



WORKSHOP ON ENTREPRENEURSHIP DEVELOPMENT IN COCONUT OIL PRODUCTION, PROCESSING AND MARKETING

10.30 AM IST, 30 Oct 2021 (Saturday). Hybrid mode.
In person at Mumbai, India. Online on Zoom.

Prior registration on <https://webinar.ncdc.in>



CONCEPT PAPER

Jointly Presented by
NEDAC Training Centre, Bangkok (NTCB) and
Laxmanrao Inamdar National Academy for Coop Research & Development (LINAC), NCDC, India

CONTEXT

Cooperatives are pivotal to the global economy. Based on a powerful idea of group synergy to create members-driven and people-centred collectives, largely of farmers and producers of various rural economic services and products, cooperatives are key players across the value chains for fairer returns to their members and communities.

It is the declared policy of the Network for Development of Agricultural Cooperatives (NEDAC) to foster the creation and growth of agricultural and other associated cooperatives as practical vehicles for promoting economic development and harnessing people power towards sustainable agriculture by pursuing sustainable use of natural resources while meeting society's growing needs for decent and resilient livelihoods.

The NEDAC Training Centre, Bangkok (NTCB) was set up in 2019 to cater to the capacity development needs of NEDAC members and others. Over these years, NTCB has conducted many residential training programmes, workshops and seminars.

The Laxmanrao Inamdar National Academy for Cooperative Research and Development (LINAC) set up by the National Cooperative Development Corporation (NCDC), Ministry of Cooperation, Government of India is dedicated to capacity development, research and consultancy services for customers from the cooperative and associated sectors in India and abroad. Set up in 1985, LINAC has its team of core faculty, panel of experts, subject / area specialists and practicing professionals from core areas of functioning of cooperative sector drawn from NCDC.

NTCB and LINAC have joined hands to bring to cooperators and all other stakeholders another trend setting program, the details of which follow.

WORKSHOP ON ENTREPRENEURSHIP DEVELOPMENT IN COCONUT OIL PRODUCTION, PROCESSING AND MARKETING

INTRODUCTION

Coconut palm, **cocos nucifera**, with *cocos* believed to come from Spanish, meaning 'monkey-faced' or 'eerie-faced' and *nucifera* from Latin meaning nut-bearing plant (from *fero* = I bear and *nux-nucis* = nut), is popularly known as *Kalpavriksha* or tree of heaven in India, mainly because every part of the tree yields benefits to the humankind. Coconut is one of the most important foods in tropical and subtropical countries, with the coconut tree being referred to as the 'tree of life'. It is one of the most beautiful and useful trees with a classical appearance of tall slim trunks crowned with elegant green leaves that enhance beauty and render unique geographical identities to many global locations. Being the livelihood of millions of people in the developing world, it is the most widespread and economically useful palm of the wet tropics through production and employment generation by associated industries. It is a perennial crop with a lifespan of 80-100 years and an economic life of 60 years or more depending upon the variety, local conditions and management practices.

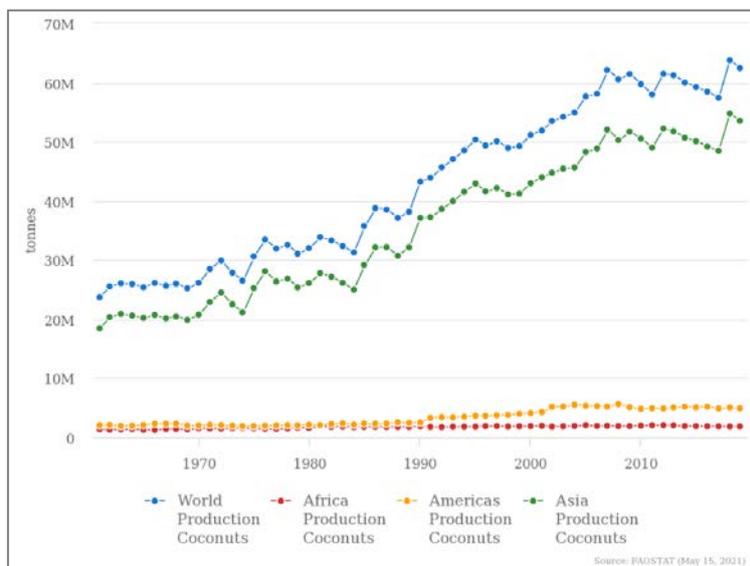
The Asia-Pacific region produces about 85 percent of the world's coconut products, such as coconut oil, water and milk, virgin coconut oil, and raw materials such as fibrous materials and timbers used in construction. The coconut industry makes significant contributions to the agri-food sectors of countries in the Asian-Pacific region. It is also a socioeconomic pillar in rural areas, where small scale holders account for 80-90% of primary coconut production.

