

The Knowledge Sharing Experience in Agriculture

Randall Ireson

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I. Introduction

Since the DPRK food crisis began in the mid 1990s, foreign donors and aid agencies have provided assistance in two main areas: agriculture and health. Agriculture is of course directly related to the need for increased food production, while aid to the health sector addresses effects of both reduced food supply and a deteriorated health-care infrastructure in the DPRK. This paper will review the history and current state of knowledge sharing in the agriculture sector, considering both knowledge sharing between aid organizations and their DPRK counterparts, and knowledge sharing among the different aid organizations working in the DPRK. It should be considered as a snapshot of a work in progress, because the nature and degree of knowledge sharing about agriculture is changing, and this conference may well influence future directions.

I will begin with a brief outline of the institutional context in which agriculture aid has been delivered. Knowledge sharing and material aid in the agriculture sector relates directly to the DPRK food crisis, and has evolved over the last decade as the DPRK food situation has changed from an acute emergency to a less critical, but longer-lasting shortfall that is still being largely met through foreign assistance. The nature of agriculture assistance has changed in parallel with changes in the nature of the food problem over that period. In the mid 1990s, the DPRK experienced a catastrophic farm production collapse. Foreign aid organizations delivered food, and later fertilizer, in an effort to improve the nutritional situation directly and immediately. Initially very little was known outside the DPRK regarding its agricultural practices or policies, or even about the proximate causes of the food crisis. Humanitarian aid representatives (multilateral, bilateral and NGO) worked diligently against the organized resistance of the DPRK government to identify and collect reliable and accurate data about local food production, farming practices, agriculture policy, and the state of the DPRK economy. To be sure, there were instances of cooperation with government such as the development of the Agricultural Rehabilitation and Environmental Protection (AREP) plan, but for the most part the position of the DPRK government was that the best role for foreign assistance was simply to provide food, fertilizer and fuel. The government could take care of everything else if these needs were met.

We recognize now that the root causes of the DPRK food crisis were not the “natural disasters” of 1995 to 1997, though these certainly contributed to the crisis. In fact, the collapse in farm production had begun well before 1995, reflecting acute shortages of fuel and fertilizer which were caused by the loss of friendly trade with the USSR and China. Thus the first instance of knowledge sharing in agriculture was the knowledge gained by international organizations about the practical conditions on DPRK farms, and about the policies and production technologies promoted by the government. With a clearer understanding of the situation in the DPRK farm sector, foreign aid organizations began slowly to adjust their programs, turning first toward short-term increases in farm production, and then toward longer-term improvements in farm

productivity. While deliveries of food aid remained high through 2002, the nature of other material assistance for agriculture changed from an emphasis on fertilizer and plastic film to improved seed varieties to improved machinery and production methods.

Foreign assistance to the DPRK has always been subject to political constraints, and aid to the agriculture sector is no exception. On one hand, agriculture is considered a “neutral” topic, one which can be addressed in purely technical terms and in ways which do not question or threaten the DPRK state. For this reason the DPRK government has accepted and encouraged aid to the agriculture sector, and has been less restrictive in allowing its citizens to interact with foreigners than in other areas such as economics, law or social sciences. However food self-sufficiency has been a core tenet of the *juche* ideology, and “*juche* agriculture” includes a number of specific recommendations regarding farming practices. Therefore knowledge sharing efforts which question either the economic desirability of self-sufficient food production or some of the farming methods which have been instituted through on-the-spot-guidance, have sometimes been seen as implicit criticisms of fundamental DPRK agriculture policy. In past years, DPRK policy makers have also demonstrated a tendency to seek “magic bullets” – simple production solutions that often do not recognize physical or environmental limitations to specific practices, but are promoted as The Solution to the nation’s food crisis. The Potato Initiative of 1999 and the nationwide call in 2000 to multiply grass eating animals are cogent examples.

Foreign assistance organizations have for the most part chosen not to question the structure of agriculture in the DPRK, such as reliance on cooperative and state farms, national procurement of staple grains for distribution through the PDS, centrally planned production targets and distribution of farm inputs, state-managed prices for staple foods, the land rezoning initiative, and so on. This paper also accepts these structural elements as given, as for the most part being outside the scope of discussion regarding knowledge sharing, and also as for the most part not being significant impediments to either knowledge sharing or to improving farm productivity.

