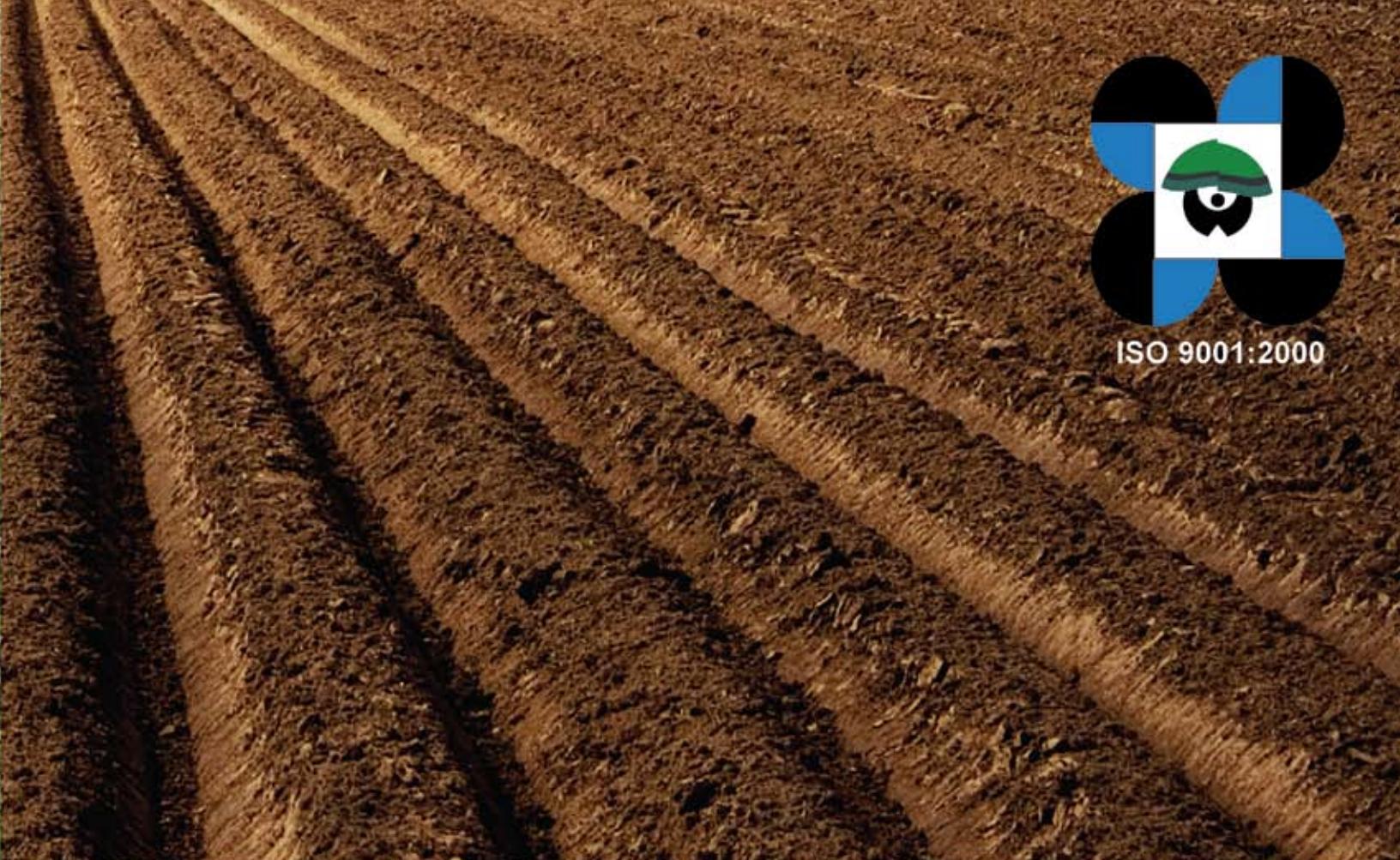




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PCARRD ANNUAL REPORT  
**2007**



# PCARRD ANNUAL REPORT 2007

Philippine Council for Agriculture, Forestry and Natural Resources Research and Development (PCARRD)  
Department of Science and Technology (DOST)  
Los Baños, Laguna 2008

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## About PCARRD-DOST

**The Philippine Council for Agriculture, Forestry and Natural Resources Research and Development (PCARRD)** is a sectoral council under the **Department of Science and Technology (DOST)**.

Established in 1972, PCARRD formulates policies, plans, and programs for science and technology-based development in the agriculture, forestry, and natural resources (AFNR) sectors. It coordinates, evaluates, and monitors the national research and development (R&D) efforts in AFNR. It also allocates government and external funds for R&D and generates resources to support its programs.

The first DOST council to be stamped with an ISO 9001:2000 certification for its quality management system, PCARRD is engaged in active partnerships with international, regional, and national organizations and funding institutions for joint R&D, human resource development and training, technical assistance, and exchange of scientists, information, and technologies.

The Council supports and manages the National Agriculture and Resources Research and Development Network (NARRDN), composed of national multi- and single-commodity and regional R&D centers, cooperating stations, and specialized agencies. As such, PCARRD has been a potent arm in catalyzing the Philippine AFNR sectors toward self-sufficiency and global competitiveness.

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## Message from DOST Secretary



The Department of Science and Technology (DOST) has been working to ensure that science and technology (S&T) activities in the country are in support of national development priorities. PCARRD, as an attached agency of the Department, has been making positive gains in this aspect by providing leadership and direction in S&T activities in the agriculture, forestry and natural resources (AFNR) sectors.

Through PCARRD's catalytic efforts, the year witnessed greater involvement of partners and AFNR stakeholders from various fronts.

It gives us great pleasure to know that S&T activities have been gaining broad-based interest and support. With this, we see a very promising paradigm for a sustainable innovation system in AFNR—a paradigm anchored on the spirit of complementation.

The Department congratulates PCARRD for its accomplishments and confidently looks forward to yet another fruitful year with the momentum gained on further enhancing the contribution of the S&T to the Filipino quality of life.

  
**ESTRELLA F. ALABASTRO**  
**Secretary**

## Foreword

For PCARRD, 2007 has been another remarkable year—a year filled with positive actions and significant strides in the agriculture, forestry and natural resources (AFNR) sectors.

We have documented the impacts of our lasting partnerships in the generation and dissemination of science and technology (S&T) products and services. The hard work and dedication we've put in together with our partners have begun to bear fruits.



Truly remarkable is the significant increase in participation of various AFNR stakeholders. Through our synergies with partners from the academe, government, nongovernment, private sector, and partners at the grassroots, the innovation system in AFNR has gained new vibrancy to buttress the country's bid for development.

We can say 2007 has been a year dedicated to innovation and partnerships. So let this report be our tribute—a memento of what can be achieved with S&T and the rich interplay of people and institutions that nurture it.



**PATRICIO S. FAYLON**  
**Executive Director**

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# EXECUTIVE SUMMARY

The Philippines faces a new set of hurdles as economic, political, and social landscapes change. Having strong implications not only in the economy but also in the human dimensions of development, these changes bring new imperatives for growth in the agriculture, forestry, and natural resources (AFNR) sectors.

Ever steadfast in meeting these imperatives, the Philippine Council for Agriculture, Forestry and Natural Resources Research and Development (PCARRD) builds on partnerships and innovations to nurture a vibrant National Innovation System (NIS). The accomplishments of PCARRD and its partners for the year 2007 attest to the strength of science and technology (S&T) and the combined efforts of people and institutions in AFNR.

A number of policy innovations were approved to enhance the management of the research and development (R&D) consortia, S&T agenda setting, Techno Gabay Program (TGP), human resource development, and S&T governance. The involvement of partner member agencies (PMA) in TGP has further mainstreamed the program at the regional, provincial, and field levels. In relation to technology management, the Council collaborated with policy makers, media, and other stakeholders in pushing for the proposed Technology Transfer Bill, now Senate Bill 1721 and House Bill 3270.

The participation of stakeholders, their capacitation and the accessibility of adequate resources for S&T activities, enabled a sustained innovation process in AFNR. Training programs on project proposal formulation and packaging, research design, and data analysis and interpretation, among others, were conducted. Linkages with international and local partners channeled more than P100 million to S&T activities this year. These meant more R&D programs and capability-building initiatives for AFNR.

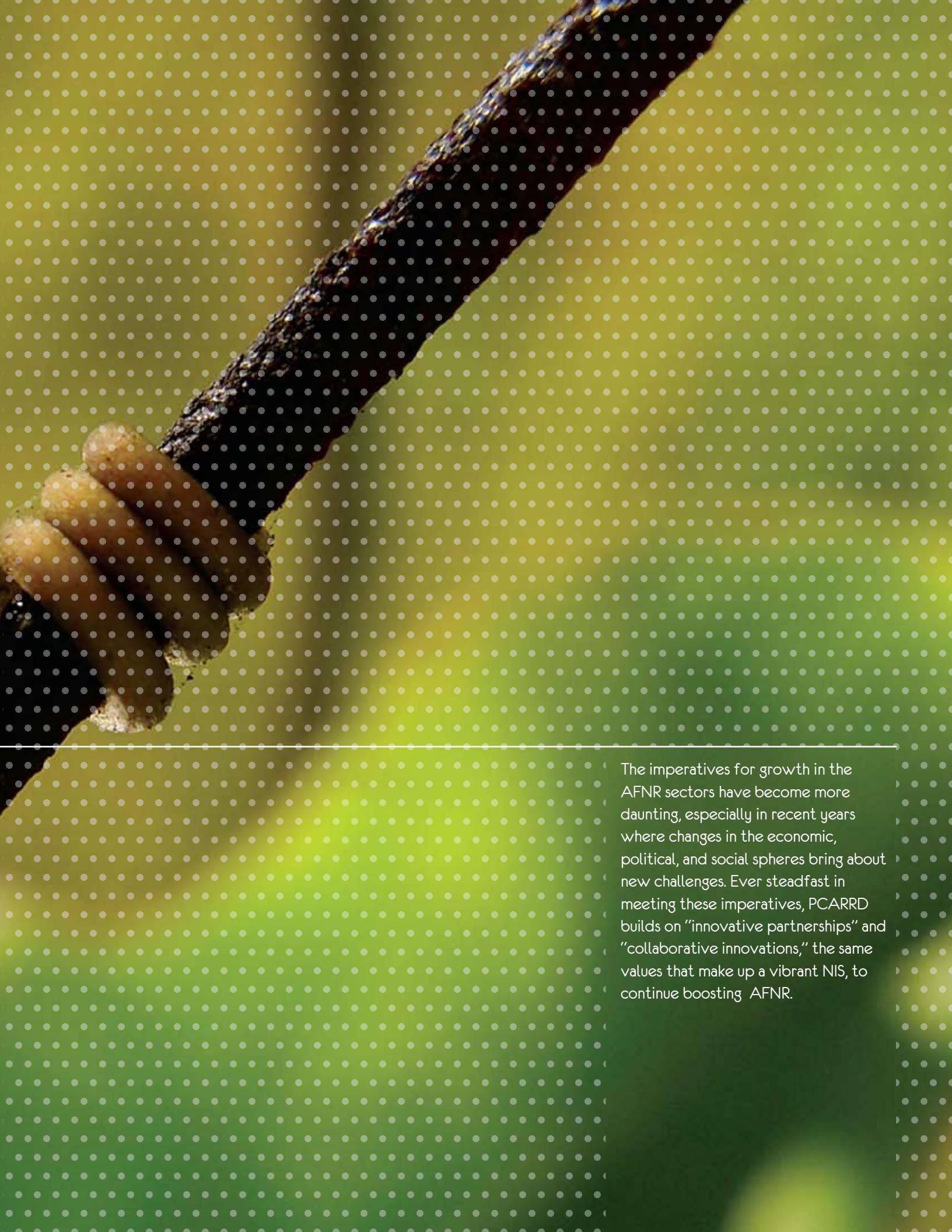
It has been a remarkable year for the TGP, with its documented impacts in the farming communities through the Farmers' Information and Technology Services (FITS) Centers and Magsasaka Siyentista (MS). The links between S&T activities and development is now more definite.

To continue nurturing the innovation process and the synergies that make it work, PCARRD embarked on several performance innovations. It renewed a corporate culture of quality improvement -- from performance evaluation and planning down to budgeting and resource utilization. It encouraged greater stakeholder involvement in organizational improvement through its customer satisfaction feedback mechanism and stakeholder/partner survey.

In the coming years, innovations and partnerships will continue to fuel PCARRD's bid for a more competitive AFNR. Such will be carried out with strong corporate commitment and will be guided by strategic policy directions. PCARRD will further infuse the TGP to the grassroots; mainstream value chain assessments and impact studies in its operations; strengthen its monitoring and evaluation system; and continually improve performance quality.



# INTRODUCTION



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The imperatives for growth in the AFNR sectors have become more daunting, especially in recent years where changes in the economic, political, and social spheres bring about new challenges. Ever steadfast in meeting these imperatives, PCARRD builds on “innovative partnerships” and “collaborative innovations,” the same values that make up a vibrant NIS, to continue boosting AFNR.

## PCARRD builds on “innovative partnerships” and “collaborative innovations”

The NIS is central to the development and sustained delivery of S&T-based solutions. Innovations, whether technological, policy, or organizational, address barriers to a sustainable AFNR, while partnerships make innovations happen, and stimulate their uptake.

However, fragmentation of efforts and the absence of an overall framework for collaboration are

harsh facts in the Philippine NIS. The need for synergies – combining of resources, capabilities, and experiences among various NIS actors is essential in order to begin a paradigm shift.

Recognizing this, PCARRD pursues knowledge and technology generation along with the stalwarts of S&T. Within its immediate network of 132 implementing

agencies collectively known as the National Agriculture and Resources Research and Development Network (NARRDN), 14 regional R&D consortia, local government units (LGU), and partner farmers. PCARRD bonds people and institutions together to develop S&T products and services, and establishes the channels for technological change. In the same way as the national system works, international partners provide



tremendous support to the NIS. They bring new knowledge and additional resources for a sustained innovation process.

Significantly, the accomplishments of the year 2007 happened with the contributions of the various stakeholders in agriculture and were anchored on a systems approach to expand the reach of S&T. These accomplishments are results of the institutional, policy, and technological innovations and the synergies that created them.

To continue nurturing the innovation process and the synergies that make it work, PCARRD embarked on improving its organizational performance. Specifically, it has been evaluating its performance in terms of service delivery and the attainment of major final outputs on S&T policy services, R&D management services, and technology commercialization services.





