

# Concurrent Papers

# Technology Sharing

# **Providing Regional IT Advisor Service in Biosafety Information and Education: Experiences In Asia-Pacific**

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## **INTRODUCTION**

The United Nations Conference on Environment and Development, also known as Earth Summit held in Rio de Janeiro, Brazil in 1992 has resulted into an agreement of 172 Governments on a number of key documents, one of which was the Convention on Biological Diversity (CBD). The objectives of the Convention are the conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources.

The Convention addresses in two different articles the issue on biosafety, namely in Article 8 (in-situ Conservation) and in Article 19 (Handling of Biotechnology and Distribution of its Benefit). In particular, Article 8 lays down the obligation for Parties to establish or maintain means to regulate, manage or control the risks associated with the use and release of living modified organisms (LMOs). Article 19.3, on the other hand, calls upon Parties to consider the need for and modalities of a protocol setting and appropriate procedures, including in particular, advance informed agreement in the field of the safe transfer, handling and use of LMOs.

With the aforementioned premise, and after five years of negotiations, the Cartagena Protocol on Biosafety (CPB) was adopted on 29 January and entered into force on 11th September 2003. To facilitate its implementation, the Protocol under Article 20 established a Biosafety Clearing House (BCH) which is part of the clearing-house mechanism of the CBD. The BCH is an information exchange mechanism established by the CPB to assist Parties to implement its provisions and to facilitate sharing of information on, and experience with, living modified organisms (LMOs). The BCH is critical to the implementation of the protocol as it is intended to be a repository of up-to-date information on LMOs and biosafety in order to assist decision-making in countries around the world as well as civil society and the biotechnology industry.

The United Nations Environment Programme as one of the implementing agencies of the Global Environment Facilities (GEF) is implementing a project for Building Capacity for Effective Participation in the Biosafety Clearing House. The project assists eligible countries to participate in the BCH by building human and institutional capacity and by providing countries with the minimum equipment required for the national participation in the BCH. Among others, countries are being offered and provided hands-on assistance by Regional Advisors in assessing and analyzing training needs and offering appropriate technical assistance in using and benefiting fully from the national BCH.

### **The Cartagena Protocol on Biosafety: An Overview**

The Convention on Biological Diversity (CBD) which entered into force on 29 December 1993 serves as the main international instrument for addressing biodiversity issues. The CBD provides, among others, a comprehensive and holistic approach to the conservation of biological diversity, the sustainable use of natural resources, and the fair and equitable sharing of benefits deriving from the use of genetic resources (SCBD 2000).

One of the issues addressed by the convention is Biosafety. With biosafety, the CBD refers to it as the need to protect human health and the environment from the possible adverse effects of the product of modern biotechnology. Biotechnology has been used for thousand of years in the form of traditional fermentation techniques in the production of cheese, bread or beer as well as in traditional animal and plant breeding techniques to create better crops. With modern biotechnology, however, scientists/researchers can now take a single gene from a plant or animal cell and insert it in another plant or animal cell to give it a desired characteristic, such as resistance to a specific pest or disease (UNEP-GEF \_\_\_\_). As such, modern biotechnology has been recognized as having a great potential for the promotion of human being, particularly in meeting critical needs for food, agriculture and health care (SCBD, 2000).

The Convention clearly recognizes the importance of modern biotechnology providing, among others for the access to and transfer of technologies, including biotechnologies that are relevant to the conservation and sustainable use of biological diversity. However, Article 8(g) and 19, paragraph 3 provides for the precautionary clauses to ensure the development of appropriate procedures to enhance the safety of biotechnology in the context of the Convention's overall goal of reducing all potential threats to biological diversity and the risks to human health. This set the stage for the development of an international legally binding instrument to address the issue of biosafety. One major concern is that while most developed countries have domestic biosafety regimes in place, many developing countries are only starting to establish their own national systems.

Henceforth, in an extraordinary meeting of the Conference of Parties to the CBD, the Cartagena Protocol on Biosafety to the Convention on Biological Diversity was finalized and adopted on 29 January 2000 in Montreal, Canada. The purpose then of the CPB is:

*“ to contribute to ensuring an adequate level of protection in the field of the safe transfer, handling and use of living modified organisms (LMOs) resulting from modern biotechnology that may have adverse effects on the conservation and sustainable use of biological diversity, taking also into account risks to human health, and focusing, in particular, on transboundary movements”.*

The enactment of the CPB has been hailed as a pivotal step towards providing an international regulatory framework to reconcile the respective needs of trade and environmental protection with respect to a rapidly growing global industry of biotechnology. The Protocol creates an enabling environment for the environmentally sound application of biotechnology, deriving maximum benefit from the potential that biotechnology has to offer, and on one end, minimizing the possible risks to the environment and to human health (SCBD, 2000).

### **The Biosafety Clearing House: Up Close**

The Biosafety Clearing House (BCH) is an information exchange mechanism established by the Cartagena Protocol on Biosafety to assist Parties to implement its provisions and to facilitate sharing of information on, and experience with, living modified organisms (LMOs). Article 20, paragraph 1 of the Protocol established the BCH as part of the clearing-house mechanism of the Convention on Biological Diversity, in order to:

- Facilitate the exchange of scientific, technical, environment and legal information on and experience with, living modified organisms; and
- Assist Parties to implement the Protocol, taking into account the special needs of developing country Parties, in particular the least developed and small island developing States, and countries with economies in transition as well as centres of origin and centres of genetic diversity.

The BCH is essential for the successful implementation of the Protocol by way of assisting parties and other stakeholders in different ways. As an example, the BCH serves as a “one-stop-shop” where users can readily access or contribute biosafety related information. In effect, this could assist Government to make informed decisions regard the importation or release of LMOs. The timeliness and accuracy of information in the BCH are ensured since the users themselves are the ones who own and update them (SCBD, 2004).

In particular, the following are some of the benefits that may be derived from using the BCH:

- access information about the national laws, regulations and guidelines of other Parties; and other countries decisions and assessments relating to specific LMOs;
- ensure that all potential exporters of LMOs to their country or those who wish to transport LMOs across their territory, are aware of national regulatory requirements;
- access information about capacity-building and other assistance available to support implementation of the Protocol;
- ensure that the relevant authorities in other countries can quickly find out who to inform in the event of an accidental movement of LMOs into their territory.

The BCH Central Portal (<http://bch.biodiv.org>) serves as a gateway to all sections of the BCH, including the search pages, the Management Centre where information is entered or updated, link to other relevant websites, and the toolkit that help users to understand how to use the BCH. The BCH functions like a “central information marketplace” where the providers and users of biosafety information interact and exchange that information in a transparent manner. To facilitate this, the BCH has been designed to make “finding” and “providing information” as clear and intuitive as possible, like providing common formats and standardized terminology called “controlled vocabulary”. The BCH website is also available in six UN official languages. The Secretariat of the Convention on Biological Diversity (SCBD) manages and hosts the central portal of the BCH.

Table 1 shows the categories of information that can be found on the BCH.

Alongside the benefits that countries could derive from the BCH, the Parties to the Protocol have also obligations to post the necessary information on the BCH central portal. The notification from the SCBD gives the requirements that need to be fulfilled as of the date of entry into force of the CPB. Therefore, it is imperative that all countries have the basic infrastructure and technical capacity, including equipment, tools and practical know-how to fulfill their obligations and to take advantage of the benefits of the BCH (UNEP-GEF-BCH, 2005).

There are several ways by which a country can make information available to the BCH. The SCBD has proposed the following options (UNEP-GEF Biosafety Project Training Module No. 5, April 2007):

1. Offline Access – Non Internet/computer Option
2. Registering Information on the Central Portal Using the Management Centre

**Table 1. Categories of Information in the Biosafety Clearing House (BCH)**

<b>National Contacts</b>	
<b>National Focal Points</b>	Individuals or institutions responsible for managing communication between their government and the CBD Secretariat, and members of the public.
<b>Competent National Authorities</b>	Authorities responsible for performing the administrative functions required by the Protocol.
<b>National Biosafety Websites and Databases</b>	Online resources maintained as official sources of information by a national government.
<b>Laws and regulations</b>	
<b>National guideline</b>	A national guideline is intended to assist with providing ways of complying with national laws, and national regulations.
<b>National law</b>	A national law is a law that has been passed by the national legislative body of a country's government.
<b>National regulation</b>	In most jurisdictions, a national regulation is 'subordinate legislation', usually of an administrative nature, that is authorized by a national law.
<b>Regional agreement or arrangement</b>	Any regional agreements and arrangements between governments to implement provisions of the Protocol.
<b>Decisions and declarations</b>	
<b>Decisions under AIA</b>	Decisions on intentional release into the environment under the Advance Informed Agreement procedure (AIA)
<b>Decisions under Article 11</b>	Decisions on LMOs for direct use as food or feed, or for processing, including placing on the market, and decisions related to import.
<b>Other decisions and declarations</b>	Includes notifications of illegal or unintentional transboundary movement, decisions under the simplified procedure, domestic regulations, field trials not covered by the AIA procedure, decisions prior to entry into force of the Protocol, decisions on transit and contained use, and declarations made on ratification of the Protocol.
<b>Risk assessments</b>	
<b>Risk assessments</b>	Summaries of risk assessments or environmental reviews taken in accordance with Annex III of the Protocol.
<b>Organisms</b>	
<b>LMO Registry</b>	Summary information about all LMOs registered with the BCH.
<b>Gene registry</b>	Summary information about gene inserts.
<b>LMO database</b>	All LMO records in the BCH (includes national duplicates).

<b>Capacity-building activities</b>	
<b>Capacity-building needs and priorities</b>	National and regional capacity-building needs and priorities required to implement the Biosafety Protocol that have been identified and categorized in line with the elements of the capacity-building action plan.
<b>Capacity-building opportunities</b>	Includes information on available or upcoming capacity-building opportunities, such as: technical assistance, scholarships and fellowships, personnel exchange/internships, scientific and technical cooperation, partnerships, discussion forums, professional networks, and others. Opportunities are typically short-term.
<b>Capacity-building projects</b>	Includes information on various ongoing biosafety capacity building projects and other relevant initiatives, such as the UNEP/GEF project on development of national biosafety frameworks. Each record contains basic information about each project/initiative, including: its status and location, the lead organization(s) and contacts, funding details, objectives and activities, main outcomes, lessons learned and a brief description. Projects are typically long-term (i.e. duration of 6 months or more.)
<b>Outcomes and Lessons Learned</b>	Summaries of the reports from completed capacity-building activities.
<b>Biosafety Courses</b>	Biosafety education and training programs with academic accreditation.
<b>Roster of experts</b>	
<b>Expert Roster</b>	Details of biosafety experts who have been nominated by a government as an expert in their field.
<b>Report on Expert Assignment</b>	Reports on the assignments undertaken by Biosafety Experts contacted through the Roster.
<b>Information Sharing</b>	
<b>Biosafety Information Resources</b>	Biosafety-related publications and information resources.
<b>Biosafety Organizations</b>	Directory of organizations involved in activities relevant to implementation of the Protocol.
<b>Country Profile</b>	Summary information about a country, including ratification status and information being reported to the BCH.
<b>Reporting</b>	
<b>National Reports</b>	National reports on measures taken to implement the Protocol.
<b>BCH Annual Reports</b>	Annual review of BCH operations.
<b>Roster of Experts Annual Reports</b>	Annual review of the Roster of Experts and the operation of the voluntary fund for its use.

Source: Ready Reference 003: A Guide to BCH Record Types (UNEP-GEF-BCH Project)



3. Registering Data Using Database Templates Locally and Send Data to the Central Portal
4. Make Data Available Through a Website and Allow the Central Portal to Retrieve it
5. Store Data on the National BCH and Actively Make that Data Available Through the Central Portal Using BCH Interoperability Standards.

### **The UNEP-GEF Project on Building Capacity for Effective Participation in Biosafety Clearing House**

In response to the urgent needs of Parties to use and participate in the BCH, the Global Environment Facility (GEF) approved in March 2004 a new UNEP-GEF project entitled "Building Capacity for Effective Participation in the Biosafety Clearing House (BCH) of the Cartagena Protocol". The project serves as an add-on to the UNEP-GEF Project for Development of National Biosafety Frameworks and as a direct response to the needs of these countries for access and management of the BCH and in close collaboration with the SCBD (UNEP-GEF Biosafety, 2004).

Specifically, the project intends to a) assist countries with how to enter the required data into the BCH, how to set-up their national BCH system, and how to use BCH; and b) assist stakeholders who will either be required to use the BCH to enter country information or search information on the BCH to support decision-making.

The UNEP-GEF Biosafety Unit, based in Geneva, Switzerland provides the participating countries with easy-to-use training materials and access to applications developed by some governments such as Canada, Switzerland and USA. These tools are widely available to all countries and stakeholders thus enabling them to learn more about the BCH including their obligations. Aside from training materials, the project also provides where required the equipment (hardware and software) for countries to set-up their national BCH system. The setting-up of National BCH, however is based on the options described under the BCH overview section of this paper. However, countries that have already received equipment under the UNEP-GEF *project for Development of National Biosafety Frameworks*, needs to be assessed first in terms of the need for additional equipment or software.

In addition to training materials and equipment, the UNEP-GEF Biosafety Unit has also recruited and provides services of regional experts to countries, on a retainer basis. The UNEP-GEF, CBD Secretariat, Capacity Building International Organization of Germany, and the United Nations Institute for Training and Research (UNITAR) have joint forces in recruiting and training the Regional Advisors to enable them to provide the best possible assistance to countries (UNEP-GEF-BCH Operational Handbook, 2005).

At the country level, the nBCH project comprises the institutional structure namely: National Executing Agency (NEA); NEA Focal Point (NFP) responsible for the BCH Project; Biosafety Clearing House Task Force (BCH TF); Biosafety Clearing House Focal Point (BCH FP); and the National Data Entry and/or an Information Technology staff. These comprise human resources who have met some suggested criteria to hold said posts in the national BCH structure. This human resource complement of the country collaborates with the UNEP-GEF-Biosafety Unit for the BCH project together with the Regional Advisors when requested.

## **PROVIDING REGIONAL IT ADVISOR SERVICE ON BIOSAFETY INFORMATION: PRACTICES AND LESSONS LEARNED**

### **Overview of the BCH Regional Advisor Service**

The BCH Regional Advisors are specialists in either Information Technology or the Cartagena Protocol on Biosafety and have been selected through a rigorous screening process by a Panel that included representatives of the International Telecommunication Union (ITU), the Science and Technical Advisory Panel (STAP) of the GEF, and members of the UNEP-GEF Biosafety Unit and the SCBD.

In particular, the Regional Advisors provide assistance to countries by helping in:

- Making the choice for type and style of national participation in the BCH
- Delivering training activities with national counterparts to train participants in the use and access of the BCH;
- Setting-up and making the chosen method of national BCH access operational;
- Developing a sustainable strategy;
- Training National Focal Points; and
- Negotiating costs of setting up the BCH

To request for such a service, countries need to provide a short description of the work required by the Advisor. The services of a Regional Advisor may be availed of at different times under the BCH project cycle which consists of the following steps:

- Step 1. Establishing BCH Task Force and Gathering Information for the National BCH System
- Step 2. Signing the Memorandum of Understanding and Receiving Funds
- Step 3. Setting up National BCH System and Testing
- Step 4. Training and National Workshop on the nBCH System
- Step 5. Closing the Project

## **Providing Regional IT Advisory Service: Experiences in Asia-Pacific**

The author of this paper had the opportunity to provide assistance of various scope and nature to different countries in the Asia-Pacific region ranging from the initial step of negotiating for the Memorandum of Understanding, facilitating introductory and stakeholders workshops, training on the use of BCH, setting-up the national BCH system and up to project closing. As of this date, there are five types of UNEP-GEF-BCH Regional IT Advisory Missions accomplished in three countries in the region namely, Lao People's Democratic Republic, Royal Kingdom of Bhutan and Kingdom of Tonga from the period April to August of 2007. Another mission will be served on the second week of November, this time in the Hashemite Kingdom of Jordan.

This section of the paper highlights the experiences of the author in performing his role of providing the much needed assistance to build the capacities of countries in the region towards participating in the BCH. This in effect redounds to the countries reaping the benefits from using the BCH and more importantly, meeting their respective obligations to the Cartagena Protocol on Biosafety.

### **Regional IT Advisory Service in Lao People's Democratic Republic**

The initial regional IT advisory service in Lao kicked off during the **First Training-Workshop for the LAO, PDR BCH Task Force**. As the first of a series of training-workshops in connection with building the capacity for effective participation in the Biosafety Clearing House for LAO, PDR, the 1<sup>st</sup> National Training-Workshop on Biosafety Clearing House with sub-title "Introduction to Cartagena Protocol on Biosafety and Finding and Registering Information on the BCH Portal" was conducted on April 9-11, 2007 at the Science Technology and Environment Agency (STEA), Vientiane, Lao, PDR.

The training-workshop is aimed at introducing the Lao, PDR BCH Task Force to the Cartagena Protocol on Biosafety (CPB) and training them on the use of Biosafety Clearing House Central Portal to include the following:

- Using HW/SW for Internet Connection
- Introduction to BCH
- Surfing the BCH Portal
- Finding Information on the BCH Portal
- Introduction to Management Centre and Lab
- Registering Data in the BCH Central Portal.

This workshop has 29 with Dr. Ruel Maningas and another Regional IT Advisor for Asia serving as Regional IT Advisors. The Lao-PDR National CPB Focal Point, the BCH Focal Point and the national data entry staff formed part of the Training Team. For this training-workshop, the IT Advisors adopted

the participatory approach to the training-workshop through the self-evaluation, questions and answer portion, training-workshop navigation and the participants facilitating the group dynamics/ice breaker activities. The group dynamics/ice breakers allowed the participants to showcase their talents in singing and dancing highlighting the rich culture and friendliness of LAO people. Said approach was greatly acknowledged and appreciated by fellow training team members from LAO and the participants as well.

The author was once again considered to serve as the Regional IT Advisor for **Lao's 3<sup>rd</sup> National Training-Workshop on July 11-12, 2007**. Participants to this workshop consisted of the BCH Task Force Members totaling to 15. They were almost the same participants trained during the 1<sup>st</sup> and 2<sup>nd</sup> workshops held on April 9-11 and May 22-23, respectively. To continue enhancing the awareness and knowledge gained about participating into the BCH during the 1<sup>st</sup> and 2<sup>nd</sup> workshops, the 3<sup>rd</sup> workshop in addition also focused on learning more about data management and introduced the participants to new initiatives relative to BCH implementation.

The mission has the following objectives:

- Continue to gain understanding among BCH Task Force members and relevant agencies about CPB and National Biosafety Framework (NBF)
- Increase the participants' understanding of data management and updating information for Lao BCH
- Navigate through the new and improved Lao-nBCH website
- Become aware on new BCH applications/tools such as HERMES and Ajax Plug-in

As in the past workshops, the NEA Focal Point of Lao provided the overall coordination of the workshop, with the BCH Focal Point and the National Data Entry staff and the rest of the STEA staff providing the much needed technical and logistical support. For this workshop, The Regional IT Advisor introduced a special session intended for the BCH-LAO project team and some support staff from STEA. Here, the Regional IT Advisor, presented in detail and demonstrated new initiatives to develop and maintain an nBCH through the content management system (CMS) technology called HERMES.

