Determination of Dry Rubber Content of Rubber Cup Lump¹

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ABSTRACT

The quality of latex from rubber trees is determined by the amount of Dry Rubber Content (DRC). Mainly, the price of the cup lumps is directly dependent on the DRC, commonly determined through visual observation by rubber dealers. Thus, no standard method is used by rubber buyers in the industry for farm gate determination of cup lump DRC. But the Philippines used a 25% conversion rate from cup lumps to dry rubber; however, other member countries used 50%. Therefore, this paper addresses the conversion rate of dry rubber content of rubber cup lumps in the Philippines. "On-site validation" was conducted by collecting data from selected rubber processing plants in major rubber-producing provinces, namely: Zamboanga Sibugay, North Cotabato, and Bukidnon. Secondary data, such as cup lumps and crumb rubber volume from 2017 to 2019, were collected and analyzed using Percentage Ratio Comparison. Results indicated that the DRC of cup lumps to dry rubber was more than 50%.

Keywords: Rubber, Conversion Rate, On-Site Validation

I. INTRODUCTION

The rubber tree is considered one of the top-priority commodities in the country. A perennial crop is scientifically known as *Hevea brasiliensis* under the family name *Euphorbiaceae*. The bark produces white sap called latex; its product is natural rubber (NR), which has an elastic property. It gives the farmer an annual net income of Php 73,500/ha/yr to Php 331,668.75/ha/yr dry rubber from the 6th to the 10th year (Castillo, 2014). Rubber provides high and regular income since it has low investment cost and allows intercropping other crops for additional income, such as rice, corn, vegetables, banana, coffee, and other fruit crops. It also has a wide range of adaptability, long periods of productivity, environmental sustainability, and huge industrial demand. Zamboanga Peninsula is the top rubber-producing region in the country with a total of 39.2 % production volume, followed by SOCCSKSARGEN with 32.4% and the Autonomous Region in Muslim Mindanao (ARMM) with 18.4% (Philippines Statistics Authority, 2020).

Latex is usually sold as a dry rubber sheet, concentrated rubber in the solution, cup lumps, or crumbled rubber. Cup lumps are the coagulated material found in the collection cup after the latex was poured into the container. Most farmers sold their cup lumps to local agents and provincial traders in the Philippines. The trading between rubber dealers and buyers normally occurred in remote areas in the country, involving small quantities of cup lumps that weigh less than 50kg per transaction.

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The price of the cup lumps is determined purely based on their dry rubber content (DRC), commonly through visual observation by rubber dealers. This practice of determining DRC through visual observation combined with other price-cut mechanisms imposed by rubber buyers has led to dissatisfaction among smallholders during rubber trading. Since no standard method or policy is available in the industry for farm gate determination of cup lump DRC, it directly affects rubber smallholders from producing good quality cup lumps.

Rejikumar and Philip (2010) stated that dry rubber remains after the dehydration of the latex, and the initial content of DRC in latex varies from approximately 20-50%. However, latex contains 2-4% non-rubber materials, such as liquids, proteins, lipids, carbohydrates, and inorganic salts (Nair et al., 1993). DRC is referred as the rubber particles found in latex. It varies according to climate, soil condition, clone, age of trees, and tapping system (length of cut and frequency of tapping). DRC in rubber needs to be known by the farmers and buyers in buying transactions since the price depends on the DRC. Thus, the study was conducted to address the issue of the DRC determination of rubber cup lumps of natural rubber plantations in the Philippines.

II. METHODS

Site Selection:

The study was conducted at selected rubber processing plants in North Cotabato, Zamboanga Sibugay, and Bukidnon. These selected sites are the major rubber-producing provinces in the country. The criterion for choosing rubber processing plants was based on the volume of raw and semi-rubber processed products and that they are operational and functional for a certain period.

Data Gathering:

An initial interview was conducted with the processing plant owners and assigned supervisors. Visual observation was also conducted on the process flow of the processing plants, from weighing rubber cup lumps, milling, weighing crumbed rubber, and packaging. Secondary data of the selected rubber processing plants from 2017 to 2019 was also gathered.

Data Analysis:

The collected data were tabulated, processed, and analysed. The monthly average DRC was computed and the comparison of percentage ratios between rubber cup lumps and recovery was done where the ratio is computed using the formula:

Percentage Ratio = (Recovery/Fresh Weight) × 100%

III. RESULTS AND DISCUSSION

Figure 1 shows the monthly average Dry Rubber Content of cup lumps of the different processing plants from January to December 2017 up to 2019. The highest DRC reached an average of 56.37 percent, acquired in April. The lowest recorded average DRC was 52.58 percent, obtained in September.



Figure 1. Monthly average Dry Rubber Content (DRC) of cup lump of different rubber processing plants

Figure 2 shows the trend of cup lumps Dry Rubber Content of the different processing plants from January to December 2017 up to 2019. As observed, data from different processing plants have different DRC values but have a consistent DRC trend. There was an increasing trend of DRC as observed in years 2017, 2018, and 2019 respectively wherein the highest reported values are in the year 2019. Different processing plants showed that a consistently increasing DRC value pattern occurred from January to June and decreased from July to December, which complements the climatic condition (Dry and Wet Seasons). It also shows that the DRC value increases during the dry season and decreases during the wet season.



Figure 2. The trend of rubber cup lump's DRC from January to December of three processing plants from January to December 2017 up to 2019.

Figure 3 shows that there has been an increase in DRC from 2017 to 2019, with a general DRC average of 52.06%, 54.10%, and 57.14% respectively. As observed, there is an increasing trend yearly above 50 percent. These increases can be attributed to different factors such as (a) the technologies introduced to the rubber farmers, (b) training and seminars for rubber production and management, (c) the introduction of high-quality planting materials, and (d) promotion and advocacy in improving rubber quality produced. All these attributes are through the initiatives of the different agencies concerned with improving the rubber industry.



Figure 3. The annual average Dry Rubber Content of a cup lump from 2017 to 2019.

IV. CONCLUSION AND RECOMMENDATIONS

Based on the data analyzed, the DRC for 2017 to 2019 is above 50%. It is therefore concluded that the 50% DRC should be used as the basis for the DRC conversion of Rubber Cup Lumps in the Philippines.

Accordingly, the PRRI recommends the following:

- 1. Adopt the 50 percent conversion rate of DRC instead of the existing 25%;
- 2. PSA to maintain the cup lump product form of rubber in some reports as this is the form required in the valuation of production in agriculture; and
- PRRI to continuously conduct studies to update this conversion rate and provide updates to the PSA.

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