# INFLUENCING THE PUBLIC: THE S&T POLICY SERVICES

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Cultivating an enabling S&T policy environment is a critical part of PCARRD's overall efforts. Hence, it has dedicated time and expertise to policy innovations in areas such as corporate operations and collaborative arrangements with the regional R&D consortia and their PMAs, the legislative branch of government, national and local government units (LGUs), nongovernment organizations (NGO), and the private sector. At PCARRD, each policy innovation represents a meeting of minds among in-house and external think tanks representing various segments of society. Hence, co-ownership is an intrinsic feature of each policy reform.

Most of the policies approved for the year relate to R&D consortia management and significantly address the S&T agenda setting, Techno Gabay Program (TGP), human resource development, incentive scheme, and governance.

PCARRD's highest policy-making body, the Governing Council (GC), has forwarded six significant policy initiatives; the most important of which is on increasing the approving authority of the PCARRD Executive Director from P1 million to P5 million on a per project basis.

The Directors' Council (DC), on the other hand, deliberated on 22 policies, guidelines, strategies, and plans; 18 of which were approved. The policies and guidelines covered the implementation of TGP and internal policies on governance, such as revisions of the guidelines on evaluation of R&D awards grants and the search for the most outstanding employee. The DC also approved the PCARRD communication plan and the action plan for the implementation of the Biofuels Act.

The GC also approved eight new R&D projects under the following sectors: livestock (2), crops (2), socioeconomics (1), forestry and environment (2), and agricultural resources management (1). The DC, on the other hand, discussed and approved/recommended to the GC 10 out of 18 projects presented. The DC, within their authority, approved four projects in livestock (1), socioeconomics (1), and crops (2).

### **Partner member agency and other new policies for collaboration at the local level**



Specific to TGP is the implementation of the PMA scheme through the tapping of member agencies of the consortium as partners of the FITS or Techno Pinoy centers.

The PMAs, therefore, will provide R&D-based technologies as needed by the FITS centers. This mechanism will help accelerate institutionalization of TGP at

the regional, provincial, and field levels through its integration in the extension programs of the partner member agencies. It will ensure sustained supply of research-based information and technical assistance support to FITS centers. In the same way as the PMA scheme is seen to enhance collaboration at the local level, another course of action has been initiated with the conduct of the technology field day.

The technology field day supports the implementation of the S&T-based farms projects. The field day showcases the successful application of S&T interventions in terms of improving productivity and increasing income of the MS. Through this



modality, farmers who have witnessed and have been inspired by the social, technical, and economic viability of the interventions are expected to duplicate/practice the same in their own farms. This activity also encourages support, cooperation, and partnership with the LGU and other officials from government, NGOs, and the private sector.

Guidelines on the conduct of the technology field day of the Techno Gabay S&T-based farms were formulated to provide the mechanics and spell out the responsibilities of participating agencies/personnel, such as the consortia, PMAs, FITS centers, and MS.



## Communicating with policy makers: A concerted effort

Approval in Congress of parallel bills on technology transfer, Senate Bill 1721 and House Bill 3270, is the object of a concerted and vigorous advocacy and awareness campaign by the Department of Science and Technology (DOST).

The PCARRD-led DOST Technical Working Committee (TWC) on Technology Transfer continuously links and networks with policy makers, media, and other stakeholders to campaign for the enactment of the bill.

The bill has unique features not found in current laws related to technology transfer such as the Intellectual Property (IP) Code and Magna Carta for S&T Workers. First, it harmonizes all technology transfer efforts by various national agencies. Second, it promotes intellectual property rights (IPR) culture in the S&T community that will eventually speed up the transfer and commercialization of innovations. Third, it encourages further innovation, as the research and development institutions (RDI) are vested with the ownership of the technologies they generated; manage these technologies through provision of IPR protection; and ensure that these are transferred to industry and properly commercialized.

Giving protection provides a venue through which the technologies are made available to industry. Economic gains in the form of royalties from licensing these technologies to industry will inspire the RDIs to generate highly commericalizable technologies, henceforth bringing more technologies to the public. More than anything else however, the initiative will create job opportunities, as more industry-driven technologies are being developed and commercialized; and promote productivity growth and economic development in the country.

In support of the advocacy and awareness campaign, the TWC's Information, Education and Communications (IEC) Group spearheads a multimedia communication campaign to create awareness on the merits of the bill among the stakeholders. The group, the first of its kind in DOST, is composed of communications specialists from DOST sectoral councils that includes PCARRD.





## Managing the network's intellectual property

To strengthen technology management support services, technical assistance on IP management was extended to three agencies, namely: Benguet State University (BSU), Philippine Sugar Research Institute (PHILSURIN), and Bicol University (BU). These agencies had their IPR policy statements approved by their respective boards/management.

Two projects of BSU were subjected to IP audit – integrated pest management in chrysanthemum and mushroom bagging technologies. From these, the following technologies were identified for patent application: a) stress/shock treatments for Pleurotus spawns and growing bags to increase mushroom yield and b) stress/shock treatments for Lentinula spawns and growing bags to increase mushroom.

For 2007, patent applications were filed for nine technologies after comprehensive project reviews and IP audits. Six of these are IPs derived from the project “Gene discovery of coconut” and one from the project “Utilization of plant growth-promoting bacteria in vegetable production and propagation of ornamentals,” both of which are implemented by the University of the Philippines Los Baños (UPLB) and funded by DOST-PCARRD. The other two patents were derived from the PHILSURIN project, “Development of microbial inoculant for sugarcane.”

Also, 11 technology disclosures were drafted during the IP Management Training Cum Writeshop on Technology Disclosure and Claim Drafting held in August. The researchers and project leaders prepared their work plans for the disclosures to be submitted to their respective mother agencies and PCARRD so that application for the protection of these technologies can be filed.



JOINT INVESTMENTS  

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IN GENERATING S&T SOLUTIONS

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The participation of stakeholders in the AFNR sectors and the accessibility of adequate resources for S&T activities are among the keys to enabling and sustaining a culture of innovation. PCARRD catalyzes the generation of new knowledge and technologies by bringing together people, institutions, and stakeholders to pool individual and institutional strengths, expertise and resources. Thus, for this year as in previous years, joint S&T investments from strategic partnerships and alliances still remains PCARRD's effective mechanism for providing S&T solutions.

## S&T Anchor Program for Philippine Native Chicken

With the partnership of R&D institutions in Region 6 led by the West Visayas State University, an organized production of day-old and hardened chicks was developed through their S&T Anchor Program for Philippine Native Chicken. The program succeeded in achieving uniformity in the physical characteristics and predictability in production performance and product quality of the 'darag.' It has also established the physico-chemical basis for the unique taste and flavor of its meat. Hence, from a mongrel fowl, darag is now a candidate for recognition as a distinct breed of chicken.

These initial R&D outputs also gave way to an alternative livelihood to the rural poor while transforming traditional native chicken production into a viable enterprise. Today, many rural farmers in Region 6 have realized the benefits of the science-based interventions on the darag chicken and have generated income from it. To date, more than 8,098 hardened chicks have been produced in Iloilo with improved quality and productivity through the S&T anchor program. Small native chicken hatcheries that produced highly uniform darag chicks were established in the provinces of Aklan, Capiz, and Negros Occidental. These ensure a stable supply of slaughter

native chickens of predictable quality.

At present, there is an increasing demand for slaughter native chickens. Moreover, several native chicken-based investment options for overseas Filipino workers (OFW), balikbayans, and retirees have been crafted, creating interest not only in that sector but also encouraging other LGUs and R&D institutions to invest their resources in native chicken development.



## Rehabilitating calamity-stricken areas

Joining hands through the project "Developing and testing a modality for rehabilitation of calamity-stricken areas", the UPLB-Agricultural Systems Cluster, the Social Action Center (SAC) of the Prelature of Infanta, LGUs, PCARRD, and local communities are helping Barangay Boboin, a farming community in Infanta, to recover from the extensive damages and losses wrought by landslides, mudflows, and floods in November 2004.

The project implementors approached the problem using PRO-ACT or Partnership for Rehabilitation of the Agricultural Systems of Calamity-Stricken Areas. The multistakeholder partnership builds collaborative undertakings with defined roles and responsibilities in implementing people-centered rehabilitation and restoration of damaged ecosystems and traumatized communities based on results of scientific knowledge and strategic alliances. The following S&T interventions were implemented: establishment of learning/demo farms where crop production technologies are tested and imparted to farmers through participatory mechanism; conduct of capacity-building activities through training, cross-visits, and educational tours; development and dissemination of IEC materials; and strengthening of the Barangay Agriculture and Fisheries



Council (BAFC) to serve as the local coordinating unit for barangay activities.

Farmers were trained on assessing and increasing soil fertility; compost making; and cultivating rice, corn, watermelon, and vegetables. Learning fields/farms managed by farmers were set up to give them the experience in crop production using the recommended package of technologies. The yields of corn ranged from 0.73 t/ha to 3.9 t/ha, while those of peanut were 1.8 t/ha to 2.45 t/ha. SAC provided the needed production inputs. Field days coincided with harvest of rice, upland corn, peanut, and hybrid and glutinous rice. Cross-visits to other farms in Laguna and a study tour to vegetable farms in Benguet were conducted. IEC materials on upland rice and compost production were prepared, collected, and distributed. The community put together a rehabilitation and development plan, which was modified when needed. BAFC actively participated in the project implementation and assumed the coordination of activities in the

area. It is envisioned that the BAFC shall continue the work that the project has started.

Results of farm interventions prompted the farmers to form clusters based on crops grown, such as lowland and upland rice and vegetables. Farmers and their partners prepared the plans and assessed farm operations.

Networking and linkage were facilitated through various means. Seeds were procured from the existing networks of PCARRD



## Tissue or clonal propagation using callus-derived plantlets of *Nepenthes truncata*

and UPLB. The UPLB Agricultural Mechanization Development Program lent its corn sheller and also provided technical assistance. The shelled corn was marketed through the SAC network. In addition to giving inputs and technical assistance to the learning farms, SAC provided loans to enable farmers to buy fertilizer and fund other production services (such as land preparation) for lowland rice.

More than a year after the project started, about 80% of the damaged farms in Infanta have been cleared and are now planted to various crops such as lowland and upland rice, corn, vegetables (watermelon, melon, eggplant, squash, bitter gourd, stringbean, peanut, and mungbean), and fruit trees. Through the trials conducted in the project site, the planting of yellow corn and watermelon was promoted in other barangays of Infanta and General Nakar. In these towns, corn was planted in 27-ha of farmland. In Boboin, 5.5 ha were planted to watermelon and 4.5 ha of other vegetables were established.



With the growing international market for pitcher plants, the Philippines can benefit from developing the technologies for propagation, breeding, and cultivation of this carnivorous plant.

Thus, the researchers from the University of the Philippines Mindanao developed methods for producing *N. truncata* plantlets through in vitro germination of seeds collected from the wild in alternative media, callus induction using in vitro seedling derived tissue explants, plantlet regeneration from calli, and in vitro cutting propagation.

A major problem in propagating *N. truncata* is the difficulty of germinating seeds. Large-scale propagation requires tissue or clonal propagation techniques that are faster and less costly.

Explants from shoot tips, nodes, roots, and leaves produced the most calli. Using different combinations of naphthaleneacetic acid and thidiazuron (plant growth regulators), plant cell clones (callus) were successfully produced. Rapid propagation through callus induction was found suitable for commercial and conservation purposes. Mass clonal propagation using explants from stored germplasm can also be done.



The tissue-cultured plants were acclimatized in the Bureau of Plant



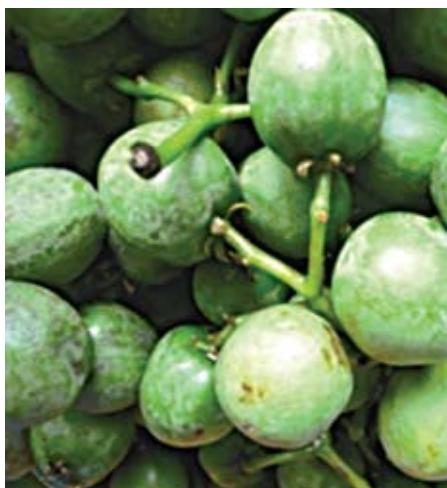
Industry (BPI) greenhouse. The best potting mix was a combination of sphagnum moss, osmunda fiber, and charcoaled rice hull.

The researchers suggested refining the propagation method and increasing the number of replicates in future experiments to increase the reliability of findings.

In partnership with UP Mindanao, PCARRD promotes the in vitro propagation of this plant to lessen the pressure on the species in the wild.

## Integrated R&D program on *Jatropha curcas* ('Tubang bakod') for biodiesel

The Integrated R&D Program on *Jatropha curcas L.* (Tubang bakod) for Biodiesel is part of the National Biofuel Program crafted through the coordination of PCARRD and UPLB in 2006. The program is the agencies' contribution to the implementation of the Biofuels Act of 2006, mandating concerned research agencies in the country to develop sustainable, reliable, indigenous, renewable, and biodegradable fuel alternatives. The program focuses on germplasm management, varietal improvement, seed technology, and development of component technologies for *Jatropha* in various production systems.



The program further focuses on the development of farming system models integrating *Jatropha* in various production systems, development of postproduction machinery for *Jatropha curcas L.*, and process and

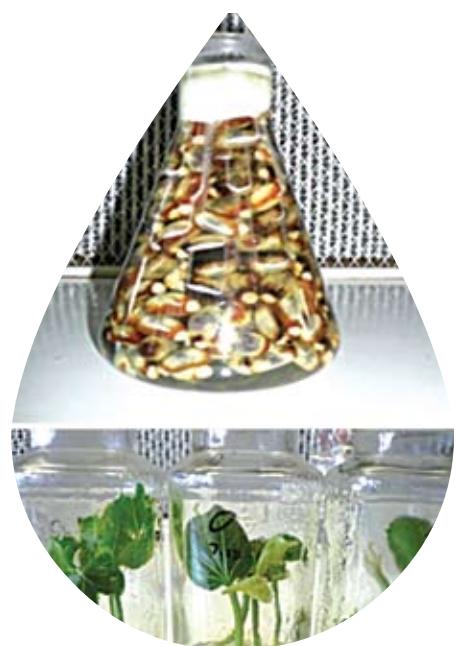
equipment development for the production of esterified *Jatropha curcas* oil.