The coconut palms are found throughout India, and the subtropical regions and Southern parts of India are more suitable for its cultivation. Coconut fruit is called *Lakshmi Phal*, which is used in most of India's social and religious functions from Kashmir to Kanyakumari, irrespective of whether the palm is grown locally or not. The use of coconut throughout India makes it a symbol of national unity.

GLOBAL TRENDS IN COCONUT PRODUCTION

Coconut is grown in 93 countries over 11 million hectares and 80 million people depend upon coconut and its processing for their livelihood. The global production of coconut has increased from 23 million metric tons in 1961 to

62 million metric tons in 2019 (Figure 2-A). However, this was slightly lower than the peak coconut production of 63.7 million metric tons recorded in 2018. Indonesia is the world's leading coconut producer in 2019, with about 17.13 million metric tons of coconuts produced. The Philippines is the second, and India is the third-largest coconut producer globally, accounting for around 14.68 million metric tons of global production volume.



Global production of coconut from 1961 to 2019 *Source: FAOSTAT*

India shares 15% of the world area and produces about 25% of world coconut production. About 10-12 million people in India depend on coconut for their livelihood either directly or indirectly. India ranks third in area and first in the production of coconut in the world. As per the latest statistics available (2018-19), the annual coconut production in India is 23.90 billion nuts from an area of 2.15 million ha, with average productivity of 9897 nuts/ha. The four southern states viz., Kerala, Tamil Nadu, Karnataka, and Andhra Pradesh are India's major coconut producing states, accounting for more than 90 per cent of the area and production. Currently, there are 49 improved varieties of which 18 tall varieties and 11 dwarf varieties are suitable for different agro-climatic zones of India. The remaining 20 varieties are hybrid varieties of which 8 varieties are Dwarf x Tall and 11 varieties are Tall x Dwarf hybrid and one variety is Tall x Tall hybrid. These hybrid varieties of coconut have a yield potential of 2.79 to 6.28 tonnes of copra per ha per year compared to 2 tonnes of copra yield realized by the tall cultivars predominantly cultivated by coconut farmers.

VERSATILE PRODUCTS FROM COCONUT

Coconut is famous for its water, milk, oil, and meat. Coconut and its products are used in daily life for several purposes, such as cooking, hair and skin treatment, food ingredients, and medicinal use. Coconut meat is very nutritious as it contains dietary fat and fibre, protein, carbohydrates, micro minerals such as potassium and phosphorous and vitamins such as niacin and riboflavin. Coconut oil, the main coconut product, is popular for its numerous beneficial usages. Medical doctors recommend using coconut oil as a cooking medium in substitution for other vegetable oils. Every part of the coconut and the tree is used by different countries in different ways. More than 50 products are prepared from coconut palm.



❖ From coconut kernel & coconut water:

Tender coconut, Tender coconut water, Coconut juice, Neera, Toddy, Arac, Jaggery, Sugar, Coconut cream, Coconut butter, Coconut syrup, Coconut hammy, Coconut snowball, Chopra, Vinegar, Coconut oil, Virgin coconut oil, Roasted copra, Coconut milk, Coconut milk powder, Desiccated coconut powder, Coconut chips, coconut butter, ingredients for dairy products, shampoo, ointments, soap etc.



❖ From coconut husk:

Husk fiber, Husk coir, Husk mat, Husk brick, Geotextile (for preventing soil erosion), net, Bags, Rope, Manure etc.



❖ From coconut wood:

Crates, Wood, Furniture, Musical instruments, Roof material, Arts and crafts, Fuel etc.



