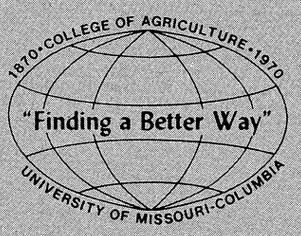

AAEA

ANNUAL MEETING

UNIVERSITY OF MISSOURI - COLUMBIA

August 9-12, 1970

SEMINAR PAPERS

to be presented at the
Annual Meeting of the

AMERICAN AGRICULTURAL ECONOMICS ASSOCIATION

at the University of Missouri-Columbia
on August 10 and 11, 1970

FOREWORD

This book contains each of the major papers that will constitute the basis for the seven Seminar Sessions to be conducted at the annual meeting of the American Agricultural Economics Association on Monday and Tuesday afternoons, August 10 and 11, 1970. The time schedule is shown on the following page.

These papers will NOT BE READ at the meeting. They are provided to you by mail in order that you may study them (or, at least, the ones which interest you) before you come to the meeting.

The Seminar Session will open with a brief review or abstract of the paper by the author. Comprehensive and formal discussion of the paper by 2 or 3 discussants will follow.

Then the group will divide into 3 or 4 smaller groups (sub-sessions), organized around specific sub-topics of the major topic. Three discussants will be prepared to lead the discussion on the sub-topic for each group.

The primary objective of this organization is to allow maximum participation in the discussion by every member present. Maximum effectiveness of this program so organized requires that you become familiar with the material in advance, and come to the meeting prepared to enter into the discussion.

Dale E. Hathaway
President

TIME SCHEDULE OF SEMINAR SESSIONS

Monday, August 10
1:15 to 2:45 pm

Tuesday, August 11
1:15 to 2:45 pm

OUTLINE OF PROGRAM

Sunday, August 9

7:30 PM — Annual Reception
Bingham Residence Hall, UMC

Monday, August 10

9:00 AM — GENERAL SESSION
Presidential Address:
Jimmye Hillman, University of Arizona

Major Address:
"Agriculture in a Modern View of Economic Structure"
John K. Galbraith, Harvard University

1:15 PM — SEMINAR SESSIONS
I through IV (See opposite page)

3:00 PM — SUB-SESSIONS
3 or 4 sub-sessions of each Seminar above

SECTIONAL MEETINGS, A, B & C
A. "Administrative Problems in Rural Development"
B. "New Models in Price Forecasting"
C. "Consumer Protection in the Modern Economy"

6:30 PM — STUDENT SECTION BANQUET

7:00 PM — INDUSTRY ECONOMISTS DINNER

7:30 PM — OZARK SUMMER FOLLIES

Tuesday, August 11

8:45 AM — GENERAL SESSION
"Economic and Political Future for Public Programs in Rural America"
Charles L. Schultze, Brookings Institution
Lauren Soth, Des Moines Register and Tribune

1:15 PM — SEMINAR SESSIONS
V through VII (See page 2)

3:00 PM — SUB-SESSIONS
Three sub-sessions for each Seminar above

SECTIONAL MEETINGS, E and F
E. "Latin American Development in the 1970's"
F. "Priorities in Agricultural Economics Programs in the 1970's"

7:30 PM — FELLOWS ADDRESS
Willard Cochrane, University of Minnesota

8:30 PM — AWARDS PROGRAM

Wednesday, August 12

7:00 AM — FELLOWS BREAKFAST

8:30 AM — ANNUAL BUSINESS MEETING

10:00 AM — GENERAL SESSION
"Farm Policy Legislation for the 1970's"
Luther Tweeten, Oklahoma State University
Reuben Johnson, National Farmers Union
W. Gene Hamilton, American Farm Bureau Federation
Don Paarlberg, Office of Secretary of Agriculture
G. R. Purnell and D. H. Plaunt, Canada Dept. of Agriculture

12:00 NOON — ADJOURN

SEMINAR SESSION I

Monday, August 10, 1970
1:15 to 2:45 PM

THE CHANGING NATURE OF THE AGRICULTURAL INPUT INDUSTRIES

Program Organizer

Paul Nelson, MED-ERS, USDA

Major Paper

"The Changing Structure of the Farm Input Industry: Organization, Scale, Ownership"

by Arlo Minden, Purdue University

Discussants

George Allen, W. R. Grace Company
Dale Dahl, University of Minnesota

SUB-SESSIONS OF SEMINAR SESSION I

Monday, August 10, 1970
3:00-5:00 PM

Sub-Session Ia
IMPROVING THE DELIVERY SYSTEM FOR FARM INPUTS
Chairman
Lowell Hill, University of Illinois
Discussants
Robert Buck, Iowa Farmer
James McDowell, Rocky Mountain College, Billings, Montana
Larry Galloway, Terra Chemical Company, Iowa

Sub-Session Ib
POLICIES AND REGULATIONS NEEDED IN INPUT INDUSTRIES
Chairman
Milton Manuel, Kansas State University
Discussants
Carlton Dennis, Agway Inc., Syracuse, N.Y.
Fritz Mueller, University of Wisconsin
Clinton Reeder, Oregon State University

Sub-Session Ic
THE ROLE OF COOPERATIVES IN THE INPUT INDUSTRIES
Chairman
W. Gordon Leith, Farmland Industries, Inc., Kansas City, Mo.
Discussants
William Swank, Ohio Farm Bureau, Westerville, Ohio
Jerome Tvedt, Farmers Union Central Exchange
George Capel, North Carolina State University

Sub-Session Id
THE MONEY MARKET - IS IT ADEQUATE FOR THE NEEDS OF TODAY'S AGRICULTURE?
Chairman
Eli Ferguson, Equitable Life Assurance Society
Discussants
Roby Sloan, Federal Reserve Bank, Chicago
John Brake, Michigan State University
John Lee, FPED-ERS, USDA

CHANGING STRUCTURE OF THE FARM INPUT INDUSTRY: ORGANIZATION, SCALE, OWNERSHIP

Arlo J. Minden*

The farm input industry has evolved to a position of prominence and considerable influence in American agriculture. Economists have documented this evolutionary process in their reflections on technological innovation and adaptation. But it is interesting to note that only in the last few years has the farm input industry attracted major attention from agricultural economists as researchers.

Dale Dahl has suggested two major reasons for the current increased interest in the farm input industry: 1) the pronounced structural adjustments in these markets during the late 1960's and 2) the decision to include farm input markets in the "20 percent rule" relating to hatch funds (3). Realization of the importance of timeliness of delivery and application, product quality and price has also perpetrated an interest in farm input markets among those concerned with farm management and production economics.

This session considers a specific market environment which we are only beginning to understand. As such, it seems appropriate to set as a goal the generation of ideas and concepts with implications for both the farm input industry and the clientele it serves. Our considerations may then include the aggregate environment of the farm input industry and that relevant to specific elements within the industry.

Major emphasis of this paper is on those phenomena common to most of the markets in the farm input industry. Reference here is to the manufactured feed, seed, petroleum, fertilizer, agricultural chemical and farm machinery markets.[1] Specific mention will be made to markets where the commonality is less clear. This discussion proceeds from a definitional statement of the current environment to a consideration of some economic stimuli which have precipitated the observed situation. The current economic environment is then contrasted with that from which the present situation was derived in an attempt to suggest implications for the future.

Although the title delineation indicates specific separation or organization, scale and ownership, I suggest at the outset that the three are pragmatically non-separable for the farm input industry. This is especially true in the context of this paper.

Current Situation

Each of the input markets can be characterized as having 1) decentralized its manufacturing operations to locate closer to raw material sources and users, 2) integrated manufacturing and distribution in an attempt to exploit supposed economies of size at the local outlet, 3) undertaken rather aggressive programs of merchandising their products as part of a service-product package, 4) become increasingly system conscious,[2] 5) continued product diversification via development of products which complement traditional product lines and various types of mergers, acquisitions, and joint ventures (3). These statements portray the current environment in the farm input industry and allude to the processes by and from which the situation evolved. However, before exploring these processes more deeply it is perhaps appropriate to be more specific with reference to individual markets.

Fertilizer

The fertilizer market can be characterized by a single word, overcapacity.[3] (9) Excess capacity has been fostered by development of production technologies which considerably increased the least-cost size of plant.

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[1] It is a bit awkward to speak of the farm input industry when, in fact, it is composed of a group of entities which are industries in and of themselves. These separable entities of the farm input industry are referred to here as markets in the broad context. Other papers and discussions in this session consider the credit market. Labor and land markets are excluded to emphasize non-durable purchased inputs.

[2] Systems consciousness reflects the growing awareness of the interdependence of raw materials suppliers, manufacturers, distributors, retailers, and users. Also included is the idea that each individual input is but a single element in the farm production system.

[3] Documentation of capacity in fertilizer may be also found in other recent publications of the Tennessee Valley Authority.

Of course, the decision of major petroleum companies to diversify from traditional markets while at the same time seeking captive markets for by-products has accentuated the situation. Expanded fertilizer production capacity in other parts of the world has effected export demand and increased the concern of many U.S. producers.

An increasing number of producers of fertilizer materials have obtained basic positions in two or three primary nutrients. Many distribute to company-owned retail outlets. Such individual company action and the apparent trend toward joint venture activity has resulted in a proliferation of various types of local level retail outlets in areas of high plant food use (7). Expansion in the number of retail outlets has resulted from an aggressive quest for market penetration and share fueled by the anticipation of capturing supposed cost and/or scale economies associated with coordinated raw material production, manufacturing, distribution, and retailing operations.

Manufactured Feed

Feed manufacturers have decentralized major portions of their feed milling and mixing operations. This change resulted from the economic advantages associated with utilizing surplus concentrate supplies in major livestock feeding areas and concern for increasing costs of centralized product, distribution and merchandising associated with an increasing array of enterprise specific nutritional developments.

Decentralization has enabled feed suppliers to better service the specific nutritional demands of users. But the movement of mixing and milling operations to areas of livestock concentration or ingredient surpluses has resulted in increased competition from many new small firms who are once again able to compete on a cost and perhaps even quality basis. Strong retail competition has fostered a proliferation of product variations and product related service packages.

Agricultural Chemicals

Manufacturing and distribution of agricultural chemicals involves firms which have been basic chemical producers for some years. There has been little change in ownership patterns among large agricultural chemical firms but some reshuffling has occurred among a few somewhat smaller firms. Development of new products has served as a continual stimulus to competitive activities among firms in the market and altered the apparent position of certain companies. New entrants into the ag chemical arena have been few in recent years with the exception of some firms whose by-products are useable in production of new or improved chemicals.

Only minor changes have occurred in distribution practices but there has been emphasis on user education and dealer services. Dealers serve in many instances as consultants to farmers on selection of condition specific chemicals and application procedures. Some companies have also developed educational programs aimed at financial institutions in an attempt to aid farmers in securing short-term financing for chemical purchases.

Farm Machinery and Equipment

The period after World War II up to the early or mid 1960's was one of rapid growth for the farm machinery market. More recently the large full-line companies have experienced a decline in the rate of growth. Some preliminary studies suggest that in fact these large companies may have experienced a decline in absolute size as measured by such crude parameters as earnings, value added, etc. (12)

There has been an increase in the number of firms classified in the farm machinery and equipment industry in the last ten years. Somewhat surprisingly many of these rather new entrants into the market have been able to maintain an economically viable position even though they have been small relative to full-line firms by conventional measures. Perhaps this phenomena is explained by the fact that many of the new establishments manufacture only specialized types of tillage and irrigation equipment or various kinds of feed or grain handling and storage equipment.

Census of Manufacturers data (14) indicates that there has been an increase in the number of firms classified as multi-unit, multi-industry companies producing farm machinery and equipment. This group of firms also generated increases in sales and receipts and value added. Nelson (12) concludes that these increases coincide "with the surge of conglomerate growth recorded by other industries" during the past ten to fifteen years. And, that this evidence is consistent with the hypothesis that diversification has occurred both by farm machinery firms entering other markets through product extension or mergers and acquisitions and by firms not traditionally in the farm machinery market developing or acquiring a market position. It is probable that much of the latter type of diversification has involved the newer specialized equipment manufacturers.

Seeds

Promotion and other merchandising activities have been expanded by major seed companies in an attempt to alert farmers of the attributes of newly developed varieties. Sales contact with farmers and procedures for final delivery of product to farmers has changed very little over the last ten to fifteen years. Seeds are typically sold as branded products through franchise dealers. Of course, specialized seed retail outlets exist but these are certainly the exception rather than the rule.

Large seed companies appear both as multi-line and single line companies. In some geographical areas large companies account for major portions of the market. In others, small specialized companies dominate. Almost without exception all companies maintain continuing research and development programs aimed at improving their offering of varieties suited to new production technologies and changes in the ecological environment.

Many agricultural seed firms are closely held corporate organizations. Primary management responsibility in these firms has been in the hands of the founding group for several years. A favorable market combined with modest expansion objectives and generally sound management practices has facilitated the large equity positions enjoyed by many "old line" seed companies.[4] Trade journals (2) report isolated instances of merger and/or acquisitions involving seed companies. Cursory review of these suggests that seed companies have been the objective of acquisition activity more often than the initiator. In those few instances familiar to this author, anticipated problems associated with generation transfer have been an important contributing influence to ownership change.

