

DEMOGRAPHIC ASSESSMENT OF THE POTENTIALS OF NATURAL RUBBER (NR) PRODUCTION IN KADUNA STATE, NIGERIA

Wuranti Valla¹, Mangbon Tordeng Amos² Henry Turman², Imarhiagbe Patience¹

¹Rubber Research Institute of Nigeria, Experimental Station, Manchok, Kaduna.

²Federal School of Statistics Manchok, Kaduna State, Nigeria.

Corresponding authors: ²mangbonamos@gmail.com 08030940135

ABSTRACT

The study highlights the suitability of Kaduna State climate in the production of natural rubber (NR), and the attitude of farmers towards cultivation of natural rubber in Kaduna State of Nigeria. Purposeful sampling technique was used to select 110 farmers from 6 local governments in Southern Kaduna. Data were collected from farmers using structured questionnaire. These were analyzed using descriptive statistics, non-parametric statistics (run test, One-Sample Kolmogorov-Smirnov Test). Results of the study indicated that (65%) of the respondents were within the age of 51 years and above. (80%) literate and (60%) had 5-10 family members. (50%) had favourable attitude towards rubber production. (70%) had moderate (10-18) level of involvement, while 8% had low (< 10) level of involvement. (58%) derived economic benefits mainly from sale of coagula. Environmentally, there was no cases of soil erosion reported by respondents. There was significantly positive correlation between the attitudes of farmers towards natural rubber production. It was recommended that maximum involvement of smallholder farmers in rubber production should be encouraged by provision of

land, credit facilities, variable inputs such as fertilizers and making planting materials readily available and affordable.

Key words: Climate, Attitude, Rubber, Production INTRODUCTION

According to Buakaew, P. (2004), natural rubber (NR) is a term applied to a wide variety of elastic substances produced from over 500 plant species. Presently, nearly all commercial rubbers of botanical origin are produced from *Hevea brasiliensis* (commonly referred to as natural rubber). Strausbaugh and core, (1989), said that the *Hevea* tree is a member of the spurge family (Euphorbiaceae) and a native of the Amazon valley in South America. Natural rubber was introduced into Nigeria in 1895 from Brazil and by 1903 the first rubber estate was established in sapele. Natural rubber Nigeria plant does well in rain forest regions of the lowland tropics with temperatures of between 21-35 °C and a well distributed rainfall of 2000mm or more. Well drained soils with a pH range of 3.5 to 5.5 have been found suitable, Uexkull and Mutert, (1995); Samarappuli, (2001). Rubber is one of the agricultural products (cash crop) that West Africa has been known for. In, the major rubber producing states are from the southern part of the country, where high rainfall are being experienced, the states where natural rubber is being grown in the south are: Abia, Anambra, Akwa Ibom, Rivers, Ebonyi and Bayelsa, it is also being grown commercially in Ondo, Edo, Ogun, Delta (Sapele) and Cross River states. Natural rubber also has been discovered to perform well in none traditional and marginal areas in Northern part of Nigeria. The states in the North that have potentials of natural rubber production are Adamawa, Taraba and Kaduna.

The rubber tree has a milky sticky secretion which is obtained as latex when the tree is tapped. This is carried out under a systematic controlled wounding of the stem. Due to the solidification of rubber when exposed to air, thin layers of the tree's bark is cut downwardly through the latex vessels where the rubber latex flows from to the tree trunk in a half spiral, the spiral allows a free

flow of the latex to a collecting cup. This is mostly carried out in the early hours of the morning or in the night before the rise in temperature as to allow the latex drip longer before coagulating. The coagulated lumps in the collection cup are processed into dry forms for marketing.

In Africa, Nigeria was once among the major exporters of natural rubber with much comparative trade advantage on its production which began in the year 1894. It was not only a source for cash crop or for foreign exchange but also a raw material for most agro-based industries, it offers employment especially to those in the rural areas and has improved the economy of the people. Even though the cultivation of natural rubber declined, due to the discovery of oil in the 1970s, there is still quite a good number of rubber producing and processing companies in Nigeria with vast natural rubber plantations such as Enghuat Industries Limited, Akamkpa Rubber Processing Company Limited and others. Natural rubber can mainly be used in two ways: Uncured natural rubber: and vulcanized rubber.

