

PRODUCTION OF BUDDED RUBBER STUMPS IN RUBBER RESEARCH INSTITUTE OF NIGERIA (RRIN): ANALYSIS OF THE IMPACT OF GOVERNMENT POLICIES

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Research Paper

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The study analyzed thirteen years production trend of rubber budded stumps at Rubber Research Institute of Nigeria (RRIN) Iyanomo, from 2002 to 2015. Empirical results of the analyses reveal that about 77% of the respondents were 41 years old and above. Also, 41% of the respondents had 16-20 years budding experience while those with 1-5 and 36-40 years had the least experience in budding. RRIN supplied total budded rubber stumps of 486,159 to farmers and generated total revenue of #13,754,564.50. The study depicts a steady increase in demand for RRIN budded stumps. NIG800 and 900 series of rubber clones budded in the Nursery Unit of Institute recorded the highest total survival rate compared to other used clones. The regression result reveals that 64% of the total independent variables were explained by the used

regression model and was significant at 1% level of probability. Wages of budders should be paid based on the survival rate of the budded rubber stumps in order to maximize and improve on budders' efficiencies and also to increase revenue generation for the Institute. Budders who are staffed should be evaluated based on the survival rate of the rubber; they budded for the year for consideration in promotions.

Key words: Rubber, Budded stumps, Government policies, RRIN

INTRODUCTION

Natural rubber (*Hevea brasiliensis*) is a perennial tree crop belonging to the family *euphorbiaceae*. The plant is essentially grown for its latex content which is used in the manufacture of elastic substances such as tyres, tubes, condom, etc. (Umar, 2011). The production of natural rubber (NR) is believed to have started in about 1876 with the exploitation of local variety, *funtumia elastic*. This variety has the challenges of poor latex yield (340kg/ha/yr) and bark regeneration after tapping. These challenges put great treat to NR industry as farmers were discouraged in its production despite ever-increasing demands of the of the produce due to the world's galloping technological industries.

The discovery of exotic variety of rubber (*Knuth. Mull, Hevea brasiliensis*) from Kew Garden in England, that yields up to 3600 kg/ha./year, came to Nigeria in 1895.

This renewed the hope and zeal among the rubber farmers. The Federal Government of Nigeria and scientists, thus swan in to action to improve the local variety in order to meet the world ever increasing demand for the produce which essentially involves Budding Technology. Budding is the merging of scion of a low quality plant with a bud of a superior quality plant of the same species in order to improve the low quality type genetically. Federal Government of Nigeria also came up with a policy measures tagged the 'Presidential Initiatives' (PI) on rubber production and utilization in 2006 in order to meet up with the world's demand. This programme invariably requires more supply of improved rubber planting materials to achieve it. Now 9 years after, what role did RRIN played in ensuring the required quantity of budded rubber stumps reach the farmers in Nigeria?

Agricultural development is believed to gain sound footing when a tangible, concrete and measurable policies and actions put in place by government convincible and agreeable by public. Therefore, agricultural policies that stand the test of time are those that are politically unbiased, gender-integrated, equal opportunity and are people participatory policy approach (PPA); and above all, yield positive dividends to the stakeholders and the society in general.

Rubber Research Institute of Nigeria (RRIN) was established in 1961 by then Mid-Western Region of Nigeria government, became federal government of Nigeria Research Institute in 1973 with the mandate to develop and improve the production, processing and marketing of natural rubber and Arabic gum in the country (RRIN, Annual Report, 2008 and 2009). The Institute is headed by the Executive Director who is also the Chairman of the Internal Management Committee (IMC) to formulate policies and administrative tactics for the Institute. The impact of the Executive Director and IMC has great influence which can be measured by the outputs of the Institute in terms of achievements of the Institute's mandate which include to develop, promote the production, processing, marketing and utilization of Natural Rubber and Arabic gum (RRIN in brief, 2011). There are many factors that influence the production process and budding success of budded rubber stumps in RRIN. The paper thus carefully looked at the major factors such as sex, age, household size, budding experience, budders' task/day that could have affected the production and budding success of the budded stumps in RRIN.

METHODOLOGY

The study was carried out at Rubber Research Institute of Nigeria (RRIN), Iyanomo, Benin City, Edo State Nigeria. The Institute has a total land area of 2078 hectares, out of which 498 hectares (24%) is under mature rubber plantation, 4.2 hectares (0.2%) is under immature rubber plantation. There is about 16 hectares of land marked for nursery farm in the Institute for the production of improved varieties of rubber material. Thirteen years' time series data (2002-2015) were collected from the Nursery Unit of RRIN and also, a questionnaire was administered on 22 budders randomly selected from the 35 total numbers of budders in RRIN. Information solicited from the budders include wages paid to budders per day, type of bud wood used, total budded stumps/day, the total survived budded stumps, budding experience, total budded stumps demanded and total supplied to farmers and the budders socioeconomic characteristics.

Both descriptive and inferential statistics were used to analyses the collected data. Descriptive statistic was used to evaluate the socioeconomic characteristics of the budders, annual production and sales of rubber budded stumps and the annual percentage changes during the

period of study; while regression model was used to determine the factors that affect the rubber budded stumps production success that consequently affect revenue generation in RRIN.

