Development of strategies for supply chain management for proper marketing of Agriculture produce in Andaman & Nicobar Islands

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EXECUTIVE SUMMARY

Andaman & Nicobar Islands is located in the Bay of Bengal and stretches to 800km with 38 permanently inhabited islands. Andaman and Nicobar are two groups of islands blanketed with 85% of forest land. The history of the region has influenced its socio economic conditions till date. This geographically distinct and ecologically rich part of India, hopes to leverage on its strength of agriculture in the recent times. With growing population, need for more production to meet the demand is a mega-evolving challenge to the Government of Andaman & Nicobar Islands.

Andaman & Nicobar Islands are unique in its climate and ecology. Majority of its land mass is still untouched by human invasions. The climatic conditions of the island suits cultivation of many tropical crops resulting in high yield. The versatility of the region comes from the distinct ethnic groups inhabiting the region. Most migrants have brought with them knowledge about different crops building a diverse and firm agricultural background for the islands.

The detailed survey for data collection and the field visits have given a fair clarity of picture in terms of consumption and production patterns. Unlike the mainland with access by roads and rails, the population and influx of tourists is almost predictable, ensuring less fluctuation in demand. Somehow, the production figures are not that colorful. The value crops grown in this region are Coconut, Arecanut, Vegetables and spices.

Objectives

- To study the agricultural business situation in Andaman & Nicobar Islands
- To suggest measures for establishing supply chain with the integration of various schemes
- To develop strategies for improving agriculture marketing in Andaman & Nicobar Islands

Observations

North & Middle Andaman

- Direct selling by farmers is 5-10% of local trade
- Transportation of vegetables to Port Blair incurs losses of 30-40%, retail point loss is 10-20% in glut
- Subsistence farming in rice, pulses, spices
- Farmers shifting to arecanut cultivation
- Decline in activities and efficiency of dairy farming due to lack of space in housing cattle and incomplete dietary provisions
- Major crops cultivated are Paddy, green gram, black gram, gourds, pumpkin, coconut and arecanut
- Technological intervention in fisheries in Middle man is lesser as compared to North Andaman
- Credit prone activities in fisheries vesting higher bargaining power with traders than fishermen

South Andaman

- Land holdings are fragmented
- Major crops are coconut and vegetables
- Wholesale market for farmers at Junglighat on Sundays are accessed by them to some extend
- Import of vegetables from mainland (Chennai & Kolkata) sometimes causing disruptions in prices

Little Andaman

- Shift in interest of farmers to arecanut cultivation due to higher incomes
- Facilities like Cold Storage in farmer markets provided by Department of Agriculture is not functional/under utilized
- Few traders transport vegetables as per requirements to the major market of South Andaman (Port Blair) and Campbell Bay
- The farmers share in consumer price is same in local as well as other island market
- Active SHGs in Neil and Havelock islands and easy access to main market of Port Blair

Car Nicobar

- Coconut is the only major crop cultivated commercially
- EHL is involved in processing and trading of coconut
- Regulated zone inhabited by tribal farmers causing difficulties in accessibility
- No revenue land

Campbell Bay

- Major crops are Coconut and arecanut
- Tractor under Panchayat not functional
- 50% crop losses by monkeys
- Handholding for extensive pulse production by providing infrastructure and farm machinery

Pressing need of revitalization

After the disastrous event of Tsunami that hit the islands in 2004, there was disruption in the traditional agricultural methods followed. The stray cattle and submerged lands of are evidences of how the agriculture in the regions needs revitalization. The pace at which global economy is evolving in different facets in astounding, demanding a planned execution of integrated development in socio-economic platform of Andaman and Nicobar Islands.

The study was carried out by a team from National Institute of Agricultural Extension Management (MANAGE), Hyderabad within duration of 4 weeks. The main objective was to find the loopholes and gaps in the existing cultivation and marketing channels of agricultural produce of the islands and suggesting methods and strategies to encompass various governmental schemes to overcome the challenges.

The strategies proposed in this study is an honest attempt to integrate the opinions and favorable outcomes for various stakeholders involved in the system and have its prime focus on revitalizing the agri scenario of A & N Islands.

Commodity: Coconut

Content:

- Introduction
- Present Scenario
- Supply Chain of Copra
- Supply Chain of Desiccated Coconut
- Issues in the supply chain
- Suggested measures for establishing supply chain with the integration of various schemes
- Strategies and Recommendations for improving marketing of Andaman & Nicobar Coconut and its value added products

Introduction

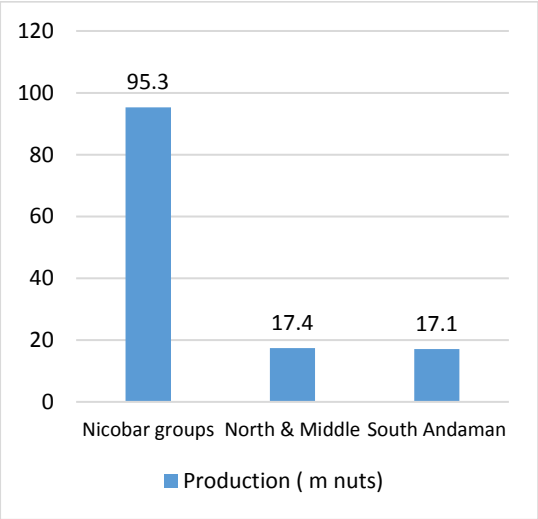
Coconut is one of the major plantation crops in India with a total cultivated area of 1975.81 thousand hectares with a production of 21,665 million nuts which makes India to stand 3rd in the world. The major producing states include Kerala, Karnataka, and Tamil Nadu. Andaman & Nicobar Islands stands 11th with an annual production of 129.80 million nuts with a cultivated area of 21.91 thousand hectares across the Island.

The major coconut producing areas are under the Nicobar group of islands which includes Car Nicobar, Nan cowrie group and Campbell bay.

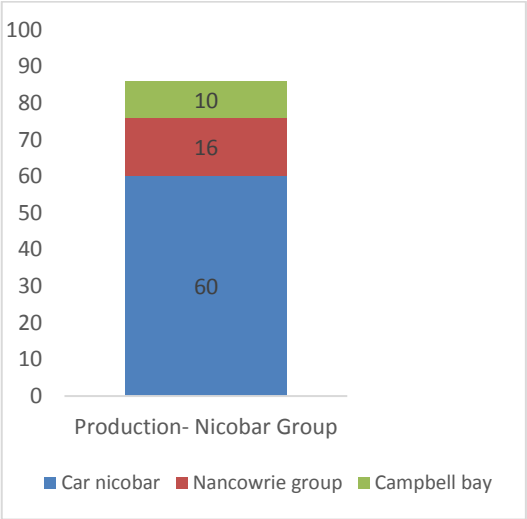
Present Scenario

The commercially available coconut is made use for making Copra, Desiccated coconut powder, tender coconut and Coconuts for consumption purpose. The tender coconut is available commercially in major tourist areas which is in and around south Andaman and the requirement is met from south Andaman itself.

In case of Car Nicobar and Nan cowrie group which is one among the major production areas the coconuts are processed by traditional methods to produce Copra. In Campbell bay zone the farmers either sold the coconuts to middleman who in turn sold it to Riflex or they sold it directly to Riflex (Desiccated coconut powder manufacturing industry).Riflex had its presence in Campbell bay and also in Hut bay and some of the middleman's and farmers were also indulged in processing coconut to copra

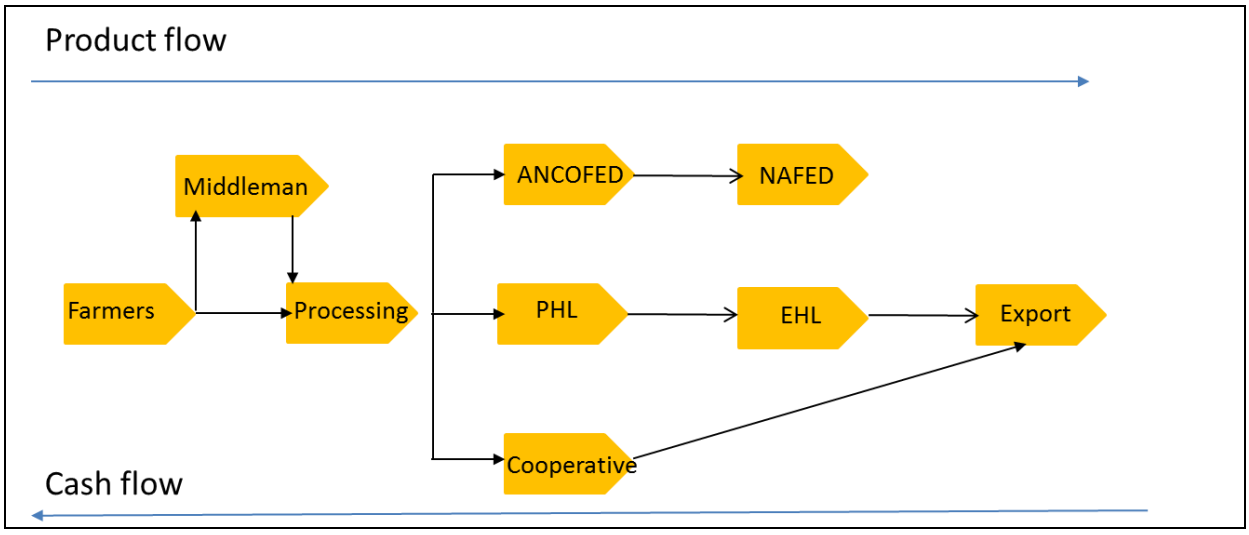


*Dept. of economics & statistics (2014-2015)



* Dept. of Agriculture (2015-2016)

Supply chain of Copra



Copra being one the major produce in the Andaman & Nicobar Islands and its majorly being produced in the Nicobar group of islands. The copra production is carried out by using traditional methods which includes sun drying of the coconut's but due to the unpredictable weather condition which prevails in the island rainfall is expected anytime which hampers the quality of the copra as moisture accumulates over it. The administration has also taken necessary steps to counter the quality issues by providing Mechanical dryers but due to lack of knowledge the farmers are not using it properly and in places it has been discarded as scrap.

At present the farmers are getting very low price for their produce of copra and due to shortage of labour farmers are switching over and not much involved in the production of copra.

Great Nicobar

Farmers in Campbell bay zone either produce copra on their own or they sell coconut to the middle man who aggregates from them and processes it to copra, and the produce was sold to ANCOFED (The Andaman & Nicobar Cooperative Supply and Marketing Federation Ltd) who as a contract with NAFED (National Agricultural Cooperative Marketing Federation of India). Later due to payment problems from NAFED procurement of copra was stopped by ANCOFED because of it the farmers had to sell their produce at lower rates (Rs. 40/- per kg) or the produce is left unsold. So the farmers of Great Nicobar Island went on a hunger strike on 12 august 2016 against the administration to implement MSP (Minimum Support Price) for copra as fixed by government of India and ANCOFED should start procuring from them again at the MSP rates.

Nan Cowrie Group Islands

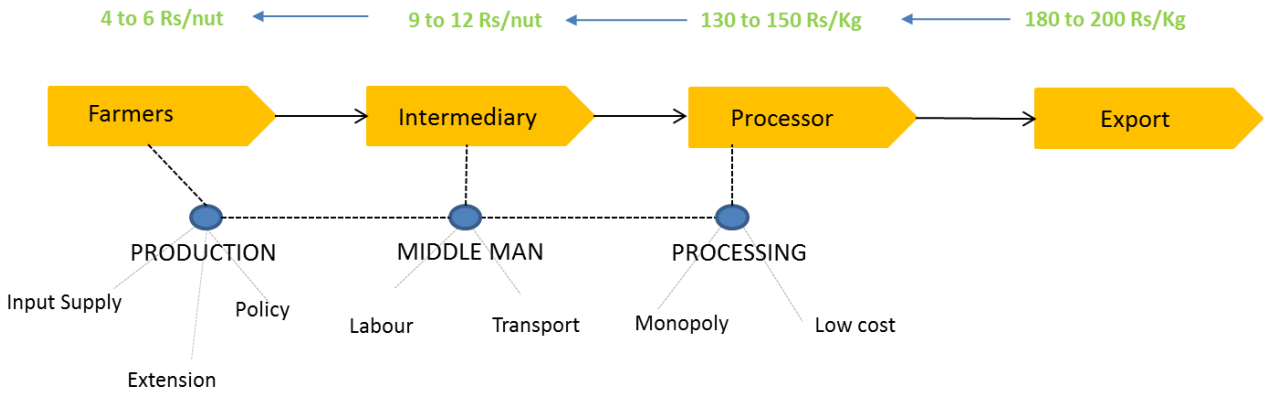
In the Nan cowrie group of islands coconut is the major crop. The conversion ratio of entire coconut harvest is 75% of copra, 10% for extracting coconut oil and 15% for raising seedling & fodder for pigs. M/S Tribal development cooperative is the only authorized copra procuring agency in the island and some small firms are also involved in the copra procurement in marginal level.

Car Nicobar

Car Nicobar being the major producer of coconut which accounts almost for 47% of the total production of Andaman & Nicobar Islands which is 60 million nuts. Tribal farmers being the dominant population in the islands and they are using merely 20% of the entire coconut produce for commercial purpose by processing it to copra and 27% being used as fodder to animal. The remaining produce of 30 million nuts are underutilised or wasted. PHL is the procuring agency involved in procurement of copra and it passes over to EHL and being exported to Chennai and Kangayem in Erode district for further processing.

Supply chain of Desiccated Coconut

Another available source for the coconut producers of Great Nicobar and Little Andaman is to sell the coconuts to M/S Riflex which is a desiccated coconut manufacturing industry. There exists a monopoly in the markets by M/S Riflex industry situated in those two Islands because of the monopoly the market rates are controlled by Riflex industry. They follow factory gate procurement system and the price ranges between Rs. 9 to 12/- per nut.



In the present supply chain the Intermediary and the processor plays a major role

- The farmers in the region are not willing and doesn't want to climb up the coconut tree to harvest the nuts
- The intermediary who have the access to labours procures it from the farmers at Rs. 4 to 5/- per nut and bears the harvesting, cleaning and transportation charges and sells it to M/S Riflex industry at a rate of Rs. 9 to 12/- per nut
- Due to Monopoly the processor is procuring the raw material at cheaper price and the availability of unskilled labour in plenty is making the processor to enjoy more profit

In case of South Andaman, the production of coconut is very less when compared to Nicobar group Islands, due to the population and tourist places the demand is matching the supply as the coconut is used for consumption and few intermediaries procure from the farmers and processes it to copra and selling it in Port Blair.

Issues in the supply chain

In order to enable functioning of business and chain to operate effectively the partner networks and the external influencers should provide support, intervene and assist the different links of the chain and facilitate the development of the business. But in the present chain there exists a lot of discrepancy and issues.

Production

- The farmers are not following strategic plantation which is reducing the productivity
- Non availability of agricultural machineries to tackle the labour issues at present the tractors are with the in charge of panchayat, and the panchayat is not taking care of it when it breakdowns
- Farmers in the area of Great Nicobar are aged and their heirs are not willing to take up farming
- Tribal people in the Nan cowrie group of Island and Car Nicobar are not much emphasised in farming for their livelihood
- Losses due to monkey is around 50% in the Great Nicobar region

Processing

- Following the traditional methods are reducing the quality and wastage is also getting more
- Lack of knowledge in using modern machineries as the mechanical dryer provided by the government is not utilised and maintained properly are kept as scrap
- Monopoly of M/S Riflex industry at Great Nicobar and Little Andaman makes it to fix the prices very less

Transportation

- Mere availability of ships and cargos makes the farmers unable to ship their produce to the market

Business Development

- Non availability of market information, where in the present chain flow of information is negligible
- No opportunity of trade facilitation implemented by government or by private players in many regions

Policy regulations

- Land dispute between the siblings of the farmer's family is making them up to lose interest in farming
- Land allocated to the Tsunami affected farmers in the Great Nicobar are lacking pathway to the field and infiltration of sea water is making the land unproductive

Under Utilisation

Region	Area(Ha)	Production (M Nuts/Year)	Reflex (M Nuts/Per Year)	Copra (MT/Year)	No. of M Nuts used for copra	Self Consumption M Nuts	Animal Feed	Oil Extraction	Left Over or Underutilised
Great Nicobar	239	9.99	1.3	500	3.3865	0.32	Nil	Nil	5.3035
Car Nicobar	9000	60	Nil	1800	12.15	1.06	16.2	Nil	31.65
Nan cowrie	4347	16	Nil	200	1.3546	0.55	2	1.6	11.0454

Source

* Conversion rate for 1MT of copra is 6773 Nuts (Obtained from cacp.dacnet.nic.in and also mentioned in the letter issued to farmers during hunger strike in Campbell bay)
* Assumed Self-consumption as 1 coconut/person/week
* Data obtained from Directorate of economics & Statistics and Dept. of Agriculture

After selling the entire produce in the form of coconut or copra and self-consumptions it was evident that there exists a huge gap of the produce

Around 50% of the entire produce of Car Nicobar and Great Nicobar is left underutilised

Around 68% of the total produce of Nan Cowrie Group Island is left under utilised

Suggested measures for establishing supply chain with the integration of various schemes

Consider broader view of mission organic for coconut sector in the islands

Since mission organic is still in progress in Andaman & Nicobar Islands, we evaluate and fetch all the benefits of being organic and should not leave any loop holes in it. Andaman administration should certify, not only coconuts as organic but also all its processed and value added products as organic and initiating Andaman & Nicobar coconut and its other products as a brand in international market and advertising all its unique features.

Learning from Lakshadweep islands' organic Mission

The land of Lakshadweep islands has received organic certification but the farmers are unable to realize a premium for the farm produce. Neither nuts nor copra fetched a premium, falsifying the belief that organic farming will bring fortune to the farmers

The land belonging to the nine islands of Lakshadweep have been certified organic by the Aluva-based International Organic Certifying Agency Indocert. "Chemical imports have been banned by the government and the coconut palms are grown under natural surroundings."