The experience in Lao is deemed significant on the part of the author having been chosen to provide technical assistance for three out of its four workshops. The 4<sup>th</sup> Training-Workshop for the LAO, PDR BCH Task Force was held on August 22-23, 2007. While the first three workshops conducted for the Lao, PDR BCH Task Force were focused on fully understanding the nature and scope of the BCH to include the benefits and obligations, and use of the BCH Central Portal, this fourth and last workshop generally aimed to make the participants have an advanced understanding of the use and

functionalities of the BCH Central Portal. Specifically, the participants at the end of the workshop were able to:

- Gain deeper understanding about CPB and information requirements for the BCH
- Navigate through the LAO nBCH website
- Practice and familiarize in registering biosafety information to the BCH Central Portal
- Brainstorm on LAO BCH sustainability

For this workshop, the topics highlighted were the reiteration of the importance of CPB and the role BCH plays to meet country obligations. This workshop also provided the participants the opportunity to have a thorough run through of BCH particularly inputting actual country BCH information to the BCH training site.

### ***Workshop on Finalization of MOU: Experience in the Royal Kingdom of Bhutan***

The mission call for the Royal Government of Bhutan held on July 23-24, 2007 is generally aimed at assisting the country in finalizing the Memorandum of Understanding. At the end of the mission, the key persons in-charge of the BCH project were able to:

- Be aware of the scope and description of the BCH Project
- Understand the phases of the BCH Capacity Building Project Operational Manual Contents
- Find procedures, resources and information on the BCH Project Operational Manual
- Understand the purpose of the Memorandum of Understanding
- Understand the requirements to fulfill all the forms that are described in the Operational Manual and their relationship with the MOU and
- Prepare the final draft of the MOU for the project.

The workshop served as an opportunity for the Regional Advisor to become more knowledgeable on the background information of the Royal Government of Bhutan's National Biosafety Framework making it as an initial entry point for technical advisory intervention. Consequently, the Regional Advisor was able to meet the country's National Executing Agency (NEA) Focal Point for the BCH, the National Data Entry/IT staff and some key technical staff.

As for the expectations, the workshop participants acknowledged the important role of the BCH to meet the obligations of the country to the CPB, and gave recognition to the urgency of the need to finalize the MOU which is one of the pre-requisites for the implementation of the BCH project. As such, relevant contributions of the BCH Advisor and significant help in the revisions to the said draft MOU was highly appreciated and recognized.

For his part, Dr. Maningas emphasized his advisory role in the process of revising the MOU in that all the decisions to be made should rest upon the NEA. Along with this, he highlighted some of the major revisions that need to be done as per the previous comments raised by UNEP-GEF on the first draft of the MOU. Dr. Maningas made some presentations on BCH which included the country obligations to the project, introduction to the MOU and BCH project operational guidelines. In addition, Dr. Maningas presented the recommended guidelines for participation into the BCH, specifically focusing on the four (4) options and new initiatives like HERMES and Ajax Plug-in. After all such initial overviews have been made, the NEA Focal Point and his co-participants agreed to adopt a new option for BCH participation, that is Option 1 (Using the BCH Central Portal) from the previous Option 4 (Interoperability Procedure Using the BCH Web Service) and also taking the opportunity of having HERMES to create/customize a national BCH website. Succeeding, three workshops with Dr. Maningas advising have been facilitated aimed at addressing the requirements for drafting the MOU between the Royal Kingdom of Bhutan and the UNEP-GEF-BCH.

Looking back at the mission's general objective of assisting the NEC in finalizing its MOU for the BCH project, it is concluded that the specific objectives set thereto to support such general objective have been achieved. More importantly, it may be noted and emphasized that the needed revisions have been done and issues/concerns raised clarified.

### **Stakeholders' Workshop on BCH for the Kingdom of Tonga**

The mission in the Kingdom of Tonga held on August 7-10, 2007 is basically aimed at providing the stakeholders' meeting-workshop participants with basic information on the biosafety clearing house (BCH). Specifically, this mission hoped to: a) raise awareness on the establishment, use and benefits of/from a nBCH; inform national stakeholders of objectives and provisions of nBCH project; b) seek input into objectives of nBCH; and c) provide initial information on the maintenance and access to the BCH central portal.

In preparation for the said mission, Dr. Maningas referred to the workshop design found in <http://moodle.unep.ch> appropriate for the conduct of stakeholders' workshop in addition to some guidance from the BCH Project Manager based in Geneva, Switzerland. Simultaneous with the compilation of necessary materials and drafting of workshop agenda, Dr. Maningas coordinated with SCBD for the training-account (for demonstration on registering information for Tonga BCH Project Team), and the needed travel arrangements.

The Stakeholders' Workshop was held at the Lopaukamea II, Atele, Tongatapu, a 15-minute drive from the Ministry of Lands, Survey, Natural

Resources and Environment (MLSNRE) office, the National Executing Agency (NEA) for the BCH project in Tonga. The workshop venue is actually a training center located in one of the colleges in the country. It is equipped with wide training hall with enough chairs and tables and excellent ventilation. For the workshop, there were 25 PCs provided with 125 kbps bandwidth internet connection. A laser printer was also provided for printing of workshop outputs and other related training materials. There were a total of 20 participants who came from different line government ministries and non-government organizations in Tonga.

After all the presentations were concluded, a stakeholders consultation was facilitated with the workshop participants requested to articulate/share their thoughts on what issues/concerns that need to be addressed/ looked at in relation to the BCH project implementation in the Kingdom of Tonga. This session yielded the following information:

- The need to make available the needed infrastructure for the said project
- Urgent establishment and regular coordination of the BCH Task Force
- A follow-up workshop should be scheduled next
- Needs more practical exercises for the next workshop to familiarize the stakeholders on the use of BCH Central Portal.
- Input information from the NBF to the BCH
- Continue close coordination with Competent National Authorities

While all of the workshops conducted in Lao used a numerical rating for the workshop performance evaluation by the participants, the Stakeholder Workshop in the Kingdom of Tonga made use of a different type of workshop evaluation. Here, only 1 question needs a numerical rating while the rest has to be answered in an open-ended manner as follows:

1. On a scale of 1 to 5, where 1 is low and 5 is high; write the number that best represents the degree to which your personal expectation of the workshop was met.
2. ME - a statement that describes your own participation in the workshop
3. WE - a statement that describes how you feel about the interaction and collaboration of all those involved in the workshop like the participants, resource person, everyone
4. THEM - a statement that describes how you feel about the way the workshop was organized.
5. IT – a statement that describes how you feel about the workshop as a whole.
6. HIM - a statement of how you feel about Dr. Ruel Maningas as resource person and facilitator
7. VENUE - comments on the venue, arrangements, food, etc

Using such an evaluation instrument, the Regional Advisor was able to get detailed assessment of the overall conduct of the workshop. In general, the workshop got favorable feedback from the participants. Also, the effort exerted by the counterpart workshop team headed by the BCH Focal Point is acknowledged and recognized. Given such a short notice and despite the absence yet of the UNEP-GEF funds for the project, the NEA had shown its resourcefulness by pooling some of their current resources to make the workshop possible. This indeed is an indication of commitment to the project which mostly becomes a very good entry point to project success.

## **LESSONS LEARNED AND CONCLUSION**

In the process of providing intervention to build the country capacity to effectively participate into the BCH through the provision of advisory and technical assistance with training, consultation and workshop as modalities, the following lessons were specifically drawn from the workshops facilitated:

- In preparing for the workshop, a considerable amount of time should be spent, specifically focusing on pre-workshop coordination such as agenda formulation and ensuring that training materials are adequate, among others. With the lessons learned in the workshops, the country BCH teams now work with ease in dealing with the project cycle depending on which stage they belong (i.e. MOU finalization, stakeholders' orientation etc.) This may indicate that the UNEP-GEF through the intervention of the Regional Advisor becomes successful in transferring not only the technology to manage the country's BCH system but the manner of coordinating and managing capacity building such as training workshop as well.
- As the series of training-workshop progresses, issues and concerns on how to effectively customize the training-workshop (i.e. materials, manner of delivering the presentation, etc) are being addressed slowly but surely. Suggestions and recommendations made during the previous workshops serve as key considerations in crafting the agenda for the succeeding workshops. This further indicates that getting feedback from the participant/stakeholders every end of the day through the workshop navigation meeting technique, is indeed at very effective tool to document things that should be looked at for immediate adjustments of training-workshop methodologies and approaches.
- The IT infrastructure when properly set up provides a conducive environment for learning. On the other side, the internet connection which is a primary consideration for implementing the project should be given utmost importance, making it more reliable and consistent in providing the necessary technological back-up.



- The actual training workshop when attended by a Regional Advisor provides an opportunity for visual confirmation of equipment (e.g. computers, LCD projector) bought for the BCH project and how they are utilized for said project.
- Lastly, the support provided by the host country, SCBD, the UNEP-GEF-BCH project team, and the travel firm provided the much-needed lifeblood before and during and after the conduct of the intervention.

It may therefore be concluded that given the experiences, lessons learned and implications highlighted, the Regional Advisor service when availed of by countries significantly contribute, among others, to fully understanding the benefits, obligations and technology behind the use of BCH in fulfillment of their obligation to the Cartagena Protocol on Biosafety. More importantly, the essence of such an intervention is deemed at the level of providing an effective and efficient channel or link between the Parties and the UNEP-GEF-BCH project management office in Geneva, Switzerland and other relevant stakeholders and institutions.

As a Regional Advisor himself, the author, in the performance of his task and missions for the BCH will always be guided by the importance of the Protocol by which the BCH is created for - "While advances in biotechnology have great potential for significant improvements in human well-being, they must be developed and used with adequate safety measures for the environment and human health".

## **REFERENCES**

- Maningas, R.V. 2007. Stakeholders' Meeting-Workshop on Building Capacity for Effective Participation in Biosafety Clearing House of Kingdom of Tonga: Mission Report, Tongatapu, Kingdom of Tonga, August 7-10, 2007
- Maningas, R.V. 2007. Workshop on Finalization of MOU Between the Royal Kingdom of Tonga and UNEP-GEF-BCH: Mission Report, 23-24 July 2007, Thimphu, Bhutan
- Maningas, R.V. 2007. 1st, 3rd & 4th Training-Workshop on Biosafety Clearing House for the Lao Peoples' Democratic Republic BCH Task Force.
- SCBD, 2004. The Biosafety Clearing House of the Cartagena Protocol on Biosafety: A Guide to the BCH, Montreal, Canada
- SCBD, 2000. Cartagena Protocol on Biosafety to the Convention on Biological Diversity: Text and Annexes, Montreal, Canada
- The Biosafety Clearing House (BCH) Central Portal <http://bch.biodiv.org>
- UNEP-GEF Biosafety Project, 2007. Training Module No. 5: Recommended Guidelines for Countries to Interact with the Biosafety Clearing House.
- UNEP-GEF Biosafety Project, 2004. Operational Handbook For Participating in the UNEP-GEF Project for Effective Participation in the Biosafety Clearing House (BCH). UNEP-GEF Biosafety Unit, Geneva, Switzerland
- UNEP-GEF Biosafety Projects Brochure, Building Capacity for Effective Participation in the Biosafety Clearing House (Undated)

# Investigation Into Training of Farm Labourers in Free State Province (RSA)

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*This study examined the training gaps that exist within the farm labourer communities in Free State Province, South Africa. The research was carried out in three different regions of the said province. Sites within each region were randomly selected. These sites were Gumtree, Glen and Naledi farm villages. Data were collected using a questionnaire and also through participatory research methodology of formal and informal meetings. Training in this study was categorized as either technical or managerial. The results indicated that there is limited training offered to farm labourers, i.e. 21.4 percent for technical and 3.0 percent for managerial skills training. It seemed from these results that technical training was given more priority in comparison to managerial training. It was also established that male employees were given better training opportunities than their female counterparts.*

## **INTRODUCTION**

Training of workers is an essential tool to farming efficiency and productivity. Farm labourers can benefit much through the necessary skills

training and knowledge acquisition. The farm worker's studies conducted by the Department of Labour, indicated that farm workers and farm worker families have the lowest levels of education and literacy of all labour groups (DoL 2001:36). This is despite the fact that these workers play an important role in implementing crucial operational decisions made by either farm managers or farmers themselves.

Although it is a known fact that workers can help increase farm productivity and efficiency, farming communities in many countries, including South Africa have paid very little attention to or have shown insignificant interest in skilling farm labourers to the advantage of both labourer and farmer. Various researchers have hinted at the importance of training farm labourers and workers in general. Verschoor, van Rooyen & D' Haese (2005:505) confirmed these findings by citing van Zyl & Kirsten (1998), who indicated that human capacity development and skills training are important determinants of successful farming practice.

They also indicated that the neglect of human development would often result in development failure. There seems to be a direct correlation between low farmer income and low investment in training (Verschoor, van Rooyen & D' Haese, 2005:505).

The economic structure of the South African agricultural set-up does not afford farm labourers the financial means to pay for their own training. They are amongst the lowest paid employees in the South African labour market and as a result they cannot afford to pay for either their own or the training of their children. Ortman (2005:304) indicated that in order for the South African economy to grow, South Africans should be educated and skilled.

The above researchers cited Paton & Singh (2005) who state that the poor and mismatched skills profile of South Africans has placed constraints on economic growth in the past. Pont (2003:6) emphasized the importance of training by indicating that there is a positive correlation between training and profit. The study furthermore highlighted that senior decision makers must be made to view training as an investment.

Farming enterprises in South Africa are also faced with challenges imposed by globalisation. In order to compete in the global economy, new products, new systems and niche markets should be identified. These require amongst others, the use of trained, productive employees, coupled with the use of new technologies. If these aspects are not addressed, farming in South Africa will lag behind international farming practices and trends.

Blunch & Castro (2005:1) complemented the above by citing that development of human capital is integral to economic growth and that this has long been recognised in economic theory. These researchers further

indicated that the attention paid to human capital increased in the 1950s as the development theories shifted away from their previous focus on physical capital and infrastructure.

### **Overview of farm labourer training in South Africa**

Marcus (1993:9) states that farm labourer training in South Africa is an area of concern and that the basic educational needs of workers in commercial agriculture remain an area of total neglect. These employees have been almost completely excluded from formal education processes. The author points out that the neglect occurs despite a number of debates that had taken place some time ago regarding the need for training. Very little has since been done to correct the situation.

This study aims to establish some of the factors hindering the training of these employees by scanning the areas of concern, the objective being to highlight possible areas of improvement. In order to arrive at this objective, the authors will focus on the historical views on farm labourer training spanning the pre- and post 1994 era in South Africa.

Only experiences highlighted in the literature and interviews will be mentioned for the above purpose. The motive for comparing these areas is to establish whether there was any significant positive development in terms of the approaches to the state of training for these workers since South Africa adopted a democratic system of governance in April 1994 as opposed to an apartheid system prior to April 1994.

### **Historical view of farm labourer training**

The historical view to training in general is important only in as far as it may be used as a basis to measure improvement or the lack thereof. It is within this context that this study deemed it necessary to include some of the historical views and practices pertaining to this subject in order to gauge the actual progress.

Training of farm labourers in South Africa was documented since 1964. During this period, the type of training was influenced by the needs for skilled and semi-skilled workers in the farming communities.

Farmers needed both skilled and semi-skilled workers to bolster their productivity. Robertson (1988:121) reiterated the need to provide skills to these workers since there were very few farm employees that were adequately trained to occupy skilled positions.

### **Farm labourer training**

The literature reveals that training of farm employees prioritized only the needs of employers as opposed to also taking the needs of the

employee into consideration (Stavrou, 1987:137). Consequently, all training focused solely on the needs of farmers. The assumption can be made that although farmers trained workers, they were only trained to fulfill the farmer's needs.

One can further deduce that this training was not about skilling and equipping workers, but about providing a specific need of the farmer. Stavrou (1987:137) confirmed this by reflecting that the training of these workers was designed to meet the minimum level necessary to satisfy mechanization requirements.

Horrell (1967:125) reflected yet another dimension of this training by indicating the racial imbalances. He mentioned the dissatisfaction of the then Director of the South African Agricultural Union (AGRISA) who complained about the lack of officially-provided training facilities for African farm labourers as compared to coloured farm labourers who were trained at the Kromme Rhee farm in the Western Cape.

Robertson (1988) also pointed out that in order to address the disparity in the availability of education for African farm workers, it was important to start by initiating an education system that would address this particular need. Furthermore, Robertson (1988) also indicated in his research findings that the modal standard of education and education levels of farm labourers in all three districts (Lion River, Lower Tugela and Elliot) were generally low.

The studies indicated that financial problems were the main reasons for respondents not furthering their education. Although financial shortages were cited as the main problem, other problems such as parental pressure against education were significant. Parents in these farming communities actively encouraged their children to look after siblings and livestock at the expense of attending school.

### **Training institutions**

South Africa has a number of training institutions, ranging from colleges, universities of technology, universities (public and private), and private training institutions to governmental training directorates and centres. Bearing the existence of these institutions in mind, one would reasonably expect to see vaster improvement with regard to the training of the working class, which also includes farm employees.

The interviewing phase of this study indicated that there were some parastatals that were linked to the training of these workers even though training was in such a poor state. Amongst these were three centres that operated in certain parts of South Africa only, and one, Boskop, which operated nationally. The other three were, Kromme Rhee, Rural Foundation and Midland Community College.

· Kromme Rhee

This was the first training centre established for farm labourers and it was set up by the state in 1964 to train coloured farm labourers. Kromme Rhee was a state institution that was run by the former House of Representatives. For a long time it catered almost exclusively to coloured farm labourers and the training needs of Western Cape farmers (Gordon, 1993b:15). This centre was closed due to financial problems.

· Rural Foundation

The Rural Foundation was established on 23 December 1982 in Stellenbosch in the Western Cape, as a non-profit organisation and was liquidated in May 1998 because of cuts in its annual subsidy from the Department of Social Development. The Foundation initially aimed at improving the quality of life of both farmers and farm labourers by organising projects on farms that would positively impact on the prevailing economic, social and physical circumstances of farm workers. This centre was closed due to the same problem as Kromme Rhee.

· Boskop

Gordon (1993b:14) reported that the state agriculture commissions in the 1970s pointed out the damaging effects of an illiterate and unskilled productivity labour force. Such reflections provided a stimulus for non-formal training by the tripartite state/agribusiness/organised agriculture alliance. This led to the development of a training programme.

This training centre was established in 1976 and was mainly designed to train African farm labourers. It was run as a parastatal. Its growth was so significant that it opened offices in Middleburg and Bethlehem and ran 53 mobile units, training workers in all parts of the country (Gordon, 1993b:15). This centre was closed due to lack of financial support.

· Midlands Community College

This institution offered two kinds of courses to workers in the commercial agricultural sector, namely technical skills training and 'employee development/management control' training. Courses developing technical skills covered a wide range of the sector-specific tasks including vehicle and machine use and maintenance, tractor, truck and vehicle licenses, fleecing, fencing, dam building, artificial insemination, spraying and chemical use, livestock care, etc. The overwhelming majority of workers who were sent for skills training were trained in machine use, maintenance and other related courses only. None of these courses required literacy. This centre was closed because of low enrolment.

## **Types of training**

The type of training offered to these employees was designed to suit the needs of their employers and not the needs of the employees (Stavrou, 1987:137). The training was thus biased in favour of farm productivity rather than the employee's individual development. Gordon (1993a:10) reported that PH Hewitt, Director of the South African Sugar Association (SASA) Experimental Station, confirmed the above-mentioned sentiments by stating the case of courses offered to sugar cane farm labourers. These courses were designed for the sole purpose of addressing the needs of the sugar cane farmer.

