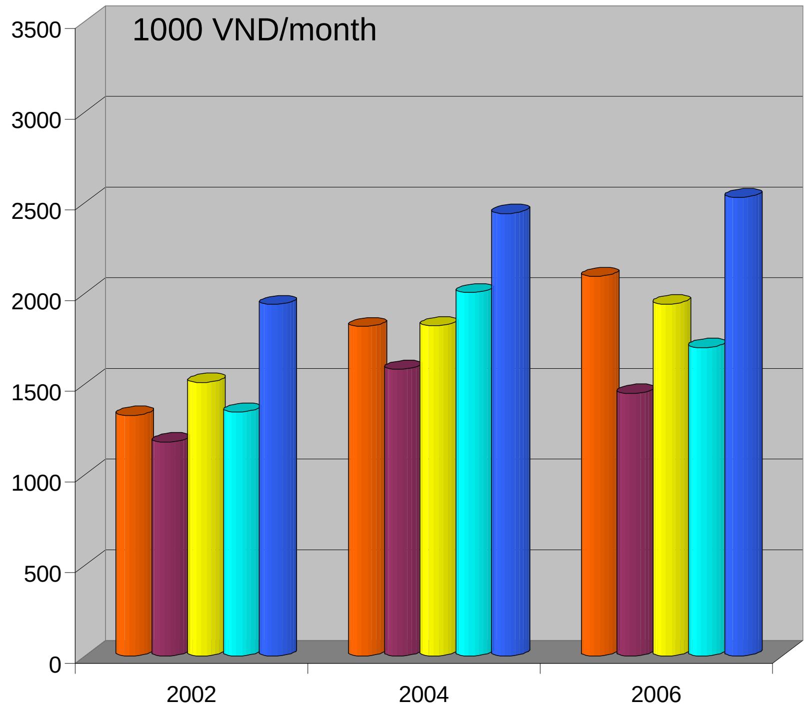
Source: Calculated from VHLSS data, GSO

Provincial data also confirm that, in general, the average monthly incomes of coconut-producing households are higher than those of non-coconut HHs

Avge. income for coconut-producing HHs



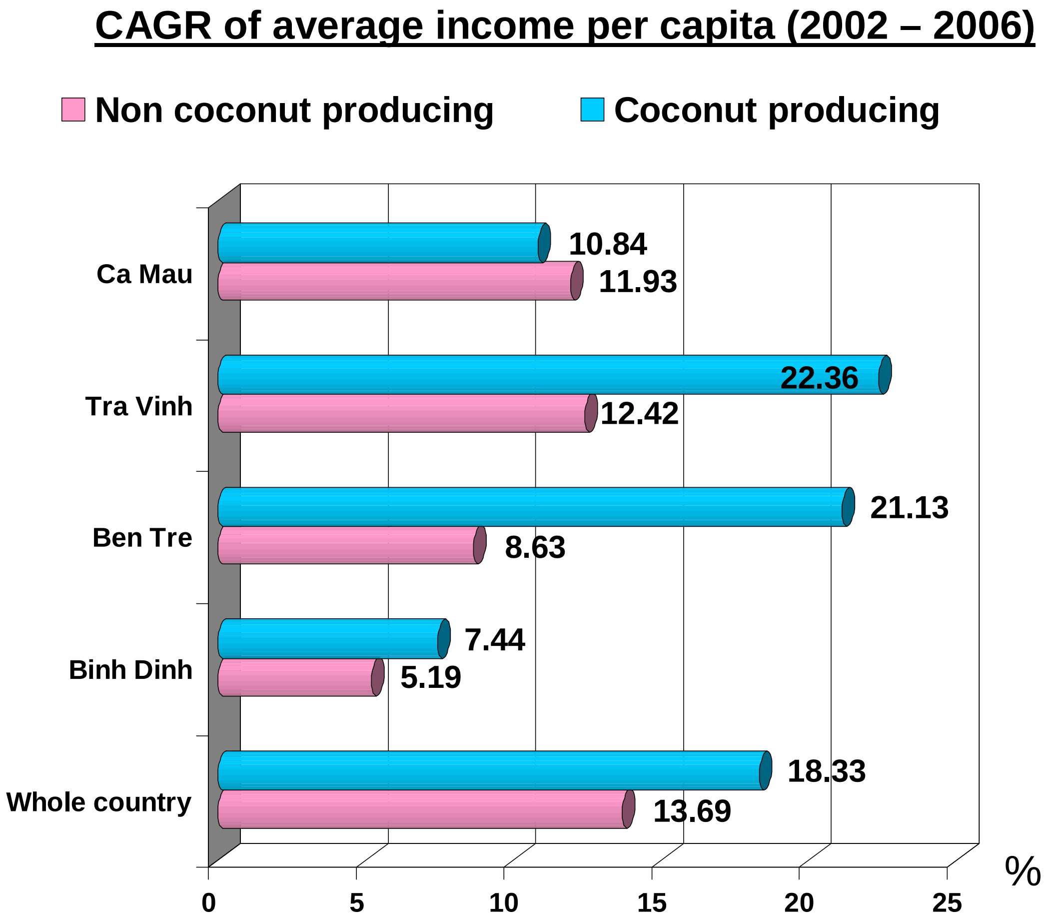
Avge. income for non-coconut-producing HHs



- According to VHLSS data from 2006, the average income per month (AIPM) for coconut-producing households (HHs) is higher than the AIPM for non-coconut-producing HHs in some provinces as well as in the country as a whole.
- Coconut-producing HHs in Tra Vinh enjoyed the highest AIPM in 2006 (3.4 mn. VND), while the AIPM for coconut HHs in Binh Dinh was the lowest (1.3 mn. VND) compared with averages of 2.7 mn. VND for coconut-producing HHs and 2.1 mn. VND for non-coconut-producing HHs in Vietnam as a whole.

Source: Calculated from VHLSS data, GSO

Similarly, the growth rate of average income per capita (AIPC) for coconut-producing households at provincial level was higher than the rate for non-coconut producing HHs during the period 2002 – 2006



- ✓ Because the price of coconuts increased very fast in recent years, the income of coconut-producing HHs also increased very quickly across the whole country
- ✓ The higher growth rate for coconut-producing HHs suggests that – other things being equal – the coconut sector has the potential to improve incomes for poorer people
- ✓ The two provinces with the highest AIPC were Tra Vinh (22.36%) and Ben Tre (21.13%) which also have the largest coconut-growing areas in Vietnam.

Source: Calculated from VHLSS data 2006, GSO

The VHLSS data indicate that ethnic minorities are less represented among coconut-growers, who have slightly more land but less high school education

	2004		2006	
	All Rural HHs	Coconut growers	All Rural HHs	Coconut growers
HH Size (# of people)	5.06	5.26	4.92	4.85
Ethnic minority (%)	16.43	7.22	17.49	8.26
Female headed (%)	16.62	17.43	16.59	16.16
HH head education: < primary (%)	2.53	2.93	0.91	1.80
HH head education: primary (%)	38.20	56.68	41.80	53.68
HH head education: High school (%)	13.86	7.82	15.29	11.66
Perennial crop land (aver. ha)	0.76	0.82	0.16	0.19
Total land (ha)	1.46	1.56	0.92	1.02

