



PCIEERD

"Enabling scientific solutions through strategic research and development"

# PCIEERD POLICY BRIEF

[www.pcieerd.dost.gov.ph](http://www.pcieerd.dost.gov.ph)



Raw materials processing for rubber production at Tire King and Rubber Products Inc., Ipil, Zamboanga Sibugay

| Photo by Ulysses Palmones

## Strengthening the Philippine Rubber Industry Towards a Sustainable Economy

Rubber is an elastic material obtained from the processed natural rubber or derived from petroleum and natural gas (synthetic rubber) substance. It is an essential raw material and is considered as one of the most profitable agri-industrial ventures in the Philippines. Its products serve all kinds of industries which would not function without the often-small technical rubber products. From aerospace to aeronautic, from the depth of the seas to the depth of the earth, from agriculture to household appliances, the significance of rubber shows a great potential for the Philippine rubber industry to become a key contributor in the Philippine economic development.

Three sectors composed the Philippine rubber industry (PhilRubber, n.d.). The first sector, the upstream sector, is mainly involved in rubber plantation operations, management, and trading. The midstream sector involves the production of Standard Philippine Rubber (SPR) for ISO certified/aligned processors. The downstream sector involves the production of rubber-based products intended for domestic and export market.

Different players from the farmers, suppliers, manufacturers, to traders compose the country's rubber industry (PhilRubber, n.d.). Two associations are in the Philippines: 1) *Philippine Rubber Industries Association, Inc. (PRIA)*; and 2) *Philippine Rubber Farmers Association, Inc. (PFRA)*. The former, with 62 member manufacturers, is

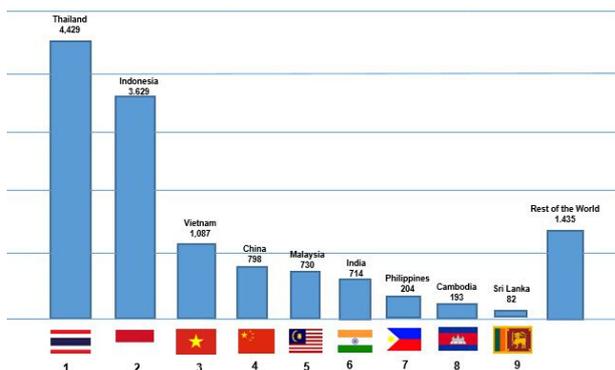
### Key Findings:

- Rubber cup lump production declined in recent years.
- Many multi-national companies sourced rubber at a very low percentage from the Philippines due to the low quality of the country's natural rubber produced.
- Stabilizing the production environment of rubber in the Philippines is necessary as the industry offers big opportunities.

**7th** in global rubber production

"The Philippines is seventh in global natural rubber production in 2017 but it has contributed only 2%".

based in Manila while the latter, catering into the farmers and barangay level manufacturers, is based in North Cotabato. On the report sourced from the rubber industry data, the Philippines holds the seventh (7th) position in the production of natural rubber in 2017 (see Figure 1). The production volume was based on the 50% Dry Rubber Content (DRC). It has contributed only two percent (2%) in the world's natural rubber production. Despite the dismal contribution, the world rubber industry recognizes the Philippines' potential in rubber production.



**Figure 1. 2017 Natural Rubber Production ('000 MT)**  
 Note: Data of Philippine volume production is based on the 50% Dry Rubber Content  
 Source: Rubber Industry data presented by Dr.Sitti Jamina Jain in the National Rubber Stakeholder's Summit 2019

Presently, the rubber industry is facing varying hurdles despite the country's resources and various interventions initiated by government bodies. It appears to have undergone economic downgrading in the recent years like the 2019 third quarter decrease in production compared with 2018. However, the Philippine Statistics Authority (PSA) reported a 6.4% increased from 142.72 thousand MT in the fourth quarter of 2018 to 151.80 thousand MT in the same quarter of 2019 (see Figure 2).

Despite these figures, the Philippines consistently generates the lowest unit value for its exports in contrast to other countries dubbed as top rubber producers. Many multinational companies source rubber from the Philippines very minimally due to the low quality of the natural rubber produced.