II. The scope of knowledge sharing in agriculture

During a decade of agricultural aid to the DPRK, the topics which have been addressed are numerous and wide-ranging. Table 1 provides a partial list of topics which have been addressed by one or more aid programs. As can be seen, they cover many fundamental aspects of farming, and do not address questions which might be called “cutting edge” research problems. Rather the emphasis in knowledge sharing has been on improving the understanding of “best farming practices” as implemented in different settings around the world. Countries hosting knowledge sharing delegations from the DPRK, and the home countries of aid organizations (bilateral and NGO) which have sponsored these delegations are listed in Table 2. The languages of agriculture knowledge exchange for the last decade have been almost exclusively Korean, English and Chinese.

Because DPRK agriculture researchers and DPRK farmers had very little knowledge of and exposure to ideas and practices outside the DPRK, most international agriculture experts visiting the DPRK in the 1990s described the knowledge and practices as two to three decades out of date. Lacking regular access to international journals, scientists who might read a single article had no basis for understanding its context in the general development of agricultural science, and

consequently little ability to evaluate it for relevance or applicability. Most early efforts at knowledge sharing – including both study tours outside the DPRK and visiting specialists coming to the DPRK – therefore focused on improving knowledge of and access to basic, current agriculture science information. Aid organizations also engaged in a parallel effort to learn more about the level of understanding and priorities of their DPRK counterparts and counterpart organizations.

Another effort by international specialists has been to overcome widely accepted misinformation, such as the “rule of thumb” for farm managers and AAS scientists that application of 1 kg of ammonium sulfate fertilizer would always result in a yield increase of 10 kg of rice. Rigid planting and harvest dates promulgated by the national information network also constrained farm managers’ ability to adapt to changes in annual weather patterns.

Two selected examples – poultry production and conservation farming - may give a better idea of the kind of information which has been transferred in the agriculture sector. In the late 1990s, the DPRK government apparently decided to modernize poultry production nationwide. Technicians were sent to Europe to research breeding and management systems, and several contracts were negotiated with European poultry housing and equipment companies and suppliers of chicks, resulting in the construction of several turn-key chicken farms in the DPRK, financed by the government. Other study delegations were supported by aid organizations and continued to learn about topics such as breeding practices, poultry genetics, chick production, nutrition, and disease control. With the outbreak of avian influenza in neighboring countries, the FAO provided training and materials for screening for the disease, and when a disease outbreak occurred in the DPRK, FAO experts came to assist in diagnosis and control, and determined the disease was not in fact H5N1 influenza.

More recently, several aid organizations introduced the concept of reduced tillage farming methods as a means of improving soil quality, controlling soil erosion, and reducing fuel use in farming. These practices are being promoted in the DPRK as “Conservation Agriculture”. Several expert missions have come to the DPRK, and other delegations from the DPRK have visited countries such as China, Brazil and the US to observe reduced tillage practices and results. Specific areas of scientific knowledge which are being developed include the effects of conservation agriculture on soil structure and soil life, weed control methods (mechanical, chemical, and by crop rotation), testing reduced tillage farm equipment in the DPRK, and soil moisture management. An important aspect of the conservation agriculture concept is the understanding that many different practices must interact in a positive way to obtain the most benefit from this technology.

These two examples typify the majority of knowledge sharing efforts in agriculture: the application of good farming practices which are well known in other countries to the conditions of the DPRK. DPRK conditions are somewhat unique, not so much because of environmental or climatological differences, but because of the economic and institutional constraints to adopting new technologies. The best assistance programs are those which are informed by and respect the physical and institutional environment of the DPRK. Very limited communication with foreign experts (by DPRK agriculture officials or scientists), limited access to consumer information and repair parts for equipment (by DPRK farm managers), and a near inability to use farm profits to

procure additional inputs that are not programmed by the government (whether consumables such as fertilizer or equipment such as tractors or seeders), make both adoption and adaptation of new technologies uneven and problematic.

On the other hand, if the government determines that a particular technology or farm practice is beneficial, it can promulgate that information and instruction throughout the country or a region in short order. Similarly, for technologies which benefit from centralization, such as seed production or production of bio-pesticides, international specialists can work directly with a DPRK research or production institute to develop both the knowledge and construct the physical facility needed to introduce a technology to the DPRK. The dissemination of related information, and distribution of the product (seed, pesticide, or whatever) is also facilitated by the centralized management of the entire agriculture sector.

