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Socio-Economic Impact of Rubber Business on Latex Tappers in Ijebu Waterside Local Government Area of Ogun State, Nigeria

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ABSTRACT: The objective of this paper was to investigate the socio-economic impact of rubber business on latex tappers in Ijebu Waterside Local Government Area of Ogun State, Nigeria using appropriate standard methods The result showed that all the tappers are male, (35.0%) of the respondents are in their 40s, 55.0% are married and 66.0% had secondary school education. Furthermore, all (100.0%) the tappers went through training for a minimum of three months before starting the business and they all admitted that rubber tree lasts for 30yrs and that the shelf life of rubber product is one year. Most (67.0%) claimed that rubber tapping business was moderately profitable and that it has helped improve their standard of living. 92.0% claimed that the cost of maintaining the business was moderate and that the business has a significant impact on the community because it serves as a source of employment to residents and helped to alleviate poverty in the study area. Among the challenges experienced by rubber tappers, insecurity and theft of rubber product stood out as a principal challenge. The study therefore recommends that adequate security should be provided either by the associations they form or by government in order to maximize their profit from the business.

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Natural rubber is an important primary product in the global economy and is found in many common place items. It is obtained from latex, the sap of the rubber tree *(Hevea brasiliensis Muell. Arg)*. By far the biggest proportion (70%) of this natural resource is used in the tyre production considering all rubber-based products, the vehicle industry claims around three-quarters of the world production (ETRMA, 2011). Although the rubber tree is native to Amazonia, more than 90% of the total natural rubber originates from tropical Asia (FAO, 2013). The top five producing countries presently are Thailand, Indonesia, Malaysia, India and Vietnam Demand for rubber increased enormously with the economic upturn in Asia and is expected to further increase strongly in the near future. In 2011, China used one third of the natural rubber produced worldwide more than the consumption by the European Union member states, USA and Japan combined (ETRMA, 2012). Consequently, rubber cultivation has grown enormously within the last few decades, especially in the so-called Greater Mekong Sub region (GMS), comprising the countries bordering the Mekong River (Cambodia, Laos, Myanmar, Thailand, Vietnam and

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the Chinese province of Yunnan). In Vietnam, the plantation area covered about 910 000 hectares (ha) by the end of 2012, including about one-third of trees too young for tapping (ANRPC, 2010). This is twice the area compared with 2004 (FPT, 2013). In the north-eastern provinces of Thailand, the rubber cultivation area expanded from 42 000 ha in 2002 to 288 000 ha in 2011, an increase of 580%. In the same period, the forest area in this region declined by 18% and the area of agricultural land by 50% (Mongkolsawat and Pulklang, 2010). In Laos, about 140 000 ha of rubber were planted by 2008, and this area is expected to double within the next decade (Douangsavanh *et al.,* 2008). In Cambodia and Myanmar, the cultivation area is expected to grow strongly in the near future (Li and Fox, 2012). In Xishuangbanna, in the southern part of Yunnan Province (China), rubber cultivation area increased from 153 000 to 424 000 ha between 2002 and 2010, equivalent to 175%. This expansion mainly occurred at the expense of natural forests (Xu *et al*., 2014). In 2012, the total harvested area of rubber in the GMS countries was more than 3.5 million ha (Li and Fox 2012) estimated additionally more than 500 000 ha of young trees not yet producing rubber. If the present expansion of rubber continues, the cultivation area in the GMS could quadruple by 2050. (Fox *et al*., 2012). Expansion is also likely to shift rubber production further into higher altitude and latitude. New genotypes (clones) of rubber are able to tolerate dry periods and lower temperatures without important loss. Natural rubber is an important primary product in the global economy and is found in many commonplace items. It is obtained from latex, the sap of the rubber tree (*Hevea brasiliensis Muell. Arg*). By far the biggest proportion (70%) of this natural resource is used in the tyre production (ETRMA, 2011). Considering all rubber-based products, the vehicle industry claims around three-quarters of the world production. Although the rubber tree is native to Amazonia, more than 90% of the total natural rubber originates from tropical Asia (FAO, 2013). The top five producing countries presently are Thailand, Indonesia, Malaysia, India and Vietnam. Demand for rubber increased enormously with the economic upturn in Asia and is expected to further increase strongly in the near future. In 2011, China used one- third of the natural rubber produced worldwide – more than the consumption by the European Union member states, USA and Japan combined (ETRMA 2012). Consequently, rubber cultivation has grown enormously within the last few decades, especially in the so-called Greater Mekong Sub region (GMS), comprising the countries bordering the Mekong River (Cambodia, Laos, Myanmar, Thailand, Vietnam and