Lakshadweep can achieve better benefits by marketing organic products such as desiccated coconut and coconut milk, but it calls for an exclusive organic certification. Though the Lakshadweep Development Corporation has a manufacturing facility on the islands for making such products on a small scale, they have not been certified yet. (Source-The Hindu Newspaper January 7, 2015)

Bringing Tribal Captains and King of Car-Nicobar & Nan cowrie Groups of Islands for talks regarding coconut Farmers/industry development in their islands

- The fact that 65% of coconut production is contributed by these two tribal locations, it calls for the need to process and value add the product
- Commercial availability of coconuts in these islands is merely 32% of the production, causing a great potential for improving commercial availability
- Implementation of TRIFED (Tribal Cooperative Marketing Development Federation of India) like model for developing socio-economic conditions of the tribal farmers
- Various industries or small scale plants for producing value added products of coconut can be set up in these areas, after generating public interest. This can be ensured by giving appropriate stake to the native tribes in these projects for the smooth functioning and respecting public sentiments.

Promoting Farmers Producer organization (FPO) in Coconut sector

Why FPO in coconut sector is required for Andaman and Nicobar Islands?

It was observed and reported by several copra and coconut producing farmers during survey that due to the nexus between middlemen and traders in market, Port Blair farmers are forced to sell their produce in local market at throwaway prices. Whenever farmer tries for direct market linkage at Port Blair they are exploited by traders who take advantage of farmer's situation (where farmers bring their bulk produce at market gate after incurring huge transport charges and having no economically viable option of taking their produce back).

Thus the need of the hour is to organize this sector in such a way that the bargaining power of the farmer increases. With proper support from the government, FPOs have the complete potential to create benefit for all stakeholders namely Government, farmers and the consumers.

What should be the approach for promoting FPOs in the island?

A Farmer Producer Organization is formed with the main objective of socio economic development of the farmers through productivity improvement, cost reduction, efficient aggregation, processing for value addition, better by-product utilization and efficient marketing of the produce. It aims at providing a fair, steady and reasonable income to farmers by organizing the unorganized coconut sector through farmer collectives.

True empowerment happens only when farmers are involved in all stages in the value addition supply chain, such as, production, aggregation, processing, marketing, distribution and sales.

Andaman and Nicobar Island's Coconut Farmers Producer Organization will have a three tier structure consisting of Coconut Producers Society (CPS), Coconut Producers Federation (CPF) and Coconut Producers Company (CPC)

Coconut Producers Society (CPS) - Each island/zone will be having at least two coconut producing societies. CPS will be formed by associating 50-80 coconut growers in a contiguous area with a range of 4000-5000 yielding palms. Farmers with a minimum of 10 palms are only eligible to be a part of this society. Once the society is formed, it should be registered under the Charitable Societies Act and with Coconut Development Board.

Coconut Producers Federation (CPF) - CPF will be formed by combining 8-10 CPS of nearby islands or zones. Nicobar group of islands contributes more in total number of CPF. A CPF would have around 80 thousand palms under it. CPF is also registered as a charitable society and further registered with CDB.

Coconut Producers Company (CPC) - At least one CPC is suggested for Whole Island. 8-10 CPFs join together to form a CPC. A CPC would consist of around 8 lacs yielding palms. This company would be registered under section 581B of Indian Companies Act of 1956. The Producer Company is wholly owned by the farmers.

Equity for CPCs is raised through farmer contributions. Companies are also expected to collaborate with technical and financial institutes, research institutes, management institutes

and other consultancies for acquiring the expertise required to move in the right direction during its initial stages.

What kind of support is required from the Andaman & Nicobar Administration for these FPOs?

Agricultural scenario in Andaman and Nicobar Island is very different from mainland states. It is a subsidy based economy which initially requires administration support to great extend in the form of financial aid (Subsidy), technical support and training support, hiring technical and management graduates for internship.

CDB's Role and support schemes in Farmer Producer Organizations

Technology Mission on Coconut (TMOC)

TMOC supports FPOs in establishment of coconut processing units at 25% of project cost, subject to a maximum of Rs.50 lakhs. Apart from this, TMOC also does hand holding for market promotion, brand building, product processing and diversification

Marketing Support:

Marketing team of CDB facilitates market identification, development and product promotion for the companies. It also works on generating demand through consumer awareness by conducting coconut festivals, exhibitions, fairs etc. Use of advancement in Information technology, exclusive coconut corners, generic product promotion etc. are some other ways in which market building is carried out by CDB.

Technology

CDB Institute of Technology (CIT), CDB's in-house research centre is set up for providing technical support, consultancy and efficient technologies for integrated coconut processing. Quality testing, training programmes, product development and technology transfer support from CIT helps FPOs in adopting modern and advanced technologies as per their requirement.

Capacity Building and Trainings

Friends of Coconut Tree (FoCT) training for coconut climbers, Neera technician training for Neera tapers etc., are some of the trainings initiated by CDB to build skilled laborers in coconut sector. This, not only addresses the issue of labour scarcity and lack of efficiency, but also provides employment opportunity with good remuneration and dignity for the aspiring people. (Source: Coconut Development Board).

Strategies and recommendations for improving marketing of Andaman & Nicobar coconut and its value added products

Due to logistics related challenges in the Andaman & Nicobar Islands, it is highly recommended to concentrate on processed and value added products of coconut which will have a higher shelf life and hence logistics delay can be managed strategically.

Coconut water bottling plant set-up at various locations in Andaman & Nicobar Islands

Market research analysts project that the global coconut water market will grow at a CAGR of around 25%, in terms of revenue, during 2015-2019. The increasing health consciousness among the consumers will drive the sales of coconut water. Coconut water contains important electrolytes essential for the human body such as potassium and sodium.

Packaged coconut water is a very popular drink in the western countries such as the US, UK, and Brazil. For example Kero Coco, a product of PepsiCo, has been reported as the most selling beverage at the McDonalds and Pizza Hut outlets in Brazil.

The market research report anticipates coconut water to replace soda drinks in numerous foodservice locations across North America during the forecast period.

Leading players in packed coconut water at the global level

PepsiCo, Coca-Cola & Vita Coco are the leading players in the global market. The global coconut water market is signified by the presence of a small number of suppliers. Vita-Coco, a leading provider, dominates the market in terms of revenue. But the low capital cost involved in setting up the bottling plant for coconut water is anticipated to attract small-scale industries to this market.

Indian Player - Jain agro food products private limited are the Pioneers in India to Preserve and Pack 100% Natural Tender Coconut Water **"Cocojal"**. Tender coconut water, besides being sold in India, is also sold exported to the USA, Middle East and Canada.

Export of coconut water from India - 2015-16 is valued at ₹ 728.53 lakhs as per coconut development board data

Consumption Market

Americas was the market leader with the largest share of global coconut water market in 2014. The US was the largest consumer in this region, as a result of the increased health consciousness among the consumers.

South Africa has been identified as the fastest-growing regional market for packed coconut water. The country is developing briskly and consumers in the country regard packed products as being more hygienic and healthy.

In the United Kingdom, the consumption of organic coconut water approximates to 25-26 million litres per year. (Source: Technavio's market research

Technology available in India

In order to bring packed tender coconut water commercially in the market, the Coconut Development Board in association with Defence Food Research Laboratory, Mysore has developed a technology

Financials for Project Cost

Capacity	5000 nuts/day	10000 nuts/day	15000 nuts/day
Building	50	50	60
Plant & machinery	65	75	85
Effluent Treatment plant	3	3	3
Electrification	3.25	3.75	4.25
Technical Know How	3.90	3.90	3.90
Preliminary & Preoperative expense	1.25	1.50	1.75
Working Capital Margin	5.00	9.50	14.00
Total	131.40	146.65	171.90
IRR	18%	19%	17%
DSCR	2.38	3.56	1.44
BEP	51%	55%	59%

(*Coconut Development Board)

We recommend for a 10000 nuts/day plant at Car-Nicobar & South Andaman whereas a 5000 nuts/day processing plants for Campbell zone and Nancowrie group of islands, completely for the purpose of exports. Nicobar Group of islands should be on priority for this proposal.

Currently duopsony kind of market situation exists in Andaman & Nicobar Islands where farmers are realizing a price of ₹ 9 (Both cases Copra production and desiccated powder) per coconut production. Hence this form of intervention will increase competition in the market and ultimately lead to better price realization.

Looking at the Scope of Fresh Coconut or Minimally processed Tender coconut in mainland and export market

Hoping successful intervention of FPOs in Andaman & Nicobar Islands. Administration can look at the scope of Fresh coconut or minimally processed tender coconut from N-M Andaman and south Andaman zone (because of road connectivity to Port Blair)

As of now Farmer price realization from coconut farming is ₹9/nut (Including Harvesting charges). Hence market opportunity can be the nearby Visakhapatnam Port where direct and regular cargo services are available from Port Blair

Telangana & Andhra Pradesh markets can be tapped as well (further market availability study need to be done).

Transportation Cost

An average full container (FCL) 20'ST may incur a cost of around $1560 from Port Blair to Visakhapatnam and by packing of coconut in package of 17.5 x 6 x 5.5 inch, leads to an acceptability of around 32200 nuts in 20'ST container.

Transportation Cost (Port Blair to Vizag)	₹ 3.3 - ₹ 3.6
Manpower	₹ 0.4
Total	₹11.7 - ₹12

Promotion of Coir Industry in Andaman and Nicobar

From various secondary studies and our primary survey it is clear that Andaman and Nicobar having huge potential for coir industry. Hence promotion of coir industry by local administration with the support of Coir Board is suggested for increasing farmer income

Export Scenario of coir industry in India

A total quantity of 5,37,040.38 MT of coir and coir products valued at Rs.1476.04 crores were exported from the country during the period April 2013 to March 2014 as against an export of 4,29,500.92 MT valued at INR 1116.02 crores achieved during the corresponding period of previous year. There was an overall increase of 25% in quantity and 32% in value over the export achieved during the corresponding period of the previous year. (Source: Coir Board)

Availability of raw material and situation in Andaman and Nicobar islands

The average weight of sun dried coconut husk is about 450 grams. Therefore the total production of husk from 89 million coconut nuts would be about 58,050 metric tonnes per year in the islands, but only a negligible quantity i.e. 120 M.T of coconut husk is being utilized presently for making coir products and the rest is wasted or used as domestic fuel

There are a few small coir rope manufacturing units in the areas of Rangachang & Burmanallah and one curled coir unit at South Andaman. There is good potential for setting up of coir based industries for producing mattresses, door mats, sofa sets, coir carpets, cushions, rubberized coir etc. in South Andaman, i.e Car Nicobar, Katchal, Nancowrie and Campbell Bay

Export Destination Availability

During the period April 2013-March 2014, 103 countries imported coir and coir products from India. China is the major importer of coir and coir products both in terms of quantity and value with a share of 36% and 24% respectively. USA, which was the major importer of Coir Products for the past few years has now been ranked 2nd position with overall share of 20% in value. The combined exports to all the EU countries are 26.21% in terms of quantity and 32.90% in terms of value. The other countries, which imported substantial quantities of coir during the year under report, are South Korea, Australia, Russia, Canada, Brazil, and Japan (Source: Coir Board)

Concluding note on coconut sector in Andaman and Nicobar islands

Andaman and Nicobar coconut sector has huge potential for increasing farmers income but it is underutilized because of several reasons like production area predominantly under tribal region, lack of value addition facilities, lack of motivation for farming because of losses caused by monkeys, lack of market opportunity knowledge and proper training.

Because of these reasons duopsony market conditions exists in Andaman & Nicobar and farmers are not able of realize fair price for their produce and have demotivation towards farming

Above suggested measures and strategies if implemented, will support supply chain of coconut sector in the island, increase the farmers socio economic condition and will definitely support current central government plans for Andaman & Nicobar prosperity and upgradation into a transhipment hub.

Commodity: Paddy and Pulses

Content:

- Paddy Introduction
- Paddy Present Status
- Recommendation for Paddy
- Pulses Introduction
- Pulses Present Status
- Recommendation for Pulses

PADDY

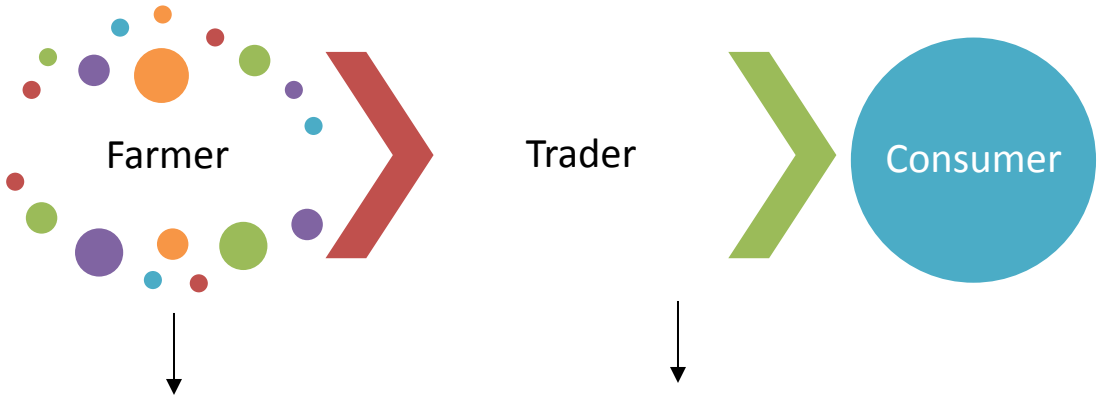
Introduction:

Paddy is the only grain crop that is being presently cultivated on Andaman and Nicobar islands. It is primarily grown in Diglipur, Mayabunder and Rangat region in North and Middle Andaman and is mostly used for self-consumption. Out of the total paddy production in the region almost 80% of the Rice is being consumed by the grower and his family and is never brought to the market for the selling purpose due to lower prices prevailing in the market. The remaining 20% of the paddy, is being hulled by old hullers in the houses of growers by traditional method and there is no modern milling facility available or being used by the farmers.

Present Status:

The varieties that are commonly cultivated in the region are Jaya, Gayatri, Ponni, Jagannath etc. But the verities that are preferred by the people are Bhavani, Masuri, Payasam rice, Burma rice etc.

A single marketing channel exists for Paddy:



80-85% self-Consumption remaining from farmers (20-15%) and from mainland

Maximum Paddy produced by farmers is utilized for self-consumption and any surplus is sold to the trader for selling. Farmers hardly themselves go to market for selling their purpose. From an area of 1300 m^2 i.e. 1 beegha, 400 kg paddy is being produced on which they incur a cost of Rs. 4000. From 40 kg Paddy 22-24 rice kg is produced on which Rs. 30 is charged.

Thus after incurring a cost of Rs 3030 per 1300sq. m. the farmer gets a price of only Rs. 900 from the trader for 40 kg of Rice and the trader sells it in the market at a price of Rs. 1200 per 40 kg

Thus a trader sells the rice brought from farmer at a profit of Rs. 7 – 8 per kg of Rice.

Calculations /ha:

1 beegha = 1300m^2

Yield = 10 mound (1 mound = 40 kgs)

Cost incurred = Rs. 4000 (approx.)

From 40 kgs paddy, 22-24 kg rice is obtained

Processing charge = Rs. 30/mound

From 1300 m^2 we get 400 kg paddy

So, from 1Ha. , we get 400/1300*10,000 = 3100 kg paddy (approx.)

Cost incurred-

Rs. 4000/ 1300 m^2

i.e. Rs. 30,000/ Ha.

Processing cost-

Rs. 30/ 40 kg Paddy

i.e., Rs. 2325 for 3100 kg paddy

40 kg paddy = 25 kg wheat (approx.)

3100 kg paddy = 1937.5 kg rice

Own consumption (80-85%) = 1743.5 kg/ha

Sold = 193.5 kg from one Ha.

Now, 40 kg sold at 900 Rs

So 193.5 kg will be sold at = Rs. 4359

So, the cost incurred is Rs. 32325 but the earning that a farmer gets is only Rs. 4359. In contrast to this, if the farmer completely stops cultivating paddy in his field, he can buy rice in Rs. 20,000 For an entire year from the CCS shop.

Reason for increasing Arecanut cultivation:

Starts yielding after 3 years;

I Ha. Land yield = 2400 kg per year

Cost = Rs. 3000/ Year

Selling price = Rs. 180/Kg

Total Revenues: Rs. 432,000/ year

Loss in milling of Rice from Paddy is nearly 37.5% because of use of traditional threshing and hullers for rice production. Farmers are using traditional hullers for producing rice from paddy leading to a lower recovery rate of Rice.

As a result farmers are shifting towards areca nut cultivation from Paddy aw they are not getting remunerative prices for Paddy. As a result paddy cultivation is decreasing and areca nut cultivation is increasing as Paddy cultivation requires intensive labor throughout the season thus increasing the cost of cultivation while it is a one-time investment in Areca nut plantations and maintenance cost is also low once the trees start yielding. Farmers are not getting correct returns from the cultivation of paddy. The area under paddy cultivation has almost halved in the past 4 years

Recommendation:

- Increase production:
    a. Input Supply: input supply at the right time and in the right quantities is crucial thing when it comes to agriculture. Since all the inputs are being provided by the agricultural dept. it has to be ensured that the facilities are extended properly.
    b. Extension Services: technological world is too dynamic now. It changes every minute of the day. Technological advancement in agriculture has too developed a lot. There are certain technologies like sowing machines harvesters etc. are available, which help in increasing the output. Similarly farmers are to be made aware of these advancements time to time and proper guidance has to be given.

- High Yielding Varieties:
  In almost all the places it was observed that there were no cultivation of suitable High Yielding Varieties. Seeds of the high yielding varieties of crops (HYVs) had appeared as a great new hope for the farmers. Use of HYV seeds in the paddy cultivation will certainly boost the production.

- **Processing:**
  Farmers are not getting good prices due to the lack of proper processing facilities. If a central processing unit is provided, it will result in better rice recovery from the paddy and encourage the farmers to increase the paddy production. This will also lead to increase in the area under paddy cultivation.

Recommended supply chain:

Our recommendation will be, the government to play a vital role in providing the right price to the farmers. Our recommendation here would be that government should make a central warehouse and modern rice processing mill in the potential area. And then the procurement of the paddy should be done from all the farmers at a fixed price or MSP, which can be stored in the central warehouse to improve the physical quality of paddy. After a certain storage time, the paddy can be processed in the central processing unit which will be set up in the nearer vicinity to the warehouse. The rice recovery from paddy will also increase. Now, the same processed rice can be sold back to the consumers through civil supply department at lower prices. When the government will start procuring from farmers at a better price, the farmers will be further encouraged and motivated to take up the paddy cultivation and it will reduce the cost of procurement of paddy from mainland.