The absence of policies focusing on strengthening the value chain competitiveness and market access, and lack of support facilities such as laboratories that will aid in the improvement of the quality of rubber are the major problems in the industry.

Furthermore, the issues in production efficiency and sustainability, including compliance to industry standards, results to low quality of rubber produced and to minimal sourcing of rubber supply locally and internationally. These circumstances impede the growth of the Philippine Rubber industry.

**Farmers produce so much but gets a little."**

Undersecretary Evelyn G. Laviña of the Department of Agriculture during the National Rubber Summit last September 16, 2019

Even with the aid of the Republic Act No. 10089 or the Philippine Rubber Research Institute Act of 2010, the plight of the industry could not be generally addressed considering the law mainly focuses on research.

Various legislative bills were filed in the Congress such as House Bill (HB) No. 2664 or the "Philippine Rubber Development Act of 2018" and HB No. 526 or the "Philippine Rubber Development Act of 2019". These encompasses programs strengthening the upstream and downstream activities of the industry and the establishment of the Philippine Rubber Board that will regulate and stabilize the industry. These should be given focus to promote inclusive growth in the industry. Stabilizing the production environment of rubber in the Philippines is necessary as the industry offers big opportunities that can generate employment in the countryside and contribute generally to the growth of the economy. Extension of greater support from policy makers, innovations and proactive approach, deployment of systematic techniques, and technical assistance should be done to combat the challenges and ensure a globally competitive Philippine rubber industry.

## Issues and Challenges

The Philippine rubber industry faces a wide array of challenges that hinders it to thrive towards becoming competitive in the global rubber market. Among the common problems encountered by the Philippine Rubber Industry are the following:

### 1. Distant location of Rubber Testing Laboratory to rubber processors

Most of the rubber producers and processors for natural rubber are located at Zamboanga Sibugay. Whereas, the rubber testing laboratory is located at Zamboanga City which makes access for small-scale rubber producers and processors difficult.

### 2. Exigency in institutionalizing a regulatory body and corresponding measures for the rubber industry

There is no regulatory body that imposes standard measures and pertinent policies and regulations that would require testing services to ensure that the quality of rubber and rubber-based products conform to the accepted international standards in the rubber industry. Existing bodies such as Philippine Rubber Research Institute (PRRI) and Philippine Rubber Industry Association (PRIA) focus on strengthening research, mainly on the upstream processing, manufacturing, trading, and propagation.

### 3. The need for distinct standards and standard practice on testing laboratories

Most of the clients only require internationally-accepted and standards such as results that will reflect the specifications

and not the standardized test results based on ISO/ASTM. In the case of rubber-based products, existing testing facilities have no common practice for providing standardized results. Some facilities practice five (5) trials for test results and others practice only one (1) trial test. The verifying body recognizes any test results as long as it is issued by a government.

#### **4. Fluctuating supply and volatile prices of rubber**

Because of the constant changes of supply and product price, consideration of testing services is not a priority for rubber producers and processors. When there is a higher demand for rubber products, clients do not require processors to undergo standard testing. There is a tendency to directly sell the cup lump or unprocessed rubber to their clients since its market price has a little difference from the semi-processed product.

#### **5. The need for distinct and greater support to grassroots technology from advanced technology**

Currently, most of the rubber stakeholders are still depending and in need of grassroots technologies. Advanced technologies developed and offered to rubber farmers are costly. This constrains the capability of rubber stakeholders to effectively carry out the activities in rubber production and processing due to limited equipment. There is a need to support the development of grassroots technologies that will substantiate the functions of advanced technologies.

#### **6. Complementing Roadmap based on the current need and situation of the industry**

There is a need to review the current roadmap of the Philippine Rubber industry. Based on the studies conducted and discussions with rubber stakeholders, the direction of strategies and techniques to further improve the industry may need fine-tuning to directly align with the need and situation of the industry.