The Training Studies Division of the National Institute for Personnel Research (NIPR) developed the 6M simulation programme (sometimes referred to as Justice for All Package) for the entire country. The 6M stands for manpower, material, machinery, money, markets and management. Gordon (1993a:12) mentioned that the training centres that taught 6M packages were supposed to teach management aspects to farm labourers but that was not the case. In other words, management was not taught to farm labourers. This was because farmers were afraid of bargaining power and that the training would influence the mobility of workers.

Marcus (1993:10) reflected that it is the manner in which 6Ms interact that makes an organisation effective. The package identifies the problems that a farmer has with labour with specific relation to inadequate communication and ignorance. The objective of the 6M package was to address economic and business literacy, tilling the soil for improved worker/management communication, increased productivity, higher profits, less militancy and a more knowledgeable and contented workforce.

## **The need for training**

According to Van Zyl (2000:20), training of adults is not just for an individual's benefit, but a country's necessity. Van Zyl (2000), further recommended that South Africa treat training as indispensable. If training of adults is to be accomplished successfully and effectively, the following aspects should be taken into consideration:

- The training should be real.
- The adults' perspectives and experiences should be taken into consideration.
- The training should be comprehensive and have relevant and direct application on the work of trainees.

Mathiba (1999:37) held the view that the reason behind adult skills training is the potential to increase worker productivity. Contrary to the above popular views, training should aim at unlocking the individual creativity and interest in terms of the job. Mathiba (1999:37) supported

Baptiste's (1996:6) idea when he concluded that human capital investment increases economic growth within societies and therefore training of adults should be viewed as nothing more than mechanisms for labour force preparation providing individuals with differential values and marketable skills needed to sustain an unequal socio-economic order, especially in deep rural areas.

According to Salamon (1991:39), training of adults is the improvement of human capital investment, and such investment should focus on the supply side of the labour market, which is expected to increase the economic growth of the country. Schultz (1963:17) suggested that although training of adults is directed at the improvement of the country's economy, it also focuses on the worker's satisfaction in terms of material, social, psychological and spiritual dimensions.

Maxwell (1996:111) supported the idea of skills development when he concluded that the aims and objectives of the provisioning of adult basic education and training should be as follows:

- Enable the individual to develop communication skills
- Develop numeric skills, and to develop a critical understanding of the context in which they (adults) live
- Enable the individual to work and interact with others
- Develop technical and practical skills
- Enable adults to understand the abilities they have gained from life and work experience

Various authors such as Brookfield (1992:13), Kotze (1994:20), and Aber & Katz (1998:48) agree that even though many educationists concluded that the training of adults and the teaching of young learners differ greatly, there are similarities. Aldrich (1999:29) suggested that South Africa has a great need for competitive trainers. Such trainers can develop the career skills of the underprivileged adult people especially in rural areas so that they can achieve higher customer satisfaction rate in their businesses. The above-mentioned authors also recommended that the trainer should realize that he/she is the driving force behind the economic growth in this country.

### **Technical training**

Stavrou (1987:138) recorded that an average of 84% of farmers interviewed during his survey, felt that there was a strong need for the training of tractor drivers, whilst 70% felt a similar need for training heavy duty vehicle drivers and tractor mechanics.

The same author also revealed that an average of 74.6% of farmers felt a similar need to train blue collar technical labourers, as opposed to 39.6% who felt a strong need to train blue collar technical labourers.



Investment in new tractors and related machinery and implements as a percentage of the gross capital formation has been rising steadily over the past few decades.

It would therefore follow that an investment in the necessary personnel skills to match that in tractors and related machinery and technology, would be considered a priority. This is also reflected by the limited existing training facilities for farm labourers that tend to concentrate almost exclusively on the training of tractor drivers and mechanical maintenance workers.

### **Managerial training**

This type of training is necessary to complement the technical skills by having personnel that match the skills levels of technical efficiencies. However, much of the available literature reflect that this type of training does not receive the serious consideration it deserves (Marcus, 1993:10).

Stavrou (1987:140), reported that management training is regarded as a highly contentious and significant issue amongst white farmers throughout South Africa especially with relation to the need for training black farm managers. The response amongst farmers surveyed, was positive, with only 8% of farmers stating that no such need existed. Fifty percent of the farmers felt a strong need for black management training and 54% for black supervision/clerical training.

The survey also indicated that 59% had no objection to training or employing a black manager, but under the present circumstances would not employ such a manager. They justified their action by arguing that the size of the farm would not financially permit the employment of any such manager and that a male heir was available to manage the farm following their own retirement.

Although this is one critical consideration that farmers cannot ignore, it is important to understand that in normal situations management is all about team work, so if this sort of work is done by a single person, many wrong decisions can be made. This view is an oversight by those farmers who hold the view of barring training on the grounds of the aforesaid reasons.

The objective of this study was to investigate the training gaps within the farming community in the Free State Province of South Africa. This was done by assessing the training needs at three farm villages in the said area. A participatory research methodology as well as a questionnaire that was completed amongst participating farm labourers with the help of fieldworkers, was used to gather information. The results obtained revealed that there were serious training limitations in these farm labourer communities.

## **LOCATION OF THE STUDY AREA**

This study was conducted in the Free State Province of South Africa. This province is known for its agricultural potential. Farming in Free State Province makes a significant contribution to the economy of the province (Free State, 2004).

The province covers an area of 129 464 km<sup>2</sup> and has a population of 2.8 million which is about 6.4% of the national population. Seventy one per cent of the province's population (about two million people) live in urban settlements, whilst 0.8 million people live in rural areas. Most people who reside in the rural areas are found on farms. These people derive their income by working on the farms, either as permanent or seasonal employees.

Although the Free State is the third largest province in South Africa, it has the second smallest population and the second lowest population density (Free State, 2004). Free State borders on the Northern Cape, Eastern Cape, North West, Mpumalanga, KwaZulu-Natal and Gauteng Province also share a border with Lesotho (Free State, 2004). These border areas of the province constitute a large portion of the rural areas, where many farms are located. Consequently, most of the farm labourers are employed in these areas. Some of these areas are extremely remote, making it rather difficult for development activists to access them. The remoteness of the areas marginalises the inhabitants even more in terms of resources and services.

## **RESEARCH STRATEGY AND METHODOLOGY**

Farm labourer training in South Africa has received very little attention from researchers and training providers hence the virtually complete absence of formally documented information. In order to carry out research on a topic of this nature where so little basic information is available, it is of vital importance that a relevant research strategy be applied that will yield an unbiased outcome.

The research team identified the following explorative and descriptive strategies as research strategy. These strategies were adopted because they bear the core characteristics of the study. The following were identified as the core features of the study: the study is of relatively short duration because the research was conducted within the confines of only one province, namely Free State Province; and there was a need to systematically collect information in order to build a data base of information about farm labourer training.

The following techniques were used:

- Desktop study: This was done in order to study the available literature.

- Interviewing: Different stakeholders were interviewed in open sessions, where every participant was allowed to give input, that is, participatory research. Other individuals or officials were interviewed telephonically.
- Questionnaires: Structured and unstructured questions were prepared and provided to the identified stakeholders.

## **Sampling**

This research has been conducted in all three regions of Free State Province viz.: Southern Free State, Northern Free State and the Eastern Free State. The random samples were collected from three farm labourer villages in Free State Province. These villages are located in the areas of Bloemfontein, Ficksburg and Bothaville.

The sampling took into account the availability of training providers in Free State Province. Furthermore, the farm villages that were considered for this study had to meet the following criteria:

- The village should have more than 500 farm labourers residing in the area.
- It should have resources such as a school and a clinic.
- The farmer should be willing to give permission for fieldworkers to conduct the interviews.
- Farm labourers should be willing to participate in the interviewing processes.

After the fieldworkers had established that the earmarked farming villages satisfied the above-mentioned requirements, they then arranged for an appointment with the relevant farm labourers in order to explain the purpose of the study.

Only one farm village per region was included in the interviews and the interviews followed the quantitative and qualitative research strategies. The sample size of interviewees totaled to 225 farm labourers.

## **Data analysis**

Both qualitative and quantitative approaches were used in this study. The outcome of the qualitative approach was integrated with the recommendations and was not presented in the analysis because very little feedback was brought to the research team, with only two out of 25 questionnaires being returned, i.e. only 8% feedback received. The entire analysis was dominated by quantitative information, where more questionnaires were returned, i.e. 201 questionnaires were received out of 215, which is a total of 93%.

The response variable (i.e. training) considered in the current study was categorical in nature. That is, the observation was scored as either '1'

or '0' indicating whether the farm labourer had received training or not, respectively and thus followed a binomial distribution. Data was analysed using the GENMOD and FREQ procedures of SAS (SAS, 2000). The GENMOD procedure was used to fit a simple generalised linear model to a response variable that was transformed using a *logit* transformation. On the other hand, the FREQ procedure was used to test for independence between variables.

The solutions obtained using the GENMOD procedures were back-transformed to the original scale for ease of interpretation. The model used for training included the effects of region, gender and qualifications. A further analysis was conducted on the set of data comprising only farm labourers who received training in order to determine the type of training and source of funding for the training. In addition, a chi-square test of independence was conducted between training and funder or benefits that accrued from the training.

## **RESEARCH RESULTS**

The summary of the data collected from all three regions of the Free State Province is presented in Table 1.

Table 1 indicates that 32.07% of males interviewed in the Southern region received technical training whilst 22.58% of the female farm labourers who were interviewed in the same region received such training.

The corresponding percentages for males and females in the northern and eastern regions were 38.89% and 31.58%, and 17.78% and 17.14 % respectively. Based on this information, it seems that male farm labourers received more technical training than females. Table 1 also provides information regarding the different stakeholders that were funding the training of these beneficiaries.

### **The effect of region, gender and qualifications on farm labourer training**

The results of the Likelihood Ratio (LR) Statistics using the GENMOD procedure of SAS (SAS, 2000) for Type I Analysis of region, gender and qualifications on training in the Free State Province are presented in Table 2.

The Type I Analysis fits each effect in the model separately. Table 2 shows that both gender and qualifications did not statistically ( $P > 0.10$ ) influence whether farm labourers received training or not. On the other hand, the region significantly influenced ( $P < 0.10$ ) farm labourer training in the Free State Province. The pair-wise analysis (contrasts) done for the three regions to indicate regions that are statistically different from one another is presented in Table 3.

The pair-wise comparisons amongst the three regions (Table 3) indicate that region 3 (eastern region) is statistically different ( $P < 0.10$ ) from the other two regions, while there was no significant difference ( $P > 0.10$ ) between regions 1 and 2 (southern and northern regions) respectively. The estimated differences between these regions were back-transformed from the *logit* to the original scales to indicate the relative odds ratios.

**Table 1. Data summary<sup>1</sup> for the three Free State regions**

		Southern Free State	Northern Free State	Eastern Free State	FREE STATE PROVINCE
		GLEN	NALEDI	GUMTREE	
TRAINING Technical	Male	32.07	38.89	17.78	29.58
	Female	22.58	31.58	17.14	23.77
	Average	27.4	21.6	15	21.33
Managerial	Male	0	0	4.4	1.47
	Female	0	26.32	0	8.77
	Average	0	13.16	2.2	5.12
SPONSORSHIP Farmers	Male	9.43	27.78	11.11	16.11
	Female	16.13	31.58	14.29	20.67
	Average	12.78	29.7	12.70	18.39
Government	Male	1.89	0	2.22	1.37
	Female	3.23	0	5.71	2.98
	Average	2.56	0	3.97	2.18
NGOs	Male	0	0	0	0
	Female	0	0	5.71	1.9
	Average	0	0	2.86	0.95

<sup>1</sup>The values given in the table refer to percentages of favourable responses in that particular category.

**Table 2. Likelihood Ratio (LR) Statistics for Type I Analysis of Training in the Free State Province**

Source	Degrees of Freedom	Chi-Square	P> Chi-Square
Region	2	5.67	0.0586
Gender	1	0.40	0.5283
Qualification	3	2.86	0.4133

**Table 3. Pair-wise comparisons between regions<sup>1</sup>**

Contrast		Estimate	S.E.	Chi-Square	Pr > Chi-Square
Region	Region				
1	2	-0.36	0.42	0.74	0.39
1	3	0.66	0.39	2.91	0.09
2	3	1.03	0.46	5.01	0.03

<sup>1</sup> Region 1 = Southern; Region 2 = Northern; Region 3 = Eastern

The relative odds ratios for the difference between regions 1 vs 2, 1 vs 3 and 2 vs 3 are 0.70, 1.93 and 2.80, respectively. Note that the relative odds ratio of 1.0 indicates equal likelihood of the event occurring in two regions. The odds ratio of 0.70 for region 1 vs 2 indicates that the odds of farm labourers receiving training in region 2 were 30% greater than the odds in region 1. On the other hand, the odds ratio of 1.93 indicates that farm labourers in region 1 have a 93% greater chance of receiving training than those in region 3. However, farm labourers have greater odds (2.80) of receiving training in region 2 compared to region 3.

### **Types of training**

The results presented in this section comprise those farm labourers who received training. The chi-square test was computed using the FREQ procedure of SAS (SAS, 2000) in order to determine the differences in proportions between the types of training (managerial and technical) that farm labourers received and the results are presented in table 4.

**Table 4. Chi-Square test for equal proportions between the types of training<sup>1</sup> received by farm labourers**

Source	Degrees of Freedom	Chi-Square	P>Chi-Square
Type of training	1	27.94	0.0001

<sup>1</sup>The percentages were: technical training = 88%, managerial training = 12%.

Table 4 shows that there is a significant difference ( $P < 0.10$ ) in the proportions of farm labourers who received managerial and technical training. The proportion of farm labourers who received technical training was 88%, whilst 12% received managerial training, indicating that more emphasis is placed on technical training as opposed to managerial training.

### **Types of funders**

The results of the chi-square test on the different types of funders who sponsored training of farm labourers are presented in table 5.

**Table 5. Chi-Square test for equal proportions between the types of funders who financed training<sup>1</sup>**

Source	Degrees of Freedom	Chi-Square	P>Chi-Square
Type of funder	3	35.49	0.0001

<sup>1</sup>The percentages were: Not funded = 41%, Farmer = 51%, Government = 6%, NGOs = 2%

There were significant differences ( $P < 0.10$ ) in the proportions of farm labourers with respect to the type of funder. About 41% of farm labourers who received training were neither funded by the government nor NGOs, whilst 51% were funded by farmers themselves. Furthermore only 6% and 2% were funded by the government and NGOs, respectively.

### **Relationship between funder and training**

The FREQ procedure of SAS (SAS, 2000) was used to compute the chi-square test of independence between funder and training and the results are presented in table 6.

**Table 6. Chi-Square test of independence between funder and training**

Sponsorships/Funders	Training	
	Technical	Managerial
None	46.51	0.00
Farmer	44.19	100.00
Government	6.98	0.00
Non-Governmental Organisations (NGOs)	2.33	0.00

Pr > Chi-Square = 0.0872

Table 6 indicates that the null hypothesis ( $H_0$ ) of independence between training and funders should be rejected ( $P < 0.10$ ). Therefore there is a significant association between training and funding at the probability level of testing ( $P < 0.10$ ).

Of the farm labourers who received technical training, about 47% paid for their own training, while 44% were funded by farmers. Government and NGO funding for technical training amounted to approximately 7% and 2%, respectively. On the other hand, all farm labourers who received managerial training were funded by farmers themselves.

### **Relationship between training and benefits**

The results of the chi-square test of independence between farm labourer training and benefits are presented in table 7.

Table 7 shows that there is a highly significant association ( $P < 0.10$ ) between type of training received and benefits accrued from training. Of the farm labourers who received technical training, 70% did not receive any benefits, 19% were promoted and 12% received salary increments. On the other hand, 83% of farm labourers who received managerial training were promoted and 28% received salary increments.

**Table 7. Chi-Square test of independence between training and benefits**

Benefits	Training	
	Technical	Managerial
None	69.77	0.00
Promotion	18.60	83.33
Salary Increment	11.63	28.27

Pr > Chi-Square = 0.0018

## **DISCUSSION**

Despite the fact that farmers, especially those from the commercial sector, are themselves relatively well educated and have acquired appropriate farm management skills (Ortmann, 2005:305), the survey nevertheless clearly indicates that there are limited training opportunities (especially with regard to management training) for farm labourers. The limited managerial training opportunities might be due to the fact that managerial jobs form a small proportion of the total work activities in the farm. Marcus (1993:10) also found that managerial training does not receive the serious consideration it deserves.

Furthermore, an earlier study by Stavrou (1987:140) reported that management training is regarded as a highly contentious and significant issue amongst white farmers throughout South Africa especially in relation to the need for training black farm managers.

However, the response amongst farmers surveyed was positive, with only 8% of farmers stating that no such need existed. Fifty per cent of the farmers felt a strong need for black management training and 54% for black supervision/clerical training. This study confirms the results of earlier studies in which high percentages (88%) of farm labourers received technical training, compared to 12% who received managerial training.

Kogi, Kawakami, Ujita & Khai (2005:278) further reflected the need for training of farming communities by emphasising the importance of training with regard to the determination of worker performance. McDonald & Punt (2002:11) reflected that training leads to increased productivity which could also be beneficial to the households of farm labourers.

Another prime concern uncovered by these findings is the contribution or lack thereof by stakeholders such as government and NGOs. It is generally expected that these stakeholders would have a huge interest in the development of human capacity, yet research indicates a minuscule contribution regarding the capacity building of the affected group.

From the results obtained, it is clear that the contribution of the South African government and NGOs with regard to funding training for farm labourers was less than that of other stakeholders. This might be due to lack of fund access among farm labourers.



For the government and NGOs to contribute effectively to the funding of farm labourer training, the needs of farm labourers should be communicated to these stakeholders. It is important, therefore, that farmers should work hand in hand with government, in order to reduce this virtual absence of knowledge and skills training for the affected group.

During the qualitative interviews with the Free State Department of Agriculture, it was found that the department's productivity section was under-resourced in terms of human and capital resources. Training providers such as *Unique Solutions and Skills for All* who provided training to farm labourers in the Free State Province, indicated that they were no longer designing training programmes for the affected groups because of lack of sponsorship. It is critical therefore that these stakeholders such as government and NGOs rethink the current state of affairs with regard to training and the social benefits that could be reaped from building the capacity of farm labourers.

Another critical issue is that there is no indication of any interest from institutions of higher learning to create development plans which would encompass training programmes that are aimed specifically at benefiting farm labourers.

Sender, Cramer & Oya, (2005: 47) indicated that failure of the training institutions to reorient their activities in favour of the poor is part of a wide political problem. It will be important to see this type of support forthcoming from these important educational important stakeholders.

Lastly, the training of farm employees needs a well thought-through plan, based on cost benefit analysis for both employer and employees. The plan should be drafted and agreed upon by interested stakeholders such as farmer and farm labourer associations, Primary Agriculture, Education and Training Authority (PAETA), NGOs and government departments. For the implementation, monitoring and evaluation of the impact of the plan, the above-mentioned stakeholders should be considered as advisors to the implementing agents.

Given that farm labourers' training plays a crucial role in the food security and agricultural sector, it is crucial that various stakeholders think about mechanisms that can improve the current state of affairs. These employees, like any other citizens have talents and potential to improve their lives, should they be given opportunities to do so.

