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Economic and Social Commission for Asia and the Pacific

CAPSA WORKING PAPER No. 76

A Preliminary Assessment of the Potential Role of Information and Communication Technology in Support of Poverty Alleviation Policies for Rural Populations

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AGRI-ICT Project Report

Robin Bourgeois

United Nations

UNESCAP-CAPSA

The Centre for Alleviation of Poverty through Secondary Crops' Development in Asia and the Pacific (CAPSA) is a subsidiary body of UNESCAP. It was established as the Regional Co-ordination Centre for Research and Development of Coarse Grains, Pulses, Roots and Tuber Crops in the Humid Tropics of Asia and the Pacific (CGPRT Centre) in 1981 and was renamed CAPSA in 2004.

Objectives

CAPSA promotes a more supportive policy environment in member countries to enhance the living conditions of rural poor populations in disadvantaged areas, particularly those who rely on secondary crop agriculture for their livelihood, through socio-economic and policy research, training and dissemination of information. In its activities, the Centre aims to serve the needs of its primary target group, high level research managers and policy analyst/planners, concerned with the role of agriculture in poverty alleviation.

Programmes

1. Co-ordination of socio-economic and policy research on secondary crops, networking and partnership with other international organizations and key stakeholders, conduction of research and analysis of trends and opportunities with regard to improving the economic status of rural populations.

2. Production, packaging and dissemination of information and successful practices on poverty reduction, and the dissemination of information and good practices on poverty reduction measures.

3. Training of national personnel, particularly national scientists and policy analysts and provision of advisory services.

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AGRI-ICT Project Report

"UNESCAP-CAPSA: Centre for Alleviation of Poverty through Secondary Crops' Development in Asia and the Pacific"

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WORKING PAPER 76

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Robin Bourgeois

UNESCAP-CAPSA
Centre for Alleviation of Poverty
through Secondary Crops' Development
in Asia and the Pacific

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Acronyms

ADB	:	Asian Development Bank
AED	:	Agricultural Economics Division (BARI)
BARI	:	Bangladesh Agricultural Research Institute
CAIS	:	Centre for Agricultural Information and Statistics (Cambodia)
CGPRT	:	Coarse Grains, Pulses, Roots and Tubers
CPDD	:	Communication, Publication & Documentation Division (NARC)
DAALI	:	Department of Agronomy and Agricultural Land Improvement (MAAF)
Danida	:	Danish International Development Agency
DoA	:	Department of Agriculture
GIS	:	Geographic Information System
ICT	:	Information and Communication Technology
ILETRI	:	Indonesian Legume and Tuber Crops Research Institute
JICA	:	Japan International Cooperation Agency
LAN	:	Local Area Network
MAF	:	Ministry of Agriculture and Forestry (Lao People's Democratic Republic)
MAFF	:	Ministry of Agriculture, Fisheries and Forestry (Cambodia)
NARC	:	Nepal Agricultural Research Council
NGO	:	Non Governmental Organization
PC	:	Personal Computer
PSICO	:	Planning, Statistic and International Cooperation Division (DAALI)
SAARC	:	South Asian Association for Regional Cooperation
SQL	:	Structured Query Language
UNDP	:	United Nations Development Programme
UNESCAP	:	United Nations Economic and Social Commission for Asia and the Pacific
VASI	:	Viet Nam Agricultural Sciences Institute

Foreword

The livelihoods of millions of farmers in Asia and the Pacific are based on secondary crops, particularly in the marginal areas where economically, ecologically and socially less favourable conditions prevail.

The so-called secondary crops, including maize, soybean, potato, cassava, groundnut and sweet potato are versatile crops that provide a wide range of end uses, not only as food for direct human consumption but also as materials for many industries including non-food industries.

Yet, secondary crops remain the forgotten crops in terms of research and development matters. Resource allocation to research these crops is limited, and policies often focus on more noble products, i.e. rice and tree crops. In a vicious circle, the poor quality of data, the lack of access to data and the scarcity of ready-to-use information for policy-making makes difficult the establishment of good links between policy makers, scientists, extension workers and farmers.

With the development of new information and communication technologies, there is a hope that better and more complete information may flow back and forth between farmers, scientists, development agents and policy makers. This workshop attempts to explore what constraints and opportunities may affect ICT in playing a significant role in poverty alleviation through the development of secondary crops for the benefit of rural poor populations in Asia and the Pacific.

Nobuyoshi Maeno
Director
UNESCAP-CAPSA

Acknowledgements

The Centre wishes to express its sincere appreciation to JIRCAS resource persons and to the Government of Japan for its support in funding this activity. Edi Pranoto proved to be a valuable consultant and was a dedicated resource person throughout the workshop. Evi Fardiah took care of logistical arrangements and administrative support. Harry Zulfikar and Muhamad Arif provided consistent technical support resolving any hardware and software problems, and maintaining the whole system for the duration of the workshop. Also to thank Matthew Burrows for his assistance during the workshop and his editing of this document.

The Centre is also thankful to the participants from Bangladesh, Cambodia, Indonesia, Lao Peoples' Democratic Republic, Nepal, Viet Nam and CIP for their active participation and input.

Robin Bourgeois
IS/DB Programme Leader
UNESCAP-CAPSA

1. Opening Address

*Dr. Robin Bourgeois**

Dear participants, and resource persons
Good morning and welcome to Bogor,

First of all, on behalf of the CGPRT Centre and its director Dr. Nobuyoshi Maeno, who unfortunately had to attend a meeting in Bangkok this week, I would like to express my sincere appreciation for your participation in this training course.

The CGPRT Centre, as one of the subsidiary bodies of UNESCAP, has been implementing various activities to contribute to alleviating poverty through promoting the sustainable development of agriculture, based on CGPRT crops in Asia and the Pacific.

CGPRT crops are a very important component of the farming systems in the region, particularly in the marginal areas where economically, ecologically and socially less favourable conditions prevail, and many farmers' activities and lives rely on CGPRT crops. Therefore, it is crucial to promote the sustainable production of CGPRT crops.

As you well know, CGPRT crops are versatile crops and they can provide an extraordinary range of end uses, not only as food for direct human consumption but also as materials for a diverse range of end-products, including industrial uses.

In this context, the Centre places the priorities of its activities in exploring income generation opportunities through expanding market opportunities of CGPRT crops. However, we have to recognize that so far these crops have often been considered as secondary to rice, wheat or perennial export crops in the economies of Asia and the Pacific.

As far as crops are concerned, the poor quality of data, the lack of access to data and the scarcity of ready-to-use information for policy-making makes difficult the establishment of good links between policy makers, scientists, extension workers and farmers.

Therefore, the CGPRT Centre considers it a vital task to strengthen the quality of data and access to data regarding CGPRT crops as well as to build a stronger capacity for national professionals to handle new Information and Communication Technologies in their own countries. This is the purpose of this 8-day training course. During the course, we hope that you will learn as much as possible in order that you will be able to boost the use of ICTs for CGPRT crops and in agriculture in your own countries. At the same time, I am sure that we will also learn a lot from you, through the sharing of your personal experiences.

This multinational training course intends to provide knowledge and skills to participants from six Asian countries, Bangladesh, Cambodia, Indonesia, Lao Peoples' Democratic Republic, Nepal and Viet Nam. We also have the voluntary participation of a CIP staff member from Indonesia, and I would like to express my cordial welcome and thanks to CIP.

* IS/DB Programme Leader, UNESCAP-CAPSA, Bogor, Indonesia.

In this training course, we will also listen carefully to the presentations of country assessments and discuss their implications for the future development of ICT in support to more efficient policy decisions for CGPRT crop development.

I do believe that these discussions with you all will give us insightful ideas to reinforce our activities in this domain. Therefore, I hope for your active attention and participation to make this training course as successful as we hope and as useful as you hope.

Finally, I would like to express my sincere appreciation to the JIRCAS resource person and to the Government of Japan for its support in funding this activity.

Thank you very much. I declare this training course officially open.

2. Introduction

CAPSA (ex CGPRT Centre), as one of the subsidiary bodies of UNESCAP, has been implementing various activities to contribute to alleviating poverty through promoting the sustainable development of the activities of rural populations relying on coarse grains, pulses, roots and tubers (CGPRT) as an important component of their livelihood in Asia and the Pacific.

These populations live mostly in marginal areas where economically, ecologically and socially less favourable conditions prevail, and many farmers' activities and lives rely on their capacity to make a living from the CGPRT sector. This sector is based on versatile activities that can provide a wide range of income sources not only in the fresh food industry for direct human consumption but also in industrial sectors including food manufacturing and non-food industries.

In this context, the Centre places the priorities of its activities in exploring income generation opportunities through expanding market opportunities for poor rural populations. However, we have to recognize that so far farmers' activities related to the CGPRT sector have often been considered as secondary to more prominent and leading sectors where governments and private companies have invested many resources (the rice industry or the traditional export sectors such as oil palm, coffee, and rubber).

Poor quality or inexistent data, the lack of access to data and the scarcity of ready-to-use information for policy-making makes difficult the establishment of good links between scientists, analysts and extension workers concerned with the fate of poor rural populations on one hand and policy makers and farmers on the other. As a result, policy makers and even scientists and extension workers give very little consideration to the development of rural and marginal areas where poor populations struggle to survive. The Centre considers it a vital task to strengthen the quality of data and access to data on this issue as well as to build stronger capacity for national professionals to handle new Information and Communication Technologies in their own countries.

