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Agri-business Potentiality in Arecanut Processing: A Study in the North Bengal Districts of West Bengal

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Abstract

The study explore the agribusiness opportunity and employment pattern of green Arecanut processing based on primary data created from 215 processing plants from Jalpaiguri and 100 processing plants from Cooch Behar districts of West Bengal. Both Participatory Rural Appraisal (PRA) and survey methods were adopted to elicit information. It revealed that most of the processing plants were run by the owners' of the land either as sole processor or in partnership. In later case usually the educated rural youths took part in joint venture by providing land and sharing finance with well experienced working counterpart. About two-third of plants remain under single ownership indicating participation and predominance of marginal processor. About 23.26% of plants in Jalpaiguri stand on leased land providing commercial expansion of the business. The highest volume of business is mainly concentrated in February to March due to availability of raw materials and the demand of processed grade item like 'Tipni', 'Sagar' and 'Rota'. Average annual employment generated from a optimum size plant operating average 625 qtls of green nut per season was found 914 mandays of which 28.80% were female. Among the different operations, highest mandays (34.54%) was required for sun drying followed by de-husking (16.79%) and preparation of Tipni grade (10.10%) and for establishing the said plant initial average fixed investment was ₹ 79270.00 which requires the attention to understand on scale of finance. The said agribusiness may be taken as a policy option for the generation of income and employment in particularly in group approach.

Keywords: Green arecanut, employment, investment, ownership, processing, tipni, rota, sagar

Arecanut *(Areca catechu Linn.)* is an important commercial plantation crops in the states of West Bengal and Assam. It also called as "Betel nut" or "Supari". Arecanut is mostly grown in Northern part of West Bengal, Assam and Southern parts of Kerala under rainfed conditions. Arecanut kernel obtained from the fruit is chewed both as raw nut or processed form. Fully ripe arecanut is generally used by the consumers of Assam, Kerala and Northern parts of West Bengal. The processed green arecanut in different forms is favoured in Rajasthan, Karnataka and Tamil Nadu. The states of Kerala, Karnataka and Assam where arecanut is grown extensively together accounts for about 93 % of the total area under arecanut in India. To smaller extent, it is also grown in Maharashtra, Tamil Nadu, West Bengal and Tripura (Anonymous, 2008-09). In West Bengal, 47.66% of the total arecanut area is in North Bengal, accounts for 45.93% of the total arecanut production. In two districts of North Bengal viz., Cooch Behar and Jalpaiguri occupies 89.94% of the total Arecanut area of North Bengal and 89.37% of the total Arecanut production of North Bengal.

Processing of Arecanut in North Bengal is a traditional occupation. Grading is not usually done by growers, however, the wholesalers grade the produce but not on any scientific basis. Grading is done on the

basis of size, colour and quality (Bhale Rao *et.al.* 1986). On an average, each acre of arecanut employs around 250 human days for cultivation and another 200 human days for processing annually (Mallikarjuniaha and Prakash, 1988). The problems associated with the Arecanut processing are numerous, like non-availability of the required quality of the green Arecanut, low returns from different processing grade, improper marketing facilities, lack of availability of institutional finance etc.

Import of processed grade Arecanut from neighbour countries, created a major problem for the processing units of Arecanut in those areas due to low price of foreign processed grades of Arecanut. Processing units of Arecanut created employment facilities in the rural areas particularly for employment in female and child labours during their leisure time. Arecanut processing is an important operation to make it available to the consumers in various processed forms. Therefore, it is important task to know the different processing stages and the cost involved in each stage. The specific objectives of the study are (1) to classify different processing units according to their volume of business, (2) to study the ownership pattern of processing plants and (3) to study the nature of investment and employment opportunity.