the Chinese province of Yunnan). In Vietnam, the plantation area covered about 910 000 hectares (ha) by the end of 2012, including about one-third of trees too young for tapping (ANRPC 2010). This is twice the area compared with 2004 (Asia commodities 2013). In the north- eastern provinces of Thailand, the rubber cultivation area expanded from 42 000 ha in 2002 to 288 000 ha in 2011, an increase of 580%. In the same period, the forest area in this region declined by 18% and the area of agricultural land by 50% (Mongkolsawat and Pulklang 2010). In Laos, about 140 000 ha of rubber were planted by 2008, and this area is expected to double within the next decade (Douangsavanh *et al.,* 2008). In Cambodia and Myanmar, the cultivation area is expected to grow strongly in the near future (Li and Fox 2012). In Xishuangbanna, in the southern part of Yunnan Province (China), rubber cultivation area increased from 153 000 to 424 000 ha between 2002 and 2010, equivalent to 175%. This expansion mainly occurred at the expense of natural forests (Li *et al.,* 2007). In 2012, the total harvested area of rubber in the GMS countries was more than 3.5 million ha 1. (Li and Fox 2012) estimated additionally more than 500 000 ha of young trees not yet producing rubber. If the present expansion of rubber continues, the cultivation area in the GMS could quad-ruple by 2050 (Fox *et al.,* 2012). Expansion is also likely to shift rubber production further into higher altitude and latitude. New genotypes (clones) of rubber are able to tolerate dry periods and lower temperatures without important loss. Consequently, the objective of this paper is to investigate the socio-economic impact of rubber business on latex tappers in Ijebu Waterside Local Government Area of Ogun State, Nigeria

MATERIALS AND METHODS

Study location: Ogun Waterside is a Local Government Area in Ogun State, Nigeria. It is the only area of the state with a coastline on the Bight of Benin and also borders Lagos Lagoon. Its headquarters are in the town of Abigi at 6°29′N 4°24′E. Other towns and villages in the local government include: Ilushin, Lukogbe, Iwopin, Olojumeta, Imakun Omi, Ode Omi, Ibu, Itebu Manuwa, Ibiade, Efire, Lomiro, Oni, Ayede, Igele, Ayila and Irokun among others. Ogun waterside has an area of 1,000 km^2 and an estimated population of 103,200 as in 2016 resulting in a population density of 103.2/km^2.

Sampling procedure: The sampling were done by carrying out a preliminary survey in order to get familiar with the communities around the study area. From this, seven communities; Ilushin, Agbure, Lukogbe, Efire, Ibiade, Abigi and Oni were

purposively selected from the communities around the study area. This selection was made due to the fact that these communities were actively involved in rubber cultivation in the area.

A document indicating the population of the area for 1991 was obtained from the National Population Commission of Ogun State and from this document a projection of 2023 population size for the area was further computed using equation 1;

$$Pn = Poert \ldots\ldots (1)$$

Where; Pn = Final population, Po = Initial population, e = exponential r = growth rate (3.2%), t = time interval (x-1991) years, t = 32 years.

Therefore, two communities (Ilushin and Agbure) were selected for the study. However, sampling intensity adopted by Diaw *et al.,* (2002) were further used to select respondents for the study. This indicated that 10% sampling intensity for population below 500, 5% sampling intensity for population between 500 and 1000 and 2.5% sampling intensity for the population above 1000.

Both primary and secondary data were used for this study. Primary data were collected with the aid of structured questionnaire while secondary data were collected from NPC document to supplement the primary data.

The questionnaire were designed to obtain information on the materials used, the quantity and price duration, socio-economic impact of rubber tree to tappers including people within the community and challenges facing latex/rubber business in the study area.

Data analysis: Data were analyzed using descriptive statistics such as frequency tables and percentage. To document the socio-economic impact of rubber tree to tappers including people in the study area. This were analyzed using descriptive statistics such as frequency tables and percentage.