The 8-day training course organized by the Centre with participants from six Asian countries (Bangladesh, Cambodia, Indonesia, Lao People's Democratic Republic, Nepal and Viet Nam) provided the opportunity to first undertake a preliminary assessment of the current situation of ICT with regard to their possible contribution to enhance the situation of poor rural populations. The sessions covering country assessments were aimed at identifying key constraints and opportunities for the development of ICT supported poverty reduction strategies linking information and decision maker and at establishing relevant strategies to strengthen the contribution of ICT for this purpose (see Workshop Programme in Appendix 1 and Opening Address in Chapter 1, List of Participants and Resource Persons in Appendix 2).

This working paper summarizes the results of a structured collective exercise where participants first presented their country reports and experience. A cross-country comparison was then conducted, item by item in order to identify common and specific problems. A brainstorming approach enabled to discuss possible solutions and strategies to be further tailored for each country. Finally, in a follow up step these strategies were synthesized into a more comprehensive framework intended to provide basic guidelines for other Asian and Pacific countries in the field of ICT to support decision-making for poverty alleviation in rural areas where poor populations rely on the CGPRT sector.

In the third chapter we will briefly discuss ICT in relation with strategic information. Then, Chapter 4 will focus on the participation of stakeholders, gender issues, governance and natural resources, and markets. The fifth Chapter deals with initiatives for the development of ICT concentrating on government, local initiatives and donors. Then, in Chapter 6 the report will develop the policy implications of this preliminary assessment providing a more

comprehensive and strategic view on how ICT could contribute to enhance the capacity of scientists and analysts to link with the policy decision-making process and therefore achieve greater impact. Finally, Chapter 7 presents the results of a double evaluation process. The trainees evaluated the training course and the training staff evaluated to what extend knowledge and know-how were successfully transferred to the trainees.

3. ICT: Access to Strategic Information

3.1 Availability of Internet service for scientists and analysts

In general, the availability of Internet services is rated as good in the capital cities and at the central level but actual access can be a problem and very little infrastructure currently exists in the provinces at the local level. While the cost of accessing the Internet is fair (US$ 15-34 per month per personal computer - PC), the quality of the connection when using phone lines is often substandard and a lot of time is wasted trying to reconnect or download information more than once.

In addition, Centres or Units usually do have access to the Internet, but scientists face several constraints. The limited number of access points imposes long waiting times. Furthermore, when rules-of-access are implemented in order to prohibit abuse of the Internet for personal use they can actually also restrict access for professional purposes (limited time per scientist, waiting list, etc.). Also, hierarchical priority rules often apply and affect the programming of computer access. Holistically, Internet access facilities are largely sub-optimal and do not permit scientists to link easily with external sources of knowledge[1].

The problems of limited individual access points and high connection costs in centres can be improved with the use of Local Area Networks (LANs) and Internet connection sharing. Donor agencies are often willing to contribute to the initial set-up costs, since this is typically a short-term investment that has the potential to yield long-term results, a feature that is usually consistent with donor strategies.

Even in the case of LANs, if all PCs are simultaneously connected to the Internet, the speed of the connection can be limited, especially when users are downloading large files. To partially solve this problem, national and international agricultural research centres, development institutions, etc. should be encouraged to reduce the number of web pages or to compress the size of the web pages on their websites to reduce user browsing time.

Another problem with LANs is that irrespective of the topology used, all of the PCs connected to the LAN are exposed to a high risk of being infected by viruses, and therefore users require astute awareness about system support and management. The switch from individual PC connections to a LAN system is unavoidable if one wants to increase the performance of ICT, but it has important consequences in terms of organizational change. Such systems need to be operated by skilled people on a daily basis, with enough financial resources to ensure proper maintenance and upgrading.

3.2 Provision of strategic information for stakeholders

All participants recognized that ICT could play a crucial role in facilitating access to strategic information. Three questions underpin this role: Who, how and to whom?

Who? One of the objectives of the training course on ICT imparted by the Centre was to empower the participants as the “Whos”. However, it would be both impractical and unrealistic to let the responsibility for ICT development and use be reliant on only one individual. A team approach is needed, that can, in some way, now be initiated by the participants of the course. This approach is needed to ensure that data is not lost and becomes the knowledge stock of the organization.

[1] Information received as per the participants questionnaire for Training Course on the Information and Communication Technologies in Relation to CGPRT Crops’ Agriculture, Appendix 3.

How? Though the focus of this paper is on new ICT, participants felt important to state more traditional media should not be discarded because new ICT development will take time to generalize and meanwhile information still needs to grow and remain accessible. Independent from the media, information and communication is a two-way process and needs to be acknowledged as such. Thus, in order to improve the generation and provision of strategic information, it is necessary to have mechanisms that ensure this two-way flow. It is imperative that the right information is supplied to the right people, in particular, mechanisms that also transfer information from users or beneficiaries to scientists.

To whom? The strategic nature of information depends on the nature of the mandate and the needs of the end user. Strategic information is relevant to the end user and is pre-emptive. Research institutes are expected to generate information that is strategic for the end users. In this case, end users are farmers (i.e. the target rural poor populations), the policy makers, and the scientific community. However, their needs may differ widely and what is strategic for poor populations may not be for policy makers; what the scientific community expects is different again. This leads to the need for making the information strategic a matter of survival for research centres since through their visibility as a provider of strategic information they will be able to secure resources for continuing their activities. This reinforces the need to build teams to reflect upon what information the end user expects and how can it best be delivered; anticipating requests.

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4. The Roles of ICT: Identifying Cross-Country Key Issues

4.1 Farmers access to ICT and gender issues

The participants gave a description of the ICT development level in their countries that, so far, shows highly limited direct individual farmers' access to ICT and, in particular for poor rural populations. However, ICT shows some potential to support increasing women's contribution to poverty alleviation. A blank country assessment form can be found in Appendix 4.

Farmer access to ICT. Several country cases highlight constraints to farmers access to ICT.

Poor links with rural populations

In Bangladesh, researchers are those who collect primary data, there is a clear gap between research centres, the extension services and farmers. One hundred extension officers cover 64,000 villages; a largely insufficient capacity to promote and develop ICT at individual farm level.

In Cambodia, there are provincial and district networks, but a village extension service is nonexistent.

In Nepal, the extension department has six to nine sub-centres in each district with one extension officer, junior technician and a village worker. A researcher for new technologies supports them. There are 75 districts (3,000 villages) to be covered and efficiency within the system is very poor because extension workers are often reluctant to stay in remote villages due to the poor facilities and lack of amenities. This in-turn limits the possibility for individual farmers to access ICT.

In Indonesia, each district has an extension service office, and at least one field extension worker per village. There is a lack of expertise and information when considering new problems and training issues because local conditions have changed but the extension officers haven't really changed/developed in 20 or so years. Farmers regularly ask extension officers about matters which are outside of the extension officer's mandate. Decentralization has brought high variability in extension services. In some districts, these services have almost disappeared while they are strengthened in others.

In Lao People's Democratic Republic, extension services were only established 3 to 4 years ago. The system is functioning but lacks staff and therefore strength.

This shows that not only farmers but also extension workers are still not able to individually use ICT to aliment the two-way flow of information mentioned earlier.

The questions therefore are: *How, through improved information and communication technology, could farmers be incorporated into the marketing system? If information is available for farmers or if farmers have valuable information how can the right information be communicated to the right people? Are extension services beneficial and reliable?*

Better incorporation of farmers into the marketing system is not dependent on ICT development. The history of agricultural development in Europe shows that other media were largely used and efficient in order to help farmers become involved in commercial farming.

Media such as brochures, leaflets, pamphlets, journals, radio broadcasts and meetings can be used to broadcast/disseminate information such as the prices of local commodities on a regular basis. Village or field extension, workers, have a crucial role to play. Due to their close proximity they are able to identify farmers needs and pass this information along a two-way channel.

Establishing information centres in the villages that would be accessible by the farmers is an intermediate solution provided farmer computer literacy and financial problems can be overcome. Alternatives include the training of younger people in these kinds of communication techniques and committing donor support. This can also be developed in synergy with the creation of farmers' associations so that information can flow to all members through an organized structure.

Gender issues in ICT. Women play a vital role in the economy of rural poor populations in all activities from production to marketing. In Bangladesh for example, there are opportunities for women to increase their income through potato and maize production, especially at seasonally festive times when high prices are paid for certain traditional foods.

Many experiences have demonstrated that women are keener to work in groups than men usually are. This is likely to make easier the access to and transfer of information. However, specific information that is highly relevant for women in CGPRT-based poor rural populations is sparse. Improving women's access to this type of information does not pose problems that are significantly different from the general problem of access to communication and information technology for remote populations. What makes it problematic is the availability of relevant information. Here, more than in other cases, feedback from the field is needed to aliment a database on relevant information to improve the livelihoods and welfare of women working on CGPRT crops, so that successful results in one country can be acknowledged, transferred and tried in other countries with similar conditions.

4.2 Improving agricultural governance

Governance is the way in which a decision maker takes decisions that affect other people. Good governance must be transparent in order to defend individual rights. If governance is not transparent it can lead to collusion, corruption, nepotism and general distrust.

Can we improve agricultural governance through ICT or is ICT irrelevant?

General agreement was reached that governance could be improved through ICT by providing decision makers with more and appropriate information regarding the various stakeholders within a system, provided that lack of information is the cause of deficient governance. ICT would expand the knowledge base of the decision makers to hopefully enable better decision-making. Whether the decision makers choose to use the better information more constructively is another matter.

ICT in terms of governance is more relevant to groups of people with a common interest rather than any one individual, especially in developing countries where the individual farmer has negligible influence in the governance of agriculture.