Database and Methodology

The processing of green arecanut in West Bengal is primarily concentrated to two Northern districts of West Bengal viz., Jalpaiguri and Cooch Behar. The study has been conducted based on primary data collected from 215 processing plants from Jalpaiguri and 100 processing plants from Cooch Behar districts of West Bengal. Both Participatory Rural Appraisal (PRA) and survey methods were adopted to elicit information with the different aspects of processing plants. A structured survey schedule was used for collecting different information from the respondents. The primary data

Table 1: Distribution of arecanut processing units in the study areas of West Bengal for the crop season 2013-14

Sl. No.	Name of the Business cluster	No. of Processing Units
Jalpaiguri		
1	Dhupguri	35 (16.27)
2	Maynaguri	15 (6.97)
3	Belakoba	10 (4.65)
4	Madarihat	24 (11.16)
5	Falakata	55 (25.58)
6	Kamakhaguri	65 (30.23)
7	Jateswar	4 (1.86)
8	Hamiltan	7 (3.25)
Total		**215 (100.00)**
Cooch Behar		
1	Dinhata Sadar	15 (53.57)
2	Choudhurihat	5 (17.85)
3	Premerdanga	3 (10.71)
4	Nishiganj	5 (17.85)
Total		**28 (100.00)**

Source: As reported by the different owners of the processing plants

Figure in the parentheses indicate percentage of respective totals

Table 2: Distribution of market arrival of green arecanut for sample processing unit in West Bengal (per annum) for the crop season 2013-14

Sl. No.	Name of the months	Cooch Behar		Jalpaiguri	
		Amount (Qt.)	% share	Amount (Qt.)	% share
1	November	435	14.19	459	13.43
2	December	499	16.28	493	14.42
3	January	593	19.34	603	17.64
4	February	636	20.74	673	19.69
5	March	647	21.10	758	22.18
6	Middle of April	258	8.41	290	8.48
Total		**3066**	**100.00**	**3274**	**100.00**

Figure in the parentheses indicate percentage of respective totals

obtained related to Financial Year 2013-2014. The data were analyzed with the help of simple statistical tools like average and percentage etc. Simple tabular method is used for interpretation of results.

Results and Discussions

Table 1 presents the distribution of arecanut processing plants in the study areas of West Bengal. A perusal of the above table shows that most of the Arecanut processing units have been established in Jalpaiguri district in the blocks, viz. Kamakhaguri (30.23 %), Falakata (25-58 %) and Dhupguri (16.27 %) and Madarihat (11.16 %). The reason is that green arecanut enter into these blocks from the farmers of foothills of the Bhutan and Doars areas. The table1 also indicate that in Cooch Behar district, most of the processing units have been established in Dinhata Sadar (53.57 %), Chaudhurihat and Nishiganj (17.88 %) nearer to Bangladesh boarder due to the availability of abundant quantity of local green arecanut from homestead orchards conventionally maintained by ethnic society of the place. On the other hand Arecanut is a natural plantation crop of said area and eventually consumed as a cultural heritage along with betel vine leaf.

Table 2 presents duration of processing season (November to April) and the volume of business of green arecanut along with percentile distributor of the same processing months of the sample processing units. The table shows that the volume of business is the highest in the month of February and March (41%) and the lowest in the month of mid of April (8%), the reason is that, month of February is the peak harvesting season of premature green arecanut and in the month of April, the availability of green arecanut in the processing plant is minimum. It is pertinent to note that ripen Arecanut is not suitable for processing under different grades. The average volume of business is higher in Jalpaiguri district compared to the district of Cooch Behar and the former market is a bit delayed compared to later simply due to early harvesting of previous crop ensures early flowering for succeeding crop and a section of farmer follow the same by default option.

In this connection, it is worthwhile to mention here that volume of business operated by the processing units depends not only on the availability of green arecanut (which is easily available in the district of Jalpaiguri) but also the number of oven operated by processing unit for boiling of green arecanut. Table 3 represents the classification of arecanut processing plants in the study areas on the basis of number of oven possessed by plant owners. Size of a processing unit is measured by number of oven locally known as chulli made of clay soil, iron rod. Boiling activity is usually under taken twice in a week depending upon the availability and supply of nut and continued for day long. A sizeable quantity of nut, need to be gathered before so that the existing facility can be utilized properly. The user capacity depends on number of oven (chulli) remains in the plant (khalan). One oven can boil up to 4.8 Qtl of green nut in a day. Single oven plants are managed under individual