❖ From coconut shell:

Charcoal, Activated carbon, Shell powder, Art and handicraft etc.

❖ From coconut leaves:

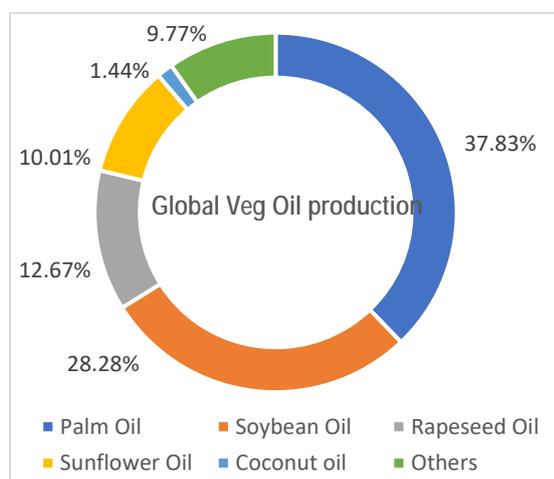
Baskets, Hats, Shade, Roofing material, Brooms, Tooth sticks etc.



GLOBAL SCENARIO OF COCONUT OIL PRODUCTION AND USE

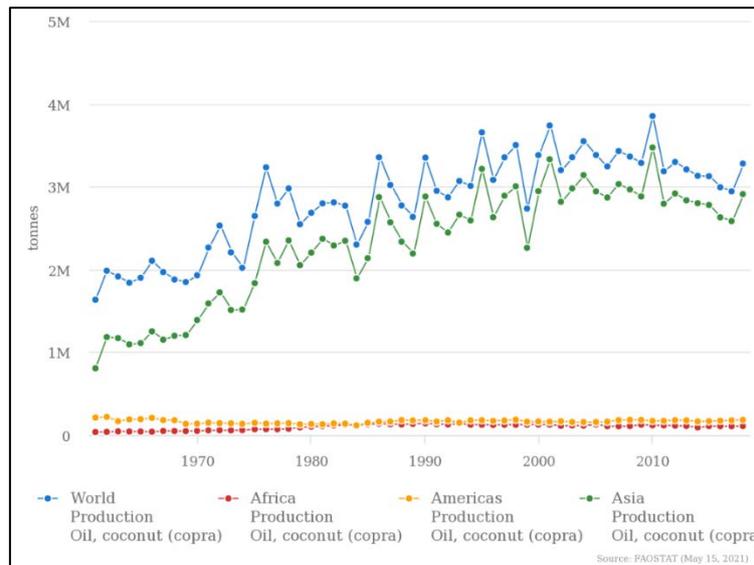
Coconut oil (CNO), the prime commercial value-added product from coconut, is traded worldwide since time immemorial. Copra is a highly valued

commodity in the world market for oilseeds, oils and fats. With an oil concentration of 65 to 70 percent copra is one of the richest sources of fat. Copra is the dried meat (endosperm) with moisture content reduced to 5-6% from 50 to 55% in the wet meat. Coconut oil constitutes less than 5% of total oils and fats entering the world market. It is a mixture of chemical compounds called glyceride containing fatty acids called glycerol. Coconut oil processing methods are classified into two major types, dry and wet processing. The oil extraction technology that uses copra as raw material is called dry processing while the method that uses fresh coconut is generally called wet processing for the production of Virgin Coconut Oil (VCO).



