Economic Analysis of Timber Production Among Saw Mill
Operators in Some Selected Local Government Areas of Ogun

State

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ABSTRACT

The study was carried out to determine the Economic analysis of Timber Production among Saw mill operators in some selected Local Government Areas of Ogun state. The objective of the study was to highlight the socio-economic effects of the timber managers/saw mill managers, determine the profitability of the enterprise and to determine the constraints affecting the industry in the area. The study areas were purposively selected and the respondents were randomly selected. Data was collected with the aid of a questionnaires. Twenty (20) questionnaires were administered in each of the four selected L.G.As., given a sample size of eighty (80). The analytical tools employed were largely that of Descriptive statistics (tables, percentages and frequency distribution) as well as Benefit-Cost analysis for the economic evaluation. Without projections, the values of the Benefit-Cost ratio are 1.046 and 1.7 for soft and hardwood respectively, and the projected values for 10 years at 10% discount rate were 1.14 and 1.91 for soft and hard wood enterprises respectively. This implies that the two enterprises were profitable and beneficial to the proprietors. Some of the problems impeding the smooth operations of the timber business in the study area include inadequate capital, lack of access roads, erratic power supply to the factory site, high cost of transportation. It was therefore recommended that proper management of forest resources, provision of good road network to link the forest and factory sites be provided.

INTRODUCTION

Throughout the period of his existence on earth, perhaps two million years man has survived as a hunter and as a gatherer of fruits and berries. He has depended on the natural bounty of forests, Savanna lands, rivers and lakes, just as all other living animals have done. It is only as a recently as perhaps ten thousand years ago that man began attempts at domesticating animals and plants; the transition from primitive hunter and gatherer of animals to the tiller of land.

In modern times, man consciously selects both plants and animals according to the well- established principles of genetic inheritance, and breeds from more closely adapted in his requirements these advances in plant and animal breeding.

Forest resources increasingly constitute a significant element in the national economies of many tropical countries. Similarly, in the present day economy, timber production and trade in Nigeria is now on increase. Nigeria export timber to countries like China, Italy, and Germany. Timber is held so much in high esteem by the government and so valuable that if you cut down a tree you must plant another to replace it, and various advancement and promotion programmes are being sponsored by the government to ensure that this is effected.

In addition to ivory and spice, timber and other forest resources attracted early trading companies (Nigeria trade Summary, Federal Office of Statistics, 1999). Timber processing has generated a relatively large capital investment Q^rtnnm\, maria. 2001). In this age of energy shortages and oil politics, the possible use and establishment of energy plantation as tree plantations to harness solar energy through bioconversion are being increasingly planned {Anou, 2006). Forestry in general has shown some marginal increase over the period in terms of its contribution to the Gross Domestic Product (G.D.P.) owing to high dependent on rural population on these sources to generate income for cash starved holder (FOS, 2000).

**PROBLEMS STATEMENT AND OBJECTIVES**

There has been an increase in food and fibre consumption due to increase of both the enclave and surrounding villages and this has led to land fragmentation due to the increasing man-land ratio and has shortened fallow period. There is therefore the need to increase the land area used for agricultural purposes. Also associated with increasing population is deforestation, which is the removal of forest site without replacement. Deforestation leads to acute shortage of industrial timber, fuel wood while also robbing use of numerous shrubs and herbs of food and medicinal values as well as valuable plant genetic resources, loss of biodiversity, which in effect limits the development of agriculture and medicine, which rely in this diversity.

Poor forest management leads to loss of protection which the plant cover gives to the soil and this is largely responsible for accelerated erosion and development of extensive gullies which invariably reduces the land available for agriculture and thereby reducing the total output of agriculture.

It has been observed that the rate of exploitations of forest resources in many developing countries in approaching a critical level, and this is due to the fact that a large proportion of the population is rural and this people, especially the rural dwellers depend directly and substantially on the goods and services the forest provides for the survival of the mankind.

