

## ARECANUT: PRODUCTION, CONSUMPTION AND MARKETING

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The arecanut (*Areca catechu* L.) is one of the important commercial crops of India. The crop is mainly grown in the states of Karnataka, Assam, Kerala, West Bengal, Meghalaya, Maharashtra, Tamil Nadu and Andaman & Nicobar group of Islands. India is the largest producer and consumer of arecanut and it continues to dominate the world in area, production and productivity. It is providing livelihood to a substantial number of farm families. Although the production of arecanut is localized in a few states, the commercial products are widely distributed across the country and are being consumed by all classes of people. Arecanut industry forms the economic backbone of nearly 16 million people in India and for many of them it is the sole means of livelihood.

Ever since 1970s, as per the government policy, area expansion of arecanut is discouraged. Nevertheless, the area increased by 70 per cent during the last two decades and the production increase was mainly due to area expansion. Area expansion of arecanut is taking place in non-traditional tracts like cleared forest lands, paddy converted lands, plains and in clay soil belt. The productivity has remained stagnant at 1200-1400 kg/ha due to climate, soil, crop and management constraints and also due

to its cultivation in unsuitable areas. The yield gap of 120-200% between national/state average and on-station experiments clearly indicates low rate of adoption of suitable technologies. Stagnating market prices and increasing cost of production, especially the skilled labour charges in the recent times have generated livelihood concerns for arecanut farmers.

### 1. Global scenario

As per FAOSTAT (2013), total production of arecanut in the world is about 1.224 million tons from an area of 0.904 million hectares (Table 1). India ranks first in both area (49%) and production (50%) of arecanut. The world area and production of arecanut showed a tremendous increase during the last four decades. The current world productivity of arecanut is 1.35 tons/ha. China ranks first in arecanut productivity with 2.73 tons/ha. India ranks 5<sup>th</sup> in terms of productivity with 1.365 tons/ha.

### 2. Domestic scenario

In India, arecanut is cultivated in an area of 473.33 thousand hectares with an annual production of 705.60 thousand tons. Karnataka, Kerala, Assam, Meghalaya and West Bengal are the major producers (Table 2).

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**Table 1. Country wise area, production and productivity of Arecanut**

Country	Area ('000 ha)	%share	Production ('000 MT)	%share	Yield (kg/ha)
India	446.00	49	609.00	50	1365
Indonesia	143.90	16	181.00	15	1258
China	44.70	5	122.00	10	2729
Myanmar	56.30	6	119.50	10	2123
Bangladesh	165.00	18	101.00	8	612
Sri Lanka	16.35	2	38.74	3	2369
Thailand	18.00	2	30.00	2	1667
Bhutan	10.00	1	10.50	1	1050
Others	3.83	0	12.38	1	3230
<b>World</b>	<b>904.09</b>	<b>100</b>	<b>1224.13</b>	<b>100</b>	<b>1354</b>

Source: FAOSTAT, 2013

**Table 2. State wise statistics of Arecanut in India**

State	Area ('000 ha)	Share of area (%)	Production ('000 tonnes)	Share of production (%)	Productivity (kg/ha)
Karnataka	235.77	49.81	436.29	61.83	1850
Kerala	100.10	21.15	102.20	14.48	1021
Assam	77.62	16.40	74.78	10.60	963
Meghalaya	16.87	3.56	26.20	3.71	1553
West Bengal	11.52	2.43	22.66	3.21	1967
Tripura	4.70	0.99	9.92	1.41	2111
Tamil Nadu	6.69	1.41	9.79	1.39	1462
Mizoram	10.74	2.27	7.27	1.03	677
Andaman & Nicobar Islands	4.23	0.89	5.88	0.83	1392
Maharashtra	2.35	0.50	3.48	0.49	1482
Goa	1.78	0.38	2.96	0.42	1660
Nagaland	0.39	0.08	2.30	0.33	5948
Andhra Pradesh	0.52	0.11	1.80	0.25	3479
Pondicherry	0.06	0.01	0.08	0.01	1509
<b>All India</b>	<b>473.33</b>	<b>100.00</b>	<b>705.60</b>	<b>100.00</b>	<b>1491</b>

