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**THE DEVELOPMENT OF AN ECONOMIC
RESEARCH PROGRAM IN THE MINISTRY OF
FOOD, AGRICULTURE AND COOPERATIVES**

Special Report Series No. 17

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1.0 INTRODUCTION

In 1985, the Ministry of Food, Agriculture and Cooperatives (MINFAC) began implementation of the Economic Analysis Network (EAN) Project to strengthen its economic and policy analysis capabilities. Considerable progress has been made in building a network of professional agricultural economists to support MINFAC's economic and policy analysis needs. However, the primary goal of institutionalizing a key economic and policy analysis agency within MINFAC has not been realized because of a lack of funds for staffing and a general lack of appreciation of the potential benefits of economic analysis in formulating more effective agricultural policies.

1.1 The Role of Policy Analysis in Improving Food Security

The EAN Project was established to support the Government of Pakistan's long-standing goal of improved food security. The Project was launched against the background of the popular notion that economic analysis does not have a significant role in policy formulation because of overriding political considerations. This view has unfortunately been endorsed by some of the country's economists. However, what has often been overlooked is the politician's appreciation of objective economic analyses that measure the tradeoffs affecting various interest groups as limited resources are allocated among competing agricultural policy goals. Unfortunately, very little of the economic analysis needed for formulation of effective agricultural policies has been attempted. As a result, most agricultural policies are implemented on an *ad hoc* basis, with little coordination between relevant government agencies. This situation has also led to many lost opportunities for improving food security because decisionmakers have not been supplied with reliable measures of economic performance under existing and alternative policies.

1.2 Objectives of This Report

This report was prepared to assess progress to date in strengthening MINFAC's economic and policy analysis capabilities and to recommend additional measures for implementation under the auspices of the EAN Project. The second section presents a simplified description of the agricultural policy process to emphasize the basic procedures MINFAC should consider in streamlining its policy formulation and analysis operations. The third section describes a simple agricultural policy analysis framework that can be useful in managing an agricultural policy research program. The fourth section analyses the current market for agricultural policy research and explains why both the value (price) and level of research are low. The fifth section reviews MINFAC's agricultural policy research program and assesses the effectiveness of the current agricultural economic research management system. Finally, the last section recommends new courses of action for improving the management of agricultural policy research, in accordance with the EAN Project's objectives.

2.0 THE AGRICULTURAL POLICY ANALYSIS PROCESS

To better understand the economic research management challenges facing MINFAC, it is useful to review the main activities necessary for formulating effective economic policies. The agricultural policy analysis process consists of a continuing cycle of at least nine distinct activities: (1) identification of broad agricultural policy goals; (2) identification of the major interest groups contributing to and/or affected by the policy goals; (3) identification of major policy problems shared by some or all interest groups; (4) evaluation of current policies and research results relating to policy problems; (5) identification of new

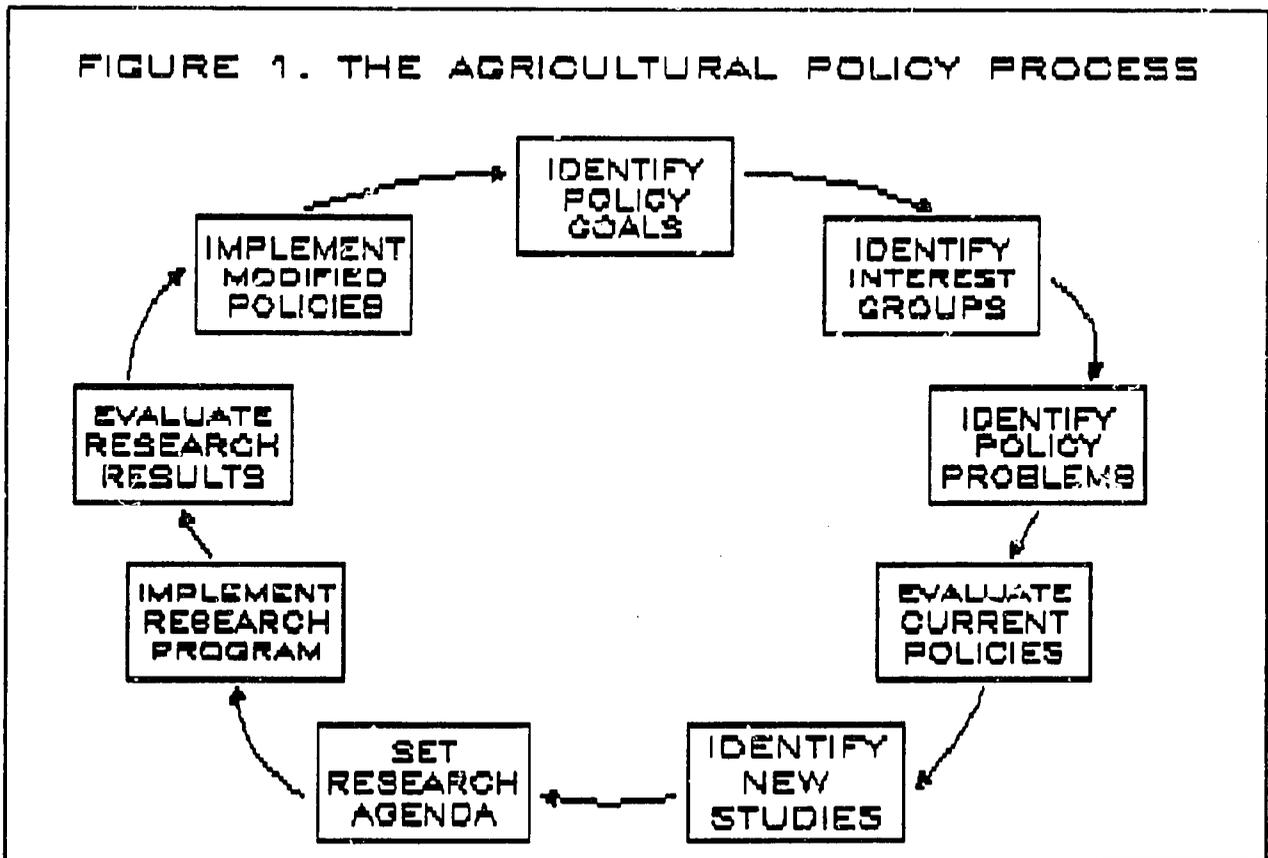
research topics needed to resolve the policy problems; (6) establishment of a policy research agenda and priorities for managing research resources; (7) implementation of the policy research program; (8) evaluation of the policy research program's results; and (9) implementation of modified policies to address current policy problems. After the cycle is completed, the process continues to reappraise policy goals, problems, and needed new policies and policy research. Figure 1 below summarizes the agricultural policy process.

2.1 Identification of Policy Goals

One of Pakistan's most important agricultural policy goals is improved food security. Other goals, as stated by decisionmakers and published in annual economic reports and five-year plans, include: full employment of domestic resources; an improved trade balance; improved nutritional status for low-income households; and improved incomes for small farmers [45,46,49,50].

2.2 Identification of Policy Interest Groups

There are at least five important groups who have vital interests in the formulation of agricultural policies: (1) household consumers of food; (2) agribusinesses providing services to link inputs to farmers and agricultural commodities to household consumers; (3) farmers producing food for subsistence and sale; (4) suppliers of such agricultural inputs as land, labor, capital, water, chemicals and improved technologies; and (5) government policymakers, who are responsible for promoting improved national economic welfare.



2.3 Identification of Policy Problems

Problems with current economic policies are identified by interaction of interest groups with government decisionmakers and independent studies by policy analysts. The problems are usually stated in terms of shortcomings in meeting agreed national economic policy goals.

2.4 Evaluation of Current Policies and Research Results

As new policy problems are identified, government decisionmakers may request policy analysts to assess the economic effects of current policies and relevant economic research results to identify new policy research needs.

2.5 Identification of New Policy Research Topics

New policy research needs are usually transformed into specific research topics that should yield information required to develop and implement more effective economic policies.

2.6 Establishment of Policy Research Agenda and Priorities

The economic research program will usually have insufficient resources to thoroughly study each proposed policy research topic. The EAN Project has implemented a research program based on an agenda of 13 topics. However, the program can be managed more effectively if a research agenda is established with priorities set on all proposed research topics across broad areas of agricultural policy concern, and among all studies supporting a particular policy concern.

2.7 Implementation of Policy Research Program

Once decisionmakers have identified policy research priorities, policy analysis agencies are assigned responsibilities for implementing a research program to produce timely, relevant policy information according to the research agenda's policy priorities. The MINFAC Directorate of Agricultural Policy (DAP) has implemented a program of economic research with EAN, cooperating public sector institutions and private research firms. Supplemental research support has been provided through special commissioned studies conducted by the EAN Project and DAP professional staff.

2.8 Evaluation of Policy Research Program's Results

As research studies are completed, the government's policy analysis agencies are responsible for evaluating the studies for their compliance with the terms of reference and their value to decisionmakers in formulating improved policies. The DAP has been organized to monitor EAN research contracts and prepare summary briefs of research results that are relevant to decisionmakers' agricultural policy information needs.