III. Cooperation and coordination

Most organizations active in knowledge sharing projects in the DPRK are aware of the need to share information among international agencies. However because working conditions in the DPRK limit both the amount of time foreigners can be in country, and the ability to communicate with other foreign organizations while representatives are in country, information sharing among international organizations has tended to be informal, *ad hoc* and incomplete. Since 1999, four international conferences have convened representatives from NGOs, multilateral and bilateral organizations to share perspectives and knowledge about working in the DPRK. These conferences took place in Beijing in May 1999, Tokyo in June 2000, Seoul in June 2001 and Beijing in May 2005. The number of participants ranged from around 50 to nearly 200, and topics discussed included food aid, health, sanitation and nutrition, and agriculture. In addition two agriculture workshops have been organized, in June 2004 in Pyongyang, and in April 2006 in Beijing. These workshops provided more time for discussion of specific agriculture development issues than was possible at the general conferences. Participants also shared technical information and discussed working conditions in the DPRK and different approaches to cooperation with DPRK counterparts.

For organizations with staff resident in Pyongyang, a monthly agriculture sector meeting provides a semi-structured opportunity to exchange information about project status, information from the field, visiting experts, and outgoing study delegations. These meetings have been especially helpful since the appointment of an FAO “Focal Point” for agriculture in 2003. Organizations which are not resident in the DPRK have always been welcome to join these meetings, but it is difficult for short-duration delegations to the DPRK to insure that their schedule overlaps the sector meeting date. For the last few years, minutes of these meetings have been distributed by email to non-resident organizations from the UNDP office in Pyongyang. However the number of NGOs with resident agriculture programs was reduced in early 2006, and the frequency of these sector meetings has declined. The three or four resident organizations with agriculture programs seem now able to share information among themselves on a regular but informal basis.

Also deriving from the agriculture sector meetings were a few “Green Table” discussions in Pyongyang which were organized to share information and views on specific selected topics:

farm mechanization, goat raising, and sloping land management. These discussions initially included Korean counterparts as well as international staff, and produced one official document – on farm mechanization which summarized salient issues and suggestions as to best practices for the DPRK regarding this topic. Drafts of the other Green Table conclusions were never approved by the government, and papers have therefore not been circulated.

NGOs in the ROK also communicate informally among themselves, and have organized a number of meetings and workshops which provide an opportunity for exchange of ideas and information. The *minhwahyeop* organization is a venue for discussion and possible cooperative activities in all sectors, not just agriculture. At least one website, www.nkchannel.org, provides links to information from different NGOs, as well as links to other relevant articles and information resources. As the web site is maintained in Korean language, however, international NGO staff mostly cannot benefit from it.

Communication and coordination between ROK NGOs and other international aid organizations has been especially problematic. Several structural impediments limit such contacts: ROK NGOs work in the DPRK through different government channels from European and North American agencies; ROK NGO staff visiting the DPRK are typically prohibited from traveling to the diplomatic quarter in Pyongyang where most international aid agencies are housed; and direct email communication between the ROK and international agencies in Pyongyang is not possible. ROK NGOs have provided substantial aid in the agriculture sector, and in the last several years have included more developmental activities and technical training than was possible in the late 1990s. ROK NGO staff are in some cases able to work in the DPRK for weeks at a time, but during these trips still have little or no contact with the rest of the international aid community. Similarly, non-Korean international aid workers communicate more among themselves and seldom with their ROK colleagues.

As a consequence, organizations with very similar projects may not even be aware of each other's programs. European programs to rehabilitate farm and county tractor repair workshops focusing on the Chollima tractor parallel ROK programs to introduce, produce and maintain light weight South Korean tractors and rice transplanters. European programs promoting use of cover crops and crop rotation parallel ROK programs promoting systematic rotation of corn and soybean. Both European and ROK NGOs are also active in goat raising and dairy operations. North Korean managers of farms receiving assistance from one international organization may know of an innovation or new seed or type of machinery being received by a neighboring farm, but will normally not know what other aid organization is involved. If there were better information sharing, the potential for synergistic cooperation and coordination of activities could be improved. At the very least, it would be beneficial for international aid organizations to share lessons learned from working on similar projects, and regarding the DPRK policy environment related to implementing a particular agriculture technology.

- Improving communication and coordination

Because the working environment in the DPRK is fluid and changing, and because the nature of technical assistance projects also evolves over time, knowledge sharing among NGOs and other aid organizations working in the DPRK must be frequent and detailed in order to be effective.