RESULTS AND DISCUSSION

Analyses of the socioeconomic characteristics of the respondents are presented in (Table 1). The study revealed that majority (50%) of the budders were middle-age people (41-45 years of age) while the youths (25 – 35 years of age) were less participants in the budding activity (Table 1). This implies that the budding activity is not an attractive business to them. This corroborates the studies carried out by Giroh (2010) that youths shun farming activities for white color jobs. The possible consequential effects of this are low productivity and extinction of some important agricultural techniques/practices with the phasing out of the elders in the societies.

Table 1 also indicated that people with family size of 7-9 dominated the population of budders in the Institute while those with family size of 1 – 3 and 10 – 12 were the least in the proportion of the respondents. This may mean that people with large family sizes are prone to be in dear financial needs due to high family pressure demands hence sorted to take any available job to cushion the financial needs of the family. Though the Table 1 also shows low participant of budders with 10-12 family sizes, it may mean that the respondents were not the bread winners of their families or were doing the job as a substitute to their main jobs as the survey study conducted in RRIN Main Nursery, Iyanomo showed that 60% of the respondents were casual workers.

The analysis in (Table 1) also shows the years of experiences in budding among the respondents. Those with 16-20 years experience represent about 41% of the total respondents, while those with 1-5 and 36-40 years had the least experience in budding. This implies the unattractiveness of farming among many Nigerians. This corroborates the earlier finding in this study.

RRIN Nursery Unit within 13 years reviewed has budded 941,899 rubber seedlings out of which 696,251 were successfully budded. From the 696,251, the Institute supplied a total rubber budded stumps of 486,159 to farmers and generated a total revenue of ₦13,754,564.50 (Table 2). The supply was however deficit by 66.97%. This implies that RRIN budded stumps has gained awareness which makes farmers trooping in seeking for the rubber planting material as the Table 2 depicts a steady increase in demands despite the annual increase in production and prices of budded rubber stumps in the Institute. It is therefore, important for RRIN to encourage farmers in the business of rubber by deliberate policy to double their effort to meet up the demands of farmers, to at least meet 90% as against the 33.03% only. In the same vein, the results in the (Table 2) implies that the higher the supply of the budded

Table 1. Socioeconomic Characteristics of Respondents.

Age	Frequency	Percentage
20 – 25	1	4.55
26 – 30	3	13.60
31 – 35	1	4.55
36 – 40	0	0.00
41 – 45	11	50.00
46 – 50	4	18.20
51 – 55	2	9.09
Total	22	100.00
Household size		
1 - 3	3	13.60
4 – 6	6	27.30
7 – 9	10	45.50
10 – 12	3	13.60
Total	22	100.00
Years of Experience		
1 – 5	1	4.55
6 – 10	2	9.09
11–15	1	4.55
16 -20	9	40.91
21 -25	5	22.73
26 – 30	2	9.09
31 -35	1	4.55
36 – 40	1	4.55
Total	22	100.00

Source: Nursery Unit, RRIN; a survey data, 2015.

Table 2. Production of Budded Stumps in RRIN Main Nursery, Iyanomo.

Year	Total budded	Total success	% success	Total demand	Total supplied	Total supply deficit	% supply deficit	Sales rate (₦)	Expected revenue (₦)
2002	52,868	29,316	55.46	52,864	8,950	43,914	83.07	10.40	304,886.40
2003	24,768	21,329	86.12	30,768	16,200	14,568	47.35	12.00	255,948.00
2004	54,210	48,856	90.12	54,210	22,200	32,010	59.05	12.00	586,272.00
2005	72,235	38,628	53.48	72,235	53,511	18,724	25.92	12.40	47,8987.20*
2006	86,592	44,580	51.48	86,592	38,628	47,964	56.39	12.40	552,792.00
2007	106,439	62,472	58.69	111,054	54,540	56,514	50.89	12.00	673,816.00
2008	120,576	96,000	79.64	150,000	92,000	58,000	38.67	12.40	114,080.00
2009	111,054	86,755	78.12	640,000	30,469	609,531	95.24	50.00	1,523,450.00
2010	103,938	72,390	69.65	154,000	63,792	90,208	58.58	50.00	3,189,600.00
2011	-	-	-	-	-	-	-	50.00	-
2012	60,700	59,646	98.26	-	-	-	-	50.00	-
2013	81,612	74,612	91.42	43,703	36,303	7400.	83.07	57.00	2,069,271.00
2014	65,702	60,702	92.38	76,513	69,566	6947	90.92	57.00	3,965,262.00*
2015	1,205	965	80.42	-	-	-	-	-	-
Total	941,899	696,251	75.79^A	1,471,939	486,159	985,780	66.97	-	13,754,564.50

β = Records between January and May, 2015. A= averageSource: RRIN Nursery Unit (2015).

stumps, the higher the revenue. Hence, the year 2014 which had the highest supply recorded the highest revenue (₦3,965,262.00), while the least supply and revenue was recorded in 2005. This could be due to the fact that in 2005 the Federal Government of Nigeria initiated a programme tagged 'Presidential Initiative on Rubber Production and Utilization' which took off fully in 2006. The programme thus has yielded positive impact in

RRIN as there has been rapid increase in the supply and revenue from the budded stumps under the period of review.