## **Government Support**

Innovative and proactive approaches have been initiated by various government bodies to take up the challenges in the rubber industry. They are but not limited to Department of Science and Technology (DOST), Department of Trade and Industry (DTI), Department of Agriculture (DA), Department of Environment and Natural Resources (DENR), and Department of Agrarian Reform (DAR).

The DA's Philippine Rubber Research Institute (PRRI) is the primary institution responsible in the agricultural aspect of the rubber industry, catering into rubber tree plantation, management, and operations. Its research projects involve not only the technical aspects but also the social aspect involving capacity building for farmers.

With its National Greening Program (NGP), the DENR considers rubber as one of the high value crops because of its potential to help livelihood in the communities, given the huge role of the Philippines in global rubber production (FMB, 2014). It ensures the proper plantation procedures of high value crops in its NGP.

The DAR's program on rubber is the Support for Rubber Development in Selected Agrarian Reform Areas which aims to support the rubber industry plantation by granting agrarian support to farmers (PCAF, 2019).

Consistent with the national government's commitment to protect and develop self-reliant industries based on agricultural development and agrarian reform through resource-based industries, the Philippine Council for Industry, Energy and Emerging Technology Research and Development (PCIEERD) of the DOST executed the National R&D Program for Natural Rubber and Rubber Manufacturing. It is one intervention taken to elevate the rubber industry, citing its importance in achieving the country's vision of inclusive growth and sustainability.

Under the program, the DOST through PCIEERD has supported and implemented several S&T projects on rubber. Specifically, these are the Upgrading and Accreditation of Laboratories to Include Rubber Analyses in Strategic Areas in Mindanao Phase 1. Integration of Rubber Testing Services in Regional Standards and Testing Laboratory (RSTL) Region IX and the Integration of Testing Services for Rubber Products.

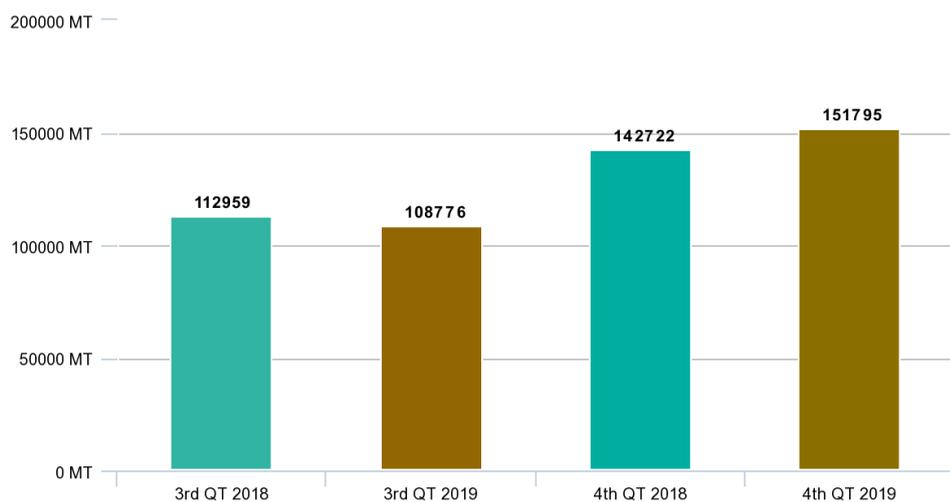
The projects include the establishment of facilities, provision of technical, financial, and technological assistance to rubber producers and processors. This is with the aim of creating a sustainable, innovative, and technology-driven Philippine rubber industry that will generate employment in rural areas and ensure its global competitiveness.

### **Integration of Rubber Testing Services in RSTL Region IX for Natural Rubber**

Natural rubber is a globally traded raw material used in numerous products such as tires, engineering components, and many others. Zamboanga Peninsula is one of the leading regions in natural rubber production producing 38% of the Philippines' total production in 2017. This volume production is based on the 50% dry rubber content (DRC).

The flourishing natural rubber industry faces a major challenge in ensuring that the state and quality of it conforms to Technically Specified Rubber (TSR) or Standard Philippine Rubber (SPR).