Forest resources, woodland and trees in rural areas provide a range of ecological, economical and social benefits. In many countries however, the forest resources are in turn creating problems, which ranges from environmental to provision of basic needs for survival and security. Nest (1999) stated that one of the most challenging problems facing Nigeria, today, is the production of sufficient food and forest resources to sustain its ever increasing population. As a means of achieving sustainability and alleviating poverty, the Nigerian farmers have found various means of mixing the use of forest and its resources viz-a- viz provision of food, shelter, medicinal firewood and raw materials for agro-allied industry. This study therefore seeks to examine the economic analysis of timber production in the study area and to answer among others the following questions. How profitable is the production of timber in the area? How can timber production be sustained in the area? What factors affect the production of timber in the area? This study is an attempt to provide answers to these and other related questions.

The specific objectives of the study are to:

1. Highlight the socio-economic characteristics of forest managers in the study area.
2. Determine the profitability of timber enterprise in the study area.
3. Determine constraints to timber productivity and sustainability in the study area, and proffer useful suggestions for policy making

The study provides an opportunity for the timber managers to be able to increase their output and sustained for a very long period of time. It will also provide an evaluation of the economic impact of timber production on the local communities, and above all helps to appreciate the importance of forest and its resources.

METHODOLOGY

The study area consists of some selected Local Government Areas (L.G.As.) in Ogun State. Ogun State is located in the rainforest region of Nigeria. It lies between latitude 5021' to 6015' north of equator and longitude 3005' to 4015' east of the Greenwich meridian. The state has a population of three million, seven hundred and fifty one thousand, one hundred and forty 3,751,140 people (NPC, 2009). The state has some mineral deposits such as iron-ore, Kaolin, limestone and shale brick, day, sandstone, gavel and silica sands. In terms of relief, Ogun state comprises an interior of well dissected undulated lowlands. The soil types ranges from Ferruginous tropical soils to hydromorphic and the ferralitic soil. The state is bounded to Lagos state in the South, Oyo state in the north, Ondo state in the east and Republic of Benin towards the west of the state. The state could boost of financial institutions and allied institutions, availability of thriving market, reliable raw materials, available labour pool, provision of infrastructural facilities etc. It is pertinent to note that both the industrial and agricultural policies of Ogun state government seem to be attractive to private investors and they have assisted in promoting the industrial development of the state over the years, including forestry management.

For the purpose of this study, purposive random sampling method was used to select four LG.As. out of the 25 constitutional L.G.As. in the state. The L.G.As. include Abeokuta North, Ifo, Ijebu- Ode and Ijebu-North. In each L.G.A., 20 questionnaires were administered to saw mill operators which give a sample size to be eighty. Primary data on socio-economic characteristics, years of experience, source of initial capital for production, information channel, profitability of *the enterprise*, *factors that determine the* profitability of finished products as well as problems encountered by both the farmers and saw mill operators were used in the analysis. Secondary data also provides some missing information gaps. Data was collected between February - March, 2009.

Data were *analyzed using Descriptive statistics (tabulation,* frequency distribution, cumulative frequency distribution and percentages. However, Benefit-Cost analysis was used for economic evaluation of the enterprise.

**RESULTS AND DISCUSSION**

Socio-economic characteristics of Timber producers and sawmill operators in Ogun State. This include the societal factors that influence timber production in the study area, such as age, gender, marital status, educational level, working experience, etc. Table 1 shows the socio-economic characteristics of timber and saw mill managers in the study area.

Table 1 shows the socio-economic characteristics of the timber/saw *mills* managers in the study area. Age is the length of past life or existence of a person. It determines the quality of labour employed and the labour force prevalent in any given enterprise. In table 1, 8.8 percent of the respondents were aged below or equal to 25 years, while respondents with 53.8 percent were in the age bracket of 26 - 35 years. Similarly, 25.5 percent of the respondents were in the age of bracket of 46 - 55 years. 5 percent of the respondents failed to indicate their ages in the questionnaire. The revelation here is that most of the respondents involved in timber business in the area are within the age bracket of 26 - 35 years people in the middle age category or active labour force). This is an indication of a brighter future for the industry to meet the increasing demand for timber and its products in the country.

