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# KOREAN AGRICULTURAL SECTOR STUDY



Special Report 5.

## AGRICULTURAL RESEARCH AND GUIDANCE

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## FOREWORD

This publication is one of a series of Korean Agricultural Sector Study Special Reports. Through the cooperation of the Republic of Korea, Michigan State University and USAID, an agricultural sector study, entitled Korean Agricultural Sector Analysis and Recommended Development Strategies, 1971-1985 was completed between September 1971 and July 1972. Concurrent with and contributing to the sector study the rudimentary components of a computerized simulation model were developed. This work continues with the objective of developing and institutionalizing a fully operational agriculture sector simulation model as a tool for use by Korean decision makers in policy formulation and program development.

The KASS special reports are the result of the work of a number of joint Korean and American task forces established to collect and analyze data and develop working papers on a variety of specific topics for background and input and follow up to the sector analysis efforts. The reports are joint publications of the Agricultural Economics Research Institute, Ministry of Agriculture and Forestry, Republic of Korea and the Department of Agricultural Economics, Michigan State University, East Lansing, Michigan.

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## AGRICULTURAL RESEARCH AND GUIDANCE

### Introduction

This report summarizes suggestions and recommendations developed as part of a United States Agency for International Development-Michigan State University rural sector study for the Republic of Korea and supplements the Korean Agriculture Sector Study (KASS) Report. Background information for these suggestions and recommendations was gathered in Korea in January, 1972.

Most suggestions and recommendations are specific to the activities of the Office of Rural Development (ORD), Ministry of Agriculture and Forestry (MAF). ORD conducts most of the agricultural research and guidance (extension) work for Korea.

In presenting our suggestions and recommendations, we do not mean to imply that the Koreans are doing a bad job in the areas covered. We found them dedicated, knowledgeable, and making excellent use of the resources at their command. We hope our ideas will help them do even better. This joint report has been prepared by Mason E. Miller and Sylvan Wittwer, of Michigan State University and Moo Nam Chung of ORD.

### Agricultural Research\*

#### Institutional Arrangements

There has been in recent years both a segmentation of the administration of federal controlled agricultural research and a shift away from

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the Office of Rural Development (ORD). The Institute of Agricultural Engineering and Utilization, the Agricultural Economic Research Institute and the National Animal Breeding Station were established two years ago as separate agencies and facilities under the vice minister of agriculture. At the provincial level, Sericulture, Animal Science, and Veterinary Science research efforts are not associated with the Provincial Offices of Rural Development (PORD) but with the federal ORD in Suwon. There are no agricultural economics or agricultural engineering programs for research in the provinces. Input into the province has to come direct from the national or federal level; it cannot come through the Provincial Office of Rural Development because they are not a part of ORD at the national level. Better liaison among these research units is recommended. The federal and provincial governments should establish an organizational structure so that this goal can be accomplished.

#### Academic Training

Development and training of human resources for research and guidance is an important key to future progress in agricultural research and technology, and is the responsibility of Colleges of Agriculture. Because of the large numbers of degree-granting colleges of agriculture consideration should be given to consolidation. Improved transportation facilities no longer necessitate colleges in every province and 10 or more in the city of Seoul. The eight veterinary colleges that now turn out DVM graduates who have great difficulty in finding jobs could be reduced to one, and immediate consideration should be given to the development of 5-year programs for veterinary students. The College of Agriculture at Suwon will expand its program to 5 years beginning in 1975. The seven agricultural engineering colleges could be reduced to three. The remaining colleges ought

to both develop more diversified programs and upgrade the training of potential research scientists. Graduate colleges ought to be developed.

At the academic staff level of the top colleges of agriculture and in the ORD provision should be made for bringing in more experts for one- or two-year assignments. The United Nations Development program offers assistance in limited areas. A more effective system of granting more fellowships and scholarships for outstanding students should be encouraged. Graduate research assistantships would close a serious gap for graduate students who will become research scientists. Appointments of part-time or full-time salaried research professors could upgrade present college research capabilities and science training programs.

Perhaps the most crucial of all needs of agricultural colleges and even ORD are modern library facilities and access to the current scientific literature. These resources could be developed without much added expense since in most instances buildings and space already exist. More contact should be made with state agricultural experiment stations and the U. S. Department of Agriculture for exchange of bulletins and journal articles. Properly directed requests backed with funds for shipping could eliminate many deficiencies.