Petroleum

Recent activity of petroleum firms in the fertilizer and agricultural chemicals fields has been alluded to earlier. There continues to be new investments in nitrogen production facilities even in view of existing excess capacity. Aggressive management of large petroleum firms supported by a sizeable commitment to uncover opportunities for efficiency in production, distribution and retail service has stimulated considerable thought and some concern throughout the farm input industry. Pipeline transportation of nitrogen from oil field production locations to high use farming areas is a reality. Proliferation of retail outlets has been an apparently logical consequence, at least from the petroleum companies' point of view as they pursue development of more effective merchandising strategies. This apparent emphasis on retailing is consistent with merchandising activities aimed at promoting the "service package" concept mentioned earlier.

Although some question the need for increasing the number of retail outlets, it is evident that farmers have benefited from it. These benefits result both from improved access as related to timeliness of application, improved product information and, of course, price competition.

I acknowledge that these brief surveys of the inputs markets are in many respects incomplete. Total innumeration of the situation is not the purpose here. But rather, the intent is to present the situation as alleged by those who have studied the area and those who are trying to compete. With that purpose in mind it seems logical to propose that there is concern in the farm input industry regarding organization as related to both scale and ownership. Changes are obviously occurring, but I suspect many are on a trial and error basis. This applies throughout the production-manufacturing-distribution-retailing system.

Farmers observe the symptoms of these changes in the form of products, ancillary services, pricing and information at the retail. Dale Dahl provided a useful survey of some possible modifications in farm supply retailing last year (4). Brian Gnauck has generated a good description of market conduct (6). Such works are beginning to provide us with an understanding of the current situations. We, as practicing economists, are concerned with how the situation developed and then with anticipating the sources and incidence of various economic stimuli in the future.

Genesis of the Current Situation

Development of the current economic environment in the farm-input industry is rooted in three major types of economic considerations related directly to input suppliers and the changes which have occurred with respect to farmer demands.

Changes in organization, scale and ownership in nearly every industry can appropriately be traced to the potential realization of economies of size in production and/or marketing, questions of acquisition and management of

[4] The essence of this statement was offered in conversation with a major accounting firm who desires to remain anonymous.

finance, and business management philosophy and motivation, i.e., influences of the technostructure.[5] The situation is certainly no different in the farm input industry.

Cost economies. Continued technological development in production of farm inputs has tended to increase the optimum size of plants.[6] Application of the basic economic principle of constructing the optimum size of plant(s) and operating at the optimum capacity has provided major impetus to the observed expansion of production capacity. Stabilizing supplies of raw materials has provided adequate cost incentive for farm input suppliers to attempt to coordinate materials procurement and production.

The systems consciousness mentioned earlier applies not only to the product market but also to the totality of firm operations. The link between production and product marketing is distribution. Coordination of materials procurement, production and product distribution allows consideration of more of the relevant interdependencies than when each activity is considered separately. Synonomously, sub-optimization for each part of the system need not yield the same composite strategy or combination of activities as simultaneous optimization of all the activities. Given an integrated materials procurement, production and distribution system and the resultant centralization of control, development of more effective marketing and merchandising programs become less a guess and more a logical process based on greater awareness of the role of such programs in total firm activity.

Finance. A. C. Hoffman implies that successful participation in the "industrial game" requires large amounts of capital (8). Or, to paraphrase further, the name of the game is money, i.e., its acquisition and use. Much of the technology generated in or related to industrial environments is geared to output expansion. Such expansion is the symptom of the economic phenomena of increasing the optimum scale of facilities by reducing unit cost. Adoption of such technology is often deemed necessary for a firm to remain competitive in terms of the market supply price of its products.

Recent merger and acquisition activity provides many examples of the importance of capital in attaining and maintaining market position. Conversations with a modest sized agricultural chemical manufacturer illustrate the situation facing many such firms. This company has developed and tested some products which have substantial potential for reducing contamination attributed to certain existing agricultural chemicals. But capital limitations prevent the company from introducing the products into the market. The concern lies in the fact that several larger companies are interested in participating in the introduction. The question for the firm is how do we acquire adequate capital to facilitate market penetration without losing autonomy.

This is not meant to imply a basically weak financial position. In many instances quite the opposite is the case. For many firms in the farm input industry have large equity positions and quite consistent earnings. But often these are inadequate to obtain financing necessary for major research, development, and marketing programs.

Of course, if the hypothesis that acquisition minded companies often seek to acquire firms with a strong capital position is correct, some firms in the farm inputs industry would seem to be prime targets for acquisition bids. This does not necessarily imply any real change in activities of the acquired firm unless the acquiring firm is disposed to impose new management styles and philosophy. Hoffman has suggested that in fact the desire for control of financial resources has been a prime motivator for much of the recent industrial merger activity. So much so that management philosophy and operations of acquired firms has been little affected by the change in ownership (8). I also suspect that it is difficult to effectively separate management functions from the accumulated technical knowledge of a product and its users without seriously disrupting the firm's performance, at least in the short run.

Management philosophy. Management philosophies in the farm input industry are of two general types: 1) aggressive-expansionist, 2) conservative. While "sound" management is often paralleled with a conservative philosophy, there are also "sound" aggressive management programs. Aggressive management is often a self-spawning phenomena emanating from the desire of managers at various levels to control larger organizations (5,13). The creation of larger organizations spawns more positions for people of the same philosophy and so on. Some companies which have been in the farm input industry for some time have experienced a change in management philosophy and its often resultant emphasis on expansion. Many of the companies which entered the inputs industry recently seem to have aggressive type management as well as some of the other motivations already discussed. Other companies have a "conservative" management philosophy.[7]

Some farm inputs firms which have operated under conservative management during the past ten to fifteen years have experienced limitations in their ability to remain competitive. They have been cautious in adopting new technologies and marketing strategies. In some instances, this has resulted in difficulty in securing adequate financing once new technologies and strategies were deemed necessary and/or desirable. To some joint venture activity has provided an alternative. Others have found mergers to be the most expedient way of obtaining capital to expedite innovations in technology and strategy.

Entry into the farm input markets by aggressive expansionistic firms is thought by some to have shocked management of "old line" inputs firms out of complacency into a realization of the need for innovative new approaches.

Cost and/or scale economies potentially available through integrated or coordinated control of material procurement, production, distribution, marketing and merchandising, the need for ever increasing amounts of capital, more precision in financial management, and changes in management philosophy from conservative to aggressive are the basis for changes in organization, scale, and ownership in most industries. The agricultural inputs industry is no exception. While stimuli such as those mentioned here have resulted in changes on the supply side of most industrial systems, stimuli from the demand side have in general been gradual and quite modest in total effect. Here there is a notable difference between the situation which has and does confront companies supplying agricultural inputs.

Motivation from the demand side. A unique motivation for changes in organization, scale, and ownership in the farm input industry is provided by structural and philosophic changes in user demands. As stated above, most such changes in the general industrial environment have taken place in the absence of any major consumer based stimuli. While the consumer remains the center of most post-production activity, he is difficult to identify individually.[8]

Agricultural economists have documented the structural changes in agriculture for many years. Similar documentation of the importance of purchased inputs in the farm production process is provided by the U.S.D.A. and university sources. Estimates of derived factor demand resulting from structural and technological changes in agricultural product have been attempted for most purchased farm inputs.

There has been a notable downward trend in the number of farmers with corresponding increases in production concentration. Farmers have become increasingly aware of the capabilities of specific technologies in their individual situations. They have also become aware of the economic payoff associated with knowing the market in which they buy factors. As a result, demands have become increasingly situation specific, technologically speaking, with the added requirement that the individual firm supply price reflect the competitive conditions of the market.

Attempts at estimating derived factor demands have provided useful information of the technological considerations. But our understanding of buyer motivation in the farm input area, i.e., the stimuli-response information feedback, is in its infancy. It is often suggested that farmers desire or demand dependable quality, in some instances custom tailoring of products to buyer specifications, and a number of product related ancillary services. While it is true that the first two of these are appropriate characteristics of changes in farmer demand, it is not clear that the ancillary product services available are in fact universally required by farmers.[9]

These technological and behavioral changes in demand have provided the apparent opportunity, or perhaps more appropriately, the necessity for changes in the retail functions of farm input suppliers. Such an environment provides for changes in existing retailing operations and entry of new retail establishments into the market, especially by those with new merchandising strategies. The farm machinery market may be the exception to this in that current organizational patterns reflect a decline in numbers of retail farm machinery and equipment establishments.

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[5] Technostructure includes the motivations and subsequent behavior of people in industrialized organizations as put forth by J. K. Galbraith in The New Industrial State.

[6] This is especially true in fertilizer production where natural gas serves as the basic fuel source for nitrogen production and the electric furnace process for phosphate production.

[7] I assume sound management whether aggressive or conservative. Aggressive management is taken to reflect that associated with the "technostructure" motivations proposed by Penrose (13) and amplified by Galbraith (5). Conservative management is taken to include those situations where a less expansionistic strategy is followed.

[8] Contributions and development of consumer or behaviorally oriented market research are acknowledged. But the consumer's impact at nearly every echelon in most industrial settings is negligible in terms of organization scale and ownership, especially in the short run.

[9] Studies at Purdue University by Riddell, Yarger, and Minden (10, 11) suggest that many services offered are not required by farmers in the first instances. Often the service packages are created and offered as a product merchandising gimmick by the input supplier to gain or maintain retail market share.

Changes in the characteristics of farm level demand have had the effect of imposing large capital requirements on input supplying firms at the retail level as well as at other echelons in the supply system. These requirements result from increased emphasis on custom tailoring of products, timeliness, and the influence of competitors' activities on the firm's merchandising and ancillary service offerings.

Various organizational structures, ownership patterns and scales of operations appear at the retail end of the farm inputs supply system. Dahl, Hoffman, and others have described the essence of some of the variations (1, 4, 8). Farmer-owned cooperatives are a major element in the farm input industry. It has been proposed that they account for about 20 percent of the manufactured feed, nearly 30 percent of the fertilizer and are active in the agricultural chemicals and seeds market.

One reason for the market position enjoyed by cooperatives is the apparent cost savings which accrue to members on the basis of patronage. Another is the traditionally hypothesized allegiance of some farmers to organizations which they control. Active educational and merchandising programs have also contributed to growth of the market share of cooperatives. Access to capital for financing expansion of services through banks for cooperatives and availability of tactical and strategic planning assistance have also been important.[10]

Recent studies at Purdue based on observations from a sample of 1500 farmers in two midwestern states suggest an additional reason for growth in the share of the inputs retail market attributed to cooperatives (10, 11). Purchases by farmers in the sample of certain types of livestock feed and agricultural chemicals from cooperatives reflected 1) smaller annual amounts per purchaser, 2) smaller average quantities per purchase, 3) larger numbers of purchases per farmer and slightly higher annual average prices paid than for non-cooperative retail suppliers. It was also found in the case of livestock feeds that nearly one-half of the total annual quantity purchased was bought by farmers operating under 220 acres or with less than $25,000 gross annual sales. These observations, although limited, seem to provide a basis for the hypothesis that some and perhaps a significant portion of the increase in retail market share of cooperatives in the past few years may have resulted from adoption of improved technology by smaller farmers. If this were true, marketing strategies of cooperatives may be much different in the future than in the rather recent past.

The agricultural input industry has changed over the past decade. Manufacturing has been decentralized while materials procurement, manufacturing, distribution and marketing have become more coordinated. Changes in ownership patterns primarily reflect entry of new companies and the inability of some firms to obtain adequate investment capital for growth. Size of companies and plants has been influenced by the apparent existence of cost economies associated with technological innovation and management efficiencies and the general move toward decentralization of certain activities. And, there has been and is a strong motivation for change emanating from the purchaser of farm inputs.

Prospects

Definitive statements about future characteristics of the farm input industry in terms of organization, scale and ownership are difficult, if not impossible, to offer, especially with the apparent vacuum of research upon which to base such statements. It is appropriate in the context of this session to propose some possibilities.

Most stimuli which have served to promote change in the farm input industry will persist. Technological developments in production processes for some inputs will continue to put pressure on plant size. Adoption of these technologies will tend to increase investment capital requirements and production capacity. Larger capital needs will cause some firms to seek participation of other firms via mergers. Others may be forced out of production. Joint venture activities resulting from attempts to coordinate materials procurement, production, distribution may increase as firms recognize possible efficiencies in such coordination and diversification but desire to remain autonomous. As one executive in the fertilizer industry implied, all we need is for the government (FTC) to leave us alone for two years. This suggests the presence of severe pressures on profits resulting from a large number of expanding competitors in a modestly growing market.

If there is any merit in the technostructure concept as related to growth motives the move to decentralized manufacturing may in itself increase production capacity. For, managers of the new facilities may strive to control even larger organizations.

The rate of change in ownership patterns may not be much different in the future, especially with respect to major farm input supplying firms. Capital limitations and market access problems will tend to make some of the newer and/or small firms more receptive to outside participation. Larger input suppliers will continue diversification via product extension acquisition and joint ventures as in the past.