2.9 Implementation of Modified Policies

After reviewing the results of studies that were initiated to produce information on the economic consequences of a particular policy problem and alternative policies to address the problem, the decisionmakers must review the findings and adopt a policy that appears most promising in meeting policy goals. The decisionmakers' new policy

choice may not necessarily reflect the course of action suggested by economic research because of social, political and administrative impracticalities in implementing the "best" economic solution.

2.10 Continuation of the Policy Process

Once a new policy choice has been implemented, the policy process continues through the nine-step cycle again as interest groups reappraise policy goals and the effectiveness of the new policy in attaining those goals. The cyclical nature of the process demonstrates several important characteristics of policy analysis. First, the base of knowledge about the policy environment is constantly expanding as new studies are conducted and current policies are evaluated in light of new goals and/or changing economic conditions. Second, the process is heuristic, in that newly acquired policy information is used to "correct" or "improve" old policies. And third, the process is optimizing, in that an attempt is made to maximize some sense of a social welfare function with each policy change.

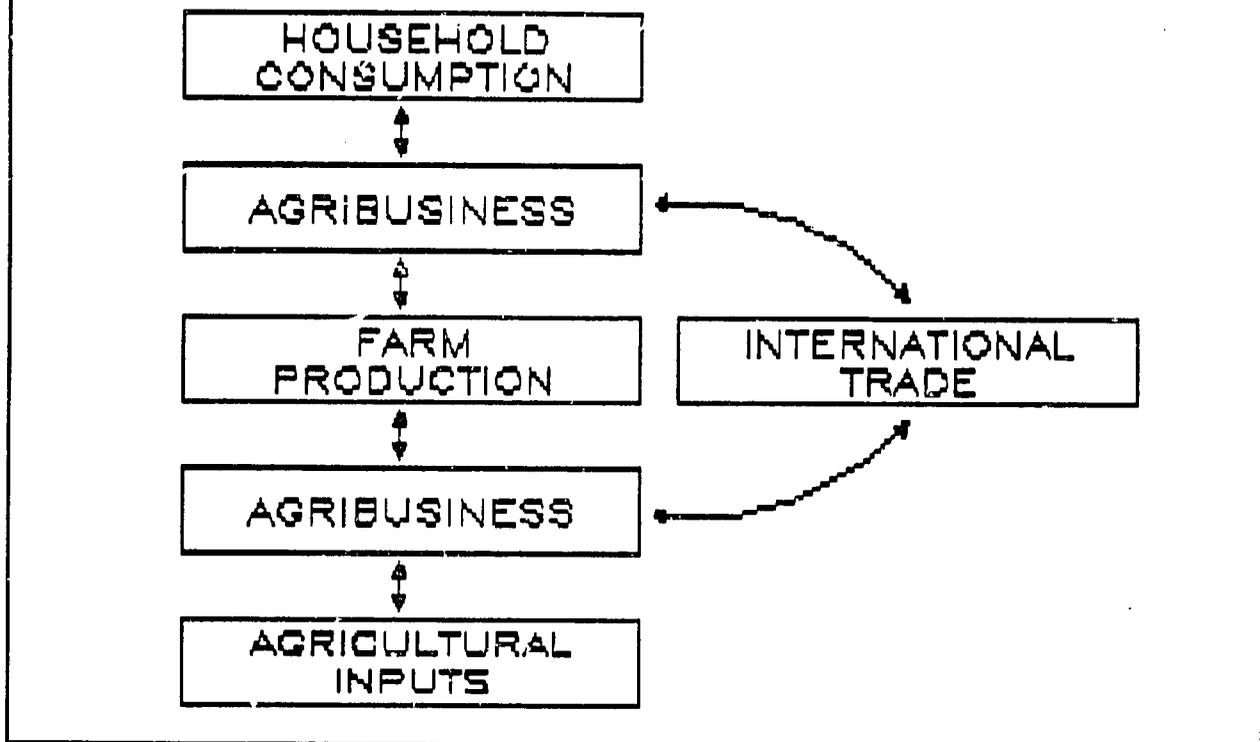
3.0 AN AGRICULTURAL POLICY ANALYSIS FRAMEWORK

In managing an economic research program to support government's agricultural policy research needs, the MINFAC is faced with the problem of determining the most effective employment of its limited resources. As research topics are scheduled for implementation, special care must be taken to place each study in a research management framework that considers the relevant policy interest groups, the availability of researchers with appropriate subject matter skills, and the relevant functional market activity.

As shown in Figure 2 below, household consumption has two-way interaction with agribusiness in the marketing of food and fiber products in response to consumer demand. Farm production interacts with agribusiness marketing functions in demanding agricultural inputs and supplying agricultural products. The owners and suppliers of agricultural inputs interact with agribusiness marketing in meeting farm input demands. Finally, agribusinesses in the input-farm production linkage and the farm-household consumption linkage also simultaneously interact with international trade functions to adjust national food and fiber market imbalances with international input and product markets.

Each component of the proposed agricultural policy analysis framework has been identified as an area of policy research interest in the EAN Membership Directory [37, 39, 40] to encourage the development of sub-networks of EAN members in those specialty areas. The EAN Project has developed local applied economic analysis workshop syllabi for strengthening the network's analytical capabilities in all functional areas of the policy analysis framework except agricultural inputs, which are covered indirectly in workshop topics on farm management, applied economic analysis, marketing, and agricultural supply analysis. In the following sections, each of the five major areas of agricultural policy emphasis are described in terms of major interest groups and policy research objectives.

FIGURE 2. AN AGRICULTURAL POLICY ANALYSIS FRAMEWORK



3.1 Household Consumption of Food and Fiber

3.1.1 Major Interest Groups

All households, as final consumers, have vital interests in attaining a reliable supply of food and fiber at reasonable prices. Households are also interested in attaining sufficient nutrition to assure sound health and labor productivity. Households' general welfare, particularly food security, is one of government decisionmakers' most important responsibilities.

3.1.2 Major Policy Research Objectives

- o Estimate the effects of changes in price policy and disposable income on household demand for food and fiber products.
- o Identify the nature and magnitude of shifts in household food budget shares over time.
- o Estimate the effects of alternative price and agricultural supply policies on household nutritional status.

3.2 Agribusiness

3.2.1 Major Interest Groups

Agribusiness interest groups include all public and private businesses organized to supply inputs to farmers and transport, store, process, and merchandise agricultural commodities from the farmgate to consumers. Government decisionmakers have important interests in this sector to insure timely marketing of agricultural inputs and products at reasonable costs.

3.2.2 Major Policy Research Objectives

- o Estimate marketing margins of major agricultural products between the farmgate and the retail consumer.
- o Estimate potential net economic benefits from the adoption of alternative transport, storage, processing, and merchandising technologies.
- o Estimate the net economic benefits of alternative arrangements to avoid marketing risks, such as on-farm storage, forward contracting, and futures markets.
- o Estimate the net social benefits of current subsidies directly affecting the production and consumption of food.
- o Estimate the net social benefits of current agricultural price support policies, with special emphasis on the effects of price support programs on net government costs, production response, and technological innovation.
- o Estimate market interdependencies among agricultural sectors and between agricultural and non-agricultural sectors in terms of changes in employment, output, imports, and exports due to changes in final demand for food.

3.3 Farm Production

3.3.1 Major Interest Groups

All farmers are the primary element of the government's food security strategy. Subsistence farmers require special consideration because they are among the nation's poorest households and depend on food production to survive. Farmers who market surplus production are of vital interest to decisionmakers because their productivity directly affects the supply of food to urban consumers and the nation's agricultural trade balance.

3.3.2 Major Policy Research Objectives

- o Estimate the physical input-output relationships for all major agricultural products and derive the associated relationships for farm-level changes in production in response to alternative product and input price combinations.
- o Estimate aggregate supply response models for major agricultural products to demonstrate production response to changes in input prices, support prices and technology.
- o Estimate enterprise budgets for all major agricultural products, which can be used to estimate farm income and whole-farm responses to changes in prices, technology,

3.4 Agricultural Inputs

3.4.1 Major Interest Groups

The main groups with interests in agricultural inputs are: the owners of natural resource inputs such as land and irrigation water; the owners of human resources, such as hired farm labor; owners of agricultural durable and financial capital; the suppliers of such purchased farm inputs as feed, seed, fertilizer, pesticides, and fuel; and the suppliers of agricultural technology, such as the Pakistan Agricultural Research Council (PARC).

3.4.2 Major Policy Research Objectives

- o Estimate the demand for major inputs by agricultural product according to changes in input prices, product prices, and technology.
- o Estimate the supply of major inputs according to changes in input prices and opportunity costs of the respective inputs in alternative uses.
- o Estimate the implications for farm production, household consumption, and international trade of reduced supplies of such critical inputs as hired farm labor, irrigation water, and agricultural chemicals.
- o Estimate potential savings on current input costs by adoption of alternative technologies as a basis for rents that may serve as financial incentives to induce technological innovation.

3.5 International Trade

3.5.1 Major Interest Groups

The main groups interested in international agricultural trade include agribusinesses marketing agricultural inputs and products government agencies concerned with international trade regulations and the balance of trade payments.

3.5.2 Major Policy Research Objectives

- o Estimate long-run trends in border prices of agricultural products and inputs and their implications for Pakistan's food security.
- o Estimate Pakistan's comparative advantage in major agricultural commodities and the implications for alternative price support and agricultural technology development and transfer programs.
- o Estimate the effects of increased agricultural production on the demand for imported inputs and the implications for Pakistan's trade balance.
- o Estimate the effects of exchange rate policies on the agricultural trade balance.

