R&D AGENDA for the Natural Rubber Industry

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September 19, 2012, Clark, Pampanga

Philippine Council for Industry, Energy and Emerging Technology Research and Development (PCIEERD)

Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development (PCAARRD)
Rubber R&D Working Group

- Philippine Council for Industry, Energy, Emerging Technology Research and Development (PCIEERD)
- Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development (PCAARRD)
- PCAARRD R&D Network of Implementers
- Forest Products Research and Development Institute (FPRDI)
- Industry Technology Development Institute (ITDI)
- Metals Industry Research and Development Center (MIRDC)
- Dept. of Trade and Industry Region IX
- Dept. of Trade and Industry ARMM
- Department of Agriculture Region IX
- Bureau of Agricultural Research (DA-BAR)
- Mapua Institute of Technology
- UP Institute of Chemistry
- UP Chemical Engineering Department
- Philippine Rubber Industry Association (PRIA)
Vision 2020

By 2020, The Philippine Rubber Industry shall already be a competitive player supported by:

**Upstream (Production & Processing):**
- Productive farms and efficient supply chain
- Accredited testing facilities
- Sufficient supply of quality natural rubber

**Downstream (Manufacturing):**
- Products w/ improved/new features and properties
- Competent manpower and research units dedicated to rubber technologies
Rubber manufacturing

Natural Rubber Processing

Natural Rubber Production
Rubber manufacturing

Natural Rubber Processing

Natural Rubber Production

Auto/Industrial
Tires
Footwear
Latex-based

Manpower/skills
Knowledge/technologies

Improved facilities/technologies

Support systems (testing services)

Support systems (testing services)

Low productivity
Lack of planting materials

Pests & Diseases

Manpower/skills
Knowledge/technologies
Natural Rubber Production

Issues/Constraints

- Low productivity due to senile/aging trees
- Poor harvesting/tapping procedure
- Poor coagulation due to use of strong acid (battery solution)
- Adulteration of raw rubber products by smallholders
- No price premium for good quality rubber
Natural Rubber Production

Issues/Constraints

- Lack of investments for the establishment of budwood garden
- Lack of available seeds/planting materials

Low productivity  Lack of planting materials  Pests & Diseases
Natural Rubber Production

Issues/Constraints

- Root diseases (white, brown, red) usually manifest as early as 6 months after planting. Leaf disease caused by fungus
- Trunk disease - bark necrosis, black stripe, mouldy rot, pink disease, & pot cancer
- Presence of diseases caused by fungus as early as 1-2 months old seedlings, (root & leaf diseases)
S & T Interventions

**Proposed R & D Initiatives**

- Validation of varietal integrity of promising clones through DNA fingerprinting

- Clonal evaluation/ multi-location trial of 20 promising rubber clones

- Adaptability trial of mini budded seedling

- Development of efficient & reliable protocol for rapid mass propagation using micro cuttings

**Quality planting materials**
S & T Interventions

Nutrient improvement for rubber

Proposed R & D Initiatives

Response of newly established rubber clones to kind, frequency and rate of fertilization (synthetic, organic and its combination)
S & T Interventions

Proposed R & D Initiatives

Development of control measures for diseases causing reduction in yield

Physiological & biochemical factors affecting Tapping Panel Dryness

Reduction of disease incidence
Proposed R & D Initiatives

Evaluation and identification of appropriate multi- and inter-cropping systems for newly planted and existing plantations
S & T Interventions

Proposed R & D Initiatives

Establishment of GIS based suitability map for Zampen, DavSur, Caraga and Palawan

Agro-ecological suitability map for rubber production
S&T Interventions

Proposed R & D Initiatives

Comparative evaluation of traditional & introduced latex harvesting system

Packaging of ready to use formic acid formulation as rubber coagulant

Good quality semi-processed rubber
S & T Interventions

**Proposed Policy, Technology Transfer and Capability Building**

Documentation, technology transfer & promotion of standard practices for nursery and plantation management and post harvest handling

Supply chain analysis and impact assessment studies on rubber

Assessment of the efficiency & effectiveness of licensing budders, tappers and nursery accreditation

Training on nursery and plantation management and post harvest handling

Upgrading of Phil. Rubber Testing Center
Natural Rubber Processing

- Improved facilities/technologies
- Capability/skills
- Support systems (testing services)

Issues/Constraints
- Management capabilities (smallholders)
- Attitude and skills of tappers
- Widespread use of strong acid for cup lumps/blocks
Natural Rubber Processing

- Improved facilities/technologies
- Capability/skills
- Support systems (testing services)