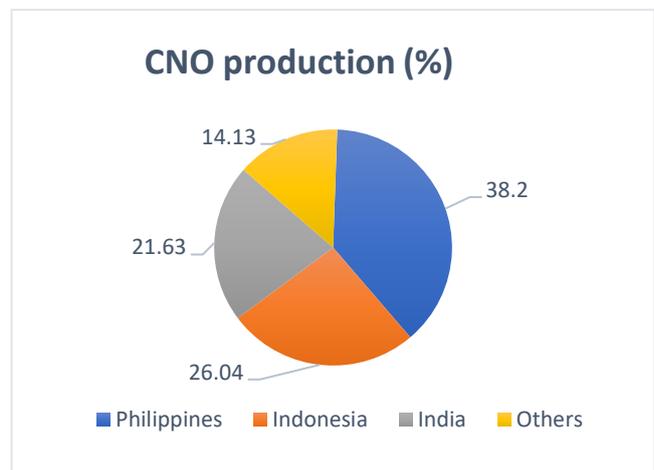
The world production of copra in 2018-19 was 4.23 million tons, while that of coconut oil was 2.88 million tons accounting for nearly 43% of the nuts produced. It ranks the ninth position among nine major edible oilseeds produced globally, contributing 1.44% of the total oil produced by these countries. Rest of the nuts was used for either fresh for culinary purpose, tender nut and other value-added products.

Coconut oil production mirrors the coconut production trend. It sharply increased from 1.6 million metric tons in 1961 to 3.2 million metric tons in 2018, with the highest recorded peak of 3.8 million tons in 2010. The extracted coconut oil constitutes about 5 % of the total coconut mass. In 60 years, the global coconut and coconut oil have almost increased by three folds. Asia alone accounts for about 85 % of global production, while Africa, America, and others only account for 15 %. The seven coconut and coconut oil production hotspots are the Philippines, Indonesia, India, Sri Lanka, Mexico, West Malaysia, and Papua & New Guinea.



Global production of coconut oil from 1961 to 2019 *Source: FAOSTAT*

The Philippines is the largest producer of coconut oil, converting over 75% of coconut produced in the country into 1.1 million tons of oil, while Indonesia uses 45%, followed by India using 30%, producing 0.75 million tons and 0.62 million tons of coconut oil, respectively in 2018-19. On the other hand, Sri Lanka converts only 9% for oil production, as over 70% of total production is used for household purposes.



The global export of coconut oil was 1.95 million tons in 2018-19. Decrease in coconut production due to cyclonic destruction of coconut plantations, the prevalence of a large number of senile and unproductive palms which are being replanted in a phased manner is the main reasons for a decrease in CNO production in the world. The Philippines is the largest exporter of coconut oil with a share of 48.97%, followed by Indonesia (34.66%).

In 2018, the highest per capita consumption of coconut oil was recorded in the Netherlands (10,511 kg per 1000 people), followed by Malaysia (4,269 kg per 1000 people), the Philippines (2,639 kg per 1000 people) and Germany (2,237 kg per 1000 people), while the world average per capita consumption of coconut oil was estimated at 457 kg per 1000 people. The average coconut oil export price stood at \$1,425 per ton in 2018.

Coconut oil finds extensive use in food, toiletry and industrial sectors because of its unique characteristics. Coconut oil has a maximum digestibility coefficient (99.3), and it is more rapidly digested than any other fat, including butter. Coconut oil has the highest smoking point ranging from 250 to 350 degree F, and is suitable for high heat cooking compared to other oils. The shelf life of coconut oil is the highest because of the presence of anti-oxidants. Coconut oil does not contain cholesterol and it is composed mainly of short and Medium Chain Fatty Acids (MCFA) or Medium Chain Triglycerides (MCT) with a very low content of Omega 6 fatty acid and rich content of lauric acid (source of disease-fighting fatty acid derivative monolaurin) and myristic acid and having superior antigenotoxic activity and antimicrobial properties. Coconut oil has substantial use in oleochemical and cosmetic industries. Coconut oil has the highest saponification value (253), which gives hardness and leathery property to soap. Coconut oil is classified under non-drying oil because of its lowest iodine value. Coconut oil has the largest percentage of glycerol (13.84%), an important by-product used in various industries, especially in pharmaceuticals, food, and oleochemical industries.

CNO, especially VCO, is gaining global importance for its known medicinal and nutraceutical properties contributing to human health, nutrition and wellness. This new development in the health sector with skin and hair treatment benefits, the CNO and VCO find great demand from personal care and beauty care applications.