4.0 THE MARKET FOR AGRICULTURAL POLICY RESEARCH

The market for agricultural policy research is generally characterized as low demand and supply, resulting in low unit value and low levels of research products clearing the market. If this market were described in a conventional supply-demand diagram, the demand and supply curves would intersect near the origin. To better understand why the agricultural policy research market makes so little contribution to improved food security, it is necessary to review the current market setting of the major policy research suppliers and demanders.

4.1 The Demand for Agricultural Policy Research

The major demanders of agricultural policy research can be classified as government, private sector and parliamentary interests. Among government agencies, the Economic Coordination Committee of the Federal Government is the most important determinant of demand. The ECC increasing refers economic research topics to MINFAC for implementation. Unfortunately, the topics are usually identified without any guidance on the terms of reference or the ECC's expectations about research results. The Federal Committee on Agriculture (FCA) can potentially be an important tool for clarifying MINFAC's responses to ECC research requests and formulating a long-term research program to meet emerging policy issues. However, the FCA currently focuses mainly on production issues and does not exercise much direct influence on policy research. Various agencies within the Ministries of Finance, Commerce, Industries, Production and Planning and Development have major interests in agricultural policy research issues, but their demand is often not focused to attract effective results from suppliers of policy research. MINFAC mainly plays a reactive role, attempting to satisfy short-term, "brushfire" research requests from the ECC, rather than establishing a broad, diversified research program to more effectively manage short-term requests and anticipate the ECC's long-range agricultural policy research needs. A newly formed Federal Special Economic Policy Committee may serve to organize the policy formulation and analysis process, but it is too early to assess its performance.

The private sector is an important demander of agricultural policy research, through the views expressed by chambers of commerce and industry, industry associations, individual processing, manufacturing and trading firms and farmers. As interest groups, their motives are usually viewed with suspicion by government agencies, particularly when special economic privileges in the form of subsidies, exclusive licenses and protective tariffs are sought.

With the advent of a new government in November 1988, the Federal Parliament has become an important new demander of agricultural policy research. The National Assembly Standing Committee on Agriculture will serve to identify key agricultural policy issues and review research results that are relevant to the formulation of new agricultural policies.

There are at least five reasons why the demand for agricultural policy research is low. First, there is a pervasive attitude throughout most government agencies that agriculture does not make an important contribution to the national economy. In a sociological sense, agriculture as come to be connoted as "backward" and the antithesis of the "modern", urban industrial sector. In stark contrast to this popular view, an EAN Project input-output analysis by Ali, Walters and Shafique-ur-Rehman has found the food and fiber system to be an important contributor to the national economy [11].

Secondly, it is difficult for Pakistan to rationalize increased expenditures for economic research when per capita income is low and so many other problems in health, education and food production are more urgent political issues.

A third factor is related to a widespread lack of information about the productivity of agricultural research. Since almost no research has been done in the past on the productivity of investments in Pakistan agricultural research, it is difficult for government agencies with views already predisposed against agriculture to consider investments in agricultural research as competitive with other social uses of capital. Fortunately, preliminary results of a study by Robert Evenson for the GOP/USAID project, Management of Agricultural Research and Technology, demonstrate rates of return to investment in agricultural research that are far above the current economic costs of capital. Evenson's findings are relevant for agricultural policy research, where policy analysis costs far less than the social benefits that can be realized by incremental changes in many of Pakistan's major agricultural policies.

Fourthly, there is insufficient economic expertise among key government agencies responsible for the agricultural policy process. Where knowledge of basic economic principles is weak or lacking, policy practitioners are often at the mercy of their own subjective, and erroneous views of how markets behave under a particular set of policies.

Finally, the cumulative effects of the above factors have resulted in a policy management system that condones, and even encourages fragmentation, duplication and *ad hoc* approaches to policy formulation and analysis across and within agencies. When policy analyses are requested, there is often very little attention to preparation of comprehensive terms of reference. Hence, economic studies are often implemented in response to vague TOR's and the results are often disappointing because the research question was not focused on the true problem.

4.2 The Supply of Agricultural Policy Research

The major supplies of agricultural policy research are: MINFAC agencies, universities, economic research institutes and private sector economic consulting firms. Most of MINFAC's policy analysis is produced by the EAN Project-based Directorate of Agricultural Policy, the Planning Unit, the PARC Social Science Division and the Agricultural Prices Commission (APCom). The EAN Project was implemented to establish prototype studies of key policy issues, thereby setting new professional standards for economic analysis. The Planning Unit produces situation reports on major commodities, and until recently, conducted periodic farm management studies throughout the country [68]. In implementing the EAN Project, MINFAC made a commitment to upgrade the analytical content of Planning Unit reports and develop a more comprehensive approach to all agricultural economic research from an organizational base in the Planning Unit. The Social Science Division of PARC is primarily concerned with analyzing the economics of agricultural research development and transfer to farmers [51]. The APCom is charged with the responsibility for recommending appropriate support prices for important agricultural crops. APCom publishes costs of production for crops with price supports for limited distribution, but does no significant evaluation of the effects of actual and alternative price supports on production and trade.

Universities are one of the most important supplies of agricultural policy research because they have some of the most capable researchers, and are better prepared to address long-range studies with major analytical components. The EAN Project has encouraged collaboration with the Sind Agricultural University, Tandojam and the University of Agriculture, Faisalabad. The Department of Agricultural Economics at Faisalabad has considerable experience in farm cost of production studies.

Economic research institutes are also important suppliers because of their capabilities in conducting studies for their traditional clients, provincial and federal government agencies. The EAN Project has encouraged collaborations with the Applied Economic Research Centre of Karachi University, the Punjab Economic Research Institute and the Center for Applied Economic Studies of Peshawar University.

The largest share of economic research is conducted by private economic consulting firms, mainly for government agencies and donors, such as the World Bank, and occasionally for other private sector firms. The EAN Project prequalified 24 firms to conduct contract research under the MINFAC economic research agenda.

The supply of agricultural policy research is low because of at least four factors. First, the personnel system, particularly in public sector institutions, often does not reward researchers on the basis of merit. When promotions and pay increases are determined largely on the basis of seniority, innovation and creativity, the prerequisites of research productivity, are stifled, if not destroyed.

Secondly, research productivity is often low because of inadequate research management. Research projects are often not monitored by principal investigators and their supervisors to ensure resource-based measures of activity. As a result, projects often suffer long delays, which reduce the researchers' credibility and marketability among clients (demanders). This problem is particularly serious among private sector consulting firms, who often fail to manage projects effectively because their public sector clients do not implement comprehensive contract monitoring programs.

Thirdly, the supply of research is low because most researchers do not have adequate training in research methods and economic theory. Most members of the Economic Analysis Network believe that economic research is somehow not legitimate unless a major primary data survey is mounted. This view is often based on the belief that secondary data sources are unreliable. Yet, even in the preparation of much of the secondary data on agricultural price statistics, there is excessive duplication among agencies because of mutual distrust of other suppliers' data [96]. And unfortunately, most researchers who conduct survey research are inadequately trained in sampling theory, questionnaire development, and survey management methods. Consequently, primary data surveys often generate unreliable data, which then become the basis for analyzing some economic issue. Among private sector economic consulting firms, economic analysis skills are inadequate for most tasks requiring estimation of simple supply-demand or production function models and optimizing the results to demonstrate the effects of some change in the model on a policy-related variable or parameter. These firms compensate for lack of analysis skills by over-emphasizing simple tabular analysis, which are inadequate for explaining complex relationships that often involve systems of simultaneous equations.

Finally, the supply of relevant agricultural policy research is often low because the researchers have no examples of quality research by colleagues to serve as professional standards of excellence. As each new generation of researchers confront a supply of mediocre studies from the past, their chances of producing quality analyses decline.

5.0 THE MINFAC POLICY RESEARCH PROGRAM

MINFAC's goal of improving its economic and policy analysis capabilities is constrained by a lack of adequately trained economists, insufficient permanent funding for personnel and operating costs of a research program and a lack of an effective economic research management plan for using existing research resources. To realize the magnitude of the policy analysis challenge facing MINFAC, it is useful to review the current agricultural policy setting.

5.1 The Current Agricultural Policy Environment

Agricultural policy was last officially described in 1980 by MINFAC [45]. In 1988, the National Commission on Agriculture made recommendations over a broad range of issues [46]. In general, the policies that have evolved over the last two decades:

- o Set farm prices low, to the benefit of non-farm consumers;
- o Collect most export tariffs from two crops: cotton and rice;
- o Support a major public sector role in procurement and storage of wheat;
- o Support a major public sector role in manufacturing vegetable ghee; and
- o Emphasize production solutions to agricultural problems.

As a result of these policies, there has been a persistent shortage of wheat, raising annual anxieties about shortages and high foreign exchange costs of imports. Government wheat procurement and storage operations have led to major marketing inefficiencies and have blocked the development of a private sector wheat storage and trading. More than

three/fourths of vegetable ghee consumption requirements are now imported, in spite of continual government complaints about the high import costs. Cotton and rice are major export earners, but the export taxes have become a major source of resentment by farmers, who claim they are being taxed less fairly than other on crops, and are not able to increase production because cotton and rice farmgate prices have been set too low. Much of the preoccupation with production solutions to agricultural problems has deflected attention from major marketing and subsidy problems beyond the farmgate.