The area under arecanut in India was 0.948 lakh hectares during 1956-57, which is increased to 4.73 lakh hectares during 2015-16. The production for the corresponding period has increased from 0.74 lakh MT to 7.06 lakh MT. Also productivity has increased from 788 kg chali/ha to 1491 kg/ha for the corresponding period. The increase in productivity was due to the introduction of superior varieties, supply of quality planting materials, better agro-techniques and plant protection measures. Though the arecanut is not an export oriented crop, the internal demand has been always remained at higher levels. Both the area and production of arecanut in India increased mainly after the year 1990. During the period from 1991 to 2015, the area was increased from 2.17 lakh hectares to 4.73 lakh hectares and the production was increased from 2.38 lakh tons to 7.06 lakh tons. The compound growth rate of area and production of arecanut in India was very high during this period compared to the previous periods. This is mainly due to the favourable price prevailed during this period.

### 3. Demand and Supply scenario

The analysis of demand of arecanut reveals a consistent and steady demand after 2003. The estimated demand of arecanut-based on the utilization pattern by 2050 is 12,14,000 tonnes against the estimated supply of 12,54,000 tonnes (Fig.1).

### 4. Export-Import scenario

**4.1. Import:** Arecanut production in our country was not sufficient to meet the internal consumption during 1950's. It was estimated that 53,000 MT of arecanut was imported during 1951. The arecanut import gradually declined

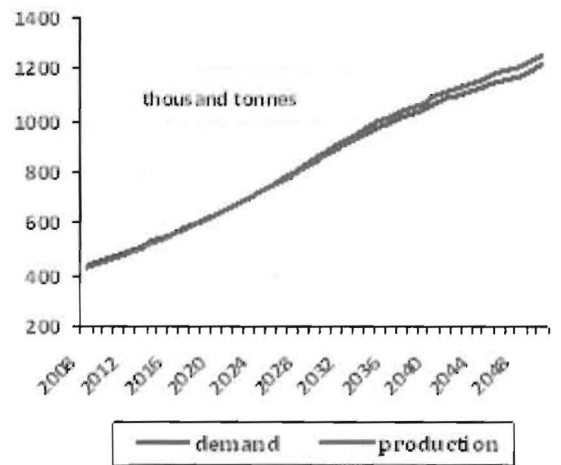


Fig.1. Projected demand and supply of arecanut

year after year due to the decision of the Government of India to restrict the import with a view to give incentive to the farmers. Mean time various promotional measures were introduced by the Government to increase the production of arecanut. These measures helped in gradual expansion of area, increased production and ultimately resulted in self-sufficiency in the production of arecanut in India. From 1974-75 to 1993-94 there was no import of arecanut into the country. As a result of liberalizing economy during the early 90's and also due to increase in domestic consumption, the import of arecanut to India has started during 1994-95 and is increasing at an alarming rate (Table 3). Sri Lanka, Indonesia, Bangladesh, Thailand and Myanmar are the major countries exporting arecanut to India.

**4.2. Export:** Arecanut has got a limited export potential. The bulk of the production is consumed domestically and only a small quantity of arecanut is exported mainly meant for the Indian settlers abroad. Interestingly, the demand is increasing gradually in the developed world also including USA, UK, Canada, Australia, Thailand, Singapore and

Table 3. Production, import and export of arecanut in India

Year	Production (tonnes)	Import Quantity (tonnes)	Export Quantity(tonnes)
1991-92	251000	0	658
1992-93	256300	0	629
1993-94	271100	0	525
1994-95	289700	545	823
1995-96	295500	5091	406
1996-97	307700	9565	513
1997-98	335500	10823	664
1998-99	309800	6707	533
1999-00	334400	11695	734
2000-01	373100	29350	712
2001-02	409300	14788	1483
2002-03	409300	21452	1555
2003-04	439200	27957	1809
2004-05	452700	32124	3695
2005-06	483100	53275	4113
2006-07	483300	76678	2268
2007-08	476000	21299	1472
2008-09	481300	41797	1518
2009-10	478010	39527	1757
2010-11	478100	72697	2486
2011-12	629670	71512	1963
2012-13	637300	97316	2273
2013-14	625860	66380	2345

