



## An Eleven Years Analysis of Demand and Supply of Improved Rubber Planting Material (2000 - 2010): A Case Study of Rubber Research Institute of Nigeria (RRIN)

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### ABSTRACT

The study reviewed RRIN production trend of rubber budded stumps and the rate of demand for the budded stumps from 2000 – 2010. Data were obtained from RRIN Nursery Unit and analyzed using descriptive statistics in order to determine the rates of changes in budded stumps production and supply to farmers as well as the changes in demand for budded stumps from RRIN by farmers. The budded stumps production for five years before and after the Presidential Initiative (PI) on rubber production and utilization in Nigeria at RRIN, farmers' demand for budded stumps from RRIN were analyzed to observe the impact of the PI programme on RRIN and the farmers. The results showed that a total of 937,092 rubber seedlings were budded and 678,859 were successful. During the period, farmers demanded a total of 1,529,070 budded stumps from RRIN, while only 455,516 were supplied; representing 29.80% of the total demand - leaving a supply deficit of 70.21%. The result also showed that the PI programme had positive impact on both RRIN and farmers.

**KEY WORDS:** Improved seedlings, budded stumps, demand and supply.

### INTRODUCTION

Natural rubber (NR) (*Hevea brasiliensis*) is one of Nigeria's major agricultural export crops. It is produced in about eight rubber traditional producing states in the Southern part of the country (Rubber belt of Nigeria), namely: - Edo, Delta, Abia, Akwa-Ibom, Rivers, Cross River, Ondo and Ogun. It also thrives in three marginal producing states in Northern Nigeria. The states are Kaduna, Taraba and Adamawa.

Prior to and since independence in 1960, Nigeria has experimented different agricultural investment strategies aimed at achieving rapid economic development for poverty alleviation. Thus, before 1970s, agriculture had contributed over 60% of Nigeria's Gross Domestic Product (GDP) (Famoriyo and Nwagbo, 1981). It also provided employment for over 70% of the population and met the food, raw materials and foreign exchange earning requirements of the country (Mesike, 2006). It is a known fact that effective agricultural development lies on the availability of sufficient and reliable production inputs such as the planting materials (seed/seedlings) among others.

Natural rubber (NR) though is an essential raw material for many industries has been facing numerous challenges due to many factors which include its long gestation period of 6 - 8 years, poor latex yield, high susceptibility to diseases and wind damages as well as the use of its close substitute – Synthetic Rubber (SR). The long gestation period of NR poses a negative impact on the crop to farmers who are always eager to have quick returns from their farms. As a result, farmers prefer cultivating annual or biennial crops to rubber. The poor latex yield of NR is actually associated with the use of unselected, un-improved rubber planting materials which only yield between 300 – 1600 kg/ha/yr instead of a yield of about 3,500kg/ha/yr as obtainable from selected improved rubber clones ( Idoko *et. al.*, 2007). The high susceptibility of some rubber clones to diseases and wind damages are some of the challenges observed in Rubber Research Institute of Nigeria (RRIN) plantation and the Institute is tackling the problems through the relevant departments. Umar *et. al.* (2011) reported that the global consumption of SR and NR is at the ratio of 60:40; implying a lower demand for natural rubber. In 1950s when SR started competing with NR in usage, the SR quickly gained advantage and overtook NR in the consumption proportion. By 1979, the ratio of SR: NR rose to 70:30 (IRSG, 1999). This weakened the NR farmers coupled with the United

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States of America's statement, cautioning all NR producing countries against expanding their NR production capacities in view of the galloping demand for SR in Industries (Umar *et al.*, 2011).

In Nigeria, the situation of rubber cultivation worsened as the Central Bank of Nigeria (CBN) in collaboration with Commodity Board in 1986 decided to reduce the price of Natural rubber, claimed that the cost of NR product in Nigeria was the highest in Africa (Ogowewo, 1986). This discouraged rubber farming in the country which led some farmers cut down their rubber trees to pave way to the cultivation of other crops, while others abandoned their rubber farms. This tremendously affected the total land area under rubber cultivation in Nigeria, as Umar *et al.*, (2011) reported that the rubber plantation size decreased from 243,479ha in 1960 to 154,000ha in 2010, indicating about 36.8% reduction.