ICT can provide counter information and therefore counter opinion to 'official' information, which is susceptible to bias and manipulation, particularly in countries with rife corruption and little transparency. Counter information can be used to challenge decision-making processes and outputs and therefore improve the governance.

By improving communication technology, communication between diverse stakeholders improves or is made possible, broadening the knowledge base and in-turn leading to better governance.

4.3 Preventing depletion of resources

Resource depletion in relation to CGPRT crop farming is due to the interaction of several actors on different types of resources as indicated in the table below:

Actors	Type of action	Natural resources involved
-Local communities - Individual Farmers	- Deforestation (land clearing) - Mining - Use of chemicals - Cultivation	- Forests - Biodiversity - Water and soil (contamination) - Soil (fertility)

Two cases from Bangladesh highlight some of these concerns. In Bangladesh, farmers often overuse fertilizers. Brochures were produced and disseminated with fertilizer usage recommendations but were ignored by the farmers and consequently soil degradation continues. Alternative solutions are now being sought with an emphasis on organic farming but still the communication media problem has not been solved.

The other concern is the decreasing level of the water table. Limited surface water is available in the highlands due to the over exploitation of deep irrigation systems. GIS can be used to map the underground area depending upon the complexity of the structure of the land under observation. However, GIS will not be able to solve the problem alone that couldn't be solved previously. It can provide different, better, and more dynamic information which may influence the actors to change their habits.

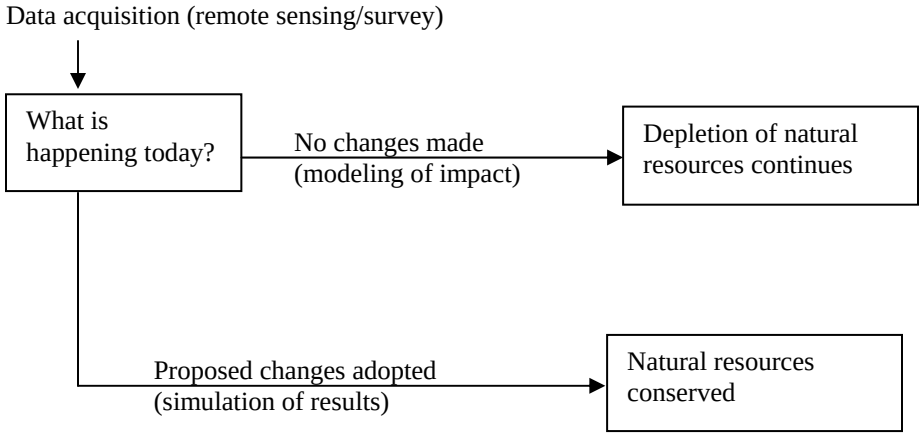
There is a common understanding that new ICT can bring information to the actors regarding natural resource depletion and can promote awareness about the state of natural resources, and practices that deplete or renew natural resources. Through ICT, environmental assessment reports are made much more accessible to the public. This makes the whole process more transparent and dramatically improves the opinion, comments and feedback channels, which were not really available years ago.

How could ICT contribute to improve the use of natural resources?

ICT can demonstrate visually, good farming and living practices using a range of media to all levels of actors. Visual demonstrations of the negative impacts of the misuse of natural resources can convince people more effectively to properly manage natural resources before it becomes too late. Through remote sensing, undisputable data can be used with a variety of modeling tools, simulation tools, bio-economic modeling and GIS to project and visualize what will happen in the future if current trends continue.

However, ICT has not only a function in raising awareness but also it enables to propose alternative solutions. Modeling illustrates what can be done now to save the natural resources of the future.

Figure 4.1 A flow chart to show the usefulness of modeling



ICT use for natural resources requires modeling specialists and access to appropriate data. Both may, unfortunately, not be readily available in developing countries. Therefore, international collaboration and cooperation is required to overcome the technical and financial constraints, which increases the dependence on NGOs and aid organizations.

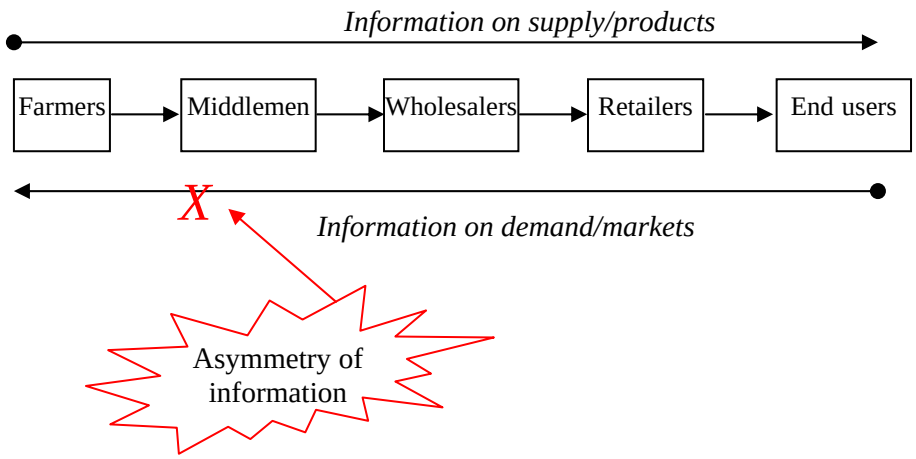
4.4 Improving the marketing system and national competitiveness

When discussing the contribution of ICT to competitiveness and marketing we mainly consider it as a two-way flow of information. It should also be remembered that competitiveness relates more significantly to commercial farming rather than subsistence farming, and that though quantitative data is useful, qualitative data such as consumer preferences and trends is also necessary.

What information should be included in ICT to improve marketing and competitiveness?

One of the major weaknesses in a trading system is a lack of or asymmetric information. This results in non-optimal decisions for production, trade and consumption. Since access to information increases the relevance of a decision it is strategic and a source of power. With regards to competitiveness, information usually concerns other countries' production, transformation and marketing costs, technology used and technological developments, subsidies and price policies.

Figure 4.2 A diagram to illustrate the two-way flow of information between farmers and end-users



In parallel, information regarding the situation within one's own country based on available local data gives a valuable insight into the conditions under which a commodity is produced and also enables to assess competitiveness within a region, country, province, district, etc.

An example of ICT for commercial farming

Five million farmers in 72 provinces of Thailand are using radio transmitters (US$ 200 each) to receive relevant farming information. However, no assessment has been carried out since the implementation of the system in 1998 to establish whether this new technology has been and still is a success (has it actually improved the lives of the farmers and how has it changed their lives?). Practical evidence is needed and would be very beneficial from a policy maker's point of view.

New ICT has a comparative advantage compared to more traditional means. It can provide better information faster, which is key to changing institutional thinking. However, this advantage can turn rapidly into a constraint since in many cases the information is already there/available but the problem is how to extract the relevant information from the thousands of sources on the Internet.

Ways to screen the sources to reduce the number of irrelevant responses are to use:

- More keywords in the search.
- Data mining, which utilizes certain keywords to extract specific information.
- Speech marks/quotation marks ("") and '+' signs to refine the search and reduce the number of returned sources.
- Links from reliable, proven sites to other sites.
- Make a list of 'favourite sites' and regularly check for updates (prices, production figures, etc). Software is freely available to download that will do this automatically though it is limited because it only checks the individual page, not the entire website attributable to that page.

Need for competitiveness in Bangladesh

Bangladesh does not export large quantities of CGPRT crops but competitiveness is still an issue because even without exports Bangladesh is still susceptible to competition from imports.

There is quite a large local demand for maize but farmers lack marketing knowledge: What to produce? How much to produce? What is the local demand?
Bangladesh must produce maize that is competitive with the imported maize. Local maize would be fresher but the quality may be inferior and if it comes from very remote areas lacking infrastructure it could be easier for the consumer to purchase the imported maize. All this needs to be explored and the results made available for local and national decisions.

5. Initiatives for ICT Development: Cross-Country Comparisons

5.1 The role of the government

This section consists of two parts: the presentation of individual country cases in the box below and a synthetic summary of the discussions.

Experiences of the government's role in supporting ICT

Bangladesh*:*
The government is finally giving more attention to ICT and has recently established new institutions to oversee IT matters and reduced computer taxes are making computers more affordable than ever before. A sub-marine cable network system is being laid and established.
Bangladesh has joined SAARC whose objectives are to promote and transfer ICT among member countries. SAARC includes the agricultural sector because of rice being a security crop and the stable food for the resource poor farmers. The government has invested in GIS technology and manpower is trained with a focus on GIS technology to try to improve the weak data currently available. Software development is ongoing with the methodology for analysis. There are no private sector initiates as yet.

Cambodia*:*
ICT in agriculture is still limited to within government institutions. The government would like to establish a provincial computer network to complement the existing central one but only has World Bank support until 2004. So far the capacity of the central network has increased. Computers are still not really used for any day-to-day tasks so the government needs to promote computer usage but at the same time provide training so that the computers are used properly and efficiently. Only one department (Dept. of Statistics and Planning) is currently using PCs and the Internet. In terms of government support and investment; in theory ICT is a priority but in practice, this is not so clear.