Efforts and policies of the DPRK to prevent information sharing and coordination among aid organizations should be recognized and countered wherever possible.

Annual general conferences like those held in the past provide an opportunity for aid organizations to discuss the overall policy environment and working conditions, and to share general successes or lessons learned. But the time available at such structured meetings is inadequate for technical specialists to share detailed program information, or to discuss practical questions such as achievements or failures in implementing various programs. More frequent interchange is needed, particularly between ROK and non-Korean organizations. Informal workshops could be helpful, but choice of a desirable venue is complicated by travel restrictions to and within the DPRK. Beijing, Dalian or Dandong would be about equally accessible to agency representatives resident in Pyongyang and in the ROK. This is still a hardship for non-Korean non-resident NGOs, but at least would not subject the workshop participants to the vagaries of DPRK visa approvals.

While potentially difficult, uncertain and time-consuming, it would be beneficial for representatives of many NGOs and aid organizations jointly to propose an annual international workshop in Pyongyang on agriculture development issues, with representation from a very wide list of resident and non-resident international aid organizations, specifically including ROK NGOs. Such a request would probably have to be presented by each aid organization through its own DPRK counterpart agency. A workshop of this type would hopefully also provide an opportunity for the delegates to make field trips to see project activities at a select number of DPRK farms or research centers. Such workshops and inter-project visits are common in other development contexts around the world, and are long overdue in the DPRK.

But until international meetings in the DPRK are possible, workshops or conferences held at least annually elsewhere in the region (and again China is both equally convenient and inconvenient to all participants), focusing on agriculture issues, and scheduled for a regular, fixed time outside the April-October peak farming season, would allow all potential participants to plan their work and travel schedule well in advance, and with confidence. DPRK participants should be invited to such workshops, if at all possible.

Other options for improving communication could include an on-line data base of program activities, or a members-only list-serve with regular updates from participating organizations. Details would have to be worked out regarding a hosting organization, as well as the format and content of information to be reported. But a regularly updated, centrally accessible information center, maintained in both Korean and English, would at the very least give interested organizations basic background information about the activities of their colleagues, and a point of contact if they wanted to request or share more detailed information about any area or activity. Such a resource might also be useful to the few DPRK planners and policy makers with access to the internet.

Important issues regarding confidential information and premature publicity about programs involving the DPRK must be recognized in developing any public access to information about agencies' program activities. Organizational inertia and the burden of report writing are also obstacles that would need to be overcome for such a data base to be kept current and relevant.

Organizations sharing information on such a data base or list serve should not be expected to disclose programs or study delegations which are in the planning stage, or which might include sensitive topics or locations. One would hope, however, that the data shared, either after a program activity is completed or well underway, would at least include information about the participants, the subject matter, the locations, and a summary of material aid contributions.

Sharing information about results of project activities such as on-farm trials and experiences, seed variety evaluations, and other research findings would reduce false starts and duplicative efforts by international organizations, and probably by some DPRK agencies as well. A searchable data base of project reports would be one means of facilitating such knowledge sharing.

IV. Knowledge sharing with DPRK counterparts

All international organizations working in the DPRK are given access through one of the DPRK government agencies charged with controlling and regulating the activities of international aid organizations. These agencies include the Asia Pacific Peace Committee, the Overseas Compatriots Support Committee, the Flood Damage Rehabilitation Committee (which was dissolved in 2005 and replaced by the Korea-America Private Exchange Society and the Korean European Cooperation Coordination Agency), the General Bureau for Cooperation with International Organizations, and the Committee for Solidarity with World Peoples. Through such agencies, international organizations are put in contact with operating organizations such as the Ministry of Agriculture and the Academy of Agricultural Sciences. In some cases international organizations work only with the central authorities, and in other cases also with province or county offices of these line organizations, and/or with specific farms. Some international organizations also work with specialized DPRK organizations, such as the Pyongyang horticulture company, the Organic Agriculture Development Association, province agriculture universities, etc.

Each of these DPRK organizations has different areas of interest and competence, which affects the kinds of program their international counterparts can carry out. For example, the Ministry of Agriculture is primarily concerned with production planning and coordination, supply of consumable inputs and equipment to the farms, and with dissemination of new information or production methods. The Academy of Agriculture Sciences, through its many institutes, is primarily concerned with research on new agriculture technologies, including practical testing and evaluation of seeds and production methods prior to approval for widespread implementation.

