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TIPAN

Transformation and Integration of the Provincial Agricultural Network

Northwest Frontier Province, Pakistan

Office of International Agriculture
University of Illinois at Urbana-Champaign

In collaboration with
Southern Illinois University at Carbondale

CONSULTANT REPORT - DUANE E. ERICKSON

PRODUCTION ECONOMICS

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the Northwest Frontier Province
Agricultural University
Peshawar, NWFP, Pakistan

and

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CONSULTANT REPORT

TRAVELER: Duane E. Erickson, Department of Agricultural Economics, University of Illinois at Urbana-Champaign

ITINERARY:
3 May 1986 Depart Champaign
5 May 1986 Arrive Peshawar
28 May 1986 Peshawar to Islamabad
29 May 1986 Depart Islamabad
30 May 1986 Arrive Champaign

PURPOSE: To serve as a Production Economics Consultant to the Northwest Frontier Province Agricultural University on the TIPAN project.

OBJECTIVES:

1. Review the research, teaching and outreach program of the Institute of Development Studies and the Department of Agricultural Economics, Rural Sociology and Extension Education.

2. Assist in developing the use of computers in analyzing data.

3. Provide guidance in the use of quantitative techniques.

4. Assist in planning and initiating an approach to strengthening the department, including staffing, equipment and facilities.

5. Give guidance in developing a farming systems program.

PRINCIPAL ACTIVITIES/ACCOMPLISHMENTS:

Each one of the objectives was addressed, and varying levels of progress are summarized below:

1. Review of Research, Teaching and Outreach Program of the Institute of Development Studies (IDS) and the Department of Agricultural Economics, Rural Sociology and Extension Education.

A) The review of the IDS research was completed by scheduling hour interviews with 10 staff members. Interviews were facilitated by Dr. Errol Rodda with Dr. Nurul-Islam Mian, Director of the IDS, arranging a meeting with his staff during which the objectives of the consultant activities were discovered. A result of this interaction was 8:00 to 10:00 a.m. interviews with IDS staff for five days.

A list of reports that the staff had completed and reports in progress was made available. This list is as follows:

S.No.	Name & Designation	Reports recently completed	Reports in hand
1.	Mr. Janbaz Khan, Sr. Res. Specialist/ Associate Prof.	1. Evaluation of Immediate Effects of Canal Construction in DIK District. 2. Resources Base and Economic Progress of Malakand Division.	Rural Development Approaches in Pakistan/ N.W.F.P.
2.	Mr. Fazal Rahim, Sr. Res. Specialist/ Associate Prof.	Problems and prospects of promoting industrial exports in NWFP.	Evaluation of Kurram Fruit Product Industry in FATA.
3.	Malik Arshad Salim, Res. Specialist/ Asst. Professor	--	Socio-economic Impacts of Afghan Refugees on the local population of Peshawar.
4.	Mrs. Shaheen Shaukat, Jr. Res. Specialist/Lecturer	The role of women in rural development in three selected villages.	Indices of prices paid and received by farmers and terms of trade for Agriculture.
5.	Mr. Hamayun Khan, Jr. Res. Specialist/Lecturer	The development of Small scale Agro-based Engineering Industry in N.W.F.P. (A case study of Mardan Tehsil.)	Prices of Agricultural commodities in N.W.F.P.
6.	Mrs. Khalida Shahnaz, Jr. Res. Specialist/ Lecturer	Impact of Male Emigration on the role of Rural Women in Kohat District.	Socio-economic condition of Women in Landless Families in Rural Areas.
7.	Miss Raheela Begum, Jr. Res. Specialist/Lecturer	Pak-China Trade with Special Reference to Trade Through Silk Route.	Vocational Training Facilities for Women in Urban Rural Areas of N.W.F.P.
8.	Mr. Manzoor Hussain, Jr. Res. Specialist/ Lecturer	--	Consumption and Saving Behaviour of the Farmers.