Table 3: Classification of arecanut processing plants, according to number of oven (locally called as Unan or Chulli) in the study areas of West Bengal for the year 2013-14

Sl. No.	Name of the block and village	No. of processing plants	No. of Chulli (Oven)			
			< 3	3 – 5	6 – 8	8 >
	Jalpaiguri					
1	Dhupguri	35	4	10	11	10
2	Maynaguri	15	3	5	7	–
3	Belakoba	10	4	6	–	–
4	Madarihat	24	3	8	11	2
5	Falakata	55	3	10	22	20
6	Kamakhaguri	65	30	15	10	10
7	Jateswar	4	22	2	–	–
8	Hamiltan	7	3	3	1	–
	Total	**215 (100)**	**52 (24.19)**	**59 (27.44)**	**62 (28.82)**	**42 (19.53)**
	Cooch Behar					
1	Dinhata	15	–	8	7	–
2	Choudhurihat	5	–	3	2	–
3	Premerdanga	3	–	–	3	–
4	Nishiganj	5	–	2	3	–
	Total	**28 (100)**	**–**	**13 (46.43)**	**15 (53.47)**	**–**

Source: As reported by the different owners of the processing plants

Figure in the parentheses indicate percentage of respective totals

capacity with little commercial implication. The number of oven may be taken as an indicator of plant size. Unit with less than 3 chulli indicating marginal size, while those having 3-5, 6-8 and more than 8 numbers of chulli may be called small, medium and large units. In Jalpaiguri district all the said types are observed while in Cooch Behar district only small and medium processing units do operative. The above table shows that out of 215 processing plants in the Jalpaiguri district, 24.19%, 27.44%, 28.82% and 19.53% of the owners of the processing plants come under marginal, small, medium and large groups respectively. But in Cooch Behar district, out of 28 processing plants, 44.43%, 53.47% of the owners belong to small and medium groups. It is clear from the above table large plants are available only in Jalpaiguri district proclaiming commercial gesture of the place. The reason may be that of local supply of green arecanut is followed by availability of labour comparatively favourable in this area.

A perusal of the Table 4 indicates the ownership pattern of arecanut processing plants. Plants are operative both under single proprietorship and multimember partnership. The phenomenon is common

Table 4: Ownership pattern of arecanut processing units in the study areas of West Bengal for the crop season 2013-14

Name of the block and village	No. of Processing plants	Single		Partnership			
				2 - 3		3 >	
		O	L	O	L	O	L
Jalpaiguri							
Dhupguri	35	24	–	2	–	–	9
Maynaguri	15	6	1	5	–	3	–
Belakoba	10	5	1	2	–	1	1
Madarihat	24	11	1	3	4	3	2
Falakata	55	30	4	6	2	4	9
Kamakhaguri	65	40	5	6	3	4	7
Jateswar	4	4	–	–	–	–	–
Hamiltan	7	2	1	1	–	2	–
Total	**215 (100)**	**122 (56.74)**	**13 (6.05)**	**26 (12.09)**	**9 (4.19)**	**17 (7.91)**	**28 (13.02)**
Cooch Behar							
Dinhata	15	7	–	3	–	4	1
Choudhurihat	5	5	–	–	–	–	–
Premerdanga	3	3	1	–	–	–	–
Nishiganj	5	5	1	–	1	–	–
Total	**28 (100)**	**17 (60.71)**	**2 (7.14)**	**3 (10.71)**	**1 (3.57)**	**4 (14.29)**	**1 (3.57)**

O = Owned land; L = Leased land

Table 5: Average investment of arecanut processing for a unit in the study areas of West Bengal for the year 2013-14

