Livelihood Option through Arecanut Cultivation in Tripura: A Case Study of Noagang and its Neighbouring Villages

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Abstract

The indigenous peoples of Tripura have traditionally been "jhum" cultivators. In course of time, the system of cultivation got declined owing to the scarcity of land and at the same time with the falls of jhum cycle. This in turn induces the scheduled tribes of Tripura to find another alternative way of living. Owing to higher employment potentiality, income returns and better marketing; arecanut cultivation among the respondents became another best vocation alternative to jhuming for earning livelihood. The study aimed to focus on the production trend, area and productivity of arecanut in Tripura in general and to analyze the income returns obtained by the farmers in particular. The study was based on primary data collected through interview with the helped of structured scheduled and the secondary data were collected from various government departments. The data were analyzed with the helped of simple statistical tools. The current study revealed that the growers grow arecanut as a means of livelihood instead of commercialisation. Further, it also provides potential employment to the farmers and thereby constituting major source of income to the cultivators. The crops was cultivated simply and traditionally without applying modern inputs whereby the labour cost constitute the major costs component incurred by the cultivators.

Keywords*: Tribes, Shifting Cultivation, Arecanut in Tripura, Cultivation Process and Economic Returns.*

Introduction

The State of Tripura is mainly hilly and extensively covered with dense forest mostly inhabited by the tribals, is markedly different from the system found in the plain areas[1]. It is situated between latitudes 22°56' and 24°32' north, and longitudes 91°09'and 92°20' east[2]. It is the third smallest State in the country and covers an area of 10,491.69 sq. km[3]. Traditionally, the tribes of Tripura living in the hilly and uplands have been jhum cultivators. Jhuming also called as swidden cultivation, as a system of mixed cropping has been prevalent in the hilly terrains of the state since time immemorial. Abundant land provided them the opportunities to practice this mode of production and provided livings at subsistence levels and was pretty economically in terms of cost of production[4]. Their livelihoods also depends on wage earnings, rearing livestock's and handicrafts making provide them additional income, as does the collections of forest resources such as timber, fuel woods, roots, medicinal herbs and fruits etc. However, due to demographic changes and in relation to the unavailability of virgin forest lands, the choice of land available for jhum has shrunk[5]. The unavailability of lands, in turn, results into the shortening of the jhum cycle and repeated jhuming on the same land without keeping longer period for restoration through fallowing must have led to a lowering of the soil fertility which further led to low yields of jhum. Short fallow periods are no longer adequate to restore the soils productive capacity[6]. Moreover, the shortage of land is also the consequences of the extension of settlements and settled cultivation in the state as well as it was also the inevitable results of the development of the state[7]. However, in the course of development, the people of scheduled tribes have opted arecanut cultivation as alternative to their previous occupation. The suitable climatic conditions do favour for arecanut cultivation in the selected areas. The crops attracts the farmers due to the possibility of intercropping particularly with perennial crops namely banana, pepper vines, cacao and cardamom when the crop is young which make better use of land and followed by generating income before the crop bear fruits[8]. The crop grows well where abundant rainfall is present as it cannot tolerate drought or low rainfall. It grows well in temperature climates within the range of 14° – 36°C with approximately 30 m in height and payback period (economic returns) starts from five to seven years[9].

Though the deep clay loam soil is more suitable for its growth, it also grows in alluvial, lateritic or red loamy soil. The crop has a gestation period of 5-8 years and a long economic life span of 35years. Due to the long gestation periods it was possible to have mixed cropping with other perennial crops and extraction of by-products give the economic advantages[10]. The cost of cultivation of the white 'arecanut' is Rs 114 per kg and for the red one is Rs 148 per kg. But it is crucial to harvest the arecanut at specific stages to obtain the best quality produce. The fruits are harvested annually, dried and dehusked. The harvested nuts have to be sun dried for 45 days. It is essential to spread the nuts

uniformly in a single layer and turning should be done once a week. This would prevent fungal infection of the nuts[9].