There will be increased competition at the retail level as manufacturers seek markets for expanding production. The observed increase in company owned retail outlets will continue perhaps even at an accelerated rate. Discussions with some managers of such outlets, however, suggest that the failure rate may also increase. Persistently low profit margins are, in some instances, causing parent companies to consider closing certain facilities.

Organizations such as that of National Farm Stores, Inc., may provide a viable retail unit. Only time will tell for sure. But if it is true that smaller farmers will be the most frequent patrons of such establishments, their future may also be questionable. It seems inconsistent with the apparent desire of farm families to integrate into the non-farm culture to create an establishment which at least implicitly supports a separatist image. The convenience of the National Farm Stores concept is desirable as is the service package included. Perhaps these attributes will be adequate to entice the patronage necessary. In any event, the farm stores idea exemplifies the type of forward thinking merchandising philosophy which will characterize the farm inputs industry for the next few years.

Large regional and national farmer cooperatives will also continue to explore needed modifications in the retail function. This is especially true if the earlier observations relative to the characteristics of cooperative patrons are correct. Member cooperatives which cater primarily to small volume purchasers will surely encounter serious difficulty as the number of these purchasers declines.

I suspect the greatest change in organization, scale and ownership patterns in the farm input industry to occur at the retail level. There will be more company owned establishments, and less individual proprietorships. Joint venture activities in the manufacturing, distribution, and marketing will spawn new outlets and/or greatly alter the nature of existing ones. Specification of the future characteristics of the retail establishment are impossible at this time. Research necessary for such specification is simply not yet available. As a result, there will be considerable trial-and-error experimentation.

Farm input suppliers are also potentially vulnerable to another emerging phenomena; namely, vertical integration by food processors and retailers. As coordination of the marketing channels for food products increases and extends to actual farm production, increased pressures will be brought to bear on input suppliers. Purchase of inputs will tend to be based solely on performance attributes and specification ordering will prevail. The implications are obvious. Farm input sales for individual suppliers will be highly sensitive to price and product performance. This suggests increased product differentiation will be necessary for suppliers to maintain access to the market.

The market for certain inputs may become increasingly saturated as input production capacity is expanded and the number of farmers declines. Farm machinery companies may already be encountering the situation where net market expansion is at best modest. With a durable input such as farm machinery a sizeable portion of the effective demand may be for replacement as opposed to net stock additions. Demand for certain non-durable inputs may tend to plateau after a period of declining rates of increase.

Governmental intervention in terms of imposed composition regulations related to potential pollutants may have the effect of temporarily reducing sales of certain products. But the more meaningful effect will be as a result of the substitution of less harmful ingredients or ingredient forms. This may facilitate entry of new firms into the farm inputs area and of course expansion of some existing firm activities.[11]

[10] Tactical planning related to moment-to-moment planning and control. Strategic planning involves development of policies and specification of decision criteria which result in tactical plans. Both types of advice are available from many regional or national cooperatives, the land grant universities and agencies of the federal government.

[11] The potential use of bromides in certain agricultural chemicals as a substitute for chlorides has potential for this type of activity.

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12. Nelson, Paul E., Jr., "The Farm Machinery and Equipment Industry: Its Changing Structure and Performance," Marketing Research Report, in press, Economic Research Service, U.S.D.A., Washington, D. C., 1970.

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14. U. S. Bureau of the Census, U. S. Census of Manufacturers, 1968.

SEMINAR SESSION II
Monday, August 10, 1970, 1:15 to 2:45 pm

THE GREEN REVOLUTION: SECOND GENERATION PROBLEMS

Program Organizer

Vernon Ruttan, University of Minnesota

Major Paper

"The Green Revolution: Second Generation Problems"
by Walter Falcon, Harvard University

Discussants

Randolph Barker, International Rice Research Institute
Carl Eicher, Michigan State University

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SUB-SESSIONS OF SEMINAR SESSION II
3:00 to 5:00 pm

Sub-session IIa

"The Implications for Technical and Economic Assistance"

Chairman: Lowell Hardin, Ford Foundation

Discussants: Erven J. Long, AID, Washington, D.C.
Arthur Moser, Agricultural Development Council, NYC
Jim Hendry, World Bank

Sub-session IIb

"Price, Income and Trade Policy Implications of the Green Revolution"

Chairman: David Hopper, International Development Research Center
Ottawa, Canada

Discussants: John Schnittker, Kansas State University
Gordon MacEachern, Agricultural Economic Research Center,
Ottawa, Canada
Quentin M. West, FAS, USDA

Sub-session IIc

"Institutional Reform, the Conflict Between Equity and Productivity"

Chairman: Eldon Smith, University of Kentucky

Discussants: William K. Gamble, Ford Foundation
Dale Adams, Ohio State University
Peter P. Dorner, University of Wisconsin

Sub-session IId

"Implications of the Green Revolution for Economic Growth"

Chairman: John Mellor, Cornell University

Discussants: Edward Schuh, Purdue University
Kusum Nair, Michigan State University
Wyn Owen, University of Colorado

The Green Revolution: Generations of Problems*

by

Walter P. Falcon**

The recent flood of literature on the green revolution has a certain similarity to the theologians' writings on God: both are concerned with existence, consequences and salvation, and both are equally contradictory in their conclusions! I am realistic, therefore, about what one additional paper can add to the green revolution controversy and have chosen to concentrate on two limited objectives: (a) a brief survey of the usage and the impact of the new high-yielding seed varieties, and (b) a more lengthy discussion of the longer-run consequences of rapid technological transfer to the less developed countries. I have deliberately avoided a quantitative projection of future production and prices, and have attempted to focus instead on general problems and mechanisms.[1/]

Since the food-population-employment-growth problems with which I am concerned are most severe in Asia, since that is where the new varieties appear to have had most impact, and since that is where my personal experience has been, this essay has a strong Asian focus. It draws heavily on the Pakistan experience and continues, albeit more pessimistically, in much the same vein as recent writings by Barker /3/, Cummings /6/, Hardin /20/, Johnston /24/, and Wharton /41/.

The First Generation: Great Production Successes, But Important Limitations

A quantitative history of the new varieties has been given by Brown /5/, Dalrymple /42/, Schertz /36/, and Willett /41/, as well as by the Agency for International Development in their extensive Spring Review of New Cereal Varieties.[2/] Since this whole story, including the pioneering work of the Ford and Rockefeller Foundations, is now rather widely known, several general comments about it will suffice.

The picture that emerges for wheat and rice in Asia is fairly clear. Starting from a position of only a few thousand acres in 1965/66, there has been a spectacular growth in the use of the new seeds, particularly in the case of wheat. By 1968/69, it is estimated that over 30 million acres were planted to the improved varieties. (See Tables 1 and 2.) These high-response varieties and the concomitant rapid growth in fertilizer use have produced yields per acre about double those possible with most of the older, local strains.

In more aggregative terms, wheat production in Asia during 1969 exceeded the 1960-64 average by 30 percent, while rice in 1969 exceeded the 1963-67 average by 18 percent.[3/] Although the weather factor in these calculations may be substantial, there can be no doubt that great strides have been made in increasing foodgrain production. One need

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* I am especially indebted to my colleague, Carl Gotsch, for helpful suggestions. Many of the ideas presented here are the product of our collaborative work on Pakistan, although he bears no responsibility for this version of them. I have also benefited from the comments of Hollis Chenery, Ralph Cummings, Jr., Morton Grossman, O. Donald Hoerr, Bruce Johnston, Charles Mann, Edward Mason, Gustav Papanek, Robert Repetto, Vernon Ruttan, Lyle Schertz, and Raymond Vernon. Portions of this research were supported by funds provided the Harvard Center for International Affairs by the Agency for International Development under contract CSD-1543.

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1/ Readers interested in commodity projections are referred to Barker /4/, Efferson /10/, F.A.O. /11/, /12/, Gotsch and Falcon /17/, and West /45/, /46/.

2/ More than twenty papers were prepared for this review. A very cogent summary of them is given by Rice /35/.

3/ See Rice Situation /43/ and World Agricultural Production and Trade /44/. This calculation excludes Mainland China, North Korea and North Viet Nam. Little is known about the use of new varieties in these three countries, but several newspaper stories (e.g., The New York Times, October 25, 1969), indicate that new seeds were a partial explanation of the improved food situation of 1969.

Table 1. Use of New Varieties, South and Southeast Asia

Rice

Country	Total Rice Area 1968/69 (Thousand Acres)	Area of New Varieties 1966/67 (Thousand Acres)	Area of New Varieties 1968/69 (Thousand Acres)
Burma	12,297	#	470
Ceylon	1,637	-	17
India	91,344	2,142	6,500
Indonesia	20,950	-	416
Laos	1,550	#	4
Malaysia (West)	1,182	104	225
Nepal	-	-	105
Pakistan (East)	21,212	#	300
Pakistan (West)	3,743	10	761
Philippines	7,904	204	2,592
Vietnam (South)	5,528	-	109
TOTAL	167,347	2,460	11,499

Wheat

	Total Wheat Area 1968/69	Area of New Varieties 1966/67	Area of New Varieties 1968/69
Afghanistan	5,500	4	300
India	39,432	1,278	10,000
Iran	4,925	-	25
Lebanon	151	-	1
Nepal	371	16	133
Pakistan	14,977	250	6,020
Turkey	20,015	1	1,780
TOTAL	85,371	1,549	18,259

Less than 1,000 acres.
Source: Barker /3/ and Dalrymple /42/.

Table 2. Fertilizer Consumption in Asia, 1965/66 and 1968/69

(Thousand metric tons of N, P_2O_5 and K_2O)

Country	1965/66	1968/69
Afghanistan	-	14.0
Burma	6.1	65.0
Ceylon	77.8	111.4
China (Taiwan)	230.2	272.7
India	764.7	1,682.0
Indonesia	94.5	212.2
Iran	41.0	83.9
Japan	1,928.0	2,300.0
Korea (South)	376.4	478.5
Laos	0.1	3.0
Lebanon	14.7	24.2
Malaysia (West)	60.0	79.0
Nepal	1.0	3.0
Pakistan	148.9	391.8
Philippines	138.0	148.5
Singapore	6.5	105.0
Thailand	33.0	35.0
Turkey	149.1	380.0
Vietnam (South)	92.9	115.0
Total	4,162.9	6,504.2

Sources: 1965/66: FAO /13/, February 1968; 1968/69: FAO /13/, February 1970.

only to have walked through fields devoted to the new varieties to realize that parts of Asia will never be the same again as a result of this technological improvement.

On the other hand, the extraordinary growth of production in certain areas such as the Pakistan and Indian Punjab has, in my opinion, caused a loss of perspective on the total Asian picture. In aggregative terms, only about 9 percent of the rice land in 1968/69 was in improved varieties and for wheat about 23 percent. Given the areas that have had rapid increases to date, there are important reasons to believe that continued rapid rates of adoption on additional areas are unlikely.

Throughout Asia one of the most severe constraints is adequate and controllable water supplies. In the case of wheat, for example, it is the higher-rainfall coastal area of Turkey and not the great Anatolian plain where the new varieties have flourished. In India and Pakistan the same point holds for wheat and obtains a fortiori in the case of rice. Although some of the largest rice yields produced anywhere in the world have come from the province of Sind in southern West Pakistan, this type of irrigated region is relatively limited in South Asia. Indeed, in most of the eastern half of India, in East Pakistan and other Asian countries, it has been very difficult to adapt varieties capable of high yields under uncontrolled monsoon conditions. While there has been limited success in such regions as Bengal and Java, again it has been largely in the winter months under irrigated conditions. District-by-district analyses for Pakistan and India show clearly the very high correlation between the growth in crop production and controlled water supplies. Moreover, fertilizer use is highly correlated with both the previous variables. For example, in India, approximately 80 percent of the total fertilizer consumed in 1968 was concentrated in 25 percent of the districts, with most of the latter being those with irrigation systems.[4/] In short, the new varieties require controlled irrigation; without that control, fertilizer provides only a low return; and without new seeds and fertilizer, the possibilities for rapid increase in crop output have distinct limitations.[5/]

A second important constraint on adoption of the new technology in Asia has been the inadequacy of pesticide programs in most countries. Many of the older, local varieties had been selected and retained precisely for their ability to withstand pests and diseases. Although Barker [2] indicates that improving the pest- and disease-resistance of new strains is more easily accomplished than developing varieties tolerant of varying moisture stress, the pesticide problem is enormous nonetheless. Any solution to it must deal realistically with organizational issues and with the important externalities that are involved. For with postage-stamp sized holdings, it does one farmer little good to spray if his neighbors do not. There are also the further problems of getting the right spray, the right equipment, and the right information to farmers at the right time. A fast-reacting pesticide system has not been easy in most of Asia, and, in my opinion, the deficiencies in pest and disease control will continue to be the second most important limitation on the technology/supply side.[6/]

The foregoing comments, and the other extensive literature now available on individual countries seem, therefore, to be suggestive of several conclusions. First, the adoption of new technology in the second, third, and nth blocks of 30 million acres for wheat and rice are likely to be much slower in coming. These blocks must include smaller farmers, about which more will be said later, and must reach into areas where water supplies are uncertain. Although it is possible that the plant breeders and geneticists can develop new strains that will overcome many of the remaining pesticide and water problems -- their performance until now has certainly been impressive -- there has been only moderate success to date along these lines. A corollary to this point is that, in the future, the almost "cost-free" nature of the new seed technology[7/] will change appreciably. The planning, constructing and running of irrigation systems is a time consuming and expensive business. Instead of having only to convince farmers to use more fertilizers, large public and private investments -- often on the order of $50 or more per acre -- will be needed. These in turn will require increased public revenues through taxation and/or aid. Whether large investments of this type can be justified on economic grounds is another matter; the answer will require a complete reassessment of costs and benefits of agricultural growth within an economy-wide framework.