PULSES

Introduction:

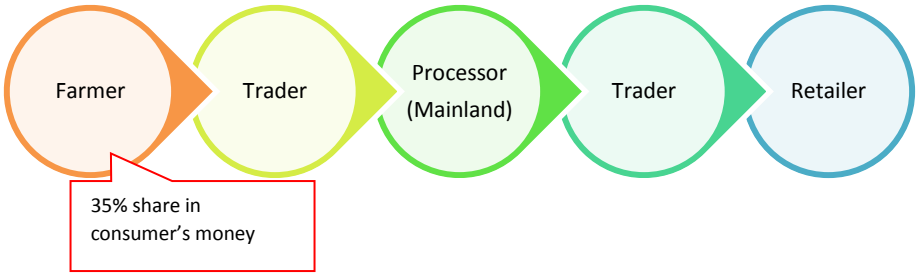
The major pulses produced in Andaman and Nicobar Islands are green gram and black gram along with minor production of pigeon pea and chick pea. The production in the year 2015 – 16 from Diglipur was around 900MT but negligible amount of it was used for local consumption and the rest was exported to mainland for processing.

Present Status

Harvesting time for pulses is from March to mid –April and individual millers do not have the required capital or the storage space to store the procured pulses and process it throughout the entire year

The entire production is sold to the trader who transports it to the mainland for processing and gets back to Andaman and sells it at double the price in the market.

A single marketing channel exists for Pulses:



A farmer produces 160 kg of pulses from 1300sq.m. of area and incurs a cost of Rs. 2000 while sells it to the trader at a rate of Rs. 70 per kg while the trader processes the pulses at a cost of Rs. 35/kg in the mainland and sells it at Rs. 200 per kg in the market thus selling at a price two times more than the price at which bought. Thus the farmer's share in the consumer money is only 35%.

Calculations/ Ha:

Cost incurred: 1300 m^2 = Rs. 2000

Yield: 1300 m^2 = 160 kg
10,000 m^2 = 1230 kg

Processing cost: 1 kg = Rs. 35
1230 kg = Rs. 43050

Sells to mainland = Rs. 70/Kg, Gross income = 70*1230 = 86000 Rs./Ha (approx.)

The same pulses after they again come to island after being processed in the mainland, costs nearly 200 Rs. a Kg.

RECOMMENDATIONS:

Regular Input Supply:

Inputs like Seeds, Fertilizers and Pesticides are to be made available to the farmers at the right time before the start of sowing. Input dealers should be allowed to sell products directly to the farmers to ensure timely supply. Direct benefit transfer to the farmers on purchase of inputs for farming.

Training in Pulses Production:

Training is to be provided by the Department of Agriculture to farmers about the best package of production for pulses and promoting the farmers to produce pulses like pigeon pea other than black gram and green gram. Creating awareness among farmers about Good Agricultural Practices like Integrated Pest Management and Integrated Nutrient Management to improve the quality of the produce and influencing them to include it in their package of practices. Demonstration showing the scientific and modernized methods of pulse production is to be carried at villages to raise awareness among farmers to promote commercial cultivation of pulses

Procurement by Government:

Procurement of pulses from the farmer at a Minimum Support Price by the Government which

would ensure the farmers a right price for their crop. Collection of the produce from the farmers at the major pulses producing regions and transporting it to the Central Warehouse for storage and processing. Processing can be done at the Central Processing unit equipped with modern facilities in batches to prevent the hike in the price of pulse when processed in mainland.

Distribution and Marketing:

The processed pulses can then be pumped into the Public Distribution System for supplying it to the public through Consumer Cooperative Shops at a reasonable price or can be purchased by retailers to sell it in the market. This would increase the farmer's share in the consumer's rupee to 68.33% in comparison to 35% when taken to mainland for processing.

Pulses being a commodity which still can't meet the current demand of the population in the islands so focus of the Government has to be on the supporting the current demand and reducing the import and not on export of the commodity.

Commodity: Spices

Content:

- Introduction
- Production Outlook
- The Demand Trend
- Trade of Spices
- Areas of Concern in Supply Chain of Spices
- Schemes for Improving Spices Production and Trade
- SWOT Analysis For Spices Production In Andaman & Nicobar Islands
- Recommendation

Introduction

Andaman & Nicobar Islands are a group of 527 islands spread across 800km in the Bay of Bengal, covered with lush green forests in 85% of its land area. In 38 inhabited islands of the region, agriculture is the major source of income. Apart from the recent growth in tourism sector, the social set up is much agrarian in the islands. Situated in the Hot or Torrid Zone, it has a tropical climate with temperatures ranging from 24-30 degree Celsius and humidity around 80%. Mostly rain fed, the islands gets showers during both South West and North East monsoons and receives an average rainfall of 3200-3250 mm. The primary agricultural soil found in this region are alluvial and colluvial in origin.

The agriculture scenario is Andaman & Nicobar Islands is bright with individuals and private firms looking to explore and expand it commercially. In this context, Agriculture Department and agencies like NABARD are willing to give handholding for agriculture sector to evolve advanced and yielding.

It was observed that majority of area under production in Andaman & Nicobar Islands are under plantation crops and vegetables. Spices are mostly grown as an intercrop in scattered way, to provide an additional income. As a low volume high value produce best suited for the climatic conditions of the region, there is an urgent need for the stakeholders to provision efforts and supplies to excel in production and trade of spices.

Despite favorable climatic conditions and promising motivation level of farmers, there is no remarkable production of spices from the islands. The local demand is met by supplies from mainland, when mainland itself imports many of it. The richness in biodiversity and conduciveness of spices production is a promise to Indian trade in the near future.

The islands fall near the coastal belt near to Indonesia and Thailand, already established global spice trading countries. This validates the potential richness of A & N Islands in evolving as a major supplier of spices.

This study is aimed at identifying the gaps and scope of production and trade of spices in Andaman & Nicobar Islands. Extensive surveys and field visits were conducted to assess the ground level realities associated with production and marketing.

Production outlook

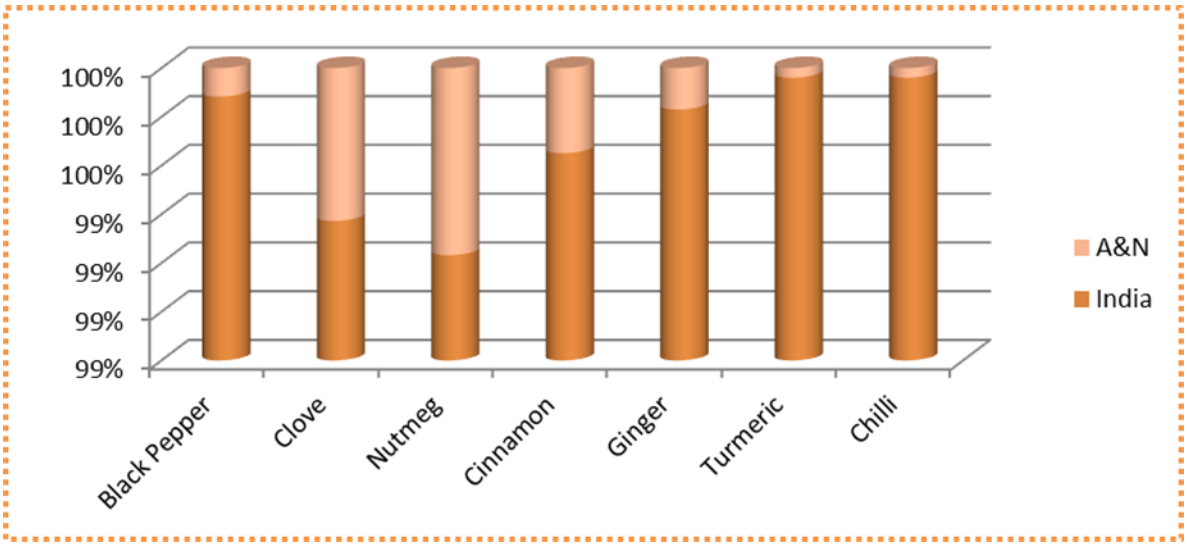
The cultivation of spices in Andaman & Nicobar Islands is catching up as a back-up revenue source for vegetable and plantation farmers. For years, the migrant and settler farmers have brought with them cultivation knowledge of common crops specific to their region. Mini-India, the proud address of Andaman stands valid in agriculture as well. Despite the lack of subsistent supply of quality input, several factors have led to the initiation of spices production in several patches of farm land.

Geographically, Andaman & Nicobar Islands holds 0.31% of India's arable land. Subjected to the constraints of regular supply and accessible market, with less or no focus to spices production, the production statistics of the islands are as follows

Table: Spices production during 2009-10 (in tonnes)

Crop	***India***	***A&N***	***Contribution***
Black Pepper	50000	58.31	0.12%
Clove	764	4.82	0.63%
Nutmeg	11271	87.22	0.77%
Cinnamon	8750	30.6	0.35%
Ginger	927912	1575	0.17%
Turmeric	981590	384.1	0.04%
Chilli	1470352	573.5	0.04%

Evidently the numbers give an optimistic picture of spices production backed up by the fact that, the climatic conditions of the region is extremely conducive. Its dense cover of plantation crops and farmer enthusiasm to cultivate spices as a mixed crop lays a positive footnote to current scenario.



From the representation of the production quantum, few inferences can be derived

- There is a higher production of Nutmeg and Clove in the islands, which indirectly means availability of propagation sources and knowledge of cultivation methods
- Both the commodities can be tagged as organic to penetrate export markets, though practically volume of production and low per capita consumption could be a challenge
- There is a potential for imparting scientific cultivation knowledge to the farming committee in other spices like pepper and chilly that are locally consumed, but mostly produced in mainland India

The scattered production trend in spices makes it difficult for farmers to find a market for their produce. The supply of produce is highly varied in quality and quantity throughout the island. There is a need to integrate the supply of inputs to regulate and monitor production, the first step of supply chain management. Based on farmer behavior, aforesaid regions are identified to have scope of production.

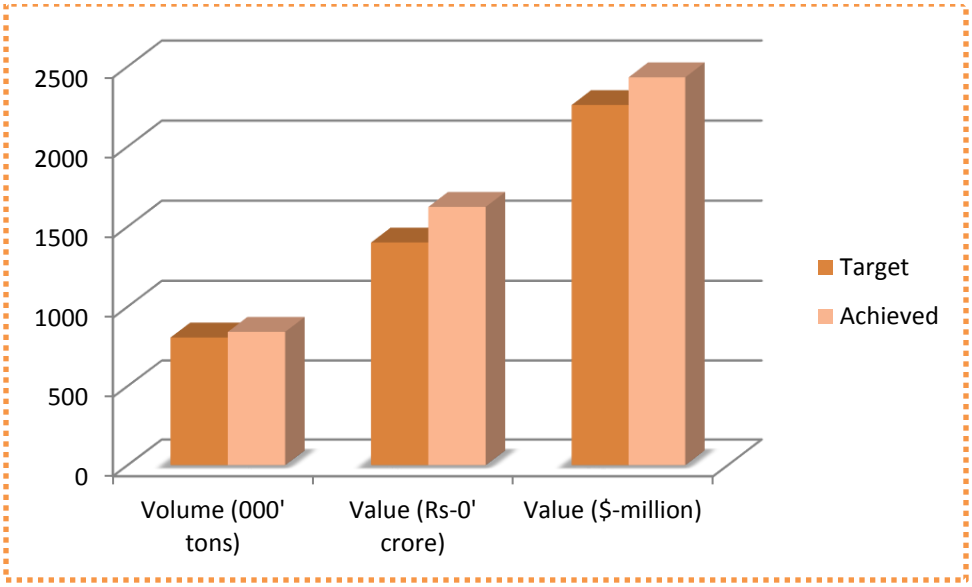
Interest Areas for spices (based on farmer behavior)	
Island	**Localities**
North Andaman (Turmeric & Ginger)	Rangat & Diglipur
South Andaman	Little Andaman (RK Pur, VK Pur)
Nicobar Islands	Campbell Bay

The Demand Trends

Spices have it variety in forms and uses. The demand for spices is constantly at a rise in any market. A market report by Transparency Market Research states that global seasonings and spices market will hit $16.6 billion by 2019, and are highly positive of their views on this booming recession-proof industry.

Unlike the mainland India, the Andaman & Nicobar Islands have a constant or predictable demand throughout. It is a virtue that every island holds; the population here wouldn't be scaled to extremes at any point of time. Interestingly, even the number of tourists who would be a larger share of demand population can also be predicted to near accuracy. The challenge lies in mapping the demand accurately. Currently, records estimate a population of 3,80,000 and tourist influx of 3,00,000, cumulating to a total demand of 6,80,000. The demand mapping per season will hint to requisite production and export of Andaman, which will be a substratum for framing policies and schemes related to primary and secondary sectors.

Yet, the colorful prospect is in the export of spices to mainland India and other countries. Spices Board reports a substantial growth during last five years compounding to 14% in terms of rupees and 5% in dollars annually. The confidence in spices comes from its growth that exceeded targets. The diagram clearly defines the difference between the targets set and achieved in spices export in 2015-16 nationally.



Trade of spices

Spices are not extensively traded in Andaman & Nicobar Islands as a major commodity. The local demand is met by small scale production carried out by some farmers. Yet, the spices fetch a better price. Though the local prices are not standardized or validated by market committees, the following rates in local market of Little Andaman as on 13th October, 2016 gives an overview.

Produce	Local market (Farmer Price)
Ginger	100 /kg
Cinnamon	60 / 100g
Tamarind (Dried pulp)	20 /kg
Turmeric (powder)	200 /kg
Pepper	750 /kg
Clove	1400 /kg
Nutmeg	60/150 g
Bay leaves	10/5gm

Spices are mostly traded and marketed after primary and secondary processing activities like drying and threshing. It is these processes that majorly determine the quality and grade

specifications of the produce. Lack of knowledge and technology in processing spices is a major challenge to the farmers as most crops are wasted after harvesting.

Global overview

HS code 0910: Ginger, saffron, turmeric ‘‘curcuma’’, thyme, bay leaves, curry and other spices (excluding pepper, vanilla, cinnamon, cloves)

The products included in this category are imported to USA (10-20%), India (5-10%) and Canada (1-5%). Interestingly, major exporters are China (20-50%) and India (10-20%). The global market of these spices is dominated by China, India and USA.

US market is a major stakeholder in spices market because of the high demand from ethnically diverse population and scalable growth of extraction based industries that produce essential oils and its likes.

HS code 0907: Cloves, whole fruit, cloves and stems

From trade perspective, India (20-50%) stands first in clove imports in the world, followed by USA (10-20%). Talking about the global supply network, majority of clove export is from Madagascar (20-50%), followed by Island groups of Indonesia and Srilanka (10-20%) and India (5-10%).

With dwindling supplies from Indonesia in 2016, Clove buyers are looking for buying the commodity beforehand. This is expected to have a positive impact on the prices and international market.

HS code 0906: Cinnamon and cinnamon-tree flowers

The major consumption points for these form of produce is in USA & Mexico (10-20%) and India (5-10%), whereas the export sources are mostly China, Indonesia, Srilanka and some parts of USA, similar to Cloves.

HS code 0904: Pepper of the genus Piper, dried or crushed or ground fruits of the genus Capsicum or of the genus Pimenta

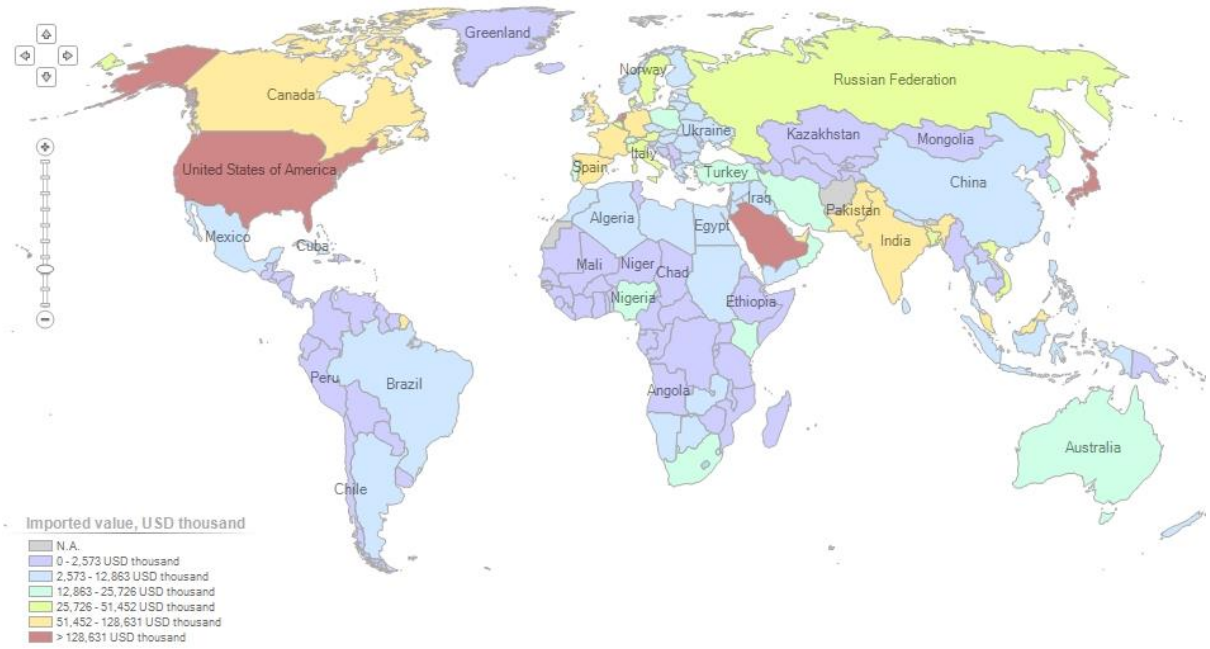
For pepper, the major buyer in USA (20-50%), Vietnam and Germany (5-10%) in the trade map. The export is concentrated in the Asian continent’s Vietnam, Indonesia (20-50%) and India (10-20%).

The global trade statistics underlines the importance of Asian countries in the trade map of spices. Andaman and Nicobar Islands that are situated in the West Coast of India shares similar climatic conditions as that of Indonesia, a limelight point of spices production.