Furthermore, plantation cultivation plays a vital role in the economy of Tripura, accounting for 17776 hectares of the total cropped areas particularly arecanut, Cashewnut and coconut with a production of 41179 MT with the productivity level of 2.32 MT per ha and adds a value of Rs 20000 million approximately[11]. Thus, arecanut as one of the plantation crop was considered as a better option for diversification of agriculture allied activities owing to better income returns with low investment and also the crops have lots of value addition[12]. Moreover, improving the productivity of lands and thereby ensuring livelihood security of marginal and resource- poor farmers[13]. Thus, the growth of plantations sector claims to have widely benefited to the poor and weaker sections of the society particularly scheduled tribes in terms of income and employment and has emerged as the main source of livelihood to the growers, showing remarkable signs of progress in term of promising alternatives to the small and marginal farmers[14]. Besides, promoting the fertility itatus of the soil of the area and prevent soil erosion because of the tree cover that is created on the hill slopes[1].

Methodology

This paper aimed to study the status of arecanut cultivation in Tripura and the feasibility of livelihood option through arecanut cultivation in the study areas particularly. Thus, information was drawn from some of the arecanut producing villages of North Tripura. Such as Noagang, Indurail, Jaromura and Saithah are located in Panisagar Block while Zoitang and Thangnang are in Jubarajnagar Block respectively. The study areas were purposively selected because of the following reasons- a) the areas witnessed mostly scheduled tribes; b) most of the arecanut cultivation in the form of a garden is located in the North district of Tripura; and c) in these areas arecanut cultivation were practised mainly in hilly areas and traditional method of cultivation were followed. The primary data were collected through structured scheduled by interviewing 103 samples of arecanut growers to fulfil the objectives during April and May, 2013. The study used simple statistical tools like standard deviation, and percentage for analysing data. Compound Annual Growth Rate (CAGR) is calculated by using the formula $Y=ab^t$ while the Coefficient of Variation (CV) was estimated by using the formula: CV=Standard Deviation/Mean*100. And also, an average price prevailed in Noagang market is given in the Appendix I.

Results and Discussion

Arecanut (Supari) Status of Tripura: The suitability climatic conditions of Tripura have favoured the plantation cultivation of arecanut across the state. In addition, plantation sector is playing an important role in providing pertinent livelihood of marginal and resource poor farmers in the state particularly to the tribal's

people. The Table-1 highlights the process of arecanut development in the state for different periods regarding areas, production and productivity from 2000-01 to 2013-14. It was observed that the area was increasing more or less consistently over the period. Although there was a drastic reduction during 2012-2013, but it was subsequently revived in the following period 2013-2014. Interestingly, the production was found to be fluctuating more often than the area. The production trends shows a positive increased from 2000-2001 to 2006-2007. But the trends overturn negative responds to the increased in areas during 2007-2008 to 2009-2010. Indeed, the arecanut production stood at 20552 MT in 3013-2014. Similarly, the productivity trends was found to be changing over the time as it was obtained by dividing total production by the area for each specific period. The lowest productivity level was observed during 2007-2008 and 2008-2009 which stood at 1.88 MT per ha for the two periods. As in these two periods the area and production remained stable over the years'. The maximum productivity was found during 2013-2014 constituting 3.19 MT per ha and was followed by the second highest in 2011-2012 which was 3.16 MT per ha respectively.