Second, given the regional constraints on new varieties for wheat and rice in Asia, and given the continuing need for broad-based and rapid agricultural growth as a part of the overall development process, there is an urgent need for increased national and international varietal research on additional commodities. In addition to wheat and rice, some encouraging work on corn and sorghum is under way; however, work on oilseeds, pulses and fibers, as well as on livestock[8/], has hardly begun.[9/] Vested interests in the developed countries, especially in the case of cotton, are a part of the explanation, but surely not all of it. While genetic research in Taiwan, the Philippines and India has become impressive, most other Asian countries have lagged -- even in adaptive research on wheat and rice. To call for more research has been the ubiquitous recommendation for years; in this case, however, it really is important.

Third, and related closely to the previous points, it is clear that economists and others must stop thinking strictly in aggregative terms about national and international commodity problems, and must give increased attention to regional questions within countries. India, Pakistan, and Indonesia are all classic cases of countries where regional commodity problems and policies are rapidly becoming of dominant importance. To anticipate comments in the next sections, it is necessary only to contemplate pricing and adjustment problems for wheat and rice, the major wage goods, when yields per acre in one-third of a country have doubled, but have held constant elsewhere within the same nation.

4/ See Grossman [19], Chapter 4.

5/ For a further discussion of environmental factors in Asia see Hseih and Ruttan [21]. The same generalizations probably also hold for much of Latin America and Africa. Although there has been inadequate testing of the new varieties in these regions, experiments in the Pampas, for example, show the adverse yield effects of relatively low and uncertain rainfall on the new varieties.

6/ One hopeful sign in the pesticide area is the recent development of granular compounds which can be applied by broadcast methods. This technology is much more neutral to scale and avoids many of the equipment and timing problems.

7/ I do not mean by this statement to indicate that the purchase of the joint input, fertilizer, was costless. However, the shift in production function was very large, and even when the additional costs of all joint inputs were deducted, profits per acre increased enormously.

8/ Brown [5], Hardin [20], and others have advocated diversification into livestock as one palliative to the income problems of less developed countries. For Asia, I am skeptical about the practicality of such a suggestion. Religious and cultural factors preclude beef and/or swine in many regions, and the disease problems of poultry are especially difficult for small farmers. Perhaps even more discouraging are three other factors, (a) the length of time required to implement an improved livestock system, (b) the average income levels that prevail in the area, and (c) the relative price of livestock to grains. In West Pakistan, the farm support price of wheat is about $2.65/60 lb. bushel (at the official exchange rate), whereas the retail price of beef tenderloin (clearly not prime!) is about $.50 per pound.

9/ My colleague, Morton Grossman, argues that with only two or three commodities and a few regions so far involved, the whole process ought to be called the Green Evolution. In India, for example, wheat acreage since 1964/65 has increased 20 percent, and production by 50 percent; but wheat is only 22 percent of total foodgrain production and is even less of total agricultural output. Total foodgrain production since 1964/65 has increased by only 2.5 percent annually. In 1968/69, non-foodgrain production, one-third of total agricultural production, was 9 percent less than in 1964/65. It is in this total growth sense, therefore, that evolution is the more appropriate term.

The Second Generation: Problems of Marketing, Markets, and Resource Allocation

In the regions of Asia where the production revolution has occurred, the impact on marketed surplus has been nothing short of phenomenal. Even with a moderately high on-farm demand from increased output, marketings have risen much more than proportionately to production. While the response of public and private sectors in a few regions has been quite good, the pace of change, the preoccupation with production, and the ability of policy makers to handle only a few issues simultaneously have meant that few policy actions were taken before crises erupted. Transportation bottlenecks have often been a problem, as an example from West Pakistan will illustrate. In Sind (the lower half of the hour-glass-shaped Indus Basin) rail marketings of rice in 1969 completely swamped the system. Large uncovered piles of rice accumulated at railheads, and prices to farmers fell substantially.[10/] Millers were working equipment at capacity and were running into severe inventory and working capital constraints. (As usual, they were blamed for the decline in price.) It nearly required a French-style, pitchfork rebellion to obtain more rail cars, to change government policy to permit trucks to deliver rice to the port, etc.[11/] In the meantime, however, farmers were "hurt," at least relative to what would have been the case with a better transport system and a faster-moving government policy machinery.

Similar stories on milling, grading, storage and transport can be told for other countries as well. The problem of limited, old-style mills, unable to handle increased supplies and to produce "export-quality" rice, is well documented in reports and government documents that I have seen for at least five Asian countries. These physical problems of marketing have been exacerbated by social factors in several countries of Southeast Asia, where specific ethnic or racial groups have traditionally controlled most of the commerce. Regardless of the efficiency of the marketing system, rural problems have tended to be blamed on these groups. Justly or unjustly, middle-men are an important factor in social and political unrest in these countries. This unrest, in turn, has posed the problem of either taking over milling in the public sector, or of developing a set of incentives and guidelines for the private trade that will protect the public interest as seen by the policy makers. Efficiency and ideology are often in conflict on this point, and the net result in many regions has been that the developments in marketing skills have lagged.

There have also been varietal/quality questions that have posed difficulties both domestically and internationally. The early IRRI rice varieties had tendencies to sun-check and to show "white belly." The baking quality of the Mexican varieties of wheat was also deemed less good (or at least different) by many Asian consumers. As a result, the new varieties sold at substantial price discounts in the market (often 20 percent). Although the new varieties were generally still much more profitable for farmers to produce, problems of consumer acceptance caused considerable anxiety among farmers, consumers, and policy makers.[12/] However important these difficulties may have been in the short run, they are clearly transitional in nature. New varieties are already being developed and introduced which will overcome many of the most severe quality problems.

In addition to the readily identifiable milling, transport, and grading questions, there are also formidable second-generation problems concerned with pricing and markets. There are economic and political dimensions to these questions, and both aspects must be incorporated into meaningful answers.

A number of the food-deficit countries have historically had a structure of relative prices that bore little relationship to world prices. Although in allocative efficiency terms, such a structure has always had drawbacks, the problem takes on even more serious proportions when countries and regions close their food import gap and become potential exporters. Adjusting domestic support prices, which at the official exchange rate are often double or more the world price, is no easier politically in these countries than in the United States.

Some indication of variations in price supports among countries can be obtained from the calculations of Schertz /36/. The range in the case of paddy is very large -- $36/ton in Burma, $93 in the Philippines, and $123/ton in Ecuador. In the case of wheat, the price of one ton also varies greatly -- $64 in Mexico, $87 in Turkey, and $101 in India. Clearly a part of this range is due to the overvalued exchange that characterizes many of the developing countries. On the other hand, absolute and relative prices among crops within countries often bear no relationship to international norms, and adjustments are essential if farmers are to be given the correct price signals, and if the social benefits of agricultural production are to be kept at the forefront of the development strategy.

The foregoing point can be seen clearly with another illustration from West Pakistan. With the new wheat-fertilizer technology, and a government-guaranteed price almost double the world market price at the official exchange rate, wheat was extremely profitable. The wheat supply curve shifted outward to the right very rapidly,[13/] and in 1968 the government tied up more than $100 million in supporting the price of wheat. These funds precluded other development expenditures that were more "productive," in part because of inflexibility of monetary and fiscal policy. Moreover, the great profitability of wheat with guaranteed prices and new technology began to cut into the acreage of cotton, the major export commodity. Given wheat's relative and absolute price, the fact that it was the major wage good, and that even at reduced prices it was an enormously profitable commodity to grow, the sensible[14/] conclusion was to lower its price. This would have assisted urban workers (whose riots, by the way, were a major factor in the change in government and the re-imposition of martial law later in 1969), and would have moved the country towards a wheat price more in line with international comparative advantage. This was not done, however, for a variety of legitimate and illegitimate reasons. The argument was always put in terms of reduced production, although income transfer was the real issue. The harmful regional income effects on rainfed areas unable to use the new technology were also quite legitimately cited as reasons for not lowering the support price. Moreover, a number of observers claimed that reduced prices would be a "dis-

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10/ Efferson /9/, p. 18, reports as follows:

> "Every mill visited in the Southern rice area had large supplies of paddy on hand. In most cases, all available paddy go-downs were filled and hundreds of tons of paddy were stored in the open, in piles on the drying floors, and without protection. These same mills had their milled-rice storage facilities filled to capacity. When asked why they were not moving the rice, they suggested that the situation at the railroad loading points be checked. At the stations it was found that all sheltered storage was filled and the yards were piled high with sacked milled rice, much of it without cover of any type. This rice was still owned by the millers. At the Larkhana Station, for instance, sufficient milled and sacked rice ready for shipment to Karachi was available to fill 100 wagons, and more than one-half of this 2,000 tons was in the open, available for attacks by birds, rodents, and possibly thieves, and subject to major damage and deterioration by the first rain. This same situation was reported to exist at many other shipping points in the region."

11/ The problem on trucks was indicative of the marketing problems that can arise under these rapidly changing conditions. Rail cars were historically graded and sealed at the point of origin. Trucks could not be sealed, and no grading system existed at the point of destination. Until the latter could be remedied, the use of trucks was banned. In addition, there was fear of increased smuggling if trucks were permitted to move the rice.

12/ The historical record shows that when the present local varieties were introduced many years ago, they too were criticized on quality grounds. Hence, the acceptance point should probably not cause undue concern.

13/ Empirical estimates of these supply curves under varying technologies are given in Gotsch and Falcon /15/, Chapter 4, and in Annex A of this paper.

14/ Sensibility, like beauty, is of course in the eyes of the beholder!

incentive" and "would kill the revolution." In the end, agricultural interests prevailed and the high price was retained.[15] The fundamental point -- that incentive is a composite of yield and price (i.e., profitability) and not just price -- was overlooked, as were the broader needs of the economy. That somehow agriculture might or should share the results of the cost-reducing effects of the new technology had been disregarded.

In addition to internal pricing difficulties, an even larger problem looms ahead on the international side. For those regions "lucky" enough to emerge as surplus areas, the problems of breaking into international grain markets have rarely appeared so difficult. The International Wheat Agreement appears to be seriously undermined, and there has been a considerable softening in rice prices, particularly in the lower-quality grades.[16]

Several elements of the international dimension deserve mention. What happens to "world prices" for wheat and rice is obviously dependent on what happens to the green revolution in the developing countries as well as to the agricultural policies of the developed nations. As indicated previously, there are reasons to believe that portions of Indonesia, India, and East Pakistan are likely to be net importers for some time. On the other hand, the quantity traded internationally is so small relative to production -- less than four percent in the case of rice -- that increases in production in key countries such as India are likely to have important international price repercussions. Perhaps even more important than what happens in the developing countries is what happens to agricultural policy in the advanced countries. Unable to adapt to rapid technological advances and structural change themselves, these countries have instituted support systems that use commodity exports to solve sectoral income distribution problems.[17] The P.L. 480 program of the United States, in spite of its considerable merit at times, certainly comes under this heading. The E.E.C. is "developing" similar arrangements, creating such anomalies as France supplying Indonesia with rice at concessional terms. Japan, with support costs triple the world market price for several million tons of rice, is in the process of supplying Korea with 300,000 tons of rice, payable in 30 years with only 1½ percent interest rates and a 10-year grace period.[18] In short, less developed countries breaking into export markets will be faced with three kinds of problems: (a) a tenacity among developed countries in fighting for shares of the commercial market, and a willingness to cut prices to retain them, (b) an increasing amount of foodgrains being supplied by developed countries at concessional terms to countries that might "normally" be the trading partners of developing countries,[19] and (c) an inability, or at least difficulty, of the less developed world to compete in "buyers'" markets in terms of specific grades, quality, deliverability, etc. The foregoing does not mean that the developing countries cannot sell in international markets. What it does mean, however, is that planners in these countries must be hard-headed about the quantities, and especially the prices at which wheat and rice can be exported, and the concomitant internal price adjustment (or export subsidy) that will be required at these levels.[20] [21]

The foregoing marketing and demand problems, any one of which could be the subject of a major paper, suggest several conclusions. First, the production gains in certain regions have shown how rapidly second-generation marketing problems can arise. Hopefully in the future, policy makers will heed earlier the warnings given by marketing specialists, and will react before crisis situations develop. Unless these milling and transport problems are solved, farm prices will decline steeply, and the quality problems of exporting will be all the more difficult. What is particularly needed in several Asian countries is a marketing strategy which resolves the basic public/private/foreign investment questions on marketing facilities. Also needed is an explicit recognition of the interaction of price support policies and techniques on the behavior and efficiency of marketing firms.