S.No.	Name & Designation	Reports recently completed	Reports in hand
9.	Mr. Farman Ali, Jr. Res. Specialist/ Lecturer	--	Time Series Analysis of Sugarcane.
10.	Noor Paio Khan, Jr. Res. Specialist/ Lecturer	--	Economic Characteristics of the people of N.W.F.P. (1901-81.)

There are six studies that concentrate on Economic Policy area and two studies concentrated on the Neighboring Economies. The Rural Development area had nine studies, according to the general classification. One was conducted on Tribal Area Development.

Impressions of Institute of Development Studies

The overall impression of the IDS research was good. A problem statement, purpose and/or objectives were part of the individual studies reviewed. Questionnaires were pretested in cases of surveys. A revised questionnaire was provided to the reviewer in cases where the questionnaire changes had occurred after pretesting. Data tabulation and analysis examples were also provided.

A great deal of hand calculation of data/or calculation computation were completed on preliminary data.

NWFP AU has a microcomputer laboratory that may be of use to researchers. Tables may be developed through the use of the LOTUS 1-2-3 spreadsheet. Mr. Tony Kerber has software programs available on hard disk so they can be used by researchers in the IDS. Study and research activities analysis can be substantially speeded up if staff adopt the use of the microcomputer data processing.

Study results are being published by the IDS in easily read publications. It was difficult to determine the distribution of these publications within the Province and Country. Studies appear to have relevance to important questions. These studies should be directed to those audiences requiring answers. The University research, teaching and outreach or extension groups should at least have copies or the indications of availability of research publications on a periodic basis. A procedure for ordering publications should be developed and distributed to the appropriate staff and institutions.

Description of Research Publication Reviews

The IDS group appears to have research projects with statements of problems, objectives, methodology, procedures and analysis of results fairly well stated. The study results, review and final publishing appear to be well organized. The studies are in a form that provide ideas for economic policy use, neighboring economies, rural development and tribal areas development.

Recommendations on Institute of Development Studies

The recommendations will be made in these areas:

1. General organization
2. Staffing and/or training
3. Study areas or research completed
4. Equipment

General Organization

The organization appears to be director dominated in terms of decision making. Individual staff members identify with a particular section of the organization. Leadership is identified and work planning appears to be operating quite well.

Staffing and/or Training

There are a few long-term staff members in the 10 staff interviewed; three of the ten staff had tenure over five years. Two of the three appear to have some administrative responsibilities that may take some experienced supervisory resources from the groups. There appears to be a large proportion of staff recruited from the University of Peshawar. Future staffing should include staff trained at other Universities. There appears to be a lack of training in statistical procedures. Knowledge of statistical tests, statistical procedures and presentation of data are definitely needing improvement. Research staff need work in elementary statistical methods, tools and use of microcomputer statistical packages. Perhaps the local statistical group has the experience to upgrade knowledge and skill in statistical procedures, if not, special efforts should be made to develop these skills. Experience in the use of SYSTAT microcomputer software package may be one direction to use and gain practical experience of statistical techniques. Also there may be a need to increase mathematics requirements for undergraduate and graduate students.

Study Areas or Research Completed

Four major areas have been defined. The staff are identifying their areas of interest, conducting studies and preparing proposals for new studies. A majority of the staff have training only in economics. The agricultural sciences are not a part of the training of a majority of the staff. Some type of coordinating arrangement may be useful for the IDS and the Department of Agricultural Economics, Rural Sociology and Extension Education. It appears that research progress reporting and coordinating meetings between these two groups are needed every three months in order to assure a free flow of information, exchange of current research and to prevent research duplications.

Equipment

Equipment needs appear to fall in one major area. Calculators for individual staff are needed. Hand held electronic calculators should be available for each staff member for daily use. Calculators with tapes appear to be in limited supply. These calculators might be kept at the central office and be checked out when needed.