Gender is the quality of being a male or female. It determines the distribution of male and female in a given occupation and distributes the" according to the intensity of the activities a different stages. As revealed in the table, 97- percent of the respondents are male, 2.5 percent did not supply their gender distribution and \ female was involved in timber ventures. This; an indication that males are the only gene- involved in timer/sawmill business and this probably because the activities are labo. intensive, or is in line with some societal bell-, that farming or agricultural activities including: forestry and fisheries is an occupation of the male folks while the female folks are only K prepare food for the males while working c their farms. It also confirms the religions belief that women in Purdue are not to leave the- homes for any outside activities.

Education is a very important factor in - development of a country's economy. It car: said to be a state of being informed, trainee c instructed mentally and morally in a school environment. It affects the capacity 3; productivity in the long run, determines - farmers skills, his allocative abilities and show how well informed he is of the innovation technology around him. Educational qualification of man also determines his competency management decision-making affecting h production. In table 1, it is evident that I' percent of the respondents did not have for - education. 1.3 percent of the sample respondents went through adult education.However, 1.3 percent failed to supply of educational qualification. More often than r:1 18.8 percent, 37.35 percent, 12.5 percent r: 26.3 percent of the respondents have prime-, secondary, technical and tertiary qualify respectively. This is an indication that timer producers are having more people with form education, and this may translate to bet- future and higher productivity in the industry.

Marital status of respondents is another soc economic factor that determines the status " respondents towards their household responsibilities. Married timber managers/s millers with large family size may have read ,1 supply of family labour to work on the from which increases the size of their operatic" j Table 1 revealed that 1.3 percent of respondents did not indicate their marital stab 22.5 percent were single while 76.3 pero/ were married couples. This is an indication of timber managers are married couples w matured minds and will make efficient decision\* in order to maximize their profits.

The years of experience of a working population in any form of occupation determines the Performance and professionalism of such to the job. The years of experience of the respondents in timber enterprise is also a factor that determines the level of specialization of the individual operator in the field of timber production. Experience enables managers to -lam to overcome problems encountered in the previous production sessions. From table 1, it can be seen that 38.8 percent of the respondents nave been in the industry from more than 10 years while 40 percent have been in the business for a period of 6 - 10 years, and only 20 percent have en experience of 1 - 5. The implication is that respondents who are actively involved in timber venture are people with experience in the job, well specialized and therefore quality outputs.

Capital especially the initial capital is crucial in any business setting. Source(s) of initial capital greatly affect the profitability and sustainability of timber production/saw milling process. Table 1 reveals the initial source of capital in timber business in Ogun State. From the table, it can be observed that most managers obtained their initial capital from personal savings, while 7.5 percent were assisted by their parents (family wealth), 3.8 percent raised their capital through cooperative societies, Similarly, 1.3 percent Obtained their capital from friends/relatives, This S an indication that most of the proprietors of timber ventures in Ogun state obtain their apital from informal sources, and this cannot be unconnected with the fact that credits are not ■eadily available for agricultural production, and the high interest rate charges often jeopardize me confidence of the borrowers in the agricultural industry.

Profitability of Timber Enterprise In Ogun State

Production cost in many production processes is the capital incurred into the production activities. This can be viewed as the monetary value of all motors of production. The factors of production could be fixed or variable. In this case, Fixed Cost (FC) include the cost of producing the milling mechanization (Ban Saw) and cost of factory acquisition. The Variable Cost (VC) of :-educing timber include cost of tree (soft and hard), permit license, cost of falling trees, cost of labour (skilled and unskilled), cost of fuel (optional), cost of generating power in the factory site etc.

Table 2 shows that the cost of production of timber in the study area Cost of trees produced day:- From table 2, it is observed that the "Timber of log per tree having most frequency of longs per tree which gives 40 percent of respondents that have agreed that a tree variable in the distribution of respondents according to number of planks per log is 12 planks per log, therefore the number of planks in a tree could be given according to the most frequent variable.

Thus,

Number of log/tree = 4logs/tree x 12 planks/log = 48planks/tree.