To respond to the need in elevating the standards of the region's rubber industry, DOST implemented the project, Upgrading and Accreditation of Laboratories to Include Rubber Analyses in Strategic Areas in Mindanao Phase 1. Integration of Rubber Testing Services in RSTL Region IX.



**The rubber industry in the Philippines had a 3.7% decline in the 3rd quarters of 2018 and 2019, but a 6.4% increase in 4th quarters.**

Figure 2. Rubber Production in 3rd and 4th Quarters of 2018 and 2019  
Source: Philippine Statistics Authority (Feb 2020)

This project is spearheaded by the DOST Region IX which aims to set up a laboratory testing facility for natural rubber that could provide an objective evidence using scientific approach on the rubber's quality and assist the rubber processors in complying with the specifications of the SPR.

The laboratory acquired the ISO 17025:2005 accreditation last 2018 and is currently working towards becoming the country's representative to the ASEAN Reference Laboratory Network for Rubber. **The laboratory is capable of testing ten (10) samples with seven (7) parameters each per week.**

### Integration of Testing Services for Rubber and Rubber Products

One of the vital concerns in producing rubber products is the reduction of defects for the safety and protection of the end-user. However, due to lack of standards and testing protocols in the country, it hampers local rubber processors to compete in the rubber market due to the uncompetitive quality of rubber products produced in the Philippines as identified by the Philippine Rubber Technical Working Group. The Philippine Rubber Industry

Development Board (PhilRubber) acts as the top advisory body in all initiatives and concerns relevant to the rubber industry; promote investment in public and private lands, joint venture in rubber planting, processing, and manufacturing of rubber products and by-products among others.

To address this issue, the DOST implemented another S&T project under the same program namely Integration of Testing Services for Rubber and Rubber Products. This project focuses on improving the quality of rubber-based products through the establishment of a testing facility.

The testing facility provides precise and accurate results that serve as basis in improving the design and construction of rubber products, thus giving a more reliable information to rubber processors concerning the safety and protection of the end-user.

The project is implemented by the Standards and Testing Division of the DOST-Industrial Technology Development Institute (DOST-ITDI), which is an accredited testing laboratory for a wide range of tests (see section on the right) catering to major industries.



Figure 3. DOST-ITDI Laboratory for Rubber and Rubber-based products



Figure 4. DOST-RSTL IX Laboratory for semi-processed rubber

## Project Contribution

- The laboratory results aid the rubber stakeholders in **complying with the market standards and requirement**.
- The results aid the rubber producers and processors in **classifying the aging of the tree**.
- The established laboratory serves as **verification in identifying the needs of the rubber trees**, and in **lay-outing of trees in the land** for the selection of appropriate and better site for rubber planting.

## Natural Rubber Tests Done in RSTL Region IX

- **Plasticity Retention** - This is a measure of the resistance of raw natural rubber to thermal oxidation. A high resistance to thermal oxidation is shown as high value of the index.
- **Ash** - Test for presence of impurities, such as fine mineral fillers, calcium carbonate, talc, aluminum silicate, and clay
- **Dirt** - Helps detect adulteration of natural rubber product, including traces of very fine sand particles and bark
- **Volatile Matter** - Indicates dryness of the rubber. High value indicates incomplete drying at the producer's factory or water ingress during transit
- **Nitrogen** - This test is a measure of non-rubber components (usually proteinaceous). High nitrogen content (>0.6%) indicates possible adulteration with skim latex
- **Mooney Viscosity** - Characterizes the processability of the rubber especially in terms of calendaring, extruding or injection molding
- **Color** - Standard Philippine Rubber Latex (SPR-L) is the only rubber that has a color specification. Light color is principally achieved by clone choice and the use of appropriate preservatives to prevent darkening by the action of enzymes. Light color is also indicative of low ash and dirt content

**The DOST Laboratory offers good quality services on rubber testing."**

MJ Saha

MJ Saha Rubber Development Corporation  
Titay, Zamboanga Sibugay

# Policy Recommendations

The goal of DOST is to improve the low quality of natural rubber and rubber-based products produced in the country. The integration of Rubber Testing Services with Regional Standards Testing Laboratory (RSTL) in Zamboanga Peninsula and Integration of testing Services for rubber and rubber products at DOST-ITDI aim to elevate the quality of natural rubber as the raw material for rubber products and ease rubber production process through the imposition of various scientific approach.