Note : HS Code : 080290, EXIM data bank, Dept. of Commerce

France, that too for the products such as *Ghutka* and *Panmasala*. The *panmasala* and scented *supari* are exported to countries like UAE, Afghanistan, Canada, Mexico, Saudi Arabia, Singapore, UK etc. The UAE has been major market for Indian *panmasala*, which accounts for 50 per cent of export from India in recent years. The UK,

Canada, Saudi Arabia and USA stand next to UAE in import of Indian *panmasala*.

## 5. Research and development

Presently, research in arecanut is conducted by the ICAR-Central Plantation Crops Research Institute at its Regional Station at Vittal and Research Centres at Kidu (both in

the Dakshina Kannada district of Karnataka), Mohitnagar (West Bengal) and Kahikuchi (Assam) while the developmental portfolio rests with the Directorate of Arecanut and Spices Development (a subordinate office under the Ministry of Agriculture & Farmers' Welfare, Government of India), Kozhikode in Kerala. In fact, comprehensive R&D efforts in arecanut started as early as 1947 with the establishment of an ad-hoc arecanut committee by the ICAR to study the problems of arecanut industry and subsequently, the Central Arecanut Research Station (CARS) was established at Vittal in 1956. Consequent to the establishment of the CPCRI in 1970, the CARS became the Regional Station of the Institute.

Since its inception, the institute has made significant achievements in improving the arecanut production techniques and thereby increasing the farm income and improving the living conditions of arecanut farmers in the country. The arecanut production techniques such as planting material production, planting, irrigation, fertilizer application, plant protection, cultural operations etc. are standardized for optimising the production condition. Also suitable inter/mixed crops for arecanut gardens for different agro-climatic regions were identified to enhance the net return from unit area.

**5.1. Enhancing the genetic base:** The institute maintains world's largest arecanut gene bank comprising 173 accessions with 150 indigenous and 23 exotic accessions. The exotic accessions are introduced from other areca-growing countries in the South-East Asia like Fiji, Mauritius, South China (Taiwan), Sri Lanka,

Indonesia, Saigon, Singapore, British Solomon Islands, and Australia representing four areca species (*Areca catechu*, *Areca triandra*, *Areca normanbyii* and *Areca concinna*) and one related genera (*Actinorhytis calapparia*).

## **5.2. Development of varieties through**

**selection:** The high yielding Mangala variety of arecanut, which is semi tall and an early bearer, was released during the year 1972. It gives an average yield of 3.00 kg chali (dry kernel)/palm (30 tonnes/ha) compared to the 2.00 kg chali/palm (20 tonnes/ha) of SK Local variety. At present rate, the gross return from Mangala variety is Rs.7.5 lakhs/ha compared to 5.0 lakhs/ha by the local variety. A field survey conducted in Dakshina Kannada showed that about 12% of the arecanut gardens were occupied by Mangala variety by 2004. Since then, the institute has released seven more high yielding arecanut varieties, Sumangala (VTL-11 from Indonesia), Sreemangala (VTL-17 from Singapore), Mohitnagar (VTL-60), Swarnamangala, Madhuramangala, Nalbari and Kahikuchi through selection, which gives 50 to 100 per cent more yield than the local varieties. The initial performance of these recently released varieties in farmers' gardens is very encouraging, resulting in very high demand of planting materials of these varieties. Another major research achievement is the release of dwarf hybrids of arecanut. The dwarf hybrids were released as VTL-AH1 (Hirehalli Dwarf x Sumangala) and VTL-AH2 (Hirehalli Dwarf x Mohitnagar) during 2006/2007. The average yield of VTL-AH1 is 2.54 kg dry kernel (chali) per palm per year, while VTL-AH2 gives 2.64 kg dry kernel (chali) per palm per year. Being dwarf in stature, the cost of cultivation

particularly for spraying and harvesting can be reduced by about 40%.