Increased computing capacity is needed as more sophisticated research is completed. A number of alternatives exist. IDS has some Cromemco microcomputers or minicomputers. One strategy would be to use microcomputers in the computer laboratory. Another strategy would be to set up computational units in both IDS and Agricultural Economics. The computing capacity would need to be large enough to service the needs of the two departments individually or separately. Staff with future additional training will need more computing capacity than now available.

B) Department of Agricultural Economics, Rural Scoiology and Extension Education

The review of the teaching and research program of the Department of Agricultural Economics, Rural Sociology and Extension Education initially included group discussion sessions. Group session of 2-2 1/2 hours were held on May 8, 10, 11, 12, 13, 14, 15, 18 and 22. Topics discussed included: farming systems research, computer application programs for use in computer aided instructions, cost of production studies, agricultural economics course outlines for undergraduates and graduates, references for use in classes, linear programming, whole farm budgeting and statistical tools. Overall curriculum development was discussed with the group. At one group session, crops budget were constructed for wheat, maize, sugarcane, bhoosa and fodder. These budgeting materials were used while running microcomputer programs from the University of Illinois' Illinet system to estimate income for a typical farm in Pakistan. The result has been a proposal for the development of a microcomputer spreadsheet for farm management and accounting.

Additional information was obtained from the Agricultural Economics, Rural Sociology and Extension Education staff by questionnaire. Definite goals appear to be present in all staff members' responses regarding the future. Positive attitudes were displayed toward the teaching function as being the major responsibility. Staff improvement through in-service training is a goal by a majority of the staff. Good solid interaction was obtained on the search for truth on economic theory questions.

One questionnaire was constructed requesting information on courses taken in statistics. The purpose was to obtain information related to the course work taken and use of statistical tools. The summary indicated all staff had taken at least one course in statistics, four had taken two courses and one had taken three courses. All staff were familiar with the chi-square analysis and analysis of variance. Four staff were familiar with correlation analysis, the T-test and the F-test. Three were familiar with the small t-test. Only two were familiar with multiple correlation analysis.

The training background of staff in graduate economics was related to at least the one or more courses level. Three of the six staff had taken a course in production economics and econometrics. The group appears to see the need of more training in the production economics area. Two books in production economics and one book in econometrics have been supplied by the consultant to the staff for personal reading. A request has been made by the staff to send additional information related to advanced courses being taught and considered. A request will be made to supply the appropriate textbook materials. It appears that a need exists for additional teaching resource materials in the form of production economics and econometric texts.

Recommendation for Agricultural Economics, Rural Sociology and Extension Education Department

The recommendation for the Department of Agricultural Economics, Rural Sociology and Extension Education are in four major areas:

1. General organization
2. Staffing and/or training
3. Study areas or research completed
4. Equipment

Comments will be made based upon the interaction with the group over the past few weeks.

1. General organization - Excellent small group interaction appeared in discussions with the Department of Agricultural Economics, Rural Sociology and Extension Education staff. Close working relationships

are evident when group discussions and activities have been completed. Individual assignments by the Department Head are jointly discussed and agreed upon by the administrator and staff.

2. Staffing and/or Training - Basic mathematics, statistics, production economics and econometrics training are needed by all staff. Individual staff members may benefit from short training courses, specific graduate work in statistics, production economics and econometrics. In general, the staff discussions and questionnaire results substantiated the recognition of the need for graduate work and other training in the statistics and econometrics area.

3. Study Areas or Research Completed - Recommendations are rather specific. The current major objectives are directed primarily towards teaching with approximately 3.67 full-time equivalents allocated to teaching and 2 full-time equivalents allocated to research and .33 full-time allocated to department administration. In general, there is a need for cost of production studies, farming systems studies, crop and livestock production projection studies and marketing studies. The equivalent of two full-time staff allocated to research will not be able to complete this research. There is a need for more staff that have responsibilities for research. The staff could be located on-campus or at the research stations. The other possibility is that cooperative efforts could be established with the IDS to jointly complete economic studies in the agricultural sector.