Lao People's Democratic Republic*:*
The government now understands and realizes the importance of ICT, however, the implementation is constrained by the lack of financial resources. The Centre for Agricultural Information and Statistics (CAIS) has just been built but still remains devoid of furniture or equipment. There is no planned budget for agricultural ICT for the next fiscal year. There is currently no unit or department specifically to compile data but plans exist to establish a unit for such purposes in CAIS when it becomes operational. The computer network is planned to be extended from the central network, to the main provinces first and then to the districts. Existing agricultural units and departments are expected to submit raw data to CAIS to be compiled and analyzed when the centre opens. CAIS needs donors to assist with the set up costs of purchasing the required equipment. The government would like to expand the capacity of the data staff of CAIS and improve Internet access. The government is planning to standardize the format for data collection.

Experiences of the government's role in supporting ICT (continued)

***Indonesia**:*
ICT is very important at an institutional level but no budget is designated to ICT activities or training in the agricultural sector. Most of the annual budget is allocated to the National Bureau of Statistics. It is very difficult for an "outsider" to obtain good information from the National Bureau of Statistics. It is very bureaucratic and there is too much red tape. Most institutions already have internet connections. No special funds are given for data collection or analysis except to the National Bureau of Statistics. The government has introduced a policy of decentralization or autonomy and each province must now have its own website which has to include, among other things, agricultural information. There is already a good general availability to networks in Indonesia and the networks are quite developed. The government's priorities currently include: database software development (SQL); training of data entry staff and database management staff.

***Nepal**:*
The government has focused its ICT activities at the central level but has not allocated budget to ICT programmes for CGPRT crops. Daily television and radio programmes are broadcast that occasionally transmit information on CGPRT crops. Generally speaking, ICT and the Internet are not adequate in Nepal and mostly centralized in urban areas. There are a limited number of ISPs and access is very poor due to a lack of fibre optic cables. Shortly, access of fibre optics will be available. The government is planning to establish Internet access in the district headquarters. Most of the research stations have Internet access though it is slow. It has recently been realized that the training of trainers on the importance of ICT so that they can go into the field and train people from all levels is important and deserves attention.

***Viet Nam**:*
Viet Nam relies on many donor organizations. The government is pushing for more and better data collection but in remote areas activities are still very limited.

Participating countries are facing severe constraints as far as the use of ICT for CGPRT sector development is concerned. Common problems range from the lack of equipment and trained staff to the concentration of existing resources at the central level. Some countries have already undertaken improvements but rely on donor contributions and/or are still at an early stage of development.

While traditional methods of data collection and processing still prevail in most countries, most of them are developing and improving their ICT at different speeds and on different scales. The main situation that can be seen in the region can be categorized into a three-level scale starting from cases where there is limited data and very limited access to the data, followed by cases where data is abundant but access very limited; and cases with abundant data, good access to the data but a lack of trained staff to process the data (see table below).

Table 5.1 The ICT attainment level of the participant's countries

Level	Data	Access	Staff capacity	Country
1	Scarce	Limited	Limited	Lao Peoples' Democratic Republic, Cambodia, Nepal
2	Abundant	Limited	Limited	Viet Nam, Bangladesh
3	Abundant	Good	Limited	Indonesia

5.2 Policy makers' expectations

If policy makers were concerned with ICT policy for CGPRT crops, what would they expect to know? What is the capacity to assist policy makers using ICT to make policy decisions? How can the raw data become strategic information?

After discussions, participants agreed on the following points:

- Policy makers request data in a processed form, such as indicators (primary data available in hard copy format does not always satisfy the needs) but statistical information is often lacking.
- Channels are already established to assist policy makers with the flow of information but it depends on how high a level the request has come from as to how urgently it is dealt with and processed.
- Scientists should not just wait for information requests and then, when they arrive, compile together in urgency as much primary data as possible even if the data is not entirely relevant. Departments responsible for data collection and processing should work together with analysts and try to anticipate and pre-empt questions and requests demanded from the important stakeholders, i.e. policy makers, and have strategic information already prepared to satisfy the demand. Effective and efficient data and statistical units work as providers of a service not just as data gatherers.
- If the request is outside of the institutes mandate it is better to be honest and say so than to agree to the request and be unable to fully satisfy it.

5.3 Involvement of the donor community

***Bangladesh**:*
Video and radio are commonly used and the government always welcomes technological development if it is justifiable and economical but there are currently no specific donors supporting ICT for strengthening the activities of rural populations dependant on the CGPRT sector.

***Cambodia**:*
Donor countries and organizations support all agricultural activities on a project-based approach. There are many donors (more than 100 for agriculture alone) with a small contingent investigating/improving ICT and data collection, processing and dissemination. The World Bank is the biggest donor currently. It is the donors themselves that decide what should be promoted and what projects should go ahead in the country not the government. There is still more potential for donors to support ICT activities.

***Lao People's Democratic Republic**:*
There is some donor support for CGPRT crops but for technical aspects of production not ICT. After the completion of this training workshop an ICT project should now be able to be proposed to the donor community.

***Indonesia**:*
A similar situation exists as for Lao Peoples' Democratic Republic; there is donor support for the forgotten 'secondary' crops, as CGPRT crops are often referred, but it is focused towards productivity aspects. Donor countries have not yet incorporated ICT for CGPRT crop research.

Nepal:
The donor community has a little involvement related to CGPRT crops, particularly hill maize. It still focuses on more traditional means such as television and radio broadcasts. Some donor countries are willing to donate to ICT but there is a lack of technical manpower in the Ministry of Agriculture to propose the kind of ICT assistance that is required.

Donor support is by far the main source of development support for ICT in agricultural research and development. However, it is very often a centralized process where donors' agendas dominate. As such, ICT development is often a centralized top-down process and rural poor populations are the last to have a chance to benefit from it.

Strong advocacy is needed to promote decentralized, pro-poor, donor supported projects so that marginal populations living in remote areas can have access to information about decision makers, markets and technologies. Experience from village information centres shows that it is possible to bridge the gap between the poor rural populations and policy makers at a still affordable cost. It requires an integrated approach combining the procurement of equipment, data generation and capacity building.

6. Policy Implications for Poverty Alleviation in Poor Rural Areas

As a result of the country assessments, participants elaborated preliminary plans for strengthening the use of ICT with the objective of contributing to poverty alleviation through the promotion of pro-poor policies using CGPRT crops as a means to improve the livelihoods of poor rural populations. This section presents the individual country proposals and the next session synthesizes these proposals as orientations for other countries.

6.1 Country proposals for strengthening ICT

Bangladesh. AED, BARI

Under the broad objective of poverty alleviation, the specific objective is to improve the capacity of scientists to use more reliable data and produce more relevant research outputs for policy makers. In order to achieve this, the database is needed to be strengthened at the microlevel with inputs from field surveys. The proposal relies on investment for equipment including PCs, SQL software and network system facilities, salaries and training of human resources. It is a long-term proposal with a yearly cost of 50,000 dollars for the first two years and then running costs of 25,000 dollars.

Cambodia. DAALI-PSICO, MAFF

The plan includes the development of a network, the creation of a Website for the DAALI with homepages at the central level, and the use of transceivers to link the farm level with the central level in order to strengthen communications and the exchange of information with other departments and with provincial offices. The plan is based on the acquisition of computers and two staggered training activities starting with basic training on PCs followed by advanced computer skills training. Resources for funding this activity may be obtained from donors such as the World Bank, ADB, JICA, France, Danida etc.

Lao People's Democratic Republic. DoA Planning Division, MAF

Facing similar problems as Cambodia, the objective is to make strategic information available to policy makers. Therefore, the plan includes: provision of equipment, upgrading of the existing system, develop networks to the newly installed Centre for Agricultural Information and Statistics, install SQL servers and train staff in DBM/GIS/Statistics/Economic and Policy Analysis. The timeframe is two years to get the proposal approved and implementation would occur in 2006-2010. Funding might be available through government (10-20 per cent) and JICA support (80-90 per cent). The expected outputs are improvements in staff capacity and skills, effective network of communication with other national and international centres, a high quality database with updated data on crops such as maize and cassava to start with. CAPSA is expected to play a supporting role in this area.

Nepal. CPDD, NARC

Nepal is a hilly country where CGPRT crops are very important. Under the objective of improving the livelihoods of rural farmers it is important to conduct quality research. The plan is to establish a CGPRT database at the central level by collecting first hand data from each district that is lacking at present in Nepal. During the second phase, provide online information

to the researchers as well as planners for the strategic planning of CGPRT crops, with a specific focus on yam and cassava. Through training and manpower improvement it is expected to provide better services to farmers in contact with scientists. Such a plan would be a three-year activity with an estimated cost of 100,000 dollars. The Swiss Development Agency is currently the major donor particularly to promote hill maize but DFID could also be contacted. Technical support is expected from CAPSA.

Viet Nam. Agronomy Department, VASI

The objectives of the plan for strengthening ICT are to improve data for policy makers, implement a database management system and improve the network information system. It relies on the provision of equipment and training courses on GIS/data analysis and statistics.

Indonesia. ILETRI

Starting from the statement that database management is still very poor, the plan relies on a strategy to work first at the organization level with two objectives: improve human resources through training and with the expertise of CAPSA and become a potential source of "fresh data" from private companies. The plan includes the need for two staff to run the database and could be extended to AARD if it succeeds in making data and research results widely available.

6.2 Strategy for strengthening ICT for poverty alleviation

The discussion of the country assessments shows that there is an important potential for ICT to improve the capacity of research organizations to better serve policy makers and farmers. However, given the limited current resources both financial and technical, it is unlikely that ICT might produce instant and drastic changes, unless sudden interest and investment from governments and/or donors happens.