Due to policy change and the low contribution of agricultural sector to the country's GDP as well as the sporadically rise in poverty levels in country, the Federal Government of Nigeria came up with some policy measures to boost agricultural sector to alleviate poverty in the Country. One of such policy measures was the Presidential Initiatives (PI) on rubber production and utilization in 2006. The area of focus of the programme on rubber include:-

- a. Land ownership and allocation.
- b. Land preparation for rubber planting.
- c. Targeted hectares to be planted within certain period of time.
- d. Replanting old rubber plantations.
- e. Subsidies for rubber production inputs, and
- f. Researches for improvement of rubber planting materials.

These targets invariably require more supply of improved rubber planting materials to achieve them. This paper therefore focused on the analyses of demand and supply of improved planting rubber materials to farmers by Rubber Research Institute of Nigeria within eleven years (2000 – 2010) of study. The paper also evaluated the impact of the Federal Government's policy, the PI, which was aimed at revitalizing rubber production and utilization in Nigeria.

## METHODOLOGY

Rubber seedlings were budded with improved rubber clones (NIG 800 series, RRIM 600, GT 1 and PR 107) at the Nursery Unit of Rubber Research Institute of Nigeria, Iyanomo, near Benin City, Edo state-Nigeria. Records were obtained from 2000 – 2010. A time series data approach was adopted in the collection of the data on the total budded rubber stumps (rubber planting materials) produced, total budding success and the quantity of budded stumps supplied to farmers within the eleven years period in the Institute. Descriptive statistics were used in analyzing the yearly percentage changes in budded stumps production and the demand and supply percentage changes for budded stumps by farmers within the time period of study. The gross percentage change in budding success was calculated as the sum total of all the values obtained from budding success, while the annual average was obtained over five years period before and after the PI. Similarly, gross percentage change for budded stumps production was calculated as the sum total of all the values obtained from percentage demand changes by farmers while the annual average was over a five years period before and after PI.



Figure 1: RRIN Main Nursery site; Iyanomo, Benin City

## RESULTS AND DISCUSSIONS

### Distribution of budded stumps production in RRIN (2000 – 2010)

The budded stumps production in Rubber Research Institute of Nigeria (RRIN) within the eleven years under review is presented in Table 1. The result revealed that a total of 937,092 rubber seedlings were budded with improved rubber clones (NIG 800 series, RRIM 600, GT 1 and PR 107). Out of this number, a total of 671,859 were successful, indicating about 71.70% success rate. However, this number, 671,859 was not all supplied to farmers. The individual year figures showed that, demand for budded stumps by farmers varies from year to year with a progressive increase from 30,769 in 2003 to 154,000 in 2010, with an astronomic rise in demand to 640,000 in 2009. Similarly, the actual budded stumps supplied and the percentage supplied also varied.

Table 1: Budded stumps production in RRIN (2000 – 2010): Demand and Supply distribution.

Year	Total Budded	Total Success	Total Demanded	Total Supplied	% budding success	% Supplied	% Budding failure	% Supplied deficit
2000	109,480	91186	91000	28690	83.29	31.53	16.71	68.49
2001	94,938	80,347	86,347	43,536	84.43	50.42	15.37	49.58
2002	52,862	29,316	52,864	8,950	55.46	16.93	44.54	83.07
2003	24,768	21,329	30,768	16,200	86.12	52.65	13.88	47.35
2004	54,210	48,856	54,210	22,200	90.12	41.00	9.88	59.00
2005	72,235	38,628	72,235	53,511	53.48	74.10	46.54	25.90
2006	86,592	44,580	86,592	38,628	51.48	44.61	48.52	55.39
2007	106,439	62,472	111,054	54,540	58.69	51.81	41.31	48.19
2008	120,576	96,000	150,000	92,000	79.64	61.33	20.38	38.67
2009	111,054	86,755	640,000	30,469	78.12	4.76	21.68	95.24
2010	103,938	72,390	154,000	63,792	69.65	41.42	30.35	58.58
<b>Σ</b>	<b>937,092</b>	<b>671,859</b>	<b>1,529,070</b>	<b>455,516</b>	<b>71.70</b>	<b>29.80</b>	<b>28.30</b>	<b>70.21</b>

Source: RRIN Nursery Unit, 2010.