Most of these issues offer striking examples of economic inefficiencies that, if removed on an incremental basis, would lead to significant improvement in food security. Unfortunately, the focus of policy research has been on issues with less potential for immediate improvements in food security.

5.2 The Advisory Committee on Policy Analysis in Agriculture

In February 1985, MINFAC, in anticipation of the EAN Project, created a three-tiered management system to implement the EAN research program. The tiers consist of an Advisory Committee, a Technical Sub-Committee, and a Steering Group. To provide major leadership to the research program, MINFAC formed the Advisory Committee on Policy Analysis in Agriculture (ACPAA). The ACPAA's specific terms of reference are as follows:

- 1) Develop an agricultural economics research program and supervise its implementation;
- 2) Fix priorities of the research studies on the basis of proposals received from various Provincial/Federal agencies, Universities, etc.;
- 3) Review the final results of the research studies; and
- 4) Recommend measures to strengthen the research capability of various public and private institutions.

To assist the ACPAA in the technical implementation of the research program, MINFAC appointed a Technical Sub-Committee of senior economists who have extensive experience in the formulation and analysis of agricultural policies. The terms of reference for the Technical Sub-Committee are as follows:

- 1) Register and maintain a list of research institutions and consultants for the EAN research program;
- 2) Circulate objectives and scopes of studies proposed to be contracted out among research institutes and consultants and pre-qualify 3-5 institutions for the award of each study;
- 3) Evaluate technical proposals of research studies submitted by consultants;
- 4) Approve the methodology, procedure and design of each study for which the institution concerned will make a presentation; and
- 5) Award studies to consultants according to the prescribed procedure.

Upon the award of a research contract under the annual research agenda, a special select group of experts in the relevant subject area was to be appointed to monitor the implementation and technical performance of the the study. The functions of the monitoring groups would be:

- 1) Assist in the formulation of the TOR of a study, if required;
- 2) Supervise and monitor the study being conducted and compare its progress against the agreed plan; and
- 3) Examine the study's draft report.

The ACPAA has met only twice: in February 1985, to develop a research agenda; and in April 1988, to review the results of the EAN Project. Because the Committee has met so infrequently, MINFAC has not had sufficient leadership to manage its economic analysis resources. During the second meeting, the Committee decided to meet at least twice a year, but no other meetings have been scheduled. A major reason for the lack of regular meetings is the Committee's large size. It consists of more than twenty key agricultural policy officials from throughout the country, thus making it very difficult to arrange a quorum for any particular meeting. Also, MINFAC has never been enthusiastic about the ACPAA, perhaps, because it is too large to be an effective management tool. In the absence of close guidance from the ACPAA, the EAN Project has been directed by the Secretary of MINFAC, through an Additional Secretary, with very little interaction with cooperating EAN institutions on the development of MINFAC's economic and policy analysis capabilities.

But more importantly, the ACPAA has not met the minimum requirements of its TOR. The economic research program initiated under the EAN Project evolved with no supervision by the Committee. Although the Committee formed a research agenda, it exercised no supervision over how priorities would be set in deciding which studies were implemented with a limited research budget. The Committee's only effort at reviewing research results came in its second meeting, where most members became aware of the scope of the research program for the first time. Finally, the Committee has not recommended measures for strengthening the research capabilities of MINFAC, cooperating EAN public sector institutions and private economic research firms.

5.3 The Current Economic Research Agenda

One of the Economic Analysis Network Project's prime objectives has been the strengthening of the Ministry of Food, Agriculture and Cooperatives' economic research management capabilities through the implementation of an Economic Research Agenda, which would set priorities on policy issues requiring immediate economic research results. The Agenda was intended to be MINFAC's prime management tool for identifying research priorities, guiding the development of Terms of Reference and allocating research funds among prequalified economic research firms and institutions to maximize the net social benefits of economic research. In February 1985, ACPAA identified 13 major areas of interest for a policy-oriented economic research agenda in agriculture and drafted preliminary terms of reference for each research area. The priority research areas are as follows:

- 1) Price and Import Policy of Seed and Constraints in the Production and Distribution of Important Seeds in the Public and Private Sectors;
- 2) Effectiveness of Pest Control Measures and Problems by Crop and Ecological Zones with a View to Examining Adoption by Small Farmers;
- 3) Application of Fertilizer and Yield Responses of Important Crops by Size of Farm and Mode of Irrigation for Different Ecological Zones;
- 4) Impact of Mechanization on Productivity and Employment by Farm Size and Tenure for Different Ecological Zones and Economic Assessment of Various Levels of Mechanization;
- 5) Constraints in the Flow of Credit with Particular Reference to Small Farmers;
- 6) Impact of Price Policy on Cropping Pattern and Farming System and Estimation of Short, Medium and Long Term Price Elasticities of Supply for Major Crops;
- 7) Study of Farm Productivity by Size and Tenure and Estimation of Domestic Resource Costs for Major Crops;
- 8) Estimate of Private Investment in Agriculture During the Sixth Five Year Plan by Broad Categories of Capital Assets;
- 9) Examination of Post-Harvest System of Major Crops for Minimizing Losses, Reducing Handling Costs and Evolving an Improved Grading System;
- 10) Study of Marketing Margins of Selected Crops in the Context of Farming Systems and Ecological Zones;
- 11) Constraints to Development of Cooperatives in the Country in Light of Examples of Successful Cooperatives in Other Countries;
- 12) Evaluation of Different Models of Extension Services in Terms of Effectiveness and Cost Including the Impact of Communication Media on Agricultural Production; and
- 13) A Study of Trade, Price and Institutional Policies Needed for Procurement, Processing, Marketing and Export of Perishable Commodities.

5.4 Economic Studies

The EAN Project identified three major opportunities for strengthening agricultural economic research within the bounds defined by the annual economic research agenda: 1) competitive contract research by cooperating institutions in the EAN; 2) special commissioned EAN studies, conducted either by Chemonics International Consulting Division, the USAID contractor assisting in implementation of the EAN Project, or awarded on a non-competitive basis to cooperating institutions in the EAN; and 3) special problem-oriented studies by MINFAC economic analysts, with technical assistance from Chemonics. These

research programs are broadly comparable to the Food Security Management (FSM) Project's suggested approach of implementing primary, secondary, and tertiary studies. In addition to these studies, a Special Studies Program was implemented for the FSM Project by the International Food Policy Research Institute (IFPRI) to conduct studies on issues outside the focus of the EAN Project. Additional economic studies have been conducted by the Kansas State University Food and Feed Grain Institute under the Post-Harvest Management Component of the FSM Project.

5.4.1 Competitive Contract Research Program

The competitive contract research program was designed to strengthen MINFA's economic and policy analysis capability by providing technical assistance and funds to cooperating EAN research institutions that serve MINFA's policy research needs. Chemonics was prepared to provide technical assistance to the contracting institutions on a priority basis. Much of Chemonics' assistance was designed to concentrate on developing analytical models that measure fundamental economic relationships (input-output coefficients, supply and demand elasticities) and use the resulting data to evaluate the effects of alternative policies. These studies will require relatively long implementation schedules, generally in the range of six to 15 months. In practice, none of the contracted studies have been completed. Three contracts have run over two years.

During December 1985-February 1986, MINFAC solicited expressions of interest in prequalification from over 40 private sector firms and public sector institutions. A total of 33 research institutions (24 private sector economic consulting firms and 9 universities and economic research institutes) were prequalified, based on evaluations of their capability statements and examples of their recent economic studies.

Contracted studies have been funded by the Project through a special non-lapsible EAN Personal Ledger Account (PLA) established by MINFAC. The GOP has provided approximately Rs 800,000 of seed funds to start the PLA, and recently raised the funding to Rs 2,000,000. A request for proposals under the competitive contract research program was delayed due to difficulties in obtaining Ministry of Finance approval for the PLA.

The EAN request for proposals was also delayed after the GOP announced the creation of a special National Agricultural Commission [46]. The Commission was responsible for evaluating agricultural policy over the last two decades and recommending new policies to improve agricultural performance over the next two decades. Because the Commission was ordering several studies to support its technical analyses of major agricultural policy issues, the EAN research competition was delayed until the EAN studies could be compared for duplicating efforts with the Commission's program.

The EAN request for proposals was issued in April 1986. In mid-May, the TOR's were revised to sharpen the analytical focus and the deadline was extended to July 3, 1986.

When 64 proposals for 13 studies on the EAN research agenda were submitted for evaluation in July 1986, it was quickly realized that the evaluation workload greatly exceeded the Technical Sub-Committee Members' available time. To expedite the evaluations, one expert was selected for each of the 13 topics. After the evaluations were completed, the Sub-Committee met in January 1987 and selected 12 proposals on nine of the study topics for further consideration. Even at this stage, it was realized that the evaluation

process needed more review. In March 1987, a Chemonics consultant reviewed the 12 proposals and recommend further refinements of the TOR's and conditions for awarding contracts.

Upon award of a research contract under the annual research agenda, MINFAC originally intended for a steering team of selected experts in the relevant subject areas to be appointed to monitor the implementation and technical performance of each study. In practice, because of time constraints and nonavailability of qualified economists to serve, monitoring teams were formed from the DAP and Chemonics staffs. Each monitoring team consisted of a DAP research officer and a Chemonics staff economist.