There is a need to build stronger human capacity and to upgrade resources through a stepwise approach, starting with adequate resources to properly upgrade system performance and related human skills. As a consequence, some steps are identified in the process of developing ICT in the participating countries. These are:

- Share knowledge with colleagues and the hierarchy.
- Assess the current weaknesses in ICT for poverty alleviation supported by CGPRT crops.
- Improve first what can be improved with no cost.
- Design comprehensive improvement proposals covering all inter-related key issues.

Regarding the last point, proposals have to state clear objectives with a long-term perspective and the related outputs, focusing on strategic information and how it can contribute to poverty alleviation. Then, clear links must be established between equipment requirements, human capacity building and outputs. Buying computers, software and implementing formal training do not guarantee success in poverty alleviation through CGPRT crop development unless these are related with clear results that can be measured with quantifiable indicators.

To raise awareness among policy makers on the interest of supporting ICT it is suggested that the participants elaborate sound proposals, that is, with limited scale but well-defined outputs and clearly measurable results, presented as pilot activities, preliminary to bigger projects. These proposals must clearly state how far they contribute to the generation of strategic information for the end-user, be they policy makers and/or farmers.

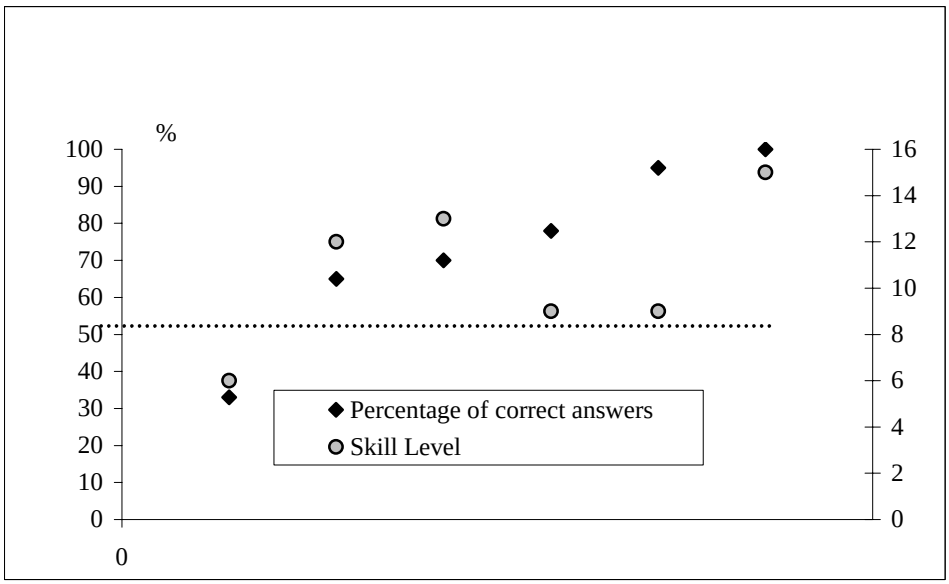
7. Evaluations

The Training Course programme included two evaluation sessions. One session was dedicated to the evaluation of the participants by the training staff and the second consisted of a survey form to be completed by the trainees in order to evaluate the quality, strengths and weaknesses of the training course (see Appendix 5 for a blank survey form).

7.1 Evaluation of participants

After the training, the participants were given a test with 10 questions (see Appendix 5) on Database Management and MS SQL. The graph below displays the results. A more detailed Analysis of Participants Answers can be found in Appendix 6.

Figure 7.1 Evaluation of participants in relation to their skill level



These results show a rather satisfying rate of knowledge and know-how transfer and acquisition, with all but one trainee attaining at least 60 per cent of correct answers to the test. The only case below average corresponds to a trainee with severe limitations in English, limited basic computer skills and lack of professional experience. It draws attention to the importance of carefully selecting and accepting participants, in particular when candidates are proposed by the participating countries to substitute with candidates unable to attend the event at the last moment. This is further justified by the evident link between the participants' skill level and their test results.

7.2 Training course evaluation

Participants received a questionnaire with 18 questions to evaluate the training course and the trainers (see Appendix 5). Overall, the participants were fully satisfied with the training. A summary of the results is shown below.

As indicated below, participants rated the effectiveness of the training course and trainers as very satisfying on a scale of 1 to 10.

Table 7.1 A measure of training and trainer effectiveness

Categories	Average
Training Effectiveness	8.5
Trainer Effectiveness	8.2

The part of the training programme that most interested the participants was Database Management followed by the Country Assessment as indicated in the table below (scale 1 to 5).

Table 7.2 Ranking of the training topics in terms of interest level of the participants

Topic	Ranking
Database Management	4.7
Country Assessment	3.1
GIS	2.4
Data Mining / Analysis	2.1
MS SQL 2000	2.1

This assessment must be related to the participants' perception that the course was somehow quite theoretical. The more practical sessions were given a higher rating.

Free comments from the participants:

1. "The training course arrangement is very good and very useful for trainees to improve their capacity in terms of database management, SQL Server, GIS, Network Connection, and country assessment discussion as well. However, the time given to conduct the training course was very short, leaving trainees not enough time to appropriate computer practices."

2. "Though at first I was not interested in the country assessments, in the end I found this topic to be very useful. It really opened my perspective about the importance of ICT. So, go ahead with similar courses in the future. Of course, the other programmes were interesting and supported my suggestions."

3. "This course was very short and intensive with the theoretical part being quite long and fast. However, the practical part was quite short, not enough for our level (we are still at the beginning level of IT Science). A suitable timeframe for this training (Topics) is at least 2 weeks excluding the country assessment part."

4. "The time given to complete course is too short so there isn't enough time to practice."

5. "This course has helped me understand something about how to manage database systems, how to work in the network of windows 2000 and SQL etc."

6. "I think the course should be more practically oriented. Conception should be cleared before practicing. Visiting some Internet sites or ICT centre could have added new and interesting events to our learning process."

7. "It is useful but needs to be extended so that participants have more time to practice exercises which will be helpful for gaining confidence."

Most of the participants felt that the training duration was very short. Actually, the original plan for the training duration was two weeks, but it was shortened to eight days due to budget and human resource constraints. Eight days is not enough to deliver basic practical knowledge of Database Management, Data Analysis, GIS and to perform a country assessment. Nevertheless, this training course was a first experience, which satisfied the participants and taught good lessons for further development of similar activities.

As such, some observations for further sessions of this kind of ICT Training Course are as follows:

- Be more rigorous in applying trainee selection criteria and insist on receiving at least three candidates per participating country so that selection by the Centre will prevail.
- Improve inter-organizational coordination among training staff to ensure smooth transition between topics and use similar examples or case studies for the various sessions of the training.
- As ICT training courses rely heavily on computer hardware and software, the installation of the material and equipment must start well before the starting date to ensure early recognition and solutions of potential problems.
- Estimate the appropriate duration of the training so that the training tempo is not too fast or too slow.
- Systematically use post-training tests for every topic to assess the trainees' knowledge after the training and the training course.
- Include e-commerce in the next ICT Training Course.

Appendix 1. Workshop Programme

Training Course on the Information and Communication Technologies in Relation to CGPRT Crops' Agriculture (AGRI-ICT)

UNESCAP CGPRT Centre
Bogor, Indonesia
8 – 16 October 2003

A. Database Management

Wednesday, October 8, 2003

08:30 – 09:00	Registration
09:00 – 09:30	Opening (Dr. Nobuyoshi Maeno, Director)
09:30 – 10:00	Orientation (Dr. Robin Bourgeois, IS/DB Programme Leader)
	Tea/Coffee
10:00 – 12:00	Relational Database Management System Overview (Mr. Edy Pranoto)
	Lunch
13:00 – 14:30	Microsoft SQL Server System Infrastructure (Mr. Edy Pranoto)
14:30 – 15:45	Creating Database and Table (Mr. Edy Pranoto)
	Tea/Coffee
16:00 – 17:30	Managing Table, Retrieving Data, Data Transformation and Creating and Managing Stored Data (Mr. Edy Pranoto)

Thursday, October 9, 2003

09:00 – 10:30	Using Query Analyzer and On-line Analytical Processing for CGPRT Crops (Mr. Osamu Koyama)
	Tea/Coffee
10:45 – 12:00	Data Mining, Analysis and Modeling (Mr. Osamu Koyama)
	Lunch
13:00 – 15:30	Continued
	Tea/Coffee
15:45 – 17:30	Continued

B. Geographic Information System

Friday, October 10, 2003

09:00 – 10:30	Introduction to GIS (Mr. Satoshi Uchida)
	Tea/Coffee
10:45 – 12:00	Manipulation of spatial data (Mr. Satoshi Uchida)
13:00 – 14:30	Pre-processing of remotely sensed data (Mr. Satoshi Uchida)
	Tea/Coffee
14:45 – 16:30	Multi-band operations and classification (Mr. Satoshi Uchida)

Saturday, October 11, 2003

09:00 – 10:30	Thematic data operations (Mr. Satoshi Uchida)
	Tea/Coffee
10:45 – 12:00	Analysis of spatial relationship (Mr. Satoshi Uchida)
	Lunch
13:00 – 14:30	[Continued]
	Tea/Coffee
14:45 – 16:30	Presentation of results (Mr. Satoshi Uchida)

C. Network System Support

Monday, October 13, 2003

08:30 – 10:00	Data, Information and System (Mr. Edy Pranoto)
	Tea/Coffee
10:15 – 11:15	Windows 2000 Network Environment (Mr. Edy Pranoto)
11:15 – 12:00	Creating an Integrated Network Services Infrastructure design (Mr. Edy Pranoto)
	Lunch
13:00 – 14:00	[Continued]
14:00- 15:30	Accessing Microsoft SQL Server over Internet and Microsoft SQL Server Replication + Backup and restore (Mr. Edy Pranoto)
	Tea/Coffee
15:45 – 17:30	Internet Connection and Network Security (Mr. Edy Pranoto)