Second, planners must pay increasing attention to the adjustment and pricing problems attendant on the new varieties. The narrow focus on foodgrains and relative neglect of other crops must be re-evaluated in a multi-crop setting. In particular, the cropping patterns of many of the irrigated areas of Asia which can best use the new varieties are quite sensitive to profitability changes.[22] What constitutes an appropriate incentive price for foodgrains in these areas with the new varieties has changed substantially; unfortunately the rhetoric which characterized the later 1950's and early 1960's, regarding the need for ever higher agricultural prices, has not changed. Vested interests in agriculture are already a fact of life in these countries, and economists concerned with agriculture must keep in mind the overall needs of development, not just the needs of the agricultural sector. Since most agricultural goods are tradable, what is especially needed in the less developed countries is an assessment of the domestic costs of earning or saving foreign exchange from producing various agricultural and non-agricultural commodities.[23] The real tragedy would be for these countries to retain outmoded pricing policies which lead to great inefficiencies in resource use, stock accumulations, and/or highly subsidized agricultural exports -- exports which were uneconomically grown in real terms in the first place. Unfortunately, experience in dealing with such problems in developed countries does not inspire confidence, nor do recent policies in a number of Asian countries.

Third, the advanced countries must consider more seriously the distorting effects of their dumping programs. The talk of a world market price for wheat or for rice is largely a fiction, and concessional pricing arrangements will be a sharp deterrent to the generation of third-country foodgrain exports.

Fourth, since there is little reason to have confidence in the developed countries' ability to deal with their sectoral income distribution problems without resort to concessional efforts, the developing countries should look increasingly to domestic markets for absorbing additional supplies. On this point, there is some room for optimism. What has been seriously underestimated, I believe, is the investment and employment uses to which wheat and rice, the wage goods, can be put. The basic elements in this argument can be stated as follows:[24] With significant increases in production, foodgrain prices in a closed economy would fall. However, given the fact that much of the increase came from

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15/ It was lowered by about 12 percent for a brief time and then reinstated.

16/ See Barker /4/.

17/ See Gotsch /14/.

18/ See McKnight /27/, p. 9.

19/ What may "save" third countries in this competition is an inability of the U.S. and other government to move quickly in response to food aid requests.

20/ When, for example, Assistant Secretary Palmby /33/ warns U.S. wheat growers at their convention that they should be thinking about feedgrain prices for wheat, the price situation can, I believe, be regarded as serious!

21/ In another paper /17/, Carl Gotsch and I were chastised for being too bearish about the international rice market. But by way of illustration, Indonesia in late 1969 was able to purchase substantial quantities of rice in Burma at about $80/ton. Although this rice was fairly low in quality, it does suggest that this figure, rather than the $200 quoted in mid-1969 for 5-7 percent broken, Thai rice ought to be one that planners should keep in mind.

22/ See Gotsch and Falcon /16/, and Annex A.

23/ See Hufbauer /22/, Lawrence /25/, and Stern, Falcon and Gotsch /38/. In West Pakistan, prices (f.o.b. Karachi) for wheat, rice, cotton, and maize are respectively 170 percent, 160 percent, 100 percent, and 235 percent of world market prices at official exchange rates of Rs. 4.75 per dollar. By contrast, the rupees required to earn or save a dollar of foreign exchange are respectively Rs. 5.25, Rs. 3.34, Rs. 3.84 and Rs. 3.34 for these same crops.

24/ See Lewis, Falcon and Gotsch /36/, and Mellor /28/, /29/ for a fuller exposition of these ideas.

cost-free technological change, prices could fall somewhat and still provide strong incentives to farmers. In addition, with adequate stocks of grain, the government can have a much more expansionary fiscal and monetary policy. (Indeed, in India, Pakistan, and Indonesia, the lack of adequate food supplies has been a major constraint on the size of the development budget.)[25/] The more expansionary monetary and fiscal policy -- particularly if it is directed toward labor-intensive public projects -- can shift the demand curve for grains, helping to counteract some of the decline in prices.[26/] Given the fact that the price of the wage good is a major development constraint in much of Asia, especially as seen by Finance Ministers, the increases in production from the green revolution can thus continue after initial import substitution has been exhausted. These increases can be converted into investable resources through fiscal and monetary expansion, and the country (perhaps even the agricultural sector if the investments are rural) would be much better off.[27/] This should be a basic element of strategy for countries moving into foodgrain surpluses. Moreover, it seems especially important for countries who find themselves with seriously distorted internal prices. This approach should provide time both to solve the institutional problems of entering international trade and to make transitional changes in relative and absolute price levels without having to rely on stock accumulation or "excessive" subsidies on agriculture.[28/] Such a strategy also has much in common with a sensible P.L. 480 policy which can effect shifts in the demand curve through investment policies, thereby helping to counteract much of the decline in prices that would have resulted from increased supplies.

The Third Generation: Social Forces and Uncertain Consequences

The first generation production problems and the second generation marketing and demand difficulties created by the green revolution are a formidable list. Nevertheless, they are largely short-run issues on which economists have worked for years. By contrast, the third generation problems, having to do with equity, welfare, employment and social institutions generally, are questions that have received inadequate attention even in the developed countries. Part of the problem arises, as Dorner /8/ has forcefully argued, because the United States' rural institutions were almost all in place when the agricultural economics profession originated at about the turn of the century. In short, the profession has had very little experience in dealing with what may be the overriding problems facing Asia today.

These third-generation factors arise from four principal sources: (a) population growth rates in excess of 2.5 percent annually in areas already extraordinarily densely populated, (b) very low average income levels, coupled simultaneously with great regional and personal disparities in income, wealth and political power, (c) limited opportunities for non-farm employment even if the manufacturing and service sectors grow very rapidly, and (d) the possibility for technological leap-frogging with agricultural inputs and techniques which are often of a labor-displacing nature. The resulting dilemma can be baldly stated: The Asian countries need agricultural growth if ever they are to break the chains of poverty; but they need equity as well, for obvious humanitarian reasons, and also if they are not to find themselves in a continuous cycle of violence and repression. The challenge of these forces is far greater in magnitude than the problems ever faced by the U.S. and most other currently developed nations. Moreover, the latter are not in much of a position to help. Although they are perhaps capable of exporting the growth technology, they have few institutional forms to export that can come to grips with the income distribution and employment questions that now plague Asia.

India, Pakistan, and Indonesia, three enormously large and regionally heterogeneous countries, present stark examples of the problems outlined above.[29/] Even with the rapid growth of the industry and service sectors, it is clear, as Johnston /23/ has shown, that non-farm jobs cannot hope to keep pace with the population explosion.[30/] Increasing agricultural un- or underemployment and/or larger unemployment in cities seem inevitable. The specific question at issue in this paper, however, is the effect of the green revolution on the structural process. The answer is far from clear cut, and will be dependent in part on the subsequent policies that are followed.

With respect to short run, direct employment effects of the green revolution, the inconclusive evidence that exists has recently been summarized by Shaw /37/. The data indicate that in some areas the shortened growing season may permit multiple croppings and add to labor "requirements." Increased yields per acre may also require more labor. On the other hand, if wheat, for example, becomes sufficiently profitable to displace a more labor-intensive crop such as cotton, total man days of labor may be reduced. In short, the employment effects of the new varieties must be analyzed in very specific regional contexts; however, in the aggregate the new varieties appear to be employment-creating in character.[31/]

Perhaps even more important than the direct effects, and often neglected in discussions on employment, are the side effects of increased food supplies/lower food prices on public and private savings and investment generally. As noted earlier, the food-price constraint is an important one and has a pervasiveness that extends far beyond the agricultural sector. Here too the green revolution helps, provided that its potential for increasing savings is realized and is transferred into real investment.

Far more disturbing, however, are two other features of the green revolution on employment, welfare and stability. Both of these derive basically from the unequal regional growth that seems to be a concomitant of the new technology. The process is as follows: The regions with irrigation, such as the Punjab, have the ability to respond rapidly to the new technology. A combination of the resulting production, plus an agricultural price policy which reflects concerns for non-growing districts as well as vested agricultural interests, will mean that incomes in the irrigated regions grow at phenomenal rates. That is all to the good; the difficulty is that welfare, between regions as among people, is more a relative concept than an absolute idea. It is not, for example, that West Pakistan is absolutely well off by any international standard. But it is the income (and imperialistic attitude) there relative to that in East Pakistan that threatens to tear the country apart. Although general tax and subsidy systems, as well as other measures of government policy, could rectify this inequity, it is necessary to look only at the developed countries to know the impracticality of such a suggestion. In this inter-regional sense, therefore, the green revolution is hardly a stabilizing influence.

25/ That this is a reasonable reaction can be illustrated by the Indonesian economy. In 1966, that economy underwent an inflation of more than 600 percent, in large part because of rice shortages. Fortunately, rice and other policies have changed since that time.

26/ Among low income workers in South Asia, for example, about two-thirds of the budget goes for food, and within the food category about half is for foodgrains.

27/ The most famous of the attempts at a Rural Works Program is discussed by Thomas /39/.

28/ Whether a subsidy is excessive in social terms can be seen through a series of calculations which determine the domestic cost of earning or saving foreign exchange for given commodities. The above comment should, therefore, not be construed as being against export subsidies as a matter of principle.

29/ In Bengal, for example, population density in "rural" areas already exceeds 1,300 per square mile and could rise to 2,500 within twenty years. Each five year plan India adds more people to her population than twice the total population of Ghana. See Revelle and Thomas /34/.

30/ To keep this point in perspective, in Pakistan the livestock sub-sector of agriculture currently contributes more to GNP than combined large- and small-scale industry.

31/ A precise statement of the aggregate employment effects would require demand schedules, supply schedules and factor-substitution schedules for agriculture, plus all the inter-industry effects.

Within a given region, the mechanism producing greater income inequality is much the same, and the form is even more virulent. Although in theory the new seeds and fertilizer are neutral to scale, in practice they are not.[32] Under rationed conditions, and unfortunately these often prevail for inputs in Asia, it is the larger farmers who obtain the fertilizer and receive the irrigation water. Moreover, with the prices and technology now prevailing, agricultural incomes of large farmers have risen dramatically. This too is not "bad," but the side effects may be. Land prices are rising rapidly, as farmers seek to expand size and find new outlets for their increased incomes. Even more important is the drive that these windfall gains are providing for certain types of mechanization. Although this is a broad question, deserving also of a separate study, several points deserve mention. First, there are powerful forces that are pressing for mechanization of all kinds. Large farmers, foreign and domestic industrialists, politicians and even aid agencies[33] have vested interests in promoting various implements, including tractors. Some forms of mechanization may be labor-displacing, others not.[34] However, large farms in wheat areas are an example of where tractors and combines will be introduced, barring strong government action to the contrary. The net result will be to make tenants into laborers, and to increase the number of people displaced from agriculture. Just as in the inter-regional illustration, the intra-regional effects of the green revolution are likely to increase the inequality of incomes within agriculture. There will indeed be agricultural growth in these areas; but probably increasing tension among classes as well.[35] Perhaps the growth in service and supply industries in small towns can absorb this additional displacement.[36] But the adjustment problems with which the U.S. had trouble in coping under much more favorable demographic circumstances and over a century, must be dealt with in Pakistan in 20 years. This labor displacement process was not "easy" in the U.S.; in Asia the situation is distressing even to contemplate. It is not an accident that the journals and newspapers are now frequently carrying such essays as "Green and Red Revolutions" [30].

Several recommendations and reconsiderations are suggested in the light of these third-generation questions. First, as long as the new varieties remain limited to a few regions and as long as farm incomes are primarily dependent on acreage rather than people, it is naive to believe that the new technology for agriculture is likely to be a stabilizing influence. Growth generally is de-stabilizing, and this form of unequal agricultural development is particularly so. Even if the first borrowings of technology are neutral to scale (which in practice they are probably not) then subsequent borrowings are likely to be labor-displacing unless strong policy measures are introduced. The magnitude of this phenomenon will vary by commodity and region, but the direction seems fairly clear. Second, some way must be found to close the gap between social and private benefits on certain forms of agricultural technology. It is not sufficient to appeal to the "Japanese method" of cultivation, to urge labor-intensive techniques for agriculture and industry, or to proclaim the virtues of small-scale industry. Such pronouncements must be transformed into instruments of direction and control: high taxes on tractors; a possible lowering of wheat and rice prices as a stimulant to the rest of the economy; much higher interest rates on capital and higher *defacto* rates for foreign exchange; progressive land taxes and perhaps even ceilings on farm size so as to make uneconomical, from a private point of view, certain forms of technology. And in any Asian country, no one should discount the size and power of the forces that are likely to be against most of these policies.

Third, neither growth nor equity problems in Asia can be solved by the green revolution or even by the agricultural sector alone. The employment problem, in particular, is total-economy in character, whose solution requires increased savings, more foreign exchange, higher investment rates, altered factor and product pricing structures -- in short, economic development. While agricultural policies should not aggravate the situation, meaningful answers to these issues must look to other sectors as well.

Fourth, given the tearing effect that unequal regional growth has on the national fabric, there is need to stress again the importance of developing new technology for the monsoon/dryland areas.