## **CONCLUSIONS AND RECOMMENDATIONS**

This study revealed that there is a significant association between training and funder, with training providers for farm labourers in favour of providing technical rather than managerial training. This might be influenced

by what is perceived by providers to be the nature of the farm worker's job specifications and or the level of the worker's education.

It was also found that the relationship between training and funding is quite significant – in virtually all cases mentioned earlier in the study, institutions offering training to farm labourers had to close due to lack of funding. Furthermore, it was also found that of the identified potential funders, NGOs and government provide the smallest contribution toward the training of farm workers.

It is recommended that these providers become actively involved in funding this type of training. Their involvement should not stop at the provision of funds, but they should become actively involved in the actual assessment of training needs.

The study indicates that there is definitely a dire need to have properly designed farm labourer training programmes with regard to farm managerial skills, maintenance, and even training in value addition of agro-products. The training should be career guided. In other words, there must be career development principles embedded in the training programmes rather than providing training with the sole purpose of addressing the needs of farmers.

Training with the afore-mentioned as one of its objectives, will leave the workers less vulnerable to retrenchment in the sense that it offers them alternatives, thus making them more marketable than would otherwise be the case.

If the workers hold a recognised national certificate in the chosen skilled areas, they can seek employment elsewhere in the farming community upon retrenchment. In other words, they become fairly indispensable in the farming industry. They will have the chance to develop their skills wherever they might find themselves.

Armed with these skills and experience, they might even think of venturing into farming and thus becoming owners of the farming industry. This will have an immense impact on the industry and can lead to improvement in farm productivity, the production of high quality agro-products and can boost export of agro-products tremendously.

The authors therefore make the following recommendations:

- Properly designed farm labourer training programmes be made available and delivered by institutions of higher learning or their satellites by way of learnerships or short courses.
- Farming SETA's should fund these training programmes especially for poor farm labourers.

- All commercial or small scale farmers should be educated regarding the need to increase productivity and to produce high quality agro-products of export quality. This should be done through well moderated farm labourer training.
- Farm labourers should be granted nationally recognised certificates to enable them to seek employment in any other sphere of the farming industry or engage themselves in small scale farming enterprises.

The Department of Agriculture and related organisations be encouraged to take this initiative seriously and support the farm labourer training programmes fully.

## **REFERENCES**

- ABER, H, & KATZ, M, (1998). "D" is for development. *People Dynamics*, 16(5):48-49.
- ALDRICH, C, 1999. What is next for the training market if the economy falters? *Training and Development*, pp.29-30.
- BLUNCH, N, & CASTRO, 2005. Multinational Enterprises and Training Revised: Do International Standards Matter. *Employment Primer Policy*. Pp.1-31.
- BAPTISTE, I, 1996. Disrobing the enemy: The social bankruptcy of human capital theory. Unpublished manuscript.
- BROOKFIELD, S, 1992. Why can't I get this right? Myths and realities in realities in facilitating adult learning. *Adult Learning*, 3(6): 12-15.
- DOL (DEPARTMENT OF LABOUR), 2001. Determination of employment conditions in South African agriculture: Report by the Department of Labour. *Government Gazette vol.435, no.22648*. Pretoria: Government Printer: (<http://www.polity.org.za/html/govdocs/reports/labour/farms/execsumkm.html>).
- GORDON, A, 1993a. Farm Worker Training-Absence of Adult Basic Education. *Institute of Education. Education Research. University of Bophuthatswana* pp.9-13.
- GORDON, A, 1993b. Education for Farm Workers-Ploughing A New Field. *Institute of Education. Education Research. University of Bophuthatswana* pp.14-15.
- HORRELL, M, 1967. A Survey of Race Relations In South Africa. *South African Institute of Race Relations, Johannesburg*. pp.124-125.
- KOGI, K, KAWAKAMI, T, UJITA, Y, & KHAI, TT, 2005. The roles of farmer trainers for participatory ergonomics in agriculture. *Ergonomics SA*, 2. pp.276-288.
- KOTZE, DA, 1994. The need for adult education. *Africanus*: 24(2): 20-30.
- MARCUS, T, 1993. Farm Worker Training-Absence Of Adult Basic Education. *Institute of Education. Education Research. University of Bophuthatswana* pp.9-12.
- MATHIBA, T, 1999. ABET and The Human Capital Theory: a critique. *Education Practise*, pp.36-41.
- MAXWELL, B, 1996. Open College Networks-are they still for adults learners. *Adults Learning*, pp.11-12.
- MC DONALD, S, & PUNT, C, 2002. Supply constraints, export opportunities and agriculture in the Western Cape of South Africa. *J. Stud.Econ.Econometrics*. 26(1).pp.1-16.
- ORTAMANN, GF, 2005. Promoting the competitiveness of South African agriculture in a dynamic economic and political environment. *Agrekon*, 44(3). Pp.286-313.

- PATON, C, & SINGH, S, 2005. Scorecard shows progress though not full marks. Financial Mail, February, 4: pp. 20-22.
- PONT, T, 2003. Developing effective training skills. From personal insight to organizational performance. Chartered Institute of personnel & development. CIPD House, Camp Road, London, SW194UX.
- SAS, 2000. The SAS System for windows. Release 8.2. SAS Institute, Cary, NC
- SALAMON, LM, 1991. Overview. Why human capital? Why now? In Hombeck, DW & Salamon, LM (Eds), Human capital and America's future. Baltimore, MD: John Hopkins University Press.
- SCHULTZ, TW, 1963. The economic value of education. New York: Columbia University Press.
- SENDER, J, CRAMER, C, & OYA, C, 2005. Unequal prospects: Disparities in the qualities and quality of labour supply in Sub-Saharan Africa. Social Protection Unit Human Development Network The World Bank. Social Protection Discussion Paper series. Pp.1-103.
- STAVROU, SE, 1987. Employment And Migration Patterns Of Black Farm Labourers In The Natal Midlands. Dissertation Submitted For The Fulfillment Of Master Of Social Science In The Centre For Social And Development Studies. University Of Natal. Durban. pp.134-143.
- VAN ZYL, C, 2000. Training of adults. *Sowetan*, 27 June 2000, p. 4.
- VAN ZYL, JV, & KIRSTEN, JF, 1998. The commercial viability of the small-scale farmer. Proceedings of the Animal Feed Manufacturers Association (AFMA) Congress, May 1998. Sun City, North West Province, South Africa.
- VERSCHOOR, A, VANROOYEN, J, & D'HAESE, L, 2005. New agricultural development criteria: a proposal for project design and implementation. *Development Southern Africa*, 22(4). Pp.500-514.

# Community-Based Research (CBR) Approach as a Research Methodology to Enable Students to Empower Rural Community

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## INTRODUCTION

Rethinking of higher agriculture education and environment in Thailand has long been attempted. An educational reform policy that has been launched to improve the quality and effectiveness of education is an interesting example of the preparation for the future. At Chiang Mai University, for example, immediate and long-term goals have been formulated in terms of the University's and Faculty's vision, mission, objective, and yearly strategic action plan, and five-year plan. Research to serve local community better has become the major policy at the university, faculty and department level. At the university level, a center to strengthen research has been set up to systematically access new research funding and strengthen faculty staff. Additionally, at the faculty level, a Faculty research manager has been recruited to facilitate the faculty staff and students to engage more in research. Research performance is used as major criteria for the promotion faculty staff (Opatpatanakit, et al, 2004).

## Limitation of Teaching-Learning, Researching, and Community Service

As I have observed for 10 years, **Teaching-Learning** process has not been productive because I did not have up to date information and knowledge on rural community situation to share with my students. Most books and articles are obsolete. Information from internet is hardly related to agricultural extension and rural development in rural Thailand. As one of the faculty staff involved in teaching-learning process, I can guarantee that in fact most students are willing to learn more about Thai rural community. However, there has been less opportunity for students to visit and learn more about local communities, except for some students who come from local communities. For technical-oriented courses such as Soil Science, Plant Pathology, Entomology, Animal Science, and Horticulture, undergraduate students are mostly involved in laboratory work.

Theoretically, for facilitation-oriented courses like Agricultural Extension, graduate and undergraduate students are expected to increase their ability to do extension work through course work, practical training and conduct research through “special problem” during four years of study. However, only some faculty staff pay attention on facilitating the community-based activities or “practical training” in agricultural extension organizations or local villages in order to increase student’s ability (Opatpatanakit, et al, 2004).

For **Researching** limitation, the performance of many undergraduate and graduate students demonstrates a lack in understanding of local community and social situation. Ability in analysis and synthesis of social situations, ability in working on community-based research, facilitation, communication and writing is rather poor. Research project under the so-called **thesis** or **independent study (IS)** undertaken by most agricultural extension graduate students in Thai universities have limited benefit to rural community. The knowledge generated by such thesis or independent study can only explain at a phenomenon level of community situation because of superficial research questions as “what is personal, social and economic characteristic of farmers? and what is the relation between such characteristics and the adoption of sufficient economic philosophy?” To answer such questions, survey research technique is normally applied by using questionnaire sent to sample target group, or interview schedule using key informants interview. Data is normally analyzed by using statistical tools mainly to check relations between variables. Through such research process, the locals are being researched in which the research output and outcome rarely solve the key informants’ problems.

Similarly, it has also been observed that many undergraduate students in the Agricultural Extension Course have similar poor performance and competency. For example, “special problem projects” found to be the literature review of particular issue from written articles are presented without critical analysis and synthesis. Only a few special problem projects appear to deal with local community situation and such critical research questions as “what is happening in the selected local community, what conditions that contribute to the situation, and how to improve the situation”.

The structure and process of teaching-learning and researching, discussed earlier, are hardly related to rural community. Asking about a **quality** of **community service** is an urgent and huge question. It is not surprising that many graduate and undergraduate students who have grown up in local communities cannot analyze why villagers are getting poorer and becoming indebted even though they have been working hard under the governmental “Village Fund” policy which has been implemented for years. Clearly, limitation of teaching-learning, researching, and community service is very critical. Thus, rethinking and preparation for the better future of agriculture, education and environment are crucial.

## **Rethinking of a Higher Agriculture Education and Environment**

It is a pity that the more I climb up for higher education, the less knowledge I have learned about my community and my root. I am an example of poor competency student in understanding rural situation in Thailand which, on the other hand, I should understand very well because I teach agricultural extension and rural development at the Department of Agricultural Extension. Once I was asked about my own community during a discussion among PhD students at the University of Western Sydney, Australia in 1992. I felt so ashamed then because I could only tell superficial story about my home community.

I realized that the 11 years I spent for my higher education is too long that I did not realize what is going on in the village. Being an undergraduate and eventually a graduate student, I was lectured about agricultural extension concepts and theories based on western society experiences while Thai rural community situation was rarely mentioned and refereed. A survey research was applied by most students. In these studies, farmers usually served as respondents and interviewed by students who selected the topics and designed the research process and selected such tool as questionnaire or interview schedule. Then the data was normally analyzed using statistical program. The knowledge emerged from research was hardly shared with those farmers who were interviewed.

### **Translation of the Idea into Action**

For young educator, how to improve teaching-learning, researching and community service is a very huge question. Thanks to my shame for having less knowledge on my own community. This has inspired me to rethink about how to use higher education as a means to learn more about my local community. My hypothesis is that I should begin with myself. Then, I decided to conduct Ph.D research at my village, rural agricultural community in Northern region of Thailand in 1992. My expectation was that researching on my own community would allow me to practice participatory action research by which knowledge generated from research process can solve community problem and can help improve my teaching-learning.

### **Learning and Practicing Participation Action Research through Ph.D Thesis**

Through the Ph.D learning process at University of Western Sydney, Hawkesbury, Australia, I have learned more about the concept of people-centered, participation approach, empowering approach, facilitating process, participation action research. I have applied participation action research on my thesis titled "Empowering Women in Rural Development: A Collaborative Action Research Project in Northern Thailand" (Sansak, 1996). This thesis argued that the development policy and plans of the government of Thailand have emphasized economic growth aimed at 'modernizing'

the country. This attempt at development has been enacted through agricultural modernization and industrialization under the name 'rural development'. Women in Development (WID) approaches based on the modernization model have been added to 'development' plans more recently. Examination of the effects of these WID programs upon rural women demonstrates that poor women are disempowered by the 'top-down' rural development programs.

This study is an attempt to test collaborative action research (CAR) as a research methodology to empower rural women to become the decision makers in the rural development process. An empowerment approach is considered as an alternative path to development where rural women can increase their capacity to bring about desired changes and increase their self-reliance. Collaborative action research was carried out in Sandee Village, northern Thailand. This suggests that rural women can be empowered through continuous cycles of the collaborative learning process of planning, acting, observing and critical reflection with the researcher acting as a facilitator, who creates an atmosphere that allows rural women to become active decision makers. Through this learning process, rural women have increased their capacity to make choices, to deal with existing constraints and to create changes that serve their needs. In this respect, **development**, as defined by villagers themselves, can be initiated from within.

### **Learn more about CBR by being CBR manager**

Practicing participatory action research to empower rural women in rural development has enabled me to further rethink of a higher agriculture education and environment which should be facilitated to serve local community development. The next question that comes to me is; "As an educator, how can I prepare the future of a higher agriculture education and environment through a better local community development?" I have been seeking for opportunity. Fortunately, in 1996, I have a chance to become a coordinator of Thailand Research Fund (TRF) due to my experience in participation action research, I was responsible for "Community-Based Research: CBR Scheme initiated by TRF based on a crucial question: how can research findings be utilized by the users, with focus on the locals?"

To answer such question, TRF has launched the CBR scheme which employs empowerment and people-centered approach. The CBR scheme mandate is to empower the locals through the following conditions:

- 1) problems and research questions have to be participatory and identified by the locals who are willing to conduct research to solve the problems or answer the questions,
- 2) the locals have to become the community researchers, and
- 3) action to solve the problem should be planned and implemented.



Each CBR project would be developed and implemented within 12 to 18 months, with the research grant of 200,000 – 300,000 baht supported by TRF. The locals who become community researchers are farmers, women leaders, village leaders, school teacher, *Tambon* administrative officers, community development workers, agricultural extension workers, community doctors, village monks, or youth group. To implement CBR scheme, the CBR centers have been set up in various provinces initially in Northern region. Such CBR centers become crucial mechanism by which CBR counselors and staff would facilitate the CBR project at the community level, as follows:

- identify community researchers,
- identify problems
- develop research questions,
- develop CBR project proposal and action plan,
- sign research contract,
- monitor CBR project through progress and final report meeting,
- produce research exploitation in terms of forums, book, VCD, DVD, community radio program and TV program.

As a CBR coordinator, I gradually become a research manager who facilitates CBR counselors of 38 CBR centers throughout the country to develop CBR projects more productively and effectively. In 2007, 264 CBR projects have been developed and implemented. At present, 650 CBR project have been granted.

### **Small Changes can be initiated through Courseworks**

An opportunity to empower the locals to manage their own community better through CBR project with the support of TRF empowers me as a university staff to rethink about “how could I facilitate the learning process of my undergraduate and graduate students better? and how could my students have opportunity to learn more about agricultural extension in rural community and in developed society?” In 1998, I started to integrate the learning-teaching process of students with the research process of the villagers through study visits, dialogue and participation in the progress report meeting. Undergraduate students who study “**Speaking and Writing in Agricultural Extension**” subject were facilitated to visit the active CBR projects, supported by TRF. Accordingly, students would practice to write an article, news on villagers’ experiences, and then broadcast through community radio or disseminate on local newspaper or village newsletter. Similarly, undergraduate students who study “**Media Production Technology for Agricultural Extension**” subject were also asked to produce such materials as poster, newsletter, board, picture, CVD, DVD, and radio program based on the needs of community researchers of CBR project.

These materials empower students to learn about CBR project, community researcher's intention, research question as well as objectives, research methodology as well as process, output of the research project in terms of knowledge.

For graduate students who study "**Agricultural Community Study**" subject, they were facilitated to identify their expectation and objective, to develop action plan and implementation. Throughout the teaching-learning process, they would conduct study visit to CBR communities, facilitation of discussion and dialogue, deep listening during dialogue and discussion with CBR researchers as well as CBR counselors and staff, process documentation of every activity, and after action review of main activity. They were normally encouraged to integrate this subject with seminar I and seminar II by identifying issue and community for thesis /IS (seminar I), developing thesis / IS proposal (seminar II) and using information from CBR communities to prepare report for this subject and other related subjects.

### **Another Step: Development of Collaboration among University, Research-Funding Agency and CBR Communities**

An attempt to integrate the thesis and independent study with the CBR process has created less impact. Only my thesis advisees agreed to implement this because of pressure from me. What should be done to create more and wider impacts? My hypothesis was that collaboration among stakeholders involved in the learning process of undergraduate students may be the condition that could facilitate more impact. Accordingly, I have developed the "**research management project**" which has been granted support by the Thailand Research Fund (TRF) since May 2002. The overall research question was "how to develop collaboration among Faculty of Agriculture, Thailand Research Fund and CBR communities so that learning-teaching, researching and community servicing can be integrated so that undergraduate students can be empowered to increase their ability".

### **Center for Community-Based Research, Faculty of Agriculture as a linkage of Collaboration**

Under the research management project, the minor research question was how my colleague and I could develop a learning community for undergraduate students? Accordingly, we have set up the Center for Community-Based Research, Faculty of Agriculture, Chiang Mai University. The Center's mission is to develop CBR projects as a means to empower community researchers. Accordingly, in 2003, there were 11 CBR projects that were developed.

The next important research question that came was how to enable the Students Affairs Unit and the Practical Training Unit to utilize seven CBR projects as a learning community for undergraduate students? An opportunity was opened during the First-year practical training period in 2003 when 120 second-year students received practical training in five CBR

communities, with the support of peer groups from the Faculty of Agriculture CBR Center. The Center's coordinator and staff became the practical training team who developed the action plan of preparation process, practical training in communities, student's presentation of outputs, and critical reflection by the training committee. This collaboration allows the Center's coordinator and staff to learn more on how to facilitate learning of students throughout the practical training process so that students can increase their ability in learning more about rural community. As it was the first time for the Practical Training Unit's staff to organize the training in local communities, they have learned how to communicate with stakeholders involved such as undergraduate students, Faculty's staff, the Center's coordinator and staff, the community researchers, village leaders and villagers. A draft "practical training manual" for the 2004 training was developed and improved. Subsequently, the Faculty of Agriculture has set a yearly budget for the Training Unit, which is hoped to sustain the system.

Similarly, it was the first time for five local communities to have 20 to 30 university students for five-day visit. Community-based researchers become the organizers who set up the action plan of training. Youth and children in villages have participated in the process and have closely communicated with students. They learn more from students about studying in university, which has been a dream for some of them. It is interesting to note that some boys and girls have changed their mind to further their study in university and instead opted for polytechnic school.

For second-year students, five-day practical training in villages enable them to learn more about local community situations which is different from what they have learned from the lecturer or seen on CD or photos. Their stay in the villagers' home allows them to directly observe the villagers' everyday life. Their worldview has widened through practices, observation, listening and exchanging ideas with the elders, middle-aged villagers, youth and children. Many students were surprised with local wisdom and the capacity of experienced villagers, which contributes to the change of their attitude towards local people. Their comments on what they have learned illustrate their willingness to participate in improving the local community situation by integrating the local wisdom and the modern technology they have learned during study in university (Opatpatanakit, et al, 2004 {b}).