D. Country Assessment

Tuesday, October 14, 2003

08:30 – 13:15	Presentation of Country Assessments (Participants)
08:30-09:00	Bangladesh
09:00-09:30	Cambodia
09:30-10:00	Indonesia
	Tea/Coffee
10:15-10:45	Lao People's Democratic Republic
10:45-11:15	Nepal
11:15-11:45	Viet Nam
	Lunch
13:15 – 15:15	Discussion Section One and Two: Key findings, constraints/ opportunities, Action and Policy Implications (All participants and resource persons)
	Tea/Coffee
15:30 – 17:30	[Continued]

Wednesday, October 15, 2003

09:00 – 10:30	Discussion Section Three: Initiatives (All participants and resource persons)
	Tea/Coffee
10:45 – 12:00	[Continued]
	Lunch
13:00 – 15:00	Discussion Section Four and Five: External Support (All participants and resource persons)
	Tea/Coffee
15:15 – 16:30	[Continued]

Thursday, October 16, 2003

09:00 – 10:30	Brainstorming and Benchmarking: using country assessments results to improve policy making processes, and update strategies and plans for expanding and improving ICT for the development of CGPRT crops (All participants and resource persons)
	Tea/Coffee
10:45 – 12:00	[Continued]
	Lunch
13:00 – 14:30	[Continued]
14:35 – 15:15	Course evaluation (Mr. Edy Pranoto)
	Tea/Coffee
15:30 – 16:00	Closing and Certificate distribution (Dr. Nobuyoshi Maeno, Dr. Robin Bourgeois)

Appendix 2. List of Participants and Resources Persons

Training Course on the Information and Communication Technologies in Relation to CGPRT Crops' Agriculture (AGRI-ICT)

UNESCAP CGPRT Centre
Bogor, Indonesia
8 - 16 October 2003

Participants

1. Mr. Quazy Mesbahul Alam	Principal Scientific Officer Bangladesh Agricultural Research Institute (BARI), Bangladesh
2. Mr. Op Pich	Technical Officer Planning, Statistic and International Cooperation Office (PSICO), Cambodia
3. Dr. Agustina Asri Rahmianna	Researcher Indonesian Legume and Tuber Crops Research Institute (ILETRI), Indonesia
4. Ms. Rini Asmunati	Research Assistant International Potato Centre (CIP), Indonesia
5. Mr. Khamtanh Thadavong	Senior Officer Department of Agriculture, Lao Peoples' Democratic Republic
6. Mr. Manoj Kumar Thakur	Technical Officer Communication, Publication and Documentation Division (CPDD), Nepal
7. Ms. Nguyen Thi Nhung	Officer Root Crop Research Centre, Viet Nam Agricultural Sciences institute (VASI), Viet Nam

Appendix 2

Resource Persons

1. Dr Robin Bourgeois	IS/DB Programme Leader UNESCAP CGPRT Centre
2. Mr. Edi Pranoto	IT Consultant UNESCAP CGPRT Centre
3. Dr. Osamu Koyama	Director Development Research Division, Japan International Research Centre for Agricultural Sciences (JIRCAS), Japan
4. Dr. Satoshi Uchida	GIS and Remote Sensing Senior Researcher Development Research Division, Japan International Research Centre for Agricultural Sciences (JIRCAS), Japan

Appendix 3. Participant Questionnaire for Training Course on the Information and Communication Technologies in Relation to CGPRT Crops' Agriculture (AGRI-ICT)

Prepared by

ESCAP Regional Co-ordination Centre for Research and Development of Coarse Grains, Pulses, Roots and Tubers (UNESCAP-CGPRT Centre)
www.cgprt.org.sg

Deadline

Please be sure to submit your answer before August 28, 2003.

Purpose of the Participant questionnaire

The UNESCAP-CGPRT Centre has prepared this participant questionnaire to gather information to be used to adjust the training.

Completing the participant questionnaire and submission

This participant questionnaire is MS Word form. Click on the box to cross or to clear, type the answer in the line marked by words in italic. Please send the completed form as an attachment to: AGRI_ICT@cbn.net.id

Appendix 3

1. In order for us to better identify your profile and adjust the training, please rate your skills according to the following table (check where applicable)

Skills	Rate*
Email	_____
MS Office	_____
Spreadsheet	_____
Internet	_____
GIS/Map Info	_____
Database Analyst	_____
System Analyst	_____
Programmer Analyst	_____
Web Developer	_____
Network Engineer	_____
Computer Trainer	_____
Other: *Double click then type here*	_____

* Beginner, Intermediate, Advance.

2. How many computers do you have in your institution? Click then select the approximate number of computers and check the most used one.

Skills	Rough Number*	Most used
Intel DX II – 66 MHz	_____	☐
Intel DX IV – 100 MHz	_____	☐
Intel Pentium I – 75 MHz	_____	☐
Intel Pentium II	_____	☐
Intel Pentium III	_____	☐
Intel Pentium IV	_____	☐
IBM Machine	_____	☐
Sun Microsystems Machine	_____	☐
HP Machine	_____	☐
Apple Macintosh Machine	_____	☐
RIS Computer	_____	☐
Other: *Double click then type here*	_____	☐

* 1-5, 6-10, 11-20, >20.

3. What is the operating system in your institution? Check the types of operating systems you have in your institution and check the most used one.

Operating System	Most used
☐ Windows 3.1	☐
☐ Windows 95	☐
☐ Windows 98	☐
☐ Windows ME	☐
☐ Windows NT	☐
☐ Windows 2000	☐
☐ Windows XP	☐
☐ Linux *Double click then type linux version here*	☐
☐ Unix *Double click then type unix version here*	☐
☐ OS/2 *Double click then type OS/2 version here*	☐
☐ Macintosh *Double click then type Macintosh version here*	☐
Other: *Double click then type here*	☐

4. What kind of spreadsheet software do you use in your institution?

Spreadsheet	Most used
☐ Lotus	☐
☐ Q Pro	☐
☐ SPSS	☐
☐ Excel	☐
☐ Star Office for Linux	☐
Other: *Double click then type here*	☐

5. How long have you used computers in your career?

_____ years _____ months

6. To how many people do you think you can transfer knowledge after this training?

_____ of people

7. Have you conducted any training during the last four years?

☐ Yes ☐ No

If yes please fill in the following table,

Topics of the Training	Number of Trainees*	Language	Date
Double click then type here	_____		
Double click then type here	_____		
Double click then type here	_____		
Double click then type here	_____		

* 1-5, 6-10, 11-20, >20.

8. What type of database do you use in your institution?

Type of Database	Version	Most used
☐ Microsoft Access	*Double click then type here*	☐
☐ SQL	*Double click then type here*	☐
☐ Oracle	*Double click then type here*	☐
☐ dBase	*Double click then type here*	☐
☐ DB2	*Double click then type here*	
☐ Informix	*Double click then type here*	☐
☐ Sybase	*Double click then type here*	☐
☐ Paradox	*Double click then type here*	☐
Other: *Double click then type here*	*Double click then type here*	☐

9. What kind of information is stored in the database?
   Double click then type here

10. Do you use a Local Area Network in your institution?

☐ Yes ☐ No

If yes, please fill in the following table,

LAN Platform	Version
☐ Novel	*Double click then type here*
☐ Microsoft Network	*Double click then type here*
☐ Linux	*Double click then type here*
☐ Unix	*Double click then type here*
Other: *Double click then type here*	*Double click then type here*

11. If any, what type of information does your institution provide to policy makers?
    Double click then type here

12. How does your institution provide this information?
    - ☐ Direct Discussion
    - ☐ Sending Research Reports
    - ☐ Workshops
    - ☐ Website
    - ☐ Through Newsletter or Equivalent
    - ☐ Email
    - ☐ CD Rom

    Other: *Double click then type here*

13. Do you have any plans to upgrade or develop the computer system in your institution?

    ☐ Yes ☐ No

    If yes, please fill in the following table,

Type of Upgrade or Development	Objectives	Target Date
Hardware	*Double click then type here*	
LAN	*Double click then type here*	
Database	*Double click then type here*	
Operating System	*Double click then type here*	
Other: *Double click then type here*	*Double click then type here*	

14. What are your objectives and expected value in attending the CGPRT ICT Training?
    Double click then type here

15. Please describe your plans after participating in the CGPRT ICT Training?
    Double click then type here

Appendix 4. Country Assessment for Training Course on the Information and Communication Technologies in Relation to CGPRT Crops' Agriculture (AGRI-ICT)

Prepared by

ESCAP Regional Co-ordination Centre for Research and Development of Coarse Grains, Pulses, Roots and Tubers (UNESCAP-CGPRT Centre)
www.cgprt.org.sg

Deadline

Please be sure to submit your answer before August 28, 2003.

Purpose and methodology of the country assessment

This country assessment (CA) is an assessment of the situation of ICTs (Information and Communication Technology) in Agricultural development of the country that is undertaken by the CGPRT Centre in collaboration with the government and other development partners. This CA identifies key development issues and challenges of ICTs in agriculture facing the country that the CGPRT Centre, along with other agencies, stakeholders and the government need to address in their policies and programmes of assistance.