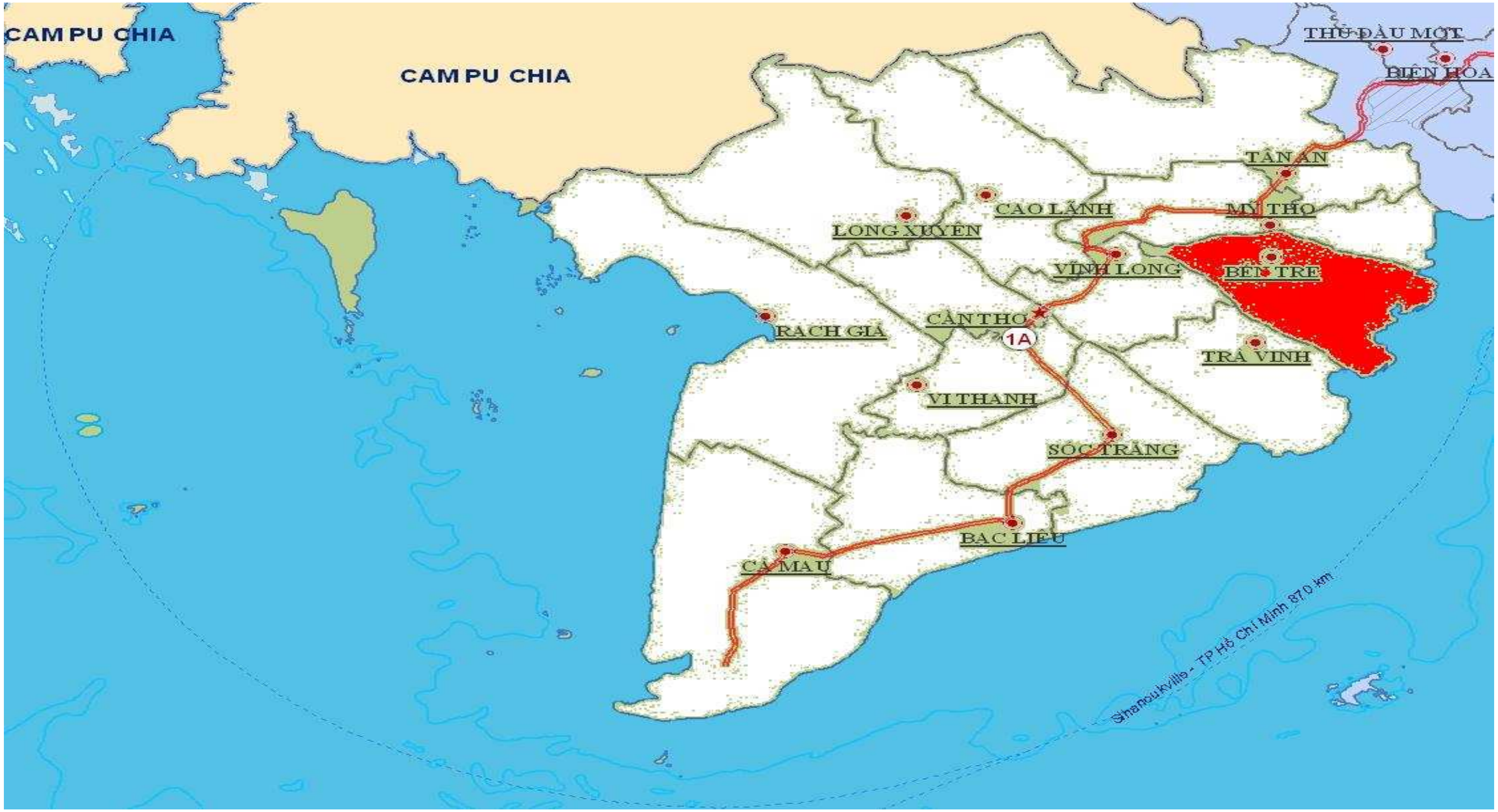
Source: Calculated from VHLSS data, GSO

4. Impact

1 Introduction	2 Demand	3 Competi-tiveness	4 Impact	5 Opport-unities	6 Next Steps

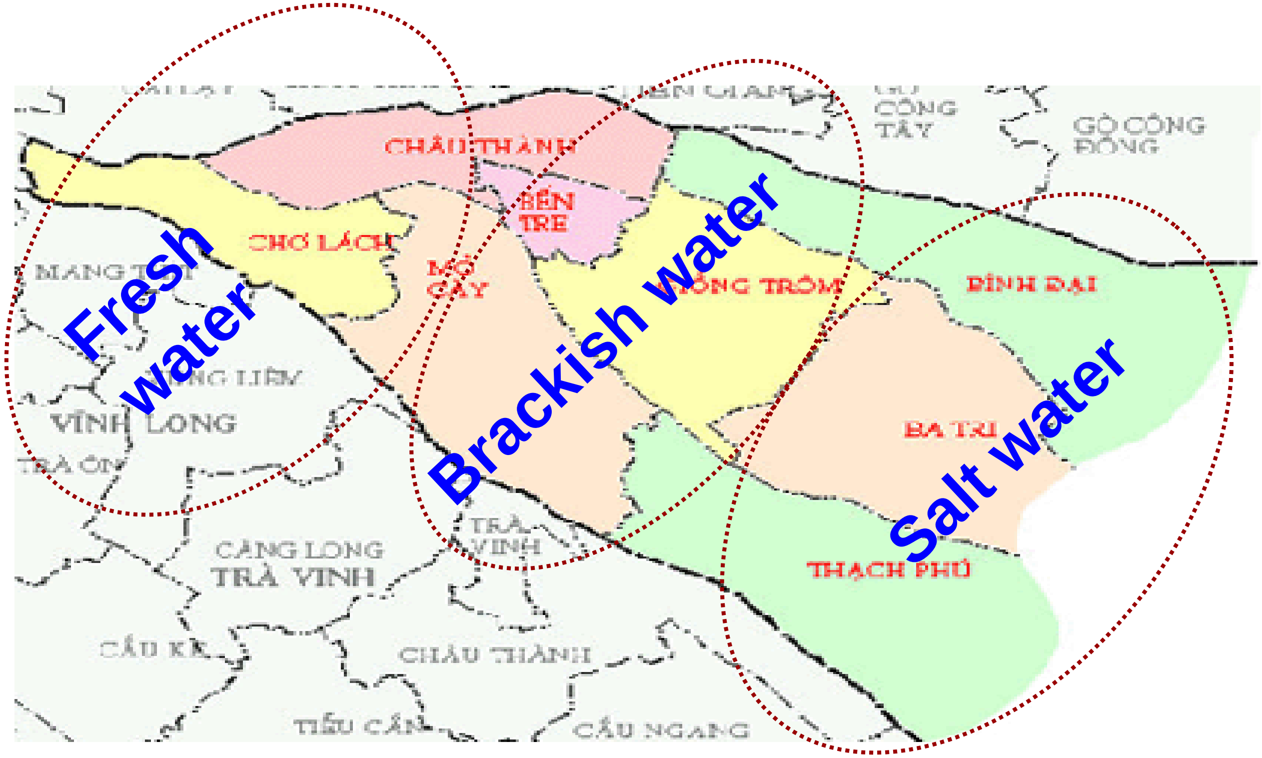
- **The coconut industry and poverty in Vietnam**
- **Background of the province and coconut industry in Ben Tre**
- **Economic impacts**
  - Economic impact distributions
  - Benchmarking cost & benefits of coconut to other crops
- **Environmental impacts**
- **Social impacts**

Ben Tre is one of the 13 cities and provinces in the Mekong River Delta, bordering Tiền Giang, Trà Vinh, and Vĩnh Long provinces, having 65 km. of coastline with the South China Sea and covering an area of 2,322 km^2



Ben Tre is the centre of a cluster of Mekong Delta provinces which together account for 33% of the production and 28% of area of the country's coconut industry

There are three climatic zones in Ben Tre: salt water, fresh water and brackish. Coconuts can be grown in all three, but the main land for growing coconuts is brackish



- ➢2 brackish districts - Mỏ Cày and Giồng Trôm have the largest coconut cultivation area in Ben Tre and many times more compared to the salt water and fresh water districts. Growing fruit in this zone is less economically efficient than coconuts so most of the brackish area is used for coconuts
- ➢Salt water is suitable for aquaculture and fresh water is suitable for fruit, so the coconut cultivation area in these two climatic zones is smaller than in the brackish zone

Source: www.bentre.gov.vn; Field trip 2008

Ben Tre's total natural land area was 235,685 ha in 2005. Agricultural land covers 181,252 ha (77%), of which 75% is farming land and the other 25% water surface for aquaculture. Coconut trees cover 44,423 ha of the agricultural land

Coconut cultivation area, productivity and yield of Ben Tre in 2007 by district

Coconut	Whole province	Town	Châu Thành district	Chợ Lách district	Mỏ Cày district	Giồng Trôm district	Binh Đại district	Ba Tri district	Thạnh Phú district
Cultivation area (ha)	44,423	1,436	5,155	1,050	16,446	11,495	4,840	1,243	2,758
New plantation (ha)	3,667	66	104	68	2,072	691	209	161	296
Harvesting area (ha)	34,906	1,281	4,756	839	11,640	9,425	4,092	685	2,188
Productivity (Ton/ha)	8.5	8.8	9.0	8.9	9.1	9.1	8.1	7.8	7.7
Production (ton)	297,413	11,273	42,804	7,467	105,924	76,343	31,918	5,275	16,410

- There are various coconut plantation forms like specialized gardens, mixed gardens with fruits (e.g. sectioned fruits, mangosteen, etc.) and more recently cocoa trees
- The province is strong in aquaculture and planting activities which are considered its leading sectors with annual export turnover of over USD 100 mn., especially from aqua and coconut products
- The main increase in coconut production is slated for Mỏ Cày District.