Some specialized DPRK organizations have a combination of interests. The Organic Agriculture Development Association carries out applied research on sustainable farming, manages one cooperative farm using sustainable practices, and is developing a capacity for mass dissemination of sustainable farming methods. The Research Center for Compound Microorganisms has operated a factory to produce and distribute beneficial soil organisms, and is engaged in research on bio-fertilizers and bio-pesticides. The Pyongyang horticulture company operates several greenhouses and is oriented to export production of cut flowers, as well as to vegetable production for domestic consumption. The Ministry of Land and Environmental

Protection operates tree nurseries and reforestation schemes, and is involved in research and development of methods for sloping land management.

These examples merely illustrate the breadth of activity and interest of the different DPRK organizations working in the agriculture sector. Most international organizations seem to have been paired with an implementing organization by DPRK authorities, and had little choice regarding the organizations or specific farms they work with. International representatives report a wide variation in the type of response and level of cooperation they receive from different agencies, counties and farms. In the best circumstances, good communication is maintained from national to the *ri* level, and even across national bureaucratic lines. In other circumstances, competition between DPRK agencies (for example the Agriculture Academy and the Agriculture Ministry) obstructs opportunities for developing a coordinated program of either research or development.

Under these conditions, implementing a well planned, coordinated program of knowledge sharing and agriculture development is difficult. A good development project includes fundamental research, applied research and implementation activities, but these tasks are often lodged in different and potentially competing DPRK agencies. Again a few international organizations have been able to successfully bridge these potential barriers, but for the most part the problems persist.

- Methods of knowledge sharing and training

As noted above, all international organizations working in the DPRK agriculture sector began their operations by providing emergency assistance, either food, fertilizer or farming equipment. Over the years the content of aid has changed, and most programs include a substantial knowledge sharing component. How this is implemented varies widely across organization, but typically involves a combination of (a) regular communication between DPRK counterparts and resident or regularly visiting international staff, (b) short-term visits to DPRK by international specialists, providing both program support and formal seminar or training inputs, and (c) trips abroad by DPRK specialists for training or orientation purposes. In the last few years, a few international organizations have also been able to organize or support farm-level training activities through their local DPRK counterpart agencies.

These four modalities of knowledge sharing reach different segments of the DPRK population. Program specific communication by resident and regularly visiting international staff builds the relationships with DPRK officials necessary to understand local priorities and practices, to introduce new information and ideas, and to propose and establish agreed activity plans. These low-key contacts gradually improve the knowledge and understanding of DPRK counterparts, but typically do not spread the information widely. They are also fundamentally necessary in order for international program representatives to learn about conditions in the DPRK.

Visits by international specialists provide opportunities for two-way knowledge sharing regarding particular subjects, and if the visiting specialist is able to participate in seminars or workshops with DPRK colleagues, wider exposure to new information is possible. However the typically short visits by international specialists may limit the depth or detail of information

exchanged, and if the visiting specialist is not already familiar with conditions in the DPRK, a considerable time may be needed to develop information appropriate for Korean conditions. In the best case, an international specialist is able to return to the DPRK on several occasions over a longer period, which facilitates continually better understanding of local conditions, as well as follow-up on research, testing or training activities begun on earlier trips.

Foreign trips by DPRK agriculture specialists have until now mostly been of rather limited duration, either to attend a conference or for a few weeks study tour. In the early stages of agricultural assistance, this modality was appropriate in order to expose DPRK specialists to a wide range of information regarding international knowledge and practices. The drawback was that the DPRK specialists would return home with ideas about new technologies, but without adequate practical experience to put these ideas into practice. In some cases, agriculture programs were begun prematurely, with great enthusiasm, and the results were very disappointing because important details had been overlooked, or DPRK staff had not learned the practical skills necessary.

At this time, longer term study is more advantageous, but is still not common. The English or Chinese language ability of most DPRK agriculture specialists is not at the level necessary for independent study abroad. DPRK policies restricting foreign travel are another constraint. Study or cooperative research in the ROK, which would be a logical solution because of shared language, is at this time prohibited by DPRK authorities. International organizations should endeavor, where possible, to invite small groups of DPRK specialists to longer term study abroad, on the order of two months or more.