#### Research and Technology Priorities

1. The primary need is to continue the focus on rice variety improvement and management for increased food production. There is a great need for a fully-integrated research program to look beyond Rice IR-667 and its counterparts. Closely allied to successful rice production is the improvement and extension of the double-paddy cropping with wheat and barley. There should be continued efforts toward alternate crops of wheat and barley in the double-cropping system.

since all these cereal grains share common fertility requirements and some virus diseases. Rape would be a good crop along with wheat and barley in the double-cropping system. There has been a fantastic increase in rape production during the past ten years and new varieties show great promise. Future success and expansion in double-cropping rests with development of earlier maturing high-yield varieties.

2. Food legumes constitute a three-fold potential for Korea: They can be an asset as a high protein food crop for people, can be used in grass-legume mixtures for pasture of livestock, and can rejuvenate much of the hill country. Worldwide, legumes have been neglected as food crops, and Korea is no exception. Many types are drought resistant. Properly inoculated with microorganisms (rhizobia), they biologically fix their own nitrogen, and opportunities are great for varietal development, although the current percentage of improved seed used by growers is very low. Experiments at the Chungnam Provincial ORD have demonstrated that the yields of soybeans in Korea can be increased 3-4 fold (to 33 bushels per acre) by use of improved varieties and with the best production technology. The 5-year plans in Korea call for yields of 11 and 16 bushels per acre for 1971 and 1976, respectively.

3. Greater utilization of the hill country for orchard crops and grapes is recommended. The Third Five-Year Plan (TFYP) estimates are far too low in their projections for expansion in this area and the use of otherwise non-productive soil. Korea contains hundreds of thousands of hectares that are now non-productive but suitable for tree fruits, nuts, and grapes. The development of these industries would depend on a progressive and expanding food-processing industry,



an expanding export market. Possibly drip or trickle irrigation could be a new technology for the establishment of orchards and vineyards in the dry seasons.

4. Food-processing research should be expanded. Mushrooms already are an example of what can be done. Studies should be extended to strawberries and asparagus along with apples, peaches and pears, for fully integrated production and processing enterprises, and maximizing the use of labor and equipment.

5. Production of high-value crops, with utilization of land and labor resources which are cheaper than in Japan, offer the greatest opportunity for agricultural development in Korea. Such opportunities exist in the two government monopolies (Ginseng and tobacco) and silk, mushrooms, and the protected cultivation, with vinyl plastic greenhouses and other structures, for winter-time growing of flowers, vegetables and fruit. The potential already is indicated by phenomenal expansions in production during the past five years, and in the availability of labor that does not compete with the manpower needs of rice and other major food crops. Additional resources for research should be directed toward the development, culture, and handling of these crops and commodities, along with development of the strawberry and asparagus industries.

6. Additional emphasis on environmental improvement research is sorely needed. Air and water pollution already are serious problems, affecting crops in the vicinity of Seoul and other metropolitan areas, and water used for irrigation. Research on utilization of waste agricultural products should cover cattle dung for methane to be used as fuel, by-products of oil crops in processing, and rice

straw for cattle feed.

Projections by KASS of research and technology for the agricultural sector of Korea favor modification of the present policy. Korea should not, with its limited paddy land resources, aim for self-sufficiency in rice and other food grains. The country should maximize its land, water, climatic, and human resources in the culture, production, and processing of high-value, high-labor requiring crops, the oil crops, and the food legumes. A final and vital research need is for coordinated, interdisciplinary, interagency research programs among the people and organizations engaged in agricultural research and advancement in new technology.

The only reasonable rationale for aiming for self-sufficiency in rice and other food grains would be wartime security. This goal may in itself supersede all other considerations, but it would not accomplish an optimal utilization of land, water and human resources.

#### Guidance Bureau Program\*

##### General Suggestions

1. The Guidance Bureau of ORD is deeply involved in helping rural Korea meet production goals of the various five-year plans. Because of this involvement, Guidance workers in most ORD Divisions become advocates of particular governmental policies. While this role now may be necessary and desirable, ORD needs to think about the long-run consequences of being perceived by farmers and other rural people as governmental policy advocates and promoters, rather than as educators. Such a perception of them can make them less credible, and

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lower their ability to influence and educate rural people.

A major difference between a governmental policy advocate and an educator is that the former tells farmers what they must do, while as educator, a Guidance worker helps farmers look at alternatives and consequences, and then make up their own minds. Even when working on governmentally-promoted programs, Guidance workers need to be educators.

2. ORD is doing a good job with the resources it has, but its potential is not being realized because it lacks sufficient budget for proper staffing and equipment. This same general assessment can be made at the provincial, gun, and branch levels of ORD.