   The staff in the Department of Agricultural Economics, Rural Sociology and Extension Education appear to have the technical agricultural training compared to staff from the IDS. The issue is one that should be settled. A clear definition of research areas that should be pursued by the Department of Agricultural Economics, Rural Sociology and Extension Education should be established. The same major definition of research areas should be established for the IDS. The current conflict between the objectives of these two groups may need clarification in order to function efficiently over the long run. It appears that the agricultural sector contributes nearly 30% of the G.N.P. An allocation of staff in agricultural economic research in the mix of total economics research may be appropriate. The need for research for farmer use, financial institution use, input industry use and government policy making use suggests that definite problem areas can be identified. The allocation of research funds needs to be made in the short run on high return research relative to investments made in that research. At the same time, the long-term goals of agricultural research may be directed toward efficient allocation of capital, labor and technology to meet national goals of providing food domestically and export products that are competitive in the world market.

4. Equipment - Equipment needs appear to fall in one major area. Calculators for individual staff are needed. Hand held electronic calculators should be available for each staff member for daily use.

Calculator with tapes appear to be in limited supply. These calculators might be kept at the central office and be checked out when needed.

Increased computing capacity is needed as more sophisticated research is completed. A number of alternatives exist. IDS has some Cromemco microcomputers or minicomputers. One strategy would be to use microcomputers in the computer laboratory. Another strategy would be to set up computational units in both IDS and Agricultural Economics. The computing capacity would need to be large enough to service the needs of the two departments individually or separately. Staff with future additional training will need more computing capacity than now available.

Equipment

Equipment and space recommendation are combined. The office space available for the department head appears to be limited. There appears to be lack of control of the staff or the student entry to the office area because of the lack of a meeting room, reception and administrative space. The question of developing a first-class department may rest on this question. An administrator must be able to control access if administrative duties are to be performed. This means a larger office is necessary to perform duties.

The second recommendation also relates to this question. There is a need for additional computing equipment in the Department of Agricultural Economics, Rural Sociology and Extension Education. Hand held electronic calculators that are battery operated with locally supplied batteries may be the first item to purchase. The second recommendation relates to a larger question of the use of the microcomputer laboratory for research purposes. This question will be addressed in the short-run and in the long-run.

a) Short-run suggestions are that the computer laboratory be used to develop computational capacity by using the LOTUS 1-2-3 spreadsheet and the SYSTAT statistical packages. Also an individual microcomputer might be purchased for the department to begin to develop the ability to use the equipment for word processing, statistical calculations and data storage.

b) Long-run suggestions are related to how much computational capacity is needed. Current skills in mathematics, calculus, matrix algebra, systems analysis, linear programming and economics need to be developed in either the Department of Agricultural Economics, Rural Sociology amd Extension Education or IDS staff. A few staff are acquiring these skills at the current time. The allocation of funds for computers with larger capacity than now available in the computer laboratory should coincide with the availability of staff that can effectively use the equipment in research. If computing equipment of larger capacity is made

available to the IDS or the Department of Agricultural Economics, Rural Sociology and Extension Education, specific skills in statistics, mathematics, production economics and econometrics must be improved. Either short course training or graduate study may be used to acquire these skills. Beginning students in Agricultural Economics and Rural Sociology should be encouraged to take more mathematics in their curriculum at the B.Sc. and M.Sc. level. Additional courses in statistical procedures, analysis procedures and tests should be encouraged by staff while advising undergraduate students who may pursue graduate study.

VISITS TO THE RESEARCH STATIONS

Four research stations were visited during May 17 through May 21. The Agricultural Research Institute, Tarnab was the first location visited on May 17. The purpose of the visit was to allow interaction between the staff and the Vice-Chancellor. A visit to the soils science laboratories provided an opportunity to see the soil testing equipment and facilities. A reporting session provided some insight on research work, staff size, and field demonstrations being carried out by Bio-chemistry, Plant Physiology, Plant Pathology, and Entomology groups. Other groups reported on the second day when I was not present.