**5.3. Cropping system:** Arecanut based multispecies cropping system developed by the Institute helps the farming community to utilize the unit area of land available very effectively to realize higher income and employment opportunities. Vermi composting of arecanut and cocoa wastes from one hectare garden helps to substitute the nitrogen and phosphatic fertilizers almost 100 per cent and 37 per cent of potassium fertilizers. Rural women and youth can be empowered through the microenterprises on vermicompost production using arecanut and cocoa bio-wastes.

**5.4. Impact of research:** With the introduction of high yielding varieties and the improved crop production and crop protection technologies, the net return from mono arecanut (Rs 3.80 lakhs ) and arecanut based cropping system with cocoa, banana and black pepper (Rs 8.8 lakhs), and arecanut based mixed farming system with dairying, aquaculture and fodder grass (Rs 6.6 lakhs) has greatly enhanced during the last four decades and consequently the arecanut farming has become more profitable now (than ever before) compared to many other crops. This has reflected in the increase in area, production and productivity of arecanut in the country as well as the very high demand for the planting materials as well. The area under arecanut in India has increased from 0.167 million hectares during 1971 to 0.473 million hectares by the year 2015. During the same period, the production has increased from 0.141 million tonnes to 0.706 million tonnes and the productivity showed a quantum jump from 843 kg/ha to 1491 kg/ha.

## **6. Arecanut-based agribusiness**

Even though several value added technologies are available for arecanut by-product utilization such as making of eco-friendly disposable plates and bowls from areca leaf sheath, leaf sheath fodder, oyster mushroom production from leaf and bunch wastes and vermicomposting, there are only very few commercial small-scale ventures. About 3.5 billion arecanut leaves and leaf sheaths are produced every year and have the potential to facilitate production of 0.3 billion kg of mushroom and Rs.7 billion worth areca leaf sheath plates and bowls. Production of vermicompost from arecanut wastes is done on a very limited scale by farmers. Vermicomposting of arecanut leaf wastes per hectare can generate a net income of Rs. 20,000 and can be taken up as micro-enterprise instead of unscientific dumping of wastes in the plantations.

## **7. Challenges and approaches**

1. In the recent period, availability of skilled labourers has become a problem for operations like spraying pesticides and harvesting. Large scale planting of dwarf hybrids multiplied through tissue culture or developing an efficient sprayer to spray on arecanut bunches from ground or developing micro aerial vehicles to overcome this problem should receive top priority.
2. Approximately 50-60% of the arecanut plantations have become either senile or unproductive in the country. In order to enhance the productivity, the old and unproductive palms are to be removed

- and planted with improved high yielding varieties, including hybrid dwarf types.
3. Development of PGPR formulation-based bioinoculant technology and precision application technology for different soil ecological conditions is to be given greater thrust for sustaining crop productivity and profitability.
  4. Arecanut based cropping systems should be promoted to enhance livelihood and nutritional security as price fluctuations affect the profitability in arecanut monocrop.
  5. Yellow leaf and fruit rot are major diseases in arecanut leading to substantial crop losses. To mitigate challenges of fruit rot disease and YLD, in addition to intensive screening of the arecanut germplasm and dwarf hybrids for disease tolerance, survey and identification of fruit rot and YLD tolerant/resistant mother palms in endemic areas needs to be undertaken and large scale multiplication through tissue culture should be taken.
  6. Arecanut is a good source of flavonoids, polymerized leucocyanidins and tannins, catechin, leucopelargonidin, leucocyanidin, carbohydrates, lipids, proteins, crude fibers, polyphenols and alkaloids (arecoline, arecaidine, guvacine and guvacoline) and should be exploited for useful purposes.
  7. Among the alkaloids, arecoline is the most potent and active constituent that

is suspected to cause health hazards and the World Health Organization classified arecoline as carcinogenic. Till today, the required scientific data is not available to classify arecoline as carcinogenic. Thus, a multi-disciplinary research effort involving chemical, medical and social sciences are to be coordinated to dispel such claims. It is desirable to separate alkaloids/polyphenols from arecanut to obtain alkaloid-free polyphenols and subsequently use it for nutraceutical/therapeutic purposes and also for suitable use of arecoline in the pharmaceutical industries. Therefore, it is essential to develop an efficient method for extraction of polyphenols from arecanut with minimum arecoline content and identification of areca nut varieties with less arecoline content.