3. Tied in with budget problems is the shift in ORD from hiring college graduates to hiring more high-school graduates. College graduates bring more knowledge and more skills to Guidance work, and have more potential as effective educators. Long-run prospects for an effective ORD program require hiring of a higher proportion of college graduates. While a college graduate is not always the best Guidance worker, a competent Guidance worker with a college background is usually better equipped.

Part of the reason ORD has proportionately fewer college graduates is its salary scale; salaries need to become and remain competitive with those in other potential careers for college graduates in ORD's fields of activity.

4. Also tied to budget problems is the lack of educational media and materials, particularly at the gun (county) and eup/myon (city/township) levels. Even if good films, slides, etc., are produced at the national level, they cannot be used unless proper equipment

is available locally. A related problem is the adequate maintenance of educational media equipment already in the various offices; I saw film, for example, being stored on open reels on the floor where dust and dirt could ruin them. Undoubtedly ORD could profit by training Guidance workers in the use and care of the educational media equipment and materials.

5. I saw local offices that did not meet minimum standards for working facilities for the Guidance staff. Some Guidance offices are not as good as those of similar agencies in their localities. While facilities are not usually the key to excellent educational programs, they can be very important to the staff's morale and ability to work effectively. ORD should upgrade field office facilities.

6. Since 1966, there has been an increasing staff turnover rate among ORD employees. The present rate of 10 percent a year is not in itself alarming, but the steady increase in the annual rate since 1966 does merit investigating.

7. ORD is developing training for its staff. This is a very important function for an educational organization that must stay up to date in knowledge and skills in order to best serve the rural sector.

ORD should continue to support the programs of the Agricultural Officials Training Institute. ORD and the Institute should develop and implement a well-rounded training program designed to train and retrain Guidance workers at all stages of their work careers.

The "intern" program, in which selected Guidance workers spend a year at the various ORD Research Stations, is an excellent idea and should be continued and supported.

Specific Recommendations for ORD Units

Agricultural Information Division: This unit has produced excellent educational materials such as films, slide sets, publications, etc. Probably the division's influence is not felt as widely as it deserves.

I recommend that information staff be established on a full-time basis at all PORDS and possibly at selected gun offices in some provinces. These staff members should go to the ORD Agricultural Information Division for training, support, and advice, and should have adequate budget to do effective information work.

Each staff member should be trained in the use of educational media and materials, in production of such materials, and in the general area of educational communication. They will have to be competent producers and performers with the media themselves, able to train others in procedures and techniques and able to consult with other ORD staffs who want to put together educational materials to support Guidance programs.

I saw no evidence of Information personnel being called on to perform all these roles. Yet the ability of ORD to reach and influence farmers and other rural people would increase measurably if competent information staffs performed in all these ways. The rest of ORD's staff may not be aware of how such a trained staff could help them.

There is interest on the part of gun and eup-myon workers in having information people help them to do a better educational and information job. Help is needed in localizing information from ORD, and originating local information.

While the increasing literacy rate among Koreans indicates that written and published materials can be used more and more, a word of caution is appropriate. Local Guidance workers indicate that present information

materials are not simple enough for rural people to understand readily. Readability levels of materials appropriate for Korean rural audiences should be determined, if research results are not available.

Training in the concepts, research findings, and knowledge from communication and other social sciences would be very helpful to ORD workers. Present pre-service and in-service training generally seems good as far as the technical side of Guidance work is concerned, but little social science information and ideas seem to be presented or used.

One or more people in the Agriculture Information Division should be specifically trained in the social sciences as they apply to communications. Such staff members could plan and conduct training with ORD staff at all levels, both pre-service and in-service.

A strong case can be made for a good applied-research program in this Division aimed at improving ORD communications. Such a program could be developed with social scientists and graduate students at SNU College of Agriculture in Suwon.

Rural Youth Division: This Division supports an active 4-H program. Guidance workers are getting many new clubs organized, but their efforts suffer in several respects.

Lack of adequate transportation hampers work of Guidance workers to encourage and develop 4-H programs through periodic visits to clubs, communities, and leaders. Nearby villages get more attention than those farther from the main and branch offices. More and better transportation is needed.

Guidance workers also have trouble involving parents and other volunteer adults in the programs or training sessions. Clubs often are very much on their own.

One suggestion made during my visit was that this Division start a newspaper for leaders and members, to spread news of club activities, pass on ideas and information to leaders and members, and better link the entire system together. This seems like an excellent idea, but such a newspaper must contain material that is simple and clear.

Since about one-third of the rural 4-H clubs are barely underway, the need for continuing support and upgrading is evident. Some of the more active and developed clubs could "buddy" with those just beginning to help them get started; some of the older, more capable members of the established club could serve as advisors. Such a buddy-club system would help the Guidance worker do his job. It would also develop leadership that is latent in some of the rural people.