Table 1 shows the studies that have been contracted to prequalified firms and public sector institutions. To date, none of the studies has been completed. The studies conducted by private sector firms have demonstrated major deficiencies in the firms' abilities to manage economic studies. At the technical level, the monitoring results have shown the private sector firms to be very weak in both survey methods and economic analysis [18]. More specifically, the firms do not have sufficient skills in survey research, quantitative analysis and economic theory to conduct the quality of analyses expected by MINFAC under the EAN Project. All private sector contractors were originally issued 13 month contracts, however, no study has yet been approved as completed according to the TOR's.

TABLE 1. SUMMARY OF EAN CONTRACT STUDIES

No	STUDY TITLE	MONITORING GROUP	CONTRACTOR	PRINCIPAL INVESTIGATOR	CONTRACT PERIOD
1	Analysis of Fertilizer Response	Rao Shafique-ur-Rehman (DAP) Mubarik Ali (EAN)	Chemical Consultants Pakistan (Pvt) Ltd., Lahore	Md. Shah Nawaz	25 Jun 87 31 Mar 89 (31 Dec 89)
2	Constraints to Cooperatives	M. Ijaz Ahmed (DAP) M.S. Anjum (EAN)	Research Associates, Islamabad	Muhammed Siddique	25 Jun 87 31 Mar 89 (31 Aug 89)
3	Impact of Mechanization	Rao Shafique-ur-Rehman (DAP) M.A. Chaudhry	United Consultants (Pvt) Ltd., Lahore	Dr. Md. Sharif Chaudhry	25 Jun 87 31 Mar 89 (31 Aug 89)
4	Marketing of Perishable Commodities	Shahab Qureshi (DAP) Kamil Lodhi (EAN)	ESESJAY Consult (Pvt) Ltd., Karachi	Mohammed Nishat	2 Feb 88 2 Mar 89 (31 Dec 89)
5	Farm Productivity in NWFP	Agha A. Raza (DAP) M.A. Chaudhry (EAN)	Center for Applied Economic Studies, Peshawar Univ.	Dr. M. Nazir Ahmad	7 Apr 88 7 Nov 89
6	Farm Productivity in Punjab	Agha A. Raza (DAP) M.A. Chaudhry (EAN)	University of Ag., Faisalabad	Dr. Ali Mohammad Chaudhry	7 Apr 88 7 Nov 89
7	Farm Productivity in Sind and Balouchistan	Agha A. Raza (DAP) M.A. Chaudhry (EAN)	Applied Economic Research Center, Karachi University	Huseini Jaghirdar	12 Jun 88 12 Dec 89
8	Marketing Margins of Selected Crops	Shahab Qureshi (DAP) Kamil Lodhi (EAN)	United Consultant Group Ltd., Lahore	Hassan Ali Sayed	12 Apr 88 12 May 89 (31 Dec 89)

NOTE: Dates in parentheses indicate contract extensions DAP has requested from MINFAC.

The public sector economic research institutions conducting the provincial components of the "Farm Productivity" study have demonstrated economic analysis capabilities so much stronger than the private sector firms. Since the private firms' economic research capabilities are relatively marginal, and the EAN Project has limited resources, there is strong doubt about continuing Project support for the private sector, since the net benefit to MINFAC will be much smaller than in the case of the public sector institutions.

5.4.2 Special Commissioned EAN Studies

A special commissioned studies program was designed to give MINFAC additional flexibility to order short-term studies on issues that are relatively more urgent than the competitive contract research program. This program allows MINFAC to commission quick studies to cooperating EAN research institutions, outside the normal competitive contract procedures. Chemonics can also conduct these studies, solely with Chemonics expatriate and local consultants, or in a cooperative arrangement involving Chemonics consultants and cooperating EAN research institutions.

In October 1985, after reviewing the ACPAA's economic research agenda and soliciting the views of numerous economists familiar with Pakistan's agricultural sector, Chemonics recommended the following priority areas for special commissioned studies:

- Marginal Productivity of Irrigation
- Farm Cost of Production Monitoring System
- Optimum Commodity Trade Strategies
- Poultry Supply and Demand Model
- Livestock Supply Response
- Optimum Sugarcane Production Strategies

MINFAC Secretary Akhund accepted the proposed topics as relevant to MINFAC's economic research needs and requested terms of reference for a special study to develop a policy framework for the poultry industry. The terms of reference were submitted in November 1985 and approved in January 1986. Chemonics fielded three economic advisors to conduct the study during February-March 1986 [38, 104].

Other commissioned studies completed by Chemonics and DAP staff have included: estimation of a supply response model for major crops [9]; an input-output analysis of agriculture's contribution to the national economy [11]; an economic analysis of the dairy sector [17]; an analysis of wheat seed production and marketing [27]; an analysis of the rationalization of irrigation water charges [28]; an evaluation of operating and maintenance investments in canal irrigation [29]; an analysis of the privatization of SCARP tubewells [32]; application of a procedure for convenient updating of Pakistan input-output models [59]; an economic analysis of the sugar industry [65]; an analysis of the agricultural production sector for policy formulation [68]; a practical guide to interindustry (input-output) analysis of the Pakistan economy [72]; an appraisal of agricultural price statistics in Pakistan [96]; and an assessment of the implications of agricultural policy research for the EAN Project [98].

Special policy options briefing papers have been prepared by Chemonics staff economists on the benefits of O&M expenditure in canal irrigation [31] and the sugar industry [66].

5.4.3 IFPRI Studies

IFPRI has conducted special studies of: determinants of household and market-oriented activities of rural women [4]; effects of the wheat ration shop system on household food security [5]; estimates of consumer price response [6]; a poverty profile of rural Pakistan [7]; the impact of changes in income and schooling on the demand for food quantity and quality [8]; exchange rate and trade effects on relative prices [33]; determinants of farm earnings [43]; the wheat economy of Pakistan [52]; background descriptive data on household food security [54]; rural credit [70]; effects of wheat pricing policy on fiscal cost and private storage [87]; effects of short-run supply management on food security [88]; wheat storage policy in Pakistan [89]; and stabilization of wheat supply through optimization of storage [90].

5.4.4 Post-Harvest Management Studies

Kansas State University, in collaboration with PARC under the Storage Technology Development Transfer Project of the FSM Project's Post-Harvest Management Component, has conducted studies on physical quality characteristics of wheat on the farm and at procurement centers [3], the feasibility of bulk handling of wheat [22], and the impact of fair average quality procurement and no loss policies on public sector wheat storage [71].

5.5 Organization of the MINFAC Economic Wing

When the EAN Project commenced in September 1985, MINFAC designated the Directorate of Agricultural Policy to be institutionalized under the Project as the Ministry's primary economic and policy analysis agency. The DAP was part of a three-unit reorganization of the MINFAC Planning Unit that had been proposed earlier in 1985. The EAN Project called for the development of a professional staff for the first two years with Project funds, while Chemonics provided technical assistance and local training to strengthen the staff and develop a research program. At the end of the first two years, the Project called for the GOP to assume permanent funding of the DAP staff. Unfortunately, the MINFAC was not able to hire staff during 1985-87. As an interim measure, Chemonics developed a *staff economics group to assist the DAP and conduct commissioned studies* while the contract research program was being started. In mid-1987, Chemonics hired a professional staff for the DAP, in lieu of MINFAC's inability to both hire staff and pay their salaries. Throughout 1986-87, no progress was made in gaining GOP approval for the permanent sanctioning of the DAP. In early 1988, plans were made to propose institutionalization of the DAP in the 1988-89 budget, however, MINFAC decided to delay the proposal for one year, since the EAN Project was scheduled to run through July 1989.

In April 1988, the ACPAA held its second meeting [47]. The institutionalization of the DAP as a permanent MINFAC agency was on the agenda, but was not considered, due to insufficient time.

Over the past two years, the EAN Project has developed several reports on the need to institutionalize the DAP [36,47,78,79,81]. In February 1989, a comprehensive analysis of the feasibility of institutionalizing the DAP was prepared for MINFAC [63,82]. Based on the analysis, MINFAC submitted a request for creation of a new Economic Wing [48]. The MINFAC proposal, since revised by the Finance Division, would merge the Planning Unit and the DAP into an agency with three directorates: statistics, economics and policy. The statistics directorate would be responsible for data assembly, data processing and forecast-

ing production of major crops. The economics directorate would be responsible for preparation of commodity situation reports, farm finance, including estimates of farm income, and agribusiness analyses. The policy directorate would be responsible for long-range analyses of agricultural inputs, production and aggregate interrelationships between agriculture and the rest of the economy. In June 1989, in anticipation of GOP approval of the Economic Wing, MINFAC began paying the salaries of the DAP staff on an *ad hoc* basis with PLA funds. The EAN Project was extended through June 1990 to develop prototype analyses of food marketing margins and marketing costs (for the Economics Directorate's agribusiness section), farm income estimates (for the Economics Directorate's farm finance section) and commodity situation reports for the Economics Directorate's commodity situation section). These analyses are designed to develop the Economic Wing's capability to use the results for quick, in-house analysis of most of the policy issues that will be requested by MINFAC and other government agencies.