The percentage survival rates of different used bud wood materials were high except that of GT1 which has 42% (Table 3). This may be the reason why the clone (GT1) was less patronized by the budders compared to other considered clones in the RRIN Nursery. The high

Table 3.Types/Rate of bud wood material used during Feb. – May, 2015 budding activities.

Bud wood material	Total budded	Freq.	% of bud wood used on total budded	Total survival
RRIM 600	265	21	21.99	80.00
RRIC 45	107	14	8.88	66.00
PB28/59	190	16	15.77	59.00
PR107	408	16	33.86	72.00
NIG.series	165	18	13.69	92.00
GT1	70	3	0.25	42.00
TOTAL	1,205	78	100.00	

Multiple choices. **Source:** Calculated from RRIN Nursery Survey data, 2015

Table 4. Regression Analysis.

Variable Name	Coefficient	t- value
Constant	-22.1717(16.955) ^a	
Sex (1= M, 2 = F)	2.884(5.245)	- 1.340
Age	0.174 (0.246)	0.550
Household size	- 0.314 (1.301)	0.707
Budding experience	0.009 (0.316)	- 0.241
Number of budded stumps	0.925 (0.200)	- 0.029
R ²	64.00%	4.630
F – value	5.70	
Sig.	0.03	

a= error terms, Dependent variable = Survival rate of budded stumps.

budding success was not unconnected to the fact the budders mode of budding experience is around 20 years. This could also be due the prompt wages payment by the RRIN Management to casual staff which might boosted their morale to put in their best budding skills. The result also depicts NIG clones series (NIG. 800 and 900 series) recorded the highest total survival rates. This may be based on the fact that the clones were developed in RRIN and hence have the best adaptability of RRIN environment. The economic and policy advice is that RRIN Nursery Management should carefully segregate the clones in the bud wood nursery farm and lay emphasis on propagating NIG and RRIM 600 clone series; especially that NIG. developed clones have the highest latex yield with about 3,500 Kg/ha./year (Umar, 2011) among all the rubber clones.

The regression analysis result in (Table 4) indicated that 64% of the total independent variables were explained by the used regression model and was significant at 1% level of probability, while the remaining 36% of the total variables were either not captured by the regression model. The coefficient values of sex (2.884), age (0.174), budding experience (0.009) and number of budded stumps (0.925) had positive coefficients on the budding survival rate. These imply that a unit increase in each of these variables will result to an increase in the percentage rates of survival of the budded rubber stumps equivalent to the value of the corresponding coefficient of the independent variables. The economic policy advice is

therefore that female budders should be more employed; and all employed budders should be given necessary incentives to make them remain in budding as experience had positive coefficients. The number of seedling for budding/day should be increased so as to give the possible increase in the survival rates of the budded rubber stumps. On the other hand, the coefficient for household size had negative value (- 0.314).

This implies that a unit increase in the number of household size among the budders will result in a decrease in the number of survival rate of budded stumps equal to 0.314%. This may be due to over stress in the family affairs that could have physical and physiological consequences that affected their budding skills. The economic and policy advice is thus that the wages of budders should be paid based on the survival rate of budded rubber stumps, while staffed budders annual evaluation should be based on the survival rate of the rubber they budded for the year.

Conclusions

Budding technique is the major practice RRIN adopts in improving the local/low latex yielding rubber varieties for higher latex yields. The NIG.800, NIG.900 and RRIM 600 series of rubber clones were mostly used for the budding in RRIN. The 13 years (2002 - 2015) review showed that RRIN budded a total of 941,899 rubber seedlings

and recorded a total budding success of 696,251, sold out to generate total revenue of ₦13, 754, 56.50. The study also revealed that most of the respondents were in their middle age and come from fairly large family sizes. The average budding experience was 23 years. This aided their budding efficiency with an average budding success of 75.79%. There was an increasing request for budded stumps by farmers in the country, suggesting a positive impact of recent government policies towards the rejuvenation of the rubber industry. Bud wood materials obtained from Nigerian developed clones recorded better budding success rates compared to their exotic counterparts. The result of the regression analysis revealed that female budders, budding experience and number of budded stumps affect the budding success positively; while the house hold size of the respondents had negative impact on the success rate of budded stumps.

Recommendations

The policies and economic advice based on the findings in this study is that more female budders should be employed, and also all necessary incentives that will motivate the budders should be given to them or sustained especially regular payment of wages as at when due. Budders should also lay more emphasis on the use of NIG and RRIM 600 clone series for budding as they have higher RRIN environmental adoptability. This will minimize waste of labour and resources; hence, maximize resources and revenue. The study also recommend that in order to get the best out of the budders' skills, the rate of budding successes should be the unit of measure for payment of their wages, while budders that are staff should have their annual evaluation performance based on the budding successes they produced annually.

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