Table-1
Status of Arecanut Plantation Crop in Tripura

Years	Area (in Ha)	Production (Qty in MT)	Productivity (MT per Ha)
2000-01	3174	6839	2.15
2001-02	3353	6850	2.04
2002-03	3503	6900	1.97
2003-04	4343	8589	1.98
2004-05	4465	9042	2.03
2005-06	4465	9580	2.15
2006-07	4349	9564	2.20
2007-08	4434	8361	1.88
2008-09	4440	8354	1.88
2009-10	4440	8600	1.94
2010-11	4400	9918	2.25
2011-12	5600	17700	3.16
2012-13	4700	9900	2.11
2013-14	6443	20552	3.19
CAGR (%)	3.85	6.12	2.19
CV (%)	18.87	40.05	19.21

Source: Public Information Bureau, Govt. of India, 2001[15]; Statistical Abstract of Tripura, 2007[16] and 2011[17]; Some Basics Statistics, 2012[18]; Indian Horticulture Database 2011[19] and 2013[19]; Economic Review of Tripura, 2012-2013[11] and 2013-14[3]; and Mission for Integrated Development of Horticulture Ministry of Agriculture, 2014[20].

The degree of disparity in the state level of arecanut development is brought out by the coefficient of variation (CV)

which is obtained by dividing standard deviation by mean value. Coefficient of variation, thus, helped in standardise in the extent of variations occurred over the years. The greater the degree of coefficient of variation the more is the extent of disparity in development process. The production coefficient of variation was 40.05% indicating high disparity and volatility in production trends over the years. Moreover, the coefficient of variations for yield is 19.21% while area is 18.87% respectively. The Coefficient of Variations of area and yield shows that the extent of increased in both were more or less steady over the periods. The compound annual growth rate is found to be highest in case of production which accounts to 6.12%, and was followed by area 3.85% and yield 2.19% respectively.

Profile of the Sample Households: The profile of the respondents deserved due important as it often determined the nature of their socio-economic character as well as social behaviour. Table-2 highlights the social behaviour of the respondents.

Table-2
Basic Profile of the Sample Households

Sl. No.		No. of Respondents	Percentages
1.	Family Size		
1a.	0-5	45	43.69
1b.	6-7	57	55.34
1c.	7 Above	1	0.97
	Total	103	100
2.	Age of the Respondents		
2a.	≤ 30	6	6
2b.	31-40	27	26
2c.	41-60	51	50
2d.	$60 \leq$	19	18
	Total	103	100
3.	Level of Education Attainments		
3a.	Illiterate	16	15.53
3b.	Primary	34	33
3c.	Middle	31	30
3d.	Secondary	10	9.8
3e.	Higher Secondary	4	3.9
3f.	Graduate	7	6.8
3g.	Post Graduate	1	0.97
	Total	103	100

Source: Field Survey, 2013

A look at Table 2 shows that the family size of the sample households was highest between 5-7 family members which constitutes 55.34% and was followed by 43.6% in the category of 0-5 family members. Meanwhile, it was also observed that the lowest family size was found in the range of above 7 which accounts to 0.97%. In general, it was likely that the number of households decline as the number of family members got increased. Thus, it can be said that there is negative relationship between member of households and their family size. The

smaller the number of family size the better is the family planning and management. It should be kept in mind that small and nuclear family types were the common family composition in the study areas.

The age of the arecanut cultivators were also collected in order to know the interest of the younger generation in growing the arecanut as alternative to their major occupations. Looking at Table-2 revealed that only 6% of the total respondents were below the age of 30 while 26% were in the category of 30-40, 50% were in the age group of 40-60 and 18% in the age group of above 60. This shows that the younger generation were not interested in growing arecanut. *Chondonbul Ranglong* (grower) said that the younger generation were not interested to do any work that they have to wait for long gestation period. They were interested to do only those works from where they can get money easily and quickly to meet their needs. At the same time they were lazy to implements any labourious works which involved lots of physical inputs.

Education is another important economic variable in determining the socio-economic condition of the households. It is not only important in getting job in government sector but it is also important in pursuing agriculture cultivation. As it often helps in proper management of agriculture inputs, technical know-how, and minimisation of costs as well as better planning which in turns can improves agriculture productivity and increased income returns from the cultivation to the cultivators. It was also revealed that below matriculation comprised 79% of which 16% were illiterate this was the major hindrance from the point of agriculture development. The number of respondents decreased as the level of education achievement increased. There was only one per cent having post graduate degree and followed by seven per cent having graduates level. This indicates that most of the arecanut cultivators in the study areas were having low level of education characterising the economic backwardness of the region.