5.6 Development of the Economic Analysis Network

Concurrent with the implementation of economic studies under the EAN Project, several activities have been undertaken to develop a national network of agricultural economists who can contribute to MINFAC policy analysis needs. The Project newsletter, *The Econogram*, was started in December 1985, with regular bi-monthly publication starting in August 1986. The newsletter has served as an important communication link between the Project and all EAN members. Several articles on EAN research results and economic research methodology issues have been published [1,2,10,13,15,18,31,32,36,42,64,67,80,81,92,95,105-108]. Numerous economic experts have been interviewed on topics that are of interest to all EAN members [24,34,35,41,44,53,56,69,73,74,77,97,99-103,109]. The newsletter has also been used to assist MINFAC in identifying policy issues by conducting regular interviews with agricultural policy leaders throughout the country [12,19-21,23,25,55,58,60-62,84-86,91,93,94]

The Economic Analysis Network has also been strengthened by the annual publication of a membership directory. Beginning with the first newsletter, 1,000 EAN membership forms were mailed to economists and cooperating EAN institutions. Members were asked to include basic biodata and their three strongest economic research interests. Returned membership forms were entered in a computerized database to develop the newsletter mailing list and the annual membership directory. The database contained 150 members in mid-1986. In 1987, when the first directory was published, the EAN had 315 members [37]. The 1988 directory had 477 members [39]. By the end of 1988, the membership had grown to over 600 members, but many were not active. The membership was canvassed for the 1989 directory, which contains 449 members [40]. Each directory contains cross-references to members' employers and research interests. The directories have been particularly useful to economists seeking to identify other economists with similar research interests. Economic consulting firms have been eager to use the directories to identify potential consultants.

The studies conducted by the EAN Project staff have addressed important policy issues. However, implementation of these studies has been far less effective than was envisioned in the Food Security Management Project Paper because MINFAC has been unable to develop a permanent economic and policy analysis agency with the necessary staff. The on-the-job training received by DAP staff hired by Chemonics on an interim basis on behalf of MINFAC has been useful in preparing these studies, but the lack of a permanent MINFAC economic and policy analysis staff has contributed to job insecurity and a short-term, project-oriented view of the studies.

5.7 Proposed New Studies

To assist the ACPAA in revising the economic research agenda and implement new studies, the EAN Project solicited suggestions from agricultural economists throughout the country. During August-October 1987, EAN cooperating institutions were requested to propose new research topics to be considered for implementation by the EAN Project. Appendix 1 summarizes 62 topics that were submitted by five institutions and four additional studies requested by the ECC and MINFA. Appendix 2 summarizes how 15 of the 62 proposed topics relate to EAN studies already contracted with private sector firms, universities and economic research institutes.

To gain a more general view of how the proposed topics relate to broad agricultural policy concerns, the 45 topics not covered by current or planned research contracts are sorted in Appendix 3 according to the five general agricultural policy research areas discussed above: household food consumption, agribusiness, farm production, agricultural inputs, and international trade. Topic 17, "Projections of Demand for Major Food Items Till 2000 A.D.," (PARC), and Topic 41, "Impact of Wheat Subsidy on Processing and Consumption, by Different Socio-economic Classes of the Population," (PARC) are omitted because those topics have been addressed by IFPRI under the SSP Component of the FSM Project. The 15 proposed topics covered under existing research contracts Appendix 2 are also omitted from Appendix 3.

No action was taken on these proposed studies during the ACPAA's last meeting in April 1988, nor has MINFAC taken any steps to review the research program.

6.0 CONCLUSIONS AND RECOMMENDATIONS

Most of MINFAC's initiatives in developing its economic and policy analysis capabilities have arisen from EAN Project activities. If the Ministry is to be successful in institutionalizing an economic research program, it must take several steps to exploit the EAN Project's benefits and establish the foundations for a program to survive after the Project ends. The most critical economic research issues facing MINFAC are: management of a policy research program; organization of research resources and revision of the research agenda.

6.1 Management of Agricultural Policy Research

Experience gained in the EAN Project has demonstrated several shortcomings of the current approach to economic research management. MINFAC does not have an effective management plan for its economic research program. Due to the critical shortage of professional staff in the MINFAC Secretariate, an agricultural policy advisory committee was appointed to provide ministry oversight to the EAN Project and lay the foundations for a streamlined agricultural policy research program. The advisory committee concept is a useful management tool, but the current committee has not been effective in managing MINFAC's economic analysis resources.

6.1.1 Abolition of the ACPAA

It is recommended that the ACPAA be abolished because: it is too large; it has met only twice in four years; and it has not been given a clear mandate to serve as the Ministry's executive body for agricultural policy coordination.

6.1.2 Creation of an Executive Committee on Agricultural Policy

It is recommended that the ACPAA be replaced with a MINFAC Executive Committee on Agricultural Policy (ECAP). The ECAP should have no more than five members. The membership should be composed of senior professional economists and agricultural policy specialists who have the confidence of MINFAC to make routine decisions on the implementation of economic research management policy. The Terms of Reference for the ECAP should include the following:

- 1) Develop a comprehensive MINFAC economics research program and supervise its implementation;
- 2) Conduct an annual review of the agricultural policy situation in terms of current problem areas, emerging problems and the implications of existing research findings for these problems;
- 3) Revise the Economic Research Agenda to define the 10 most important researchable agricultural policy issues in order of priority for study with MINFAC economic analysis resources;
- 4) Conduct quarterly reviews of the Economic Wing's operations to ensure timely supply effective performance;

- 5) Recommend measures to strengthen the MINFAC economic research capability; and
- 6) Recommend measures to strengthen the research capability of public and private institutions supplying economic and policy analyses to MINFAC.

6.2 Organization of Economic Research

MINFAC's economic and policy analysis capability is weak because of several organizational problems. MINFAC has tended to rely more on the Planning Unit for economic analysis support, but the supply of research by all MINFAC agencies is not coordinated in a systematic manner. Research is often duplicated or neglected because there is no central economic analysis coordinating agency within MINFAC. When economic studies are conducted, the terms of reference often lack clear connections to MINFAC's major areas of policy concern with respect to subject areas of economic analysis, economic policy interest groups and market functions. Many of these organizational problems can be improved by establishing a formal policy analysis framework and clarifying the roles of all economic analysis suppliers in meeting MINFAC's policy analysis needs.

6.2.1 Agricultural Policy Analysis Framework

It is recommended that each economic study be classified according to an agricultural policy framework consisting of five major areas of policy concern: household consumption, agribusiness, farm production, agricultural inputs, and international trade.

6.2.2 Role of the Private Sector

Given the weak performance of private sector economic consulting firms under the EAN Project, it is recommended that MINFAC minimize use of these firms for future studies. Because of the firms' limited analytical capabilities and the resulting large contract monitoring requirement, it is recommended that no more than two private sector contracts be implemented at any given time. MINFAC should always be vigilant to new private sector research capabilities, but every effort should be made to avoid awarding studies to institutions without proven performance records.

6.2.3 Role of Public Institutions

It is recommended that MINFAC continue to solicit research proposals from universities and public sector economic research institutes in cases where major analytical expertise is required. The "farm productivity" studies being conducted by the Applied Economic Research Center, the University of Agriculture at Faisalabad and the Center for Applied Economic Studies have demonstrated higher research quality than is generally available in the private sector. If these institutions produce superior research products on the farm productivity studies, MINFAC should consider extending those contracts to provide annual updating of farm productivity data and long-term analytical support of MINFAC's interests in factors determining changes in agricultural productivity.

It is recommended that MINFAC establish new guidelines on the areas of economic research responsibility and cooperation between the Economic Wing and all other MINFAC agencies to ensure timely and efficient disposition of studies. Since the Economic

Wing is being created as MINFAC's prime economic analysis agency, the guidelines should be designed to avoid duplication of research effort and maximize the complementarity of all MINFAC economic analysis resources.

It is also recommended that MINFAC establish new guidelines on the Economic Wing's responsibility for coordinating MINFAC's agricultural policy formulation and analysis functions with all other Federal and Provincial agencies.

6.2.4 Role of the MINFAC Economic Wing

It is recommended that MINFAC expedite GOP approval of the proposed new Economic Wing to crown four years of work toward the institutionalization a key agricultural policy analysis agency.

It is recommended that MINFAC implement the Economic Wing in accordance with the Proposal's emphasis on: a strong in-house economic analysis capability; no primary data collection by Economic Wing staff; contracting all research studies requiring more than three calendar months for completion to firms and economic research institutions established by the EAN Project; limiting all contracted studies to no more than one year after the contracts are signed, with most studies being finished within four to six calendar months; a strong publications program for disseminating all routine statistical reports, economic analyses and policy options papers to a broad audience of Economic Wing clients and building a strong sense of professionalism among the Wing's staff by exposing their works to the critical reviews of their peers.

6.3 Revision of the Research Agenda

The research agenda is one of the most important economic research management tools because it allows a convenient listing of needed economic studies based on priorities of policy problems. The agenda has not been updated since 1985, although the agricultural policy situation has undoubtedly changed to reflect new research priorities. The current approach to recommending new studies has been to choose narrowly focused study topics without much consideration of strategic policy issues. In arriving a new research agenda, MINFAC should review changes in the policy situation since the last agenda was made and define new studies that support current and emerging agricultural policy analysis needs.