CGPRT Centre will collect all CA submissions, compile and make available the information to participants of the Training Course on the Information and Communication Technologies in Relation to CGPRT Crops' Agriculture (AGRI-ICT). It is our hope that this information will be used as reference material for discussion during and beyond the training.

The CA report is one outcome of the CA, which is considered important in itself. The CA process is to be "..participatory, dynamic and continuous; it ensures learning from prior experience, know-how, new ideas, advocates new approaches, reaches or revised consensus, and updates the CA document accordingly".

Appendix 4

Completing the country assessment and submission

This country assessment is in MS Word form. Click on the box to cross or to clear, type the answer in the line marked by red words. Please send the completed form as an attachment to: AGRI_ICT@cbn.net.id

Section I. Internet Access to CGPRT Crops' Agricultural Sector

"**Section I. Internet Access to CGPRT Crops' Agricultural Sector**" is designed to quickly assess the Internet access to the top five CGPRT crops' Agricultural Research Institutes including the contribution of ISPs in the agricultural sector.

1. Please list the top five CGPRT crops' agricultural research institute in your country. To match to the column title, please click on the box to cross or clear

Institution Name	Sector	Online	ICT Statistics
double click then type the institution name here	_____	☐	☐
double click then type the institution name here	_____	☐	☐
double click then type the institution name here	_____	☐	☐
double click then type the institution name here	_____	☐	☐
double click then type the institution name here	_____	☐	☐

2. How do the ISPs (Internet Service Provider) provide access and services to ICT (Information and Communication Technology) in the agricultural sector in your country?
   Please double click then type your answer here

Section II. Identifying the Key Issues

"**Section II. Identifying the Key Issues**" is designed for identifying the key issues that need to be addressed in relation to the use of ICTs for agricultural development.

3. How can ICTs be used to help provide strategic information for farmers, government authorities, and other key players?
   Please double click then type your answer here

4. How can ICTs be used to facilitate the participation of farmers in providing commercially relevant and reliable information to consumer groups and marketing bodies?
   Please double click then type your answer here

5. What role can ICTs play in improving agricultural governance?
   Please double click then type your answer here

6. How can ICTs be used to help in the effort to stop the depletion of natural resources?
   Please double click then type your answer here

7. What role can ICTs play in the improvement of the domestic and international marketing system of CGPRT crops' agricultural products?
   Please double click then type your answer here

8. How can ICTs be used to support efforts to improve your country's competitive position in international CGPRT crops' agricultural markets?
   Please double click then type your answer here

9. How can ICTs increase opportunities for women in the CGPRT crops' agricultural sector?
   Please double click then type your answer here

Section III. The government and Local Initiatives

"**Section III. the Government and Local Initiatives**" is designed to quickly assess the Government's efforts in ICTs in agriculture for development.

10. Please list the Government's primary developmental and sectoral policies.
    Please double click then type your answer here

11. Has the Government (or any third party or donor) conducted an ICT in Agriculture Assessment of the country?

    ☐ Yes ☐ No

    If Yes, please provide details (title, conducted by, year, and URL)
    Please double click then type your answer here

    If No, please indicate if you think an assessment is required:
    Please double click then type your answer here

12. Has the Government developed, or is the Government planning to develop, ICT in Agriculture policies?

    ☐ Yes ☐ No

    If Yes, please provide a description of the Government's plan of action:
    Please double click then type your answer here

    If No, please suggest how the CGPRT Centre may assist in formulating ICT in Agriculture policies, and proceed to the next set of questions:
    Please double click then type your answer here

13.1 Ministry/Agency in charge of ICT in Agriculture policy formulation:
Please double click then type your answer here

13.2 Was the process of ICT in Agriculture policy formulation participatory in nature, and did it involve stakeholders?

☐ Yes ☐ No

If Yes, please list the sectors/players that were involved:
Please double click then type your answer here

13.3 Does the Government have an official policy on Open Source Software?

☐ Yes ☐ No

If Yes, please briefly describe the Government's policy on Open Source Software (e.g. is Open Source a policy for Government procurement of software; is there a policy on Open Source technologies to foster industry?):
Please double click then type your answer here

List the principle governmental and non-governmental players in Open Source Software in the country:
Please double click then type your answer here

14. During the last 24 months, please list and elaborate the development of ICTs in agriculture initiated by the government.
Please double click then type your answer here

Section IV. CGPRT Centre Access and Initiatives

"**CGPRT Centre Access and Initiatives**" is designed to quickly assess the CGPRT Centre's initiatives in ICT in Agriculture to the member countries and the expectation of the member countries.

15. Please elaborate the expectations of the policy makers in order to improve and strengthen the quality of data and information to be used to prescribe policy recommendations for CGPRT crops' agricultural development in your country.
Please double click then type your answer here

16. The CGPRT Centre has played or is playing a crucial role in assisting the national government with ICT in Agriculture policy formulation.

☐ Yes ☐ No

If Yes, how?
Please double click then type your answer here

Section V. Donor Community

"**Section V. Donor Community**" is designed to quickly assess the donor community's contribution (bilateral, multilateral, formulations, etc.) to ICT in Agriculture for Development. Here we are requesting information on who the top donors are, and what are their primary interest and/or focus.

17. International Donors of ICT in Agriculture for Development.
    Please list (in order of total contributions for 2002) the top five donors who have invested in ICT in Agriculture for Development. DO NOT include UNESCAP

	Donor	Specific Area of Support	Amount (USD)
1.	*double click then type*	*double click then type*	US$ 0,00
2.	*double click then type*	*double click then type*	US$ 0,00
3.	*double click then type*	*double click then type*	US$ 0,00
4.	*double click then type*	*double click then type*	US$ 0,00
5.	*double click then type*	*double click then type*	US$ 0,00

18. Please list (in order of priority) the five top areas of ICT in Agriculture for Development for the donor community.

1.	*double click then type the area of support start from the highest priority*
2.	*double click then type the area of support start from the highest priority*
3.	*double click then type the area of support start from the highest priority*
4.	*double click then type the area of support start from the highest priority*
5.	*double click then type the area of support start from the highest priority*

Annex 5. Evaluation of UNESCAP CGPRT Centre ICT Training Course

1. The objectives of this UNESCAP AGRI-ICT Training Course are to improve and strengthen the quality of data and information required by policy makers in CGPRT crops' systems (a) by applying ICT or information and communication technologies (including CGPRT crops' management information system, Geographical Information System; modeling, statistics and operation research; public awareness; Internet: searching, providing and disseminating information in the development of CGPRT crops; and (b) to raise awareness and understanding among policy makers on the potential of ICT for agricultural development as a prerequisite for the emergence of strong leadership and commitment of member countries in this area. Please cross one answer to express your opinion concerning how this training course has met the objectives.

Strongly Agree	Agree	Slightly Agree	Undecided	Slightly Agree	Disagree	Strongly Disagree	N/A
☐	☐	☐	☐	☐	☐	☐	☐

2. Why did you attend this AGRI-ICT Training? You may choose more than one option.
   - ☐ Improve my skills in computing
   - ☐ Learn new computer terminology
   - ☐ Be more competent in the use of the Internet, Database, and GIS
   - ☐ My supervisor sent me

3. How would you define the atmosphere of training course? You may choose 3 options
   - ☐ Co-operative
   - ☐ Highly motivated
   - ☐ Creative
   - ☐ Active
   - ☐ Productive
   - ☐ Concentrated
   - ☐ Poorly motivated
   - ☐ Passive
   - ☐ Unproductive

4. Rank the topics of the training course according to your interest from 1 (most interesting) to 5 (less interesting)?
   - ☐ Database Management
   - ☐ SQL 2000
   - ☐ Data Mining
   - ☐ GIS
   - ☐ Country Assessment

Appendix 5

5. What was the practical versus theoretical level of this course (one answer)?
   - ☐ Very practical
   - ☐ More practical than theoretical
   - ☐ As much practical as theoretical
   - ☐ More theoretical than practical
   - ☐ Highly theoretical

6. How did you find the facilities (hardware, software, etc.) used in the course?
   - ☐ Very good
   - ☐ Rather good
   - ☐ Modest
   - ☐ Insufficient
   - ☐ Very poor

7. How did you find the tempo of the course?
   - ☐ Far too fast
   - ☐ A little too fast
   - ☐ Suitable
   - ☐ A little too slow
   - ☐ Too slow

8. What was your overall impression of the course?
   - ☐ Very Good
   - ☐ Good
   - ☐ Satisfactory
   - ☐ Fair
   - ☐ Poor

9. Do you agree that taking this course was a useful experience?
   - ☐ Agree Strongly
   - ☐ Agree Somewhat
   - ☐ Disagree Somewhat
   - ☐ Disagree Strongly

10. How useful was this course for you in terms of your future?
    - ☐ Very useful indeed
    - ☐ Rather useful
    - ☐ Moderately useful
    - ☐ Fairly useless
    - ☐ Quite useless

11. Did you learn anything you didn't expect to?
    - ☐ Yes
    - ☐ No

12. What unexpected thing(s) did you learn?

_____

_____

_____

_____

13. What was the best part of the course in your opinion?

_____

_____

14. What would you like to say more about the course?

_____

_____

_____

_____

_____

_____

15. Course Name: Database Management and SQL 2000								
Survey Questions:	Strongly Agree	Agree	Slightly Agree	Undecided	Slightly Agree	Disagree	Strongly Disagree	N/A
My knowledge of the subject matter has increased.	☐	☐	☐	☐	☐	☐	☐	☐
I have gained skills that I can put into practice in my job.	☐	☐	☐	☐	☐	☐	☐	☐
The resource person had a good command of the subject matter.	☐	☐	☐	☐	☐	☐	☐	☐
The resource person presented the subject in a manner I could understand.	☐	☐	☐	☐	☐	☐	☐	☐
My expectations about this course were met.	☐	☐	☐	☐	☐	☐	☐	☐