Rural Youth Division workers report they periodically have to drop what they are doing and help the rest of ORD work with farmers and farm production to meet national goals. If this commitment is extensive, it breaks into development of a continuing, viable 4-H program. Although all Guidance workers are needed in this kind of push, there should be as little interference as possible with the orderly development of the youth program.

As the Koreans say, this is the program that is training youth for Korea's future. In fact, I got the impression that the 4-H program was in some ways more effective than the agricultural high schools in preparing youth for rural life.

The various farm machinery training centers seem to be doing a good job of training youth. However, the facilities of some of the most recently established ones are inadequate. No new center should be established unless it can meet the standards of the better centers.

Despite good training, trainees run into problems. They lack the machines to work with; they may not have money enough to follow the recommended practices they learn. A follow-up program of project assistance is needed to keep these young men and women interested, skilled and committed to the improvement of rural life.

Finally, efforts should be made to make the 4-H National Committee more effective as a fund-raising organization for youth programs.

Community Development Division: Guidance workers in this Division have to be competent in both technical subject matter and human development. Their programs in promoting sideline industries in rural areas seem to be working well. Their Residential Guidance Worker (RGW) program of giving intensive help and guidance to selected villages is ending its third year and is about to be evaluated.

These Residential Guidance Workers also get involved, in varying degrees, in pushing for farmers to meet national production goals. To the extent that they are perceived as advocates of government policy, they lose their effectiveness for helping rural communities in total development. Thus, to whatever extent possible, RGWs should not be involved detrimentally in carrying out government production-goal efforts.

If the RGW program is to continue, every effort should be made to cut the worker turnover rate. Since they often work and live under very difficult conditions, new incentives may have to be found to keep them on the job long enough to be effective, since most tasks undertaken are slow to achieve fruition.

Home Improvement Division: This Division faces an extensive and difficult job with limited resources. Much of its annual budget is spent in the field directly for home improvement projects, and more budget is needed



for its own staff and programs.

Competition for university-trained women in Korea is heavy, so the proportion of such women in the Division has gone down drastically, with a corresponding rise in the proportion of high-school graduates employed. Money is certainly a problem; it is a real question of whether ORD can devote enough money to this Division to compete successfully in this job market for women. The Division needs to hire more university-trained women, but the realities of the situation seem to be that high-school-trained women will have to do much of the job for some time to come.

In this situation, this Division needs money and staff for a continuing training program to upgrade its workers in many areas of technical subject matter, and human relations and concerns. Some of this upgrading starts with training conducted by the Agricultural Officials Training Institute. The Institute should have women on its faculty to help plan and conduct such training, since the Institute has begun training women in guidance work.

The recent placing of the Home Improvement and Applied Nutrition staffs under a pay and promotion system separate from the rest of ORD needs to be reversed so that all ORD employees again are handled the same way. This move was a program downgrading that was unnecessary and unfortunate.

Liaison should be developed with women's colleges and universities to train women specifically for ORD work. Current curricula in these places are urban-oriented; there needs to be a complementary rural-oriented program as well, to provide such groups as ORD with well-trained staff.

Research in home improvement should be encouraged in women's colleges and universities. Some of it may have to be done in the Home Improvement

Division itself. In any case, more research is needed, particularly at the village level, to help point up what can be done and how.

Workers in this Division, as with those in several of the other Divisions, feel that so much time and effort goes to specific governmentally-ordered national-goal programs, such as establishment of methane gas facilities, that they are prevented from doing a total educational job. The Division will be able to expand its basic long-range home improvement only if it is given more time and budget not tied specifically to a national goal program.

Applied Nutrition Project: This project is the newest Division of ORD, and has to depend largely on field staff from the other divisions to carry out its programs. As a result, it seems to have a very good feedback system from field to national level. National and provincial-level project workers are continually in the field, observing and helping.

Since it is a new Project, it is still fighting for recognition and status within ORD. Being in ORD tends to limit it to working with agriculture and agencies closely connected with agriculture. At the same time, the staff sees the desirability of the Project being broader and having ties with local schools, health units, etc. MAF and ORD should encourage this.

Technical Dissemination Division: This key Division tries to achieve national production goals in agriculture. The principal need of the Division is for a viable, realistic, relevant agricultural research program to back it up. Without adequate answers, Guidance workers will not be able to help farmers meet rising national production goals. Nor will they be able to help farmers begin production of high-value new crops. Much of the work of ORD Research Bureau is agricultural, but more is needed.