From the mean value in table 2, the total production per day is 318.83 (cubic) planks. Therefore, to know the number of trees produced per day we have:

No of tree/day= Productivity/day = 318.83 Planks /log

To determine the cost of tree produced per day, we have:

1. Softwood:

Cost of softwood = Price of softwood x No of trees/day

From table 2, the mean purchasing price of soft wood is given as N359.84 Therefore, cost of softwood/day = Price of softwood x No of trees/day

= 6.64 x N359.84

= N2389.34/day

To obtain the cost of softwood produced per month, from the survey, production process does not take place on Sundays. Therefore, the average working days per month for timber production are 25 working days in a month. Hence,

Cost per month=N2389.34 x 25 days =N59733,44

And total expenditure for purchasing softwood for a year is given as:

Cost per year = 59733.44 x 12 = 716801.25

1. Hardwood:

The cost of hardwood follow the same pattern as that of the softwood, and from table 2, the mean value for price of hardwood is given as N86.56 per tree.

Therefore,

Cost per day= N6.64 x 806.56 Cost per month =N5355.56 x 25 days -N133888.96

Cost per year = N133888.96 x 12 months =N1606667.52

Permit License The permit license mean value is given as N3394.18. Therefore, Permit license / year=N3394.18 Cost of falling tree

The cost of falling tree at mean value is given as N2125.06 per day.

Therefore,

Cost of falling tree=N2125.06 x 25

=N53216.5 x 12

=N637518.

Transportation Cost

At mean value, transportation cost per day is given as N16215.19.

Therefore,

Total transportation cost=N16215.19 x 25 =N405379.75 x 12 =N4864557 Cost of labour

Labour cost is of the three categories: the unskilled labour according to the respondents are being paid per week, some enterprises pay their skill workers per week too while others pay per month. So, the total cost of labour was determined as:

From table 2, the mean value cost of unskilled labour per week is given as N2464.47.

Total unskilled labour Cost per year =N2464.47/week x 52 weeks =N138152.44

Cost of skilled labour per week at mean value is N3841.05.

Therefore,

Semi-skilled labour (weekly) =N3841.05 x 52 weeks =N199734.6

The mean value of skilled labour cost =N9052.63

Therefore,

Skilled labour (monthly) =N9052.63 x 12 months =N108631.56

Therefore Total cost of labour =N128152.05 + 19973.6 + N108631.56 =N436518.21

Power Generating Cost: At mean, the NEPA (Nos PHCN) bill per month is given as 19744,16.

Therefore, NEPA bill yearly =N19744.16 x 12 =N236929.92

FIXED COST: This is the summation of Cost of milling machine (Ban saw) and cost of site acquisition.

At mean, Machine Cost = N 1690875.00 Cost of site acquisition=N116136.10.

Cost of Producing Softwood/year (N) Cost of tree=N716861.25 Permit license=N3394.18 Cost of falling =N637518 Transportation =4864557 Labour = 436518.92

Power=23692.92

Total =6895718.91

Cost of producing hardwood (N)

Cost of tree=N1606667.52 Permit license= N3393.18 Cost of falling = N637518 Transportation =4864557 Labour=426518.56 Power=23692.92 Total =7785585.18

BENEFITS

Benefits are the revenue generated from ci production process of both the softwood afl hardwood production process. Table 3, S" the descriptive statistics breakdown of reverxij generated in the study area.

Revenue Estimated Sale x Price

Revenue for the softwood From table 3, the estimated sale per day is gneias 75.62 planks as the mean value price

softwood per plank at mean =N2 7.38

Therefore,

Revenue from sales =Estimated sales/ de, price of a plank =N75.62 X 270.38=N20446.14

Monthly revenue =N20446.14 x 25 days

Yearly revenue =N511153.39 x 12 =N6133840.68

Additional income waste

The statistics mean for additional income waste (table 3) is given as N130170.

Therefore,

Additional income from waste=N1301.70 Monthly additional income from w;r- =N1301.70 x 25 days =N32525.00

Yearly income from waste=N32355.00 x months =N390300.00

Number of planks domestically used Mean value of planks domestically used (table I - is given as 4.47 planks from a production Therefore, value of planks domestically used =N4.47 plank x 270.38

=N1208.60 .