16. Course Name: Data Analysis								
Survey Questions:	Strongly Agree	Agree	Slightly Agree	Undecided	Slightly Agree	Disagree	Strongly Disagree	N/A
My knowledge of the subject matter has increased.	☐	☐	☐	☐	☐	☐	☐	☐
I have gained skills that I can put into practice in my job.	☐	☐	☐	☐	☐	☐	☐	☐
The resource person had a good command of the subject matter.	☐	☐	☐	☐	☐	☐	☐	☐
The resource person presented the subject in a manner I could understand.	☐	☐	☐	☐	☐	☐	☐	☐
My expectations about this course were met.	☐	☐	☐	☐	☐	☐	☐	☐

17. Course Name: GIS								
Survey Questions:	Strongly Agree	Agree	Slightly Agree	Undecided	Slightly Agree	Disagree	Strongly Disagree	N/A
My knowledge of the subject matter has increased.	☐	☐	☐	☐	☐	☐	☐	☐
I have gained skills that I can put into practice in my job.	☐	☐	☐	☐	☐	☐	☐	☐
The resource person had a good command of the subject matter.	☐	☐	☐	☐	☐	☐	☐	☐
The resource person presented the subject in a manner I could understand.	☐	☐	☐	☐	☐	☐	☐	☐
My expectations about this course were met.	☐	☐	☐	☐	☐	☐	☐	☐

18. Course Name: Country Assessment								
Survey Questions:	Strongly Agree	Agree	Slightly Agree	Undecided	Slightly Agree	Disagree	Strongly Disagree	N/A
Experience from other countries provided me with relevant information.	☐	☐	☐	☐	☐	☐	☐	☐
I understand better the situation of ICT in my country.	☐	☐	☐	☐	☐	☐	☐	☐
The resource person had a good command of the subject matter.	☐	☐	☐	☐	☐	☐	☐	☐
I had enough time to express my opinion.	☐	☐	☐	☐	☐	☐	☐	☐

Database Management and SQL 2000 Participant Skills Assessment

PERSONAL Identification
Name:
Title:
Nationality:
Occupation:
Home Address:
Office Address:
Email Address:

Score:
Checked by:

1. What are the model(s) of DBMS (cross all appropriate answers):
   - ☐ Open DBMS
   - ☐ Hierarchical DBMS
   - ☐ Network DBMS
   - ☐ Relational DBMS
   - ☐ Object DBMS

2. What are the advantages of DBMS (cross all appropriate answers):
   - ☐ Reduce data redundancy
   - ☐ Reduce data inconsistency
   - ☐ Single User

Appendix 5

3. What does RDBMS stand for?
   - ☐ Relationship Database Management System
   - ☐ Relational Database Management System
   - ☐ Remote Database Management System

4. How are the tables in RDBMS related to each other (cross all appropriate answers)?
   - ☐ Through Foreign Key
   - ☐ Through Data Type
   - ☐ Through Primary Key

5. Which of the following are software for RDBMS (cross all appropriate answers)?
   - ☐ Microsoft SQL 2000
   - ☐ Oracle
   - ☐ Microsoft Access

6. FK (Foreign Key) and PK (Primary Key) can be assigned in a table using the following ways (cross all appropriate answers):
   - ☐ Using Analysis Services
   - ☐ Using Enterprise Manager, select the database, select table then design
   - ☐ Using Enterprise Manager, select database, then select database diagram

7. What does SQL stand for?
   - ☐ System Query Language
   - ☐ Structure Query Language
   - ☐ Stream Query Language

8. There are four main tools in SQL 2000: Enterprise Manager, English Query, Analysis Services, and Query Analyzer. Which one is dedicated to performing Data Mining, Data Analysis, and Pattern Searching?
   - ☐ Enterprise Manager
   - ☐ English Query
   - ☐ Analysis Services
   - ☐ Query Analyzer

9. Please arrange in logical order using numbers 1,2, and 3 the following three phases of database design methodology:
   - ☐ Physical Database Design for relational databases
   - ☐ Conceptual Database Design
   - ☐ Logical Database Design for the relational model

10. Which one(s) is/are not appropriate to be identified as entity in SQL 2000 (cross all appropriate answers)?
    - ☐ Crops
    - ☐ Districts
    - ☐ Land use management
    - ☐ Groundwater Control

Appendix 6. Analysis of Participants Answers

The rating of qualitative answers using a verbal scale was performed using the table below:

	10	8.75	7.5	6.25	5.0	3.75	2.5	1.25	0
Variable	Strongly Agree	Agree	Slightly Agree	Undecided	Slightly Disagree	Disagree	Strongly Disagree	N/A	
Median	9.375	8.125	6.875	5.625	4.375	3.125	1.875	0.625	

With Total Score = $\sum (M_i * F_i)$

Whereas:

M_i = Median for variable ***i***
F_i = Frequency for variable ***i***

Training effectiveness and general assessment

Question 1: How the training course met the objectives?

			Responses				
Num	**Question**	**Avg**	**9.375**	**8.125**	**7.5**	**6.25**	**5.0**
1.	The training course met the objectives	9.0	5	2			

Question 6: Training Facilities

Variable	Very Good	Rather Good	Modest	Not Sufficient	Very Poor
Score	10	7.5	5	2.5	0

			Responses				
Num	**Question**	**Avg**	**10**	**7.5**	**5**	**2.5**	**0**
6.	How did you find the facilities	9.6	6	1			

Question 7: Training Tempo

Variable	Far too Fast	A little too fast	Suitable	A little too slow	Too slow
Score	4	7	10	7	4

			Responses				
Num	**Question**	**Avg**	**4**	**7**	**10**	**7**	**4**
7.	How did you find the tempo of the course?	6.1	3	3	1		

Appendix 6

Question 8: Overall Impression

Variable	Very Good	Good	Satisfactory	Fair	Poor
Score	10	7.5	5	2.5	0

			Responses				
Num	**Question**	**Avg**	**10**	**7.5**	**5**	**2.5**	**0**
8.	What was your overall impression of the course?	7.9	1	6			

Question 9: Training Usefulness

Variable	Agree Strongly	Agree Somewhat	Disagree Somewhat	Disagree Strongly
Score	10	7.5	5	2.5

			Responses				
Num	**Question**	**Avg**	**10**	**7.5**	**5**	**2.5**	**0**
9.	Do you agree that taking this course was a useful experience?	9.3	5	2			

Question 10: Training Usefulness for future consideration

Variable	Very Useful	Rather Useful	Moderately Useful	Fairly Useless	Quite Useless
Score	10	7.5	5	2.5	0

			Responses				
Num	**Question**	**Avg**	**10**	**7.5**	**5**	**2.5**	**0**
10.	How useful was this course for you in terms of your future?	8.9	4	3			

Table Summary for Training Effectiveness based on question number one, six, seven, eight, nine and ten.

Num	**Question**	**Average**
1.	The training course met the objectives	9.0
6.	How did you find the facilities?	9.6
7.	How did you find the tempo of the course?	6.1
8.	What was your overall impression of the course?	7.9
9.	Do you agree that taking this course was a useful experience?	9.3
10.	How useful was this course for you in terms of your future?	8.9
	Total Average:	8.5

Trainer effectiveness

Topic: Database Management and SQL 2000

Survey Questions:	Strongly Agree	Agree	Slightly Agree	Other answers	Total
My knowledge of the subject matter has increased.	2	5			8.5
I have gained skills that I can put into practice in my job.	1	4	2		7.9
The resource person had a good command of the subject matter.	4	3			8.8
The resource person presented the subject in a manner I could understand.	1	5	1		8.12
My expectations about this course were met.		5	2		7.77
				Average	8.2

Topic: Data Analysis

Survey Questions:	Strongly Agree	Agree	Slightly Agree	Other answers	Total
My knowledge of the subject matter has increased.	1	5	1		8.1
I have gained skills that I can put into practice in my job.		6	1		7.9
The resource person had a good command of the subject matter.	3	4			8.7
The resource person presented the subject in a manner I could understand.		6	1		7.9
My expectations about this course were met.		6	1		7.9
				Average	8.1

Topic: GIS

Survey Questions:	Strongly Agree	Agree	Slightly Agree	Undecided	Other answers	Total
My knowledge of the subject matter has increased.	1	5		1		7.9
I have gained skills that I can put into practice in my job.	1	4	1	1		7.7
The resource person had a good command of the subject matter.	2	4	1			8.3
The resource person presented the subject in a manner I could understand.		5	2			7.7
My expectations about this course were met.		5	1	1		7.6
					Average	7.9

Appendix 6

Topic: Country Assessment

Survey Questions:	Strongly Agree	Agree	Slightly Agree	Undecided	Other answers	Total
Experience from other countries provided me with relevant information.	4	2	1			8.7
I understand better the situation of ICT in my country.	3	2	1	1		8.1
The resource person had a good command of the subject matter.	5	2	0			9.0
I had enough time to express my opinion.	2	3	1	1		7.9
					Average	8.4

Table Summary for Trainer Effectiveness based on question numbers 15, 16, 17 and 18.

Num	**Course Name**	**Average**
1.	Database Management and SQL 2000	8.2
2.	Data Analysis	8.1
3.	GIS	7.9
4.	Country Assessment	8.4
	Total Average:	8.2