Source: Ben Tre, DARD (obtained August 2008)

Ben Tre also has significant coconut processing facilities …

In 2007, the total consumption in Ben Tre was 369.60 million nuts. Local production was 297.38 mn. nuts with the remaining 72.22 mn. nuts being collected from other provinces

Usage was as follows:

- For industrial processing: 226 mn nuts

- Outside province consumption: 25. mn. nuts

- Local consumption: 0.6 mn. nuts

- Export: 118 mn. nuts

Ben Tre has over 250 coconut processing facilities which consume 226 million nuts annually. The larger-scale copra processing and drying factories include Phú Hưng, Betrimex, Malaysia, etc. In addition, many small facilities and households are processing jelly, charcoal, thread, craft and other products.

Source: Ben Tre DARD

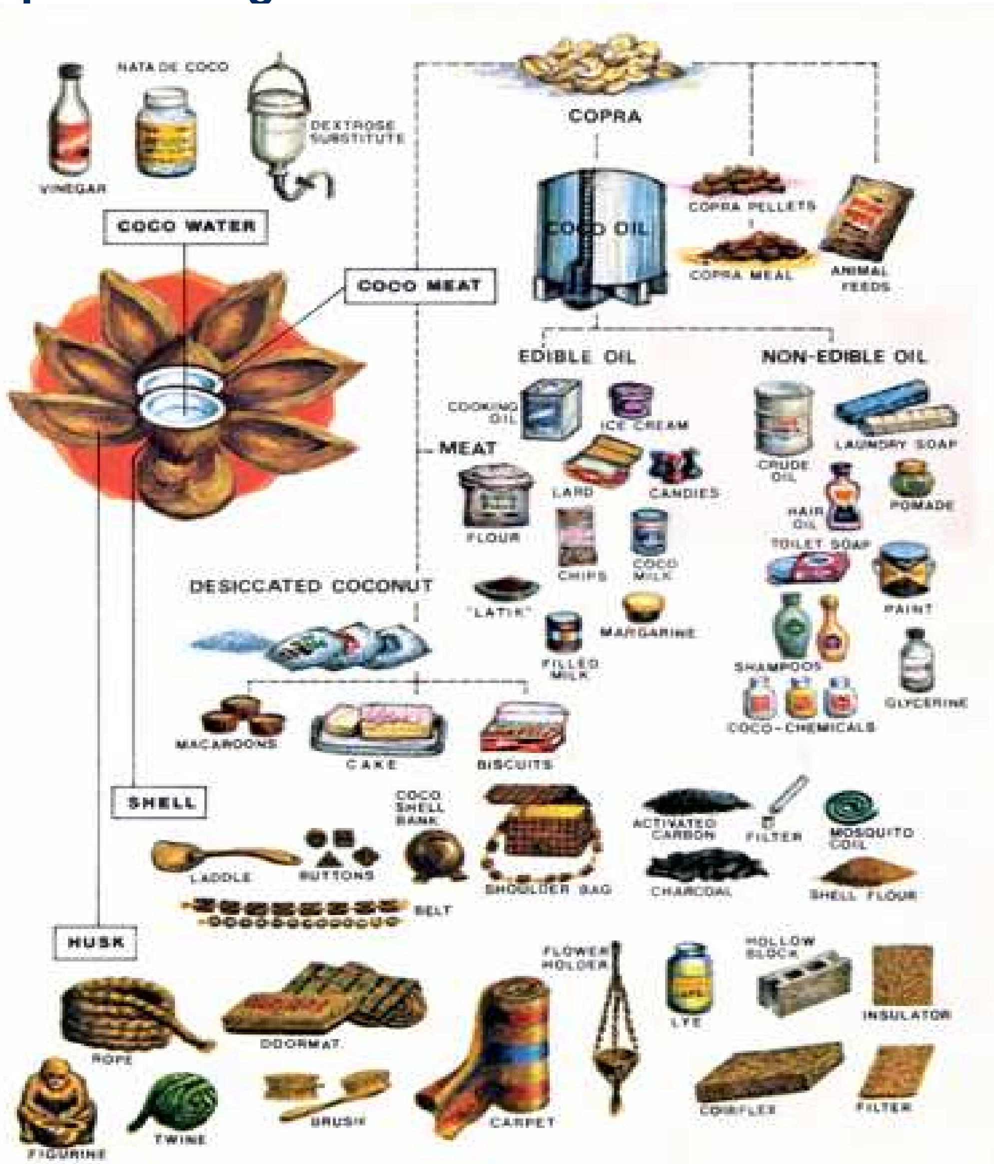
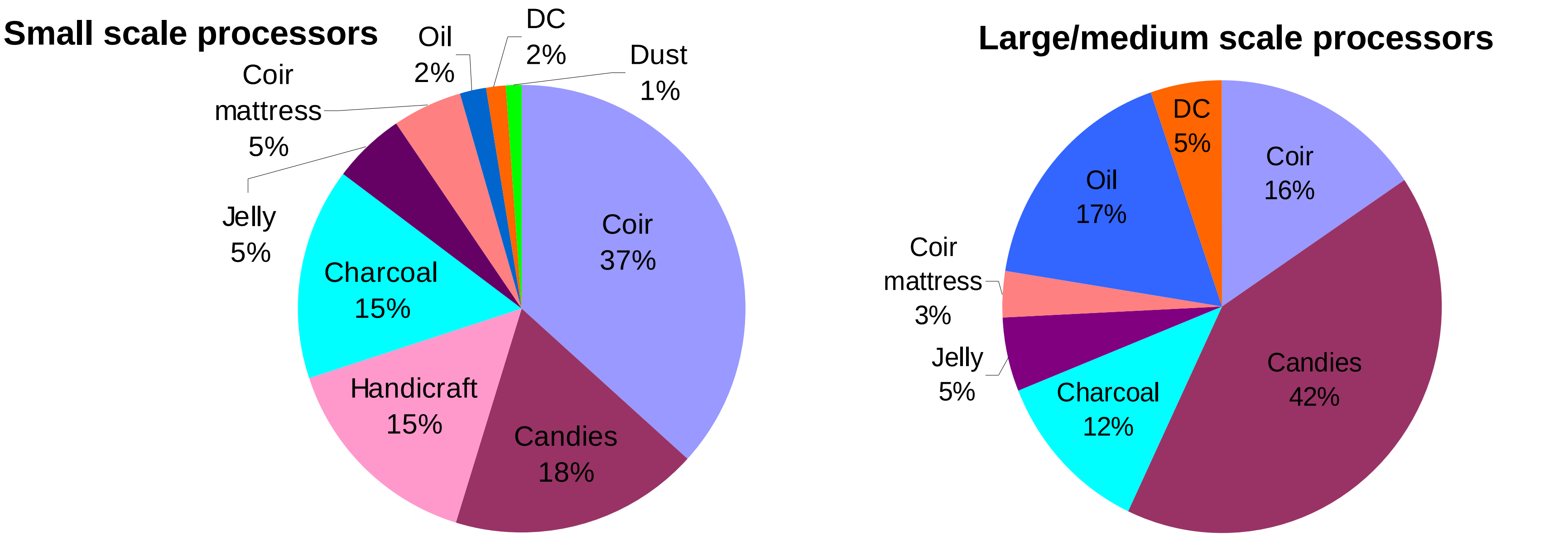


Diagram illustrating the coconuts product chain
Source: Divina D. Bawalan

There are two scales of coconut processing in Ben Tre: small-scale with limited facilities and capital, and medium/large scale private companies with high investment; each has different product focuses



Category	Small - scale	Large/Medium scale
Type of processor	Facility	Private Ltd. or Government company
Average employee	30 people	250 people
Labour	6% skilled and 94% unskilled	10% Skilled and 90% unskilled
Charter Capital	150 million VND	5 billion VND
Working Capital	4 billion VND	> 100 billion VND
Annual Revenue	1.5 billion VND	15 billion VND

Source: Department of Science and Technology, Ben Tre Province

Increases in prices, quantities and stable consumption in recent years have brought large amounts of foreign currency to Ben Tre though coconut exports

Export turn-over of the coconut industry

2005: USD 43.35 mn.

2006: USD 45.83 mn.