Annual Income Earned by the Respondents: The annual income received by the sample households were also collected to know the economic status of arecanut cultivators.

Table-3
Annual Income of the Sample Households

Range of Income (in Rs)	No of Respondents	Percentages
≤ 100000	36	35
100001-200000	46	45
$200001 \leq$	21	20
Total	103	100

Source: Field Survey, 2013

Table-3 highlights that 45% of the households were earning an annual income between Rs 100001- 200000 while 35% were

earning less than Rs 100000. The remaining 20% were earning more than Rs 200000 annual income. However, the average annual income of the sample households stood at Rs 156267 in general. This is the income received from different sources in the previous year. Generally, the respondent's annual income is good enough to mitigate their daily needs although massive investment for agriculture development and human resource development may be difficult for them.

Varieties of Arecanut (Supari): Arecanut cultivation was practised as homestead cultivation by the farmers in the selected areas; only some farmers carried cultivation in the form of garden. The cultivation is done in hilly areas and traditional method of cultivation was practised. There were two varieties of arecanut cultivated in the study areas identified by the growers through their shape and period of production. They called them as "Desi" type and "Assami" type. Desi type was round in shape and was smaller than Assami type. They started to bear fruits on September and at the end of February. On the other hand, Assami type was bigger in size than Desi type and was oval in shaped while bearing fruits on January and at the end of June. It was revealed from the study that almost all the growers grew both types of Desi and Assami respectively. But it should be noted that the proportion of Desi type production was much higher than the Assami type in the study areas.

Plantation Management: The current management systems used by the growers were self acquired. Only one grower out of total respondents own planting materials, he prepared a seed bed by ploughing the land two to three times and the selected nuts were placed on the seed bed. This process of management is mainly practise in the month of May and June respectively. After six months, the nursery is ready for planting in the main field. It was found that most of the growers were buying the seedling from the local market as well as from the private seedling suppliers. The price of the sapling ranges from three to four Rupees per sapling. Meanwhile, the sapling was planted in a digging pit of 8×8 inch and the space was 2×2 m on an average. But the technical requirements was 2.7×2.7m (9×9ft) [21] or 2.4×3m (8×10ft)[22]. Moreover, the used of machinery, fertilizer, insecticide, pesticide were not found among the cultivators.

Size of Landholdings: In the study areas arecanut cultivation was the major plantation crop cultivated by the peoples owing to the geographically hilly areas. Thus, the size of landholdings became important economic variable in practising cultivation. As land is consider major wealth in rural areas at the same time important for accessing others forest resources.

The Table-4 revealed that the largest landholding was between 1-10 acres of total landholdings among the samplers which accounts to 97 respondents and was followed by above 20 acres comprising four households respectively. And also, the smallest size of households' landholdings was observed in between 11-20 acres which constitutes to two respondents among the sample

households. However, the size of landholdings under arecanut cultivation was largest between 1-10 acres which comprises to 101 respondents while there were only two respondents possessing land under arecanut cultivation between 11-20 acres. It should be remembered that landholdings under arecanut cultivation is only some part of households total land holdings; the size of total landholdings might be very large among the samples but the area under arecanut cultivation may be very small in size. This is why, land holding under arecanut was nil in the category of above 20 acres. This means that there is no arecanut plantation garden covering above 20 acres of land owned by the respondents. This shows majority of them were small and marginal farmers. Therefore, the average size of total landholdings among the sample households was 5.57 acres whereas the average size of landholdings under arecanut cultivation was 3.69 acres respectively.