To determine the constraints facing latex/rubber business in the study area. This were analyzed using logistic analysis. The logistic regression is given as

$$P^1 = b0 + b1x1 + b2x2 \ldots. b9x9 \ldots. \quad (1)$$

RESULT AND DISCUSSION

Table 1 shows the demographic information of the respondents in the study area. The result on gender shows that 100% were male while there was no female in the business of rubber tapping.

Table 1: Socio-demographic characteristics of respondents

Variables		Frequency	Percentage
Gender			
	Male	100	100
	Female	0	0
Age	**Total**	**100**	**100**
	30 to 39	18	18
	40 to 49	35	35
	50 to 59	19	19
	60 to 69	28	28
Total		**100**	**100**
Marital Status			
	Single	17	17
	Married	66	66
	Widowed	12	12
	Divorced	5	5
	Total	**100**	**100**
Education			
	Informal	8	8
	Primary	34	34
	Secondary	55	55
	Tertiary	3	3
	Total	**100**	**100**
Household size			
	1 to 5	79	79
	6 to 10	21	21
	Total	**100**	**100**
Occupation			
	Rubber Tapping	100	100
	Total	**100**	**100**
Nativity			
	Indigene	12	12
	Non-Indigene	88	88
	Total	**100**	**100**

Source: Field Survey, 2024.

The age of respondents in the study area showed that most of the respondents in the business of rubber tapping (35.0%) are within the age bracket of 40-49yrs followed by 60-69yrs, 50-59yrs and 30-39 which accounted for 28.0% and 19.0% respectively while less of respondents within the age bracket of 30-39 (18.0%) were involved. This implied that people who are involved in the rubber tapping are people in the middle age groups as well as those in their sixties while the younger people participated less perhaps because of awareness. This agrees with Emeji *et al.,* (2015) when he noted that people in the age bracket between 26-55 years are active workforce in every society and tend to participate more in any community project. Furthermore, the marital status showed that 66.0% were married, 17.0% were single, 12.0% were widows, while only 5.0% were divorced. This was in line with the findings of Olawuyi *et al*., (2019) who pointed out that married people are usually more involved in forest activities because of family responsibility. Majority of respondents (55.0%) had secondary level of education.

Table 2: Rubber tapper business information

How Long in Business		
0 to 10yrs	48	48
11 to 20yrs	41	41
21 to 30yrs	11	11
Total	100	100
How Did you Enter Business?		
Inherited	0	0
Training	100	100
Total	100	100
If Training, How Long?		
1 month	5	5
2 months	10	10
3 months	65	65
4 months	17	17
5 months	3	3
Total	100	100
Ideal Year for Rubber Tapping		
6 years	100	100
Total	100	100
How Many Years will a Rubber Tree Serve?		
30 years	100	100
Total	100	100
Shelf Life of Rubber Product		
1year	100	100
Total	100	100
How many Tons Produced Daily		
1 ton	65	65
2 tons	26	26
Half a ton	9	9
Total	100	100
Is the Work Profitable?		
Yes	90	90
No	10	10
Total	100	100
If Yes, How Profitable?		
Highly	23	23
Moderately	67	67
Low	10	10
Total	100	100
How Has the Business Improved your Standard of Living?		
Children School Fee Payment	46	46
Able to Save for Future Use	27	27
Able to Establish other Business	27	27
Total	100	100
Do You work on Salary?		
Yes	100	100
No	0	0
Total	100	100
Are you Paid Based on What You Produce?		
Yes	92	92
No	8	8
Total	100	100
Do You Have Personal Rubber Plantation?		
Yes	69	69
No	31	31
Total	100	100
What is the Cost of Maintaining the Plantation?		
Highly	6	6
Moderate	92	92
Low	2	2
Total	100	100
What are the Contribution of the Plantation to the Community		
Source of Employment	51	51
Use of Free Area to Farm	19	19
Source of Royalty	28	28
Adequate Electricity	2	2
Total	100	100

Source: Field Survey, 2024

This is an indication that majority of the respondents had secondary education which likely meant that rubber tapping require a form of education. Household size between 1 and 5 was the highest with 79.0% while household size of 6 to 10 recorded 21.0%. 100% of the respondents were rubber tappers. 12.0% of the respondents were indigenes while 88.0% were non-indigenes signifying that people come from different places to start the business in the location.