### ***Increasing Research Ability of Undergraduate Students through "Special Problem" Research Project***

It is not easy to encourage academic staff of the Department of Agricultural Extension to employ CBR with their teaching-learning, researching and community servicing as they prefer the mainstream survey research more than participatory learning and research process. In March 2003, the Center's coordinator and staff have facilitated the "15 days practical training" of 30 third-year undergraduate students of Agricultural

Extension Course in six CBR communities. The outcome turns up very productive because community researchers have increased their ability to manage the "student's practical training" as a tool to further identify what research questions can be answered by students and Faculty staff. Consequently, the impact was that 9 students have decided to undertake their research activity as required by the curriculum under the "special problem" subject which would be granted by TRF. Eight students have developed research activities in accordance with the CBR project while one student has developed research activities on her own community. This is a starting point of encouraging the staff who were the advisors of those 9 undergraduate students involved in CBR communities (Opatpatanakit, et al, 2004 {a}).

It is interesting to note that the Faculty of Agriculture, the Center for Community-Based Research, the Thailand Research Fund and CBR communities have gradually developed their collaboration by which the undergraduate students have learned and experienced living in local community, and developed their capacity in undertaking community-based research. Similarly, local communities have increased their ability to manage "student practices" as a means to further identify community problems, analyze causes of problems, and solve problems through participatory action research by which students become the co-researchers.

### **Development of CB-MAG Scheme as a Means to Empower Graduate Students and CBR Communities**

As discussed earlier, most thesis and Independent studies undertaken by graduate students of "Agricultural Extension" hardly dealt with the research question on "how to solve the problems". From the year 2000, I started encouraging graduate students, especially my thesis advisees, to apply CBR in their thesis and Independent study (IS) because CBR could enable students to provide answers to question like "how to solve the problems" in the community based on data collected.

For example, two thesis advisees conducted CBR project on "how Karen in *Maehaenoi* village and Lahu Na-Shele in *Hoynamrin* village, Chiang Mai Province could empower themselves in managing changes" through community-based research project. Participatory action research has been applied in facilitating villagers in two communities to develop their learning process and ability to manage changes better (Opatpatanakit, et al, 2004). This thesis found that the empowering process includes: 1) analyzing the problems and thematic concerned, 2) identifying research questions, 3) developing action plan, 4) implementing action plan, (e) regular critical reflection on the output and outcome of each activity, 5) adjusting the next activity, and 6) synthesizing the conditions contributed to the empowering process.

The same study also revealed the a) facilitating process organized by either villagers themselves or external researchers, b) financial support from such research agency as Thailand Research Fund, c) concept, belief, understanding as well as skills of villagers who become researchers of the community-based research project, d) participation of researchers (villagers and external researchers) in decision making process based on analyzed information, e) working process in terms of action plan which is designed to be the learning process based on analyzed information, f) continuous critical reflection on the output and outcome of each activity, g) ability to adjust action plan in accordant with analyzed information.

Furthermore, a small success in enabling the undergraduate students to apply CBR project in undertaking "special research", contributes to my intention to encourage graduate students. My next question was that "how could I encourage graduate students to apply CBR in conducting thesis or independent study?" I was thinking of my experience in facilitating my thesis advisees to apply CBR project. Within my Department, staff and students were not motivated to use CBR because it takes much longer time to conduct (8-18 months) compared to a mainstream survey research (6-8 months). Furthermore, the complex situation in rural community requires outside competent researchers who have the ability to actively facilitate community researchers and involve villagers to successfully deal with the problems. To develop such competency, outside researchers would take longer time in participatory learning process. Thus, only my thesis advisees have applied CBR with their thesis and IS.

However, I tried another attempt by discussing the concept with 40 CBR Counselors and staff of seven CBR Centers in Northern Region. We agreed to develop "Community-Based Research for Master Grant: CB-MAG" scheme, and then proposed for TRF approval. In order to develop the CB-MAG structure and system, we supported CB-MAG of three master students on Agricultural Extension Course, namely;

- 1) Approach to Develop Rice Production Database Through Youth Participation in Pasak Sub-district, Mueang Lamphun District, Lamphun Province
- 2) Learning Process of Youth towards Agricultural Community Changes of Pasak Sub-district Community, Muang Lamphun District, Lamphun Province
- 3) Approach to Develop San River Database through Youth Participation, Mueang District, Lam Phun Province

Considering the learning process of two CBR projects undertaken by two students and three CB-MAG projects, we found that the CBR approach allows graduate students to gradually become productive facilitator of the learning process who identifies 1) the research core team through stakeholder analysis, 2) community problems through community

situation analysis, and 3) research question, final goal, and objective identified through problem encountered. Then, an action plan would be participatory developed, especially knowledge generation process based on data and information collected by the villagers who become active researchers. Emerging knowledge can be appropriately utilized in dealing with selected community problems. Through the CBR process, graduate students would be empowered to manage their thesis or independent study to benefit the locals. Research methodology and process are participatory designed by stakeholders themselves who gradually become data collectors, knowledge generators and decision makers in solving their own problems. Through CBR as research process, graduate students empower themselves in terms of expressing their worldview, knowledge, and skills needed to facilitate the learning process properly.

Furthermore, we have found that the CB-MAG system can be effectively implemented with the full support of CBR centers particularly in developing CBR proposal based on Center's strategic research issue, the community, and Center's monitoring system. The timeframe and amount of research grant should be similar to CBR project that is 200,000 baht for each project of 12 to 18 months in duration. It is interesting to note that 40 proposals were submitted, and 18 CBR project proposals were approved in September 2007. Additionally, my next question is "how to encourage CBR Centers in other regions, especially those CBR Centers that are organized within the educational institution context, to apply CB-MAG project to strengthen Center's research management". Hopefully, we will have at least 100 CB-MAG to be granted by March 2008. Furthermore, I will facilitate further step to develop CB-MAG scheme to be a matching fund between the department and CB-MAG for a more sustainable mechanism for graduate students.

### **Another Preparation: Development of CB-Ph.D**

TRF provides Kanjanaphisek scholarship for those technological based and basic science Ph.D students approximately 500 million baht each year. This Ph.D scheme produces interesting research findings that have been published internationally, yet are still far from being used to cope with community problems. I would say that lessons learned from developing CB-MAG management system are very helpful to develop "Community-Based Research for PH.D Grant (CB-Ph.D) scheme. To develop CB-MAG scheme, in the beginning of 2007, I have facilitated CBR Center at Faculty of Agriculture, Chiang Mai University, supported by TRF, to provide CBR grant for one Ph.D student who conducted CBR project to increase youth potentiality in Conservation of Maesan River in Lamphun Province. This grant was a trial for the development of CB-Ph.D grant which I will develop and propose to TRF for the approval of the CB-Ph.D scheme by July 2008.

## **Discussion: Lessons Learned**

Translating the idea of rethinking and preparing for the future of agriculture, education and environment into action is not easy. This article has demonstrated small success towards this end. The lessons that can be learned include:

- Searching for opportunity by collaboration with the existing mechanism such as TRF research grant, CBR projects, CBR centers, CBR counselors and staff, CBR communities.
- Start with initiation of small changes, but do it continuously.
- Creating new mechanism for better and wider research support such as CB-MAG, CB-PhD.

## **Conclusion**

This article shares some lessons learned on how to make the idea of "rethinking agriculture education and environment" more concrete. Research management innovations such as CBR Centers as a mechanism to manage CBR projects, Faculty of Agriculture's CBR Center, collaboration among department, and CB-MAG scheme are concrete preparations for the future of higher agriculture, education and environment. Factors that can contribute to the development of these concrete innovations are as follows:

- faculty staff willing to learn CBR approach
- research grant supported by Thailand Research Fund (TRF) and TRF CB-Program officers
- CB- research counselors and staff on the CBR Centers who identify strategic thematic concern and strategic community of the Center, and play crucial roles in developing CBR project proposal and monitoring system
- community researchers
- CB-MAG scheme

Thus, both the regular CBR and CB-MAG projects are examples of the concrete action of rethinking higher agriculture education and environment. This is also a concrete preparation for the future of qualitative and productive teaching-learning, researching and community service of higher education.

## **Acknowledgement**

I gratefully thank the Thailand Research Fund for research grant and supporting me as a coordinator. I also thank the CBR counselors and staff,

community researchers and undergraduate as well as graduate students who share life in our learning process to better prepare the future for agriculture education and environment.

## References

- Opatpatanakit, Avorn. 1995. "Collaborative Action Research: An Alternative Approach to Empower Rural Women in Higher Education." Paper presented at the ASAIHL Seminar on Higher Education for All. Bangkok University, Thailand. 21-23 June 1995.
- Opatpatanakit, Avorn. 1999. Participatory Action Research: Alternative Methodology to Research for Sustainable Agriculture. Pp. 173-178. In Sumalee Suthipradit, Chumpon Kunta, Suphachai Lorlowhakarn and Jaturaporn Rakngan. 1999. Sustainable Agriculture: Possibility and Direction, Proceedings of the 2nd Asia-Pacific Conference on Sustainable Agriculture, 18-20 October 1999. Phitsanulok, Thailand.
- Opatpatanakit, Avorn. 2000. Area-based Research Management as a means to strengthen community development: The Thailand Research Fund-North's Experience. Proceedings of the International Conference on the Impact of Agricultural Research and Development in Southeast Asia. 24-26 October 2000. Cambodian Agricultural Research and Development Institute, Phnom Penh, Cambodia.
- Opatpatanakit, Avorn. 2001. Facilitating Learning Community through Empowering the Locals. Paper Presented at the International Workshop on "Participatory Technology Development and Local Knowledge for Sustainable Land Use in Southeast Asia" 6-7 May 2001. Suan Bua Resort, Chiang Mai, Thailand.
- Opatpatanakit, Avorn. 2004. Community-based Research as Alternative Methodology for Developing Knowledge-Based Community. Pp. 46-51. Fedro Zazueta, Seishi Ninomiya and Royal Chitrado. Proceedings of the AFIT/WCCA Joint Congress on IT in Agriculture. 9-12 August 2004. Hydro and Agro Informatics Institute, National Science and Technology Development Agency, Bangkok, Thailand.
- Opatpatanakit, Avorn, Prason, Patchrin, Lerttithikun, Krairerks, Supapun and Wongjun, Dueanpen, Saowaluck, Timkasikum, Wattanapong. 2004. Empowering students through Facilitation of local community-university collaboration. Paper presented at the International Conference on Making Educational Reform Happen: Learning from the Asian Experience and Comparative Perspectives. 22-23 September 2004 (a). Central Sofitel Hotel, Bangkok, Thailand.
- Opatpatanakit, Avorn. 2004. Empowering Mae Hae Noi Villagers to Manage Changes to be more self-reliance. Sumpun Chaitep and Nat Vorayos. Proceedings of The 11th Tri-University International Joint Seminar & Symposium 2004 on "Role of Asia in the World -Population, Food, Energy and Environment," 26-31 October, 2004. Chiang Mai University, Thailand.
- Opatpatanakit, Avorn, Karnjanawiboon, Krongkarn, Oupra, Ranee and Jayo, Jakhadte. 2004. Learning to Manage Changes in Karen and Lahu Shele Community. Paper presented at the 7th SEAGA-KKU 2004 International Geography Conference on Southeast Asia: Development and Change in an Area of Globalization. 29 November – 2 December 2004. Charoen Thani Princess Hotel, Khonkhan, Thailand.
- Opatpatanakit, Avorn, Lerttithikun, Saowaluck, Timkasikum, Wattanapong, Krairerks, Supapun and Wongjun, Dueanpen. 2004 (b). Partnership in Educational Reform: Collaboration of Local Community, University and Research Funding Agency. Paper presented at the International Conference on EDU-Com 2004 New Challenges for Sustainability and Growth in Higher Education: The Second International Conference on Collaboration in the 21st Century. 24-26 December 2004. Sofitel Raja Orchid Hotel, Khonkhan, Thailand.
- Opatpatanakit, Avorn. 2006. Thailand Research Fund: A Research Funding Agency and Its Influence on Agricultural Extension Projects. Pp. 290-305 In A. W. Van den Ban and R. K. Samanta (eds.) Changing Roles of Agricultural Extension in Asian Nations. Delhi: B. R. Publishing Corporation.
- Sansak, Avorn. 1996. Empowering Women in Rural Development: A Collaborative Action Research Project in Northern Thailand. Unpublished Ph.D Thesis. University of Western Sydney, Hawkesbury, Australia.



# Change and Challenge of Agricultural Extension in Korea

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## INTRODUCTION

Recently, Korea and USA reached an agreement with FTA. Korea's National Assembly will be to ratify the FTA. However, the most sensitive issue is agriculture and the service industry to propel Korea and America's FTA. This is due to Korea's agriculture being less in the competitive edge. FTA will inflict severe losses to Korean agriculture. Also being taken for granted is the fact that neo-liberalism and economic globalization are irrevocable currency of the international economic order. The Roh administration argues that the FTA between Korea and USA is beneficial to both sides and a wise alternative to bring continuous development to both Korea and U.S.A.

Currently, those with small holdings of arable land are under severe pressure from the free trade of agriculture products. Consequently, Korea will be forced to face the competitive market of paramount American companies at home and abroad. It is time to devote ourselves to discussion appropriated towards a response policy to minimize domestic agricultural loss and to improve agricultural competitiveness.

If that is so, what are the alternatives to overcome these crises? There are many factors that have to be kept in mind and one way to solve these problems is enhancing the competitiveness of agricultural sector while eliminating the cause of the crisis.

First of all, it is important to take into account the current situation and paradigm. The most important thing though is to insure the competitive power of agricultural organization and technology. In other words, we will succeed in coping with the changes of the agricultural market environment through consolidating our manpower and technology.

In the agricultural sector, there must be an agency or organizations which will take charge of strengthening human and technological power.

The most appropriate agricultural institution is the Agricultural Extension Service or Centers in the light of organization's mission and vision. According to its role and function, it is providing new agricultural knowledge and technical service for farmers.

The Agricultural Extension Service in Korea was established with the Agricultural Demonstration Station in 1906. It was reorganized as the Rural Development Administration (RDA) in 1962 and has since continued its efforts toward the development of prosperous rural community and improved quality of rural life.

Over the last four decades, Korea has experienced dramatic changes in farm practices as a result of agricultural extension services. We have achieved self-sufficiency in rice and year-round supply of green vegetables through the diffusion of greenhouse technology.

Nevertheless, the era of globalization is blooming in the agricultural sector as well, and Korean agriculture is struggling to cope with the new international trade environment and challenges. Finally, Korean agricultural extension was altered from the centralized system to a decentralized system through the 'Local Autonomy Act' and the local extension workers now belong to local governments.

Ten years have passed since the devolution of Korea agricultural extension. During this time, various problems and changes have emerged. The people involved are arguing that the extension service was encountering serious crises. What is worse was 47 local centers have been integrated with agricultural administrations.

However, the department of agricultural colleges or academies which were researching for Extension rarely found it. It is essential to evaluate a decade of localization of agricultural extension system in Korea. Therefore, we should identify the changes and challenges of Extension Agencies and Personnel and suggest the development directions and implications of agricultural extension service in the future.

### **Research questions**

The purpose of this study was to evaluate a decade of localization of the agricultural extension system in Korea and to suggest the development directions and implications of the agricultural extension service in the future. In order to achieve the purpose of this study, we identified fundamental changes in Korean Agricultural Extension Service and reviewed the positive changes and negative problems after localization. Finally, we suggested the development directions and implications of the agricultural extension service in the future.

## Research methods

This study was carried out through literature review. The data for this study were collected from the annual extension service reports and documents, The Korean Journal of Agricultural Extension and Journal of Agricultural Education and Human Resource Development. Content analyses of these documents were done.

## Background

### Present Agricultural Status in Korea

Agriculture has been an important industry for the Korean people and has been a way of life for a long time. Korea has natural scenic beauty with mountains, hills and paddy fields. It experiences four distinct seasons in a year, i.e. a pleasantly warm spring, hot summer, a pleasingly cool autumn and cold winter (see Figure 1).

**Figure 1. Four Seasons in Korea**

seasons	spring	summer	autumn	winter
	march-may	June-August	September-November	December-February
climate				

However, Korean climatic and soil conditions are not favorable to agriculture due to the four distinct seasons with hot and humid summers, cold and dry winters, and uneven precipitation with heavy rainfall in July and August. The country is largely mountainous (65%) and only a small portion (19%) of the total land area is arable.

### Farm Households and Farm Population by Year

An average farm household occupies 1.48 ha. of arable land as shown in Table 1. The Number of farm households declined from 2 million in 1980s to 1.27 million in 2005, or about 8.0% of the total households. The farm population stood at 3.4 million persons in 2005, or about 7% of the total population.

While the total population has expanded at a moderate increase rate, the farm population has declined since 1960s due to fast industrialization and urbanization.

**Table 1. Changes in Farm Households by Farming Acreage**

Year	Cultivated Area (000 ha)	Farm Households (1,000/%)		Farm Population (1,000/%)		Average Farm Size (ha)	Average Farm Family Size	GDP.	
								(billion won)	Agri. (%)
1960	2,205	2,350	53.7	14,569	58.3	0.86	6.2	-	-
1965	2,275	2,507	51.7	15,812	55.1	0.91	6.3	-	-
1970	2,295	2,483	42.4	14,432	44.7	0.93	5.8	2,763.9	25.5
1975	2,240	2,379	35.2	13,244	37.5	0.94	5.6	10,388.1	24.0
1980	2,196	2,155	27.0	10,827	28.4	1.02	5.0	38,774.9	13.8
1985	2,144	1,926	20.1	8,521	20.8	1.11	4.4	84,061.0	11.6
1990	2,109	1,767	15.6	6,661	15.6	1.19	3.8	186,690.9	7.8
1995	1,984	1,499	11.6	4,883	10.8	1.30	3.3	399,837.7	5.5
2000	1,888	1,384	9.6	4,031	8.3	1.36	2.9	576,664.5	4.2
2005	1,836	1,272	8.0	3,434	7.0	1.48	2.7	778,444.6	3.2

Source: Ministry of Agriculture and Forestry, 1960 - 2005

As the economy grows and becomes industrialized, non-farm sectors have pulled labor greatly from the farm sector, and the trend of labor shortage and the price of farm labor have increased dramatically. Agriculture in Korea still has an important role in the national economy, although it accounts for only 3.2% of the GDP. However, the importance may not be explained simply in the statistics because of multi-faceted functions of the agriculture in the total welfare of the nation including the contribution to the environment.

During the period of economic development, it was the agriculture sector that contributed greatly in achieving fast economic growth in Korea by providing inexpensive food items, a diligent working labor force and an accumulation of capital. The basic standard of living in terms of material affluence has risen substantially due to the increased production. However, in spite of the merits of industrialization, it has been a mixed blessing, producing both products and pollution at the same time.

Furthermore, as a result of the weak competitiveness of Korean agriculture, the farmer's household income has decreased comparatively. The differential between farm and urban household incomes are widening even more.

### **Change in Farm Households by Farming Area**

As shown in Table 2, most of the farm households were mainly cultivating rice . However, the ration of rice cultivation steadily reduced from 76.8% in the 1960s to 51% in 2006, while, the vegetables and fruits acreage ratio increased throughout the country.