Sl. No.	Item of costs (Fixed)	Economic life/years*	Qt./Kg./p	Rate (₹)	Cost (₹)	Percent
1	Preparation of oven	4 – 5	4	900	3600.00	4.54
2	Building (Brick floor with tinshed) for one	10-12	—	—	44000.00	55.51
3	Vessels made of copper/Aluminum locally known as 'Deski'	4-5	5 p	2880	14400.00	18.17
4	Ladles (String implements)	3-4	7 p	90	630.00	0.79
5	Knives (Locally known as 'Zhati')	7-10	12 p	160	1920.00	2.42
6	Sarasi (For pressing tipni grade)	3-4	25 p	40	1000.00	1.26
7	Plastic wrappers	2-3	12 kg	40	960.00	1.21
8	Gunny bag	2-3	40 bag	24	960.00	1.21
9	Gas chamber for fumigation (made of bamboo and plastic)	2-3	1 p	—	3600.00	4.54
10	Hand tube-well (with plastic pipe)	4-5	2 p	—	3700.00	4.67
11	Van for carrying arecanut	5-6	2 p	—	4500.00	5.68
Total					**79270.00**	**(100)**

*As reported by the owners of the processing unit.

*P = Piece

throughout the study area. 62.79% of processing plants run under single ownership, 26.28% under 2-3 member partnership and 20.93% under more than 3 member partnership in Jalpaiguri district while the figures are 67.85%, 14.28% and 17.86% for Cooch Behar district. One of the primary impediments of establishing processing plant is an open yard required for sun drying of decorticated nuts after boiling. The asset value of such yard adjacent to market fringe is quite high. In such a position a good number of plants are arranged on temporal case. The perpetuity of such plants depends on prosperity of business, amount of lease money and participation of the land owner as working partner in the firm. 6.05% farms under single ownership and 17.21% farms under partnership run under leased land in Jalpaiguri district while the figures are 7.14% each for Cooch Behar district.

Average estimate of expenditure for installation of arecanut processing plants is delineated in Table 5. The estimate has been prepared for a 4 oven plant exclusive of lease value of land and interest on fixed capital. The working capacity of the plant is 24 packet green arecanut (each packet 80 kg in net weight) per processing cycle, 2 cycle per week and average 44 cycles per season (November to April). The input items required for

Table 6: Conversion of green arecanut to processed nuts per processing unit of West Bengal for the year 2013-2014

Months	Arecanut		Name of the grades (Kg.)							
	Green (Qt.) (Kg.)	Green to processed (Qty.) (Kg.)	Tipni	Sagar	Rota (Red)	Paniwala	Gunglee	Rota (White)	Mara dana	Chur
2	3	4	5	6	7	8	9	10	11	12
Nov.	80-85	6.50 (100)	4.00 (61.53)	1.00 (15.38)	1.00 (15.38)	–	–	–	0.50 (07.69)	–
Dec.	80-85	6.50 (100)	4.00 (61.53)	1.00 (15.38)	1.00 (15.38)	0.50 (7.69)	–	–	–	–
Jan.	80-85	8.00 (100)	4.00 (50.00)	1.00 (12.50)	2.00 (25.00)	0.50 (6.25)	–	0.50 (6.25)	–	–
Feb.	85-90	8.50 (100)	3.50 (41.18)	–	3.00 (35.29)	0.50 (15.88)	0.50 (5.88)	0.50 (5.88)	–	0.50 (5.88)
March	85-90	10.00 (100)	2.50 (25.00)	–	5.00 (50.00)	1.00 (10.00)	–	1.00 (10.00)	–	0.50 (5.00)
Middle of April	85-90	11.00 (100)	1.50 (13.64)	0.50 (4.55)	5.50 (50.00)	1.00 (9.09)	0.50 (4.55)	2.00 (18.18)	–	–
Total	**495**	**50.5**	**19.5**	**3.5**	**17.5**	**3.5**	**1**	**4**	**0.5**	**1**
Out of	**625**	**63.76 (100)**	**24.62 (38.62)**	**4.42 (6.93)**	**22.10 (34.65)**	**4.42 (6.93)**	**1.26 (1.98)**	**5.05 (7.92)**	**0.63 (0.99)**	**1.26 (1.98)**

Figure in the parentheses indicate percentage of respective totals.