THE VIRGIN COCONUT OIL INDUSTRY

VCO called as mother of all oils, is extracted from fresh coconut milk obtained from mature kernel (12 months old from pollination) of coconut by mechanical or natural means, with or without the application of heat, which does not lead to alteration of the nature of the oil. VCO can be consumed in its natural state without the need for further processing. Hence, VCO does not undergo chemical refining, bleaching or deodorizing. VCO is colourless, free of sediment and has natural fresh coconut scent. It is free from rancid odour or taste. Virgin coconut oil consists mainly of medium-chain fatty acids, lauric acid, which constitutes 48% of VCO and possess potent antimicrobial

properties capable of destroying disease-causing bacteria, fungi, viruses and parasites. VCO has considerable potential for therapeutic uses such as antimicrobial, anti-HIV/AIDS drug, anti-cancer therapy, and the treatment of Alzheimer's disease. VCO is one of the best natural remedies to various skin ailments.

VCO represents the highest value addition from raw coconut. VCO introduced in the world market in 2000-2001 gave a new dimension to coconut production, i.e. coconut products for health and beauty. It is one of the fastest-growing products in the niche market. Over the last ten years, the export of value-added products from coconut witnessed fast growth. The Philippines is the largest producer and exporter of VCO. Export reached over 42 export destinations: USA (59.7%), Netherlands (10.1%), Canada (8.5%) and the rest to Europe, China, Japan, Singapore, Australia and SE Asia. Compound Annual Growth Rate of global demand of VCO projected during 2019 to 2024 is 11%, and VCO market is projected to reach US\$ 5 billion by 2024¹. In India, the demand for VCO for domestic and export is increasing due to the increased awareness of the health benefits of this product.

COCONUT OIL IN THE ASIA PACIFIC REGION

Currently, coconut is one of the major crops that provide livelihood security to millions in the Asia and Pacific, which occupy more than 89.60% of the global coconut area and 85.91% of copra production, earning more than 1.08 billion US\$ as export income. The most promising global virgin coconut oil market is in the Asia-Pacific region, valued at USD 271.9 million. The Philippines and Indonesia are the most significant contributors to this market in the region. The coconut industry contributes significantly to the agri-food industries of Asian-Pacific countries. Small-scale coconut growers account for 80-90 percent of primary coconut output in rural areas. Fiji, Kiribati, Samoa, Solomon Islands, Tonga, and Vanuatu belong to the 17-member Asia and Pacific Coconut Community (APCC), an inter-governmental alliance of Asia Pacific coconut producing countries. It represents 90 per cent of the world production of coconuts and exports of coconut products. In addition, Papua New Guinea, Fiji, Solomon Islands, Marshall Islands, Vanuatu, and Kiribati have substantial copra and copra oil exports for further refining.

Malaysia is the largest importer of CNO with a share of 32%, closely followed by USA (31%) and EU (10%). EU, USA and Malaysia accounted for about 73 percent of global imports of CNO. India does not import coconut and copra,

¹ Virgin Coconut Oil Market : Global Demand Analysis & Opportunity Outlook 2023, <https://www.researchnester.com/reports/virgin-coconut-oil-market-global-demand-analysis-opportunity-outlook-2023/253>

though it imports small quantities of coconut oil. India was a net importer of coconut oil till 2009-10, but became a net exporter during 2010-11 to 2017-18 except in 2014-15.

Though India is one of the major producers of coconut oil in the world, the country exports coconut oil in only small quantities recording a meagre share of only 0.36% in 2018-19. From 33,500 tons in 2016-17, India's exports of CNO declined significantly to seven thousand tons in 2018-19. India's share of coconut oil export has declined significantly during 2017-18 and 2018-19 due to the very high domestic wholesale price of coconut oil much higher than international prices, and hence export has become non-competitive. There has been a significant rise in domestic prices of copra and coconut oil in India since 2017. The 2018-19 domestic prices of CNO was significantly higher, almost 2.5 to 3 times higher than the international price. The international price of other major vegetable oils also remained at a very low level during the same period, which resulted in the decline of CNO export from India in 2017-18 and 2018-19. It is sensible to emphasize exports of high-value products over less competitive primary commodities and increase better value realization.