**Table 2. Changes in Number of Farm Households by Farming Acreage (unit: family, %)**

farming area	1960	1970	1980	1990	1995	2000	2004	2005	2006	
rice	1,789,510 (76.8)	1,114,673 (44.9)	Not Examined	1,231,839 (69.7)	823,458 (54.9)	787,451 (56.9)	659,508 (51.6)	648,299 (50.9)	639,142 (51.3)	
fruit	9,444 (0.4)	45,821 (1.8)		107,262 (6.1)	143,600 (9.6)	143,362 (10.4)	136,952 (11.0)	145,236 (11.4)	138,797 (11.1)	
industrial crop	15,609 (0.7)	145,259 (5.8)		38,585 (2.2)	45,693 (3.0)	37,647 (2.7)	36,131 (2.9)	27,883 (2.2)	37,067 (3.0)	
vegetable	24,437 (1.0)	251,975 (10.1)		172,360 (9.8)	246,648 (16.4)	238,291 (17.2)	261,726 (21.1)	230,011 (18.1)	261,089 (21.0)	
flower	-	-		6,404 (0.4)	10,062 (0.7)	8,091 (0.6)	10,805 (0.9)	10,196 (0.8)	10,395 (0.8)	
upland crop	436,034 (18.7)	319,733 (12.9)		114,132 (6.5)	69,898 (4.7)	91,930 (6.6)	69,247 (5.6)	125,513 (9.9)	78,407 (6.3)	
livestock	1,592 (0.1)	190,328 (7.7)		88,522 (5.0)	156,923 (10.4)	72,179 (5.2)	82,626 (6.7)	82,283 (6.5)	73,604 (5.9)	
sericulture /etc	52,503b (2.3)	415,529c (16.7)		7,938 (0.4)	5,463 (0.4)	4,523 (0.3)	4,410 (0.3)	3,487 (0.3)	6,590 (0.5)	
Total	2,329,128	2,483,318		2,155,073	1,767,033	1,500,745	1,383,468	1,240,406	1,272,908	1,245,083

Source: Ministry of Agriculture and Forestry, 1960 - 2005

## Agricultural Extension Service in Korea

### The Mission and Goals of Agricultural Extension Service in Korea

The "Rural Development Law" describes the objective of the agricultural extension organizations as contributing to the development of farmers' welfare through conducting agricultural experiments and research along with the transfer of scientific techniques and knowledge on agriculture and rural life and the training of rural leaders and farmers.

The following are specific missions of the Rural Development Administration:

- (1) Conducting experiments and research for developing agricultural technology concerning food crops, livestock, veterinary medicine, horticulture, sericulture and farm machinery, etc., and for developing farm management.
- (2) Transferring scientific technique and knowledge for the improvement of agriculture and rural life, especially through informal education and demonstration of the effect of scientific knowledge and technology on agriculture and rural life, and through fostering rural people's organization.

- (3) Training farmers, local leaders, rural youth, students and teachers in agricultural high schools as part of cooperative education as well as research and extension officials in agricultural technology organizations.

The efficiency of farm management to meet the demands of competitive agriculture and a substantial increase in the farmers income are the key concerns of the Korean agricultural extension services. Extension activities for agricultural technology transfer in Korea are based on the following objectives:

- (1) To attain a stable and labor-efficient production of major grain crops.
- (2) To improve the quality and cost-efficient production of cash crops and livestock.
- (3) To maintain safe and pollution-free crop production and adequate pest management.
- (4) To create extra revenue by exploiting high-tech agriculture.
- (5) To provide technical support on the production for special local or export markets.
- (6) To develop sustainable agriculture.

To accomplish the above goals and objectives, the area-specific model projects for higher income and new technology are implemented at the national as well as regional levels.

## **Agricultural Extension System in Korea**

### **Organizational Set-up**

The Rural Development Administration (RDA) is the central government organization for agricultural research and extension service. It was first established in 1906 as the Agricultural Demonstration Station, and subsequently renamed as the Agricultural Experiment Station in 1929 and the Institute of Agricultural Improvement in 1947. It was re-organized as the Office of Rural Development (ORD) in 1962 and was re-constituted in 1994 by incorporating national offices from the Ministry of Agriculture and Forestry (MAF).

The Rural Development Administration (RDA), an outside arm of extension and research of the MAF, is the national level headquarters for rural development planning and implementation in Korea. As shown in Figure 2, the RDA which is headed by an administrator maintains various extension programs through two Bureaus, the Farm Management Office and Information Office, the Policy Management & Public Relations Office, and nine Research & Development Institutions (ex. National Institute of Animal Science, Crop Science, Agriculture Biotechnology. etc.).

The Provincial Agricultural Research & Extension Service (ARES), numbering nine in all, represents the provincial organization of the RDA,

and ARESs are outside arms of the provincial government and consequently controlled and administrated by the governors. The Region-specific Crop Experiment Stations were providing extension service as expedients to accommodate new markets and structural changes of organizations, though they are originally research-oriented agencies. The extension method of agricultural extension experiment stations were similar with those of extension agencies, and the extension methods used mainly were 'experiment plot demonstration exhibition', 'consultation using telephone, internet, face to face meetings', 'visiting farms and consulting'. These were generally carried out through farmer's request, which implies that the extension services of agricultural experiment stations were provided in a passive way (Hwang, Kim and Park, 2007).

The 159 City/County Rural Extension Offices (including one special city center and six metropolitan city center) are administratively and technically under the hierarchical control of ARESs. At the same time, each extension office forms an outside arm of the respective city/county government. The County Extension Office, however, is considerably dependent on the county government in many ways, including financing, which is probably the most important aspect of agricultural extension work.

There are real grass-root extension organizations under the jurisdiction of the county extension offices named "Farmers Counseling Office" totaling 625 with 33 "Branch Offices" across the country at the EUP/Myun(Township) level. Each of the offices makes plans and carries out localized programs, and at the same time executes national extension programs financed by the national government.

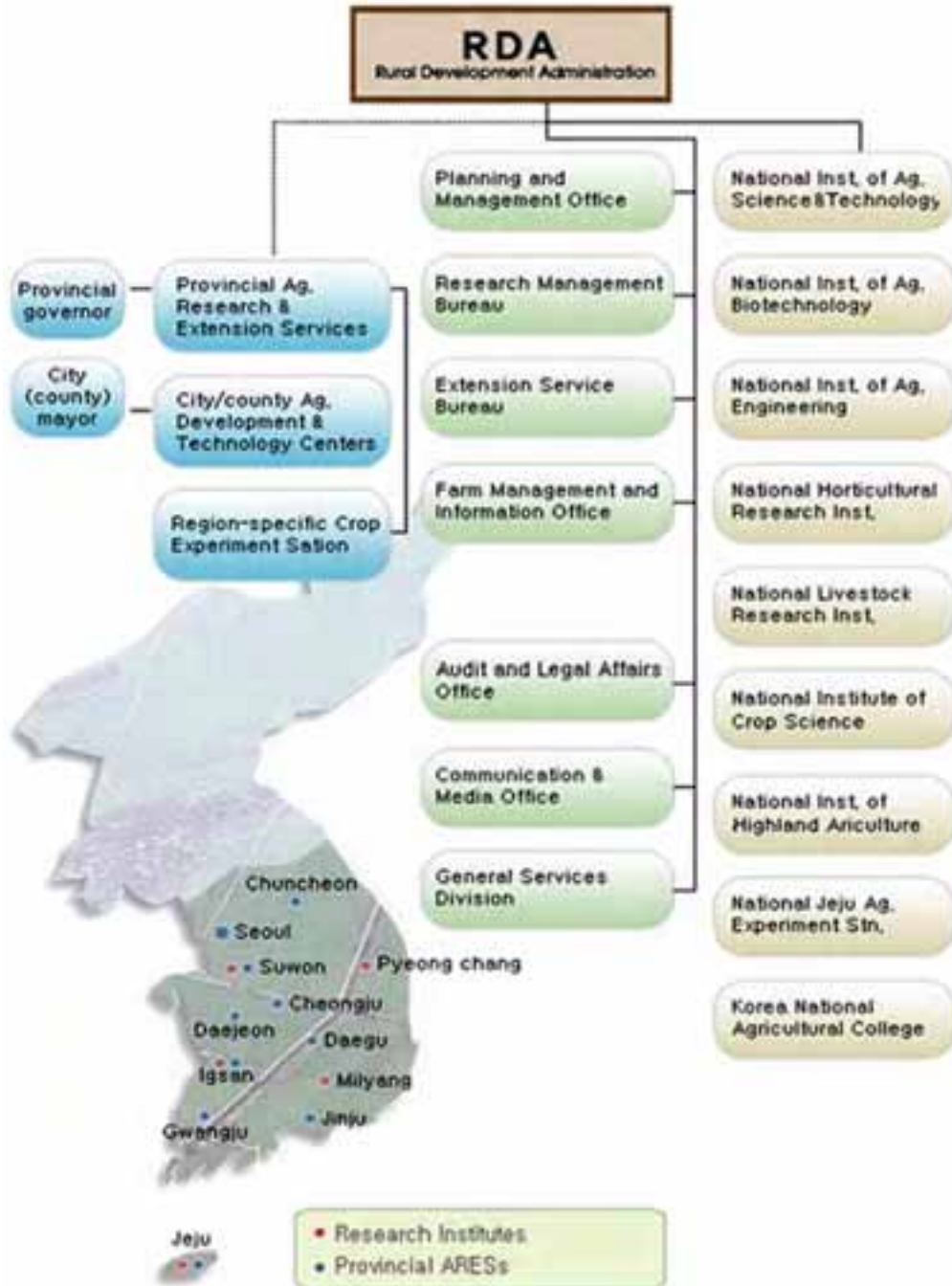
### **The characteristics of Organizational Set-up**

Figure 3 shows the linkage of research and extension for agricultural technology transfer in Korea.

The characteristics of organizational system can be summarized as follows (Kim, Sung Soo, 2001:304-305):

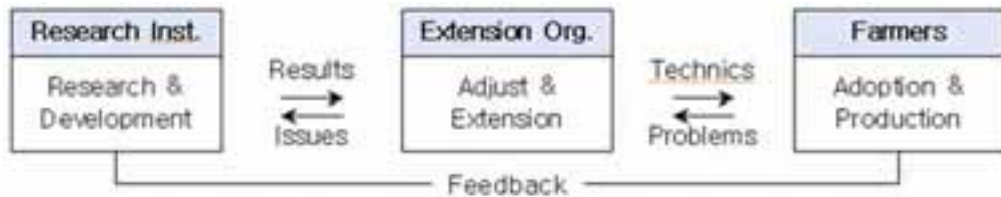
- (1) Since both functions of research and extension are integrated under the same administrator of RDA, the results of agricultural research and experiments and newly-developed technology could be more effectively, efficiently and timely disseminated to the farmers though the nationwide extensional channels and networks. Problems which occur in the course of extension activities can be easily adopted as research projects.
- (2) Results of research are thoroughly examined, screened, and given economic analysis by the research and extension joint evaluation committees. These results are reflected for agricultural policies, and extension services. Related extension specialists are always aware of

Figure 2. Agricultural Extension Organizations in Korea





**Figure 3. The Linkage of Research and Extension**



Source: Van den Ban (1988). Rural Development Administration

- research programs going on and actively participate in research planning and evaluation activities.
- (3) Participation of researchers in extension programs is not only helpful for technical dissemination but also provides very useful information for improving agricultural research findings on the farm field through their involvement in extension activities such as field observation trips, training farmers, evaluation meetings, etc.
  - (4) The institutional cooperative relationship of the extension service system with provincial and local governments, generally known as general administrative agencies is another characteristic. With this relationship, the extension program is not only easily integrated into comprehensive rural development policies, but also supported from the administrative agencies.
  - (5) Close cooperative relationship between the extension program and administrative policies exists at all levels and the budget for agricultural extension services comes from the central, provincial and city/county governments in collaboration with each other.

### **Decentralizing Extension Service**

Since the mid-1980s, more than 60 governments, mainly in developing countries, have experimented with some form of decentralization. Defined as the transfer of power and resources from higher to lower levels in a political system, decentralization can take three forms. These forms can stand alone or work together:

- 1) De-concentration, or administrative decentralization, occurs when agents in higher levels of government move to lower levels.
- 2) Fiscal decentralization occurs when higher levels of government cede influence over budgets and financial decisions to lower levels.
- 3) Devolution or democratic decentralization occurs when resources, power, and often tasks are shifted to owner-level authorities who are somewhat independent of higher authorities, and who are at least somewhat democratic (Manor, 1999).

For democratic decentralization to work well, elected bodies at lower levels must have substantial powers and resources (financial and administrative), and strong accountability mechanism must be created to hold bureaucrats accountable to elected representatives and elected representatives accountable to citizens.

Several other features are helpful but not essential to effective democratic decentralization: a free press, multi-party systems, a lively civil society, experience with democratic politics, and respect for laws and formal rules. It helps if wealth and property are widely and relatively equitably shared, and if a middle class exists but does not exercise unyielding hegemony over poorer groups. It also helps if the region is free of severe social conflict, and if there is an effective government administration.

Some form of decentralization of extension appears to be needed in achieving broad-based rural development. As a separate strategy or as a complement to reform and modernization, decentralization produces more efficient and equitable service delivery by actively engaging rural people in development and making better use of local resources and knowledge.

Decentralization also leads to greater participation resulting in a better understanding of the government's role and, in turn, helps improve the image of extension. Decentralization extension systems have shown evidence of increased resource mobilization, reduced strain on central finances, greater accountability, and more responsive administration (Bird, 1994; Swanson, 2004).

However, is the Korean status really true? Over the last four decades, Korea has experienced dramatic changes in farm practices as a result of agricultural extension services aimed at achieving self-sufficiency in rice and other staple foods. For example, during the last 40 years, it has achieved self sufficiency of rice and year-around supply of green vegetables by diffusion of green house technology.

During the past decade, a fundamental change has been taking place in the field of agriculture. Korean agriculture has to respond to globalization under borderless trade of UR and WTO. However, the era of globalization is blooming in the agricultural sector as well, and Korean agriculture is struggling to cope with the new international trade environment and challenges. Political demand for decentralization trends in Korea has led the government to plan to localize its agricultural extension system by changing the status of extension personnel stationed at the provincial and county level from the central officials' status to local officials' status as of January 1997, regardless of opposition of academic society of extension professionals.

## The Changes after Decentralizing Extension Services

### The changes in Agricultural Extension Systems

#### Agricultural Extension Agencies and Personnel

In 1987 the number of extension agencies was 181 at the city/county level and 1,464 at the Eup/Myun (township) level. However, the number of extension offices was reduced to 157 at the city/county level and 534 at the Eup/Myun (township) level in 1998, a year after implementing localization as shown in Table 3. In 2006, the number of extension offices was 159 at the city/county level and 641 at the Eup/Myun (township) level which has 36 branch offices.

**Table 3. Number of Extension Agencies by Selected Year**

Year	Central	Provincial Level	City/County Level				Average of farm land per each center(ha)	Average of farm household per each center
			Total	City	County	Eup/Myun Office (Branch Office)		
'57	1	9	167	-	-	-		
'60	1	9	167	27	140	-	13,203.6	14,071.9
'64	1	9	(▲4) 171	30	141	410		
'65	1	9	171	30	141	600	13,304.1	14,660.8
'70	1	9	(▲1) 172	32	140	618	13,343.0	14,436.0
'75	1	9	(▲1) 173	35	138	1,473	12,948.0	13,751.4
'80	1	9	(▲6) 179	40	139	1,465	12,268.2	12,039.1
'85	1	9	179	40	139	1,456	(10)	10,759.8
'87	1	9	(▲2) 181	42	139	1,464	(22)	
'88	1	9	181	43	138	1,461	(18)	
'89	1	9	(▲1) 182	45	137	56	(26)	
'90	1	9	182	45	137	58	(26)	11,887.9
'92	1	9	182	46	136	1,302	(26)	
'95	1	9	(▼21) 161	64	97	1,413	(9)	12,323.0
'96	1	9	(▲1) 162	69	93	1,415	(9)	
'97	1	9	162	69	93	1,415	(9)	
'98	1	9	(▼5) 157	67	90	534	(18)	
'00	1	9	157	67	90	527	(9)	12,025.5
'03	1	9	(▲2) 159	70	89	548	(21)	
'04	1	9	(▲1) 160	73	87	579	(26)	
'06	1	9	(▼1) 159	74	85	641	(36)	11,547.2

#### Agricultural Extension Personnel

Extension personnel are central or local government officials. On the other hand, the administrator of RDA is in charge of extension personnel administration, including appointment, positioning and promotion of personnel. However, since 1997, most of the personnel affairs have been managed by the governor of each local government.

The number of extension personnel has steadily increased to reach a total of 7,979 at the end of 1980s. After localization of the extension service in 1994, administration authority was transmitted from the central to local government. Again in 1997, the government decided to change the nomination right of field extension personnel from the central to local government. To date, there is a total of 4,919 extension officials throughout the country, as shown in Table 4.

In 2006, there is a total of 80 extension personnel at the national level or RDA, mostly senior subject-matter specialists. Furthermore, there is a total of 242 extension personnel at the 9 Agricultural Research & Extension Service (ARES), while 4,597 extension personnel are stationed at the 159 city/county extension offices.

Percentage-wise, approximately 6% of the total number of extension personnel are stationed both at the national-level (RDA) and at the provincial-level agencies. The remaining 94% of the total extension personnel are working directly with rural people, stationed at the local level of either county extension offices or their branch offices. An extension center covers 8 villages of the lowest administrative unit with 8,000 farm households and 11,547 has. of farm land, on the average.

**Table 4. Number of Agricultural Extension Personnels in Selected Year**

Year	Total	increase or decrease	Central	Provincial Level	City/County Level			Remarks
					total	center	branch	
'57	952	-	82	177	693	693	-	
'64	4,790	3,838	71	210	4,509	2,017	2,492	
'70	6,360	1,570	73	236	6,051	2,882	3,169	
'75	7,626	1,266	82	226	7,318	2,667	4,651	o Rice & Barley Guidance
'80	7,980	354	106	226	7,648	2,997	4,651	o Farm income Guidance
'85	7,979	(-1)	105	226	7,648	3,328	4,320	
'89	7,979	-	105	226	7,648	7,250	398	
'92	7,064	(-915)	105	290	6,669	6,375	294	
'93	7,063	(-1)	105	289	6,669	6,375	294	
'94	6,964	(-99)	95	289	6,580	6,286	294	
'95	6,843	(-121)	95	289	6,459	6,346	113	
'96	5,545	(-1,298)	85	241	5,219	5,159	60	o 1st Restructuring
'99	5,153	(-392)	71	234	4,848	4,821	27	o 2nd Restructuring (1)
'00	5,032	(-121)	71	235	4,726	4,700	26	o 2nd Restructuring (2)
'01	4,883	(-149)	71	226	4,566	4,540	18	o 2nd Restructuring (3)
'02	4,728	(-155)	71	228	4,429	4,411	18	
'03	4,738	10	71	227	4,440	4,393	47	
'04	4,901	163	71	240	4,590	4,528	62	
'06	4,919	18	80	242	4,597	-	-	

## Extension Budget

Experience has shown that in allocating operational authority and responsibilities, subsidiarity is the key: decision-making should devolve to the lowest possible level of government consistent to make efficient use of funds. All levels of government must be willing to involve farmers and other stakeholders in project planning, designing, and implementation.

Sustainable agriculture which has been defined as ecologically sound, economically viable, and socially just and humane, has received considerable attention in recent years from environmentalists, agriculturalists, and consumers. Extension services need more funding and manpower to meet emerging needs of environmentalists, agriculturalists, and consumers. However, the Extension Budget by Year, especially after localization of 1997, did not reflect these needs as shown in Table 5.