Table 7: Average employment of labours per processing unit in West Bengal for the year 2013-2014

Sl. No	Name of the operations	Employment (in Mandays)			Total labour
		Male labour	Female labour	Child Labour	
1	Collection of raw materials	55	–	–	55 (5.84)
2	Staking	18	–	–	18 (1.91)
3	Boiling	18	30	–	48 (5.10)
4	De-husking	–	63	95	158 (16.79)
5	Preparation of Tipni	–	30	65	95 (10.10)
6	Preparation of bamboo roof (Macha)	25	–	–	25 (2.66)
7	Sun-drying	260	65	–	325 (34.54)
8	Preparation of gas chamber with fumigation	60	18	–	78 (8.29)
9	Pressing of Tipni	20	15	–	35 (3.72)
10.	Packaging and grading	25	50	–	75 (7.97)
11	Marketing	29	–	–	29 (3.08)
12	Labour (Mandays)	510 (54.20)	271 (28.80)	160 (17.00)	914 (100)
13	Total labour employed/Qtl.*	0.82	0.43	0.26	–

* Av. Volume of business per processing unit - (i) for W.B. = 625 qtl./year.

1 Dali = 15 kg boiled nut (Basket); Figures in Parentheses indicate percentage of totals

Permanent skilled labours work included in different operations.

establishing the unit are preparation of oven (made of clay and iron rod), processing yard (partly shaded and rest open floor), vessel for boiling (made of copper/ aluminium), ladle for stirring (made of wood), knives (locally called Zati used for decortications), processing fork (used for Tipni grade), polythene wrapper, gunney bag, gas chamber (made of bamboo and plastic used for fumigation), hand tube well (for water supply) and carrying van (for carrying the goods ready to use as and when required). The table gives an average static review of respective costs based on 2013-14 market price, however the same may change marginally from place to place according to local adjustment. However over time the costs will increase but the quantity of items remain same. At 2013-14 market prices, the estimated establishment cost comes at ₹ 79,270.00 which will support the plant upto 3 years without any new investment as fixed cost.

Conversion of green arecanut fruit to dehusked and dried nut items has been presented in Table 6. Water percentage of green nut reduces with the advancement of maturity which in turn relatively gives more dry weight of processes product over time from same quantity of green fruits. On an average 80-85 kg of standard green fruit obtainable gross dry nut product ranges from 6.5 kg during the onset of processing season i.e. at the month of November to 11.0 kg during end of the season i.e. at the month of April. Besides the said quantitative increment of output, the percentile distribution of finished grades also changes seasonably. During early two months of the season 'Tipni' grade covers 61.53 % followed by 'Sagar' and 'Rota (Red)' each share @ 15.38 % of the total harvest. But then after the share of 'Tipni' grade decreases gradually and finally comes to 13.64 % at the end of the season. It is pertinent to note here that 'Tipni' grade is better prepared from prematured nut and supply of it reduces with the advancement of the season. The reverse is observed is case of 'Rota (Red)' which is better produced from relatively matured green arecanut. The percentile proportion of 'Rota (Red)' gradually increases to the tune of 50 % up to to the end of the season. The grade like 'Sagar' an associate of 'Tipni' appear on first half of the season while Rota white an associate of Rota Red comes at 2nd half. Special grade namely 'Paniwala' and 'Gunglee' is produced in option and specific demand from the client. Other two grades 'Maradana' and 'Chur' are basically marginal by products of the processing operation.