Through the program, researchers have identified 13 accessions of *Jatropha* with potential based on selected on-site morphological and oil characteristics. Accessions with high percent oil content, low free fatty acids, and high sterol/steryl ester were considered promising. The yield performance of the identified potential varieties will be validated from the mature plants currently planted at the UPLB field genebank. By the end of 2008, the researchers hope to narrow down the accessions to the top three potential species based on morphological and oil characteristics. So far, mites, thrips, and scale insects have been identified as some of the common pests associated with *Jatropha* species. On the other hand, diseases observed were damping-off, root and stem rot of seedlings, and leaf spots of standing trees.

UPLB implements the program in collaboration with the Central Luzon State University, Department of Environment and Natural Resources (DENR), LGUs, state colleges and universities (SCU), Department of Agriculture (DA), Philippine Chamber of Mines, Department of Energy, and Commission on Higher Education (CHED). Three component projects

are funded by the Philippine National Oil Compay - Alternative Fuel Corporation, while the other two component projects are funded by the DOST. The program began in July 2007.

CHED, through the Philippine Forest Corporation, has likewise funded the establishment of at least 10 ha nurseries and trial plantations in 17 SCUs. They will also conduct provenance trials. To date, plantations covering a total of 153.3 ha have been established by the 17 SCUs, while 746 ha were established by private/corporate companies.



## Nursery and plantation establishment of natural dye yielding plants in Aklan



An intensive study of natural dye-yielding plants in Aklan was implemented to provide farmers with appropriate technologies to effectively manage and develop natural dye plantations. The established 5 ha natural dye plantations for annatto/achuete, malatayum, sibukao, and luyang dilaw at Barangay Castillo, Makato, Aklan will eventually serve as a steady source of raw materials for the Common Dyeing Service Facility (CDSF) being managed and operated by the Aklan State University (ASU). Moreover, with the technical assistance from the Philippine Textile Research Institute for improving dye quantity and yield from these different dye sources, ASU's CDSF can now provide better service to its clients. As such, the initial linkages with its clients within Aklan and Metro Manila are undoubtedly sustained. Through a better understanding and appreciation of the cultural management and utilization potentials of these dye plants, this DOST-funded project had created a better market niche for Aklan's famous natural fabrics (piña, piña-seda, and abaca) and propelled the region's export industry through the production of high-value products.

## Institutionalizing forest certification in support of the furniture and handicraft industry

Under the PCARRD-funded Furniture and Handicraft R&D Program, the initial steps for forest certification in the country have been done through the project "Institutionalizing forest certification in support of the furniture and handicraft industry."

The initiative coincides with intense competition and strict quality requirements (such as forest certification) in the world market such that Philippine furniture and handicraft suppliers find it difficult to compete.

The project is implemented by researchers from the UPLB-College of Forestry and Natural Resources (CFNR). They conducted a series of workshops to orient the stakeholders on forest certification, its institutionalization in other countries, and its links to sustainable forest management.

Various stakeholders signified their interest to share resources and expertise to institutionalize forest certification in Region 13; thus, sustaining quality supply of raw materials for the furniture and handicraft industry.

A perception survey conducted to assess the extent of familiarity of the stakeholders with sustainable forest management and forest certification showed that stakeholders have a

good grasp of forest certification and sustainable forest management.

Through this project, a forest certification working group has laid down concrete plans towards institutionalization of forest certification. Also, the group conducted a strength, weakness, opportunities, and threats (SWOT) analysis to guide their planning. The SWOT analysis showed that stakeholders need to acquire legitimacy in order to be more effective. Thus, the project assisted the working group to get a mandate from the Caraga Regional Development Council.

Stakeholders also finalized a list of criteria and indicators for certifying forest plantations. This is expected to expedite the process of institutionalizing forest certification because the identified criteria and indicators closely correspond to the requirements of accrediting bodies like the Forest Stewardship Council.

A working group created thru the project pursued the development of a forest certification scheme for the CARAGA Region. Among the important recommendations is the dissemination to concerned agencies/stakeholders of the importance of forest certification. Likewise, the project also recommended including the other stakeholders such as those

not initially consulted by the project like peoples' organizations and church groups.

The lessons and experiences from this project will help future efforts in setting up a national forest certification program.



## Management and decision support system for smallhold plantation



Through the component project of the Furniture and Handicraft Program implemented by UPLB-CFNR, a model was developed by which information technology-based decision support system (DSS) can help improve the production processes of raw materials for the wood, furniture, and handicraft industry. The model hopes to show how DSS can be used in communication, education, and technology transfer; and ultimately how it can improve the management of smallhold tree plantations.

The database was derived from the synthesized results of completed studies as basis for the silvicultural regimes and management requirements for mahogany, mangium, and yemane in plantations. A database of different policies affecting the decisions that farmers take was formulated while a dynamic growth model to simulate plantation environment was also made a component. Put together in a DSS (databases and dynamic models), a decision-making tool is now being developed that allows the developers to conduct a trial and error or "what if" analysis on a proposed or existing plantation, prior to implementation of an activity or treatment. The developed DSS can guide smallhold tree plantation developers in making technical and business decisions (i.e., from choice of species to conduct of cultural management activities to final harvest to transport of raw materials).



## Curbing the threat to the banana industry

PCARRD formulated and spearheaded the implementation of the S&T Anchor Program for Banana. The program aims to increase the production of disease-free planting materials and quality banana products and improve the socioeconomic welfare of smallhold growers of saba, lakatan, and latundan. It also aims to help the industry expand its niche in the export and domestic markets. The program started in 2004 and has churned out significant technologies and information. Among these are ripening schedules for lakatan and mass rearing protocol for black earwig, a predator of banana bunchy top virus (BBTV) vector.

In 2007, the project component on the development of disease management strategies for lakatan,

latundan, and saba against BBTV, Fusarium wilt, Sigatoka, and Bugtok/Moko continued its activities on surveying, determining BBTV incidence between ratooned crops and annual crops, and comparing monocultivar and mixed cultivar farming system. All the findings are being integrated to serve as bases for the formulation of effective disease management strategies.

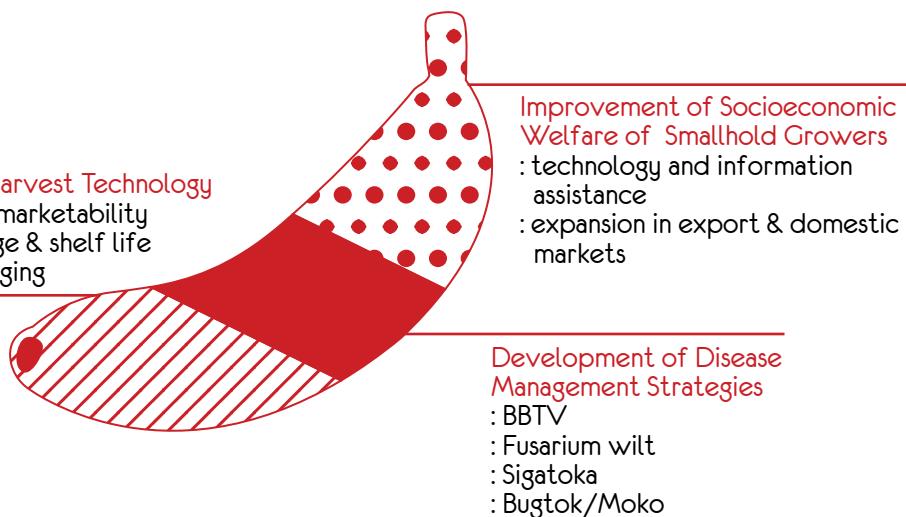
On the other hand, surveys to determine the presence and distribution of *Ralstonia solanacearum* have been completed. This information will form part of the development of a distribution map, which will guide in instituting quarantine measures to prevent spread of the disease. In addition, *Ralstonia solanacearum*, the

causal organism of bugtok and moko, is effectively inhibited by exposing to 0.25% commercial disinfectant containing potassium peroxyomonosulfate for five seconds. This can be used as a possible substitute for sodium hypochlorite solution or 70% ethyl alcohol as surface disinfectant, especially by farmers who are also into piggery.

As a necessary step in controlling Fusarium wilt, its incidence has been mapped. This map will serve as guide in preventing spread of the disease. An adjunct activity to the mapping operation is the collection of samples to identify the strain(s) of *Fusarium oxysporum* f. sp. *cubense* (*Foc*) present in the country. This information is vital in developing control measures since strains differ in

**R&D Activities on Postharvest Technology**

- : increase production & marketability
- : improvement of storage & shelf life
- : improvement of packaging





their infectivity. Twenty-five isolates and 12 diseased specimens have been collected and sent to South Africa for identification.

While isolates are being identified, possible control measures involving the use of antagonists are being developed. So far, 22 endophytic fungi have been isolated and will be tested for their antagonistic properties against *Foc*.

The biology of an important vector, a mealybug (*Dismicoccus neobrevipes*), has been described and a predator against it has also been identified. Rearing protocol for the predator (*Chelisoches morio*) has been established and is undergoing improvement. Other potential biological control agents identified earlier are being maintained for future use.

R&D activities towards generation of the postharvest technologies are implemented side by side with other components. The retail shelf life of latundan can now be extended

by nine days through the sequential application of 1-methylcyclopropene and ethephon.

To remain competitive in the local and global markets, new products with improved packaging have been developed in coordination with the private sector. These products are shelf stable boiled banana (saba) in retort pouch, shelf stable banana roll in retort pouch, sliced banana in tropical fruit juice, and microwaveable frozen grilled banana. The shelf stable boiled banana has elicited positive response from a Korean buyer of Sagrex, a Filipino private firm. This led to an initial arrangement towards technology commercialization under the DOST Technological Innovation Commercialization Program. To improve the image and visual appeal of the products, attractive packaging materials with labels containing the required information have been developed for the use of small- and medium-scale banana processors.



## Providing an enabling environment

### **Capability -building initiatives—paving the way for better goat breeding and goat show handling**

As a support to the increasing interest on goats, PCARRD in the past year grounded the National Goat S&T Program, which aims to decrease preweaning mortality from 25% to 10%; increase slaughter weight from 15 kg to 30 kg; and decrease kidding interval from 9 months to 8 months by 2020.

Among the initiatives undertaken during the year are the capability-building efforts on goat marketing

and breeding that contributed to the creation of the Philippine Boer Goat Breeders Association and eventually the development of the official goat registry. In this registry, goat bloodlines are recorded, thus ensuring the genetic quality of the animals sold as breeders.

Traditional animal shows were transformed through science-based innovation into an effective tool for genetic improvement. In cooperation with the DA-Regional Field Unit 2, Isabela State University, and private sheep and goat raisers in Region 2, two training courses were conducted

to impart to the local DA technicians the principles behind small ruminant breeding and selection, as well as the goat breed standards and show animal handling and judging.

The lessons learned were eventually shared to the local goat and sheep raisers, such that during the 2nd Cagayan Valley Goat Expo, adjudged best goats and sheep in the conformation show exhibited the most desired physical attributes that are indicative of superior genes. These are clear proofs that animal handlers and raisers in the region have internalized and are able to put into practice the science of goat and sheep breeding, health care, and management.

### **Encouraging overseas contract workers and their family circle to invest in goat production**

To provide livelihood options to overseas Filipino workers (OFW) and the Overseas family circles (OFC), PCARRD inked a memorandum of agreement with the Department of Labor and Employment (DOLE) thru the National Reintegration Center for OFWs (NRCO). Under the agreement, PCARRD pledged to assist the OFWs by providing them science-based information and technology through the FITS Centers in the regions or through electronic





(e) media, publications, or personal interaction.

During the year, PCARRD provided the NRCO copies of technology investments briefs, as well as the directory of all FITS centers and contact addresses of the MS all over the country. These materials can be reproduced and distributed by NRCO to its regional coordinators.

Among the investment options that caught the interest of OFWs and OFCs in 2007 was the goat investment brief. Thus, in cooperation with the Federation of the Goat and Sheep Producers and Associations of the Philippines, Inc., PCARRD conducted a follow-up orientation seminar on goat raising to give prospective raisers an idea on investing on goat and at the same time discuss the services that PCARRD offers. The Federation then vividly described the investment portfolio and the commodity. Participants who got interested in goat farming were then introduced to the e-learning course on establishing a slaughter goat enterprise.

### **Learning ecotourism**

In partnership with the different consortia, a training/workshop on in situ and ex situ biodiversity

conservation techniques for ecotourism was conducted for 25 participants.

The training/workshop enabled the participants with basic skills in evaluating sites for ecotourism. As a result, participants made a detailed analysis of the sites. Thru the experiential learning methods for adult learners (i.e., a mixture of lecture-discussion, activity-workshops, and field trips), the participants learned what an ecotourism area is and how to rate a particular site as a possible ecotourism destination.

The participants also learned the importance of in situ and ex situ conservation strategies in relation to ecotourism. This training will be useful to the participants, especially for those from the regions where ecotourism is identified as a priority program under the Science and Technology Agenda (STA).

### **Developing Organic Agriculture in the Philippines**

A training program for the development of organic agriculture (OA) in the Philippines capacitated 29 trainers/participants from the National R&D Network, government agencies, and NGOs. Field study tours to organic farms were conducted/



arranged and gave the participants the opportunity to observe actual field conditions. The participants prepared re-entry plans to implement in their own agencies and localities. From this training, the participants gained the following:

- ✿ increased understanding on the principles, concepts, and practices of OA;
- ✿ increased knowledge on the benefits derived from OA;
- ✿ increased recognition of the concerted effort needed in promoting and creating awareness in OA; and
- ✿ increased awareness that OA is a knowledge-intensive, sustainable, and science-based farming system.



## Capability building and governance

In support of the 14 regional consortia, the Council released P5.08 million for consortium regular operations to facilitate the conduct of regional planning, R&D prioritization, and consultation activities; quarterly meetings of the Regional Research and Development Coordinating Committee (RRDCC), Regional

Technical Working Group, Regional Applied Communication Office (RACO), and Regional Management Information Service (RMIS); monitoring and evaluation of ongoing R&D projects of consortium member-agencies (CMA); and the generation of additional resources for priority programs and activities.

To address regional R&D prioritization, the consortia through consultation activities identified their priority commodities that support the National STA: 2006-2010. Correspondingly, the respective RRDCC approved the regional program proposals packaged on these focus.

## Nurturing the skills—scientists, researchers, managers in agriculture R&D

During the year, P1.70 million was invested on full scholarships for 8 new researchers (7 PhDs and 1 MS); and continuing support to 12 (11 PhDs and 2 MS) ongoing scholars and 2 graduated scholars. Seventeen institutions were benefited in the process. This brings to 1,151, the total count of PCARRD scholar grantees since 1973.