**Table 5. Extension Budget by Year** (unit: Million Won, %)

Year	Total	National	Local		
			Provincial	City/County	Sub-Total
1960	925	359 (39)	130(14.0)	435(47.0)	565(61.0)
1970	6,654	1,984(30.0)	572(8.0)	4,098(62.0)	4,670(70.0)
1980	40,209	5,476(13.6)	3,812(9.5)	30,921(76.9)	34,733(86.4)
1990	211,043	59,705(28.3)	29,050(13.7)	122,288(57.9)	151,338(71.7)
2000	258,672	86,426(33.4)	31,516(12.1)	140,730(54.4)	172,246(66.6)
2005	308,032	82,099(26.7)	30,031(9.7)	192,902(62.6)	225,933(73.3)

Source: The Annual Extension Service Reports (2005), RDA.

## The Negative Changes in Localization

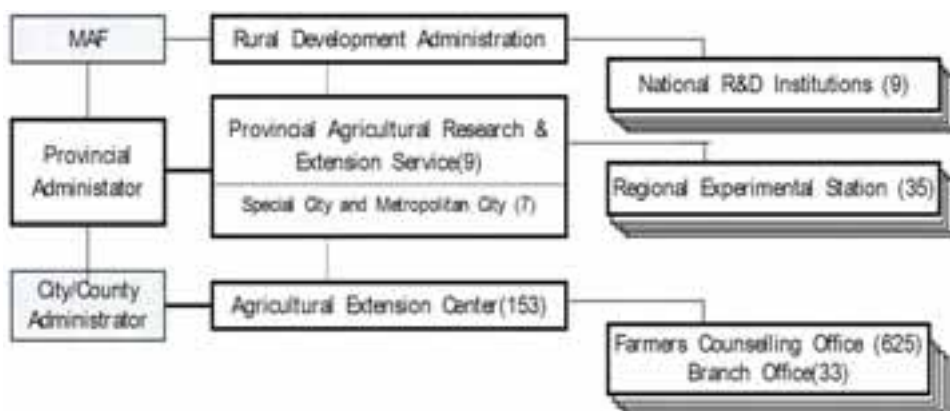
After localization, various problems emerged in Korea Agricultural Extension Service. It is well known that they have difficulty in conducting many projects for farmers, because of the weakened linkage between central institutions and local institutions.

## Problems in Institutions and Organizational Structure

As shown in Figure 4, the Agricultural Extension Service Systems in Korea was constituted by Rural Development Administration, Provincial Agricultural Research & Extension Service, and Agricultural Extension Center.

Before 1997, the results of agricultural research were effectively and efficiently diffused to farmers through the national extension network. Both functions of research and extension were practically integrated so that the administrator of the RDA was responsible for these two closely interdependent administrative functions and there were certainly clear-cut advantages for the extension service.

**Figure 4. Organization for Agricultural Extension in Korea**



City/County Extension Centers were disseminating and guiding the newly developed results of agricultural research institutions and experimental stations to fields, to provide feedback on where to find the emerging problems in the course of farming procedures to Research Institutions. In other words, it functions as a link between technology development and field utilization among the Extension Institutions.

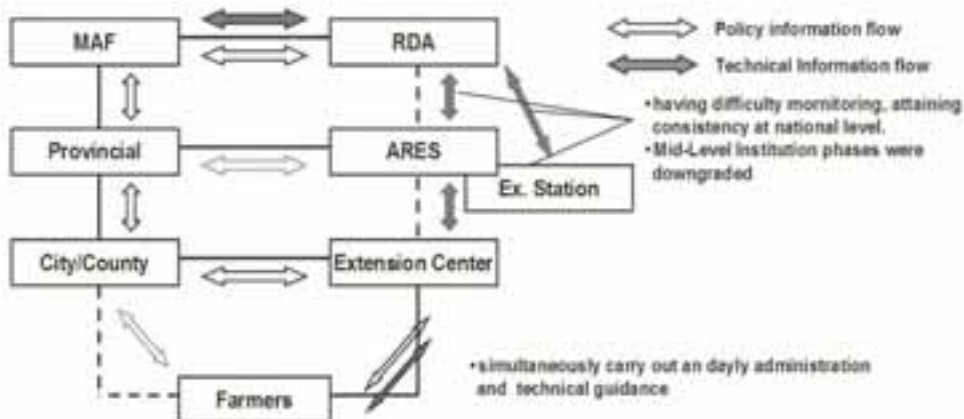
The inter-linkage role and functions needed by AEC were possible only when the cooperation or linkages between the central and local institutions were well constructed. However, after localization, because of the weakness in the tie between institutions, AEC's role and functions were weakened. In particular, City/County AECs, conduct closed extension service with fragmented systems without a communicated flow of specific knowledge and information about central-local institutions. It disrupts the utilization of the human and other resources efficiently and adulterates the quality of extension service or programs (Yoon, 2006).

Also, there were some role conflicts between Extension Center and Agricultural Administrative Organs in local governments because they competitively executed similar policies or because job sharing was not obvious (Terrami, 2004).

An outside arm of the respective city/county government is administratively and technically under the hierarchical control of ARESs. Because city/county ECs have dual operational systems of agricultural administration and agricultural extension, they have difficulty in pursuing consistency and maintaining unification of agricultural policies as shown Figure. 5.

Given these issues therefore, the Ministry of Agriculture & Forestry and the Rural Development Administration should make efforts to establish a cooperative system and to clarify their own responsibilities and authorities.

**Figure 5. dual operational systems of agricultural administration and agricultural extension**



Source: Rural Development Administration (2002).

### Decreased Morale of Extension Personnel

After localization, agricultural extension service was influenced by the City/County governor's will and positive attitude. Hence, AECs have a difficulty in implementing their own roles and functions with highly administrative loads (Jo and Song, 2003). Consequently, Agricultural Extension Service at City/County level was considerably weakened.

Another researcher, Kim (2003), found that agricultural extension educators had a somewhat negative attitude about their organizational environment, felt role conflict, and were not very satisfied with their jobs. In those instances, agricultural administration covered the selection of subjects and subsidies, exercising higher authority and accountability in the course of implementing agricultural policies in each project, while agricultural extension institutions were merely covering the transfer of technical guides and following up with lower authority and accountability.

As the authority of official appointment, funding and inspection were relinquished to the local government governor, and agricultural extension personnel were transferred to local agricultural administrative manpower, rather than disseminating technical guides and exploring farming problems for the fixation of result from R&D institutions.

AECs weakened function affected the morale of extension personnel, and once again, the deterioration of quality of extension services for clientele.

### Unbalanced regional development

Building the local government capacity is a prerequisite for centralizing extension services because local governments often do not

have the technical and managerial capacity to take on responsibility for managing technology programs. Local institutions taking on responsibility for extension might require investment in staff development, facilities, and management systems. Policy-makers must allow time, perhaps several years, for local institutions to develop this capacity and experience needed for effective program management.

As far as decentralized systems are concerned, centralized monitoring and evaluation were weakened; AECs were more concentrated to regional-specific crop-based extension service without centralized monitoring and management rather than the dissemination of new agricultural technology. Thus, new technology for farmers was delayed and overflowing production and price depreciation followed. Consequently, in spite of expectations which enabled the establishment of local special projects and enabling the field guide for farmers, the quality of extension services were downgraded.

Furthermore, a gap among regional agricultural extension centers in terms of human power and operational budgets was widened.

### **New Directions for Agricultural Extension Service**

Agricultural extension agencies as well as people who work in the fields of agriculture recognize that Korean agriculture is in a crisis. The Rural Development Administration which works for agricultural extension service at the national level is concentrating efforts to solve the current problems and is seeking new directions and strategies.

### **New Paradigms in Korea**

Sulaiman and Hall (2004) have recently given a useful overview of trends in Korean agricultural extension. In form and content, they see a change from 1) technology dissemination to supporting rural livelihood, 2) improving farm productivity to improving farm and non-farm income, 3) forming farmers groups to building independent farmer-operated organizations, 4) providing services to enabling farmers to access services from other agencies, and 5) marketing information to market development.

Several scholars also argued that the agricultural extension service's target should change 1) from rural industry to comprehensive rural life, 2) from nation's goal achievement to the farmer's, 3) from agricultural technologies to rural welfare, 4) from central government to local government as a new paradigm (Leem, 1995, Lee, 2000).

That is to say, agricultural extension service should focus on 1) improving the farmer's livelihood, 2) achievement for farmers, not oriented toward nation's goal 3) making an affluent society on the basis of culture



and welfare, not just of dissemination of traditional agri-technology, and 4) reflecting special features and needs of local residents.

Agricultural Extension Service Development Task Force Team at RDA (2002) has expected that price of agricultural products will go down, income of farmers will decrease, and growth rate of agricultural economy will slow down in ten years. With these, Korean agricultural policies should therefore be aimed at 1) constructing foundations for agricultural competition, 2) consumer-driven production and marketing, 3) building systems for sustainable agriculture and safer agricultural product supply chain, and 4) supporting welfare and revitalization of rural economy.

RDA (2002) has defined agricultural extension service as a knowledge-based project which provides farmers and consumers with skills and information related to farm life. That is, as a new concept, agricultural extension service, aims at systematically collecting, centralizing, decentralizing, and connecting skills and information which help farmers, consumers, and researchers upgrade their ability of technology innovation, problem solving, and decision-making(see Figure 6).

**Figure 6. New Paradigm in Korean Agricultural Extension Service**

Terminology	Agricultural Extension Services	⇒	Agricultural Knowledge & Information Services
Concept	<ul style="list-style-type: none"> <li>◦ business to provide new techniques through training and setting a model</li> </ul>	⇒	<ul style="list-style-type: none"> <li>◦ systematically collecting, centralization, decentralization and connecting agricultural knowledge and information needed for all process</li> </ul>
Target	<ul style="list-style-type: none"> <li>◦ farmers</li> </ul>	⇒	<ul style="list-style-type: none"> <li>◦ farmers + consumers</li> </ul>
Function	<ul style="list-style-type: none"> <li>◦ dissemination simple technique</li> <li>◦ improving rural life</li> <li>◦ nourishing of farmers or group</li> </ul>	⇒	<ul style="list-style-type: none"> <li>◦ skills and manage consulting</li> <li>◦ nourishing consumer science</li> <li>◦ nourishing organization on each items</li> </ul>
Method	<ul style="list-style-type: none"> <li>◦ demonstration exhibition</li> <li>◦ face-to-face contact</li> </ul>	⇒	<ul style="list-style-type: none"> <li>◦ different by farming acreage</li> <li>◦ cyber consulting</li> </ul>
Resources	<ul style="list-style-type: none"> <li>◦ extension agents in rural</li> </ul>	⇒	<ul style="list-style-type: none"> <li>◦ network in whole country</li> </ul>

Source: Agricultural Extension Service Development Task Force Team at RDA (2002)

RDA (2005) decides upon the mission of agricultural extension service as the project for supporting knowledge, information, and techniques of farmers and consumers. Their mission statement is as follows: First, dissemination of technology transfer and upbringing manpower to actualizing knowledge-based agriculture toward the 21st Knowledge and Information Society. Second, change into public service for farmers and consumer to sustain or improve rural life toward liberalization.

### **New Developmental Strategies in Agricultural Extension Service**

Following are some of the discussions on the new direction of Korean Extension Service. Im(1996) argued that the essential function of offering techniques, information, and knowledge should continue, but the content should change according to changes in the situation of the system, both internal and external, as well as needs of customers. In addition, agricultural extension service should strengthen its function of supplying techniques and information related to structural adjustment as well as the extension of agricultural technology, because the main purpose of agricultural extension is to indicate the development of rural communities.

For Kim (2003) agricultural extension service's mission and vision should be to nurture agriculture to make it oriented toward knowledge, technique, and consumer. This assertion is based on following context: First, knowledge-based agriculture depends on knowledge, technique, and consumer, which is distinguished from industrial society. Second, the contents demanded from farmers are related to special features from knowledge-based society. Finally, to strengthen agricultural competitiveness through building productive agricultural organization with receptive farmer, both new identification and concept are needed.

Lee(2004) also suggested new directions about agricultural extension service. First, new direction is the connection between government agencies and non-government agencies, and between school education and continuing education (INSTITUTION VIEW). Second, new direction is the expansion from rural residents only to urban residents and from just adult to all age groups (OBJECT VIEW). Third, new direction is the connection between agricultural techniques and agricultural project and the connection between professional agricultural education and liberal agricultural education (CONTENT VIEW). Fourth, new direction is the connection between on-line education and off-line education and the development of new instructional methods (METHOD VIEW).

Jo and Song(2003) also made overture of new direction. They presented key political projects as significant policies of agricultural extension service.

- ◆ Nourishing consumers-driven agriculture
- ◆ Monitoring environmentally sound & sustainable agriculture

- ◆ Branding and quality control
- ◆ Multi-functionality of Agriculture
- ◆ Consulting
- ◆ Upbringing Farmers group
- ◆ Providing cyber-agricultural knowledge
- ◆ Exporting agricultural production
- ◆ R&D Function, etc.

Terrami(2005) argued that the social role of agriculture is being expanded to provide 'service' such as green tourism and amenities with the public. Therefore, extension institutions should cope actively with this change. The Korean Extension Offices should regard the services which farm enterprises provide with consumers in line of their own agricultural production as the same kind of agricultural activities, and should enhance their potential to provide extension service correspondently with those farm enterprises. The partnership between the public and the private at the local level is very important to manage regional agricultural system. The Extension Centers make efforts to build those partnerships.

Local Agricultural Extension Service Development Task Force Team at RDA(2005-2006) made various efforts and attempts to revitalize local extension agencies. With this, they identified seven subjects as part of reform agenda, and 34 subjects as sub-agenda. And it is valid from 2006 to 2010. The tasks are as follows:

- ◆ Identification of agricultural extension institution
- ◆ Institutional reform for group vitalization
- ◆ Customer-driven agricultural extension service
- ◆ Field-based competency development
- ◆ Vitalization of linkage and cooperation between central and rural organization
- ◆ Advancement of professional development program
- ◆ Foundation of organizational innovation's culture

Recently, RDA has been making various efforts such as restoring extension personnel status to centralization and implementing single career path for local personnel, among others, to revitalize Korean Agricultural Extension Service.

### **Summary and Conclusion**

Korean government changed the status of extension personnel from central government staff to county/city government staff for the sake of democratization and localization since 1997.

This brought about various problems such as: 1) decreasing number of extension agencies, personnel, and funds, 2) weakening linkages between national and local extension offices, with a consequence that the AEC functions weakened; 3) decreasing the morale of extension personnel, and 4) widening capacity gap for regional development.

In order to revitalize Korean agricultural extension service, it is essential to determine whether organizational structures are well constructed, personnel are appropriately trained, and operational systems are functionally organized. Therefore, the Ministry of Agriculture & Forestry and the Rural Development Administration should make efforts to establish the cooperative systems and to clarify their own responsibilities and authorities.

In order to insure that extension educators are professional individuals with the expertise, it is crucial to establish the systems that nationally recognize them as experts, and that provide them professional career development paths.

Also, it is important to restore the morale of extension personnel not only to continually achieve the national goals of food production, balance national development and preservation of environment, but also to meet increasing needs of farmers.

## **Reference**

- Agricultural Extension Service Development Task Force Team(2002). The Mission and Strategies for Agricultural Knowledge and Information Service together with Consumers and Farmers. Suwon: Rural Development Administration.
- Extension Service Bureau(2005). The Study of the New Concept and Programs Setting on Agricultural Extension Service in Korea. Suwon: Rural Development Administration.
- Extension Service Bureau(2006). A Study of the Better Linkage and Cooperation between Agricultural Extension Agencies and pool. Suwon: Rural Development Administration.
- Extension Service Bureau(2006). The Assessment of Korean Agricultural Extension Workers Competencies and Professional Development System. Suwon: Rural Development Administration.
- Extension Service Bureau(2006). The Performance Assessment of Korean Agricultural Extension Specialist Association' Activity and the Directions of Professional Development for Agricultural Extension Workers in Korea. Suwon: Rural Development Administration.
- Feder, G., Willett, A., & Zijp, W.(2002). Agricultural extension-generic challenges and some ingredients for Solutions.
- Jo, Y. C., & Song, Y. S.(2003). A Study on Recognition of Local Extension Agents to the Rural Extension Reform Programs in Korea. The Korean Journal of Agricultural Education Vol.35(4). pp.87-97.
- Kim, J. H.(2007). Analysis on the Fitness and The Images of The Term on Rural Extension Work in Korea. The Korea Journal of Agricultural Education and Human Resource Development. Vol.39(1), pp.137-165
- Kim, J. M.(2003). A Study on the role and competence development of rural extension workers in transition. The Korean Journal of Agricultural Education and Human Resource Development. Vol.35(4). pp.69-85.

- Kim, J. M., Ju, D. J., & Kwak, J. H.(2006). Professional Development System for Rural Extension Workers in Korea. *The Korea Journal of Agricultural Education and Human Resource Development*. Vol. 38(1). pp.67-92.
- Kim, S. S.(1997). The First Year Pre-Evaluation of Localization of Agricultural Extension. *Korean Journal of Agricultural Extension*. Vol.4(2).415-421.
- Kim, S. S.(2000). Problems in Localization of Extension Educators in Korea. *Korean Journal of Agricultural Extension*. Vol.7(1).
- Kim, S. S. (2001). Localization of Extension Educators in Korea. *Korean Journal of Agricultural Extension*. Vol.8(2). pp.299-314.
- Local Agricultural Extension Service Development Task Force Team(2005). *The Reports of Local Agricultural Extension Service Development Task Force Team ('!-d!)*. Suwon: Rural Development Administration.
- Ministry of Agricultural & Forestry(2006).
- Rivera, W., & Alex, G.(2004). *Agriculture and rural development discussion*. Washington, D.C: The World Bank.
- Rural Development Administration(2006). *The Annual Reports of the Korean Agricultural Extension Service 2005*. Suwon: Rural Development Administration.
- Im, S. B.(1995). The Roles of Rural Extension for the Structural Adjustment of Rural Korea. *Korean Journal of Agricultural Extension* Vol.2(1). pp. 71-79,
- Terrami(2005). *A Study on the Function and Role of the Local Extension Service Institutions in Rural Korea*. Suwon: Rural Development Administration.
- Terrami(2006). *The Comparative Analysis Research on Organizational Characteristics of the Local Extension Service Institutions in Rural Korea*. Suwon: Rural Development Administration.
- Van den Ban, A.W. & Hawkins, H.S.(1996), *Agricultural Extension*, 2nd edition, Blackwell Science, England.
- Van den Ban, A.W.(2004). "world trend agricultural extension". *Society of Korean agricultural education*.
- Lee, Y. H.(2000). Trends and Directions of Agricultural Extension Services under the Local Autonomy Period in Korea . *Korean Journal of Agricultural Extension* Vol.7(1), pp. 45-64.
- Song, Y. S., Cho, Y. C., & Yoon, Y. H.(1999). A Study on the Legal Status of Local Agricultural Extension Services. *Korean Journal of Agricultural Extension* Vol.6(1). pp.1-13,
- Yoon, E. Y.(2007). A Study of the Better Linkage and Cooperation between Agricultural Extension Agencies. *Korean Journal of Agricultural Extension and Development*. Vol.14(1). pp.1-27.