Finally, farm-level workshops provide an important means of bringing practical knowledge to the operational level in the DPRK, and a few international organizations have been able to implement this practice. Good coordination and planning with DPRK counterparts is needed to agree on practical objectives, and to develop appropriate educational materials and train DPRK trainers in both the subject matter and the methodology of on-farm education. For the most part, DPRK authorities have limited the ability of international organizations to undertake such activities, but it appears this situation may be changing.

V. Recommendations for improved knowledge sharing in agriculture

Considering the state of farming practices in the DPRK in 1995, and the knowledge and orientation of DPRK agriculture officials and scientists, many positive changes have taken place over the last dozen years. These changes have occurred because of both the interest and commitment of the DPRK, and because of the continued support and patience of international organizations working in the agriculture sector. In some ways, one could say that the DPRK is now at a point from which rapid development in agricultural knowledge and practice is possible. Many of the simplistic and rigid ideas of the 1990s are being replaced with a greater understanding of the complex interrelationships among soil, crop, environment, and farming methods that characterizes modern productive farming. DPRK farms, and work groups on those farms, have marginally greater freedom for planning and decision making that recognizes local conditions and priorities. The two main DPRK agriculture organizations, Ministry of Agriculture and Academy of Agricultural Sciences, now have considerable experience working with foreign

experts, and have sent numerous staff abroad for varying periods of time, and thus are much more conversant with current R&D issues, and with state of the art agricultural practices around the world.

International organizations working in agriculture therefore now have a significant opportunity to contribute to the improvement of food production and food security in the DPRK. However we must recognize that all assistance to the DPRK takes place in a highly charged political context. First is the international political situation on the Korean peninsula, where security concerns and denuclearization affect what governments are willing to offer in terms of aid and assistance, or to permit in terms of travel and exchange. Second is the internal political concerns of the DPRK government, where most information about the world outside the DPRK is considered potentially threatening and to be controlled. Third is the programmatic and organizational priorities of the international aid organizations, where funding sources, religious motivations or other agendas cause each organization to support certain activities and not support others.

Recognizing this situation, I recommend five approaches for improving knowledge sharing in the agriculture sector.

1. *Agriculture aid programs in the DPRK should focus explicitly on development rather than on emergency relief or recovery.*

Much has been accomplished to introduce new ideas and information, and this effort should be continued. Agricultural assistance should seek medium and long-term solutions, rather than just short-term fixes and commodity support to farms which are not economically efficient. Food or fertilizer assistance will be necessary for some time to come, but the focus of knowledge sharing activities should be on identifying and implementing production systems which are suited to DPRK conditions, and at the same time working to modify whatever limiting conditions are presented.

As a corollary to this point, agriculture knowledge sharing should stay focused on fundamentals for now, rather than supporting “cutting-edge” or basic research. In the future, when the DPRK has developed both the personnel and the internal economic ability to support basic research, international organizations can support these efforts.

2. *We urgently need an inter-agency discussion regarding a desirable strategy for the development of DPRK agriculture, ideally involving DPRK policy makers.*

Observers and analysts have proposed different ways of solving the DPRK food problem. Some advise that agriculture should only be a minor component of the DPRK economy, with most food imported and paid for by increased industrial or service exports. Some advise that the DPRK should focus on exporting high-value agriculture products, and import low-price basic foodstuffs to feed the population. Some advise use of biotechnology, crop intensification and more efficient use of conventional farm inputs to increase production profitably. Some advise relying on sustainable farming methods that could meet basic food requirements with minimal use of imported fertilizer and fuel.

With international aid organizations espousing such disparate agendas, DPRK policy makers are confronted with technical recommendations which, bluntly stated, are contradictory. It seems that in the best situation, some farms are being organized or provided with assistance to support one of these approaches, and other farms are moved in other directions. In other cases, farms are implementing several strategies simultaneously.

It may be that the international organizations working in the agriculture sector cannot come to agreement regarding the desirable trajectory for the DPRK agriculture sector. Ultimately, of course, this is a choice for DPRK decision makers, not for international agencies. However raising these issues among ourselves, *and* with our DPRK counterparts, should help make knowledge sharing activities mutually reinforcing, rather than contradictory.

3. *All international agencies working in the DPRK should share with each other the scope and content of their training and development programs, and the identity of participants in training programs both in and outside the DPRK.*

This recommendation arises from the discussion above regarding knowledge sharing among international organizations. With such information about what each of us is doing, and who we are working with, we will be able better to reinforce, complement and support common program and information areas, and to avoid redundancy and overlap. In the best case, sharing this information will facilitate explicit coordination between international organizations, and simultaneously bring linked information to the DPRK by multiple paths and to multiple counterparts. The existing knowledge gap between ROK and non-ROK organizations should be explicitly addressed and reduced.