According to Wuranti Valla, natural rubber was introduced in Kaduna State in 2007 with a demonstration plot. By 2008, it was observed that the plant could thrive better with the Southern Kaduna weather. The farmers were therefore sensitized to embrace natural rubber cultivation as one of their cash crops. Today, 8 local governments in Kaduna State have been sensitized and natural rubber cultivation is being practiced.

OBJECTIVES

To determine farmers' attitude towards rubber farming and to identify the benefit derived from rubber production by point scale the magnitude economic and environmental benefits accruing to them for cultivating natural rubber.

MATERIAL AND METHODS

Convenient/ purposively sampling was used to sample 110 farmers and their farms in six local government's area. Run test was used to test for randomness. One-Sample Kolmogorov-Smirnov Test was also employed to test if our observations are from the same population. Also correlation analysis was performed between the attitudes of farmers towards natural rubber production.

DATA ANALYSIS

Table 1: Data Presentation on Natural Rubber Farmers and Hectares of Land cultivated in Southern Kaduna.

S/No	L.G.As.	Farmers	%	Hectares	%
1	Kaura	62	56.36	40	55.56
2	Jabba	6	5.45	4	5.56
3	Sanga	5	4.55	8	11.11
4	Jama'a	13	11.82	12	16.67
5	Zangon/K	21	19.09	4	5.56
6	Kachia	4	5.56	4	5.56
	Total	110	100.00	72	100

Source: 2019 field survey

Result and discussion

Table 2: Socio-demographic characteristics of respondent in Kaduna State

Variable	Respondent	Frequency	Percentage (%)
Sex	Male	110	100
	Female	0	0
Age	31-40	17	15
	41-50	22	20
	51 and above	72	65
Educational level	No formal education	22	20
	Primary education	28	25
		50	45

	Post-secondary education	Tertiary	11	10
Marital Status	No response		1	1
	Single		4	4
	Married		105	95
Household size	1-5		39	35
	6-10		66	60
	11 and above		6	5
Household members involved in farming	1-3		22	20
	4-6		77	70
	7 and above		11	10
Years of farming experience	Below 24 years		60	60
	25-34 years		33	30
	35 and above		11	10

Source: 2019 field survey

Table 3: Maturity, Productivity and gross income of rubber production

Planted Natural Rubber in Hectares	Indices	Hectares	Yield in (kg)/H/Yr.	Price/kg (₹)	Productivity/annum In kg	Estimated Returns ₹
	Mature (NR)	16	2000	250	32,000	8,000,000
	Immature (NR)	56	2000 (Estimated)	250 (Estimated)	112,000 (Estimated)	28,000,000 (Estimated)
Gross income from mature NR						₹ 36,000,000.00

Source: 2019 field survey

Socio-Demographic Characteristics

Farming Characteristics of Respondents Gender and Marital Status

Table 2 above shows that 110 respondents were males representing 100%. Majority (72%) of farmers were in the age bracket of 51 and above. 80% of them has one form of formal education. 95% were married and have 6-10 family size eating from the same pot. 80% engaged family labor in natural rubber production. 90.91% have farming experience of 12 years, while only 9.09% have experience of natural rubber cultivation below 12 years

Income Expected from Rubber Production in Southern Kaduna

From table 3: above, the total hectares of natural rubber cultivated in Southern Kaduna under this period of study were 72 ha., made up of 16 hectares of mature natural rubber plantation and 56 immature rubber plantation, while the yield per hectare per year of matured natural rubber was 2000 kg of dry rubber. The table shows that the price of dry natural rubber per kilogram during the prevailing current price was ₦250.00 (Two Hundred and Fifty Naira). The total productivity of dry natural rubber from the mature natural rubber per annum in kilogram was $16 \text{ Ha} \times 2000 = 32,000 \text{ Kg}$ of dry natural rubber per annum. The estimated returns from mature natural rubber per annum was $32,000.00 \times ₦250.00 = ₦8,000,000.00$ (Eight Million Naira). If the total 72 hectares of cultivated natural rubber plantation were tapped, returns from sales of dry natural rubber could be estimated as ₦36,000,000.00 (Thirty Six Million Naira Per Annum). This implies that on the average, the 110 natural rubber farmers in Southern Kaduna could be earning an estimated amount of ₦327,272.73 per annum.