BUSINESS POTENTIAL FOR ENTREPRENEURS

The lion's share of the production of coconut in India is consumed domestically for food preparation and extraction of oil, and a very small quantity of coconut is exported to the Middle East countries. Recent declines in coconut production and export in India are mainly attributed to market fluctuations. Besides the unforeseen fluctuations in climatic conditions, global warming, tsunami, floods, insects and pest attacks etc., have also contributed to this. Further, more coconut cultivated lands are being converted for other development and construction activities. However, a four-fold increase in yield can be achieved by adopting scientific technologies in coconut cultivation compared to unscientific practices. Stakeholders have taken many steps to increase the area of coconut cultivation and diversification of production, including schemes for introducing value-added products to gain more profit to the farmers. There is a scope of preparing more than 50 by-products from the coconut palm. Only selling coconuts is not going to benefit the farmers. What is needed is diversification of manufacturing value-added materials to cater to various industrial applications and exports for realizing better income for farmers. Besides, coconut-based cropping systems need to be promoted by raising compatible subsidiary crops and/ or integrating with livestock, increasing the productivity and net returns from the unit area of coconut plantations.

Cultivation of subsidiary annual, biennial or perennial crops like tapioca, elephant foot yam, *Dioscorea* sp., ginger, turmeric, banana, pineapple, sorghum, bitter gourd, black pepper, cocoa and floriculture like Gladiolous also increase farmers' income.

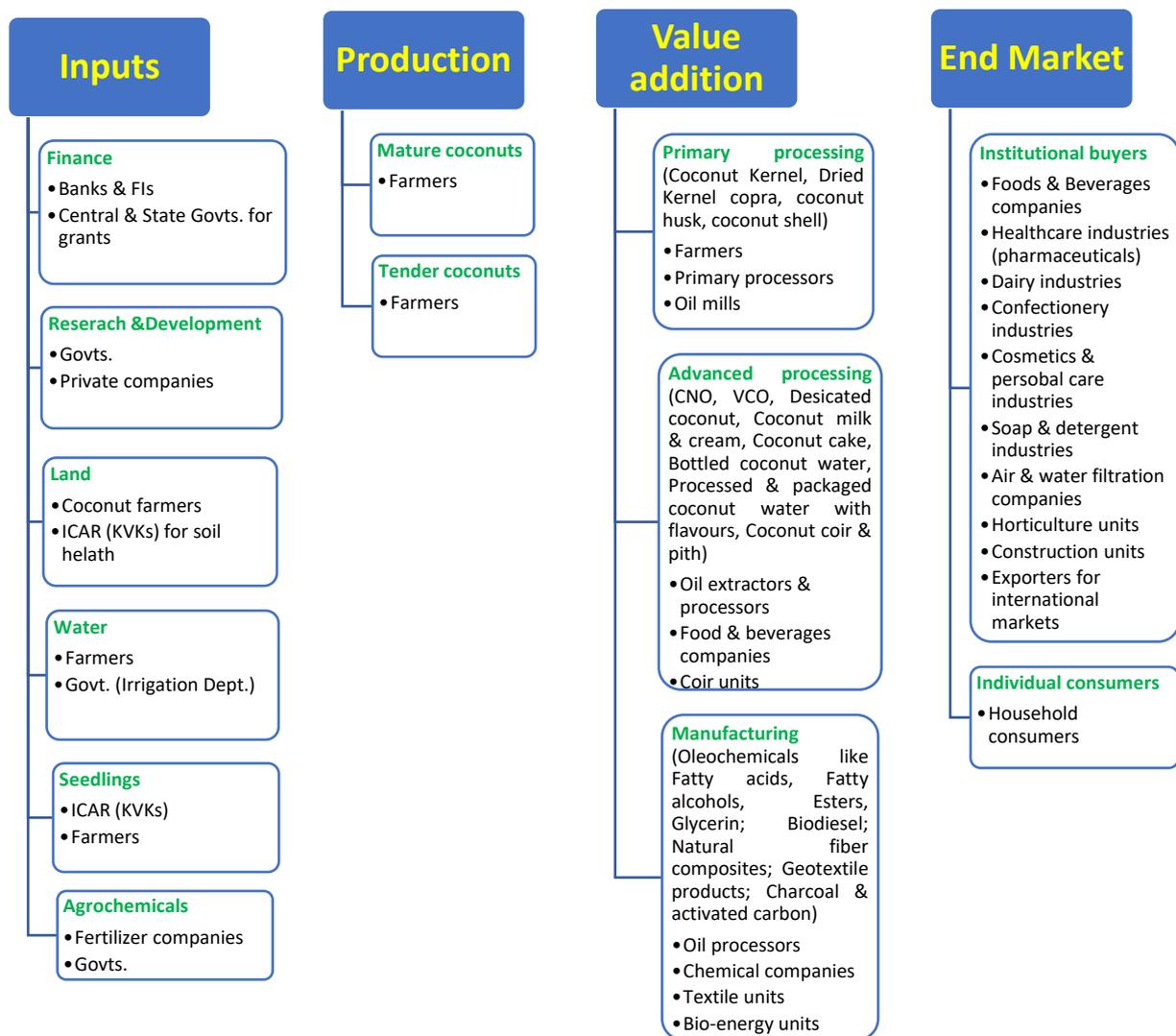
Value addition reflects the difference between the price for which a firm sold its product and the cost of purchasing input by them. Processing coconut is a means of value addition and increasing farm income. However, the extent of value addition from processing coconut into traditional products like copra and coconut oil is low due to the high cost of production and less margin. Hence product diversification for high value-added products is one of the approaches that could increase farm income. Though India is a major coconut producing country globally, utilization of coconut into high value-added products is low compared to other major coconut growing countries. Hence, it was found difficult to survive the industry depending on copra and CNO alone because its share in the edible sector at the international and national level is meagre and poses competition with other vegetable oils with less cost of production. Its price also depends on the demand and supply of other edible oils with less cost of production. Hence copra-coconut oil centred industry has been diversified, and tremendous progress is achieved in product diversification and by-product utilization in the world. There is enormous scope for value addition for every part of the coconut and coconut palm in various sectors like food & beverages, dairy sector, health and beauty (nutraceutical and cosmeceutical products), art and handicrafts etc.