4. *It is time to develop and insist on longer-term training programs abroad.*

As noted earlier, short study tours were effective in introducing new ideas and topics to DPRK agriculture decision-makers. Now the primary need is in-depth study and developing practical skills, to take place at international research centers and at commercial farms outside the DPRK. Challenges which must be met include both language training for DPRK participants, and persuading the DPRK government to allow more specialists to travel abroad for longer periods of time. International organizations should, as much as possible, de-emphasize short-term delegations in favor of longer-term training and research.

5. *It is time to develop and insist on more coordinated training courses in the DPRK, with international expert participation.*

The logic behind this recommendation is identical to the preceding point. In-depth training is now necessary. Training in the DPRK avoids the language problem associated with study abroad. Training in the DPRK is inherently less costly per person than sending people abroad. Training-of-trainers will be required, as well as the introduction of new methods of pedagogy and knowledge transfer. Before this recommendation can be implemented widely, however, DPRK experts must be trained in technical or scientific specialties (often abroad) and gain

enough practical experience that they can act as true technical resources to training session participants. For now, bringing international experts to assist this process is unavoidable.

VI. Conclusion

When one considers the history of knowledge sharing in the DPRK regarding agriculture, there is much to be commended. A great deal of information and knowledge has been transferred among all the actors, and many positive fundamental changes are visible in applied techniques and cropping systems. For exactly this reason, the time is ripe for a conscious re-direction of knowledge sharing activities toward agriculture development rather than humanitarian aid and relief. In fact, this change is already being implemented by many NGOs and other international aid organizations. We should explicitly and publicly recognize it, and work together to support this direction.

It is unlikely that DPRK authorities will coordinate or facilitate communication among the different international aid organizations. For this reason we must undertake this task ourselves. The first three recommendations above address this issue: the desirability for developing a common vision – if possible – and the need to know in some detail what each of us is doing. With a common vision and with efforts to support each others' programs, there is more opportunity to improve both the scope and depth of agricultural knowledge in the DPRK, and also to influence DPRK farm policies positively.

But even if we cannot come to agreement on a development strategy, or if we cannot develop explicit coordination of activities, we need to share information about program activities in much greater detail than in the past. With this information, we can each make - in our own programs and with our own DPRK partners - the supportive links to activities of our international colleagues which our DPRK counterparts may not know of. Sharing our results with each other may also avoid repeating unproductive trials, and more widely introduce crops, crop varieties, or cultivation practices which others have found to be useful.

Table 1. Partial List of Agriculture Topic Areas Included in DPRK Aid Programs

Field crops

Rice, corn and soybean breeding
Seed production and testing
Sweet potato production
Potato production
Seed potato production, including micro tuber and true potato seed
Oil seed production, especially canola
Crop rotation methods

Plant protection

Integrated pest management
Production of Bt, pest predators

Horticulture

Fruit production, especially apples
Cut flower production
Greenhouse vegetable production
Greenhouse design and operation

Soil science & environmental protection

Soil analysis methods
Fertilizer application rates
Forage and cover crops, especially green manures
Conservation agriculture: reduced tillage
Sloping land management
Reforestation

Animal husbandry

Confined poultry production
Confined swine production
Dairy animals, especially goats
Milk processing
Rabbit production
Epidemiology and disease control, including avian flu and foot and mouth disease
Fish production, especially trout and carp

Other areas

Biofuels, especially bio-diesel
Legume inoculants, use and production
Biogas technology (esp. collocated with livestock)
Irrigation methods, including improved gravity, sprinkler and drip
Farm mechanization and machinery maintenance
Farm machinery production
Potato starch production
Sericulture

Table 2. Nationality of aid organizations and location of knowledge sharing programs for agriculture in the DPRK (partial list)

<u>Nationality of aid organizations</u>	<u>Location of programs for agriculture study/training</u>
Australia	Australia
China	China
France	Denmark
Germany	France
Great Britain	Germany
Ireland	Great Britain
Italy	Italy
Korea (Republic of)	Netherlands
Sweden	Russia
Switzerland	Sweden
Taiwan	Switzerland
U.S.A.	Taiwan
	Thailand
	U.S.A.
	Vietnam