For the reference of trade concentration in terms of imports, world maps highlighting major importing countries, ie buying points are attached herewith.

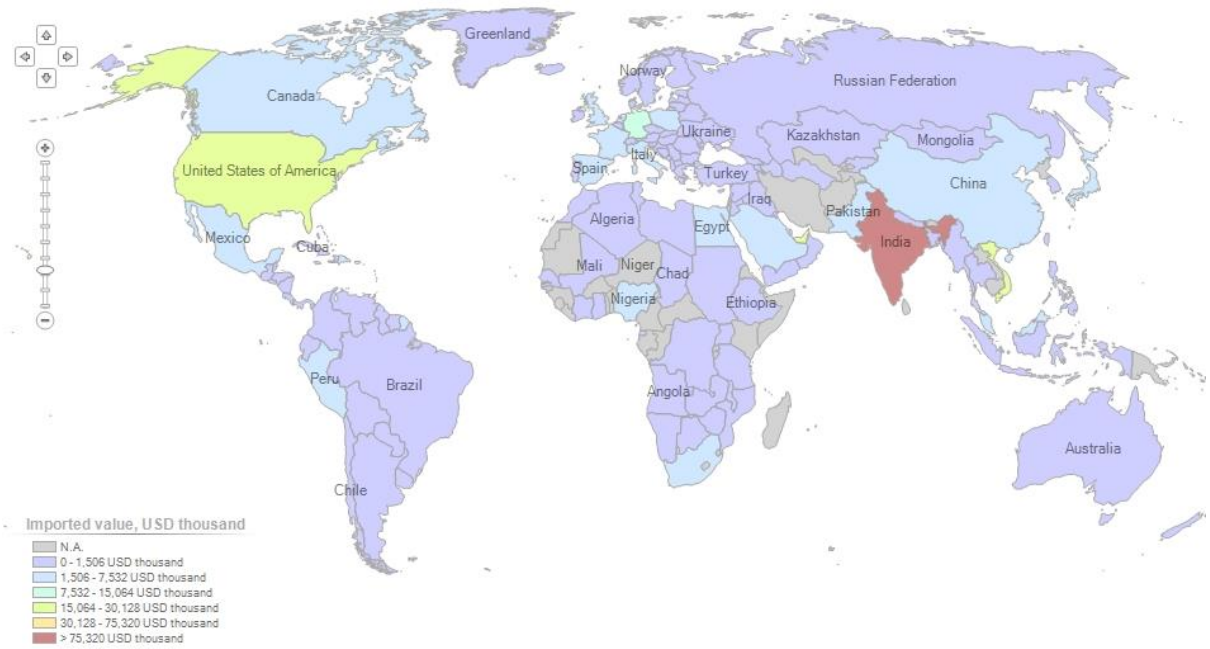
List of importing countries for the selected product in 2015

Product : 0910 Ginger, saffron, turmeric "curcuma", thyme, bay leaves, curry and other spices (excluding pepper of the genus Piper, fruit of the genus Capsicum or of the genus Pimenta, vanilla, cinnamon, cinnamontree flowers, cloves [wholefruit], clove stems, nut



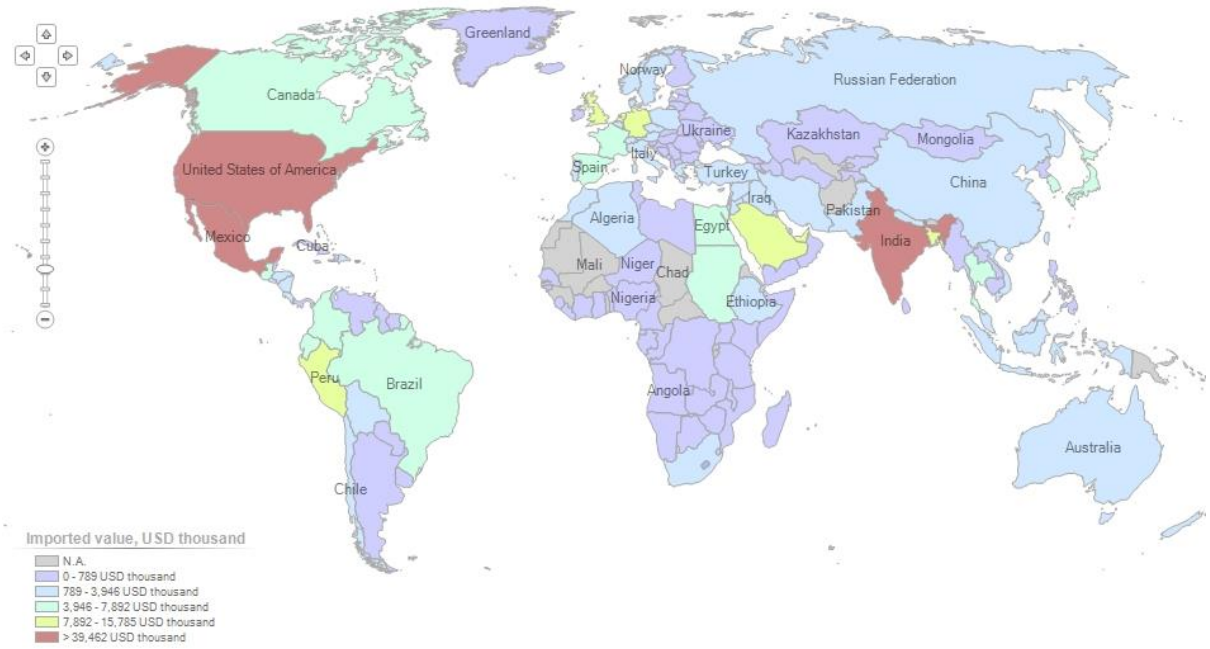
List of importing countries for the selected product in 2015

Product : 0907 Cloves, whole fruit, cloves and stems



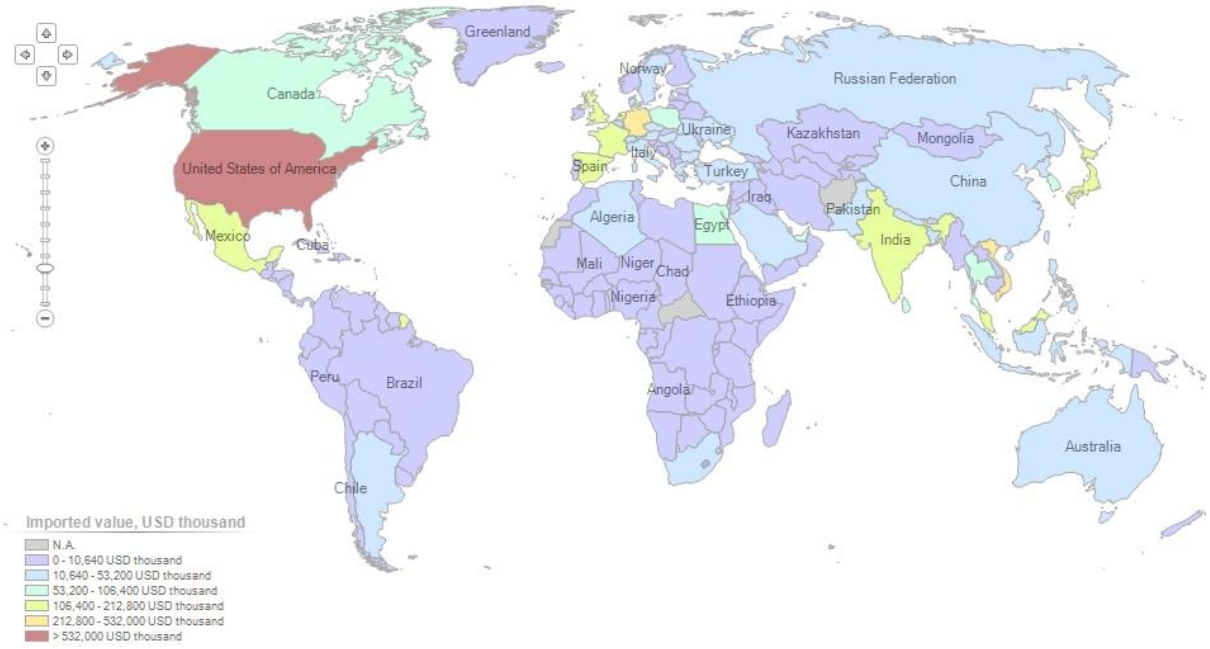
List of importing countries for the selected product in 2015

Product : 0906 Cinnamon and cinnamon-tree flowers



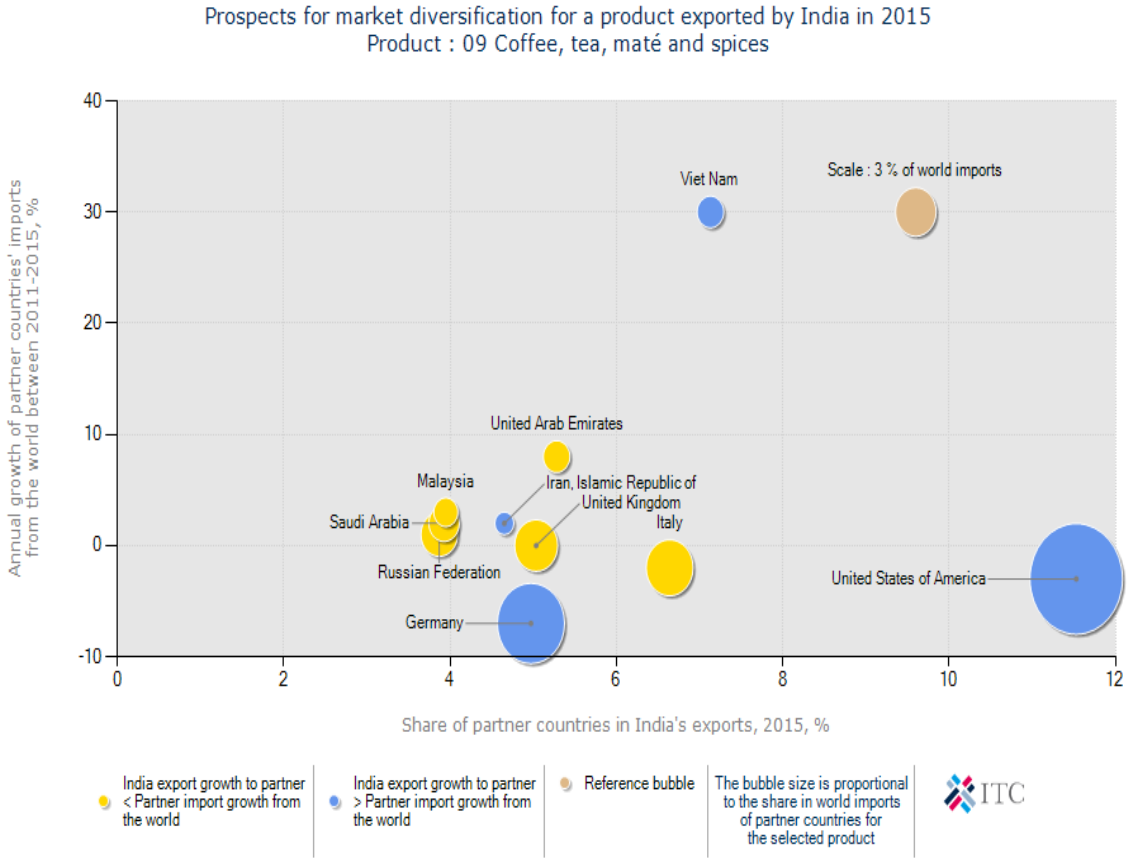
List of importing countries for the selected product in 2015

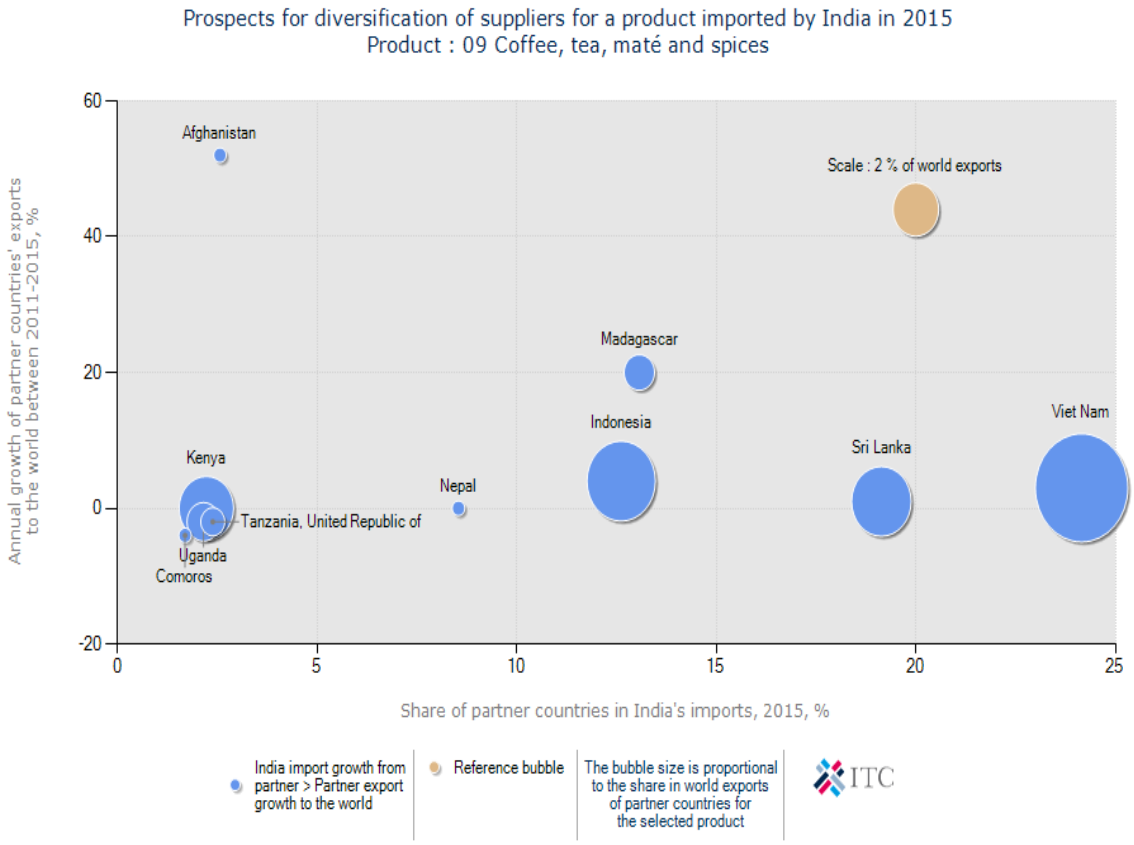
Product : 0904 Pepper of the genus Piper; dried or crushed or ground fruits of the genus Capsicum or of the genus Pimenta



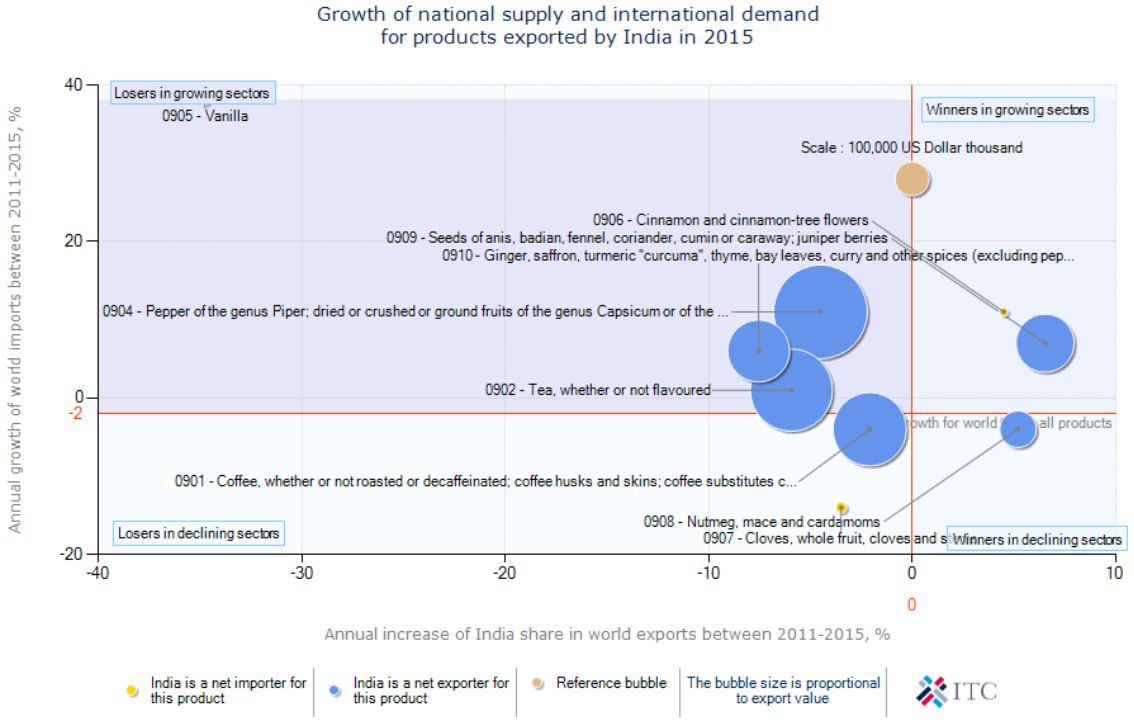
Indian Scenario

- The spices like Saffron, Ginger, Turmeric etc are exported to almost all major countries from India. Yet, majority of the exports are directed to USA, UK and Middle East. The demand from India is fed by Nigeria, Indonesia, Bangladesh and Pakistan.
- India is dependent on Madagascar and Tanzania for supply of clove, whereas majority of its exports are to USA. The distribution of clove supply from India is spread across Canada, South Africa and Australia.
- India has an extensive supply network for Cinnamon to Australia, USA, Canada, Middle East, Vietnam and Russian Federation. There is an influx from Vietnam and China.
- India is a strong supplier for Pepper in the world markets like USA, Thailand, Mexico and Canada. Major suppliers of pepper to Indian market are Vietnam, Indonesia and Brazil.
- Products like nutmeg, mace and cardamoms are mostly exported from India to Middle East Countries like Saudi Arabia and UAE, and a share is traded to Pakistan. A part of it even caters the USA and Europe. India at times also import from Indonesia and China.