Table-4
Size of Landholdings by the Respondents (in Acre)

Land Size	Total landholdings	Landholdings under Arecanut
1-10	97	101
11-20	2	2
Above 20	4	
Total	103	103
Average	5.57	3.69

Source: Field Survey, 2013

Other Agro-Based Activities: Even though Arecanut cultivation was occupying major plantation cultivation among the samples but they also pursue other agro-based activities. They did not fully depended on arecanut as their main source of income but they also take up various economic activities which add additional income to the farmers.

Table-5
Other Agricultural Activities practised by the Respondents

Types	No of Family	Percentages
Pineapple	18	17.47
Rubber	16	15.53
Betel Leaf	15	14.56
Litchi	5	4.85
Banana	11	10.68
Bamboo	1	0.97
Lemon	9	8.74
Fishery	14	13.59
Jackfruit	6	5.82
Tea	2	1.94
Papaya	4	3.88
Paddy	6	5.82

Source: Field Survey, 2013

In Table 5, it was revealed that 17.47% of the total respondents were taking up pineapple cultivation, which was followed by

15.53% of cultivating rubber plantation, at the same time 14.56% were pursuing betel leaf cultivation along with banana cultivation which constitutes 10.68%. Moreover, there were 13.59% of sample households cultivating pisciculture in the study areas. The rest of agro-based activities constitute a small proportion of the total economic activities pursued by the farmers.

Costs Associated with Arecanut Cultivation in the Study Areas: Cost is important economic variable used in measuring economic activities during production process. It is the price paid for something to get in place in another form of utility. Here, per acre estimated costs associated with different stages of arecanut plantation were briefly discussed.

Establishment Costs: The gestation period of arecanut is seven years. The costs of seedlings and labour were found to be the major costs involved in setting the plantation garden. Most of the farmers were establishing their plantation by purchasing seedlings from others or local market. The cost of one seedling on an average is three rupees. The average number of seedlings planted per acre is 815. Labour cost was another cost component involved in setting the plantation. It was needed for clearing shrubs, trees, digging pits, planting and cleaning of garden. The first three years required three times cleaning in a year and from fourth year it required two times cleaning in a year. Used of chemical fertilizer, insecticide and pesticide were not found in the study areas. Moreover, rainfall was the only source of irrigation received by the farmers.

Operation and Maintenance Costs: Only labour cost was incurred by the growers. Since one or two times in year was needed for cleaning the garden for operation and maintenance of the plantation. The labour wage rate prevailed during 2013 was Rs 200 per day.

Other Costs Associated: The other cost associated in arecanut plantation includes costs on harvesting, transportation and sack. Labour was required for plucking and collecting, the wage of labour was Rs 100 per sack or Rs 20 per tree. But it varies from village to village. Transportation cost involved for carrying the products from garden to local market and the price for carrying per sack was Rs 15.

Table 6 shows the average costs of cultivation incurred per acre by the respondents during 2012-2013 in the study areas. The costs were calculated separately for each farmer who sold as whole garden basis or per unit (bi) basis. Out of 103 respondents 74 were selling as whole garden basis while 29 were selling as per unit, this is, called as "bi". It was observed that the whole garden sellers were incurring only labour cost for maintenance and operations of garden and no other costs involved. On the other hand, per unit sellers have to incur costs on labour for cleaning garden, plucking and collecting. Other costs involved were transport cost and cost of sack for carrying the products. The average per acre cost for all the respondent was Rs 2189

and the standard deviation was 1420 which indicates a high variability in per acre costs spent by the farmers in cultivating arecanut. Thus, the maximum cost incurred per acre was Rs 6400 and the minimum cost was Rs 31 respectively. The reasons was that some farmers have more immature plantation which requires three times cleaning the garden in a year, which in turns, increases the costs of operation and maintenance of the farmers. However, there were some households who were found to be engaging themselves in cleaning the garden and even during harvesting season they were involved in plucking and collecting the fruits. Hence, this reduces the cost for some households since the wage for family labourers were not accounted in the present study.