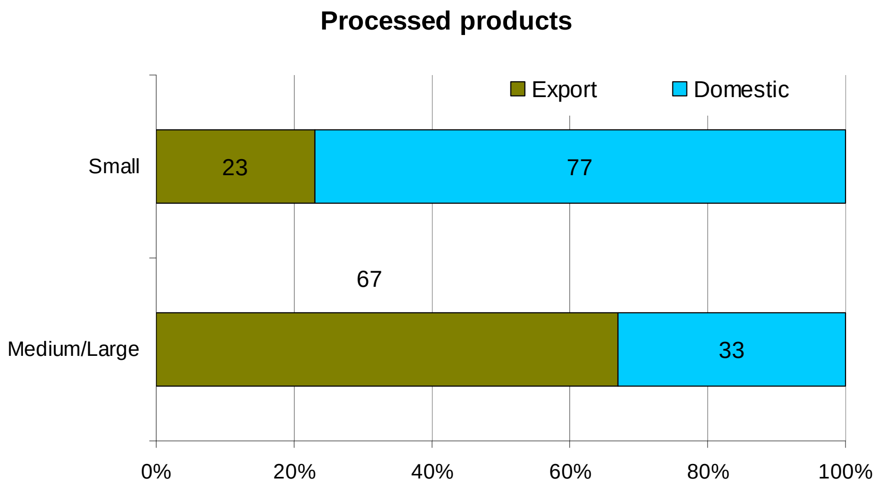
2007: USD 58.56 mn.

Quantity of coconut production exported

Product	Unit	2005	2006	2007
- Fiber	Ton	65,499	71,778	53,846
- Coconut candy	Ton	7,989	8,834	10,133
- Desiccated (DC)	Ton	13,464	6,230	10,614
- Charcoal	Ton	13,745	6,795	11,006
- Coconut jelly	Ton	1,913	2,118	3,819
- Coconut peat	Ton	1,394	1,972	3,096
- Fiber net	1,000 m^2	7,127	9,631	8,075
- Nut	mn nuts	72	88.5	118.6

Prices of coconut product exports in 2007

Product	Unit	Price
- Fiber	USD/ton	251
- Coconut candy	USD/ton	660
- DC	USD/ton	1,080
- Charcoal	USD/ton	224
- Coconut jelly	USD/ton	
- Coconut peat	USD/ton	
- Fiber net	USD/1,000 m^2	352
- Nut	USD/1,000 nuts	148



Source: Report of Ben Tre People's Committee for first six months of 2008

The export turn-over of coconut industrial products was about 74% of the export turn-over of all industrial and small scale industrial products and 28% of the total exports of Ben Tre in 2007

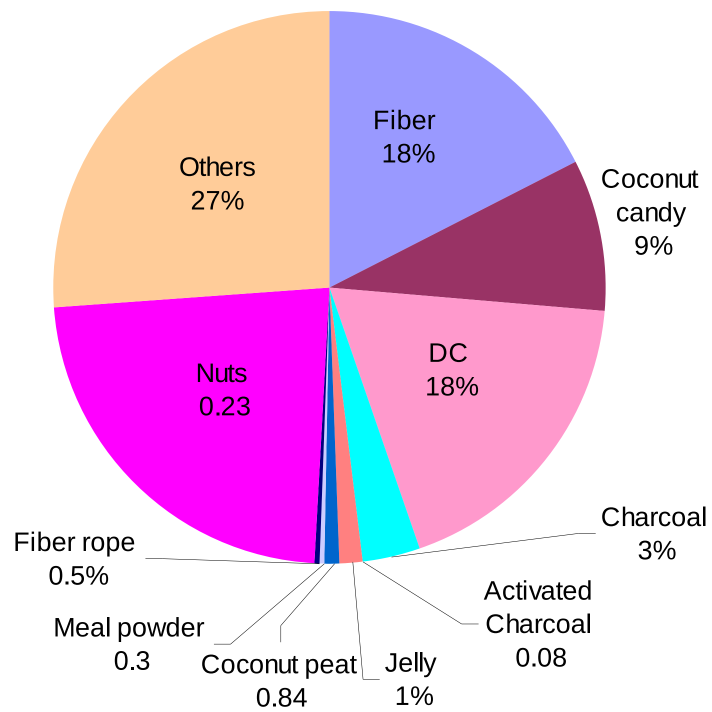
Export turnover of Ben Tre in 2007

Items	Value (mn. USD)
▪ Industrial and semi- industrial products	76.583
▪ Agricultural products	17.486
▪ Aquatic products	47.286
Total	**141.354**

Export structure of Ben Tre's industrial products

Items	Value (mn USD)	Share in 2007 (%)
Exp. turnover of industrial and small scale industrial product	76.583	100
- Fiber	13.499	17.63
- Coconut candy	6.707	8.58
- Desiccated Coconut (DC)	14.100	18.41
- Charcoal	2.468	3.22
- Activated Charcoal	0.061	0.08
- Coconut jelly	0.945	1.23
- Coconut peat	0.642	0.84
- Coconut meal powder	0.231	0.30
- Fiber rope	0.382	0.50
- Nut	17,552	22.91
- Others	19,994	26.10

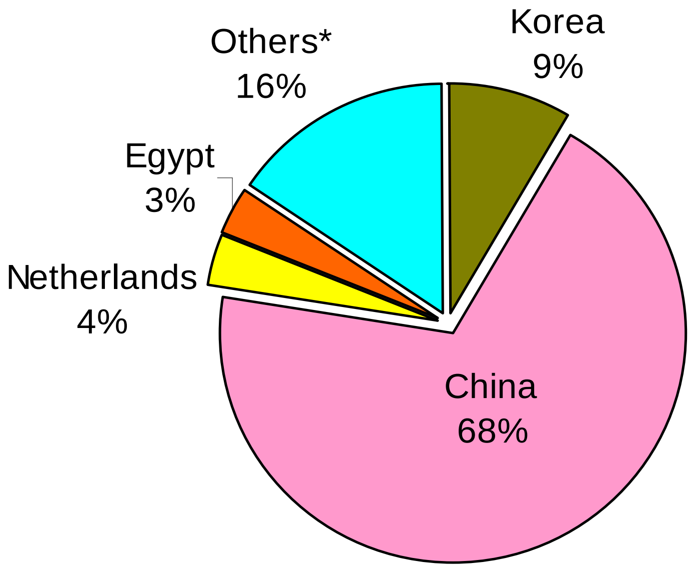
Export structure of industrial products



Source: Report of Ben Tre People's Committee for first six months of 2008

While precise figures are difficult to find, it is estimated that more than two thirds of the value of coconut product exports derives from China, including fiber, jelly, DC, candy and whole nuts

Destination share of Coconut product exports by value



* Others includes: Taiwan, Hong Kong SAR, Kuwait, U.A.E, France, Russia, South Africa, and Australia

- ✓ The world demand for coconut products is increasing resulting in a developing export market. In 2001 Ben Tre exported coconut products to 23 countries, in 2005 to 58 countries/regions, and in 2007 to 67
- ✓ China needs to import coconut products to meet the demand of its large population. They usually import raw nuts or primary products and then re-process for added value.