In support of DOST-Science Education Institute's Accelerated S&T Human Resource Development Program, 64 applications for MS and PhD graduate scholarships in the high-end sciences were evaluated. Of these, 28 (6 PhD and 22 MS) were approved and grantees were cleared for enrollment beginning the second semester of School Year 2007-08.

Under the thesis support program, eight (4 PhD and 4 MS) researchers were awarded thesis/dissertation grants, while three (2 PhD and 1 MS)

ongoing studies were supported. Four graduated during the year, bringing the total number of thesis grantees to 75 since 1991.

The best thesis award was conferred to Dr. Salvacion J. Legaspi. Dr. Legaspi is a PCARRD scholar in horticulture at UPLB. The award is in recognition of her pioneering research study titled, "Yield and quality of toddy from tall and dwarf varieties of coconut (*Cocos nucifera L.*) as influenced by inflorescence morpho-anatomy and season."

Her innovative study on toddy (the base product for processing coco sap sugar, vinegar, and syrup) generated guideposts for improving the widespread practice of sequential toddy and nut production scheme, thereby reducing labor costs and maximizing toddy yield and nut production during the wet and dry seasons.

As part of the re-entry program, three grants, totaling P650,000, were approved to enable graduated scholars (2 PhDs and 1 MS) to apply their learnings upon their return to work. Researches of these scholars focus on hastening the reproductive maturity of mahogany (*Swietenia macrophylla King*) seedlings through grafting for clonal seed establishment; improving farmers'



productivity and profitability through the assessment and valuation of greenhouse gases mitigation of climate-friendly farming practices using geographic information system and crop modeling and simulation in lowland rice ecosystems; and increasing crop productivity through the use of plant growth promoting rhizobacteria to sustain the environment.

Consistent with PCARRD's recent policy to utilize its capability funds for the training of research managers and researchers, P6.1 million was handed over to NARRDN to enhance the research management and technical capabilities of policymakers, consortium directors, and researchers on the various aspects of research and technology management.

Sixteen nondegree training courses (Appendix 1) were conducted,

benefiting some 497 researchers from 360 institutions nationwide.

Another two researchers from the National Agriculture and Resources Research and Development System (NARRDS) were granted postdoctoral fellowships in Korea to hone their skills in the conduct of cutting-edge researches. Dr. Edwin Ramos from the Nueva Vizcaya State University is now doing research on environmental engineering in the aspect of hydrological modeling and remote sensing, while Dr. Gerardo Estoy from DA-Philippine Rice Research Institute (PhilRice) is working on the integrated pest management method.

An ex-post evaluation study will be conducted in the immediate future to assess the extent to which these program participants were able to apply their learnings in their work setting.

Meanwhile, P1.72 million was released to the regional consortia for capability building of CMA researchers. Trainings conducted were on project proposal formulation and packaging (which introduced the concept of value chain analysis as an innovation), mentoring of researchers and research design, data analysis and interpretation, among others. These RRDCC-approved trainings were

conducted for researchers to generate technologies, particularly on their priority regional programs in support of the National STA.

To address the widening disparity in the number of S&T workers in agriculture, a conference-workshop on the State of the R&D Workforce in the AFNR Sector is due for implementation. The object is to arouse the consciousness of major stakeholders on the state of the AFNR's dwindling R&D workforce, for them to collectively map out the strategies and action agenda to alleviate the situation. The commitments of concerned national agencies, especially high-level decision makers from both government and private institutions, will be obtained.

On facilities development, P968,723 was granted to two member institutions of the NARRDS for the reconstruction of the Philippine Coconut Authority's typhoon-damaged laboratory in Albay; development/upgrading/rehabilitation of the UPLB's National Agromet Station's facilities/equipment and database management system; and the National Germplasm's Repository's documentation, morphoanatomical, seed research, and in-vitro units and conservation facilities for asexually propagated germplasm.



## Recognizing excellence: The partners, the frontrunners

"The NSARRD is one of PCARRD's way of motivating scientists and researchers to strive for excellence in R&D by giving additional incentives," PCARRD Executive Director Patricio S. Faylon pointed out.

The NSARRD held during PCARRD's 35th anniversary on November 9 at the Intercontinental Manila was the venue where the most outstanding R&D outputs generated by the network member agencies were presented and disseminated at the national level.

RESEARCH CATEGORY WINNERS
 <p>"Inventory and conservation of endangered, endemic, and economically important flora of Hamiguitan range and its environs" of the Central Mindanao University and Davao Oriental State College of Science and Technology. These are member agencies of the Northern Mindanao Consortium for Agriculture and Resources Research and Development (NOMCARRD) and Southern Mindanao Agriculture and Resources Research and Development Consortium (SMARRDEC).</p>
 <p>"Aerobic rice technology in rainfed areas of Bulacan" of the Tarlac College of Agriculture, International Rice Research Institute, and National Soil and Water Resources Research and Development Center from the Central Luzon Agriculture and Resources Research and Development Consortium (CLARRDEC).</p>
 <p>"Improving productivity of unmanaged kawayan tinik plantation for quality poles and shoots" of the Mariano Marcos State University (MMSU) from Ilocos Agriculture and Resources Research and Development Consortium (ILARRDEC).</p>

The Council also recognized its S&T partners for development during the anniversary. Hon. Romulo L. Neri, CHED chair, was given a plaque for his vision of empowering rural communities that paved way for the inclusion of the TGP in the Philippine Medium Term Development Plan. The inclusion of TGP in the plan institutionalized it both in the local and national levels.

**DEVELOPMENT CATEGORY WINNERS**

"Kawayan briquette technology", again of MMSU from ILARRDEC.

"Towards a sustainable semi-temperate vegetable production: Characterization and propagation of indigenous vegetables of the highland Cordilleras" of the Benguet State University from the Highland Agriculture and Resources Research and Development Consortium (HARRDEC).

"Enhancing the technical capability of agrarian community beneficiaries on postharvest technology and enterprise development" of the Bureau of Postharvest Research and Extension from CLARRDEC.

Another recipient was the International Service for the Acquisition of Agri-biotech Applications (ISAAA). ISAAA is a not-for-profit organization that delivers the benefits of new agricultural biotechnologies to the poor in developing countries. It aims to share powerful technologies to those who stand to benefit from them and at the same time establish an enabling environment for their safe use.

ISAAA's vision brokered gene technologies between PCARRD and technology owners, which fast-tracked the transformation work in papaya and sweetpotato.

PCARRD also showed its appreciation for the efforts of the LGU of Balungao, Pangasinan. Its partnership with the Council helped increase interest on goat raising in the country, thus providing livelihood and income to thousands of rural people.

## Innovations in collaboration

Partnerships operate in various and innovative ways. Through the years, PCARRD took part in the evolution and offering of new and creative synergies within the network of agricultural S&T.

### A continuing collaboration with South Korea

The continuing collaboration with the Rural Development Administration (RDA) of South Korea had yielded two pioneering activities. One is the English language course for R&D and the other was the "Global Technology and Information Search (GTIS)." For this year, there were 10 Korean participants in two batches for the



English Language Course. The first batch was in July and the second in August.

GTIS was specifically created for Filipino scientists/researchers sent to Korea to discover valuable information and technologies of that can be adapted in the Philippines.

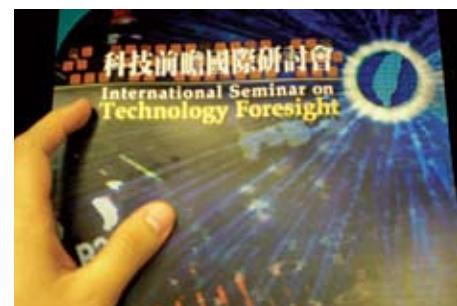
Postdoctoral fellows pass on the technologies and information they learned to colleagues in the academe

and the R&D network through a seminar series held in PCARRD.

Together, PCARRD and RDA have implemented the exchange scientists/experts mission program of 10 Filipino experts and 11 Korean scientists, dispatch of 4 applied communication experts, and granting of 2 postdoctoral fellowship programs for 2007. The exchange program is a strategy of supporting researchers and scientists to visit and learn from the international agricultural research projects of both the Philippines and South Korea.

### Partners in S&T forecasting

In strategic cooperation, the Council was active during the First Joint Science and Technology Committee Meeting between the Philippines and Taiwan held in May. The Philippine and Taiwanese delegates discussed



possible cooperation between the National Science Council of Taiwan and DOST. Research proposals were presented to identify areas of collaborative S&T between the two countries.

The "PCARRD and Science and Technology Policy Research and Information Center Collaboration on Technology Forecasting" was approved during the Working Group Meeting; and consequently, five PCARRD staff participated in the Technology Foresight Training Workshop and the International Seminar on Technology Foresight held in Taiwan in October.

### **PCARRD and Australia**

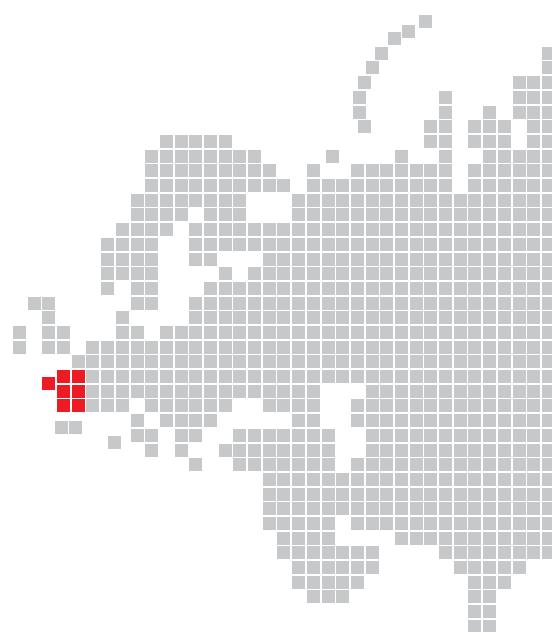
Partnership with the Australian Centre for International Agricultural Research (ACIAR) reached another level. Three major programs secured funding and support from ACIAR. These are: 1) R&D Management and Commercialization Skills Program and R&D Project Management and Commercialization Skills Program, which trained representatives from the NARRDN on managing R&D projects; 2) Seminar-Workshop on ACIAR-funded Projects for Impact Assessment, which resulted in the development of impact assessment studies to be coordinated by PCARRD for two ACIAR-funded projects; and 3) Philippines-ACIAR Horticulture Workshop, which

evolved programs seen to enhance the market competitiveness of vegetables and tropical fruits prioritized under the Philippines-ACIAR cooperation. ACIAR is investing Aus\$ 5 million to support these efforts (Aus\$ 3 million for vegetable R&D and Aus\$ 2 million for fruits R&D), which are expected to commence early 2008.

Specifically, ACIAR in its 113th annual meeting upheld its goals in strengthening agriculture in developing countries and reviewing programs and policies on agricultural R&D. Representatives from India, Indonesia, Vietnam, and Papua New Guinea took part in the gathering at Canberra, Australia. Australian and national scientists of partner countries agreed on priority setting exercises for R&D. Incidentally, Dr. Faylon is a member of the Policy Advisory Council.

For the Philippines, part of ACIAR's plan is to increase the market competitiveness of agricultural products, particularly horticulture and aquaculture products. The planned initiatives on proper management of farm-based land and water resources may lead to profitable and sustainable agriculture.

ACIAR will also support R&D projects to strengthen agricultural programs in the Visayas and Mindanao regions.



### **NARS leaders and senior managers advocate ICT/ICM policies**

The national agricultural research system (NARS) leaders and senior managers of various countries gathered in PCARRD to share knowledge, experiences, and best practices on information and communications technology and management (ICT/ICM).

The event, "ICT/ICM sensitization and awareness building workshop for NARS leaders and senior managers," served as a venue for the NARS leaders to develop and advocate appropriate policies for the effective use of ICT in agricultural research.

The presentations of the Global Forum on Agricultural Research (GFAR), Food and Agriculture Organization, International Livestock Research Institute of the Consultative Group on International Agricultural

Research, and Asia-Pacific Agricultural Research Information System gave an overview of global ICT/ICM initiatives in agricultural R&D.

Delegates from Bangladesh, Thailand, India, Japan, Nepal, Papua New Guinea, Pakistan, and the Philippines gave talks on the status and prospects of ICT/ICM in their respective countries.

Delegates also shared insights on important issues for strengthening national agricultural research information system.

Based on the success of the event, many NARS leaders expect collaborative activities on ICT/ICM in agricultural research with other participating countries. The event was initiated, sponsored, and coordinated by the Asia-Pacific Association of Agricultural Research Institutions (APAARI) and GFAR in cooperation with PCARRD.

### **French Ambassador Chésnel at PCARRD**

French Ambassador to the Philippines, His Excellency Gerard Chésnel, paid a quick visit to PCARRD in February to introduce the new Attaché for Scientific and Technical Cooperation, Ms. Inès Loge, and the Counselor for Cooperation and Cultural Affairs, Mr. Georges-Gaston Feydeau.

The short visit affirms partnership with the French Agricultural Research Center for International Development or CIRAD and increases possible work areas in the future. The

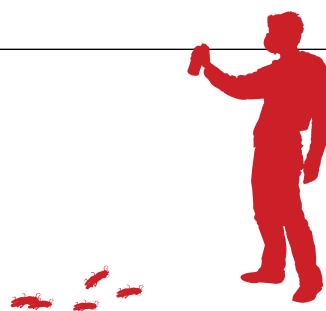


cooperation between PCARRD and CIRAD has been dormant since its last collaborative project in 1998. PCARRD is currently reactivating its fruitful ties with the agency.



### **Allies in promoting biofertilizers and biopesticides**

The Food and Fertilizer Technology Center for the Asian and Pacific Region in Taiwan teamed up with PCARRD and the Council of



Agriculture, Taiwan Republic of China for a workshop on the "Appropriate use of biofertilizers and biopesticides for small-scale farmers in the Asian and Pacific Region".

The event covered the sharing of knowledge in reducing dependence of small-scale farmers on conventional chemical inputs among the participating countries. It provided the region's scientists/researchers and extension workers with valuable information on recent developments in bio-agents as alternative methods to increase yield of agricultural lands without harming the environment.

#### **A link with APAARI-ICRISAT to enhance the agricultural systems in the Asia Pacific**

PCARRD participated in the Expert Consultation on Agricultural Research Networks and Consortia in Asia-Pacific and APAARI Mid-Term Executive Meeting in October at the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Hyderabad, India.

Dr. Faylon and Dr. Jocelyn E. Eusebio, PCARRD Crops Research Division director, joined the 70 participants from different agricultural agencies in the meeting. Three other meetings on APAARI and the Cereals and Legumes Asia Network undertakings provided

a neutral platform for strengthening the NARS.