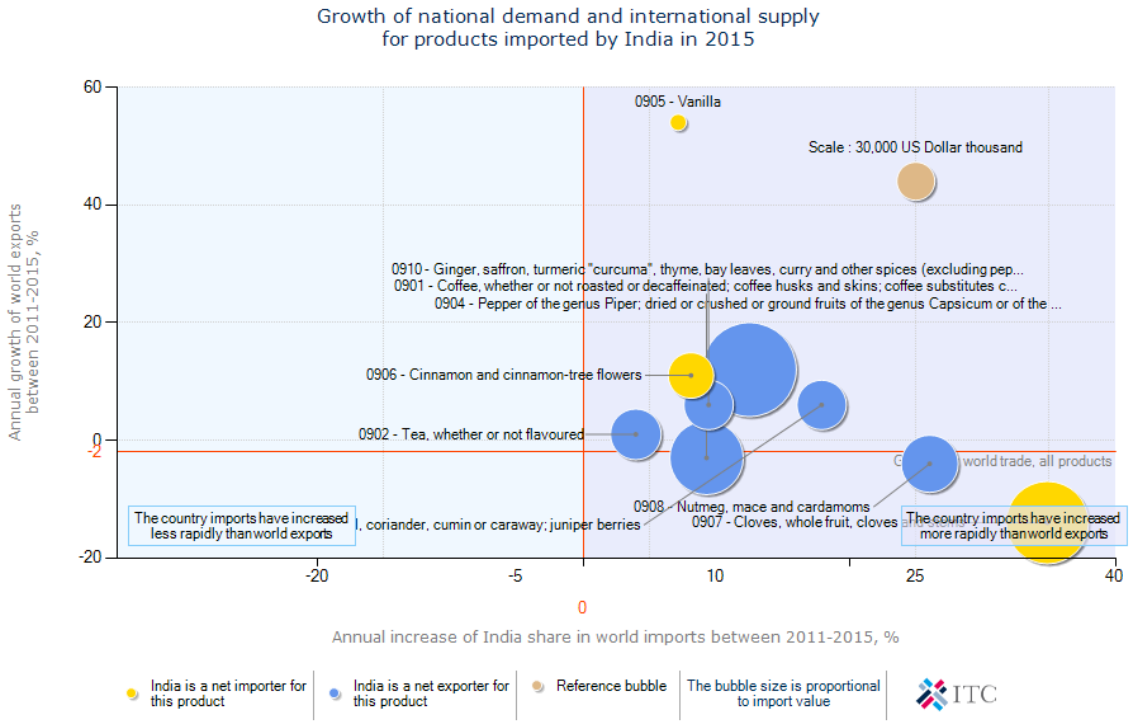



Prospects for diversification of suppliers for a product imported by India in 2015
Product : 09 Coffee, tea, maté and spices
Annual growth of partner countries' exports to the world between 2011-2015, %
Share of partner countries in India's imports, 2015, %
Afghanistan
Scale : 2 % of world exports
Madagascar
Indonesia
Viet Nam
Sri Lanka
Kenya
Nepal
Tanzania, United Republic of
Uganda
Comoros
India import growth from partner > Partner export growth to the world
Reference bubble
The bubble size is proportional to the share in world exports of partner countries for the selected product
ITC

Inferences


Growth of national supply and international demand
for products exported by India in 2015
Annual growth of world imports between 2011-2015, %
Annual increase of India share in world exports between 2011-2015, %
Losers in growing sectors
Winners in growing sectors
Losers in declining sectors
Winners in declining sectors
0905 - Vanilla
Scale : 100,000 US Dollar thousand
0906 - Cinnamon and cinnamon-tree flowers
0909 - Seeds of anis, badian, fennel, coriander, cumin or caraway; juniper berries
0910 - Ginger, saffron, turmeric "curcuma", thyme, bay leaves, curry and other spices (excluding pep...
0904 - Pepper of the genus Piper; dried or crushed or ground fruits of the genus Capsicum or of the ...
0902 - Tea, whether or not flavoured
0901 - Coffee, whether or not roasted or decaffeinated; coffee husks and skins; coffee substitutes c...
0908 - Nutmeg, mace and cardamoms
0907 - Cloves, whole fruit, cloves and s
India is a net importer for this product
India is a net exporter for this product
Reference bubble
The bubble size is proportional to export value
ITC

With respect to global spice market, the focus spices should be Cinnamon & Cloves as world imports of these commodities are growing at a larger pace.



All the spices fall under the category of "country imports increased more rapidly than world exports" which points out at an increasing local demand for spices.

Areas of concern in Supply Chain of Spices in A&N Islands

The supply chain of spices in the islands is highly under developed. Even amidst high motivation levels of farmers to cultivate spices, there is severe shortage of quality inputs. Unlike the promotion and penetration of information associated with exotic vegetables and spices, there exists a supportive environment for dissemination of knowledge in terms of package of practices and processing. This favorable stratum is underutilized by stakeholders and knowledge partners.

Another important constraint associated with spices cultivation is the lack of aggregation points. The farmers are not equipped with knowledge for large scale cultivation. There are no market forces that function for sourcing outputs and enable marketing. The level of aggregation we find in other crops like coconut and arecanut is absent in spices. This is one major reason for lack of enthusiasm in exports from the islands to the mainland by extensive production.

Connectivity to mainland India, a major consumption point for spices is highly limited and selective. Spices have an upper hand over other commodities with its lower volume. The failure to aggregate the produce results in a segmented market, a major bottleneck to access mainland markets.

The marketing regulations are also not favorable for substantial growth of spices production and trade. There is no transparency and information flow with regard to prices and demand in the market system. There is complete absence of commercial processing and penetration of processing knowledge in spices market of A & N.

Schemes for improving Spices production and trading

Sl No.	Type of assistance/ schemes	Criteria for assistance	Maximum Limit	Schemes/ Components
1.	Establishment of new garden of Spices (For a maximum area of 4ha per beneficiary) a) Perennial Spices (Black Pepper, Cinnamon, Clove , Nutmeg)	50% in 3 installments of 60:20:20 subject to survival rate of 75% in 2nd year and 90% in 3rd year)	Rs.25,000/ha	Sub Schemes of NHM under MIDH
	b) Rhizomatic Spices (Ginger, Turmeric)	50%	Rs.15,000/ha	
2.	RKVY (as implemented by Govt of Andhra Pradesh-for reference) a) Supply of Silpauline sheets to chilli growers b) Supply of HDPE sheets to chilli / turmeric growers c) Supply of PP equipments to chilli growers d) Supply of Turmeric boilers, polishers e) Quality Improvement training	50%	Rs.365 lakhs in total	Integrated spices project under RKVY – Post harvest schemes (Similar project also taken in Telangana)
	f) Turmeric Seed material	40%		
3	For Export Oriented Production Pepper: a) Supply of pepper threshers	Pepper growers with area upto 8 ha.	Subsidy: Rs.7000/- per thresher	
	b) Distribution of bamboo mats	• 51 to 100 nos. of yielding vines • More than 101	1 mat 2 mats	
	Turmeric a) Turmeric Boilers	Growers upto area 8 ha.	50% cost or Rs.4000	
	b) Turmeric Polishers		50% or Rs.16,000	

General Post harvest improvement programmes for spices

(i) Construction of drying yards for drying spices

- Construction of concrete/cemented drying yards in the farmers' field for drying spices like chilli, ginger, turmeric, pepper, seedspices and tree spices on clean and hygienic surfaces
- Estimated cost of construction is Rs.600/- per square meter
- Eligibility : Growers having area upto 4 ha
- Subsidy :
    - General Category - Rs.150/-per sq. mtr. (25% of the cost)
    - Scheduled Caste - Rs.300/-per sq. mtr.(50% of the cost)
    - Scheduled Tribe - Rs.540/-per sq. mtr. (90% of the cost)
    - Individual growers will be provided subsidy for area upto 150 sq.mts.
    - Community drying yards by NGOs/Farmers' Groups (SHGs), Association of Farmers & Agri. Market Committees - 50% of the cost

(ii) Supply of polythene sheets for drying spices

- Eligibility: Growers having area upto 4 ha
- Polythene sheets-
    - Upto 1 ha. two sheets
    - 1 to 4 ha.-three sheets
- Silpauline sheets
    - One sheet per beneficiary
- Subsidy:
    - Tribal Growers - 50%
    - Other category - 33.33%

iii) Supply of Moisture

- Eligibility: Growers having area upto 8 ha
- Subsidy: Rs.2500/-device towards 32% of the cost

iv) Quality Improvement Training Programmes

Promotion of organic farming

The major bottlenecks in promoting organic farming are

- Non-availability of organic farm inputs
- High cost of organic certification of farms and processing units

(i) Assistance for Certification of Organic farms/Processing units

- Aims to help growers/processors of spices in acquiring organic certification, which is a pre-requisite for marketing organic spices

- Eligibility: Possession of a valid confirmation or in conversion or organic certificate from any of the Inspection And Certification Agency accredited under National Programme For Organic Production (NPOP)
- Subsidy:
    - 50% cost of the certification, subject to a maximum of Rs.75000/- for group of farmers, NGOs and Farmers Co-operative Societies/Associations
    - Individual farmers and processors are eligible for 50% of the cost of certification subject to a maximum of Rs.25000/- per certification. (Cost for maintaining Internal Control System in groups also will be considered within the maximum limit of Rs.75000/- provided the cost involved for ICS is certified by a competent authority decided by the Board)

(ii) Bio-Agent units

- To set up bio-agent production units by providing financial assistance
- To be implemented with the participation of interested NGOs
- A training center for personnel who are interested to start multiplication of bio-agents
- Eligibility: Selected NGOs having land for the purpose and building to set up the unit
- Subsidy: Support to purchase equipment's and accessories and mother culture for setting up the unit at a maximum subsidy of Rs.1.30 lakhs per unit towards 50% cost

(iii) Organic cultivation of spices

- Eligibility: Growers having area upto 8 ha.
- Subsidy: Maximum of Rs.5000/- per hectare towards 12.5% of the estimated cost of production.
- Assistance for meeting cost of certification is also included in the subsidy

(iv) Support for vermicompost units

- Eligibility: Growers having area upto 8 ha.(Upto4 ha.- two units and 4 to 8 ha. three units of one ton capacity per cycle)
- Subsidy : Rs.2000/- per unit or 33.33% of the cost whichever is less for a unit with one tone output of vermicompost at a cycle

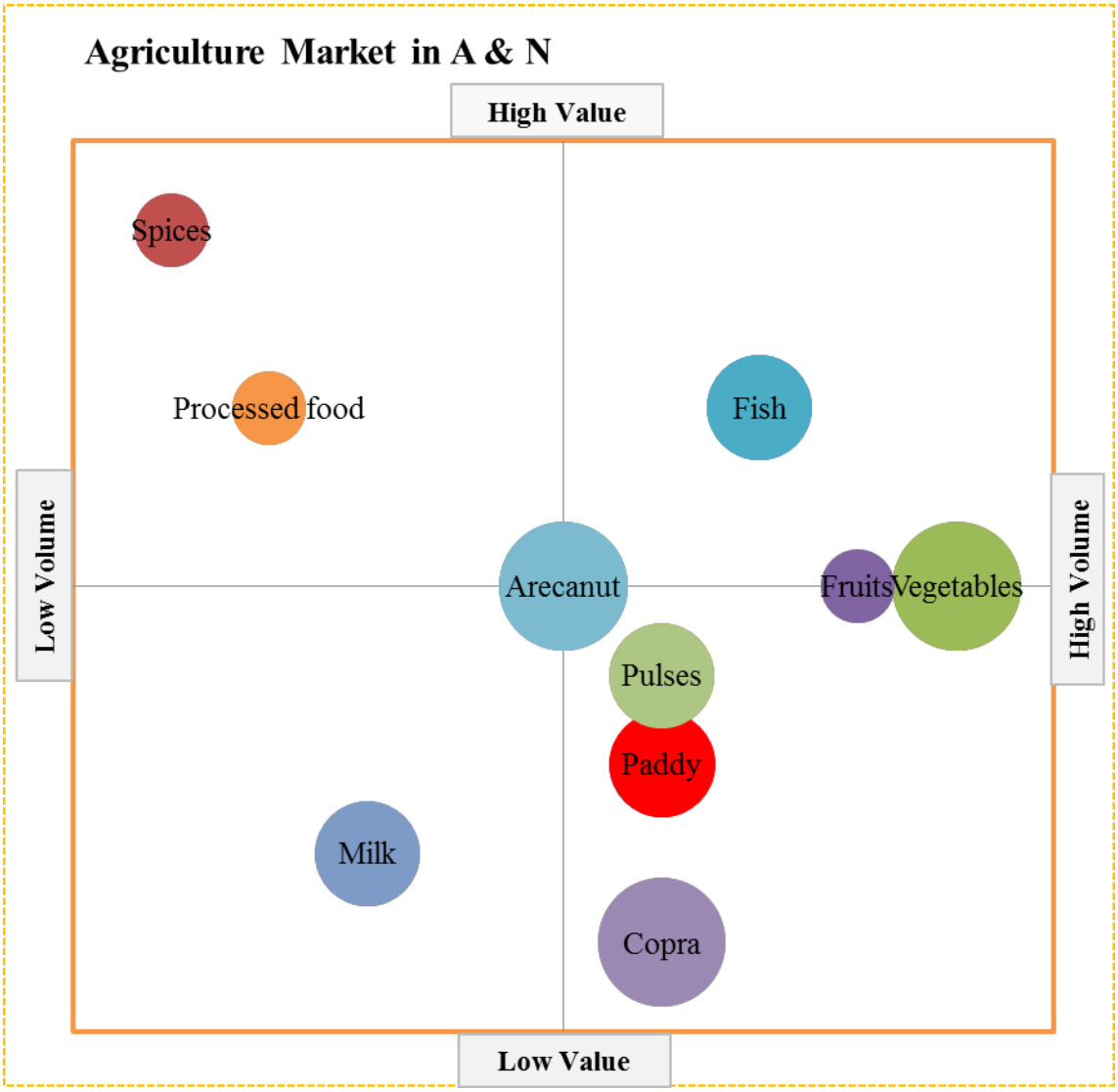
SWOT Analysis of Spices Production in Andaman & Nicobar Islands

Strengths	**Weakness**
• Low volume & high value produce • Conducive climate conditions • Direct interference of Central Government in developmental activities • Lack of private access to markets in supply of inputs – regulated supply	• Shortage in supply of quality inputs • Lack of adaptation of scientific methods of cultivation in spices • Under developed inter island transport systems for integrating product outputs to enable marketing
Opportunities	**Threats**
• Spread of Plantation Crops. Spices can be grown as an intercrop with them as an additional revenue source • Demand from mainland India • Proximity to major production hubs like Indonesia • Lesser penetration of inorganic inputs facilitating prolific spread of organic spices • Handholding and schemes offered by agencies like NABARD • Branding and labeling of island produce	• Constant or limited local demand • Data insufficiency and inaccuracy to formulate efficient plans and schemes to aid production and trade • Prone to natural disasters • Change in Government policy and gaps in implementation

Recommendations

Focus on spices to meet demands of local and Mainland market

If the agriculture and allied industry produces of Andaman & Nicobar Islands are mapped, spices and processed food will fall in the quadrant of low volume, high value produce.



This emphasizes the need to focus on increased production, processing and trade of spices from the islands. An integrated action plan reaping the benefits of schemes offered by NHM and Spice Board will substantially increase farmer's income and socio economic conditions of the island.

In spices, the global trend recommends the need to promote cultivation of spices like clove and ginger, which are currently cultivated and traded in a minor scale in the islands. Unlike the clove in the international market, the produce in islands is marketed prior to oil extraction. This is a potential area that can be explored for positioning the produce.

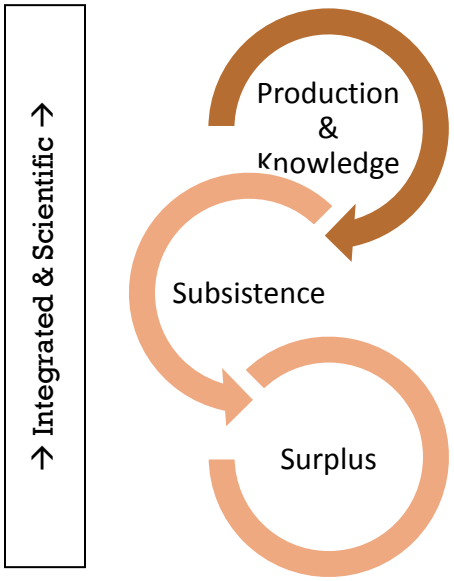
Organic certification, labeling and branding of spices

Spices are of heavy demand globally. With attainment of "Organic Zone" title, A & N islands should look forward to establishment of organic certification agencies. This will facilitate labeling and branding of the island produce and its export to different consumption points.

Country branding is a global talk of today with success stories to cite as in the case of Spain. A & N Islands can think of a brand that can help them position in the national and international market preferably in premium organic segment. Being a part of EEZ will accelerate the growth in this direction.

An Action Plan

The potential of spices cultivation is yet to be explored in A & N Islands. While adapting any new commodity in similar geography, the processes have to be sequentially well planned



Production Knowledge: The first phase of action plan requires enabling production and imparting scientific knowledge related to the crops. Extensive field work and calculated supply provisions will be essential for successful completion of this phase.

Subsistence: The second step is reaching subsistence level. Unlike the current scenario in which most spices and its processed forms are imported from mainland, the islands should aim at meeting its demand with its own supplies.

Surplus: The last and major phase will need commercially specialized production of spices, their processing and trading to mainland initially and to other nations. This will require high infrastructural investments.

Commodity: Fisheries

Content:

- Introduction
- Marine Production in the Andaman and Nicobar Islands
- Demand for marine products in the islands
- Trade of marine produce
- Areas of concern in the supply chain of fisheries in the A& N islands
- Schemes under the Directorate of Fisheries, Andaman and Nicobar Administration
- SWOT of Fisheries Industry in the A & N islands
- Recommendations

Introduction

The Union Territory of Andaman and Nicobar Islands have immense collection of natural recourses. The fishing industry supports a major portion of the economy of Andaman and Nicobar Islands.