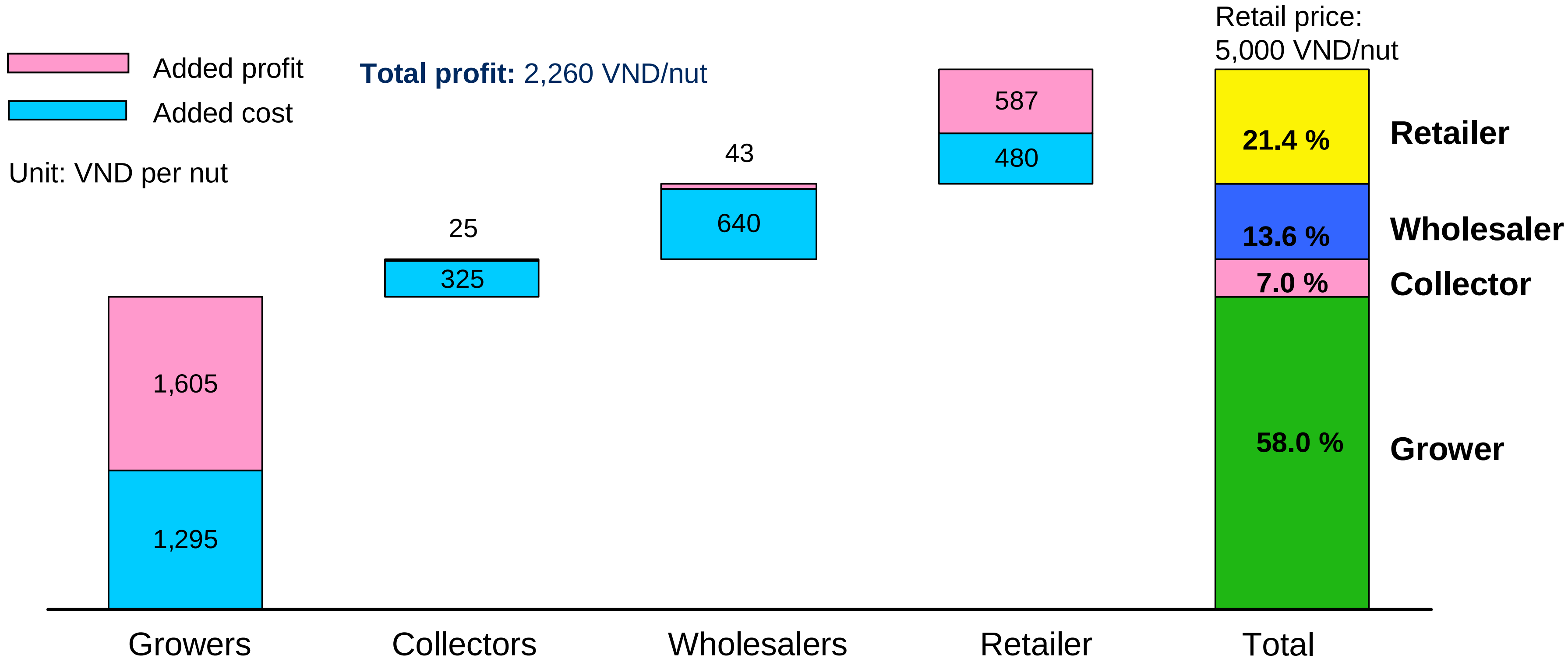
Source: Calculated from Ben Tre People's Committee report, 2007

4. Impact

1 Introduction	2 Demand	3 Competi-tiveness	**4 Impact**	5 Opport-unities	6 Next Steps

- **The coconut industry and poverty in Vietnam**
- **Background to the province and coconut industry in Ben Tre**
- **Economic impacts**
  - Economic impact distributions
  - Benchmarking cost & benefits of coconut to other crops
- **Environmental impacts**
- **Social impacts**

"Xiêm" & "Dứa" are dwarf coconut varieties which grow in Ben Tre and are used for drinking. The total gross margin of all actors in the value chain is estimated at about 45% of final retail price, with growers capturing some 71% of total profit



- The "Xiêm" and "Dứa" varieties of coconut are used mostly for drinking, rather than processing. Based on a small sample of interviews, these dwarf coconuts create a profit of around 2,260 VND per nut thru' the chain. Growers earn the highest profit at 1,605 VND/nut, but the total profit of each other stakeholder is much higher than the growers because their production is much bigger and their business cycle is shorter.
- Compared to processed coconuts, the profit from "drinking coconut" trees is lower (calculated per nut) but their density and yield are higher.

Source: Team analysis, Field trip in Ben Tre, August 2008

“Ta” & “Dâu” are tall coconut varieties which grow in Ben Tre. They have thick meat with an oil content of 60-65%, so they are used for processing both for sale in the domestic market and for exporting

Total profit:

- Domestic market: total profit is 3,125 VND/ nut, 60% of the total profit
- Exports: total profit is 3,144 VND/nut, 56% of the total profit.

- “Ta” and “Dau” coconuts are grown in Ben Tre for processing. They creates a profit of around 3,125 VND/nut, with growers enjoying the highest profit of some 3,035 VND/nut. However, at survey time processors got more total profit than growers because the value of coconut products was high
- There is only a small difference between the profit from the domestic market and exports because Vietnam mainly exports raw coconuts, and the value added in raw coconut exports is very low.

Source: Team analysis, Field trip in Ben Tre, August 2008

A high-level comparison between Ben Tre and Binh Dinh, the sixth largest coconut producing province, suggests that coconuts have helped the development of Ben Tre in many aspects including income, cultivation, etc.

Binh Dinh

Located along the coastal region of Central Vietnam with ecological conditions suitable for coconuts and a long history of their cultivation

- ***Average household: 5-6 members (1-2 children under 16 of age)***
- ***Average farm size: 0.34 ha***
- ***Ave monthly household income: 39.5 $- 93.3 $ (31% of which come from coconut, 2003)***
- **Utilization of coconut**: food, drink, fuel, firewood and as planting materials
- **Coconut Yield**: 38 nuts/tree/year
- ***Farmers practicing intercropping***: 7.3%
- ***Households processing coconut : 28.1%***

Ben Tre

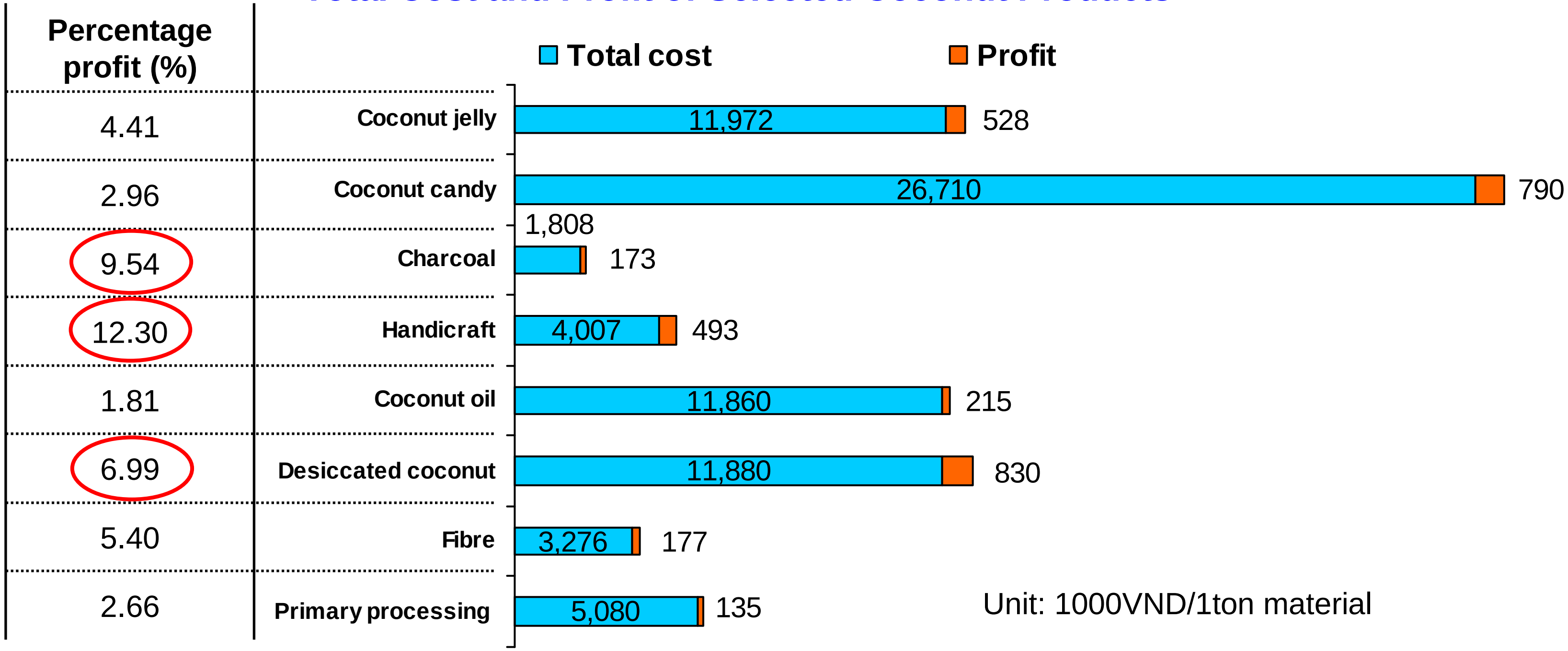
The most famous coconut growing province in the Mekong Delta, with wide cultivation but less basic processing

- ***Average household: 4-5 members (1-2 children under 16 of age)***
- ***Average farm size: 0.3-0.5 ha***
- ***Average monthly household coconut income: 95.5 $/ha - 150$/ha (in 2008)***
- **Utilization of coconut:** food, DC, fiber and handicraft
- **Coconut Yield**: 45 nuts/tree/year
- ***Farmers practicing intercropping***: 83.1%
- ***Farmers rising livestock : 63.3%***

Source: Poverty reduction in coconut growing communities

Profit margins on coconut products in Ben Tre vary widely; profits on desiccated coconut (DC) are highest at around 830,000 VND per ton of material

Total Cost and Profit of Selected Coconut Products



- DC has the highest profit margin at 830 VND/kg of material. The DC industry is becoming well-established in Ben Tre, and DC is already being produced and exported
- Very little coconut oil is now produced in Ben Tre as the profit margin is very low. The production process is very simple: raw oil is made from pressing the brown cover which is salvaged from extracting white meat
- Other coconut products – such as fiber, candy, jelly, and handicrafts – appear to be profitable and to be creating many jobs for local people, and possibly also for people living in neighbouring regions who are also unskilled and poor.