The Cereal Crops Research Institute, Pirsabak, was visited on May 19. Maize breeding, variety evaluation, international testing and selection research were discussed. Seed production for wheat and maize research were discussed. Sorghum and millet are being considered. A shortage of seed adaptable to Pakistan is noted in sorghum and millet. Rice and barley breeding are also being carried out. One self-propelled 12-foot combine was being used at Pirsabak to harvest wheat. Wheat is bagged, cleaned and rebagged, checked for germination and other qualities before being released. Fast mechanical harvesting rather than traditional methods is needed to produce a higher quality seed crop. A visit to the station machinery area revealed some equipment in good repair. Also a number of tractors, old combines and other pieces of equipment were in need of spare parts to make them functional again. The Cereal Crops Research Institute appears to be conducting research and seed production work that have high returns for capital invested.

The third research location visited was the Mardan Sugar Crops Research Institute on May 20. Reports on sugar beet seed varieties imported from Denmark, Sweden, Belgium and Germany were discussed. There are some problems in sugar beet seed production in Pakistan. Some sugar beet varieties have also been obtained from the Salinas Valley in California with good results. Date of planting, time of fertilizer application, herbicide use and other technology studies were discussed briefly. Weed control, harvesting and leaf defoliation were problems discussed for the sugar beet production. A discussion of the sugarcane stem and root borer, white fly, pyrilla and termite control studies was presented by the staff doing entomology research. Sugar beet insect and

disease research work is conducted at Mardan. Also, there is some work being done on germ plasm related to induced flowering to improve the sugar content in sugarcane.

The fourth location visited on May 21, was the Agricultural Research Institute (North), Mingora, Swat. Abdul Qadir Syed, director, provided a personal tour. Research work on rape and mustard, tomatoes, asparagus, onions, mushrooms, apples, peaches, pears, almonds, cherries, strawberries, wheat and plums was noted on this 26 acre farm. The land base, according to the director, should be expanded by at least 100 acres. Additional staff and buildings are needed. The research director is an enthusiastic person indicating interest in agricultural economics and agricultural engineering research.

Recommendations Based on Four Research Station Visits

1. Agricultural economics studies related to crop and livestock production costs are needed at each one of these stations.

2. The Agricultural Research Institute, Tarnab, is the only station with a staff member allocated to Agricultural Economics, Rural Sociology and Extension Education. Coordination is needed between Tarnab and the Department of Agricultural Economics, Rural Sociology and Extension Education at the NWFP Agricultural University. A farming systems research study perhaps can be done in cooperation with the Tarnab Research location.

3. The Sugar Crops Research Institute does not have a staff person trained in Agricultural Economics, Rural Sociology and Extension Education. There is need for cost of production studies to be completed for sugarcane and sugar beets. The alternatives are to conduct the work through NWFP AU staff from Peshawar or by stationing a staff member at Mardan. The overall effort may be initiated by the farming systems research approach. A study team might be assembled for farmer interviews, identification of major problems and initiation of appropriate research on the sugar beets production costs. Also, the sequence of various kharif and rabi crops net returns may also need study.

4. The Agricultural Research Institute at Mingora offers potential to begin studies on the costs of producing tree fruits, tree nuts, strawberries, tomatoes, mustard, rape, asparagus and mushrooms. The maize seed multiplication work at Kabal near the Swat river provides an opportunity for either a NWFP AU staff at Peshawar or a new staff person trained in Agricultural Economics stationed at Mingora to conduct cost studies on maize. The enthusiasm of the current director, Abdul Qadir Syed, would be helpful in research work with an outreach component. Coordination is being provided by Dr. William Seiders, TIPAN, regarding the maize seed multiplication project. The coordination between TIPAN, the local

Mingora research and extension workers in the Kabal village and the Madyan area are illustrations of working with farmers in a coordinated effort that will have impact in the coming years.