Monthly value of domestically used planks ■

=N1208.60 x 25 days jl

=N30214.97 |

Yearly value of domestically used planks \*

=N30214.97 x 12 months =N362579.58

Number of Planks as gift

Numbers of planks mean value from table is planks per production.

Therefore,

Value of planks as light =4 planks x N270.38 =N1081.52

Monthly value of planks as light = N1081.52 x 25 days

year value of planks as light =N27028 x 12 = 24456.00

(Revenue from Softwood Enterprises

'This is obtained from the summation of revenue Sated from sales, additional income from , number of planks domestically used and number of planks as gift.

therefore, Total revenue (TR)

6133840.68 + N390300.00 + N362579.58 + N324456.00 = N7211176.26

Revenue from the Hardwood

From table 3, the mean price for hardwood is

therefore,

Revenue from sales = Estimated sales/day x price

= 75.62x N512.88 33783.99

Monthly revenue from sales =N38783.99 x 25 9599.64.

Yearly revenue from sales =N969599.64 x 12 11635195.68.

additional Income from waste=N1081.52 x 25 ;x 12 months

No of planks domestically used 1.48 x N572.86 x 25 days x 12 months 9283.84 tof planks as gift

=4.4 x N572.86 x 25 days x 12 months

= N615432.00

Total revenue from Hardwood enterprises $1135795.69 + 324456.00 + 615432.00 + 83.84)

=N132643 67.52

Benefit-Cost (B/C)

The Benefit cost analysis of the production is the of benefit accrued from the production and the cost incurred for the same production process. Undiscounted Benefit-Cost Analysis

(a) Softwood enterprise:

Total cost=N6895718.91 JRevenue=N7211176.26 t=Total Revenue = N51176.26

Total Cost N 6895718.91 =1.046.

(b) Harwood enterprise:

Total Cost = N7785585.18

Total Revenue = N13264367.52

B/C = 13264367.52

7785585.18 = 1.70

**Discounted Benefit-cost analysis**

The projection of benefit- cost for 10 years period for both the soft and hardwood enterprises was determined to ascertain the profitability of the venture in the long run. Ten percent (10%) discount factor was used for the projection and this was as a result of the present cost of credits from financial institutions which stands between 10 - 21% interest rate on loans Accordingly,

Benefit/cost Ratio=Discounted Benefit

Discount cost

i.e. B/C=Bn/(l + i)n

Cn/(1 + i)n

Benefit/Cost Ratio=44304866.94

38867296.31

=1.14

Table 4 and 5 shows the Discounted Benefit - cost for softwood and Hardwood enterprises in Ogun State.

*Benefit/Cost Ratio=81496274.05* 42574635.36

= 1.91

From table 4 and 5, it is evident that the two enterprises are profitable i.e. both the softwood and hardwood enterprise. However, hardwood enterprise is more profitable than the softwood. The later has a higher B/C ratio of 1.91 than the former with B/C ratio for 1.14.

*Constraints to* timber *Production in* Ogun State Many constraints have been identified through the conduct of this research for the smooth operations of the timber/sawmill enterprises in Ogun state.

1. Exorbitant tariff charges: Many timber/saw mill

managers complained of high rate of tariff and license especially in the free forest areas where there is no fixed tariff rate on every economic tree. This has by no means cause a lot of set backs in timber logging and sawmilling business.