Finally, while there is need to keep social and private benefits from diverging among the large farms, the opposite side of the coin is to assist small farmers. From Table 3, it is clear that huge numbers are involved, under any reasonable definition of smallness. Given the resources available, and the political interests that are involved, a broad-based welfare system does not seem to be the answer. Nor do special loan or credit arrangements to small farmers which are used for unproductive investments. There is reason to be even more skeptical, as has been amply demonstrated in the United States, about price support or input subsidies as an instrument. It is the large farmer who has the marketed surplus and who uses most of the inputs. (Nearly one-third of the farmers in Indonesia, Pakistan, and India, for example, are net purchasers of grains.)

Table 3. Distribution of Farm Size in Indonesia, Pakistan and India

Area (acres)		Indonesia[b] (1963) No.Farms (000)	Percent	East Pakistan[c] (1960) No.Farms (000)	Percent	West Pakistan[c] (1960) No.Farms (000)	Percent	India[d] (1961) No.Farms (000)	Percent
Under	1	5,423	44.7	1,492	24	742	15		
1 to under	2½	3,218	26.5	1,677	27	856	18		39.1
2½ to under	5	2,173	17.9	1,615	26	806	16		22.6
5 to under	7½	653	5.4	698	12	581	12		12.8
7½ to under	12½	399	3.3	442	7	759	16		14.9[g]
12½ to under	25	413	2.3[d]	188	3	729	15		6.1[h]
25 to under	50			26[e]	*	286	6		4.5[e]
50 to under	150					88	2		
150 and above						14	*		

* Percentage less than 0.5.

[a] Gene Wunderlich [28]. Percentage distribution only is available, based on sample surveys.

[b] Asian Development Bank, Asian Agricultural Survey [1].

[c] 1960 Pakistan Census of Agriculture [18].

[d] Amount is for over 12½ acres.

[e] Amount is for over 25 acres.

[f] Amount is for all holdings below 2½ acres.

[g] Amount is for 7½ to under 15 acres.

[h] Amount is for 15 to under 25 acres.

32/ Strictly speaking, the seed-fertilizer technology is neutral, but the factor and product markets in which the technology is used often have large imperfections. In the case of irrigation wells, however, there are definite economies of scale.

33/ The I.B.R.D., for example, is currently proposing a $25 million loan to finance tractors in India, and has several other similar loans pending. In Pakistan, an I.B.R.D. mechanization loan also provided for the special importation of tractors at the official exchange rate and, in addition, provided special credit arrangements.

34/ The agricultural evidence by Shaw [37] indicates how necessary it is to talk about specific regions, commodities and implements before concluding anything about labor displacement.

35/ See Munthe-Kaas [31]. Although the rural poor may not "lead" the class or regional fights, they are likely to be involved -- even used -- in the process by disaffected leaders on either the right or the left.

36/ Grossman [19], Chapter 2, indicates that it was the rural cities of around 100,000 in India where population and jobs grew the fastest in the 1960's.

It is spurious to argue for higher farm prices or increased subsidies to "help the small farmer," for it would be hard to design a more inefficient system for reaching them. (Some rough calculations for India and Pakistan indicate that of $10 transferred via a price support system, only about $1 goes to "small" farmers.) The small-farmer argument, which is always displayed by the representatives of larger farmers whenever pricing is an issue, should be viewed very skeptically.

Except for the obvious and important point of assuming a ready supply of inputs such as fertilizer, the literature of agricultural development has little to offer in the way of positive suggestions for dealing with the agricultural production alternatives for millions of small Asian farmers. Providing credit in kind (as under the BIMAS program in parts of Indonesia) has worked in some circumstances, as have a few cooperative arrangements. The program at Comilla in East Pakistan, for example, has shown the merit of cooperative credit, marketing and pump facilities at the village level. On the other hand, most of the cooperatives of South and Southeast Asia have been run as heavy-handed government agencies with little local support except among the rural elite who have benefitted from them. Similarly, loan programs especially designed for small farmers have generally had little success because of prohibitively high transaction costs for issuing and monitoring small loans. Perhaps most promising as an aid to the smaller operator is the provision of adequate supplies of irrigation water. The employment effects from this type of infrastructure are substantial, and reliable water supplies may provide the flexibility for diversifying and intensifying output. On the whole, however, the outlook is far from bright for the smaller farmer.

Given all these problems, it is not clear what will happen, or even what ought to happen. However, an extraordinary recent article by Dandekar [7, pp. 54-55] offers two possibilities that should induce much serious thought about institutions and agricultural organization in Asia:

> "The problem is how to hold and reverse this process [of growing income inequality.] Communism presents in my opinion a logically well-conceived solution and a well-tried strategy. Briefly, it consists of three stages. The first stage is expropriation. Its purpose is to abolish the feudal institution of tenancy and to destroy politically, the landlord class. The second stage is redistribution of the expropriated land in equal holdings. Its purpose is to win allegiance, support and participation of the agrarian masses and also to demonstrate the absurdity, under conditions of overpopulation, of distributing land in equal holdings on the principle of land for everyone. The third stage is consolidation or collectivization of the land so distributed into sizable areas under cooperatives or communes. It is in this final form that the reorganized agrarian structure is able to meet the challenge of the situation. I have no doubt that the communist strategy can break through the vicious circle of poverty and rescue an overpopulated agricultural country out of the conditions of overpopulation." . . . . [On the other hand,]
>
> "If, in a situation of overpopulation, capitalist agriculture is to be promoted and encouraged, there is not land enough, at the same time, to give a small plot of land to members of the landless. In fact, their numbers may grow . . . . The fundamental issue of equality cannot be resolved by such means. But people are willing to be patient if a more elementary issue is attended to, namely the right to a living through gainful employment. . . . the capitalist sector in agriculture, as in industry, must be taxed sufficiently to enable all the residual landless labour to be gainfully employed on works which will create capital in agriculture and infrastructure from which ultimately the capitalist sector will profit."

Myrdal [32], for one, does not believe that the second alternative is feasible on political grounds. If it is not, then the first solution with all its attendant production and other difficulties, ought not to come as a surprise to Asian governments or their advisors.

Concluding Comments

The foregoing assessment of the Green Revolution is hardly one of wild enthusiasm. The purpose has not been to argue that it should not have happened or to deny its great production successes in certain regions. Rather, the intent has been to indicate how limited a solution the revolution is, given the broader development problems of South and Southeast Asia.

Four central themes stand out in the analysis. First, impressive as the gains to date have been, the term "revolution" can only be used correctly to describe about 10 to 15 percent of Asia. One of the greatest second-generation obstacles is that set of individuals who believe, explicitly or implicitly, that the first-generation solutions have been found. Many additional answers are needed, and any complacency on varietal research would be most unfortunate both in terms of growth and regional equity. Clearly also, a real revolution will require greatly expanded investments in irrigation and substantial improvements in systems for pest control.

Second, the sudden increases in agricultural output have already or will soon, necessitate basic pricing decisions on the parts of governments. It would be a great pity if the nations of Asia, in the face of remarkable productivity changes, maintained pricing structures which did not keep in mind the needs of the entire economy. As a result of the increased production from the green revolution, there is considerable potential for expanding the development effort with investment programs that are wage-good intensive. As regards exports, the developed countries could play a major facilitating role; however, their probable increased use of dumping programs will provide the most formidable kinds of competition for those developing nations who generate export surpluses. Hence the internal market opportunities and the external market difficulties indicate the probable need for downward adjustments in relative grain prices in several Asian nations.

Third, the limited technological revolution in agriculture has permitted an easing of one critical development constraint. It has not, however, provided a panacea for solving the employment and equity problems, and indeed, has probably been de-stabilizing in the sense that it has widened income disparities within and between regions. Lest this view be regarded as too bleak, it should also be emphasized that without the green revolution, the development situation in these countries would now be even more dire.

Finally, although it is important to recognize and understand what has happened in the past, the great challenge of the future will be to forge institutions that can deal simultaneously with the demographic explosion, rapid economic growth and equality of income distribution. Certain obvious mistakes in policies can be avoided, such as the subsidization of tractors. However, there is little in the way of a broad, institutional blueprint in the history of the developed countries or in the general writings of agricultural economists that are now of much help on this issue. The Asian challenge of the 1970's will be to encourage growth elements in the economy -- such as the green revolution -- while at the same time fostering equity so as to prevent a decending spiral of violence and repression.

New Varieties, Irrigation and Price Policy in West Pakistan

In [15], Carl Gotsch and I present the results of farm management work done on representative farms from different regions of West Pakistan. Using linear programming techniques which (a) vary commodity prices in the objective function, (b) include the new seed-fertilizer technology in the form of additional activities, and (c) introduce increases in water supplies by varying the water resource constraints, the following sample graphs and tables were developed. We are fully aware of the problems involved in using programming techniques in this manner and in drawing conclusions from the results. On the other hand, the tables and charts presented here for central West Pakistan do supplement a number of the broader conclusions presented in the text of this paper. They are attached to provide some rough, albeit incomplete, quantitative insights on these issues.

* * * *

Conversion Units:

$1 equals Rs. 4.75

1 maund equals 82 2/7 pounds

Figure A-1 SUPPLY CURVES FOR RICE 12.5 acre Representative Farm
Central Punjab, West Pakistan

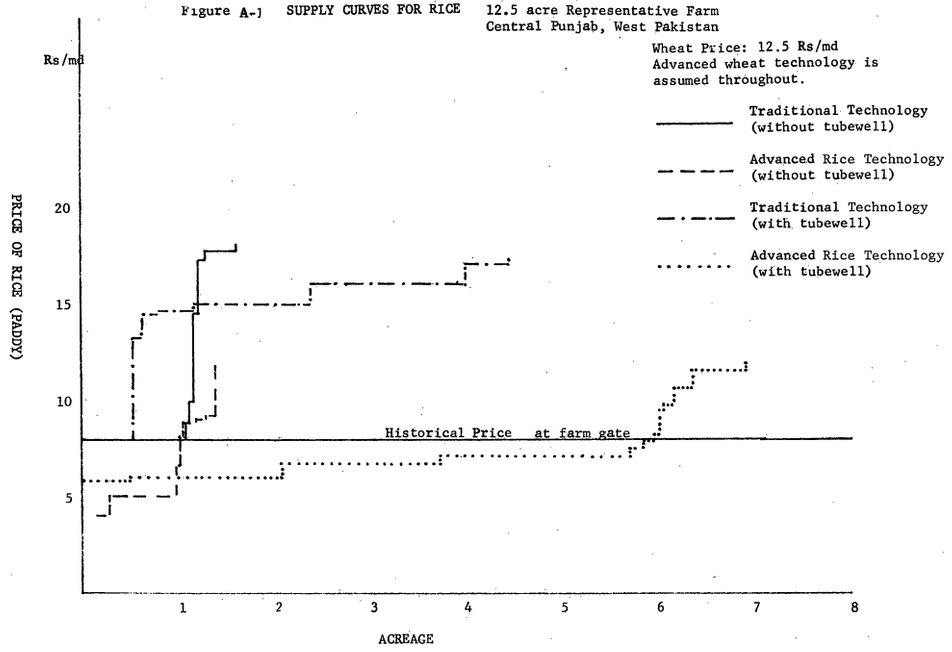

TABLE A.1 . OPTIMAL CROPPING PATTERNS 12.5 Acre Farm CENTRAL PUNJAB West Pakistan

I.D.	Crops (Acres)	Traditional Technology (1) Without Tubewell	(2) With Tubewell	Advanced Wheat Technology (3) Without Tubewell	(4) With Tubewell	Advanced Rice Technology (5) Without Tubewell	(6) With Tubewell	Advanced Wheat and Rice (7) Without Tubewell	(8) With Tubewell	Advanced Wheat, Rice, and Maize (9) Without Tubewell	(10) With Tubewell
NET REVENUE (rupees)		2034	3192	2358	3649	2197	3382	2475	4131	2763	4387
CRC	Coarse Rice	.27		.61		1.04	3.93	.89	6.70		1.77
SFR	Summer Fodder (required)	.60	.67	.66	.67	.60	.67	.60	.67	.60	.60
SFO	Summer Fodder (optional)	.60	.67	.60	.67	.60	.67	.60	.67	.60	.67
CTD	Cotton	3.01	7.37	3.21	2.45	1.94	1.47	2.32		.58	
KVG	Summer Vegetables	.10	.10	.10	.10	.10	1.0	.10	.10	.10	.10
WHF	Wheat	5.13	1.13	5.33	6.15	5.22	5.07	5.10	6.50	5.57	5.70
GRM	Gram									2.19	1.76
OIL	Oilseeds	.31		.32							
BER	Berseem (required)	.80	.89	.80	.89	.80	.87	.80	.89	.80	.89
BEO	Berseem (optional	.85	.85		.85	.56	.85				.85
MAZ	Maize									2.78	3.54
SUG	Sugarcane		1.00		1.00	.59	1.00	.43	1.00	.29	1.00
RVG	Winter Vegetables	.13	.20	.20	.20	.20	.20	.20	.20	.01	.20
FRT	Fruit		.30		.30		.30				.30

Figure A-2 SUPPLY CURVES FOR WHEAT
12.5 acre representative farm
Central Punjab
West Pakistan