Supply varied from 8,950 in 2002, (16.93%) to 92,000 in 2008, (63.33%). Although year 2005 recorded the highest percent budded stumps supplied (74.10%), with the actual quantity supplied of 53,511, had a deficit supply of 25.90% and whereas year 2008 recorded the highest actual quantities of budded stumps supplied (92,000), but supplied 61.33%. This was followed by year 2010 and 2007 which recorded about 63792 (41.20%) and 57,540 (51.80%), respectively. This implies that, the quantity of budded stumps produce does not necessarily translate into quantity of budded stumps supplied to the farmers. A number of factors could be responsible for the variations which include losses resulting from death either at the budded stumps harvesting stage or during transportation. Precautions must be taken at these stages to minimize losses. Another reason is the fact that RRIN has been consuming a good proportion of the budded stumps it produced through her massive replanting of old plantation plots in the Institute. Therefore, the actual total improved budded stumps supplied to the farmers were 455,516 as against the total demand for 1,529,070 during the eleven years under review. This indicates a gross percentage supply of only 29.80%, leaving a supply deficit of 70.21% (Table 1). This implies that RRIN was not able to meet the farmers' demand for budded stumps during the period of study.

### The impact of Presidential Initiative on budded stumps production in RRIN (2000 – 2010)

Year 2006 was the commencement year for the Presidential Initiative (PI) on rubber production and utilization in Nigeria. The percentage change in budded stumps production and demands in RRIN is presented in Table 2. The Table is divided into two for discussion purposes; the five years (2001 - 2005) before the PI and the years (2006 -2010) after the implementation of the programme PI. The budded stumps productions in five years before and after the programme (PI) were compared. Except in 2004 that recorded a positive change of 126.06% in the budding success produced, the other four years recorded negative changes. The gross percentage change recorded in the five years period before the PI was only 0.13%, giving an annual average budding success of 0.03% which is a very small increase, implying an insignificant change in the budding success. However, between 2006 and 2010, there was a high and positive change in the first three years of the commencement of the programme PI; however the last two years under review recorded negative changes in the budding success. The negative changes recorded in 2009 and 2010 may be due to administrative policy changes in the Institute. The general overview of the budding success in the eleven years of study was negative (- 82.90%), but the gross percentage change after the PI was 83.03%, with an average positive change of 16.61% per annum. This implies that the PI programme had a positive impact on RRIN's budded stumps production, though due to the severe negative impact of the poor budding

success before the PI programme; the Institute was left with a gross negative change in the budding success of – 82.90% (Table 2).

Table 2: Percent change in budded stumps production and demand in RRIN (2000 – 2010).

Year	Total Success	% change in budding success.	Total Demanded	% change in demand
2000	91186	-	91000	-
2001	80,347	-13.49	86,347	-5.11
2002	29,316	-63.51	52,864	-38.78
2003	21,329	-27.25	30,768	-41.80
2004	48,856	125.06	54,210	76.19
2005	38,628	-20.94	72,235	33.25
2006	44,580	15.41	86,592	19.88
2007	62,472	40.14	111,054	28.23
2008	96,000	53.67	150,000	35.07
2009	86,755	-9.63	640,000	326.67
2010	72,390	-16.56	154,000	-75.94
<b>Total</b>	<b>671,859</b>	<b>- 82.9</b>	<b>1,529,070</b>	<b>357.66</b>

Source: Generated from Table 1.

### Analysis of the Impact of PI on farmers' demand for budded stumps in RRIN

Before the commencement of the PI programme in 2006, only 2004 and 2005 recorded positive changes in the demand for budded stumps by farmers from RRIN, while the others years had negative changes during the period under review. The gross change in demand for budded stumps by farmers from RRIN before the PI was 23.75%, with an annual average demand change of 4.75%. After the commencement of the PI programme, the result showed high and positive changes in demand (Table 2). Although there was negative demand change in 2010, the gross demand change recorded during the period was 333.91%, giving an annual average demand change of 66.78%. At the same time, the overall demand change in the eleven years reviewed was 357.77%. This indicates that RRIN has been playing a strategic role in inculcating the idea of revamping rubber production in the country especially in creating farmers' awareness on the significance of the crop especially the high yielding clones and the PI programme on rubber only catalyzed the Institute's activities. This is clearly depicted in Table 2, as positive values were obtained before and after the PI but the absolute values recorded after the PI programme were higher than those obtained before the programme. This however, implies that the Presidential Initiative on rubber had a positive impact on the farmers' demand for improved budded rubber stumps (planting) at RRIN.

### CONCLUSION

The study revealed that in the eleven years reviewed, RRIN had poor budding success records in the first five years periods before the Presidential Initiative on rubber production and utilization; but had tremendous improvement after the PI in 2006. The paper also indicated that farmers' demand for RRIN's rubber budded stumps has been quite stable under the period of review, with an astronomic rise in the demand after the year of PI programme. This implies that giving all the necessary support required by both RRIN and the rubber farmers, the aims and objectives of the programme, PI – boosting rubber production and utilization in Nigeria will be realized in a short while.

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