1. Bad feeder roads: This is a problem prominent

in timber business in the study area. This single problem is responsible for the high cost of logging and transportation experienced by the saw millers and timber managers. This problem often forced the truck drivers to patronize nearby forest resources where most of the economic trees were almost in extinction due to over exploitation; there are no access roads to deep saw millers' operational capacities.

iii. Power failure: A general problem in every household in Nigeria today. The erratic power is one of the most important constraints pointed out by all the saw millers. Extra fees are usually charged for wood processing when Ban saws are operated with diesel generators. The problem coupled with high fuel scarcity and cost (as a result of the deregulation of the downstream sector). Many of the saw mills in the study are operating below their installed capacities or have been closed down as a result of this menace.

iv. High Cost of spare parts: Most of the machines and equipments used in saw milling activities have depreciated quickly as a result of heavy work in which they are exposed to. Since procuring new machines might be difficult, it is now incumbent on saw millers to look for new spare parts to replace the worn out ones.

v. Labour Constraints: Saw mill business or timber logging is labour intensive, and to ensure smooth running of the business, labour availability at all times must be guaranteed. More than one-quarter of the respondents expressed their feelings on lack of stable workers and labourers to use. The few workers and labourers available in the area charge exorbitant wage which the saw miller could not afford.

vi. Inadequate Capital: This was highly expressed by the timber proprietors as a hindrance to large-scale output in the saw milling business. The respondents indicated that money is being spent at every stage of the business before the sales of the output and since the majority of the saw miller depend majorly on their personal savings (as revealed in table 1) depend majorly on their saving to run the business there is the possibility of insufficient capital to cater for all expenses.

vii. Low Market Demand for Wood: The present economic recession in Nigeria and the global "Economic melt-down” today has made the timber market low in demand for the products. This is because many people. can no longer afford the high cost c‘ building facilities and this in turn reduces the market output of saw milling products

**CONCLUSION AND RECOMMENDATION**

From the findings, it can be concluded that the timber production is beneficial to the enclave *timber* managers/saw *mill* managers, individuals, | and *the society at large. Such benefits range* from the provision *of* employment opportunities to income generated by the proprietors. The study had revealed that hardwood enterprise is *more profitable* than the softwood *because it* has a *higher* benefit-cost *ratio. However, most of the* respondents who had *tertiary educator* complained of *lack of access* roads, inadequate capital, erratic power supply as an impediment to smooth operation of timber enterprises. Based on this, it is recommended that credit facilities especially from the formal sector be extended to timber / saw mill managers, access roads be provided and tariffs be reduced to boost their revenue generation.

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**Table 1:** Socio-Economic Characteristics of timbre sawmill managers in the study area.

|  |  |  |
| --- | --- | --- |
|  Characteristics | Frequency | Percentage |
| 1 £§e distribution |
| Nil | 4 | 5.0 |
| 25 | 7 | 8.8 |
| 26-35 | 43 | 53.8 |
| 36-45 | 18 | 32.5 |
| 46-55 | 8 | 10.0 |
| Total | 80 | 100.0 |
| Sender distribution |
| I Nil | 2 | 2.5 |
| | Female | 0 | 0.0 |
| I Male | 78 | 97.5 |
| Total | 80 | 100.0 |
| Educational Qualification |
| I Nil | 1 | 1.3 |
| Adult Education | 1 | 1.3 |
| Non-Education | 2 | 2.5 |
| Primary Education | 15 | 18.8 |
| Secondary Education | 30 | 37.5 |
| Technical Education | 10 | 12.5 |
| Tertiary Education | 21 | 26.3 |
| Total | 80 | 100.0 |
| Marita! Status |
| Nil | 1 | 1.3 |
| Married | 61 | 76.3 |
| Single | 18 | 22.5 |
| Total | 80 | 100 |
| Years of Experience |
| Nil | 1 | 1.3 |
| >10 | 31 | 38.8 |
| 1 - 5 | 16 | 20.0 |
| 6-10 | 32 | 40.0 |
| Total | 80 | 100.0 |
| Sources of Initial Capital |
| Nil | 1 | 1.3 |
| Cooperative societies | 3 | 3.8 |
| Friends/ Relatives | 1 | 1.3 |
| Inheritance | 2 | 2.5 |
| *Parents* | 6 | 7.5 |
| *Personal savings* | 66 | 82.5 |
| Sponsored | *1* | *1.3* |
| Total | *80* | 100.0 |

Source: Filed survey, 2009.