Source: Team analysis, field trip data in Ben Tre, August 2008

DC is more productive per labour day than coco-candy production because it involves more capital-intensive processes

No. of labor days/ha	DC	coco candy
Plantation, management, & harvesting	215	215
Selling labor for collectors/wholesalers	10	10
Selling labor for processors: - DC - Coco candy - Fiber - Charcoal - Raw oil - Jelly	 15 17 6 3 13	 150 17 6 3 13
Total	**279**	**414**
No. of FTE (assuming that famer spend 6 days/month for coconut sector)	279/(6*12) = 3.8	414/(6*12) = 5.75

Observations: 6 famers, 10 processors, 4 collectors

Local financial impact per ha (1,000 VND/ha)	DC	Coconut candy
Farmer		
- Selling nuts	40,500	40,500
- Selling labor for collectors/wholesalers	900	900
- Working in processing workshops * DC * Coco - candy * Fiber * Charcoal * Raw oil * Jelly	 730 561 500 120 578	 2,813 561 500 120 578
Procurement	225	225
Local processors * DC * Coco - candy * Fiber * Charcoal * Raw oil * Jelly	 4,172 1,200 1,000 400 486	 5,625 1,200 1,000 400 486
Total	**51,372**	**54,908**

Source: Team analysis, field trip data in Ben Tre, 2008

Measuring the efficiency impact of the coconut industry supply chain on a per hectare basis demonstrates the higher value and pro-poor impact of processing

DC as an intermediate coconut product is profitable, but less so when compared with a final processed item such as coco-candy

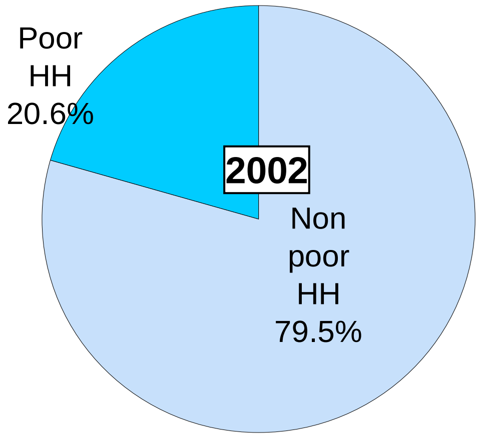
Industry	Total income (1,000 VND/ha)	Pro-poor income (VND/ha)	Employment creation (FTE/ha)	Women in supply chain (%)	Jobs in rural communities (%)
DC	51,372	44,114	3.8	45	100
Coco - candy	54,908	46,197	5.75	70	100

- To calculate certain indices, we have assumed that 100 % of white meat is used for DC processing only and vice versa for coco-candy.
- The DC industry is a relatively new sector in Ben Tre needing more investment in higher technology. The export price of DC is higher than for other exported products so this segment brings much benefit not only to the businesses but also to their workers.
- The coconut oil in Ben Tre has been in decline since the DC industry came to Ben Tre. The efficiency in producing coconut oil is less than in DC because of the price. Most of the white meat is now used to produce DC because it is more profitable and the brown cover from white meat is material used to produce raw coconut oil.

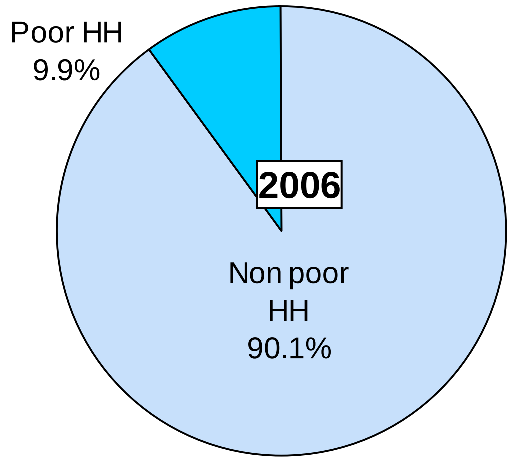
Source: Team analysis, field trip data in Ben Tre, 2008

In Ben Tre, the number of coconut-producing households (HHs) classified as poor decreased from 20.6% in 2002 to 9.9% in 2006. HHs classified as poor have a smaller area allocated to coconuts than other HHs

Poor and "non-poor" classification of coconut-producing HHs in Ben Tre in 2002 (%)



Poor and non-poor classification of coconut-producing HHs in Ben Tre in 2006 (%)



	% of poor/non-poor coconut-producing HHs in Ben Tre			Coconut area in Ben Tre (m2)		
	2002	2004	2006	2002	2004	2006
Non-poor HHs	79.45	89.4	90.1	2,937.93	3,190.79	2,973.23
Poor HHs	20.55	10.6	9.9	2,265.36	1,367.83	531.71

Source: Calculated from VHLSS data 2006, GSO

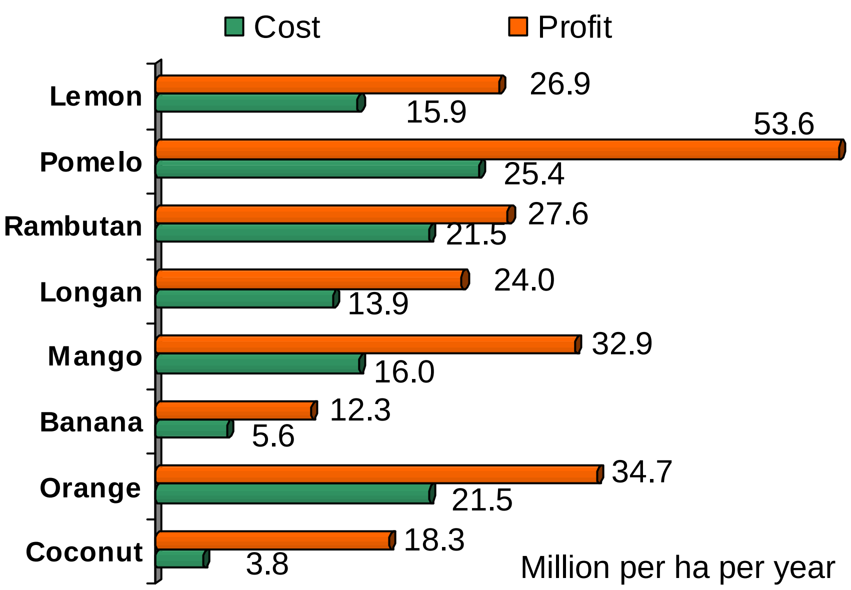
4. Impact

1 Introduction	2 Demand	3 Competi-tiveness	**4 Impact**	5 Opport-unities	6 Next Steps

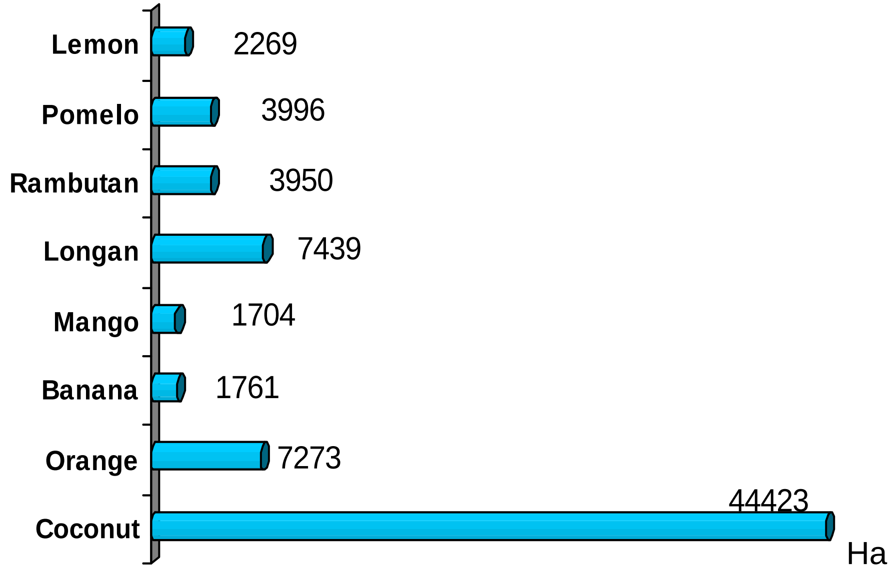
- **The coconut industry and poverty in Vietnam**
- **Background to the province and coconut industry in Ben Tre**
- **Economic impacts**
  - Economic impact distributions
  - Benchmarking cost & benefits of coconut to other crops
- **Environmental impacts**
- **Social impacts**