5. Other research stations may have similar opportunities in securing sound economic data that reflect current returns with current technology. Also, projections can perhaps be made to determine the effect of additions of technology for the major crops of maize, wheat, sugarcane, sugar beets, and tobacco. Also the farming systems research approach may be a possibility to evaluate the effect of both rabi and kharif season crop sequences in terms of total crop production, crop utilization and overall crop supplies. The development of economic data from these studies for each of the regions will be determined through the allocation of research and outreach resources. Basic economic information is needed as a foundation for making farmer recommendations, marketing studies and policy recommendations for the various regions.

6. The picture is not clear for the research activities in livestock production. If meat and milk compose 88 per cent of the income derived from livestock in the early 1980's, initial cost studies should be considered as a part of farming systems research in the cattle, goats, sheep and buffalo. A staff member or a group of staff members at the NWFP Agricultural University with experience in cost of production studies may need to provide the basic format to obtain costs and establish procedures for publishing costs for use in outreach, research and teaching. A farm management manual or farming systems manual for the entire Northwest Frontier Province may need to be published after individual area or division studies are completed. A budget is needed for distribution of these published studies as plans for these are made for year 1, year 2, year 3, year 4, year 5 and so on. Data may be supplemented by obtaining data from individual farmers in various parts of a region, district or other geographical areas.

7. A staff member in Agricultural Economics, Rural Sociology and Extension Education has begun discussions trying to do some farming systems research. Mohammad Nawab Khan has proposed a farming systems study and there is a need to fund some research at either the Pirsabak, Mardan or Mingora locations. A preliminary draft has been reviewed. The rewriting of the proposal has been suggested to sharpen parts for submission as a project. The first step recommended is to begin this effort to supplement previous work done by the Department of Agricultural Economics, Rural Sociology and Extension Education and the Institute of Development Studies.

8. The final recommendation relates to the establishment of a structured committee that may support farming systems research. A suggested name for this Northwest Frontier Province Agricultural University standing committee is "Farming Systems Advisory

Committee." One member from each concerned academic department would be appointed by the Vice-Chancellor for at least a two year term. Members from this committee could be selected for a particular farming systems task force research committee to jointly work on a specific geographical or crop or livestock problem. A task force committee would be assigned to a major problem, complete an initial farming systems needs assessment survey, identify problems and secure appropriate staff to conduct particular research efforts. The first place to secure research help would be from members of the overall Farming Systems Advisory Committee.

9. One additional staff person is needed for the "Farming Systems Research Studies."

10. Training of staff in mathematics, statistics, and advanced production economics, should be encouraged through short-term training either on-campus or at some training location. One possibility is the use of the National Agricultural Research Center.

Seminars Presented

Three seminars were presented while at the Northwest Frontier Province Agricultural University. Dates of the seminars were May 12, 26, and 27. Seminar titles were:

1. Farming Systems Research;

2. Production Economics Research, Teaching and Outreach Opportunities;

3. Microcomputer use in Teaching, Research and Outreach

These seminars were well attended and good discussions followed.

Some student unrest was noted while at the NWFP Agricultural University. NWFP AU and TIPAN staff are aware of the overall situation regarding student protests on examinations and make-up tests.

ACKNOWLEDGEMENT

My thanks and appreciation go to the TIPAN team members, all of whom gave generously of their time in discussing their activities. Special thanks are due Dr. Errol Rodda, Dr. Martin Waananen, Mr. Joe Marion, Dr. William Seiders, Dr. Ray Cragle and Mr. Tony Kerber for their counsel and support during the stay in Peshawar. Also, my thanks go to the TIPAN staff and their wives for the social activities, interaction and advice regarding local conditions.

Special thanks go to Vice-Chancellor G.M. Khattak, Pro-Vice Chancellor Nurul Islam Mian, Dr. A. Jamil Siddiqi, members of the IDS staff and the Department of Agricultural Economics, Rural Sociology and Extension Education staff for their cooperation and patience during my stay at the NWFP Agricultural University, Peshawar. Thank you for your Pathan hospitality and personal attention.