The Council remains a member of the APAARI, which plays an important role in harmonizing 17 NARS and several international and regional agricultural research institutions in the Asia-Pacific Region.

#### **Resources generated**

A total of P107.04 million was generated from collaborative activities with local and international R&D institutions. Ninety-five percent (95%) or P101.87 million of this amount is from local donors and 5% or P5.17 million from foreign partners (Table 1). These also include exchange mission and counterpart funds of institutions provided with seed funds for collaborative activities.

**Table 1. Resources generated from partner agencies, 2007.**

Partner Agencies	Amount (In Pesos)
<b>Local</b>	
DOST	29,378,490.74
UPLB	307,450.00
UPLB-FI	346,960.00
DAP	7,940,000.00
DA	408,508.00
NEDA	1,710,516.00
PMS	1,058,425.00
LGU-FITS Centers	51,500,000.00
LGU-Municipality of Alfonso Lista, Ifugao (KR2-CFV)	1,786,000.00
PSRDFI	132,000.00
PNOC-AFC	3,932,812.00
PBS Asia	500,000.00
SUCs	2,873,844.00
<b>Sub-total</b>	<b>101,875,005.74</b>
<b>Foreign</b>	
CIP-IPDF	164,062.50
ICRAF	50,000.00
SEARCA	50,000.00
ACIAR	2,588,855.98
IPGRI	689,748.50
ITCC-RDA	964,103.96
IFPRI	226,990.54
FFTC-COA	398,503.00
IWMI	35,000.00
<b>Sub-total</b>	<b>5,167,264.48</b>
<b>Grand Total</b>	<b>107,042,270.22</b>



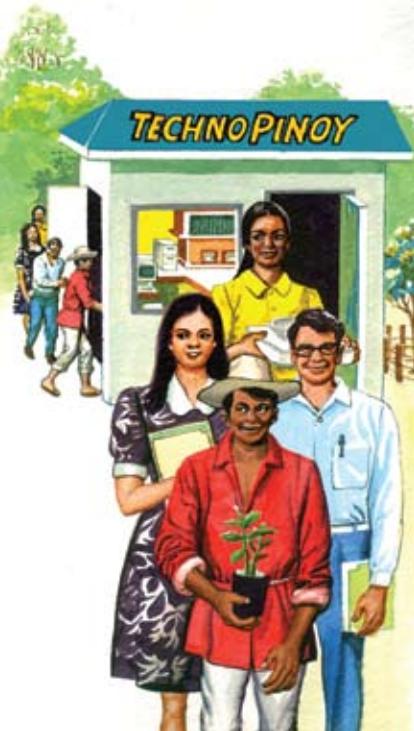
The image shows a lush, green cornfield. The corn plants are tall with broad, lanceolate leaves that have distinct yellowish-green veins. The plants are densely packed, creating a textured pattern across the frame. In the background, a bright blue sky with a few wispy clouds is visible, suggesting a sunny day. The overall scene is one of agricultural productivity and natural beauty.

THE LINK BETWEEN  
S&T AND LIVELIHOOD:  
THE TECHNOLOGY  
COMMERCIALIZATION SERVICES



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The results of almost ten years of TGP presence in the farming communities, best practices, and proven technologies through the FITS Centers and MS were documented. The year also witnessed how traditional and nontraditional partnerships pushed the program closer to the grassroots. With its recent achievements toward improved productivity and enhanced profitability for farmers, the program has again proven that equally important to innovations are effective modalities and that more can be achieved if all stakeholders play their respective roles.



Techno Gabay brings the science-based information and technology services to the people. The initial assessment in the 14 regions documented a significant increase in productivity and technical efficiency given the services of Techno Gabay.

"There is a remarkable difference in productivity between Techno Gabay and non-Techno Gabay farmers. For example, in Isabela and in Region 8, yields per hectare were greater by 1.25 t in corn and 0.76 M t in rice, respectively. Net income difference is more than 100%," states Dr. Albert P. Aquino, PCARRD director for Socio-economics Research.

The Techno Gabay is integral to other extension modalities of the government and other agencies. Its component projects are the establishment of new FITS centers, implementation of PMAs' policy, the establishment of S&T-based farms, and the promotion of S&T interventions through the conduct of technology field days, as well as information exchange through IEC and ICT strategies.

### **Community involvement in the Techno Gabay Program**

The MS is the conduit for a technology to gain favorable reception in the community. They are the outstanding farmers or farmer leaders recognized by the community who apply innovations in their farms using S&T-based technologies and indigenous practices. PCARRD taps them for disseminating technologies and information by making their farms as a showcase of feasible and viable technologies in the community, with the help of partners from NGOs, private sector, and SCU. They are also requested to act as resource persons; provide technology services and showcase information to other local farmers.

#### **Cultivating S&T-based practices**

Selected MS are being assisted to put up their respective S&T-based farms. This modality identifies and analyzes the gaps in the existing farm practices.



A local team composed of members from PMAs and the FITS center in the area recommend specific S&T interventions to address the gaps in the MS farm practices.

Farm assessments conducted by these local teams identified 60 S&T-based farms on various focus commodities/products. The regional

consortia nationwide lead in their implementation.

To promote the concept and benefits of the S&T-based farms, five technology field days were conducted in the MS farms.

Selected commodities included in the event were:



Organic vegetable production of MS Nestor Acosta in ILARRDEC

Application of the recommended S&T interventions with the farmers' best practices showed increased farm productivity.

Recently, MS Abesamis harvested 4,000 kg of fresh mango fruits from 37 trees, increasing his income by P16,580. Meanwhile, the net income of MS Navales increased to P1,788.89 per mango tree.

The Techno Gabay also supported 25 S&T-based farm projects of

Mango production of MS Wilfredo Abesamis at Peñaranda, Nueva Ecija and MS Alexander Navales at Mati, Digos, Davao del Sur

the national single commodity R&D centers and specialized agencies, which include: Philippine Carabao Center, PhilRice, Southern Tagalog Integrated Agricultural Research Center, Sugar Regulatory Administration, PHILSURIN, DENR-Ecosystems Research and Development Bureau (ERDB), Forest Products Research and Development Institute, and the Philippine Council for Aquatic and Marine Research and Development. The S&T-based farm projects in these agencies will

Corn fodder production of MS Valentin Cabugas and MS Rosalio Manangkil at Pinikit Sultan Naga Dimaporo

showcase the advantages of applying their proven component technologies in terms of improving productivity, increasing income and/or increasing value of agricultural products of cooperating farmers/farmer-groups. These S&T-based farm projects are expected to address technological gaps in the farms of FITS centers' clients on the following commodities: dairy buffalo, rice in rainfed lowlands, sugarcane, bamboo nursery, bamboo-based products, and fisheries.

### **Multi-institutional research-for-development partnership in the Ilocos Region**

Excellence and innovation has been the ILARRDEC's trademark for the past 28 years. The remarkable accomplishments of the consortium, PCARRD's regional arm in Ilocos, can be attributed to an efficient management system with its partners.

"The strong relationship among the 17 agencies is focused on increasing the region's productivity. Each member-agency fully understands the situation and acknowledges the needs of the consortium," says RRDCC Chair Miriam E. Pascua.

"Every year, MMSU, ILARRDEC's base agency allocates P1 million as consortium fund. We also collect not

less than P1 million from the member-agencies to support our activities," Pascua added.

For instance, with much support and cooperation from the member-agencies, ILARRDEC's program on the promotion of organic agriculture led to the promulgation of a resolution in Region 1 through the Regional Development Council.

Consuelo N. Belarmino, DA's supervising agriculturist, "We at the Department of Agriculture spearheaded the establishment of eight demo farms on organic farming all over the region with PHILRICE, MMSU, Cotton Development Administration , Ilocos Sur Polytechnic State College, Pangasinan State University, DENR, and the Don Mariano Marcos Memorial State University (DMMMSU) as partner agencies."

The innovative partnership united the various initiatives of the agencies to foster change in the farmer's practices.

For Rogel R. Pimentel, regional technical director of DENR's Ecosystems Research and Development Service (ERDS), their efforts at the DENR-ERDS complement the collective effort toward sustainable development.

"DENR through ERDS leads in the production of IEC materials. We maintain active collaboration with ILARRDEC member-agencies. We prepared the information kit that contains salient information on organic agriculture," he said.

Dr. Evangeline Pera, a project leader at DMMMSU also upholds the relationship with the other agencies. "At DMMMSU, we work at the marketing aspect of organic agricultural products with the help of other partner member agencies."

MMSU, on the other hand, takes charge of the profiling of existing

organic agriculture practices and technologies in the region.

"We at the RRDCC assign member-agencies that we feel are capable on specific fields, mango for example is one of the priority commodities both for the region and the consortium. Many agencies work on mango, but because MMSU has the most capability to do mango research and extension, the university led the mango research, hence in four years we came up with the MMSU Gold, a new mango variety," adds Pascua.



Committed to his vision of transforming the consortium into a world-class model of collaboration, Dr. Stanley Malab, ILARRDEC's consortium director, believed in the cooperative manpower, the principle of innovation and working for the best.

"We put the enhancement of the consortium manpower a priority. For example, we wanted to revive the kawayan industry. We trained our farmers to produce quality poles, coupled with research. We train clients to manufacture export quality furniture and explore possible markets for them."

Another key attribute highlighting effective institutional partnership at ILARRDEC is their initiative to promote and enhance the participation of the farmers. Leo Pascua, TGP coordinator, shares that they conduct an annual search for the best FITS center and MS. "Since 2003, we have awarded 9 FITS centers and 9 outstanding MS," he said.

Nestor Acosta, MS for organic farming appreciates the work done of the various institutions. He said, "I specialize in organically grown rice and vegetables. In 2003, I harvested 15 t of palay using 60 bags of chicken dung. By applying ILARRDEC-generated technologies like off-season tomato production and organic agriculture, I was able to generate substantial income from what used to be a wasteland. I have created lots of linkages with other agencies and organizations through the consortium. And foremost, I became famous, not only with my fellow Ilocano farmers who visit my farm but also with foreigners, Muslim farmers, students, and experts." (*Taken from the series of video documentation of the TGP in 2007.*)

#### **Tangible benefits of partnership and the promise of malapapaya**

One program being given attention nowadays is the production of malapapaya trees as an alternative source of income of farmers.

The 23 member-agencies of the Southern Tagalog Agriculture

and Natural Resources Research and Development Consortium (STARDEC) have in fact worked out the establishment of a S&T-based malapapaya farm in Pagbilao, Quezon.

Engr. Edilberto Marino is MS in the production of improved quality malapapaya planting stocks. After his retirement as an engineer in a big company, he became interested in farming. Marino is now six years into planting malapapaya. At the moment, it is estimated that he has 8,000 trees of malapapaya planted into his 10-ha farm.

"When I started planting, a group of people came to visit my farm. They were from PCARRD, STARDEC, and DENR-ERDB. They offered a position that truly is an honor for me, thus I readily accepted it. By becoming a Magsasaka Siyentista, I am given the opportunity to attend seminars and literacy programs. I learned that I could access information that I would need from the Internet. It also exposed me to other people. We share our knowledge in planting malapapaya trees."

"As a Magsasaka Siyentista for malapapaya, I promote the benefits of growing these trees. One is income; two, is its environmental effects. I learned from the Internet that planting these trees help sequester carbon dioxide in the atmosphere and control air pollution—these are the benefits to the environment. And lastly, is the utilization of idle lands."

Toothpicks, chopsticks, wooden spoons for ice cream, lollipop and

popsicle sticks, matchsticks, pencil, tongue depressors, wood handles for brushes, boxes and crates, luggage bags, and furniture are products that can be derived from malapapaya. Research shows that the veneers from malapapaya are good materials for food boxes or bento boxes. It has huge demand for export in Japan as a substitute for styrofoam, which has been banned since 1992.

Tony Limlengco an entrepreneur from JOPA Enterprise relates "the demand for malapapaya is bright because the economy as well as the population is growing, therefore there is an increasing need for its use."

"Globally, the Philippines is becoming competitive. Nowadays, China has already improved their export tariff, which basically is an indication that we can export products with higher profit. Currently, we are exporting our products to Hong Kong."



The relationships between and among the farmers and the government units spell tangible outputs in the future of malapapaya trees in the world market.

*(Taken from the series of video documentation of the TGP in 2007 by the FARM Foundation, Inc.)*

### Ripples from a goat farm: A farmer-scientist story

As a child, Darwin Tinatas loved to take care of dogs and chicken. As he grew up, his penchant for animal breeding naturally led him to livestock production, particularly goat breeding.

He said, "More and more enthusiasts look for quality goats today that is why we decided to expand and produce breeder stocks, which are more expensive." Tinatas manages a 5-ha farm in Balengayen, Tugbok, Davao City.

He began his business with a start up stock of 10 Anglo Nubians. This led him to seek assistance and attend trainings and seminars.

Darwin learned about the benefits from the program of PCARRD and from one of its regional consortia, the Southern Mindanao Agriculture and Resources Research and Development Consortium (SMARRDEC). Darwin enthused, "The program is a great help to us because it gave us a lot of exposure to the various technologies, like AI (artificial insemination). This process is not common and when we were exposed to this process, we practiced it in



our farm and passed it on to other farmers."

Applying the knowledge he learned from the training, Darwin's initial stock of 10 increased to more than 100, all with improved quality.

Today he sells stocks to those who would like to go into goat production. He also supplies goats to other areas in Luzon and Visayas.

"With the help of PCARRD and SMARRDEC, we were also exposed to linkages. And the biggest is in marketing—before we only have the local market, and now, our market is nationwide. The program really helped us in our situation," he said

Darwin also has a large collection of forage and legumes that provide the essential nutrients needed by the animals. He plants Setaria, Molasses,

Atratum, Paspalum, Native Napier, Florida Napier, Guatemala, Korniva, Ratun Maize, and Tully.

"We don't use herbicide so we planted improved pastures—those that are fast growing and rich in protein that are needed by goats. These are those that can be integrated into other crops that exist in the farm."

Complementing the small ruminant project are high value commercial crops and 2 ha of rice. He maintains 50 durian trees, which are fertilized by goat manure.

His remarkable achievement as a farmer, qualified him to be an MS by SMARRDEC.

According to Marie Ann M. Constantino, manager of the FITS Center for Livestock and Poultry

at DA XI Davao City, Darwin encouraged other farmers to go into goat farming and at the same time assisted in the AI technology for goat in the region and the other regions in the country.