Although the absolute profit from coconuts is lower than for some other perennial crops, the land area allocated in Ben Tre to coconuts is larger

Cost – Profit of some crops in BT in 2007



Area of some crops in BT in 2007



The reasons that the area allocated to coconuts is higher than to other crops area that:

- Coconuts can grow on all kind of soil while fruits are less suitable, so most of Ben Tre's brackish zone is used for coconuts
- Coconuts can grow with other crops (intercropping), including cocoa, banana, and pomelo
- Only a small cost and not much labour is required to take care of coconut trees while other crops need higher investment.
- Coconut demand is projected to increase in the future so farmers expect that the coconut price will be higher, which has incentivised more famers to jump into this sector.

Source: DARD of BT, 2007

Intercropping cocoa with coconuts results in higher profit for the farmer than monoculture of coconuts

Unit: 1,000 VND/ha

Items	Coconut only	Coconut intercropped with Cocoa		
		Coconut	Cocoa	Total
Cost	3,811	2,286	11,140	13,426
Yield (kg/ha)	8,100	8,100	1,300	
Revenue	22,146	22,146	34,970	57,116
Profit	18,336	19,860	23,830	43,690
Feasibility	Monthly income	Monthly income	Every 2 weeks	Every 2 weeks

- The model of intercropping coconut with cocoa was first developed in Ben Tre 2-3 years ago. The total cultivation area of coconuts is still limited at about 8,000 ha compared to 44,000 ha of coconut so most farms in Ben Tre are still coconut monoculture
- Intercropping with cocoa increases coconut productivity and quality in comparison with monoculture because the coconuts receive more nutrients from the fertilization of cocoa. However, so far there have been no systematic studies to identify the potential increase in coconut productivity resulting from intercropping with cocoa.
- Intercropping also helps famers to save about 40% of their costs compared to monocropping because there is no need to pay more for fertilizer or labor for coconuts.

Source: Ben Tre Statistical Year Book 2007

4. Impact

- **The coconut industry and poverty in Vietnam**
- **Background to the province and coconut industry in Ben Tre**
- **Economic impacts**
    - Economic impact distributions
    - Benchmarking cost & benefits of coconut to other crops
- **Environmental impacts**
- **Social impacts**

While the coconut industry has brought significant economic benefits to Ben Tre in recent years, there has also been significant environmental pollution

The Giồng Trôm, Hàm Luông, and Thơm rivers have become very **crowded** with junks and other boats carrying nuts and fiber. In addition, most of pre-processing facilities such as collecting nuts, dehusking, peeling, and firing shells are concentrated along the riverside, which is also causing serious environmental **pollution**.

Coco peat is known to be a harmful waste product with high lignin content. Lignin in fresh coco peat causes fish and plants to die if they live in places that are infected with lignin of coco peat. 200 thousand tons of peat are littered annual causing **discolouration and odour** in the water.

Companies firing shells and causing **smoke pollution** have sometimes not obeyed the directions of the authorities causing air pollution which affects not only plants but also the health of residents. In Giồng Trôm District, in general the distance from the charcoal facilities to neighbouring households is from 5-60 metres, and most of them have no chimney, or chimneys only 10 metres long, so significant air pollution can occur.

4. Impact

1 Introduction	2 Demand	3 Competi-tiveness	4 Impact	5 Opport-unities	6 Next Steps

- **The coconut industry and poverty in Vietnam**
- **Background to the province and coconut industry in Ben Tre**
- **Economic impacts**
    - ➢ Economic impact distributions
    - ➢ Benchmarking cost & benefits of coconut to other crops
- **Environmental impacts**
- **Social impacts**

Poor people are involved in most areas of the coconut supply chain in Ben Tre

Input supply	Planting	Procuring	Processing	Transporting	Consumption
Households Hired workers	Farmers	Farmers	Hired workers	Hired workers	Hired workers
▪ Poor households with little land area cultivate the seedlings, and buy fertilizers and chemicals for producing their own coconuts. ▪ About 50% of poor workers sell their labour to the producers with large coconut area in seed transportation, purchase of fertilizers and chemicals, etc. for the producers	▪ The poor workers are involved in planting, caring, harvesting, and transporting products to selling places for the producers. ▪ About 60% of the poor households for the producers	▪ Poor workers working for wholesalers/ traders go to every coconut planting household to buy fruit and other materials from the coconut tree and are involved in transporting to the processing facilities, the company or directly to Chinese coconut-procuring ships docking at the Hàm Luông River	Poor workers are involved in: ▪ For coconut products: peeling, drying, burning shells for charcoal, and loading transportation ▪ For the fiber thread: fiber stripping, drying, packing and transportation ▪ For candy: material purchase, malt stirring, cutting, wrapping, packing and transporting ▪ For handicraft: material purchase, making handicraft items & transport	▪ Poor households with small plantation areas travel to the selling places by bicycles and motorcycles ▪ Households with large areas hire poor workers to transport fruits by various means, including junks and other boats, motorcycles, etc., to selling places ▪ At the processing facilities, poor workers are involved in loading material inputs and transporting products to selling	▪ Poor workers are involved in loading, transporting, packing and delivering products to the selling places as contracted with the owners.

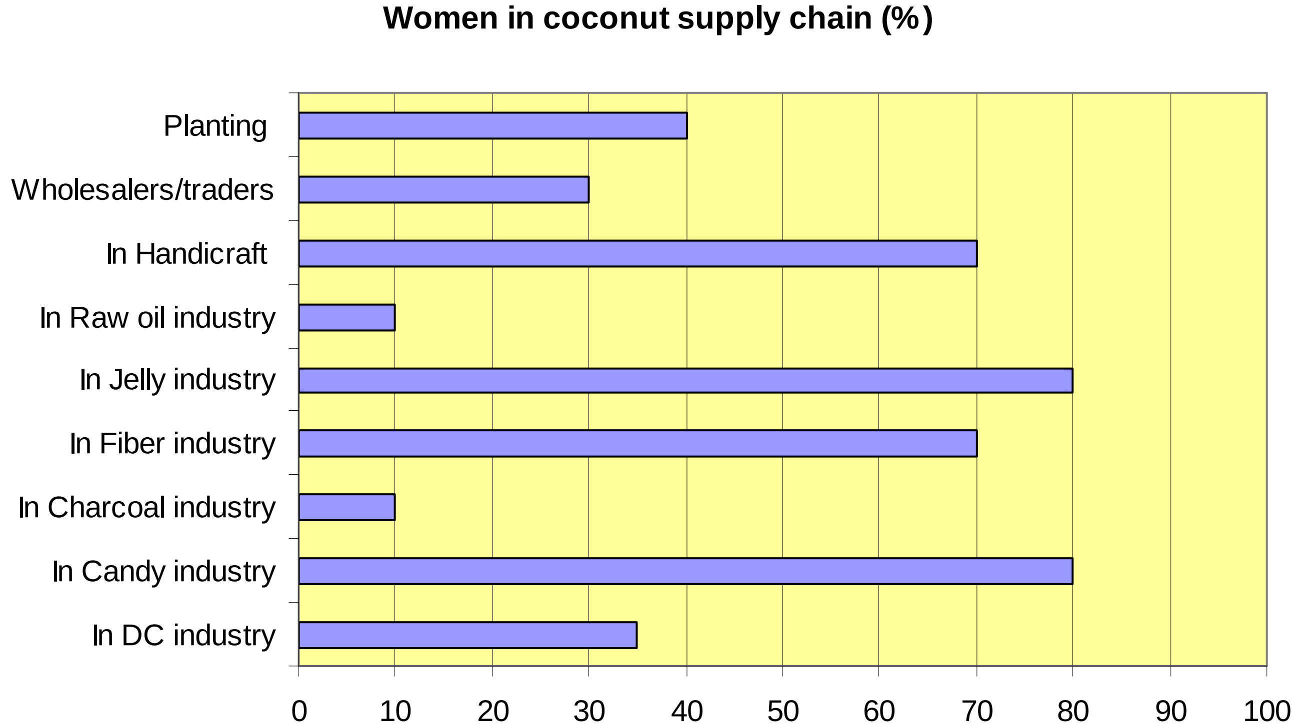
Source: Coconut value chain analysis (Ben Tre – IFAD)

The coconut sector has created many jobs for the local people in Ben Tre, especially for the poor who participate in all activities steps in the supply chain

- Coconut production has attracted over 42% of the population (571,428 people). Processing activities employ the most with an average 30-50 workers for a candy workshop,100 -150 for a DC enterprise, and 5-10 for a handicraft facility
- Most of the hired workers do not sign written contracts with the business owner. Owing to lack of education and skill, poor workers usually have to participate in simple processing steps (manual work – accounting for 70%) with low wages
- Some workers can participate in more complicated steps (technical work) with higher wages as a result of their greater experience and skills
- The activities that generate most jobs in the supply chain include processing and transportation, which account for 50% of the total labourers in the chain
- In order to generate more job in the future, it is necessary to focus on the processing step at all districts and town (e.g. by establishing production and processing facilities to create onsite jobs for the poor).