The table 2 displayed the detailed information of the respondents in rubber business. It showed that 48.0% (which represented the majority) had been in the business for less than 10 years, 41.0% had done the business for less than 20 years while only 11.0% had been in the business for over 20 years. This implied that there are high chances that rubber tappers will leave the business while only very few will remain the business as time goes on. All the respondents were trained before venturing into the business which meant that a level of skill is required for the business. This implied that it is not a business that can be ventured into anyhow or by just anyone because of the skill requirement involved. This possibly informed why it is only that are into this business. Also, majority (65.0%) of the people in the business trained for 3 months while 17.0%, 10.0%, 5.0% and 3.0% trained for 4 months, 2 months, 1 month and 5 months respectively.

Table 3: Socio-economic impacts of rubber business.

Socio Economic Impact	YES (%)	NO (%)
Poverty Alleviation	97(97.0)	3(3.0)
Development of Community	100(100.0)	0(0.0)
Income Generation	83(83.0)	17(17.0)
Increase in Standard of Living	87(87.0)	13(13.0)
Source of Employment	88(88.0)	12(12.0)
Source of Royalty	78(78.0)	22(22.0)
Adequate Electricity	56(56.0)	44(44.0)
Use of Free Areas to Farm	92(92.0)	8(8.0)
Provision of Schools	67(67.0)	33(33.0)

Source: Field Survey, 2024

This showed that anyone that will want to go into the business must have a level of commitment by dedicating about 3 months for training. Furthermore, all the respondents confirmed that rubber tree can be tapped after 6 years of planting depicting that it is a business that requires patience before profit can be made. In addition to getting information about the rubber tree, all the respondents pointed out that rubber trees can last for 30 years and that the shelf life of rubber products or extracts is 1 year. 65.0% agreed that they tap up to 1 tonne daily, 26.0% claim they tap 2 tonnes while only 9.0% claim that they extract half tonne daily. 90.0% of the respondents noted that the business is profitable whereas only

10.0% counted it as not a profitable business. As regards how profitable it is, 67.0% admitted that it moderately profitable, 23.0% admitted that it was highly profitable while only 10.0% regarded the profit as low.

The result in table 3 showed that rubber tapping business greatly impacted the respondents. The highest benefit was on community development (100.0%), followed by poverty alleviation with (97.0%) and very few people (3.0%) were not fully satisfied. Most of the respondents used the free areas to farm as another source of generating income which lead to the highest percentage of employment opportunities (88.0%) in the study area and increase in the standard of living (OkwuAbolo *et al*., 2021).

Table 4: Logit regression model for constraints facing rubber tapping business

Constraints	Coefficients	Odds-ratio
Poor Production	-0.11	0.90
Insecurity or Theft of the Product	1.07	2.91*
Bad Road or Cost of Transportation	0.11	1.11
Government Policy	-0.23	0.8
Tax or Fluctuation in Tax Payment	0.99	2.70*
Seasonality or Climate Change and Global Warming	-0.58	0.56
Risky	0.06	1.06
Cost of Management	0.32	1.37
Storage Facilities	-0.63	0.53
Constant	0.20	1.22

CF: Constraint Factors PP: Poor Production ITP: Insecurity or Theft of the Product BR/CT: Bad Road/Cost of Transportation, GP: Government Policy. TFTP: Tax or Fluctuation in Tax Payment RIS: Risky. SCCGW: Seasonality or Climate Change and Global Warming COM: Cost of Management. SF: Storage Facilities

CF= 0.20(Constant) - 0.11(PP) + 1.07(ITF) + 0.11(BRCT) – 0.23(GP) + 0.99(TFTP) – 0.58(SCCGW) + 0.06 (RIS) + 0.32(COM) – 0.63(SF)….2

Odds ratio (Unit Change): Constant (1.22) PP (0.90) ITP (2.91) BRCT (1.11) GP (0.80) TFTP (2.70) SCCGW (0.56) RIS (1.06) COM (1.37) SF (0.53)

The equation 2 showed the relationship between the dependent variable and the independent variables. It showed how each independent variable contributed to the constraints encountered by rubber tappers. It could be deduced that poor production, government policy, seasonality or climate change and global warming and storage facilities had an inverse relationship with constraints encountered while the other independent variables had positive or direct relationship with the constraints experienced by the business owners. The result showed that the major constraint of rubber tapping business is insecurity or theft of the product followed by tax payment. This showed that theft is a common challenge in the rubber tapping business. Also they see tax payment as another constraint encountered by the business owners.