He also led in the formation of the Southern Mindanao Goat Raisers Association and the Goat Industry Development Council for the regional level. Darwin is also the regional representative of the Federation of Goat and Sheep Producers of the Philippines and the director for Research and Education of the Southern Mindanao Goat Raisers Association.

"He is actively involved in the conduct of seminars and trainings, not only in Davao City, but in other provinces of the region and other parts of the country. He is also conducting researches to improve the technology on goat raising. In 2006, we had 85 adopters.. More and more are encouraged to follow goat raising," Constantino said.

"He gives lots of advice. When a goat is sick, he will tell us what to do and what to use for medication. He gives us planting materials for forages grasses and legumes for free. We



heard that he will be given a grant from PCARRD to establish an AI laboratory and we are hoping for the project to materialize. We expect that we will become the beneficiaries of that project, by way of upgrading our goats through AI," said Angel T. Galang, one of the adopters of Darwin's goat projects.

Today, Darwin is the ripple in the farm, influencing and encouraging his co-farmers to work their way up through goat farming.

*(Taken from the series of video documentation of the TCP in 2007 by the FARM Foundation, Inc.)*

### **Swine raising and biogas technology: bringing benefits to rural communities**



Foul-smelling wastes from backyard hog raising are a common cause of protests from his

farmer-neighbors in Barangay Mandug, Davao City. Often, his neighbors expressed worries of the possible health hazards and the environmental effects that may ensue.

Felimon Santander, however, saw the problem as a window of opportunity, which could benefit his family and the community. He believed something could be done. He turned to S&T for the solution. And sure enough, he found one—the biogas technology.

He installed a biogas digester in his farm to properly dispose of the wastes and turned them into an environment-friendly energy.

"Livestock production emits annoying smell and this is hazardous to public health. With this technology, we have found a pollution-control device," says Felimon. He adds, "Amidst energy crisis, fellow Filipinos should realize that we need to find ways to save energy."

The biogas technology that Santander introduced produces enough fuel for his household needs like cooking, lighting and heating; and for on-farm requirements. The technology also produces sludge, a by-product, which can be used as a soil conditioner, fertilizer, dipping medium for seed soaking, feed for freshwater fish, and disinfectant for pig pens.

It was not long when other farmers followed suit. With the use of the biogas technology, some of Santander's neighbors even gained interest in swine raising.

Soon the adopters of the technology formed a cooperative so that they can bring the technology to their own communities.

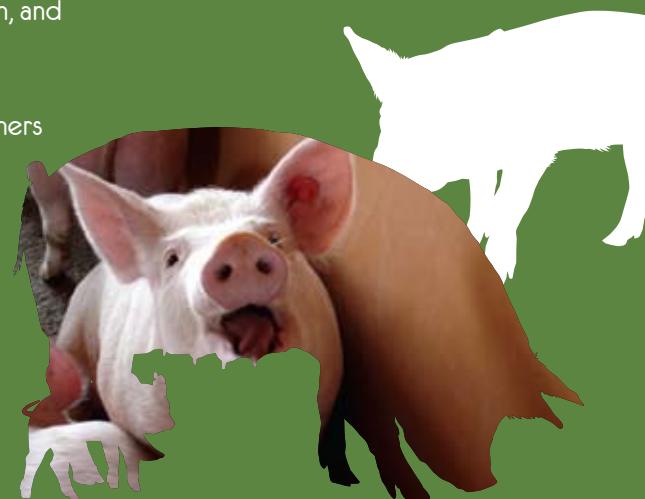
Roque Galaraya, a biogas technology adopter, says "Nagbibigay kami ng mga connection sa mga kapitbahay namin, mas mura, P200 per connection," relating that he was able to provide biogas to his neighbors at a cost much lower than liquefied petroleum gas or LPG.

Because of Santander's innovation and willingness to share the technology to other farmers, he was

chosen as MS or farmer scientist of SMARRDEC.

Through the support of SMARRDEC, Santander was able to promote the technology not only in Southern Mindanao but in other regions as well. SMARRDEC also provided support to swine raisers and LGUs in installing Felimon's technology.

With the partnerships of Santander, his colleagues in the biogas cooperative, SMARRDEC, PCARRD, and the local governments, the biogas technology continues to be replicated from one community to another, across provinces and regions.



## The escalating number of FITS centers

Two thousand seven is considered the banner year of Techno Gabay because it recorded the highest number of new FITS centers—197. By end of the year, a total of 402 FITS centers operated nationwide, serving 63,968 farmer-clients.

Region 1 (ILARRDEC) has the most number with 57 FITS centers, followed by Region 3 (CLARRDEC) with 48 and Region 7 (CV-CIRRD) with 43. Most of the FITS centers are LGU-based.



While the increase in the number of the FITS centers has been accelerating, the implementation of the PMA scheme widened collaborative efforts supporting operation of the FITS centers. Series of planning and consultation workshops were conducted from July 31 to November 23 to infuse the PMA concept in the regions and local communities. The workshops facilitated identification and understanding of the roles of partner member agencies, FITS centers, and consortia in the implementation of TGP. The workshop further generated the work plans for 2007 until 2008 and became the venue for the discussion of major issues/concerns in implementing TGP in various levels. It also provided a briefing on the management and administration of the TGP funds.

In 2007, 111 partner-member agencies committed to provide the expertise, technologies, and technical assistance needed by the FITS centers and their clients.

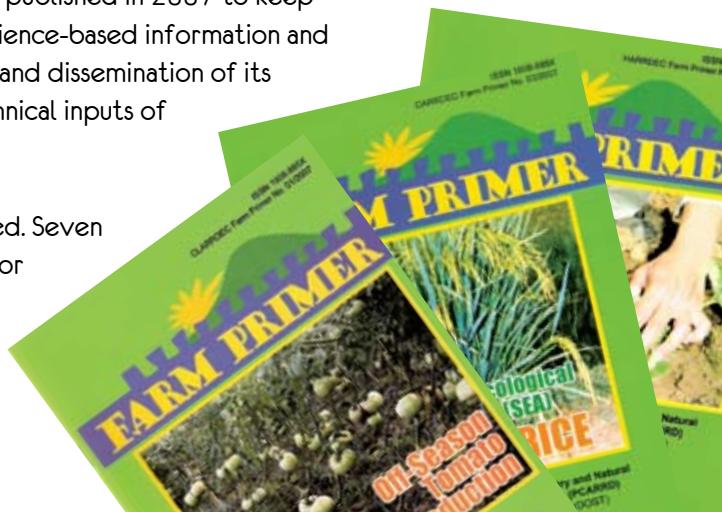
The increasing acceptability of the program by the LGUs, partner member agencies, and other stakeholders assures the sustainability of the TGP and operation of the FITS centers.

## Facilitating information exchange

One innovation that PCARRD has embarked on during the year was its co-ventures with members of its regional consortia in coming up with IEC materials. Aptly dubbed as "co-pub" or co-publications, 2007 saw the release of 15 farm primers in cooperation with its regional partners. These farm primers are aimed at increasing the adoption of location-specific technologies and ultimately enhancing livelihoods. To further reach PCARRD's clients in the southern part of the country, two of these primers were written in Visayan language. One was written in Tagalog.

The farm primers comprise only a tenth of the 158 titles PCARRD has published in 2007 to keep its network and other clients abreast with relevant and up-to-date science-based information and technologies. Another notable output was the packaging, production, and dissemination of its profitability analysis of selected commodities, which entailed the technical inputs of the experts from the Council's research network.

Fact sheets on 20 industries in AFNR were also packaged and produced. Seven investment briefs were developed in response to the clients' needs for information on economic returns and investment opportunities. These important publications were distributed during the Council's 35th anniversary and were packaged in a commemorative bag. Other



memorabilia were produced and given as tokens to the Council's long-standing local and international partners and several clients.

Specifically for the FITS centers, which serve as the node structure for all the Techno Gabay modalities, exchange of S&T-based information was facilitated through the various IEC strategies and ICT facilities and information systems. For instance, PCARRD reprinted its relevant publications for the FITS centers and the regional consortia. With the program, 13,000 copies of reprints of Philippine Recommends were published. Other IEC materials including 4,000 copies of technology posters, 1,000 copies of farm primers, and 7,000 copies of information bulletin leaflets were also distributed. These IEC materials focused on livestock and poultry, papaya, sugarcane, vegetables, feedlot fattening, timber, etc.

Trainings were conducted to enhance the implementers' capability to produce and package information and technologies into different knowledge products and IEC materials. As of November 30, a total of 363 RMIS representatives from the member agencies of the consortia, FITS-Information Service Specialist (ISS), and Technology

Service Specialist (TSS) participated in the conduct of Adobe In-Design CS2 Training Workshop (co-publication of farm primers) in 14 regional consortia.

Twenty regional consortium staff and FITS representatives participated in the training on nonlinear video production conducted in Western Visayas Agriculture and Resources Research and Development Consortium (WESVARRDEC), Visayas Consortium for Agriculture and Resources Program (VICARP), NOMCARRD, SMARRDEC, and Cotabato Agriculture and Resources Research and Development Consortium (CARRDEC).

The module on "Packaging of technologies and documentation of MS best practices and building capabilities of FITS in IEC production" conducted in STARRDEC was participated by 15 FITS managers. A Regional Communication Planning Workshop was also held in Iloilo City on February 7-9, aimed at guiding and assisting the RACOs from 14 regional consortia in creating their respective communication plans and equip them with the skills to produce appropriate and need-based IEC materials. It also enabled the RACOs to make year-long plans and address issues and concerns.



Techno Gabay enhanced the ICT capability of the Techno Pinoy centers to hasten and make more efficient the delivery of information and technology services. The program provided each of the 223 FITS centers with a set of desktop computer and printer, flash disk, digital still camera, and two cellular phones (FITS staff and MS). Each regional R&D consortium was also provided with one PC notebook with a wireless connectivity for smooth coordination and monitoring of TGP.

The regional consortia through the RMIS group coordinated with the appropriate local service providers to address the ICT requirements of each center and facilitate the provision of appropriate interconnectivity.

The current capacity of PCARRD's E1 line serves only the 80 FITS centers under the K-AgriNet Program in addition to the requirements of PCARRD secretariat and the regional consortia. To facilitate



the access to PCARRD's online services, the Council through the Enhancing FITS Program, increased its bandwidth from 2MBPS to 4MBPS with the Philippine Long Distance Telephone Company as the service provider. The increased capacity will access for the burgeoning number of FITS centers including the use and updating by the FITS centers of the database under the web-enabled FITS information system.

During the year, PCARRD has fully accomplished the enhancement of Regional Profile and FITS Information System (IS) and developed web-based interactive mapping. In the latter part of the year, efforts were concentrated on trainings on the enhanced FITS-IS and Web Content Management System using Joomla. Eighty-three participants comprised of RMIS coordinators, FITS managers, and ISS of the K-AgriNet sites from ILARRDEC, HARRDEC, Cagayan Valley Agriculture and Resources Research and Development, CLARRDEC, and WESVARRDEC were trained on the enhanced system. Similar trainings will be conducted for the other consortia. The idea is that the trained personnel and staff would then train the other FITS staff of the remaining FITS centers in their respective regions thus saving on time and resources.

Finally, PCARRD's initiative to promote PCARRD Short Messaging System has significantly increased its membership and utilization with 782 registered members.

## More on ICT

Five new databases and information systems were developed. These include: (1) the policy database for the Office of the Executive Director, which systematizes the compilation, storage, and retrieval of policies; (2) PCARRD ISO online, which aims to efficiently handle the processes in institutionalizing continual improvement program targeting quality systems procedure development; (3) PCARRD

LinPha Photo Archive with the Applied Communication Division, which functions as a photo gallery; (4) Management Information Services Division's Open Computer and Software Inventory, which is an automated inventory and deployment system that provides relevant inventory information on the various computers in PCARRD; and (5) PCARRD e-learning site, an online learning management system designed to modernize the training of the country's AFNR sectors by delivering information and knowledge through e-modules.

Overall, 10 commodity information systems, 51 websites, and 19 databases were maintained and updated.



The screenshot shows the official website of the Philippine Council for Agriculture, Forestry and Natural Resources Research & Development (PCARRD). The header features the PCARRD logo and the full name of the organization. Below the header, there are several main menu items: News, About Us, About PCARRD, News of the Month, Research, User Services, and Publications. The "News of the Month" section highlights recent news items, including the launch of the PCARRD e-learning site and the recognition of community R&D endeavors. The "Research" section features a banner for the 2008 Outstanding Research and Development Awards. On the right side, there is a sidebar with links to various PCARRD publications and a "Newsletter" section. The overall layout is clean and professional, designed to provide quick access to key information and resources.

## E-learning as a support service

PCARRD joined DA's Agricultural Training Institute (ATI) in developing e-learning modules for Open Academy for Philippine Agriculture. The program is in line with enhancing PCARRD's information and technology services for the clients and stakeholders of TGP. PCARRD committed to developing e-learning modules for bamboo, small ruminants, and organic fertilizer.

### **Training goat raisers online to be good entrepreneurs**

As PCARRD's contribution to the goat industry's effort to promote goat production as a business option, an e-learning course titled "Establishing a slaughter goat enterprise" was developed and launched during the year. This course is the first of a two-part online course titled, "Build assets thru goats!" This activity is in partnership with DA-ATI, which is currently hosting the e-learning site for agriculture and fisheries.

As an on-line version of the Farmer Livestock School on Integrated Goat Management, it contains four modularized topics on the basic requirements in starting an economic sized slaughter goat enterprise.

The course is highly interactive, complete with modularized topics, lessons, sub-lessons, self-assessment questions, field and table activities, end-of-module tests, and a profile of the author and reviewers. Pretest



shows that it is highly acceptable by goat raisers, as users found the course easy to comprehend while being fun and nonthreatening.

The course, which was launched in December, has 40 enrollees to date. Included in this roster of enrollees were those from families of OFWs who participated in the earlier orientation seminar in cooperation with the Federation of Goat and Sheep Producers and Associations of the Philippines Inc. and NRCO-DOLE. This online course cuts down costs in conducting face-to-face training courses, as it can already assist interested raisers who have access to the Internet. It thus saves time and government money without delaying learning benefits, minimizing travel costs and time away from work, while meeting the needs of a geographically disperse group of entrepreneurs.