Source: Team collected from many sources

Although there appears to be more involvement by men than women in the supply chain, women are particularly important in certain areas of processing



- In the coconut sector, women seem to be slightly less involved in the supply chain than men, who appear to play a particularly important role in planting and trading.
- In most producing households, male famers are the key people who plant and take care of the coconut gardens while women spend about 1/3 of their time on agricultural activities.
- In processing, women participate in light works requiring patience and skillfulness such as drying fiber, whittling brown skin, cutting and wrapping candy.

Source: Team analysis, Field trip data in Ben Tre 2008

Chapter 5 - Opportunities

1 Introduction | 2 Demand | 3 Competi-tiveness | 4 Impact | **5 Opport-unities** | 6 Next Steps

A. Conclusions

B. Opportunities

Conclusions – 1. The demand for coconuts

- **Raw coconuts** are consumed widely in the Asian and Pacific region which accounts for ~90% of global consumption. Certain countries in the region are increasing cultivation of raw nuts while others are major players in the production and export of intermediate/ semi-processed products such as copra, coconut oil, copra meal, and desiccated coconut. **Copra** consumption is aimed primarily at the domestic industry and little is exported. Vietnam, India, and Mexico have recorded the highest rates of copra consumption since 1990
- **Coconut oil** has experienced relatively flat consumption figures over the past 15 years. Overall consumption and imports are highest in the EU but the greatest growth has occurred in China, Russia, and Vietnam
- **Desiccated coconut** has also experienced relatively flat consumption. The US and the EU account for almost 60% of total consumption.
- **Demand** is influenced by developments and drivers in the confectionery, baked goods, oleochemical, cosmetics/personal care, and biofuels industries. In the food processing industry, these drivers consist mainly of changes in tastes, preferences and dietary habits. In other industrial markets, the cost-performance benefits of coconut-derived materials are weighted against competing materials
- **In Vietnam**, consumption of coconut oil, copra, and desiccated coconut has been rising steadily over time.

Conclusions – 2. The competitiveness of coconuts

- About 56 million tons of coconuts are harvested globally. **Indonesia, the Philippines, and India** account for ~78% of global production as these countries have very large amounts of land devoted to coconut cultivation

- The Philippines, Indonesia, Sri Lanka, and India have rather large coconut-**processing industries** and are heavily involved in the production of copra, coconut oil, desiccated coconut, oleochemicals, virgin coconut oil, and other items

- **Vietnam exports** large numbers of raw nuts to Cambodia, China, and Thailand for processing. This means that it misses any opportunities to generate **higher value-added** products from downstream processing of these nuts

- The major producing countries mentioned above have more **land** devoted to production and higher productivity (nuts/tree), but Vietnam is increasing its coconut production area, especially in Ben Tre, and has **younger trees** which are at an earlier stage of their productive capacity

- Vietnam is a growing producer and exporter of **desiccated coconut**.

Conclusions – 3. The pro-poor impact of coconuts

- Growing coconuts appears to have had a **positive pro-poor impact** as the number of poor households growing coconuts has dropped as a proportion
- **Higher prices** for raw nuts have dramatically increased profits for farmers
- **Desiccated coconut processing and coco candy** production have positive pro-poor impact
- **Intercropping coconut and cocoa** cultivation can enhance farmers' incomes
- **Women** are extensively involved in coconut processing activities
- Processing and transportation account for about 50% of all jobs in the coconut industry.

Chapter 5 - Opportunities

1 Introduction	2 Demand	3 Competi-tiveness	4 Impact	5 Opport-unities	6 Next Steps

B. Conclusion

A. Opportunities

SWOT Analysis of Vietnam coconut supply chain*

Strengths

- A large quantity of ~680 mn nuts/year are available for the local and export markets both for raw nuts and processing markets
- Young trees provide long-term production possibilities
- The oil plant institute and universities can provide R&D support for production, processing and new product development.
- Value is added from certain food and non-food processing activities
- Other inputs for food products, sugar and packaging are available locally
- A strong culture and tradition of value added production for some products with good brand names
- The quality of coconut production (Nut size, thickness & oil content) is comparable with APCC competitors
- The good river transport system improves logistics for raw nut business
- There is no export tax on raw nuts

Weaknesses

- Too many raw nuts are being exported to China and elsewhere
- A commodity orientation, as contrasted with a niche market orientation, prevails though out the industry
- Lack of value-added processing
- Supply is seasonal, thus coconut availability is lower during the rainy season
- Coconuts have a limited shelf life, and they spoil. Thus, scheduling coordination is required between production and processing.
- Low input cost cropping, little investment in fertilizer.
- The selection of seed by farmers (cross of genotypes cannot be fully physical inception of the parent stock) effects yield and timing of first fruit bearing.

Opportunities

- To increase the yield of existing palms and of land already planted by increasing the application of fertilizer, seedling selection, planting high yielding variety and planting density to increase yield by up to 40%
- The area of coconut planting will be expanded in the future. This is already happening in Ben Tre
- More efficient transactions might be realized through third party supply chain management from the farm to processors.
- Biggest market is in China, whose producers have superior technology and good work force. However, it is closed to competing imports of finished products. Opportunity to find alternative channel (supermarkets) for distribution within China.
- Diversification into production of Virgin Coconut Oil, charcoal, fiber and other diversified ancillary products. Consistent high quality is key here so that larger lot sizes can be produced and sold. This would also expand value-creating opportunities at the farm level. Good hardy craft designs. Most (90%) by product processing is still farm based. Need to encourage different modes of industrial organization and the use of new process technologies.

Threats

- Export of excessive numbers of raw nuts depletes supplies needed for domestic processing
- Local processors face lack of raw material and high current prices
- Many coconuts move to China which means that the China could continue to capture a higher portion of the value-added processing
- China mostly depends on Vietnam for raw material and its purchasing patterns means that it can determine the price of coconuts in Vietnam
- Thailand has developed a high value aromatic variety with price as 3-folds as price of Vietnam coconut. If the market shifts toward this high end, Vietnam is disadvantaged.
- In recent years prices for raw materials have gone up while the price for value added products, like DC, has stabilized or declined
- New value added production as it comes on line has a distortional impact on raw material prices because the market is thin and weak marketing (e.g., market information sources, knowledge of customers, advanced buying/selling tools)
- Growing and processing of coconuts is not coordinated as there is no working plan to develop adequate levels of processing activities in line with expanded production of raw nuts

*Source: “IFAD SWOT Analysis of Coconut Supply Chain”

Chapter 6 – Next steps

1 Introduction	2 Demand	3 Competi-tiveness	4 Impact	5 Opport-unities	**6 Next Steps**

- **Next steps**

In view of the promising results from this small-scale study, Prosperity Initiative has signed an MOU with Ben Tre Province and commenced a comprehensive feasibility study into developing pro-poor opportunities with CAP

The broader feasibility study is likely to include the following:

- To validate data already provided
- To identify end-product demand market segments
- To quantify market segments
- To ascertain demand and industry drivers
- To obtain screening/purchasing criterion
- To investigate further the Ben Tre and Tra Vinh Coconut Value Chains
- To analyse coconut processing carried out in China
- To carry out a more detailed pro-poor impact study in Ben Tre and other provinces
- To do benchmarking study of other competitors in the region
- To develop a marketing plan to increase exports and investment