## 8. Marketing

In India, arecanut is marketed as unhusked fruits, dehusked and dried nuts, boiled, dried, whole and split kernels and value added products. About one third of the total arecanut production in India reaches the consumers as ripe fruit and the remaining in the processed form. Arecanut is marketed in the primary, secondary and terminal markets like most of the agricultural commodity. The primary market is at the village level generally held once in a week on a fixed day. The secondary markets are regular wholesale markets held daily and situated in district and taluk headquarters and important trade centers. Assembling and distribution taken place in these markets. The arecanut is further

assembled in terminal markets for further distribution for intra and interstate trade as well as for exports. In Karnataka, Kerala and Tamil Nadu, more than 30% of the marketable surplus is dealt by Co-operative societies like CAMPCO, Mangalore, MAMCOs, Shivamogga and TSS, Sirsi and other cooperatives.

**9. Developmental and policy aspects**

**9.1. Social cost:** Arecanut sector in India is facing a crisis owing to the policy level conflicts of interests and is a matter of concern for the millions of small and marginal farmers, who are solely dependent on arecanut farming for their livelihood. On one hand the possible huge social cost of growing arecanut with all the existing institutional support for the crop and on the other hand the possible marginalization of millions of farming community in the event of threats of partial or complete ban on the cultivation and allied activities of the crop are major issues to contemplate.

**9.2. Complex domestic value chain:** The supply chain of the arecanut is long as well as complex. There exists a huge knowledge gap about the arecanut consumption pattern and the distribution across the commodity chain. The

available researched information on these aspects has mostly contributed to the academic knowledge rather than to the policy institutions and developmental agencies.

**9.3. Price volatility:** Fluctuating market prices and increasing cost of production, especially the skilled labour charges in the recent times have generated livelihood concerns of arecanut farmers. Market studies reveal that around 75 percent of the arecanut trade is in the hands of private trades, which has provided ample scope for hoarding and resulted in market imperfections and low price realization. While considering the period from the year 2000 onwards, we may broadly categorize the arecanut price pattern into 'price stagnation' (neglecting some intermittent price boom and bust periods). The price stagnation of the crop for such a long period has evidently caused disinterest among arecanut farmers. From 2001 onwards import of arecanut in to the country registered a significant increase due to change in global scenario in the context of trade liberalization. Surging imports, which is around 12 percent of the domestic production, certainly has a significant role in price stickiness (Fig. 2 and 3)