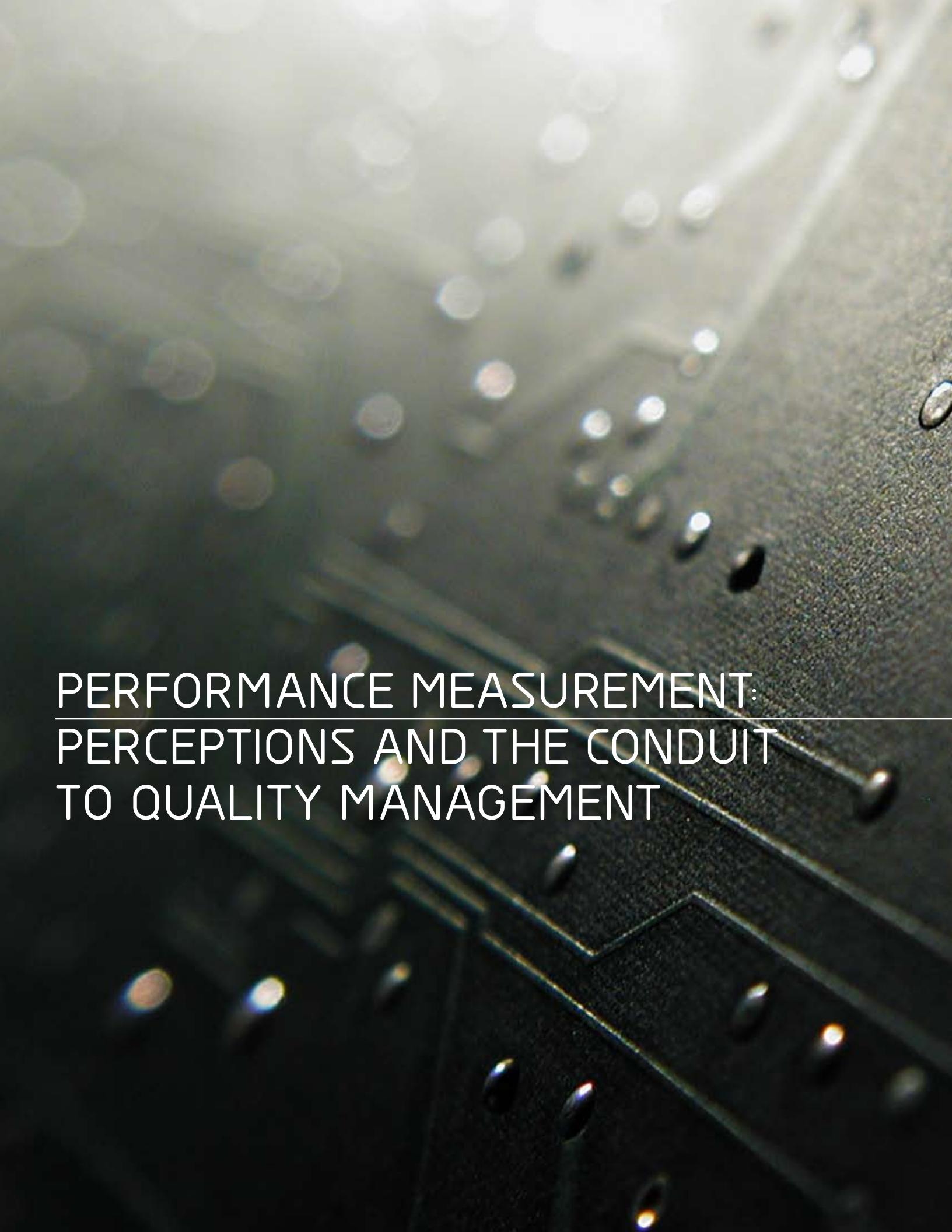
### **Growing bamboo for money and a healthy environment**

This e-learning course is all about growing bamboo not only for its economic potential but also for aesthetic, environmental, and

ecological significance. The course discusses the many uses, unique attributes, and possibilities of bamboo. It will teach the e-learner the most practical and general way to grow bamboo for various management objectives. It may even open up new economic opportunities for the learner.

The whole course consists of four modules that include a variety of supporting information, such as choosing the bamboo species for planting; propagation of bamboo; bamboo plantation establishment, maintenance and protection; and bamboo plantation management and harvesting.





# PERFORMANCE MEASUREMENT: PERCEPTIONS AND THE CONDUIT TO QUALITY MANAGEMENT

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The new and emerging imperatives for growth in AFNR require the organization to continually implement reforms in its processes. While keeping its footing within the bounds of bureaucratic systems, PCARRD pursues operational innovations backed by its continual improvement policy. Such policy resulted in a number of innovative approaches to quality management, from performance evaluation and corporate planning down to budgeting and resource utilization.

The Council has lived up to its standards of pursuing quality management and engaging in innovative undertakings. Efforts toward innovation are intended to lead to effective management.

The annual review and planning workshops are regarded as a catalyst to promote innovation in the whole system. The continual improvement program and the budget processes, as well as the finance and administration management system concentrate on building up on current opportunities and address the critical needs of the Council.

## **PCARRD continual improvement program**

In March, Societe Generale de Surveillance Philippines, Inc. renewed the ISO 9001: 2000 certificates conferred to PCARRD. This demonstrated that the quality management system (QMS) continues to systematically fulfill the requirements for efficient services within the scope of the Council's policy and objectives.

The achievement further puts the Council ahead of the other government agencies in responding to the President's call to adopt an ISO 9001:2000 QMS. The Philippine President advocates the implementation of the Government Quality Management Program that primarily aims to promote public sector performance.

The review and revision of quality procedures is part of the ongoing effort to improve quality management. For the year, the following quality system procedures were evaluated:

- QSP 15 Development and Dissemination of Technology Transfer and Promotion Modality
- QSP 31 Budget Preparation
- QSP 32 Budget Programming and Allocation
- QSP 33 Funds Control and Monitoring
- QSP 35 Awards and Incentives for Service Excellence

Along this line, some staff joined quality management skills training on: 1) total quality management, 2) seven habits, 3) supervisory development course, 4) seminar on records control, 5) computerization in records management; and 6) 5S.

The Philippine Quality Award (PQA) initiative took off with the conduct of two field visits to PQA awardees—the Marikina City Government and the National Economic and Development Authority—Region I. Participants to the field visits observed and learned the best practices in quality management of the two institutions. In addition, a series of in-house workshops were conducted to document and assess PCARRD's QMS vis-à-vis the requirements of the PQA criteria. These activities were geared to identify innovative practices that can potentially raise the level of organizational performance and productivity.

It is expected that the Council will remain proactive in enhancing its partnership with its stakeholders and clients as well as influencing other public organizations to pursue the path to quality management.



## Innovations in review and planning as a pathway to performance

For three consecutive years, the review and planning exercises marked out the link to performance and growth through innovative approaches.

In year 2005, the performance over the last four years, from 2001 to 2004 was analyzed. Outputs were compared against budget allocation to see if the Council has been efficiently utilizing the budget or has effectively prioritized its programs and projects. The outcome provided significant insights to the way budgeting and target setting process is conducted.

In 2006, performance review was conducted. This assessed the organizational performance as

perceived by the staff on four key areas: 1) strategic management and governance, 2) human resource and capability management, 3) financial management, and 4) banner program management.

This initiative required a follow through as the overall perception was "moderately good," and there were issues that needed attention.

Thus, in 2007, PCARRD initiated an analysis of the client satisfaction feedback (CSF) to determine how well the Council responds to the needs of its clients.

To augment the findings from the analysis of CSF, a partner survey on PCARRD's performance was also

conducted. This survey gave a picture of how PCARRD partners rate performance as well as provided external insights on how PCARRD can further improve its performance and role in the national development process.

Findings from these evaluations enabled a broader perspective and collective understanding of the services of the Council. These are used as guides in developing the action plan toward more fruitful management of the PCARRD system. Furthermore, having established the CSF mechanism, PCARRD commits to respond by improving and surpassing its current performance level.

## Finance and administration

### **Financial management and administrative support services**

PCARRD managed a total of P384.6 million in 2007, which is an 11.6% increase over that of 2006. This includes P236.5 million appropriations for the regular programs, P4.7 million for additional personnel benefits, P6.7 million continuing appropriations from 2006, P115.4 million sub-allotment from DOST for the Enhancing FITS Centers Program (P98.7 million) and R&D projects (P16.7 million), and P21.3 million trust funds.

A total of P313.2 million cash allocation equivalent to 81.4%

of these funds was received. Use of the cash allocation was carefully prioritized to ensure balanced distribution among priority expenditures (e.g., Grants-in-Aid releases for S&T projects, monitoring and evaluation expenses), regular operations, and employee compensation and benefits.

The year saw a 53% increase in number of personnel trained and participating in other human resource development activities.

Improved partnership with the PCARRD employees association facilitated formulation and implementation of economy measures, as well as activities that

promoted employee welfare.

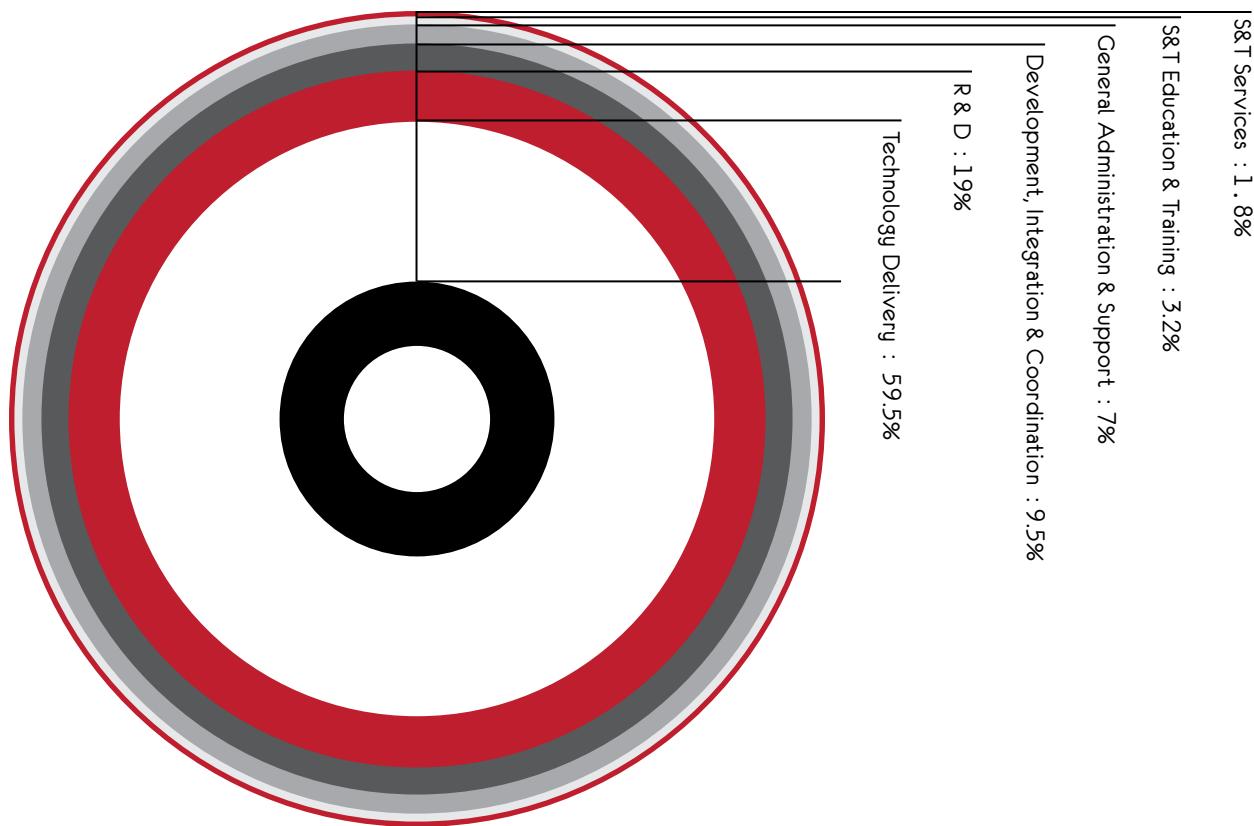
The Annual Procurement Plan for 2007 was developed and implemented in strict adherence to pertinent provisions of Republic Act No. 9184.

### **Fund utilization**

Fund utilization rate in 2007 reached 95%. Of the total allotment received in 2007, P15 million was forwarded as continuing appropriations in 2008.

A bulk of the Council's funds went to technology delivery initiatives (59.5%) and R&D activities (19%). About 73% of the total funds held in

## Fund Utilization by S&T Function (FY 2007)



trust were used during the year. A big portion went to R&D activities (43.81%) and S&T information services (29.79%). The balance of P5.8 million is still valid for use in 2008.

### Physical plans, accomplishments, and the budget hearing process

The preparation of budget proposals was based on overall budget management and expenditure allocation. The proposals were then guided through to finalization by the physical planning activities and the preparation of the physical report of operation and its accompanying narrative.

In 2007, budget preparation focused on an examination of the setting of specific performance targets vis-à-vis new major final outputs and the accomplishments of the current year. This established the purpose and scope of new indicators for the next year.

Following such changes, appropriate formats have been circulated and presented for Department of Budget and Management (DBM) monitoring and evaluation. This signifies that monitoring and reporting of PCARRD accomplishment will be strictly examined. Through the procedures, accurate and quality reports will be sent to policy makers and other government partners, specifically the DBM.

# POLICY DIRECTIONS: SPURRING ACTION TOWARD SUSTAINABILITY

The year 2007 witnessed significant milestones toward its corporate vision of “competitive AFNR sectors.” In the coming years, PCARRD shall continue to make significant strides toward this vision through innovations in its operational policies. Such will be carried out with strong corporate commitment on one hand and partner support on the other.

## **Enhance the capability of the R&D network**

PCARRD shall enhance the capability of its R&D network to hasten the process of science-based development. Specifically, PCARRD's capability-building programs will boost individual and organizational capabilities in frontier sciences; development, management, and administration of R&D programs and projects; and packaging research results for dissemination. This will be coupled with strong advocacy for an institutional and policy framework that enables capability advancement among individuals and institutions in the R&D network.



## **Further infuse Techno Gabay program at the grassroots**

S&T-based solutions will continue to pour in at the grassroots eliciting greater appreciation of S&T as the engine of rural development. TGP, with its initial success, will be further institutionalized in the regions by becoming an integral part of extension services offered by local institutions such as SCUs and LGUs.

The MS, serving as agents of science-based rural development, will be more involved in technology promotion as their farms transform into showcases of S&T-based farming systems that bring better harvest and income.

PCARRD shall localize its information materials through partnerships with the applied communications offices of the regional R&D consortia. This would ensure a better uptake of research results.

For faster and far-reaching information and technology delivery, PCARRD shall continue to capitalize on ICT and build ICT capability at all levels of TGP implementation.