Table-6
Average costs of Operational and Maintenance incurred by the Respondents per Acre

Sl. No	Nature of Costs	Whole Garden Seller (in Rs)	Per Unit Seller (in Rs)
1.	Total Labour Costs	1651	3548
1a.	Plucking and Collecting		1669
1b.	Cleaning Garden	1651	1879
2.	Transport Costs		494
3.	Costs of Sack		140
	Total Costs	1651	4182

Source: Field Survey, 2013

The Table 7 highlights about the establishment cost incurred by the arecanut cultivators in the study areas. While amortised establishment cost is calculated using the following formula: Amortised Cost= TEC $\{(1+i)^{AL}*i/ (1+i)^{AL}-1\}$[23]. Here, TEC= Total Establishment Cost; i= interest rates of nine per cent is taken; AL= the average life of arecanut which is taken to be 30 years.

Table-7
Estimates of Total Establishment Cost (in Rs/Acre)

Nature of Costs	Estimated Cost	Percentages
1.Seedling Cost	2445	10
2.Clearing Garden Cost	21240	88
3.Planting Cost	600	2
Total Establishment Cost	24285	100
Amortised Establishment Cost	2364	

Source: Field Survey, 2013

In Table-7, the estimate of the establishment cost for seven years in one acre was shown. The land used for arecanut

cultivation was an ancestral land as well as Patta land which were owned by the farmers in the region. So, the costs of labour and seedling were the only costs that have to be accounted in calculating the total establishment cost. Thus, it was observed that 88% of the total establishment cost per acre was constituted by the labour cost for clearing the plantation garden and jungle up to seven years, 12% for the seedling cost and two per cent for planting cost. The prevailing daily labour wage was Rs 200 per labour. In the current study, on an average of 815 saplings were planted in one acre of land. The amortised establishment cost was revealed as Rs 2364. This was the minimum cost that should be taken into account every year after the arecanut trees in one acre yield economic return till the whole life of arecanut. Interest rate of nine per cent was taken from the current interest rate of fixed term deposits of Tripura Gramin Bank 2013for five years and above.

Forms of Selling: Arecanut can be sold mainly in three forms such as ripen, green (raw) and dried either at home or market. Local peoples used the term "bi" for selling arecanut. Where one bi=420 ripen arecanut and for green arecanut one bi=440 arecanut. Prices were determined per 'bi'. Recently, the farmers were also selling the products in a bag (on an average one bag contains four 'bi') because of the difficulties and complexities in counting of arecanut. Another form of selling was based on whole garden for one season. In this system, traders purchased the whole garden after making observation of the garden and fixed the price with farmers both have bargaining power. The traders will owned the garden for the particular season and also bear all the costs for plucking and collecting. The price was fixed based on various factors like the number of trees bearing flowers, previous year market prices and expected market price. However, farmers selling in dried form were very few. Ripen arecanut were dried under the sunshine for 40-50 days and were taken to market for sale. The dried arecanut contained in one bag was four and half to five 'bi'.

Arecanut Prices in the Local Market: The market structure of arecanut was Oligopsony in nature in the selected areas where only few buyers were buying arecanut in the market. The buyers determined the price of arecanut in the market. Sometimes they force the producers to sell at low remunerative price against their will. The price got fluctuates every season. The general price for green arecanut ranges from Rs 100-130 per 'bi'. The

price of ripen arecanut ranges from Rs 170-400 per 'bi'. It is important to note that more than 70% of the products were sold in the month of November, December, January and February. Therefore, it will be rational to take the price per 'bi' as an annual average price which was Rs 250 per 'bi' for the year 2012-2013. On the other hand, green arecanut were sold in the month of September, October, and November. Thus, the average price for green arecanut was Rs 120 per 'bi' while the price for dried arecanut ranges from Rs 1200-1400 per sack.