Issues/Constraints
- Poor quality rubber
- Poor sanitary and safety conditions
- Low level of wood utilization from senile trees
Natural Rubber Processing

- Improved facilities/technologies
- Capability/skills
- Support systems (testing services)

Issues/Constraints
- Lack of accredited testing labs
- Lack of personnel trained in testing
- Awareness of existing standards
S & T Interventions

**Proposed R & D Initiatives**

- Upgrading and Accreditation of laboratories in strategic areas
  - Establishment of Reference Laboratory for rubber
- Training and Proficiency Program for Laboratory Personnel
- Local and international accreditation for testing labs

Accredited Testing Laboratories
DOST REGIONAL OFFICES

IX – 14 processors @28,500MT/year
24 traders/exporters
21 farmers’ coops
18,515 smallholders

ARMM –
10 processors @2,435MT/year
15 farmers’ coops
9,742 smallholders

XII – 9 processors
5 traders/exporters
9 farmers’ coops
10,378 smallholders

XIII – 3 farmers’ associations

X – ___processors

XI – ___processors
**Proposed R & D Initiatives**

- Improvement in the processing and effluent treatment systems thru SETUP Program
- Processing technology for producing latex-based products using concentrate
- Biotechnology for reducing extractable proteins in natural rubber
Proposed R & D Initiatives

Globally competitive furniture and handicraft from rubber wood

Lumber drying facility in Mindanao

Best sawmilling practice

Utilization of rubber latex waste protein as binder for densified fuel

Increased wood utilization

S & T Interventions
S & T Interventions

**Proposed Projects on Policy and Training**

Benchmarking and compilation of best practices and critical technologies including effects of cultural practices, cost effective processing technologies and waste management technologies

Study on the social and technical barriers on the innovation capacity of the Phil rubber industry

Information and technology dissemination, training and appropriation of experts (Balik-Scientist Program)

Information dissemination/ capacity building for SUCs and processors esp. smallholders
Rubber manufacturing

Manpower/skills
- Knowledge/technologies

Support systems (testing services)

Issues/Constraints
- Lack of manpower trained in rubber (graduates)
- No specific course/curriculum for rubber
- Lack of researchers/experts working on rubber
Rubber manufacturing

Manpower/skills

Knowledge/technologies

Support systems (testing services)

Issues/Constraints

• Lack of innovative product design/improved formulation
• Lack of substitute materials for imported auxiliary chemicals
• Lack of environment friendly technologies and recycling techniques
• Lack of innovations in process engineering
Issues/ Constraints

- Low awareness of testing lab for rubber products
- Some test requirements are not available in the country (flammability, rubber permeation tests, etc.)
S & T Interventions

**Proposed R & D Initiatives**

Development of Technical courses/training modules on rubber technology c/o private universities (MIT)

Trainers’ training (chem/chem engg) w/ CHED, Lead: MIT, PRIA

Industry-University partner research system c/o the ERDT thru the Visiting Professors Program

Appropriation of experts for product formulation and testing (Balik-Scientist Program)

Pool of graduates/technical experts on rubber
S & T Interventions

Proposed R & D Initiatives

Industry-University partner research system for the development of formulations for identified rubber products in the following areas: Automotive, industrial, Tires, Footwear, Latex-based

Development of new formulations using nanomaterials

Development of new commercially viable modified natural rubbers and specialty rubber for eco-friendly applications ex ‘green tires’

Research on substitute raw materials (fillers, etc)

Innovation in process engineering and equipment design (increased efficiency, cost effective, tool & die)

Innovative rubber products
Proposed R & D Initiatives

Expansion of rubber products testing services at ITDI

MOA with PRIA and ITDI for the existing testing services

Local and international accreditation for testing services

Accredited Testing Lab for rubber products
Targeted Industry Outcomes for Rubber
Network of Implementers
NATIONAL RUBBER R&D PROGRAM 2012-2020

Region 9
WMSU, DA-ZAMPIARC, JRMSU, LGU DOST 9

Region 4
FPRDI
DA RFU IV-B

Region 13
DA- CARIARC, LGU DOST-CARAGA

Region 11
DA-SMIARC, LGU DOST 11

Region 12
USM, SKSU, CFCST, DA-CEMIARC, LGU, PLGU-North Cotabato
DOST 12

Region 10
MSU-IIT CMU DOST 10

NCR
DA-ATI ITDI ERDTT Network

Region 10
MSU-IIT CMU DOST 10
Let us work together for a globally competitive Philippine Rubber Industry