Conclusion: From the study, rubber tree business has impacted positively on the livelihood of respondents and this in no small measure has helped them to meet up their needs, in reducing poverty and increasing their daily income. Therefore, to improve and maintain continuous supply of products for sustainability of the business, regeneration of the rubber tree should be encouraged through afforestation and reforestation programmes. Furthermore, government should introduce good and active policies against fluctuation or increase in tax payment, and employ more manpower for proper security of the rubber plantation and its resources. Government should provide good road network in order to make the products available at the right time and there should be infrastructural development in rural areas as this can help foster easy access to resources.

Declaration of Conflict of Interest: The authors declare no conflict of interest.

Data Availability Statement: Data are available upon request from the first author.

REFERENCE

Association of Natural Rubber Producing Countries (ANRPC) 2010. Natural Rubber Trends & Statistics. Available from: URL: http://asiacommodities.com.vn/upload/File/Natural%20Rubber%20Trends%20&%20Statistics.

Douangsavanh, L; Thammavong, B; Noble A. (2008). Meeting regional and global demands for rubber:

Emeji, EO; Eze, US; Ubaoji, KI (2015). Human Redisposition to Obesity. *The Bioscientist*. 3(1): 68-78. http;//www.bioscientistjournal.com

European Tyre and Rubber Manufacturers' Association (ETRMA) (2012). European Tyre & Rubber Industry Statistics; 4. Available from: URL: http://www.etrma.org/statistics-23.

FAO (2013) Food and Agriculture Organization of the United Nations. Processing of Natural Rubber. http://ecoport.org/ep?SearchType=earticleView&earticleId=644&page=4343.

FAO (2013) Food and Agriculture Organization of the United Nations. Manufacture of Latex-Grade Crepe Rubber.http://ecoport.org/ep?SearchType=earticleView&earticleId=644&page=4363. File/Natural%20Rubber%20Trends%20&%20Statistics%20-

FPT Securities Joint Stock Company. Natural rubber industry report (2013). Available from: URL:
www.fpts.com.vn6. Asia Commodities. The statistics of Vietnam rubber 2013.Available from: URL: www.asiacommodities.com.vn7.

Li, H; Aide, TM; Ma, Y; Liu W; Cao, M. (2007). Demand for rubber is causing the loss of high diversity rainforest in Southwest China. *Plt. Conser. Bio*. 16:157-171.

Li, Z; Fox, JM. (2012). Mapping rubber tree growth in main land Southeast Asia using time-series MODIS 250 m NDVI and statistical data. *Appl. Geo*. 32: 420–432

Mongkolsawat, C; Putklang, W. (2010). An approach for estimating area of rubber plantation: Integrating satellite and physical data over the Northeast Thailand. Paper presented at the 31th Asian Conference on Remote Sensing. Hanoi, Vietnam 2010. Available from: URL:http://www.as.org/aars/proceeding/ACRS2010/Papers/Oral%20Presentation/TS36-1.pdf8.

Okwu-Abolo, C; Soaga, JA; Idoko, SO (2021). Socio-economic benefit of rubber agroforestry system for improved livelihood in Edo State, Nigeria. E3S Web of Conferences 305, 02010: 1-7. RUBIS. https://doi.org/10.1051/e3sconf/202130502010.

Olawuyi, EB; Odeyale, OC; Agboola, FO. (2019). Impact Assessment of Deforestation on Rural Households' livelihoods in Olokemeji Forest reservs of Ogun State, Nigeria. *FOUJAHE*. 3(1): 20-29.

Xu J, Grumbine RE, Beckscha¨fer P. (2014). Land scape transformation through the use of ecological and socioeconomic indicators in Xishuangbanna, Southwest China, Mekong region. *Ecol. Indic*. 36:749–756.