Efforts of this Division to train farmer-leaders as diffusers of good agricultural practices and ideas at the gun and myon levels are commendable and should be continued; the training should not relate only to IR-667 but should cover other crops as well.

Agricultural Information Division staff should take part in planning and preparing educational materials for these farmer-leader training sessions as proposed above.

The soils and fertilizer program of the Division which trains Guidance workers to perform soil testing services for farmers, also should train farmers to run the tests themselves. Then Guidance workers could concentrate on other aspects of soil fertility, including provision of fertilizer recommendations for farmers.

Additional support and guidance for Korea's move toward processing facilities in rural areas is needed. Installing processing facilities needs to be matched by enough produce to warrant the facilities. For example, processing facilities are not warranted for one seasonal crop, but if other fruits and vegetables also are produced in that area in sufficient quantity, processing facilities become feasible. This Division should support and develop such combinations, and probably needs applied research to gather feasibility and operations information.

The separation of the Agricultural Economics Research Institute from ORD in 1970 seriously weakened ORD programs in farm management. ORD is making efforts to strengthen this section of the Technical Dissemination Division, and these efforts need to be continued. Consideration eventually should be given to moving this program from subdivisional status to that of a full-fledged division of ORD.

Programming and Evaluation Division: This Division has the tremendous

task of coordinating and overseeing the work of the other divisions.

One question is whether this Division ought to retain responsibility for handling the budget which supports rural organizations such as the village farm leader training, and local level volunteer leader training.

The efforts of this Division to help build a viable rural leadership network are commendable. Rural leadership needs continuing ORD help to survive and develop, and this investment offers a great potential payoff for rural Korea.

It seems, however, that other Divisions in ORD might well take on these responsibilities, to free this Division to move in new directions.

One new direction should be toward better and more constant evaluation. At present, evaluation work is primarily short-term, and aimed at assessing organization results in meeting national planning goals. While this information is useful, it does little to help the Guidance Worker do a better job; nor does it allow comparison of effective or different methods or means of education.

As ORD planning and operating shift from the present top-down system to a more local decision-making model, as I feel they will, evaluation information of ideal planning and operating will be vital to the success of ORD. Other types of evaluation research should be promoted and encouraged now: staff members should be sent overseas to school to become evaluation researchers; and the current evaluation program and staff should be expanded and strengthened. Academic training abroad is one of the best ways to ensure an upgraded evaluation staff.

Agricultural Officials Training Institute: This Institute is vital for the future of ORD. Guidance workers appreciate the efforts of the Institute and see it as an important means of their getting training and updating

in knowledge and skills.

The Institute should be encouraged in its efforts to build a training program for the various ORD needs. It also should develop plans for "life-long" training and upgrading program of ORD employees.

While educational media and other equipment for the Institute is adequate, much of it is very outdated and should be replaced soon.

The Institute staff today is inbred--mostly College of Agriculture, SNU, many former ORD system workers. I found no staff with any real background and training in the subject of training, and staff members need to take advanced graduate study.

The staff and Institute should have both formal and informal ties with a department of the College of Agriculture, SNU, to improve the teaching program of the Institute. The Department of Agricultural and Extension Education would be a logical place for such ties and also could encourage development of evaluation and research programs for the Institute in the areas of teaching and learning.

The Institute also needs staff members with social science training since rural development entails human development and working with people. Guidance workers need to understand these aspects of their jobs and do them better.

The Institute is beginning to train women Guidance workers. The Institute staff should include one or more women to promote and implement this training. The Institute should continue to coordinate its planning with the Home Improvement and Applied Nutrition Divisions in this area of training.

#### Recommendations for Agricultural Education

1. In many agricultural high schools, young people are required to take an agricultural curriculum regardless of interest or future plans.

The Ministry of Education should allow a choice and strengthen the agricultural training offered to those who want it and can benefit from it. Too often facilities for agricultural teaching in these high schools are most inadequate in equipment, facilities, land and animals. Often students are taught theory but given little or no applied training.

2. The Extension Education academic program of SNU's College of Agriculture should be encouraged and promoted. Graduates of this program will make good ORD replacements and should be candidates for ORD evaluation and training positions. A strong academic staff and program also can provide an "outside" group to constantly question and examine ORD's philosophies, programs, procedures, and results; such a program would keep ORD alive and innovative.

3. Efforts to get Guidance workers and agricultural high school vocational agriculture teachers to work together should continue. These two groups traditionally provide much of the educational leadership. Only by working together can they bring their potential to bear on creating the best programs for rural Korea.