The Andaman and Nicobar Islands have a coastal length of 1,912 Km and the Continental Shelf area of about 35,000 Sq.Km. The Exclusive Economic Zone (EEZ) around these islands is about 6,00,000 Sq.Km. forming 28% of the total EEZ area of the country.

Fishing as a commercial activity is of a relatively recent origin in the Andaman and Nicobar Islands. There is no traditional fishing community in the Islands. Fishermen from West Bengal, Andhra Pradesh, Kerala and Tamil Nadu have come to these islands either through settlement schemes of the Government, or voluntarily. In view of the potential and scope for development, Fisheries is considered as a thrust sector for the overall development of the Islands.

Composition of fish catch in the islands:

The marine catch in the Andaman and Nicobar Islands can be classified into three types:

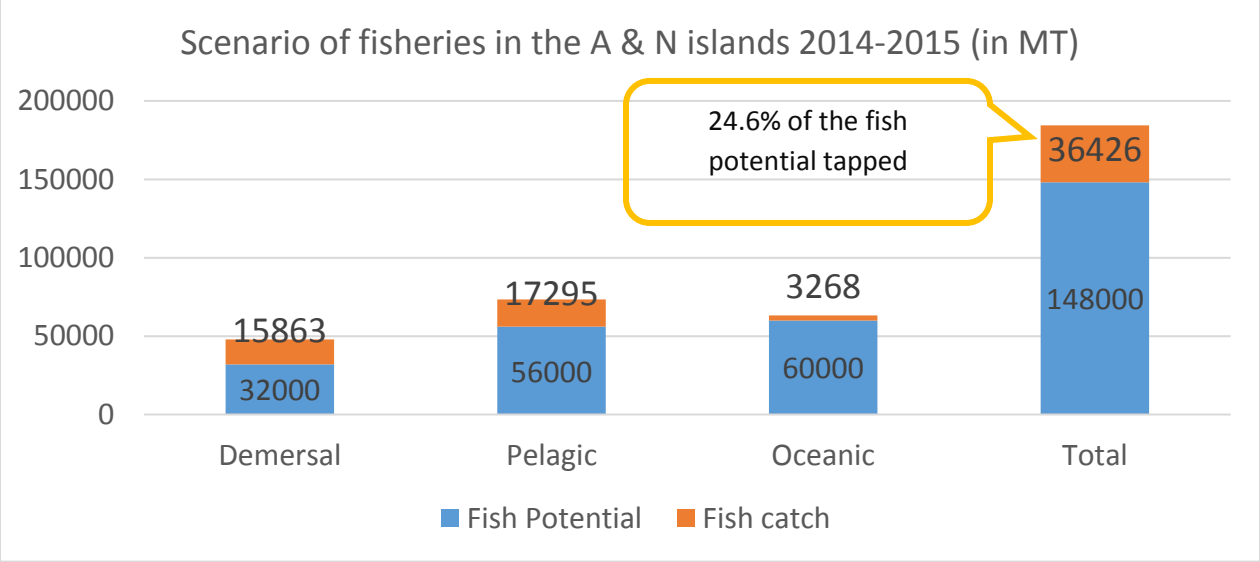
1. Pelagic
   Pelagic fish live in the pelagic zone of ocean or lake waters – being neither close to the bottom nor near the shore. Pelagic fish range in size from small coastal forage fish, such as herrings and sardines, to large apex predator oceanic fishes, such as Bluefin tuna and oceanic sharks. They are usually agile swimmers with streamlined bodies, capable of sustained cruising on long-distance migrations.
   Common pelagic fish found in the islands are anchovies, sardines, neritic tuna and mackerel.

2. Demersal
   Demersal fish live on or near the bottom of the sea. Demersal fish are found by the seafloor in coastal areas on the continental shelf, and in the open ocean they are found along the outer continental margin on the continental slope and the continental rise.
   Common demersal fish found in the islands are perches, pomfrets, cat fish, penaeid shrimps, crabs deep sea lobster and shrimps etc.

3. Oceanic
   Oceanic fish (also called Open Ocean or offshore fish) live in the waters that are not above the continental shelf. Oceanic epipelagic fish can be true residents, partial residents, or accidental residents. True residents live their entire life in the open ocean. Only a few species are true residents, such as tuna, billfish, flying fish, sauries, pilot fish and remoras, dolphin, ocean sharks and ocean sunfish. Most of these species migrate back and forth across open oceans, rarely venturing over continental shelves. Some true residents associate with drifting jellyfish or seaweeds.
   Common oceanic fish found in the islands are yellow fin tuna, skipjack tuna, big eye tuna and oceanic squids etc.

Marine production in the Andaman and Nicobar Islands

The total marine catch in the Andaman and Nicobar Islands in the year 2014-2015 is 36426 MT. The untapped potential yet lies at 148000 MT. Most of the fishing in the islands is done using trawlers. As such the deep seas lie mostly unexplored. A graphical representation is given below:



Production outlook:

As we can see from the graph depicted above roughly 25% of the fish potential is being tapped. The maximum untapped potential lies in the case of oceanic produce. The main reasons being insufficient fishing infrastructure and inadequate scientific training and skill upgradation of fishermen.

However, with better infrastructure investment and regular trainings by marine specialists will help in improving the present numbers.

The Working Group on Revaluation of Potential Marine Fisheries Resources estimated annual exploitable stock of marine fish in A&N Waters as 2.435 lakh tonnes from the EEZ of India.

Sl.No.	Name of pelagic fishes	Potential (tonnes)	Present Exploitation (tonnes)
1	Mackerel	5000	152
2	Lesser Sardines	10000	2988
3	Anchovies	1000	826
4	Carangids	1000	4571
5	Seer Fish	5000	1679

6	Pelagic Shark	1000	72
7	Coastal tunas	100000	813
8	Prawn	-	123
9	Crabs	-	552
10	Lobster	-	38
11	Others	16000	17425
	Total	**139000**	**29239**

All demersal including Perches	**22500**	**1819**
Oceanic tuna and tuna like fishes	82000	---
	243500	**31058**

From the above table, it is seen that coastal tuna has the potential for harvest up to 1.00 lakh tonnes and oceanic tuna and tuna like fishes u pto 0.82 lakh tones per annum. Tunas alone constitute 74.74% (1.82 lakh tonnes) of total potential, which remains unexploited in A&N Water. The reasons are mainly attributed to non-availability of Tuna long liners and required infrastructure for harvest. The remaining 25.26% (0.615 lakh tonnes) of the potential is only being utilized by the local fishermen.

Apart from marine produce, farmers are increasingly preferring for fresh fish cultivation. It has been seen that fresh produce often attracts better returns than marine fish. Fishermen colonies mostly in the Northern and middle Andaman have been seen farming fresh water fish in captive. The data available for fresh water fish produce is sadly limited.

Demand of marine products in the islands

The consumption for marine produce is mainly found in the local markets or in Port Blair. The major demand drivers are the tourist influx. The islands are a closed form of an economy, with a known native population (3, 80,000) and tourist inflow of approximately 3, 00,000 comprising both domestic and foreign tourists (Highest during the months from October to March). As such it is comparatively easier to form a demand mapping for the marine produce. A systematic mapping will help in resolving issues regarding supply and demand inequalities and help in proactive marketing of the produce and better realization of the marine produce by the fishermen.

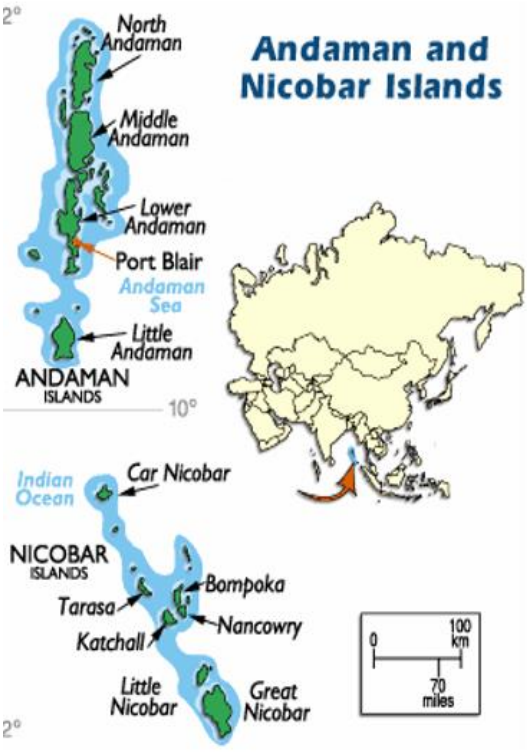
Most of the demand in the islands is for fresh marine produce. The major consumption points are the hotels, restaurants and local markets. For domestic consumption fresh produce is more preferred. A small segment of the produce is sent to the mainland. Due to limited data available on public domain, it is difficult to track the current domestic consumption of marine produce.

Trade of marine products

Andaman and Nicobar Islands is blessed with a rich marine resource albeit not optimally tapped. The markets in the Andaman and Nicobar Islands are limited with a fixed native population and mostly driven by the influx of tourists throughout the year. Therefore, the islands hold immense potential to be a significant contributor to India's marine exports. The tsunami on December 26, 2004 drastically affected the islands and caused tremendous losses amounting 34.37 crores to the fisheries sector. The industry is slowly recovering and there are bright hopes looming.

Taking a look at the location of the Andaman and Nicobar Islands in the Bay of Bengal, the islands lie on one of the major trade routes in the world. This strategic location can prove to be a boon once scientific fishing practices and organized marketing come in place.

Strategic Location of Andaman and Nicobar Islands with respect to marine trade



- India is the 2nd largest fish producer after China with an output of 9.58 million tonnes in FY 2014-2015
- It is one of the major exporters (1.05 million tonnes) worth US$ 5.57 billion to the major marine markets of the world namely US, EU and Japan.
- Popularly exported marine produce from India are frozen shrimps, fish, fresh cuttlefish, fresh squid, live items and dried items.

Port Blair lies at a distan

- 1302 km from Kolkata
- 1224 km from Vizag

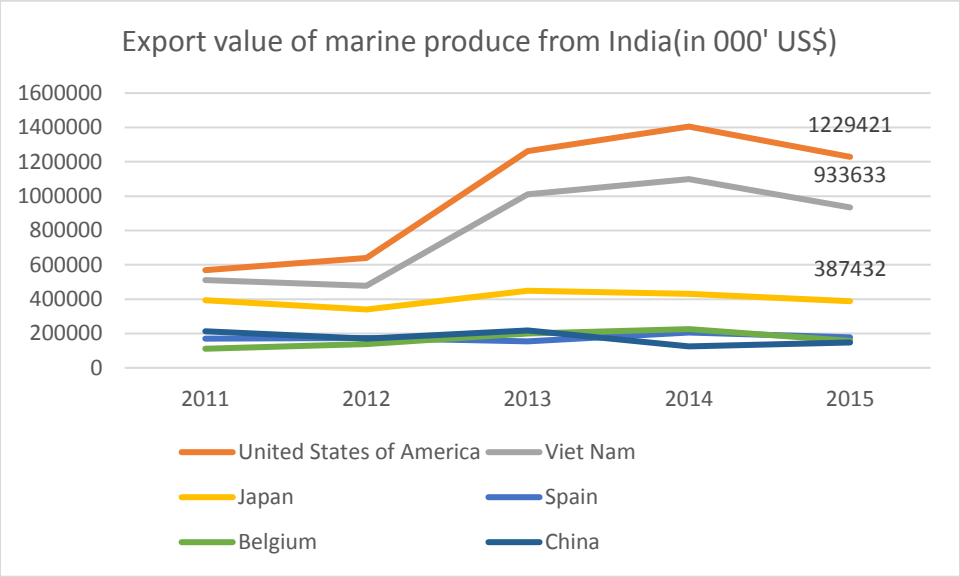
Major fish markets

Reef fishes are one of the important resources of Andaman and Nicobar Islands. At present some entrepreneurs are dealing in the post-harvest processing, packing and export of reef

fishes, shrimps and lobsters in frozen form as registered 100% EOUs from Andaman and Nicobar Islands. A dozen private traders are also engaged in procurement and dispatch of high value items in chilled form such as lobsters, shrimps and groupers beside crabs in live form to mainland. Similarly, some traders are engaged in procurement of shark flesh and shark fins and transport to mainland. 3 entrepreneurs have been given Letter of Permission (LOP) for capture and export of live groupers.

India's exports represent 4.6% of world exports for marine products thereby making it the fourth largest in the world for fish and crustaceans, molluscs and other aquatic invertebrates. The United States of America (1.2 billion US$), Vietnam (0.9 billion US$) and Japan (0.3 billion US$) are our largest import partners in 2015. A graphical representation is given below:

(HS Code 03: Fish and crustaceans, molluscs and other aquatic invertebrates)



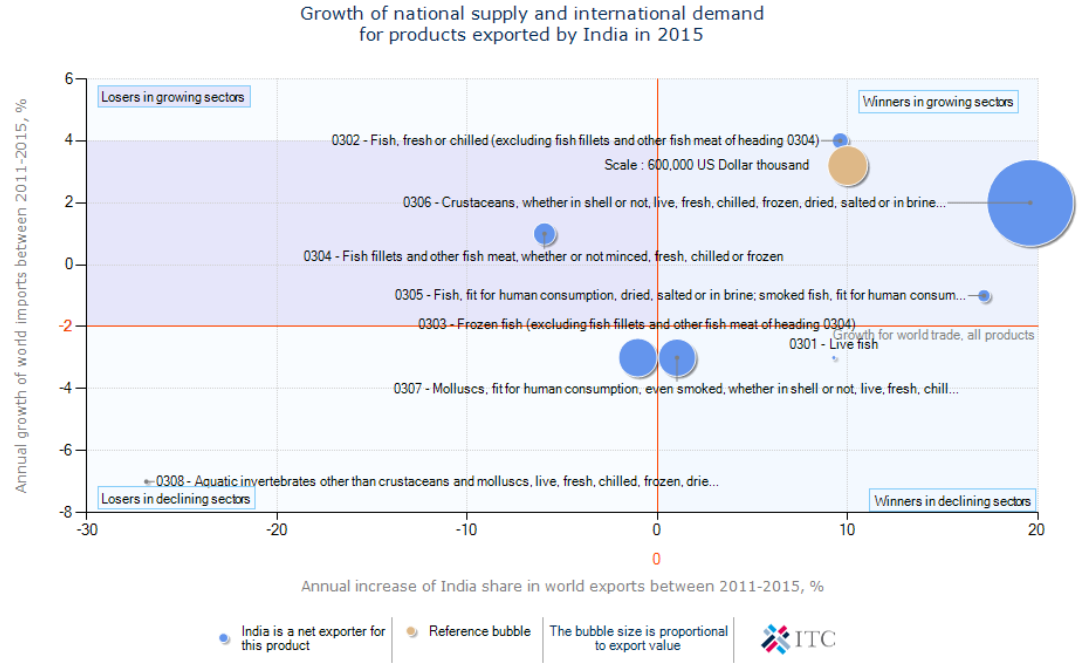
- 500 MT fish exported to mainland India
- 1500 MT catch is exported to SE Asian countries from mainland India

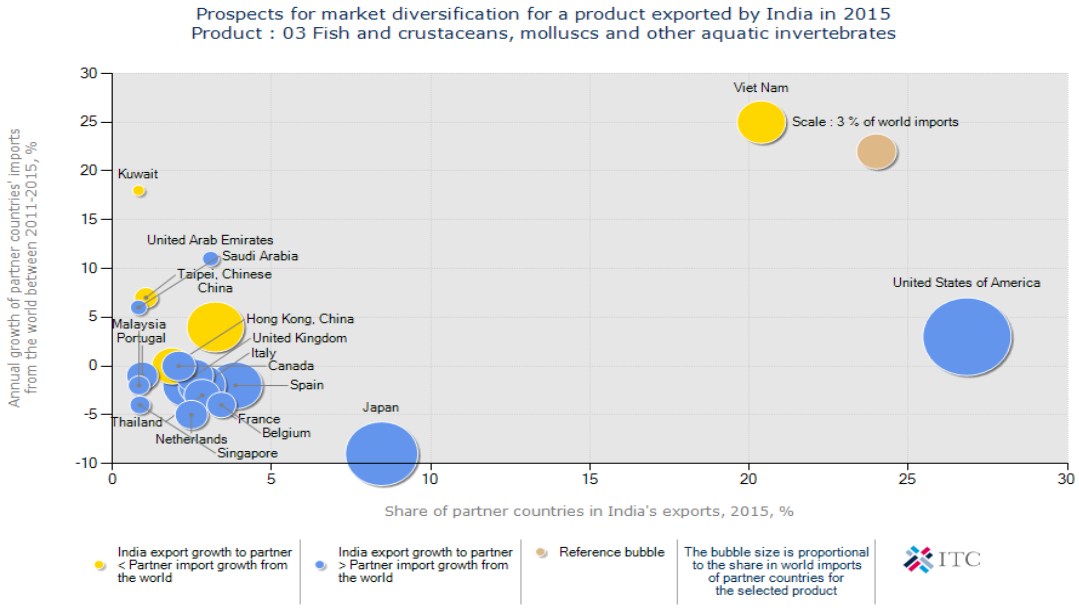
Trade outlook:

With a vast marine produce potential lying untapped, Andaman and Nicobar Islands can significantly contribute to the marine exports from India. Also, three of the countries among the top 6 importers of India's marine exports lie on the same trade route as the islands giving India an edge in marine exports.