Marketing Behaviour: The buyers of the arecanut in Noagang and Bagbassa markets were mostly traders from Karimganj district of Assam. They bought the product either from the market or they have direct contact with the farmers and buying arecanut from their home. These products were taken to Badarpur of Assam where huge quantities of arecanut were stored and again distributed in different states of North East India. In addition, it was also observed that some traders from Mizoram were also buying arecanut from the growers through direct contact.

Net Income of the Growers: The net income of the growers were obtained after deducting all the costs incurred by the growers for the year 2012-2013 as well as deducting the amortisation cost which was considered as Rs 2364 per acre.

The income per acre yield was also shown in the Table 8 which was received by the cultivators. The average per acre income for the whole garden seller and per unit (bi) seller was Rs 11367 and Rs 19108 respectively. The standard deviation values for whole garden seller was 3050 and for per unit seller was 8908 respectively. The standard deviation values of per unit seller was higher than the whole garden seller, this indicates the per unit seller were market driven. It should be noted that the better the quality of the fruit the higher the price the grower's is about to receive. It was also observed that 11.65% of the per unit seller were having per acre income of more than Rs 20000 whereas only 1.94% of the whole garden seller were earning more than Rs 20000. From this point, it can be said that it was more profitable to sell per unit than whole garden. Indeed, the proportion of income earned through whole garden seller is much more than the per unit seller. The former constitutes 71.85% while the latter constitutes 28.15%.

Table-8
Economic Returns per Acre from Arecanut

Net Income (in Rs)	Whole Garden Seller		Per Unit Seller	
Ranges	No of Respondents	Percentages	No of Respondents	Percentages
Less than 10000	27	26.21	3	2.91
10001-20000	45	43.7	14	13.59
20000 and Above	2	1.94	12	11.65
Total	74	71.85	29	28.15

Source: Field Survey, 2013

Conclusion

The present study observed that arecanut is an important source of livelihood for the rural peoples whose lands are not suitable for other food crops cultivation. Thus, arecanut becomes important source of livelihood and acts as the dominant source of income to the cultivators. The employment potentiality either cannot be neglected due to its high labour intensity. In addition to arecanut cultivation, in the study areas, other allied agriculture activities were also cultivated which in turns adds their income. Their socio-economic conditions would have been improved provided they were more literate. As the current study was located in the hilly areas, labour cost is the major cost incurred by the growers owing to impossibility of using capital intensive technique. Hence, arecanut is cultivated using simple and traditional method without consuming modern inputs like fertilizer, pesticide, hybrid seed, irrigation etc. therefore, there is a chance of increasing arecanut production in the study areas cultivated by the growers if they would have adopted modern's agriculture inputs. Needless to say, rainfall is the only irrigation source for the growers, to carry agriculture activities in the local areas. In terms of income, per unit seller is more profitable than whole garden seller. Owing to the intervention of brokers, so the farmers cannot fully reap the advantages of current market price prevailed. Thus, arecanut cultivation was providing 41% of the total income of the respondents while 34% of farmers were getting more than 50% of income from arecanut. Therefore, the important of arecanut as a source of livelihood cannot be neglected in the study areas.

Suggestions: Government interventions in the form of providing subsidies and bank loans are extremely important for the poor farmers for further expansion of arecanut cultivation; i. The exploitation of producers by intermediaries could be stopped by setting Cooperative societies with motivation, ii. Arecanut cultivation should be more encourage particularly among the large size of landholdings in the study areas, iii. Saplings distributed by the government agencies should be distributed on the right season in order to avoid plantation failure; and iv.Mature and good quality of seedlings should be provided without failed for the success of plantation cultivation.

Appendix-I
Average price of arecanut per "bi" in Noagang market

Month	Ripen per "bi"(in Rs)	Green per "bi" (in Rs)
September	NA	120
October	300	100
November	250	130
December	240	NA
January	240	NA
February	230	NA
March	230	NA
April	250	NA
May	160	NA
June	250	NA
July	NA	NA

Source: Field Survey, 2013; Note: NA= Not Available

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