## **Mainstream value chain assessments**

Stakeholders can expect more relevant science-based solutions as PCARRD mainstreams value chain assessments in program and project development. By building on the results of value chain assessments, PCARRD's efforts will be focusing on specific industry constraints thereby achieving greater efficiency, effectiveness, and relevance.

## **Strengthen the monitoring and evaluation system**

Committed to continual improvement, PCARRD shall strengthen its existing mechanisms for M&E. To cultivate a learning organization, clear links will be established between the past, present, and future results and interventions.

## **Mainstream impact assessment of completed programs**

To complement its enhanced M&E system, PCARRD shall mainstream impact assessments in its operations. Impact assessment shall be conducted for completed projects supported by PCARRD to provide lessons to the organizations in the AFNR and to guide future research, development, and extension initiatives.

## **Continue to improve organizational performance**

PCARRD intends to become a more responsive provider of science-based solutions and it will do so by stepping up the efforts on improving organizational performance. While adhering to the principles of its ISO certification, PCARRD shall scale greater heights in quality improvement with the pursuit of the PQA.



## APPENDICES

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## **Appendix 1. 2007 PCARRD trainings conducted for the NARRDS**

1. R&D Project Management and Commercialization
2. Research Methods in Evaluating Poverty Impact of Development Programs in AFNR
3. Continuing Education Program on RTM for NARRDS' Leader-Managers
4. Training on Plant Genetic Resources (PGR) Conservation and Management
5. Trainor's Training on Socio-Economics Research Methodologies in AFNR (a)
6. Trainor's Training on Socio-Economics Research Methodologies in AFNR (b)
7. Trainor's Training on Socio-Economics Research Methodologies in AFNR (c)
8. Training on Plant Genetic Resources (PGR) Documentation and Information Management
9. Training on Organic Agriculture
10. Technical Report Writing for a Refereed Journal
11. Risk Management and Social Marketing of Public Sector Biotechnology Products (a)
12. Risk Management and Social Marketing of Public Sector Biotechnology Products (b)
13. In-Situ and Ex-Situ Techniques for Biodiversity Conservation and Ecotourism
14. Intellectual Property Management and Technology Valuation and Transfer Negotiations
15. Risk Management and Social Marketing of Public Sector Biotechnology Products
16. Technical Report Writing for Publication and Presentation
17. Adobe InDesign CS2 Training Workshop

## **Appendix 2. PCARRD Governing Council**

<b>Chair</b>	Secretary Estrella F. Alabastro Department of Science and Technology Bicutan, Taguig, Metro Manila
<b>Vice-chair</b>	Secretary Arthur C. Yap Department of Agriculture Elliptical Rd, Diliman, Quezon City
<b>Co-vice-chair</b>	Secretary Angelo T. Reyes, (replaced by Jose Atienza since 312th GC September 2007) Department of Environment and Natural Resources Diliman, Quezon City
<b>Secretary</b>	Executive Director Patricio S. Faylon PCARRD Los Baños, Laguna
<b>Members</b>	<p>Chancellor Luis Rey I. Velasco University of the Philippines Los Baños Los Baños, Laguna</p> <p>Dr. Feliciano B. Calora, Private Sector Maquiling Breeze Resort Subd. Lalakay, Los Baños, Laguna</p> <p>Mr. Henry Lim Bon Liong, Private Sector Chair, SL Agri-Tech Corporation 2302 Pasong Tamo Extension Makati City</p> <p>Deputy Director General Margarita R. Songco National Economic Development Authority NEDA sa Pasig Jose Ma. Escriva Avenue, Pasig City</p> <p>For. Leonardo D. Angeles, Private Sector Philippine Wood Producers' Association 3F LTA Bldg., 118 Perea St. Legaspi Village, Makati City</p>

### **Appendix 3. PCARRD Technical Advisory Committee**

<b>Chair</b>	Patricio S. Faylon Executive Director PCARRD Los Baños, Laguna								
<b>Vice-chair</b>	Mr. Senen C. Bacani (Private Sector Representative to the DTI- Export Development Council) President Ultrex Management and Investment Corp. 2504-C West Tower, Phil. Stock Exchange Rd. Ortigas, Pasig City								
<b>Secretary</b>	Dr. Danilo C. Cardenas Deputy Executive Director for R&D PCARRD, Los Baños, Laguna								
<b>Members</b>	<table border="0"> <tr> <td>Forester Marcial C. Amaro, Jr. Director Ecosystems Research and Development Bureau College, Laguna</td> <td>Dr. William C. Medrano Executive Director Commission on Higher Education DAP Bldg., San Miguel Avenue Ortigas Center, Pasig City</td> </tr> <tr> <td>Mr. Nicomedes P. Eleazar Director DA- Bureau of Agricultural Research Elliptical Road, Diliman, Quezon City</td> <td>Mr. Mauricio C. Feliciano Assistant Vice President Land Bank of the Philippines Office of the Area Head, Area IV-B Silangan Road, UPLB, College, Laguna</td> </tr> <tr> <td>Ms. Sheila Marie M. Encabo Officer-In-Charge Agriculture Staff National Economic Development Authority Amber Avenue, Pasig City</td> <td>Mr. Meneleo J. Carlos, Jr. Chair Federation of Philippine Industries 2<sup>nd</sup> Flr, Concepcion Industries Bldg, 308 Sen. Gil Puyat Avenue, Makati City c/o RI Chemical Corp.</td> </tr> <tr> <td>Mr. Leonardo Q. Montemayor President Federation of Free Farmers #41 Highland Drive Blue Ridge, Quezon City</td> <td>E. Rodriguez, Jr. Ave, Cor. Borris St., Brgy, Bagong Ilog, Pasig City (Along C-5 beside Security Bank)</td> </tr> </table>	Forester Marcial C. Amaro, Jr. Director Ecosystems Research and Development Bureau College, Laguna	Dr. William C. Medrano Executive Director Commission on Higher Education DAP Bldg., San Miguel Avenue Ortigas Center, Pasig City	Mr. Nicomedes P. Eleazar Director DA- Bureau of Agricultural Research Elliptical Road, Diliman, Quezon City	Mr. Mauricio C. Feliciano Assistant Vice President Land Bank of the Philippines Office of the Area Head, Area IV-B Silangan Road, UPLB, College, Laguna	Ms. Sheila Marie M. Encabo Officer-In-Charge Agriculture Staff National Economic Development Authority Amber Avenue, Pasig City	Mr. Meneleo J. Carlos, Jr. Chair Federation of Philippine Industries 2 <sup>nd</sup> Flr, Concepcion Industries Bldg, 308 Sen. Gil Puyat Avenue, Makati City c/o RI Chemical Corp.	Mr. Leonardo Q. Montemayor President Federation of Free Farmers #41 Highland Drive Blue Ridge, Quezon City	E. Rodriguez, Jr. Ave, Cor. Borris St., Brgy, Bagong Ilog, Pasig City (Along C-5 beside Security Bank)
Forester Marcial C. Amaro, Jr. Director Ecosystems Research and Development Bureau College, Laguna	Dr. William C. Medrano Executive Director Commission on Higher Education DAP Bldg., San Miguel Avenue Ortigas Center, Pasig City								
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Mr. Leonardo Q. Montemayor President Federation of Free Farmers #41 Highland Drive Blue Ridge, Quezon City	E. Rodriguez, Jr. Ave, Cor. Borris St., Brgy, Bagong Ilog, Pasig City (Along C-5 beside Security Bank)								

## Appendix 4. PCARRD Directors' Council

<b>Executive Director</b>	Dr. Patricio S. Faylon
<b>Deputy Executive Directors</b>	Dr. Danilo C. Cardenas Research and Development
	Mr. Richard M. Juanillo Officer-in-Charge, Institution Development and Resource Management
<b>Division Directors</b>	Dr. Romulo T. Aggangan Forestry and Environment Research
	Dr. Albert P. Aquino Socio-Economics Research
	Dr. Leah J. Buendia (Acting Director) Planning and Development
	Dr. Bessie M. Burgos Technology Outreach and Promotion
	Dr. Jocelyn E. Eusebio Crops Research
	Ms. Luz C. Firmalino (Acting Director) Management Information Service
	Ms. Emerita A. Huelgas Finance and Administration
	Dr. Lily Ann D. Lando Applied Communication
	Dr. Elaine F. Lanting (Acting Director) Institution Development
	Dr. Digna O. Manzanilla Agricultural Resources Management Research
	Dr. Edwin C. Villar Livestock Research

## **Appendix 5. Regional Research and Development Coordinating Committee (RRDCC) chairs and consortia directors**

Region/Consortium/ Base Agency	RRDCC Chairpersons	Consortium Directors
CAR - HARRDEC (Cordillera Administrative Region - Highland Agriculture and Resources Research and Development Consortium)/Benguet State University (BSU)	Dr. Ben D. Ladilad Regional Director Department of Science and Technology - CAR (DOST-CAR) BSU Compound, Km 6 La Trinidad, Benguet	Dr. Sonwright B. Maddul Vice President for Research and Extension BSU La Trinidad, Benguet
Region I - ILARRDEC (Ilocos Agriculture and Resources Research and Development Consortium)/Mariano Marcos State University (MMSU)	Dr. Miriam E. Pascua President MMSU Batac, Ilocos Norte	Dr. Stanley C. Malab Vice President for Research, Extension and Agribusiness MMSU Batac, Ilocos Norte
Region II - CVARRD (Cagayan Valley Agriculture and Resources Research and Development)/ Isabela State University (ISU)	Dr. Romeo R. Quilang President ISU Echague, Isabela	Dr. Edmundo C. Gumpal Vice President for Research Development Extension and Training ISU Echague, Isabela
Region III - CLARRDEC (Central Luzon Agriculture and Resources Research and Development Consortium)/Central Luzon State University (CLSU)	Dr. Feliciano S. Rosete <sup>1/</sup> President Ramon Magsaysay Technological University (RMTU) San Marcelino, Zambales	Dr. Teotimo M. Aganon Vice President for Research, Extension and Training CLSU Science City of Muñoz, Nueva Ecija
Region IV - STARRDEC (Southern Tagalog Agriculture and Resources Research and Development Consortium)/University of the Philippines Los Baños (UPLB)	Dr. Luis Rey I. Velasco Chancellor UPLB College, Laguna	Dr. Enrico P. Supangco Vice Chancellor for Research and Extension UPLB College, Laguna
Region V - BCARRD (Bicol Consortium for Agriculture and Resources Research and Development)/ Bicol University (BU)	Dr. Fay Lea Patria M. Lauraya <sup>2/</sup> President BU Legazpi City	Dr. Ninfa R. Pelea Professor III University Planning Officer BU Legazpi City
Region VI - WESVARRDEC (Western Visayas Agriculture and Resources Research and Development Consortium)/University of the Philippines in the Visayas (UPV)	Dr. Glenn D. Aguilar <sup>3/</sup> Chancellor UPV Miag-ao, Iloilo	Dr. Ma. Luisa E. Mabunay <sup>4/</sup> Acting Director Professor and Vice Chancellor for Research and Extension UPV Miag-ao, Iloilo

1/ Effective May 17, 2007, vice Dr. Rodolfo C. Undan.

2/ Effective October 12, 2007 vice Dr. Modesto D. Detera.

3/ Effective June 14, 2007, vice Dr. Rochellir D. Dadivas.

4/ Effective October 16, 2007, vice Prof. Marilou J. Ang Lopez.

Region/Consortium/ Base Agency	RRDCC Chairpersons	Consortium Directors
Region VII - CV-CIRRD (Central Visayas Consortium for Integrated Regional Research and Development)/Negros Oriental State University (NORSU)	Dr. Henry A. Sojor President NORSU Main Campus 1, Dumaguete City Negros Oriental	Dr. Peter T. Dayot Vice President for Research and Extension NORSU Main Campus 1, Dumaguete City Negros Oriental
Region VIII - VICARP (Visayas Consortium for Agriculture and Resources Program)/Visayas State University (VSU)	Dr. Jose L. Bacusmo <sup>5/</sup> President VSU Visca, Baybay, Leyte 6521-A	Dr. Jose L. Bacusmo President VSU Visca, Baybay, Leyte 6521-A
Region IX - WESMARRDEC (Western Mindanao Agriculture, Forestry and Resources Research and Development Consortium)/Western Mindanao State University (WMSU)	Dr. Grace J. Rebollo <sup>6/</sup> President WMSU San Jose, Zamboanga City	Dr. Emilie C. Enriquez Associate Professor I Chairman, S&T Division University Research Center WMSU San Jose, Zamboanga City
Region X- NOMCARRD (Northern Mindanao Consortium for Agriculture and Resources Research and Development)/Central Mindanao University (CMU)	Dr. Mardonio M. Lao President CMU University Town Musuan, Bukidnon	Dr. Rebecca B. Cagmat Professor CMU University Town Musuan, Bukidnon
Region XI – SMARRDEC (Southern Mindanao Agriculture and Resources Research and Development Consortium)/University of Southeastern Philippines (USEP)	Dr. Alexander M. Campaner <sup>7/</sup> President Southern Philippines Agribusiness and Marine and Aquatic School of Technology (SPAMAST) Malita, Davao del Sur	Dr. Lourdes C. Generalao Professor USEP Bo. Obrero, Davao City
Region XII - CARRDEC (Cotabato Agriculture and Resources Research and Development Consortium)/University of Southern Mindanao (USM)	Dr. Nelson T. Binag President Sultan Kudarat Polytechnic State College (SKPSC) Tacurong City	Dr. Hersie C. Nicor Director Agricultural Research Center USM Kabacan, North Cotabato
CARAGA - CARRD (CARAGA-Consortium for Agriculture, Forestry and Resources Research and Development)/Northern Mindanao State Institute of Science and Technology (NORMISIST)	Dr. Joanna B. Cuenca <sup>8/</sup> President NORMISIST Ampayon, Butuan City	Dr. Rowena P. Varela <sup>9/</sup> Acting Consortium Director Vice President for Research and Extension NORMISIST Ampayon, Butuan City

5/ Effective November 1, 2007, vice Dr. Paciencia P. Milan.

6/ Effective September 28, 2007, vice Dr. Emmylou B. Yanga.

7/ Effective August 31, 2007, vice Dr. Julieta I. Ortiz.

8/ Effective November 5, 2007, vice Dr. Edgar W. Ignacio.

9/ Effective November 5, 2007, vice Dr. Gaudencio C. Petalcorin, Jr.

The Office of the Executive Director, the Planning and Development Division and the Applied Communication Division packaged this Annual Report 2007 for publication.

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