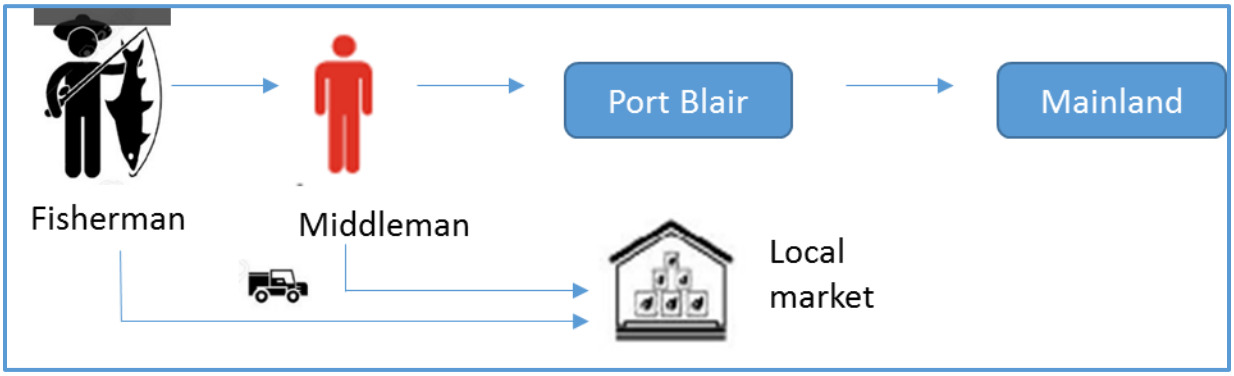
With sufficient fishing infrastructure, modern export oriented processing facilities and favorable trade locations, the Andaman and Nicobar Islands can become a shining hub for fishing industry and trade. Till the time suitable infrastructure comes up, the fish produce can be processed in the nearest sea ports in the mainland to Port Blair. The table given below provides an estimate of the fish handling centres at the nearest ports.

Major fish markets connected to Port Blair	Fresh/Chilled Fish Handling Centres		Live Fish Handling Centres		Dried/Salted Fish Handling Centres	
	Number	Capacity(MT)	Number	Volume(m^3)	Number	Capacity(MT)
Kolkata	12	67.50	9	600.66	9	44.44
Vizag	3	38.60	-	-	8	280.13
Chennai	8	27	10	175.83	17	55.70





Areas of concern in the supply chain of fisheries in the A & N islands



High Expenditure incurred by the fishermen • Transport • Fish feed • Labour • Diesel • Ice blocks	1. **Accessibility to Cold storage** facilities 2. Lack of **waste management** mechanisms 3. **Cool chain** for longer shelf life	1. Lack of **scientific methods** of fishing 2. No **auctions** are held 3. Irregular **inter-island shipping** services	• **Limited processing** of fish • Need for **supply and demand mapping** for fisheries. • Limited utilization of **subsidies**

The islands have an unorganized system of fish marketing and a lack of systematic supply and demand mapping. This leads to frequent imbalances in the market leading to stock-outs or unsold wasted produce. Most of the fish is consumed in the local markets in the islands. There are also few traders who aggregate fish and other marine produce from smaller islands and transport it to Port Blair which is the most populated and busiest market in the Andaman and Nicobar Islands.

Most of the fishermen remained unaware of the subsidies and schemes and complained of high input expenditure incurred by them for their daily catch. The markets are in a very rudimentary stage and lack usage of electronic weighing machines. A proper waste disposal mechanism was also lacking for the fish markets.

For every day's unsold produce, farmers stored their produce at the nearest cold storage or kept it in ice boxes. The cold storages require further upgradation and standardization according to the kind of produce being stored. The usual temperature maintained is 9-10 degree Celsius. But fish like heavy tuna require a temperature of atleast 6 degree Celsius to facilitate core freezing.

There was limited processing for fish going on in the islands. Farmers only resorted to dry fish making when they knew that the particular stock would not get a fair price.

Schemes under the Directorate of Fisheries, Andaman and Niocbar Administration

UT Plan Schemes

- Creation of infrastructure facilities
- Development of capture & culture fisheries & Resource Management.
- Human Resource Development, Extension in Fisheries & Welfare of Fishermen Families.
- Modernization / upgradation of fisheries Museum.
- Strengthening and Re-organization of Fisheries Department.

UT Plan Programmes

- Subsidy for construction of mechanized boats to fishers/ fisheries coop. societies/ entrepreneurs.
- Financial assistance to fish farmers for renovation of ponds for fresh water fish culture.
- Subsidy to Fishermen/ Coop. Societies/ Co-operative federation for purchase of fish transport vehicle/ tricycle.
- Subsidy for purchase of Navigational Aids.
- Organizing training and extension programme for the uplift of fishermen/ fish farmers/ private entrepreneurs.
- Sponsoring of progressive fish farmers/ fishermen for study tour to mainland.

Centrally Sponsored Schemes.

- Motorization of traditional fishing craft.
- Group Accident Insurance Scheme.

Centrally Sponsored Programmes.

- Subsidy @ 50% subject to a maximum of Rs. 30,000/- to fishers for purchase of inboard engine/ outboard engine not more than 30BHP.
- Insurance coverage for all licensed fishermen under Centrally Sponsored Group Accident Insurance Scheme.

Rashtriya Krishi Vikas Yojana (RKVY)

- Purchase of Deep Freezer for fishers.
- Purchase of Insulated Ice Boxes to fishers.
- Construction/ procurement of Deep Sea Fishing Vessels.
- Setting up of Ice Plant & Cold Storage
- Setting up modern fish retail outlet.
- Purchase / construction of intermediary mechanized fishing craft.
- Purchase of fresh water fish harvesting net.
- Construction of Nursery ponds and purchase of breeding materials for freshwater fish seed production.

Rashtriya Krishi Vikas Yojana Programmes

- Subsidy @ 50% subject to a maximum of Rs. 20,000/- for purchase of deep freezer to fishers.
- Subsidy @ 50% subject to a maximum of Rs. 10,000/- for purchase of Insulated Ice Boxes to fishers.
- Subsidy @ 25% subject to a maximum of Rs.25.00 lakh / vessel for construction/ procurement of Deep Sea Fishing Vessels.
- 25% subsidy for setting up of Ice Plant & Cold Storage.
- Subsidy @ 50% subject to maximum Rs.1.00 lakh for setting up modern fish retail outlet.
- Subsidy @ 50% subject to maximum Rs.7.50 lakh purchase / construction of intermediary mechanized fishing craft of not less than 10 mtrs OAL for individual/ fishers.
- Subsidy @ 50% for purchase of fresh water fish harvesting net.
- Subsidy @ 50% for Construction of Nursery ponds and purchase of breeding materials for freshwater fish seed production.

SWOT of Fisheries industry in Andaman & Nicobar Islands

Strengths	Weakness
• 30% of India's EEZ • High value produce such as shrimps, prawns and tuna are abundantly present. • A healthy number of fishing colonies present here. • Initial handholding by NFDB in the form of schemes • Relatively unpolluted coastal waters for developing coastal aquaculture	• Lack of state of the art fishing vessels, harbor facilities and ancillary requirements • Lack of modern fish marketing and processing facilities • Lack of regular training and extension • Limited data available to monitor the status of fisheries in the islands • Poor maintenance of cold storages and poor accessibility to them • Erratic inter-island transportation systems • Lack of a comprehensive government policy regarding profitable and sustainable fishing
Opportunities	**Threats**
• The islands lie on one of the most important trade routes in the world • Fresh water fish farming holds high promise • A modernized processing facility which provides a boat to fork supply chain solution (Feasibility Study may be conducted) • Increasing encouragement from government to boost agri-related exports • High potential lies in oceanic fish, with total untapped potential being 70-80% • High attraction for tourist inflow due to fresh sea food and game fishing • Upcoming plan of a dry dock and ship repair industry at Port Blair • Upcoming plan of transshipment hub at Campbell Bay	• Natural disasters • Change in government policies and schemes

Recommendations

Development of modern wholesale and retail market under schemes from NFDB

Fish complex would be constructed at the identified places with facilities like loading and unloading facilities, retail stalls, electronic weighing machines, aquarium shops, ice plants and a cold storage unit. Apart from these, other facilities like marketing information centers with digital display boards, offices for fish traders and dormitories for fishermen could be provided. An efficient waste disposal mechanism can be developed and can be used for making fish compost by a tie-up with the Agriculture Department which can be supplied to farmers.

Such a well formed and systematic infrastructure would ensure economies of scale, timely availability of cold storages, centralized supply and demand mapping and thereby facilitating easy marketing of fish. Fishermen and traders arriving from nearby islands also can take advantage of a centralized fish market. Once such scale is achieved, auctions can be brought in place to ensure fair pricing of the marine produce. A modern fish market would also benefit institutional buyers such as hotels, caterers or hostel or army canteen.

Skill enhancement and regular training of fishermen with a commercial objective

The fishermen community in the Andaman and Nicobar Islands use traditional methods of fishing. As a result, a large quantum of pelagic and oceanic fishes lie untapped inspite of the huge potential. Regular training on scientific fishing by expert personnel will help in updating the fishermen's knowledge and skills. Currently CIARI, Port Blair is conducting training sessions for fishermen. But the reach is limited. An extensive and more inclusive training schedule would deem to be useful for the fishermen. Training programmes (short courses, intensive courses, training at field and summer and winter schools with different time duration) are also conducted by Central Marine Fisheries Research Institute and Central Institute of Fisheries Nautical and Engineering Training.

Development of a cold chain for EOU (Export oriented unit) marine produce

"Frozen" refers to products (e.g. Ice cream, butter, fish and meat products) which are required to be stored at extreme cold ambient, at below -18-degree C. The food products are output from processing factories and IQF/blast freezers can be used to achieve rapid freezing or a crystallization stage of the product. Deep freezing protects from natural microbial and enzymatic activities. Equipment for blast freezing or IQF is part of a production facility. There are a number of products which are so processed and kept in deep frozen state for preservation purposes. Cold-chain comes into use on final dispatch of finished product to market.

In case of deep frozen meats and fish products, including frozen processed foods, the inventory is preferably moved to retail cabinets (deep freezers) and the cold storage (Hub) spaces come into use to buffer such movement - on exiting the processing plant, reefer transport is a core necessity.

Promotion of dry fish

The largest dry fish market of Asia is situated at Jagiroad in Marigaon District of Assam. Dry fish from this market are also exported to Southeast Asian countries like Singapore, Malaysia etc. As the south east Asian countries are a potential destination for dry fish marketing, dry fish can be a potential source of trade for the islands. The strategic location proves to be a boon for the scenario.

Andaman and Nicobar Islands are located in the Tropical Zone barely 11.7-degree north of the Equator thus receiving ample sunshine and therefore conducive for dry fish manufacturing.

Fish Processing Plant at Port Blair

A unique, integrated fish supply chain unit guarded by the concept of Boat to fork concept set up in Port Blair, will be a perfect enhancer for faciliting export of marine produce. The processing unit can be set in conjunction with the modern wholesale/retail market.

Tuna comprising almost 44% of the present catch in the islands seems to be a preferred fish for processing. Tuna fish commands high demand throughout the world. Canned Tuna and sashimi grades are most preferred and imported by the two largest fish markets USA and Japan.

A sustainable Tuna processing plant can be set up-wherein automated canning will be done to ensure efficiency and quality borrowing from Iceland's example of fisheries industry. The plant can be set up through a joint venture of Andaman Government or solely by the private partner.

With an upcoming dry dock and ship repair facility at Port Blair and a transshipment hub at Campbell Bay according to the present government's strategic plan, such a unique value proposition would prove to be a boon for marine trade and earn brownie points for India.

Commodity: Milk

Content:

- Current Scenario
- Existing Supply Chain of Milk in Andaman & Nicobar Islands
- SWOT of Milk Industry
- Schemes under the Department of Animal Husbandry Dairying & Fisheries Govt. Of India
- Areas of concern in the supply chain of Milk in the A& N islands
- Recommendation

Current Scenario

ANIIDCO

The Dairy Division of ANIIDCO takes care of the dairy business in Andaman and Nicobar Islands. They are currently undertake these following activities.

- Procures average 4000 Liters milk per day through four collection centers.
- Those centers are located at different parts of the Islands. One collection centers at each place present at Port Blair, Neil Island(South Andaman), Kadamtalla, Mohanpur(Middle Andaman) and Diglipur (North Andaman)
- The average quality of milk is 3.4% fat and 7.5% SNF and price paid to the milk producers is Rs40 / - per liter.
- The Dairy plant process about 6000 LPD (liters per day) including 2000 LDP reconstituted milk.
- 5000 LPD milk is packed for city supply and 1000 LPD milk is used for manufacturing and packaging of curd , paneer, butter milk
- 2000 LPD of toned milk and 3000 LPD of cow milk is marketed under ANIIDCO brand in Port Blair city. It also markets 700 LPD curd and 30 KgPD Paneer
- Deficiency of fat and CNF are being met from skim milk and whole milk powder purchased from other cooperative dairies
- The ANIIDCO incurring huge loss on account of transportation cost, operational cost, marketing cost, corporate overheads.

Milk Producers

Most of the milk producers are present across the North Andaman. The producer's sells their milk by two means and one is door to door selling and other is they sell to ANIIDCO.

In Door to door selling the producers sells their milk directly to consumer by going near to them. They are getting Rs 55/- per litter. And here the chance to adulteration is high and up to certain extent they are doing.

While they are selling to ANIIDCO they are getting Rs 40/- per liter. Here they cannot do adulteration

Existing supply chains of Milk in Andaman and Nicobar Islands

BMC- Bulk Milk Cooler

SWOT of Milk industry in Andaman & Nicobar Islands

Strength	**Weakness**
There is no strong competitors for milk procurements and marketing. Payment to milk producers deposited directly in their bank account	Total milk production is less Milk productions areas are scatters due to geographical conditions No institutional structures for procurement of milk Non availability of professionals to manage dairy operations Long distance and poor condition of road increases the transportation cost
Opportunity	**Threats**
Availability of uncovered potential area Possibility for collection of milk twice in a day	Consumer preference to use dry milk or long shelf life dairy products Due to less urban population , limited requirement of dairy products which results in increase unit cost Cost of imported materials is comparatively high

Schemes under the Department of Animal Husbandry, Dairying & Fisheries Govt. Of India

Rashtriya Gokul Mission

Objectives:

The Rashtriya Gokul Mission is being implemented with the objectives of:

- Development and conservation of indigenous breeds
- Breed improvement programme for indigenous cattle breeds to improve their genetic makeup and increase the stock;
- Enhancement of milk production and productivity;
- Upgradation of nondescript cattle using elite indigenous breeds like Gir, Sahiwal, Rathi, Deoni, Tharparkar, Red Sindhi
- Distribution of disease free high genetic merit bulls for natural service.

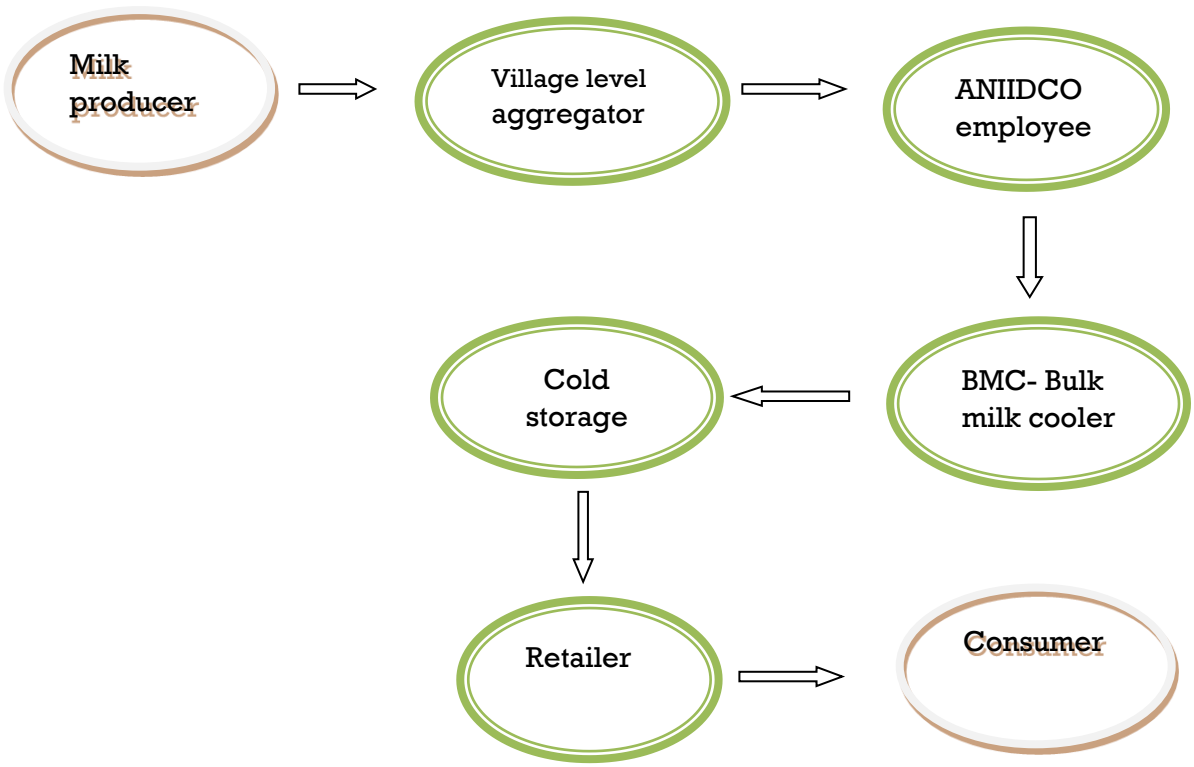
Areas of concern in the supply chain of Milk in the A& N islands

- Lack of interest of farmers in delivering the milk to collection centers(ANIIDCO)
- Exorbitant transportation charges incurred in collecting the milk from farmers
- Procurement price by ANIIDCO
- Electricity problem
- 70-80% of the offspring are male
- Unavailability of dry fodder (maize, jowar, bajra)
- Unavailability of organized data

Recommendations

- Augmentation of BMC capacity and keeping it in a centralized place to encourage farmers in delivering the milk
- Purchase price from farmers should be increased to get good quantity and quality
- Other supports like feed(urea molasses block) and consulting regarding cattle rearing should be provided
- Solar panels should be installed to rectify the electricity problem
- Milk collection should be done twice per day
- Milk may be collected through common milk collection centers , preferably one in two villages . It will reduce the transportation cost and enhance the efficiency
- Increase the number of female in offspring, government must plan for semen which results into female as of now there is 80% of the offspring are male.
- Increase the volume of milk from 6000 LPD to 10000 LPD , it will reduce the operational cost
- Training for the producers should be arranged because to spread awareness of rearing and technical aspects
- Financial and advisory support should be given to encourage the producers
- Emphasis may be given to enroll more and more women employee
- Computer based data management system should be installed
- Adulteration Kit should be used while collecting milk from the producers to grade the quality of milk
- Distributer's and retailer's details should be maintained regularly
- Instead of own insulated vehicle they can use hired vehicle to reduce the transportation cost