6.3.1 Review the Current Policy Situation

It is recommended that the ECAP conduct an annual review of the current agricultural policy situation to: determine changes in interest groups' perceptions of policy problems; measure changes in economic performance under current policies; and identify emerging policy problems that may merit preemptive analysis in anticipation of their growing importance. It is further recommended that the Economic Wing establish working groups to maintain current databases on most of the information deemed useful by ECAP in performing its review.

6.3.2 Strategic Policy Considerations

The EAN Project commissioned studies have identified recurrent policy issues that merit strategic consideration in any revision of the research agenda. It is recommended that ECAP revise the agenda with respect to each study's relevance to the following strategic policy issues:

- 1) Net social benefits of self-sufficiency in major crops, particularly wheat;
- 2) The net social benefits of government involvement in providing agricultural marketing services;
- 3) The economic implications of government sanctions for the location and financing of agribusiness firms; and
- 4) The economic implications of jurisdictional conflicts in the formulation and implementation of agricultural policies.

6.3.3 Design and Implementation of New Research Agenda

It is recommended that the ECAP conduct an annual revision of the economic research agenda in light of the changing policy environment and studies completed or ongoing under the current agenda. It is recommended that the 45 topics listed in Appendix 3 be used as the basis for the beginning the revision process.

To effectively utilize MINFAC economic research resources and address priority policy problems on a timely basis, it is recommended that ECAP set priorities for the five general policy research areas to give the Economic Wing guidance on long-term policy research planning.

It is also recommended that ECAP set priorities on all studies within each general policy research area to allow more effective use of research resources on a particular policy research area.

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APPENDIX 1. ECONOMIC RESEARCH TOPICS PROPOSED FOR 1987-88 UNDER THE ECONOMIC ANALYSIS NETWORK PROJECT

TOPIC NO.	NAME OF INSTITUTE PROPOSING TOPIC	PROPOSED TOPICS OF RESEARCH
1	1 APPLIED ECONOMIC RESEARCH CENTRE, KARACHI	1 Bio-physical and socio-economic constraints in the adoption of non-traditional oilseed production in Pakistan.
2	AERC	2 Farm family Budget studies on a nationally co-ordinated basis in different ecological zones.
3	AERC	3 Determination of Export potential for fruits and vegetables.
4	AERC	4 Impediments in the development of dairy industry in Pakistan.
5	AERC	5 Increasing income disparities profile in rural Pakistan.
6	AERC	6 Investment pattern of expatriate income in Pakistan agriculture.
7	AERC	7 Impact of changes in rural real income on investment in agriculture.
8	2 Pakistan Agricultural Research Council (Social Sciences Division)	1 Agro-economic evaluation of improved seeds in the production of major crops.
9	PARC	2 Fertilizer response functions by different farm sizes.
10	PARC	3 Factors affecting N and P ratio in the production of different agro-ecological zones.
11	PARC	4 Economics of alternative pest management and weed control technologies constraints in their adoption especially at small farms.
12	PARC	5 Water use efficiency in different crops and under different sowing methods and land levelling techniques.
13	PARC	6 Price policy of water and fertilizer and its impact on production and resource use.
14	PARC	7 Identification and assessment of post-harvest management in the farm-retail food chain.
15	PARC	8 Study of the channels and margins in marketing of fruit and vegetables.
16	PARC	9 Study of the current status of food chain margins (Transport, storage, processing, handling and packing costs) and measures for improvement.
17	PARC	10 Projections of demand for major food items till 2000 A.D.
18	PARC	11 Marketing of oilseeds and local edible oils with special emphasis on trade margins.
19	PARC	12 Crop-Livestock farming systems.

APPENDIX 1. ECONOMIC RESEARCH TOPICS PROPOSED FOR 1987-88 UNDER THE ECONOMIC ANALYSIS NETWORK PROJECT
(CONTINUED)

TOPIC NO.	NAME OF INSTITUTE PROPOSING TOPIC	PROPOSED TOPICS OF RESEARCH
20	PARC	13 Economics of alternative crop rotations.
21	PARC	14 Cropping system research: Implication for technology design and transfer.
22	PARC	15 Farming systems development using opportunities for improved farm management and cropping systems.
23	PARC	16 Economics of small tractors.
24	PARC	17 Analysis of emerging trends in terms of: On-farm & Non-farm income & employment generation. Wages for farm & non-farm mechanized work. Farm machinery demand creation. Alternative contractual arrangements. Demand for repair & maintenance services. Custom hiring of tractors & farm machinery. Energy demand under alternative rates of farm mechanization.
25	PARC	18 On-farm testing & evaluation of technology generated by experiment stations & constraints in their adoption especially at small farms.
26	PARC	19 Methodologies for transferring information to farmers, fields & linkages between research and extension.
27	PARC	20 Strategies for improving farm production and processing skills of rural women.
28	PARC	21 Technologies of production of traditional and non-traditional oilseeds and constraints in the adoption of improved technologies.
29	PARC	22 Impact of public sector interest free loans on production and income with special reference to small farms.
30	PARC	23 Economic Analysis of Public and private investment in the agriculture sector.
31	PARC	24 Returns to investment in agricultural research.
32	PARC	25 Production capacity of different farm sizes under differential rates of technological transformation in different agro-ecological zones of Pakistan.
33	PARC	26 Rural labour market studies.
34	PARC	27 Emerging occupations in rural areas.
35	PARC	28 Employment and wages of rural women in farm production and processing.
36	PARC	29 Marketing of milk with special emphasis of on designing models of integrating milk collection and processing with producer associations for delivery of inputs and scientific information.
37	PARC	30 Production and marketing of live-stock fodders and

feeds.

APPENDIX 1. ECONOMIC RESEARCH TOPICS PROPOSED FOR 1987-88 UNDER THE ECONOMIC ANALYSIS NETWORK PROJECT
(CONTINUED)

TOPIC NO.	NAME OF INSTITUTE PROPOSING TOPIC	PROPOSED TOPICS OF RESEARCH
38	PARC	31 Impact of price support and procurement policies on resources allocation, production, income and employment in different agro-ecological zones.
39	PARC	32 Domestic & cooperative advantage in the production and export of food commodities.
40	PARC	33 An analysis of procurement and price policy of potato, onion and pulses.
41	PARC	34 Impact of wheat subsidy on processing and consumption, by different socio-economic classes of the population.
42	3 National Fertilizer Development Centre, Islamabad	1 Application of Fertilizer and yield responses of important crops by size of farm and mode of irrigation for different ecological zones.
43	NFDC	2 Constraints in the flow of credit with particular reference to small farmers.
44	NFDC	3 Impact of price policy on cropping pattern and farming system-estimation of short, medium and long term price elasticities of supply for major crops.
45	NFDC	4 Study on farm productivity by size and tenure and crops-estimation of domestic resources costs for major crops.
46	4 Agriculture & Cooperation Department, Government of Baluchistan, Quetta	1 Study on methods to improve salable cultivation in Baluchistan.
47	A&CD, GOB, Q	2 Study on determining most economic cropping pattern under various farming systems in Baluchistan.
48	A&CD, GOB, Q	3 Study on consumptive use of water for important cash crops.
49	A&CD, GOB, Q	4 Study on economic and effective use of farm machinery.
50	A&CD, GOB, Q	5 Impact of irrigation projects on productivity, farm income and employment in various ecological regions of Baluchistan.
51	A&CD, GOB, Q	6 Role of private sector in marketing of fruits and vegetables in Baluchistan.
52	5 UNIVERSITY OF AGRICULTURE, FAISALABAD	1 Evaluation of Major Crop Procurement/Price Policies
53	UOA, F	2 Evaluation of Appropriate Water Pricing Policies
54	UOA, F	3 Study the Impact of Rural Electrification on Farm and Off-Farm Sectors
55	UOA, F	4 Study of Trends in Farm Profitability Over Time
56	UOA, F	5 Identification of Optimum Combinations of Crop and Livestock Enterprises

APPENDIX 1. ECONOMIC RESEARCH TOPICS PROPOSED FOR 1987-88 UNDER THE ECONOMIC ANALYSIS NETWORK PROJECT
(CONTINUED)

TOPIC NO.	NAME OF INSTITUTE PROPOSING TOPIC	PROPOSED TOPICS OF RESEARCH
57	UOA, F	6 Comparative Study of Public and Private Ownership of Tubewells
58	UOA, F	7 Study of the Economies of Small versus Large Tractors
59	6 ECONOMIC COORDINATION COMMITTEE	1 Diversification of Agricultural Exports
60	ECC	2 Economic Evaluation of Agricultural Procurement System
61	7 MINFA	1 Study of the pesticide industry for industry viability and product pricing, quality, and effectiveness.
62	MINFA	2 Study of the availability and uses constraints on specialized agricultural machinery.