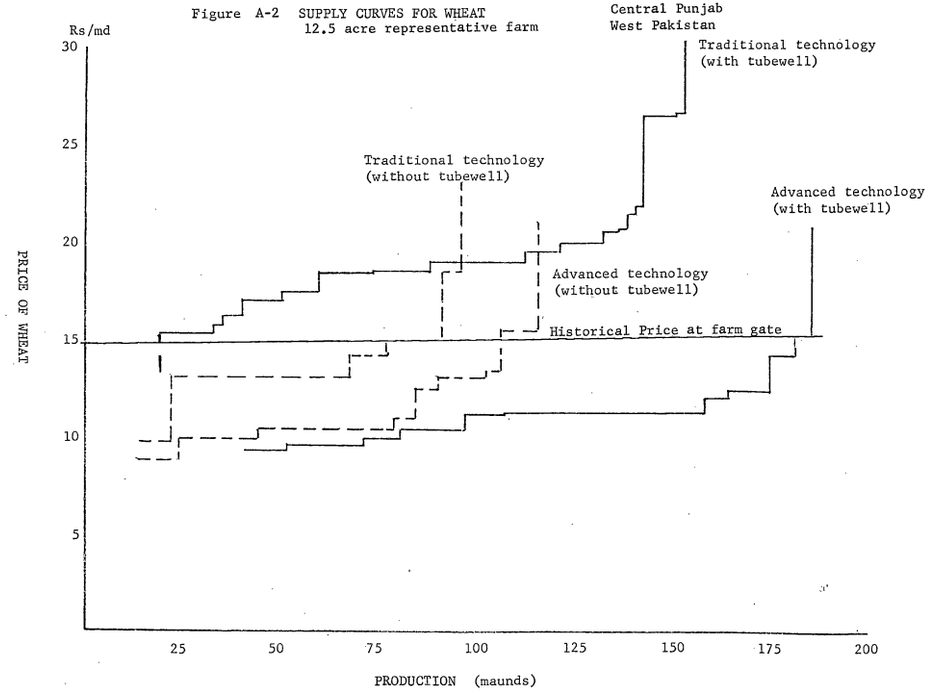

Table A-2. COMPARISON OF OPTIMAL CROPPING PATTERNS AT DOMESTIC AND WORLD MARKET PRICES (12.5 Acre Representative Farm with Tubewell) Central Punjab, West Pakistan

ID	Crops	Domestic Prices (acres)	World Prices (acres)
CRC	Coarse Rice (IRRI)		4.57
SFR	Summer Fodder (required)	.67	.67
SFO	Summer Fodder (optional)	.67	.67
CTD	Cotton		3.62
KVG	Summer Vegetables	.10	.10
WHF	Wheat (Mexi-Pak)	4.67	4.17
GRM	Gram		
OIL	Oilseeds		.67
BER	Berseem (required)	.89	.89
BEO	Berseem (optional)		
MAZ	Maize (J-1)	4.75	
SUG	Sugarcane	3.86	
RVG	Winter Vegetables	.20	.20
FRT	Fruit		

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SEMINAR SESSION III

Monday, August 10, 1970
1:15 to 2:45 PM

SECONDARY IMPACTS OF PUBLIC INVESTMENTS

Program Organizer

Allan Schmid, Michigan State University

Major Paper

"A Framework for the Evaluation
of Secondary Impacts of Public Investments"

by Charles Leven,
Washington University, St. Louis

Discussants

William Lord, University of Wisconsin
Dean Jansma, Pennsylvania State University

SUB-SESSIONS OF SEMINAR SESSION III

Monday, August 10, 1970
3:00-5:00 PM

Sub-Session IIIa
WATER RESOURCES AND OTHER PUBLIC WORKS
Chairman
Maurice Kelso, University of Arizona
Discussants
Robert Kalter, Cornell University
Paul Barkley, Washington State University
David Major, Massachusetts Institute of Technology

Sub-Session IIIb
HUMAN RESOURCES
Chairman
Leroy Hushak, Ohio State University
Discussants
Howard Robinson, North Carolina A & T University
Daniel Hamermesh, Princeton University
Loren Ihnen, North Carolina State University

Sub-Session IIIc
RURAL INDUSTRIALIZATION AND OTHER EMPLOYMENT GENERATING ACTIVITIES
Chairman
John Thompson, South Dakota State University
Discussants
Clark Edwards, ERS, USDA
Ben Chinitz, Brown University
Dwight Blood, Utah State University

A FRAMEWORK FOR THE EVALUATION OF SECONDARY

IMPACTS OF PUBLIC INVESTMENTS

by

Charles L. Leven

Director, Institute for Urban and Regional Studies
Washington University
St. Louis, Missouri

presented at

American Agricultural Economics Association
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Columbia, Missouri

A Framework for the Evaluation of Secondary
Impacts of Public Investments

All of the sessions on this set of programs reflect a single general problem, namely the neglect of the economics profession in regard to the question of economic (or social) criteria for resource allocation in the public sector. In short, we have only very imperfect analytic techniques for comparing the merits of one project or activity as compared with another, we have no theory of how the allocation of public funds among programs and purposes is determined, and we have clear differences in acceptable philosophies as to why governments should spend at all.

It is the intention of this paper to consider some of the problems involved in formulating analytic techniques for program selection - not the need for more cogent theories or philosophies of government spending. It is also the intention to focus on the allocation of resources through government[1] and resource allocation mainly for developmental purposes, at that. Nonetheless some theoretical and philosophical issues and some consideration of the problems of analyzing government spending, in general, will emerge in the discussion.

To start the discussion it will be helpful to distinguish between developmental and non-developmental government programs. A non-developmental government activity consists simply of the allocation of resources to the provision of a good or service which, for a variety of reasons, is more appropriately provided through other than market channels. This could be because of a tendency to monopolization where regulation is not feasible, where the "exclusion" principle operates[2], or simply where marginal costs are zero. In any event, the non-developmental public good is simply a case

of a way of providing a commodity which is more efficient than through an ordinary market. A developmental activity, on the other hand, has as its purpose changing the production possibility surface in the private sector. This could come about by increasing the stocks of capital goods or known reserves of resources, through improvement in the quality of human resources, or by changing the geographic pattern of resource availability.

Now, in an ultimate sense all public sector activities have both commodity providing and developmental purposes. But while such services as public parks, drinking fountains, or even monuments, may in some sense "improve" people, they really do not do so except in the sense that all utilitarian consumption, public or private, is "people improving". On the other hand, something like the building of a railroad into a previously unsettled region comes close to being purely developmental, although rarely would there be no initial service users. In any event, what is really of interest is not the matter of identifying a priori what is or is not "developmental", but rather the concept of a "developmental" purpose which can be regarded, for practical purposes, as of no particular importance in large classes of governmental activity and of paramount importance in others, with some cases remaining in between. This distinction will be drawn more sharply later on.

While my remarks will be mainly concerned with efforts at "figuring out" ways of making better rather than worse decisions on the deployment of developmental resources in the public sector, it should be noted, at least briefly, that not all people, or even all economist who are interested in this problem, regard it as one that it is necessarily possible or even desirable to "figure out". Typically, of course, neoclassical economics has maintained what metaphorically could be described as an "Ostrich" position. In its simplest form, of course, it simply asserts that an elected government will in fact provide what services people want provided, or it will be replaced in office by a government that will so provide, at least within the context of a democratic framework. Clearly it is recognized that governments might not necessarily be completely responsive, but if they are not it is to be viewed as a political problem.[3] In short, if one defines economics as being concerned with the allocation of resources through markets, implicitly one is defining a non-market resource allocation as a non-economic problem.

A somewhat less conservative position might be characterized as a "semi-ostrich", or "Emu" position. Essentially it could be characterized by the literature of Welfare Economics, at least up until the 1950's.[4] This literature did recognize that government programs could have economic significance, but it was much more concerned with the philosophical underpinnings of the rationale for public sector activity rather than with providing any guidelines for actual discrete decision making. At that level, about all that it said was that economics could point out the implications of various alternative actions, but beyond this could not provide guidelines as to what ought to be done.[5] In any event, we are all familiar enough with the Ostrich and the Emu to realize that they probably can not give us any advice on the kinds of things that governments ought to be spending money on, in general, much less how they ought to be spending money to obtain secondary, or developmental effects.

Another bird in the developmental barnyard is "Chicken Little". Currently, he is more likely to talk about how we should not be developing - polluting and littering - but he has been with us for a long time, mainly telling us of the grave necessity for federal efforts to make "Podunk" grow.[6] While the Ostrich and the Emu are unlikely to see development as a legitimate purpose of government, and hence not amenable to economic analysis. Chicken Little is unlikely to see it as anything but a squawking contest, and hence not requiring any economic analysis. For example, to the extent he could be made to look at the problem, the Ostrich would claim that the benefits of an expansion of the water supply in Western Nebraska would be very small since very few people live there. In contrast, Chicken Little would cite the fact that very few people live there as the main argument why large increases in water supply were necessary.

Just who is correct in this situation, the Ostrich or Chicken Little really constitutes the core of the problem of how we establish a framework for analyzing secondary benefits. We will return to this controversy later on but first we should reflect a bit on the song of the Blue Bird of Happiness.

The Blue Bird of Happiness was hatched during the 1930's with the fundamental belief that by accounting for "the benefits of a project to whomsoever they may occur" and comparing these benefits with project cost, one necessarily could calculate whether a project would be welfare increasing, and, at least in principle, could place any set of projects in rank order of social desirability.[7] While no one could quarrel with the notion that something which does more good than harm for society is a desirable undertaking, unfortunately it is a case that the capability of calculating benefits as a scalar quantity probably is limited to non-developmental activities of government. Traditionally, the calculation of benefits involved three steps. First, estimation of the amount of project use over the life of the project. Second, establishing a value for a unit of project use. Third, establishing a social rate of discount for the purpose of computing the present value of benefits occurring over a stream of years.

This would seem to be an entirely appropriate procedure so long as one could assume that the demand for the service was independent of the existence of the project in question. Suppose, for example, that water were in sufficiently short supply in the New York metropolitan area, such that it was necessary periodically to prohibit the watering of lawns. In such a situation it would seem quite appropriate to estimate the amount of increased water consumption that would occur if this prohibition were lifted, to multiply this increased use by the present price of water, to discount these "benefits" to the present, and to compare this discounted present value of benefits with the cost of providing the capacity needed to permit the increase in watering. The resulting excess benefits or benefit-cost ratio could then be the basis of deciding whether such capacity should or should not be built. It might be the case that at the margin some people would be persuaded to settle in the New York area or move away from the New York area because of the lawn-watering situation, but most people would probably agree that such effects would be negible.

But, it is the very nature of developmental programs that they are intended to influence the location of people or economic activities and so the question of determining the quantity of use becomes a very ambiguous one. For example, if we think of an area location in which population growth is, say, absolutely constrained by full utilization of present water capacity we might want to consider providing more capacity. In this case it might be socially beneficial to provide such capacity, even where excess supplies of water exist in the region from which it is expected that inmigrants would be attracted, not because it is economically efficient to provide water capacity for the future users at that location - clearly it is manifestly inefficient - but simply because it is in the interest of that region, or quite likely in the interest of the nation as a whole, to have a higher proportion of the population in that area for other economic reasons or even for non-economic reasons.

Essentially the foregoing says that if we are to consider developmental projects objectively, that the resultant distribution of population must enter the objective decision function as an argument. Moreover, short of an a priori specification of welfare weights, there is no objective way to transform changes in that distribution into cardinal numbers.

Perhaps it might be useful to illustrate the same point with another hypothetical example, say the spending of a million dollars of federal funds on education in Appalachia for the purpose of "raising income in Appalachia consistent with the optimum development of the American economy". What would be a sensible sufficient condition for such investment could be warranted. One interpretation would be that the present value of the increase in income

in Appalachia would have to be at least one million dollars, such that income in the rest of the United States was no different than it otherwise would have been. But that condition could be satisfied only under the condition that Appalachia was, in fact, the most efficient location for the investment in education. In that case, development would have been the same if a million dollars had been appropriated, simply for education in general, with the implicit understanding that it be spent in the most efficient manner. It would have made no sense to legislatively earmark the investment regionally.

A more liberal interpretation would be that the present value of increased income in Appalachia would have to be at least a million dollars with total national income being no different than it otherwise would have been - in other words, that income of the rest of the United States be not more than a million dollars less than it otherwise would have been. Unfortunately, this interpretation also makes no sense since it would be a simple matter to demonstrate that an unrestricted grant of one million dollars to Appalachia would always be preferable, since they could always use it for education and would have the additional option of using it for anything else which they might want. Here it might make sense to earmark the developmental funds regionally, but it would make no sense to specify them by program.

But in the real world we actually experience the appropriating of funds for specific purposes in specific locations. If that process is to make any sense whatsoever, then the criteria which we must have in mind as a sufficient condition would have to be less stringent than the first interpretation above, but more stringent than the second. In short, it would imply that the allocation of income among regions itself must necessarily enter the social welfare function. The foregoing discussion was meant to illustrate the inapplicability of a Benthamite calculation of benefits for a developmental project. Historically, of course, interest in the calculation of developmental benefits included an interest in the determination of developmental effects where such effects were "secondary" to the "primary" purpose of providing non-developmental services. Essentially, it represented an increased degree of sophisication from initial Benthamite concepts. In other words, it was recognized that if we ranked projects according to their orthodox benefit-cost ratios we might be doing something a bit foolish, by failing to take into account that projects might also vary in terms of their capacity to secondarily generate employment opportunities, in the region or the nation, over and above the employment that would be created by the construction itself, which ordinarily would be taken care of in the way that project costs were calculated.