VCO is one of the high-value products from coconut. Return from coconut can be increased manifold by establishing VCO processing units.

There is a huge demand for coconut oil raw material for oleochemicals for higher value addition. Coconut oil is an important feedstock material to the oleochemical industry because of its unique fatty acid composition, which falls under the carbon spectrum highly desired by the oleochemical industry. The primary utilization currently is in the production of detergents, soap and cosmetics.

KEY PLAYERS IN COCONUT VALUE CHAIN

Coconut value chain is characterized by product based four types of chain, i.e. coconut food chain (traditional/ non-traditional food), Coconut sports drink chain (coconut water), Coconut chemical chain (especially Oleochemicals), and Coconut by-products chain (coconut shell & husk, especially coir industries). There are several players involved in every step of the value chain of coconut. Coconut value chains and the key players are as follows:



CHALLENGES IN COCONUT OIL PROCESSING

- ❖ Low farm productivity leading to low supply of coconut for processing
- ❖ Non-availability of quality coconut kernel/ lack of scientific farming and pest & disease control
- ❖ High cost of inputs, machinery and others
- ❖ Lack of capital & finance including incentives/ limited access to credit linkages
- ❖ Growers as well as processors not organised as viable coconut-based cooperatives
- ❖ More manual intervention/ need of automation
- ❖ Limited knowledge and skills in appropriate coconut processing technologies
- ❖ Lack of economic viability and sustainability because of small scale processing ventures (scale of economy)
- ❖ Lack of adequate logistics and storage infrastructures

- ❖ Lack of knowledge on GMP, HACCP and Quality norms & standards
- ❖ Labour issues at grower level as well as processor level on account of ongoing pandemic
- ❖ Widely fluctuating farm gate prices because of competition from other vegetable oils/ products
- ❖ Shifting from traditional products to high-value products like VCO is required.