Table 4: Result for RUN test (test for randomness)

Runs Test		
	Farmers	Hectares
Test Value ^a	9.50	6.00
Cases < Test Value	3	3
Cases >= Test Value	3	3
Total Cases	6	6
Number of Runs	4	4
Z	.001	.000
Asymp. Sig. (2-tailed)	0.980	.890

a. Median

The probability value shows run test using median as our cut of point are not statistically significant, which means that our data are randomly collected across the surveyed area of southern Kaduna. The total number of runs is 4 in our two areas considered, farmers and hectares.

Table 5: One-Sample Kolmogorov-Smirnov Test

		Farmers
N		6
Normal Parameters ^{a,b}	Mean	18.8333
	Std. Deviation	22.3196
		5
Most Extreme Differences	Absolute	.270
	Positive	.270
	Negative	-.253
Kolmogorov-Smirnov Z		.661
Asymp. Sig. (2-tailed)		.775

The result shows that we do not reject our null hypothesis and conclude that the farmers are from the same population.

Table 6: Correlation analysis

Correlations				
			Farmers	Hectares
Spearman's rho	Farmer s	Correlation Coefficient	1.000	.516
		Sig. (2-tailed)	.	.295
		N	6	6

	Hectares	Correlation Coefficient	.516	1.000
		Sig. (2-tailed)	.295	.
		N	6	6

The result shows positive correlations between the attitudes of farmers towards natural rubber production.

Summary

From the research study, it is clear that the sustainability of rubber production in the Nigeria agriculture economy has a doubting future. Making inference from the contributions from varying age group and the discouraging attempt of the government support to rubber production, we could deduce that there is a falling wiliness/enthusiasms from the older generation who are noted to be larger contributor to rubber production in Nigeria.

The survey presented the larger percentage of the contributor to be people of age group of 40 and above with the negligence youthful population having lesser participation in rubber production. Male farmers are the dominant operators of the rubber farm. The result showed that most of the respondents had little or no formal education. This will definitely have a bad effect on sustainability due to adoption of improved technology. Respondent's household size was found to be six on the average. Farmers' major source of financing is through their personal savings with little or no input from the government, and with the constant increase in cost of farm labor these can lead to impediments for farmers that will not boost sustainability of agriculture. It is discovered that majority of the farmers strongly agree various government activities such as provision of funds, support, provision of storage facilities, policies restructuring land ownership, provision of infrastructural facilities such as good roads, water, electricity and housing, extension services and increase information sources, agrochemicals, pest, diseases, fire, and wind outbreak control

devices, availability of market, early planting of new rubber, preservatives, improved techniques and materials that are majorly lacking among the farmers if provided to them will help lead to sustainability of rubber and agriculture as a whole.

With this justification, we can postulate a there will be discouraging future for the sustainability of rubber production in the Nigeria agricultural economy. Unless government makes an encouraging effort through positive contributions to support the willing population of rubber farmers and equal interest the younger generation, rubber production may not be sustained. It is therefore imperative that government make available resources to funding farmers to assure a huge production of rubber. This in turn will not only generate income to the participating farmers but will equally provide the nation an avenue to generate foreign exchange and income.

Conclusions

Irrespective of the enormous challenges hampering the achievement of sustainable development in Nigeria agricultural sector with reference to rubber as an agricultural produce, it can be employed at a level high enough to address the various problems (economic: poverty, unemployment, environmental degradation; deforestation) while at the same time leading to sustainable development of agriculture.

The government can provide other assistance such as storage facilities, basic infrastructural facilities, agro-chemicals to boost production

Recommendations

1. All stakeholders in the Natural rubber industry should contribute towards funding of research activities on natural rubber.

2. Regular trainings and workshops for rubber farmers through collaborative efforts in funding of research by government, nongovernmental organizations, and users of research results on natural rubber should be provided.
3. Provision of basic infrastructural facilities (improved budded stumps (planting materials), tapping knives, fertilizer) capital, and funding should be provided for the farmers. Thereby to boost the economy of the rural people and increasing the GDP of the nation.
4. The policies guiding the interest of rubber farmers and various forms of awareness should be provided for the farmers and all other produce in the agricultural sector as a whole.

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