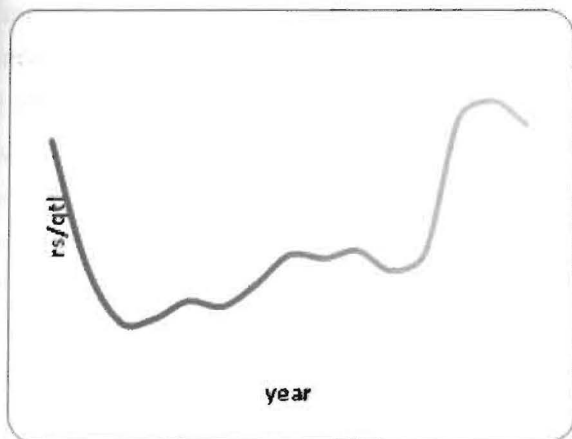


Fig. 2. Arecanut prices (2000-2014),Source: DES

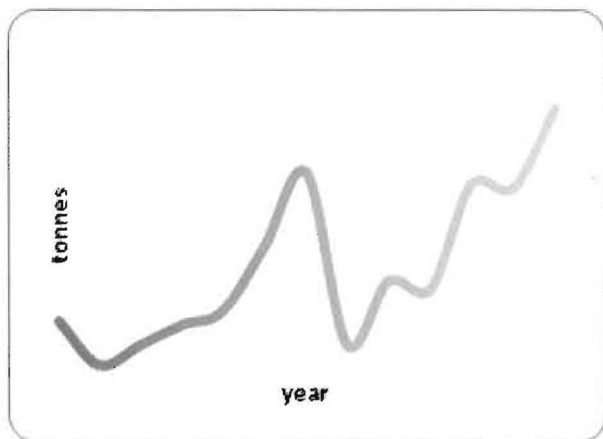


Fig.3. Import of arecanut to India (2001-2013), Source:DES

#### **9.4. Indiscriminate area expansion of arecanut:**

The area under arecanut in the country has increased about 40% during the period from 1998-99 to 2010-11. This increase in area has been mainly attributed to the state of Karnataka with 71.4% increase in area during the same period. Area under arecanut has also increased in Kerala with 38% increase during the last decade. These indiscriminate expansions of area under arecanut due to the remunerative price prevailing during the period of 1995 to 2000 have resulted in the surplus production of arecanut in the country.

**9.5. Policy issues:** Integrating youth/ women farmer organizations with other main stream groups in agriculture with leadership roles and mainstreaming functions should be supported with policy prioritization. An in-depth and comprehensive study on the market channels of arecanut (both chali and red varieties), consumption pattern, market structure and distribution pattern covering the entire nodes from production to consumption is imperative, thereby providing a clear depiction of the distribution scenario of arecanut produced in the country. The information generated through such a study is vital for the policy institutions for determining and fixing the future of the crop and also for further planning on the crop keeping view of the existing conflicts of interest and livelihood concerns.

Additional area expansion both in traditional and non-traditional areas is to be strictly prohibited and simultaneously the arecanut-based cropping systems should be encouraged in the existing arecanut plantations in the country try. We need to have a futuristic vision to evolve integrated and scientifically

planned areca based cropping models in the country which include livestock, fishery component, and staple food/nutritional components. Evolving region specific arecanut-based sustainable cropping system models and promoting multi species cropping system in collaboration with Directorate of Arecanut and Spices Development should be given emphasis. Available alternative uses of arecanut for medicinal and industrial purposes have to be promoted in a wide manner to increase the domestic consumption of the produce, through institutional funding. Rejuvenation of senile and unproductive areca gardens should be carried out using high yielding varieties/hybrids. The technological interventions should be implemented through farmer participatory group approach. Clusters of a contiguous area of 25 ha each is to be delineated and Community Based Organizations (CBOs) of farmers are to be formed to implement the interventions.

#### **10. Scope**

It is a reality that arecanut does not hold the status of a food crop and most importantly still wide debates are going on regarding the social cost of promoting arecanut. In these circumstances, we must find a trade-off, whereas on one hand the traditional arecanut grower shall be protected and on the other hand the social cost should be reduced. One option is to strictly prohibit the additional area expansion both in traditional and non-traditional areas. And the other option is to encourage the arecanut based cropping systems. Above all we need to have a futuristic vision to evolve integrated and scientifically planned areca based cropping models in the state which include livestock, fishery component, and staple food components.

It is possible to transform arecanut cultivation into a profitable and sustainable venture by following appropriate measures. First and foremost step to be taken is the rejuvenation of senile and unproductive areca gardens with high yielding varieties/hybrids released by ICAR-CPCRI. Soil test based Integrated Nutrient Management practices; organic recycling through vermicomposting of arecanut bio-waste *etc.* are excellent options for sustainable and efficient arecanut production. To reduce the cost of production and increase the unit level farm return arecanut based intercropping, mixed cropping and mixed farming should be practiced. Improvising

domestic markets for arecanut is indubitably a key issue of debate especially in the context of growing concern on the social costs of promoting the crop. The supply chain of the arecanut crop is long as well as complex one wherein more than 75% of the domestic arecanut trade is lies in the hands of private traders. Therefore, steps are to be taken to streamline the marketing systems by making it much more organized one. In the recent period, the low quality/low grade arecanut is imported to India in huge quantum. Therefore, adequate trade policy measures should be taken in this regard along with enforcing stringent food safety based trade barriers to safe guard the remunerative prices in the domestic sector.

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