CHALLENGES IN COCONUT OIL MARKETING

- ❖ Inconsistent supply and supply & production instabilities (Achilles' heel of Coconut oil market)
- ❖ Adulteration especially in the case of VCO
- ❖ Poor marketing system because of multi-layered copra trading (chain of middlemen) and absence of marketing cooperative for bulk trading
- ❖ Less adherence by suppliers to regulations
- ❖ Lack of campaign of health benefits and environment-friendly products leading to low domestic demand
- ❖ Lack of access to markets owing to the remoteness of farms, high transport cost
- ❖ Lack of proper market information
- ❖ Limited market promotion
- ❖ Inconsistent supply
- ❖ Lack of adequate logistics infrastructures
- ❖ High transportation/ shipping costs leading to the costlier product compared to other vegetable oil/ products
- ❖ Lack of incentives to promote export
- ❖ Lack of branding, tagging and details like origin of product in product label
- ❖ Low adoption of technology like the mobile based expressive bidding process
- ❖ Low adoption of pre-shipment third party inspection and quality validation practices.

OPPORTUNITIES IN MARKET-BASED RESEARCH AND DEVELOPMENT IN COCONUT OIL

Considerable opportunities for research and development in the coconut industry exist, which include:

1. Market-focused trade and consumer research on understanding current and potential market opportunities, requirements and potential supply chains for major coconut products and by-products;

2. Value-adding product opportunities and processes research that explore the opportunities to increase value to the end-user, including quality assurance, minimizing processing losses supporting product development and innovation, sharing improved profits equitably amongst all supply chain members;
3. Smallholder engagement research to understand smallholder producers' capability and constraints in participating in such supply chains; to take up the research, technical improvements, and other support effectively; and to identify extension processes to expand such improvements to the wider industry; and
4. Medicinal uses of coconut oil and the effect of lauric acid clinical tests to understand the benefits of consuming virgin coconut oil and the recommended intake levels required.

Asia-Pacific region has been dominant in the past and continues to remain at a leading position at present. The market witnessed exponential growth since there is high demand for coconut oil for cooking and cosmetic purpose. The market is highly driven by the rise in coconut oil use for personal care, the availability of oil at low prices, and the rise in the number of retail owners expected to dominate the market development. The coconut oil market in the Asia Pacific sees maximum growth as consumers are aware of the benefits of coconut, and the use of coconut products traditionally has boosted the development of this market. Consumers in the Asia Pacific are expected to prefer coconut oil more readily due to awareness about its health benefits. This is a significant driver for the growth of the coconut oil market in the Asia Pacific. The dependency of the consumers on oil-based cuisines and their willingness for better health-related substitutes has boosted the growth of the coconut oil market in North America. In the African countries that are highly dependent on agriculture and their related products for their economy, the coconut oil market is also expected to grow.

OBJECTIVES OF THE WORKSHOP

The overarching goal of the proposed workshop on 'ENTREPRENEURSHIP DEVELOPMENT IN COCONUT OIL PRODUCTION, PROCESSING AND MARKETING' is to bring various stakeholders on one stage and brainstorm the various possibilities for the promotion of entrepreneurship in this sector through cooperatives. At the same time, the workshop will identify the bottlenecks at various levels and aim at evolving options. The key beneficiaries of this workshop are the coconut farmers, coconut-based cooperatives, promising entrepreneurs, youth and women.

The proposed outline of the 150 minutes long workshop on a hybrid mode (in-person and Zoom) is as follows:

A. Technical Sessions (90 minutes)

- i. Scientific farming of coconut along with subsidiary crops
- ii. Value additions
- iii. Supply Chains
- iv. Role of Collectives (Coconut based cooperatives and others)

B. Industry voices (30 minutes)

C. Way Forward (30 minutes)

EXPECTED PARTICIPATION

Coconut farmers, entrepreneurs, coconut-based cooperatives, youth, women, vulnerable communities, scientists, technocrats, policymakers, coconut oil processors, sellers/ exporters, subject matter experts, academicians, supply chain players, development finance institutions, quality control institutions and the media.

DATE & TIME

30 October 2021, Saturday.

10.30 AM to 1.00 PM Indian Standard Time

REGISTRATION

Prior registration is required on <https://webinar.ncdc.in>

There is no fee for online (Zoom) mode participants.

ONLY NEDAC MEMBERS CAN TAKE PART IN PHYSICAL (IN PERSON) MODE at MUMBAI. Venue at Mumbai will be notified separately.

CONTACT DETAILS

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