However, these objectives cannot be achieved without the support of the government, different sectors, and stakeholders concerned with the Philippine Rubber industry. Given the results of this study, the following are recommended to be applied to this context or similar ones in the future:

- Encourage collaboration among industry players and responsible government institutions such as local government unit in the conduct of policy gap analysis, strategic planning, and resource mobilization to formulate and update related policies to assure the sustainability of the local rubber industry.
- Encourage agro-entrepreneurs and small-scale farmers by providing incentives to entice them to venture on the industry and through trainings, information dissemination, and advocacy campaigns among rubber producers and processors that will capacitate them to improve the quality of their products through sustainable, technologically-advanced and up-to-date production and post-harvest practices.
- Urge the government to subsidize the rubber price in the event of downturn of prices to maintain a standard price of rubber and ensure the sustainability of local rubber business and complementary services.
- Strong support to R&D in the development of grassroot and innovative technologies that will enable both the small-scale and medium rubber stakeholders to sustain the activity in the industry.
- Provision of financial support for upgrading of laboratories should include budget for expansion of laboratory space so it can accommodate additional equipment and samples for testing.
- Introduce rubber product industry to rubber producers to come up with a QA/QC system to level off and ensure that local raw rubber is of sufficient quality and quantity.

- Encourage the development of "artisanal" rubber products (not just improving production and quality) to give opportunities to smallholder rubber keepers and local farmers. Currently, rubber is subject to the volatility of prices from market forces. The rubber industry can very well learn from the experiences of cacao when it had turned the tide of unsteady market with preeminence of local chocolate industry. This way too, the testing facilities and services that were established would have direct uses and clients.
- Encourage research and development on innovative rubber products. Standardizing the rubber products for purposes of export might yield marginal benefits due to price volatility. However, the focus should be on the development of value-added materials from rubber as a base material like nanomaterials and nanofibers for smart paper, nanopackaging, coating,

building construction, biomedical, and other sectors owing to their sustainability, durability, cost-effectiveness, renewability, and so on.

- Perform routine resource (re)assessment on behalf of the industry for analyzing current production areas and and site suitability analysis expanding rubber area production. This can be an added service and alternative activity of the personnel testing centers in slack periods (when testing is not done).
- Currently, the Philippines does not have any regulation on the mandatory testing of raw natural rubber. The country should establish a mandatory testing of natural rubber during every stage of its production. The necessary testing for natural rubber enumerated above must be in place to ensure the quality of rubber being produced in the country.

## REFERENCES

(1) Beliczky, L. S. & Fajen J. (n.d). Rubber Industry. Encyclopedia of Occupational Health and Safety. [retrieved from: <http://www.ilocis.org/documents/chpt80e.htm>]

(2) N.a. (n. d). Securing the Future of Philippine Industries. [retrieved from: <http://industry.gov.ph/industry/rubber/>]

(3) DOST-PCIEERD(2012). R&D Agenda for Natural Rubber Industry [retrieved from [http://pcieerd.dost.gov.ph/images/downloads/presentation\\_materials/Rubber\\_RD\\_Agenda\\_for\\_PRIME.pdf](http://pcieerd.dost.gov.ph/images/downloads/presentation_materials/Rubber_RD_Agenda_for_PRIME.pdf)]

(4) N.a. (2016). Zamboanga Region Has Highest Rubber Production in the Philippines. [retrieved from: <https://mindanaoexaminer.com/zamboanga-region-has-highest-rubber-production-in-philippines/>]

(5) ETRMA.(n.d). The General Rubber Goods' Industry, Its Challenges and the Actions needed [retrieved from: <http://www.etrma.org/rubber-goods/grg>]

(6) Factfish.(2016). Philippines: Natural rubber, production quantity (tons) [retrieved from:<http://www.factfish.com/statistic-country/philippines/natural+rubber,+production+quantity>]