|  |  |  |
| --- | --- | --- |
| Descriptive | Number | Mean |
| Sift tree | 64 | 359.84 |
| Hard tree | 64 | 806.56 |
| Permit license | 73 | 3394.18 |
| Falling of tree | 77 | 2125.06 |
| Transportation | 79 | 16215.19 |
| Unskilled/WK | 38 | 3841.05 |
| Skilled/month | 38 | 9052.63 |
| NEPA bill/month | 77 | 18,744.16 |
| Fuel used/day | 40 | 3652.00 |
| Source: Filed survey, | 2009 |  |
| Table 3: Descriptive statistics of Revenue generated |
| Descriptive |  | N Mean |
| No. of planks sell/day | 77 75.62 |
| Price of Softwood |  | 78 270.38 |
| Price of Hardwood |  | 80 512.86 |
| Number of produced / day | 77 318.83 |
| Additional income (waste) | 76 1294.47 |
| Domestic usage |  | 48 4.48 |
| Number as gift |  | 14 . 4.0 |
| N(List wise) |  | 11 |

Source: Filed survey, 2009.

Table 4: Discounted Benefit-Cost for softwood Enterprises

Year Cost(N) Benefit (N) (1 + i)n Cn/(1 + i)n Bn/(1 + i)n

|  |  |  |
| --- | --- | --- |
| 1 | 6895718.19 | 7211176.26 |
| 2 | 6895718.19 | 7211176.26 |
| 3 | 6895718.19 | 7211176.26 |
| 4 | 6895718.19 | 7211176.26 |
| 5 | 6895718.19 | 7211176.26 |
| 6 | 6895718.19 | 7211176.26 |
| 7 | 6895718.19 | 7211176.26 |
| 8 | 6895718.19 | 7211176.26 |
| 9 | 6895718.19 | 7211176.26 |
| 10 | 6895718.19 | 7211176.26 |

|  |  |  |
| --- | --- | --- |
| 0.909 | 6268208.49 | 6554959.22 |
| 0.826 | 5695863.82 | 5956431.59 |
| 0.757 | 5178684.22 | 5415593.37 |
| 0.683 | 1709776.02 | 4925233.39 |
| 0.621 | 4282241.44 | 4478140.46 |
| 0.564 | 3889185.80 | 4067103.41 |
| 0.573 | 3537503.80 | 3699333.42 |
| 0.467 | 3220300.73 | 3367019.31 |
| 0.424 | 2923484.80 | 3057538.73 |
| 0.386 | 2661747.50 | 2783514.07 |
|  | 38867296.31 | 44304866.94 |

Source: Field Survey, 2009

Benefit/Cost Ratio = 44304866.94

 38867296.31

 1.14

Table 5: Discounted Benefit-Cost for Hardwood Enterprises

Year Cost(N) Benefit (N) (1 + i)n Cn/(1 + i)n Bn/(1 + i)n

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| *\l* | 7785585.18 | 13264367.52 | 0.909 | 7077096.93 | 12057310.08 |
| 2 | 7785585.18 | 13264367.52 | 0.826 | 6430893.36 | 10956367.57 |
| 3 | 7785585.18 | 13264367.52 | 0.757 | 5846974.47 | 9961540.61 |
| 4 | 7785585.18 | 13264367.52 | 0.683 | 5317554.68 | 9059663.02 |
| 5 | 7785585.18 | 13264367.52 | 0.621 | 4834848.40 | 8237172.23 |
| 6 | 7785585.18 | 13264367.52 | 0.564 | 4391070.04 | 7481103.28 |
| 7 | 7785585.18 | 13264367.52 | 0.573 | 3994005.20 | 6804620.54 |
| 8 | 7785585.18 | 13264367.52 | 0.467 | 3635868.28 | 6194459.63 |
| 5 | 7785585.18 | 13264367.52 | 0.424 | 3301088.12 | 5624901.83 |
| 10 | 7785585.18 | 13264367.52 | 0.386 | 3005235.88 | 5120045.86 |
|  |  |  |  | 42574635.36 | 81496274.053 |

Source: Filed Survey, 2009.

Benefit/Cost Ratio = 81496274,05

42574635.36

 = 1.91