APPENDIX 2. CLASSIFICATION OF PROPOSED ECONOMIC RESEARCH TOPICS ACCORDING TO TOPICS CONTRACTED BY EAM

TOPIC NO.	NAME OF INSTITUTE PROPOSING TOPIC	PROPOSED TOPICS OF RESEARCH
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CONTRACTED STUDY: "APPLICATION OF FERTILIZER AND YIELD RESPONSES OF IMPORTANT CROPS BY SIZE OF FARM AND MODE OF IRRIGATION FOR DIFFERENT ECOLOGICAL ZONES," CONTRACTED WITH CHEMICAL CONSULTANTS LTD., LAHORE

THE FOLLOWING PROPOSED TOPICS ARE RELEVANT TO THIS CONTRACT:

9	PARC	2	Fertilizer response functions by different farm sizes.
10	PARC	3	Factors affecting N and P ratio in the production of different agro-ecological zones.
42	3 NFDC	1	Application of Fertilizer and yield responses of important crops by size of farm and mode of irrigation for different ecological zones.

CONTRACTED STUDY: "IMPACT OF MECHANIZATION ON PRODUCTIVITY AND EMPLOYMENT BY FARM SIZE AND TENURE FOR DIFFERENT ECOLOGICAL ZONES AND ECONOMIC ASSESSMENT OF VARIOUS LEVELS OF MECHANIZATION", CONTRACTED WITH UNITED CONSULTANTS LTD., LAHORE

THE FOLLOWING PROPOSED TOPICS ARE RELEVANT TO THIS CONTRACT:

23	PARC	16	Economics of small tractors.
24	PARC	17	Analysis of emerging trends in terms of: On-farm & Non-farm income & employment generation. Wages for farm & non-farm mechanized work. Farm machinery demand creation. Alternative contractual arrangements. Demand for repair & maintenance services. Custom hiring of tractors & farm machinery. Energy demand under alternative rates of farm mechanization.
58	UCA, F	7	Study of the Economies of Small versus Large Tractors

CONTRACTED STUDY: "STUDY OF MARKETING MARGINS OF SELECTED CROPS IN THE CONTEXT OF FARMING SYSTEMS AND ECOLOGICAL ZONES", CONTRACTED WITH UNITED CONSULTANT GROUP LTD., LAHORE

THE FOLLOWING PROPOSED TOPICS ARE RELEVANT TO THIS CONTRACT:

15	PARC	8	Study of the channels and margins in marketing of fruit and vegetables.
16	PARC	9	Study of the current status of food chain margins (Transport, storage, processing, handling and packing costs) and measures for improvement.
18	PARC	11	Marketing of oilseeds and local edible oils with special emphasis on trade margins.

APPENDIX 2. CLASSIFICATION OF PROPOSED ECONOMIC RESEARCH TOPICS ACCORDING TO TOPICS THAT HAVE BEEN CONTRACTED
(CONTINUED)

TOPIC NO.	NAME OF INSTITUTE PROPOSING TOPIC	PROPOSED TOPICS OF RESEARCH
<p>CONTRACTED STUDY: " STUDY OF FARM PRODUCTIVITY BY SIZE AND TENURE AND ESTIMATION OF DOMESTIC RESOURCE COSTS FOR MAJOR CROPS", CONTRACTED WITH AERC, UNIVERSITY OF AGRICULTURE, FAISALABAD AND CAPES.</p> <p>THE FOLLOWING PROPOSED TOPICS ARE RELEVANT TO THIS CONTRACT:</p>		
39	PARC	32 Domestic & cooperative advantage in the production and export of food commodities.
45	NFDC	4 Study on farm productivity by size and tenure and crops-estimation of domestic resources costs for major crops.
55	UOA, F	4 Study of Trends in Farm Profitability Over Time
56	UOA, F	5 Identification of Optimum Combinations of Crop and Livestock Enterprises
<p>CONTRACTED STUDY: "A STUDY OF TRADE, PRICE AND INSTITUTIONAL POLICIES NEEDED FOR PROCUREMENT, PROCESSING, MARKETING, AND EXPORT OF PERISHABLE COMMODITIES", CONTRACTED WITH ESESJAY CONSULT LTD, KARACHI</p> <p>THE FOLLOWING PROPOSED TOPICS ARE RELEVANT TO THIS CONTRACT:</p>		
3	AERC	3 Determination of Export potential for fruits and vegetables.
51	ACD, GOB, Q	6 Role of private sector in marketing of fruits and vegetables in Baluchistan.

APPENDIX 3. CLASSIFICATION OF PROPOSED ECONOMIC RESEARCH TOPICS ACCORDING TO GENERAL RESEARCH CATEGORIES

TOPIC NO.	NAME OF INSTITUTE PROPOSING TOPIC	PROPOSED TOPICS OF RESEARCH
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GENERAL POLICY AREA 1: HOUSEHOLD CONSUMPTION

2	AERC	2 Farm family Budget studies on a nationally co-ordinated basis in different ecological zones.
5	AERC	5 Increasing income disparities profile in rural Pakistan.

GENERAL POLICY AREA 2: AGRIBUSINESS

4	AERC	4 Impediments in the development of dairy industry in Pakistan.
14	PARC	7 Identification and assessment of post-harvest management in the farm-retail food chain.
36	PARC	29 Marketing of milk with special emphasis of on designing models of integrating milk collection and processing with producer associations for delivery of inputs and scientific information.
37	PARC	30 Production and marketing of live-stock fodders and feeds.
38	PARC	31 Impact of price support and procurement policies on resources allocation, production, income and employment in different agro-ecological zones.
40	PARC	33 An analysis of procurement and price policy of potato, onion and pulses.
52	5 UQA, F	1 Evaluation of Major Crop Procurement/Price Policies
60	ECC	2 Economic Evaluation of Agricultural Procurement System

GENERAL POLICY AREA 3: FARM PRODUCTION

1	1 AERC	1 Bio-physical and socio-economic constraints in the adoption of non-traditional oilseed production in Pakistan.
11	PARC	4 Economics of alternative pest management and weed control technologies constraints in their adoption especially at small farms.
19	PARC	12 Crop-Livestock farming systems.
20	PARC	13 Economics of alternative crop rotations.
21	PARC	14 Cropping system research: Implication for technology design and transfer.
22	PARC	15 Farming systems development using opportunities for improved farm management and cropping systems.
25	PARC	18 On-farm testing & evaluation of technology generated by experiment stations & constraints in their adoption especially at small farms.
27	PARC	20 Strategies for improving farm production and processing skills of rural women.

APPENDIX 3. CLASSIFICATION OF PROPOSED ECONOMIC RESEARCH TOPICS ACCORDING TO GENERAL RESEARCH CATEGORIES
(CONTINUED)

TOPIC NO.	NAME OF INSTITUTE PROPOSING TOPIC	PROPOSED TOPICS OF RESEARCH
28	PARC	21 Technologies of production of traditional and non-traditional oilseeds and constraints in the adoption of improved technologies.
32	PARC	25 Productive capacity of different farm sizes under differential rates of technological transformation in different agro-ecological zones of Pakistan.
44	NFDC	3 Impact of price policy on cropping pattern and farming system-estimation of short, medium and long term price elasticities of supply for major crops. *
46	4 A&CD, GOB, Q	1 Study on methods to improve salable cultivation in Baluchistan.
47	A&CD, GOB, Q	2 Study on determining most economic cropping pattern under various farming systems in Baluchistan.

GENERAL POLICY AREA 4: AGRICULTURAL INPUTS

6	AERC	6 Investment pattern of expatriate income in Pakistan agriculture.
7	AERC	7 Impact of changes in rural real income on investment in agriculture.
8	2 PARC	1 Agroeconomic evaluation of improved seeds in the production of major crops.
12	PARC	5 Water use efficiency in different crops and under different sowing methods and land levelling techniques.
13	PARC	6 Price policy of water and fertilizer and its impact on production and resource use.
26	PARC	19 Methodologies for transferring information to farmers, fields & linkages between research and extension.
29	PARC	22 Impact of public sector interest free loans on production and income with special reference to small farms.
30	PARC	23 Economic Analysis of Public and private investment in the agriculture sector.
31	PARC	24 Returns to investment in agricultural research.
33	PARC	26 Rural labour market studies.
34	PARC	27 Emerging occupations in rural areas.
35	PARC	28 Employment and wages of rural women in farm production and processing.
43	NFDC	2 Constraints in the flow of credit with particular reference to small farmers.
48	A&CD, GOB, Q	3 Study on consumptive use of water for important cash crops.

APPENDIX 3. CLASSIFICATION OF PROPOSED ECONOMIC RESEARCH TOPICS ACCORDING TO GENERAL RESEARCH CATEGORIES
(CONTINUED)

TOPIC NO.	NAME OF INSTITUTE PROPOSING TOPIC	PROPOSED TOPICS OF RESEARCH
GENERAL POLICY AREA 4: AGRICULTURAL INPUTS (CONTINUED)		
49	A&CD, GOB, Q	4 Study on economic and effective use of farm machinery.
50	A&CD, GOB, Q	5 Impact of irrigation projects on productivity, farm income and employment in various ecological regions of Baluchistan.
53	UOA, F	2 Evaluation of Appropriate Water Pricing Policies
54	UOA, F	3 Study the Impact of Rural Electrification on Farm and Off-Farm Sectors
57	UOA, F	6 Comparative Study of Public and Private Ownership of Tubewells
61	7 MINFA	1 Study of the pesticide industry for industry viability and product pricing, quality, and effectiveness.
62	MINFA	2 Study of the availability and uses constraints on specialized agricultural machinery.
GENERAL POLICY AREA 5: INTERNATIONAL TRADE		
59	6 ECC	1 Diversification of Agricultural Exports