(7) Trading Rubber-based products Across Asean and Globally (n.d.) [ retrieved from: <https://www.asean.org/storage/images/2015/October/outreach-document/Edited%20Rubber-based%20Products.pdf>]

(8) Business and Biodiversity Campaign (n.d.) Sustainable Rubber. [retrieved from: <https://www.business-biodiversity.eu/en/natural-rubber>]

(9) R.A. 10089 "Philippine Rubber Research Institute Act of 2010. May 13, 2010. [retrieved from: <https://www.officialgazette.gov.ph/2010/05/13/republic-act-no-10089>]

(10) Alan N. Gent (n.d.) Rubber, Chemical Compound. Encyclopedia Britannica. [retrieved from: <https://www.britannica.com/science/rubber-chemical-compound/Tapping-and-coagulation>]

(11) Craig Freudenrich (n.d) How Rubber Works. How stuff works. [Retrieved from: <https://science.howstuffworks.com/rubber.htm>]

(12) Philippine Rubber Technical Working Group (PhiRubber). Philippine Rubber Industry Roadmap 2017-2022. Zamboanga City: DTI Region IX.

(13) Forest Management Bureau. Specifications/standards for NGP's High Value Crops: Cacao, Coffee and Rubber. [Technical Bulletin No. 4]. Quezon City: Forest Management Bureau, Department of Environment and Natural Resources.

(14) Philippine Council for Agriculture and Fisheries (2019). Rubber Stakeholders' Summit opens door for gov't support, linkages, new ideas. Retrieved from <http://www.pcaf.da.gov.ph/index.php/2019/10/16/rubber-stakeholders-summit-opens-door-for-govt-support-linkages-new-ideas/>

(15) Saha, M. (2018 Nov). Personal Interview.

(16) Laviña, E. G. (2019, September). National Rubber Summit. Kidapawan City.

### Disclaimer:

This policy brief is solely based on the results of the study conducted in relation to the program implemented by DOST-PCIEERD. It should be noted that this document is being published for comments on its substantive merit and policy implications. This will help the government to formulate well-considered and transparent policy decisions.

*Acknowledgements: Dr. Martin Wee (Director, Dost-IX), Ms. Rosemarie S. Salazar (Project Leader), Ms. Sonora L. Buñag (Asst. Project Leader, DOST-IX), Mr. Shadam E. Sukanob and Mr. Ruber M. Lim (Project Staff, DOST-IX), Engr. Adelaida G. Senica (Project Leader DOST-ITDI), Engr. Ner C. Rodriguez, ( Project Leader Coordinator, DOST-ITDI), Dr. Sitti Amina M. Jain (Rubber TWG Member/DTI-IX Director), Engr. Niñaliza Escorial (Chief SRS, PCIEERD), Ms. Mary Grace Buenavides, Ms. Kristina Paula Anacleto, and Ms. Bianca Ignacio (ITDD-PCIEERD), Mr. Bang Hwan Choi (CTK Asia Rubber Corp.), Elmer D. Ladiero (Tire King & Rubber Products Inc.)*

## PCIEERD POLICY BRIEF

highlights PCIEERD's stance on policy issues related to industry, energy and emerging technology sectors through the coordination of the Policy Unit and the PCIEERD Technical Working Group for Policy Review and Development

**For more information, please contact:**

**Policy Coordination and Monitoring Division (PCMD)  
Philippine Council for Industry, Energy and Emerging Technology  
Research and Development (PCIEERD)  
Department of Science and Technology (DOST)  
4th & 5th Floor, Science Heritage Building  
DOST Compound, Gen. Santos Avenue  
Bicutan, Taguig City 1631  
Tel. Nos.: 63 (2) 837-2071 to 82 loc. 2107  
Website : [www.pcieerd.dost.gov.ph](http://www.pcieerd.dost.gov.ph)**

**Dr. Enrico C. Paringit  
Executive Director, DOST-PCIEERD**

**Ms. Grace F. Estillore  
Chief SRS, PCMD**

**Technical Writers:**

**Ulysses M. Palmones  
Sofia Annella G. Wenceslao  
Jenny M. Malificio**