# Local Wisdom on Agricultural Transmission of People in Nongpong Village, Dongyang Sub-District, Nadoon District, Mahasarakham Province, Thailand, 2006: A Case Study

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## **INTRODUCTION**

Agriculture as an occupation in Thailand has been practiced since ancient times. It is also considered as an important occupation regarded as the major occupation of the Thai people. Most of the people in all regions practice this occupation, more particularly in the northeastern part of Thailand.

Nongpong village is a small village located in Dongyang Sub-district, Nadoon District, Mahasarakham Province in northeast Thailand. At the time of the study, there are 116 households and 556 people who are related to each other, had *harmonious relations*, and primarily did rice paddies. They had learnt, inherited and accumulated the knowledge of indigenous agriculture from their ancestors. In those years it was said that Thai agricultural wisdom is the capacity to integrate wisdom, knowledge base, skills and techniques of agricultural technology with the development based on traditional knowledge wherein the populace is able to be self-supporting in planting, plant breeding, animal raising, animal breeding, mixed farming, integrated farming, and appropriate adaptation of technologies to agriculture (Thongtum, T. 2006 and Srisalup, N. 2000).

At present, modern agriculture plays a significant role in changing the many aspects of life in communities, particularly the ways of villagers in the practice of agriculture. In particular, this may lead to the collapse of crucial agricultural traditions that have been accumulated for a long time and leave the trail of traditional agriculture behind in the past. Data from this research intends to find ways to restore and conserve the agricultural

customs that have faded into insignificance. It will also pave the way for further developing and sustaining the knowledge base of the locality.

## **OBJECTIVES**

1. To study the status of the people in Dongyang Sub-district, Nadoon District, Mahasarakham Province.
2. To study the transmission of local wisdom on agricultural knowledge of Noonpong villagers including plantation, animal raising and processed agricultural products.
3. To study the problems encountered in the transmission of local wisdom on agricultural knowledge among Noonpong villagers.

## **SCOPE OF THE STUDY**

This is a case study on the transfer of agricultural knowledge wisdom of villagers in Dongyang Sub-district, Nadoon District, Mahasarakham Province, 2000. The transmission of local wisdom on agricultural knowledge included plantation, animal raising and agricultural product processing. It also seeks to study the problems encountered in transferring the agricultural knowledge wisdom of Noonpong villagers who practiced the occupations concerned. The following terms are defined for more clarity:

**Intelligence of locality** refers to the knowledge of villagers in the locality that was acquired from their experiences including the inherited knowledge from their ancestors that had been accumulated from the previous generations to the present one (Chansru, S., 1993: 145-149)

**Agriculture** refers to the plantation and animal husbandry learnt and experienced through observation and practice, given available resources such as soil, water and air to yield agricultural products (Likhitprasert, A., 1993: 205-216).

**Plantation** refers to farming, rice paddies and crop farming.

**Animal rising** refers to raising, breeding, and nurturing animals (cattle, buffalo, duck, chicken, pig, and fish).

**Agricultural products processing** refers to the application of new technologies in processing the products obtained from agriculture to make them beneficial for consumption.

## **MATERIALS AND METHODS**

The sample of this study consisted of 188 farmers, aged above 40 years, from 70 families engaged in agriculture in Dongyang Sub-district, Nadoon District, Mahasarakham Province in 2006. Purposive Sampling was

used to select the research participants. The sample criterion of above 40 years was used since it is believed that farmers above 40 years old have adequate work experience in farming. The sampling group consisted of 70 respondents.

The tool used to collect data was an interview schedule which consisted of open-ended and close-ended questions, and was divided into four sections; 1) general condition of villagers, 2) general conditions of Noongpong village, 3) the transmission of local wisdom on agricultural knowledge, and 4) problems encountered in transferring the local wisdom on agricultural knowledge.

The researcher interviewed 54 respondents from 70 farmers (77.14%) between December 2006 and January 2007. Sixteen farmers could not be interviewed because of their unavailability, but they were able to participate in focus group discussions (FGDs).

Data analysis in this study was done through content analysis, frequency and percentage in order to discuss and describe the data.

## **RESULTS OF THE STUDY**

The proportion of male to female respondents was equal (50% each). Most of them are 40-45 years old (22.2%) and 46-50 years of age (22.2%). Majority (70.4%) are married and have five family members (31.5%). Most villagers have reached the educational level of fourth grade (87.0%).

### **General data on Nongpong village and work conditions of Nongpong villagers**

Nongpong village is 15 kilometers from Nadoon District. Its total area is 1,364 rais; 1,195 rais for agriculture, 83 rais for residence, and 86 rais and 200 square meters for public area. The population is composed of 556; 286 men and 270 women who all uphold Buddhism as their religion. There are 116 households, one temple, one school, one nursery school and one public health center.

As regards work condition, most of Nongpong villagers have farming as their main occupation (94.4%) and some supplementary occupation of trading (13%). The former have income of 40,001 to 50,000 baht/year and the latter with 20,001 to 30,000 baht/year.



## **The transfer of agricultural knowledge wisdom**

### The transfer of agricultural knowledge wisdom in cultivation

1) With regard to the transfer of agricultural local wisdom in cultivation, all villagers transferred the agricultural local wisdom in growing rice as the major plant (100%). Their main objectives were to grow rice for household consumption (94.4%) and only few (5.6%) grow rice for distribution in the locality. Most villagers use the method of growing rice by transplanting paddy sprouts in the field by family members (77.8%), and serving the field with rice seedlings (22.2%). As regards maintaining the major plants, most use manure together with chemical fertilizer, controlled water levels and removed weed (48.2%). More than half of them employ labor force in the locality to harvest (57.4%); the farmers themselves and their family members help in harvesting (42.6%).

Almost all the villagers transferred the knowledge they obtained from their parents (81.5%). More than half of them transferred the local wisdom by serving as an example to their children (74.1%), and by demonstrating, explaining and performing simultaneously (25.9%). Almost all the villagers continued transferring the same knowledge wisdom (94.4%) by transferring the local wisdom to their children (90.2%) and by serving as an example and letting the children follow what was demonstrated (52.9%).

2) In regards to transfer of local wisdom in terms of minor plant cultivation, most villagers cultivate the minor plants (51.9%) through home-grown vegetables (42.9%). The objective of cultivating the minor plants is for family consumption (32.1%). The method of cultivating the plants is to sow the seedlings (64.3%), to maintain them by using manure and chemical fertilizer, and watering (67.9%) and harvesting the yields by themselves and their family members (82.1%).

Almost all the villagers transferred the local wisdom from father, mother, both father and mother, and relatives equally (39.3%) by serving as an example and letting the children follow their example (78.6%). Most villagers continued transferring the same local wisdom (96.4%) by transferring this to their children (70.4%). More than half of them served as an example and let the children follow their performance, and advised them on some techniques as well (51.9%).

### The transfer of agricultural knowledge wisdom in animal raising

1) On the transfer of agricultural knowledge wisdom in animal raising, the following were revealed:

On the aspect of raising cows, 66.6 percent of the respondents use the feces as manure to be used for fertilizing rice paddies and growing

other plants (40%). There was a method to raise cows in pension and tie them in rice paddies (83.3%). The remaining feces are manually removed from the pen while being cleaned and sanitized to be germ-free (56.7%). Most of the local wisdom was transmitted from the father and mother to the children by demonstrations and instructions according to the recognized procedure. These were practiced until proficiency is attained (80%). Furthermore, there was the transfer of local wisdom to the children (92.3%). More than half of their parents transferred their local wisdom to their children by demonstrating and letting them follow the demonstrated performance coupled with explanation (53.8%).

As regards raising water buffaloes, 28.8percent of the respondents use water buffaloes as labor force in doing rice paddies by means of raising them in pen and tying them in rice paddies. Water buffaloes were vaccinated under the program offered by DLP (46.1%). Most of the villagers transmitted the local wisdoms from father and mother (76.9%) by demonstration and instructions and then performing according to the demonstrated procedure (53.8%). The transfer of local wisdom to all the children was done by practicing through demonstration and instructions (100%) and then performing according to the demonstrated procedure (66.7%).

With regard to domestic fowl rearing, 88.8percent mainly aimed to have food for the family and to use the feces as manure for cultivating home-grown vegetables (97.5%) and by raising in terms of free range chicken (100%). Most villagers transmitted the local wisdom from father and mother (87.5%) and by performing under actual situation in raising chickens (57.5%). It has been found that the transfer of knowledge to their children was done (89.5%) by performing under actual situation in raising chickens (65.8 %).

On the aspect of silkworm rearing, 11.1 percent of the respondents mainly aimed to weave cloth for family use or for sale (60%). The method of silkworm rearing was to fix shelves on all the spaces available around the house (100%), to raise freely under natural condition and to protect from flies by drawing a mosquito curtain or hanging up the net. Most of the villagers transmitted from father and mother (60%) and relatives (40%) by performing as an example coupled with advising techniques (60%). It was found out that the transfer of knowledge was done to all the children (100%) by performing as an example, following the exemplified procedure coupled with advising techniques in terms of performing together and helping each other (100%).

As regards fish culture, all or 100 percent raise fish in pond around the area of the rice paddies was by feeding natural food such as food scraps or vegetable scraps and constructing natural habitat by using small branches of wood and wood scraps (100%). All villagers transferred the local wisdom from father and mother and then transferred the same

knowledge they received to their descendants by performing as an example, following the exemplified procedure coupled with advising techniques in terms of performing together and helping each other (100%).

On the aspect of raising pigs, 8.9 percent sell the pigs in the communities. The pigs were raised in closed-household by separating the pen from the house. The pen is cleaned everyday and the pigs are fed with natural food and rice barn. All the pigs are vaccinated under the program offered by DLP (100%). The transfers of knowledge from mother, father and relative was done by 50 percent of the villagers while the other 50 percent got their knowledge from DLP. The transfer of local wisdom was done by performing as an example, letting their children follow the demonstrated procedure coupled with advising techniques (75%). The transfer of knowledge from DLP was done by attending exhibitions (75%).

As regards dog rearing, 22.2 percent mainly use the dogs to watch over the house or as pets (100%) and the dogs are nurtured by natural rearing (100%). The dogs are vaccinated under the program offered by DLP to prevent Rabies (90%). More than half of villagers transferred the local wisdom from father and mother (60%) and relatives (40%) by performing in actual situation in terms of helping each other and advising and teaching (100%). Almost all the villagers transferred the local wisdom to their children (70%) by performing in actual situations in terms of helping each other and advising and teaching.

### The transfer of agricultural knowledge wisdom in agricultural products processing

#### **Animal products processing**

1) Processing of animals that villagers reared themselves. About 27% of the respondents villagers transferred the local wisdom of processing cow products. Their aim was for family consumption (70.3%) and for selling in the local market and provincial market (18.9%). The major method of processing was sun-drying for one day (64.9%). Other method used was fermentation such as salted fish, soured fish and pickled fish (18.9%). Most villagers learned their local wisdom from father and mother (70.3%) and by performing as an example, and making their children follow the exemplified procedure coupled with advising techniques (75.7%). It was found that their children learned through example, coupled with advising techniques (81.1%).

2) Processing of natural animals. Most villagers (93.8%) transferred the knowledge wisdom of processing fish products mainly for home consumption (100%). Half of the villagers used the method of processing by fermenting (50%), both sun-drying and smoked (28.1%) and only sun-drying (21.9%). The respondents transferred the local wisdom from father and mother (71.9%) and by performing simultaneously, helping each other,

coupled with advising techniques and doing by themselves (56.2%). It was also found that their children also practiced the same methods of transmitting the knowledge (100%).

### **Plant products processing**

1) Processing of plants that villagers cultivated by themselves. Villagers transferred the local wisdom of processing rice products (33.4%) mainly for family consumption (45.8%) and selling in the local market (54.2%). Processing was done by making various kinds of sweets (41.7%) by pickling, fermenting, roasting and sun-drying (8.3%). The villagers transferred the knowledge wisdom from relatives (41.7%) and by doing simultaneously in terms of helping and advising each other with techniques in actual situation (100%). They transferred the knowledge wisdom to their children and relatives (30.4%) by advising and performing simultaneously and bringing the products for family consumption especially if the products are of bad quality while giving advice on new techniques (100%).

2) Processing of plants from nature. Villagers transferred the knowledge wisdom of processing tamarind products (30.3%), mainly for family consumption (57.6%) and for selling in the local market (42.4%) by pickling (8.3%).

### **Problems encountered in transferring the local wisdom on agriculture**

#### Plantation

1) One of the problems encountered in transferring the local wisdom of agriculture was deficiency in water supply for agriculture and consumption. The water shortage caused plantation activities to be discontinued or suspended (92.6%). The minor problem was the limited time of transferring the knowledge wisdom. This was because the respondents needed to work in different localities and to perform several jobs simultaneously (50%). There was also the problem of low price for the product which was less than the investment.

2) As regards problems encountered in transferring the local wisdom on plantation, it was found that the children and relatives of respondents preferred working in different provinces and come back to the community only during planting season. Others did not visit the community for years causing the transfer of local wisdom to be discontinued (96.3%). The minor problem was water shortage that caused discontinuance and loss. The respondents were discharged to transfer the local wisdom to their descendants because of loss and low income from plantation. However, the respondents still transferred the basic local wisdom to their descendants in the area of growing plants for family consumption so that they would not buy from the outside (72.2%). Some children and relatives lacked interest,

paid little attention or ignored them because of the thought that these are waste of time and will only have little profit (20.4%). Furthermore, there are equipment and machinery to be used in agriculture which they could not handle because they lacked the ability besides being too expensive. The ones who obtained higher level of education did not like agriculture as an occupation and thought that their high education could land them to better jobs and hence better incomes (14.8%).

### Animal raising

1) Problems encountered in transferring the knowledge wisdom on animal raising include deficiency in animal food supply during the dry season (82.2%) and their lack of time to raise animals because of their work in different provinces. Therefore, they were not interested in transferring the local wisdom and so the transfer was discontinued (51.1%). Investment on animal husbandry was high, but the price of the product was low for certain animals. This caused the transfer of local wisdom to be discontinued (28.9%). Also, there were much more equipment and machinery to be used in animal husbandry causing the transfer of local wisdom to be useless, including ignorance of the transfer of local wisdom because of their fear of having trouble with animal husbandry.

2) As regards problems encountered in transferring the knowledge wisdom on animal husbandry, there was not enough capital and there was a deficiency in animal food supply during the dry season (80%). A minor problem was that they encountered losses and so their confidence on transferring local wisdom was undermined (77.8%). The education of their descendants and relatives in other provinces gave them little time to participate in animal husbandry, so they lost interest and ignored the transfer, but paid more attention to other jobs such as working as employee (24.4%). Learning how to use equipment and tools for animal husbandry took some time (17.8%). The new generation did not obey the traditional procedure and thought that the high education will allow them to get better jobs and earn more income. Moreover, too many technologies were now being used in production (15.6%).

### Animal and plant products processing

1) With regard to problems encountered in transferring the local wisdom in animal and plant products processing, it was found that villagers needed to work in different provinces and had limited time to learn the entire process that was transferred from their parents (83.3%). The processed products got low price and there was no assured market for these (32.4%). Raw materials were also not sufficient in supply (24.3%). The equipment and tools were not up to date, so the processed products were of low quality.

2) As regards problems encountered in transferring the local wisdom on animal and plant products processing, there are very many new technologies used in products processing that caused the users not to follow them. They did not understand the new technologies and it took much time to learn how to use them (27%). The minor problems include: the products got low price and there was no definite market for their product (21.6%). Their children and relatives were not interested on learning in products processing and got the idea that purchasing processed products was more convenient (16.2%).

## **DISCUSION AND CONCLUSION**

This study focused on the transfer of a body of local wisdom on agricultural knowledge. Results revealed that the respondents received their local wisdom from father and mother, and relatives. The respondents still transferred the local wisdom to their children and grandchildren by adapting them to the changing time and technologies. Although the descendants paid little attention and were less aware of the values of wisdom, respondents still practiced the idea of transferring what they have learned and also applying them appropriately by demonstration and letting their descendents follow the performance, by demonstrating, explaining, advising and performing simultaneously. This is the way how the Noongpone villagers live their life the traditional way. The transfer of knowledge was in accordance with social activities influenced by religion and the beliefs of that group, and were automatically carried out step by step, which was in agreement with the findings of Kwaesuk (2000: 14). She said that Intelligence of locality will be transferred to the learners or target groups automatically, without being educated from any institution, but using commonsense in terms of imitating, and inheriting within families. The transfer of knowledge was done primarily by demonstration, actual performance and perpetual performance until they become proficient. The work to be used in daily life must be the work learned from actual performance and utilization, not those mentioned in textbooks. This was in agreement with what a village leader once said that intelligence of locality is the knowledge gained from their experiences and intelligences including the collective knowledge of the ancestors from generation to generation (Thongthum,T., 2006 and TKC, 2005). During transmission, there was adaptation, application and exchanges of knowledge until it becomes the new local wisdom under social circumstances, culture and environment. It is a pity that those knowledge bases have been omitted and are going to disappear if there is no research, collection, category and building of its values consecutively and sincerely.

## **RECOMMENDATIONS**

Some recommendations for the people to be aware of the values of intelligence of locality and the transfer of agricultural local wisdom are made for the government or concerned agencies as follows; 1) there should be an in-depth research particularly on the local wisdom on agriculture to gain more explicit and continual data, 2) the study should be carried out in many areas

to collect data for comparing, categorizing and grouping the local wisdoms available for study and research, and 3) the promotion of building the networks of agricultural local wisdom on issues should be conducted. This will be much beneficial on maintaining the agricultural intelligence of a locality and in building a database on developing the local wisdom on agriculture to be consecutive, sustainable and extensive, to make them a Thai heritage.

## **REFERENCES**

- Wongsasun, K. 2000. Thai Living Book. Bangkok: Thirdwave Education. 200 p.
- Senakhum, T. 1996. " The Development of Alternative Agriculture". p 22-29. Alternative agriculture. Vithoon Liemjumroon, Bangkok: Pimdee. 202 p.
- Singhklawanitch, T. 1980. Agricultural Development. Bangkok: Bunakitja. 174 p.
- Thongthum, T. the village headman, interviewed on, 24 October 2006.
- Sisalub, N. "Thai Wisdom" Thai encyclopedia for Thai juvenile by the Royal desire of Majesty the King. Book no. 23(2000). p 11-30.
- Petchthongkhum, M. and et al. 1973. Introduction to Agriculture. Bangkok: Ramkhamhaeng University, 200 p.
- Thailand Knowledge Centre (TKC). 2005. "Intelligence of Locality". Retrieved May 2, 2005, from <http://www.tkc.go.th/index.aspx?pageid=110&parent=0>.
- Chansru, S. "Intelligence of Locality" in Pongpits, S. 1993. Local Community Knowledge and Rural Development. Book No. 1, p. 145-159. Bangkok: Amarinth Printing group Ltd. 500 p.
- Mahasawatd, S. and et al., 1983. Documentary paper for teaching the subject 818 Agricultural Development, Political Science, Sukhothai Thammathirat Open University.
- Likitprasert, A. "Natural Agriculture" in Pongpits, S. 1993. Local Community Knowledge and Rural Development. Book No. 1, p. 205-206. Bangkok: Amarinth Printing group Ltd. 500 p.
- Kwaesuk, O. 2000. The report of outcome in the execution of workshop; the transfer of local community knowledge and distribution of mass media knowledge, Ubonrachathani: the educational center of northeast out-school. Retrieved May 12, 2005 from <http://www.nfe.go.th/042103/digit-lib/wisdom1.html>.