The employment opportunity of arecanut processing enterprise has been explained in Table 7. There is an operational sequence of the process and for each step some sorts of specialization is also required. The sequence is composed of a set of activities namely, collection of green fruit, staking in peal, boiling of green fruit, decortications of boiled green fruit, second boiling of decorticated nut, preparation of low height bamboo roof for sun-drying of green nut, pressing of half dried nut for Tipni grade, fumigation of dried nut, packaging of products and disposal for market. Most of the activities are performed by hired casual labour with ongoing market wage rate. For decortications of boiled green fruit and pressing of half dried nut for 'Tipni' grade, local female labour and their grown up children are engaged on contract basis. For decortications job, the unit is one basket full fruit containing 15 kg of green fruit and a standard skilled women labour can decorticate 30-35 baskets in a day. The rate of decortication of one basket full fruit is decided in such a way so that the women labour can earn parity Wage prevailing in the market. The children can also decorticate 20-25 baskets in a day along with their elder. For 'Tipni' pressing the unit is decided on per kg of green nut and the rate remains one rupee lower than the decortications activity. The quantitative requirement of labour input for running a four oven processing unit having a standard operational turnover of average 625 quintal green fruit for six months processing season has been delineated in the said table. From the given data it is observed that the unit can generate 914 mandays over the season of which 34.54 % goes for sun-drying, 26.89 % for dehusking of fruits and pressing for 'Tipni' and around 5-6 % each for collection of green fruits from orchard, boiling of green fruits and dehusked nuts; packaging and grading etc. Regarding gender distribution of labour, 54.20 % for man, 28.80 % for female and 17.00 % goes for grown up children. Males are exclusively dominating in collection of green fruits, staking, preparation of bamboo roof and marketing while female and children reserve their exclusively upon dehusking and preparation for 'Tipni'. Other works are shared by male and female in complementary mode. The remarkable observation of the said information states that the given enterprise provides a holistic support to the job starved society of the area to sustain upon family income rather than individual.

Conclusion

Arecanut is a traditionally chosen plantation crop grown in homestead orchards of Terai farmers of West Bengal that encouraged the agribusiness through green nut processing relied upon assured local supply of primary input required for running the plant with little interruption.

The emergence of agribusiness of arecanut processing in two teari district of West Bengal is backed by the availability of green nut produced in homestead orchards of the said zone. The seasonal processing activities continue from November to April with a peak concentration during February and March (41%). The size of business of a processing palnt is directly related with number of oven it posses. Usually one oven can boil upto 4.8 qtl of green nut in a day. Units less than 3 oven (chulli) is treated as marginal while 3-5, 6-8 and more than 8 may be called small, medium and large respectively having a percentile representation 24.19%, 27.44%, 28.82% and 19.53% out of 215 processing plants operated in Jalpaiguri district. About two third of plants are on single ownership and the rest are under partnership. One of the major impediments of starting a processing plant is arranging of open yard required for sun drying activity. On an average a plant with 4 number of oven can manage 24 packet of green arecanut (each packet 80 kg in net weight) per cycle and with in a season of six months can operate 44 cycles. The costing of establishment of such an unit comes 79,270 at 2013-14 price and the unit will serve upto 3 years. On an average, 80-85 kg green nut converted in 6.5 kg to 11 kg dry processed products of different grade. The productivity improves with the advancement of maturity of nut over the season. Predominance of 'Tipni' grade (61.53%) in opening season (November-December) is reversed by 'Red Rota' (50.00%) during the ending phase (March-April). Other grades called 'Sagar' 'Rota (white)', 'Panimala', 'Gunglee' are produced in between. The study reveals that with a standard prcessing of average 625 qtls of green nut, the plant can generate 914 mandays for various activities of which 54.2% 28.8% and 17.00% done by male, female and children respectively. An analytical review of the study indicates that agribusiness through processing of green arecanut opens up a vista of forward linkage opportunity both in employment and income within the close vicinity of farm producer ensuring supplementary synergy between farm and non-farm sector of rural livelihood domain.

Notes:

- Arecanut boiled in vessels made of brass then quality of the Arecanut is to be good.
- After boiling of Arecanut cutting processing will be completed within 24 hours. This system is called as de-husking.
- Process to Tipni: First, green Arecanut along with husk boiled for half an hour. After dehusking the nuts to be boiled for another half an hour. Thereafter, the boiled Arecanut is to be sundried for 4-5 days. In between the soft arecanut pressed into pieces, this process is called Tipni.
- Single boiled nuts while dehusked and dried turn into deep red colour (Red Rota) and price is comparatively low.
- A successive boiling after dehusking makes the nuts light black colour gives better price.
- Rota (White): Green Arecanut fruits boiled for half an hour and after that dehusked nut put into 2nd boiling with one chemical, locally called 'hydro' for half an hour. The product colour will be white while dried.
- Chur: Broken, off size, small particles of dried nuts.
- Maradana: During the preparation of 'Tipni', some low grade off quality products is obtained due to processing failure. The colour will be light black.

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