Recommended Supply chain for milk



Commodity: Fruits and Vegetables

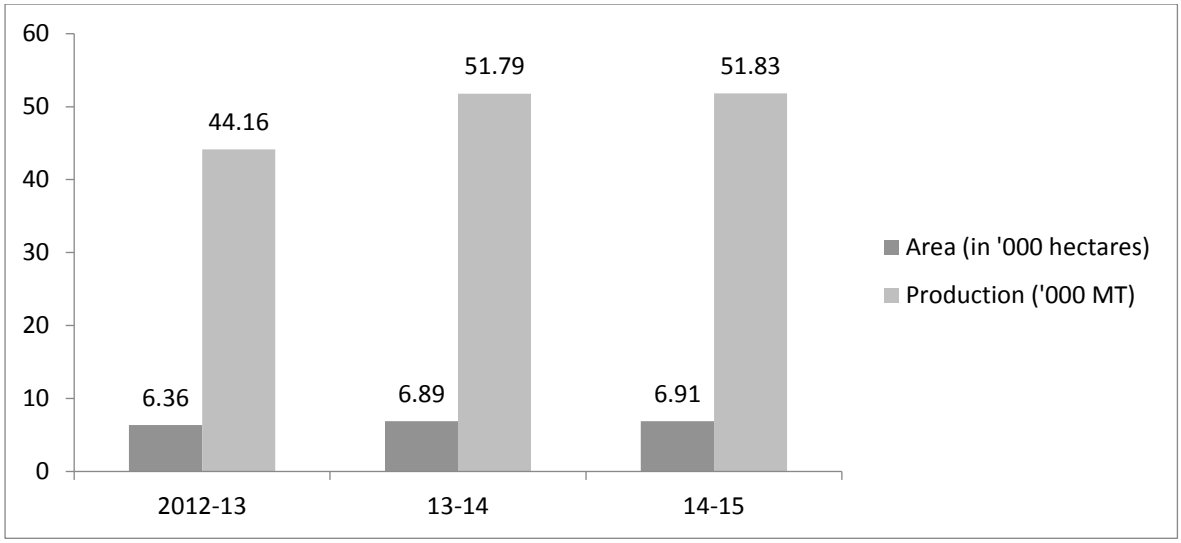
Content:

- Introduction
- Three level network
- Payment and Charges
- Area of concern in supply chain
- Recommendation

Introduction

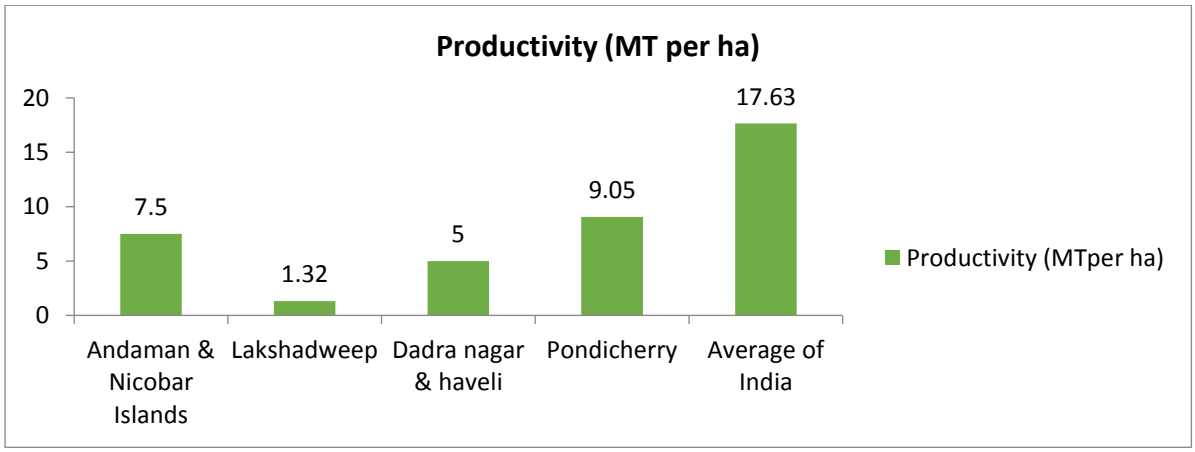
In Andaman and Nicobar Island about 60% of vegetable is lost in supply chain from the farmer to final consumer. Consumer ends up paying 50% more than what they could be paying if the supply chain was improved, because of wastage, as well as multiple margins in the current supply chain structure. Farmer share in costumer rupee is nearly about 66.6%. Major vegetable grown in the island are Bhindi ,Cowpea, Bitter gourd , Brinjal , Chilli , Pumpkin, Tomato , Cucumber, Little gourd, Marsa, Radish, Poi, Bottle gourd, Snake gourd, Ridge gourd, Spinach, Ash gourd, Drumstick, Musk melon, Cauliflower, Cabbage, Knol kohl.

The cultivated land area on the islands has increased from 6.36 thousand ha in 2012-13 to 6.91 thousand ha in 2014-15 (8.7% increase). The increase in production has been of 7.67 thousand MT (17.3%) from 2012-13 to 2014-15, indicating that productivity is increasing at a good pace



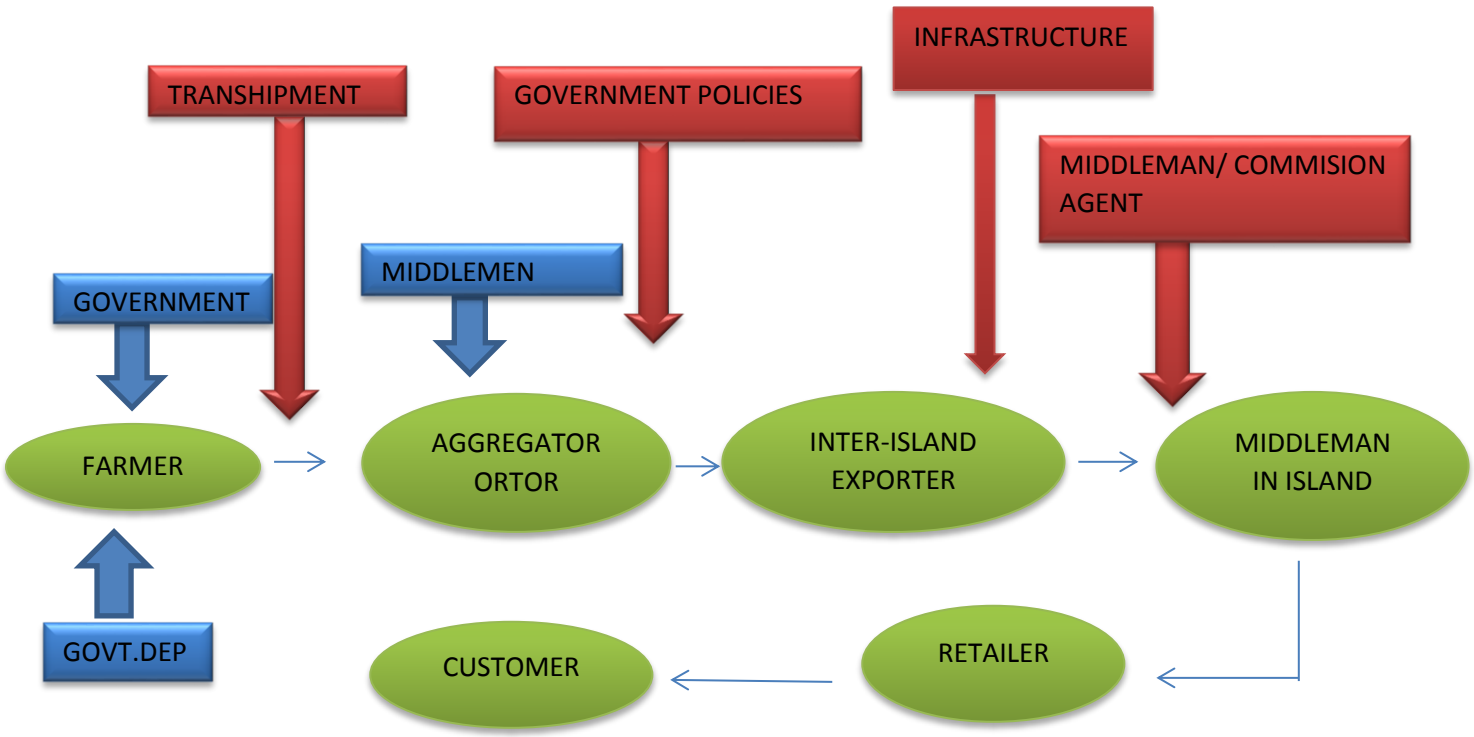
Source : Horticulture Statistics Division, DAC&FW.

Further, if we look at the productivity, the islands have a productivity of 7.5 MT/ha which is above other UTs such as Lakshadweep and Dadra & Nagar Haveli. However, when compared to the average productivity of India (17.6 MT/ha) it can be seen that there is a lot of scope to increase the productivity.



Source : Horticulture Statistics Division,

Three level Network



A. Core Process – It involves farmer, aggregator, inter-island exporter, middlemen, retailer and government.

B. Partner Network- It involves Government department and middlemen. Government department help farmers in terms of availability of seed, fertiliser, organic manures, etc. Government procure these seed and fertiliser on the basis of tender. Lowest tender offered gets the order. In this process many a time quality of seed and fertiliser get compromised. Middlemen procure vegetable from farmer at farm- gate and sell it further.

C. External influence- Government policies, infrastructure, transhipment regulation & Commission agents influence production and cost respectively.

PAYMENT AND CHARGES

Farmer → **Middlemen** → **PMB** → **Cargo**

Farmer	Middlemen	PMB	Cargo
@40/Kg	25 loading/peti and 25 unloading/peti	25/peti	150/peti

1peti=50 kg

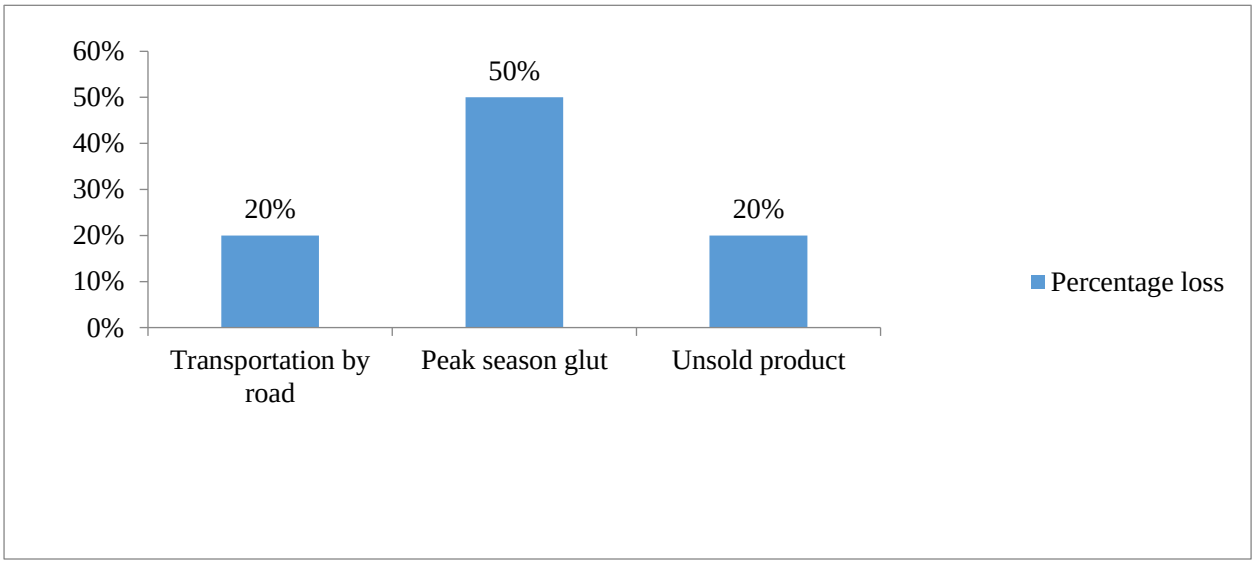
Total expenditure on transportation for 50 kg=250 (4.5/kg)

Selling price at retail point= 60 per Kg

Area of concern in supply chain

North Andaman

- Cold chain is not properly developed
- Huge loss
- No specialised ferry for transportation and road is very poorly developed
- Lack of functional cold storage



South Andaman

- Availability of quality seed and organic manure at proper time
- Farmer don't get place in market to sell their product
- Road is not well developed

Hut bay, Netaji Nagar, Rkpur & VK pur

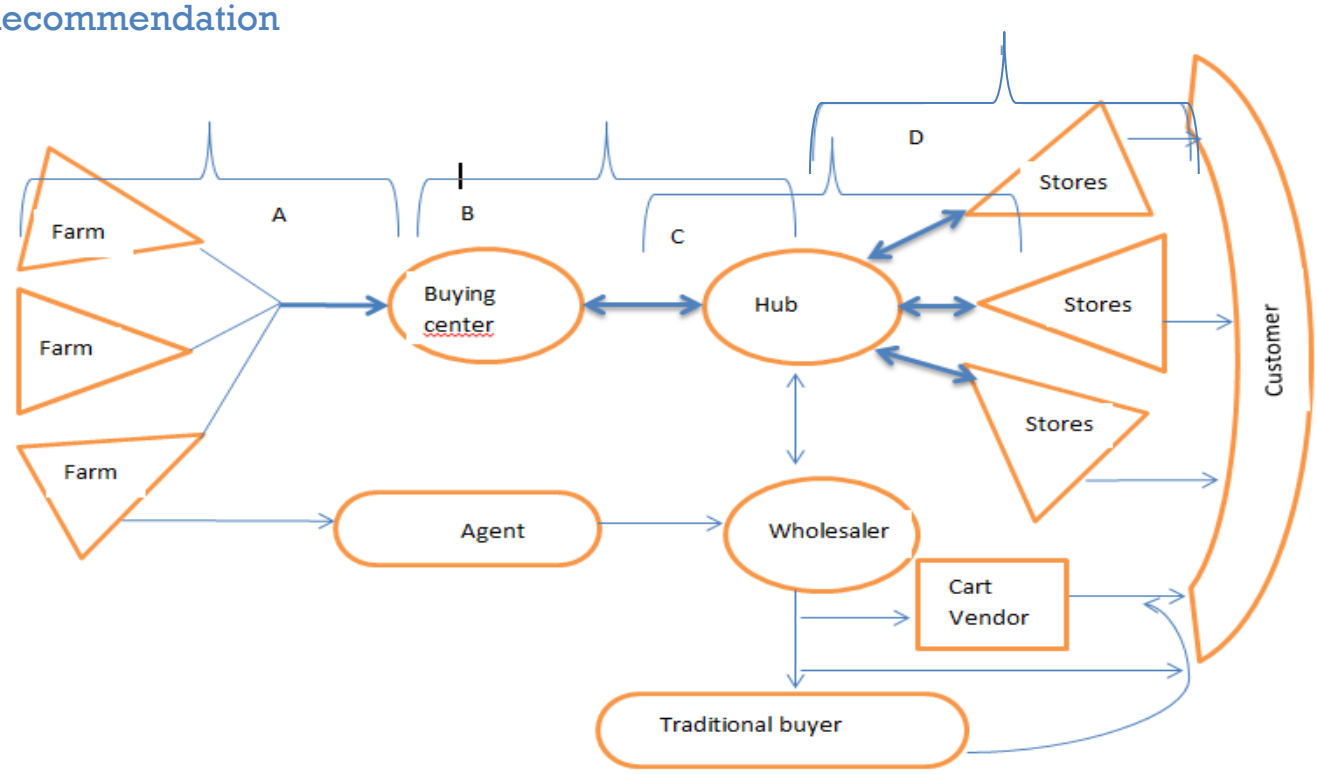
- Unavailability of Cargo ship
- No functional cold storage
- Stray cow is big problem
- Farmer field is poorly developed and have no drainage facility

Campbell Bay & Kamota

- Speed boat not available
- Monkeys pose great threat to vegetable production

Region	Crucial observation
North Andaman	Loss during transportation is very high
	Cold chain is not properly developed
South Andaman	Non-availability of Road connectivity (Badmash pahar,Lal pahar) Non-Availability of seed, fertiliser at right time and of right quality, Market place for farmer
Hutbay	Non-availability of ship for inter-island transportation
Campbell Bay	Speed boat should be immediately provided

Recommendation



Hub and Spoke Model

North Andaman

- Special ferry twice a week
- Vegetable carriage
- Transportation by road need specialised vehicle having refrigeration facility
- Cold storage should be made operational

Little Andaman, Campbell & Kamorta

- Ferry and speed boat is required
- Farmer should be encouraged to "Farmer producer group" and sell their product
- Speed boat should be provided

South Andaman

- Quality Seed and fertiliser should be available to farmer at right time
- Farmer are not well connected by road in Wandoor, Badmash pahar,Lalpahar
- Farmers should get FARMER MARKET to sell their product(Junglighat and Neil Island, Diglipur)
- In Neil island Market place provided by farmer is not efficient
- Infrastructure at market yard is poorly developed and need immediate action
- Existing SHG in Neil island should be trained to take up processing activity

CONCLUSION

Andaman & Nicobar being a group of Islands completely cut off from the main land has many challenges and opportunities that need an entirely new approach to deal with. Of all the agricultural commodities produced in the islands coconut and fishes have huge potential to be sold and exported in the international market which could lead to greater revenue generation for the entire islands but needs the entry of many buyers that would create a sustainable environment for higher production in the entire islands. For Cereals and Pulses the population is still dependent on import from mainland to meet the required demand of the entire Islands. Thus the current focus of the Government needs to be on being self-sufficient on these two crops by promoting production and preventing the post-harvest losses to enable the farmers a better price realization for their produce. Modernization in post-harvest Management is the need of the hour for the entire Islands to be self-sufficient. Spices as a commodity has high earning potential but the current low production prevents it being from being a major cash earning crop. So the Government needs to raise the awareness among farmers about the high potential of these crops and could export it in a huge scale to mainland as well as International Markets. Promotion of Dairy Framing among farmers by raising awareness about integrated nutrition for cattle is a step that could lead to increase in milk production in the Islands.

The Islands pose a huge scope for Agriculture and allied sectors but currently requires the coordination of all departments of the Government to work holistically for the development of the farmers and as a whole for the entire Islands.