In the early 50's, however, it was established that secondary benefits of a national character could not be claimed in the absence of a belief that unemployment would otherwise have existed in the absence of a project.[8] Since, it was very difficult to establish that the average rate of unemployment in the nation over the life of the project, say 50 to 100 years, could be materially effected by the existence of the project, appropriately conservative attitudes were taken toward allowing for secondary benefits.

Within this context of developmental benefits such conservatism continues to seem warranted. For example, it does seem to make very little sense to put very lumpy durable investments that will last for some 50 or 100 years in uneconomic locations simply to solve the problem of a presently existing shortfall in aggregate demand or even of the presence of structural unemployment. This is not to say that the possibilities of using otherwise unemployed labor in project construction should not be fully taken into account in assessing project costs at alternative locations. Rather, it is to point out that we should not be persuaded to shift a major outdoor recreation project, for example, from a much more warranted location, say in Illinois, to a less efficient location, say in North Dakota, simply because we believe that the long run labor demand prospects are weaker in the latter state. On the other hand, we might clearly want it shifted to the North Dakota location, if in fact it appeared in the national interest to induce a relative shift in population, from increasingly congested areas in Northern Illinois where the provision of infrastructure investment is becoming increasingly expensive, to North Dakota, where excess capacity exists. But this latter reason, which would seem to be a much more valuable one, would be almost equally the case even if the employment outlook in North Dakota relative to its population was relatively favorable compared to the one in Illinois. In other words, it is our image of the resultant distribution of population and its social desirability which is the real "secondary" consideration and not simply an accommodation to differentials in trends in labor demand.

It should be clear that if we adopt a less restrictive view of development than simply the amelioration of structural unemployment, that secondary benefits may easily be justifiable even where we feel that full employment in the nation really would prevail either with or without the intended project. In fact, it is conceivable to think of projects where there is nothing "secondary" about the developmental effect at all, and in fact, where the development itself may be the primary purpose.

One example of such a developmental purpose might be to encourage the geographic reallocation of population and production facilities so as to lower the aggregate transport requirements of the national economic system. Investments made for this purpose probably would tend to be population concentrating, although given the dispersed location of resources this would not necessarily be the case, depending upon the commodity composition of final output and depending upon the technologies employed in producing it. Another very commonly articulated developmental purpose would be to encourage the distribution of private capital to be more coincident with the distribution of natural increases in the population; in short to produce a situation where the necessity to migrate would be minimized. Another purpose would be to encourage rural to urban migration in order to exploit economies of scale in private sector production. A related and somewhat conflicting developmental objective would be to stimulate a reallocation of the urban population more towards a distribution into a rather large number of medium size cities as opposed to a relatively small number of very large megalopoli as a way of economizing on congestion costs and to ameliorate the social pathologies which might be a function of urban scale. Finally, still another developmental objective might be to encourage the dispersion of waste producing activities so as to increase the ability of the eco-system to absorb undesirable by-products.

We are now, of course, only beginning to emerge into an era of positive use of public projects to achieve these kinds of developmental objectives. We should realize, however, that we have, mostly unconsciously, been achieving them all along. For example, extensive investment in radial expressways for the meritorious prupose of lowering transportation cost so that some combination of assembling a larger labor force at a central location and the permitting of lower residential densities could be achieved. Unfortunately these programs have also had the consequence of lowering the demand for the renovation of deteriorating inner city locations to the point where non-rejuvenatable cores plague at least all of the older cities. Another example is what seems to many as a politically explainable, but economically unjustifiable concentration of investments in natural resource development mainly in the West, and to some extent in the South. While perhaps somewhat foolish in retrospect, within a traditional benefit-cost field, this allocation may have been responsible for considerable savings in even greater urban congestion which would otherwise have occurred in the absence of such a stimulus to population dispersion.

Up to this point most of the discussion has centered around the question of the multi-dimensional character of developmental effects of public projects. This seems quite appropriate since the difficult questions of project evaluation really do involve the multi-dimensional character of development much more than they involve the more traditional issues of unit benefit valuation and establishing a rate of social discount. But what is the significance of this multi-dimensionality in establishing a framework for the evaluation of secondary benefits? For one thing, it would be very helpful if we would stop referring

to them as "secondary" benefits. As we pointed out earlier the "developmental" thrust has been a part of public investment all along, and it now appears that it may become a major thrust, not only with respect to influencing the distribution of population and activities, but also with regard to controlling the location and amounts of pollutant emissions.

An other potential issue in regard to multi-dimensionality, at least in the minds of some, is how incommensurables can be made commensurable, or in other words, how additive benefit valuations can be assigned to a variety of developmental impacts.

My earlier position has been that these may not be resolvable, even within the narrower framework simply of economic development benefits.[9] Without further belaboring the point let me simply note that there seems to be no way to add an income distribution effect to an increase in available services in an unambigious way, short of having decision makers specify a national welfare function - something they are quite unlikely to do a priori. In the absence of such a specification, however, at least we should be prepared to develop analytical techniques that will spell out the impact on distributional vectors for decision makers consideration.[10]

At the Institute for Urban and Regional Studies at Washington University we currently are involved in another project in which we are trying to design a research effort which would not only enable the tracing out of impacts on economic distributions, but also would give us a methodology for estimating the impacts of a major change in a river basin on sociological, political, hydrologic, biological, and ecological processes of the effected region. Certainly at this level of complexity it can be seen that there is not much sense in trying to reduce all of these effects to a set of additive numbers so that a "benefit" score can be established for any project.[11]

Actually, this viewpoint is really not very different from the one implicit in the Water Resources Council Special Task Force Report of last year.[12] In that report they recommend the establishment of four benefit evaluations accounts, namely an economic efficiency account, a well being account, a regional account, and an environmental quality account. Without splitting hairs these really are more or less equivalent to primary benefits, impacts on size distribution of income, impacts on regional distribution of employment, and non-quantifiables such as improvement of water quality, preservation of historic and other areas, etc. While the report still talks about the possibility of summarizing all of the accounts it does seem to recognize that this would be a very difficult, and perhaps impossible job.

Perhaps it is just as well that we are about at the point of finally abandoning Benthamite concepts of benefit estimation. I really do not believe that any serious economists believe that it is possible to compute the disutility of one proposed tax as opposed to another. This is not to say, of course, that we have nothing to say about the relative desirability of different taxing instruments. We realize, however, that the effects are highly complex, consisting of many elements which are not additive, and where non-economic considerations, if not economic ones will vary from situation to situation and from time to time. Sometimes we can establish the superiority of one tax measure over another, or at least the conditions under which one measure would be superior. In other cases, we can only spell out the variety of consequences leaving the ultimate decision to the political process.

This inconclusiveness is not really regarded as very escapable or necessarily as paralyzing. The economic analysis of a proposed tax does not represent a "dis-benefit" calculation, but rather comes to us more in the form of something like a "consumers' report" for public sector decision makers. It tells us the characteristics of various models, which are better at which things, and maybe that one of them seems to dominate all of the criteria that have been considered. Legislators, of course, do not always select the "best buy" even where it can be identified, no more than consumers always select the "best buy" as recommended in Consumers' Report. The main reason for this, of course, is that the analysis in Consumers' Report does not analyze every feature, but only those which the editors think are most important. Clearly there may be some features which are not considered which are very important to some people causing them to move away from the "best buy". Similarly, we understand that legislators may select economically inefficient solutions, mainly where political considerations which are not always apparent to us, are far more important. In both cases, of course, "non-best buy" selections may be the result of foolishness or chicanery; but this is no reason to stop publishing the reports.

At the beginning of the paper we talked about the Ostrich and how he believed that government decision makers in a democratic system necessarily would make wise decisions in the long run, regardless of the facts with which they were presented. In this context, the traditional benefit-cost view is almost the polar extreme of the Ostrich view, essentially resting on the belief that what is best can be objectively calculated so that optimal decisions can be made regardless of the competence or representativeness of decision makers. Both of these seem nonsensically extreme positions. We probably would all feel more comfortable if we realized that a benefit evaluation seen in the broad context of the recent Task Force report is really nothing more than a "consumers' report" analysis of project effects for project "selectors".

There is one further problem quite different from the problem of multi-dimensionality, that I would like to allude to, if only briefly. For convenience let me refer to it as the "stock-adjustment" problem. Stated simply, the stock-adjustment problem refers to the fact that typically when excess demand for public service appears, frequently we tend to think of meeting that demand only by an addition to capacity, not allowing for the possibility of reallocating the use of existing capacities. A case in point is the problem of a prospective municipal water shortage in the Los Angeles metropolitan area. Among the solutions that have been more or less seriously discussed are further diversions from the Colorado Basin, the building of major projects in the desert areas, diverting the Columbia River into the upper Colorado and hence to Southern California, constructing an undersea aqueduct from the mouth of the Columbia River to the Los Angeles area, or the desalinization of salt water. Convergence on a solution is not occuring very rapidly, mainly because all of these would be extremely expensive undertakings. If we stop and think for a moment, however, it seems very interesting to note that a little over 90% of all water presently available and utilized in the state of California is used for irrigation.[13] Assuming that Los Angeles uses about its pro rata share of urban water in the state it would mean that something like 3 or 4 percent of the total water in the state goes to meeting Los Angeles' needs. Thus, by reducing irrigation use by 5% we could substantially more than double the amount of water available for Los Angeles. Buying out 5% of the farms in the central valley probably would be cheaper than diverting the Columbia River. Moreover, a solution no where near that drastic could be achieved simply by raising the price of water to farmers sufficiently to cut their aggregate use by 5% (or whatever percentage was required). One might argue further that this would be politically impossible. But this is not at all clear. For example, if the political resistance were insurmountable an alternative would be to raise the price of water by enough to cut aggregate good use by, say, 5% and return to irrigation users in the form of a cash payment an amount equal to the reduction in acre-feet of water used, times the initial price of water to farmers. This is simply one illustration of the general problem of rationalizing the use of existing capacities.

Essentially, the problem of dealing with excess demand for a public service all to frequently is seen as soluble only by adding to the capacity to provide that service. True, at least some analysis is made to determine whether the meeting of that excess demand would yield benefits at least as great as the cost of providing the capacity, but we seldom ever think of either transferring capacity from one market to another, attempting to bribe the excess demanders to withhold their demands, or simply transferring capacity from one location or group of users to another by administrative fiat. It is entirely possible that in some cases, if not most, that providing new capacity would be more efficient

than any of the other alternatives. On the other hand, it would seem useful to check on the possibilities of rationalizing the economic use of existing capacity before seeking simply the lowest cost way of adding new capacity.

The situation in regard to the provision of new capacity for many governmental services is very much like what we might expect to find in a housing market where excess demand could be met by new construction provided that the benefits of serving the excess demand would be at least equal to the cost of construction, but where rents charged to existing occupants in existing housing could never be changed. We know enough about the history of the New York rent control experience to understand the limitations which this places on efficient economic adjustments.

In some cases, of course, reallocation of existing capacities does seem to occur rather easily. For example, redeployment of police forces frequently takes place in response to an increase in crime incidence in one section of the city, even though it may result in a lowering of protection in other areas. With somewhat greater political resistance, we frequently observe the redrawing of school district boundaries in response to a shifting population which produces excess demand in some areas with excess capacity in others. With even greater resistance we find that common carrier transportation services are occasionally terminated.

With respect to most developmental programs, however, it seems very difficult to achieve any reallocation of capacities. This is not surprising, of course, because the very nature of a developmental program is to influence the location of population and economic activities, and once they have relocated in response to publicly provided infrastructure it is very difficult politically to withdraw that structure. Short of absolute withdrawal, however, it may be the case that there is greater scope for use of increased user chargers to rationalize present stocks, or even where we do not wish to deny people the benefits of services which they have been receiving we could resort to a scheme involving an increase in users charges with a fixed payment subsidy return much as suggested in the California water example above. At least in some cases this should permit excess demands to be met at lower cost such that no group is left worse off and the general revenues are left considerably better off.

In summary, let me try to reemphasize what appeared to me to be two very substantial problems in regard to providing a framework for establishing criteria for developmental benefits. First there is a problem of multidimensionality of developmental effects which seems to be resoluble only by moving away from a cardinal utility concept of social benefit measurement and towards a multidimensional analysis - quanitatively stated wherever possible - more in the tradition of the kind of analysis which we make of proposed taxes. Second, there is the question of the stock - adjustment problem wherein it is very difficult to solve excess demands only by additions to capital stock with no possibility of rationalizing existing use. Hopefully, some improvements in this situation could be obtained by a more complete administrative intergration of service management, with facilities construction and planning, but obviously solutions will not come easily.

Having made these suggestions I leave to my discussions and the audience the question of deciding what kind of bird I am.

SEMINAR SESSION IV

Monday, August 10, 1970
1:15 to 2:45 PM

RURAL POVERTY - PROBLEMS AND PROGRAMS

Program Organizer
William Motes, ERS, USDA

Major Paper
"Poverty & Our Social Order: Implications & Reservations"
by James Copp, ERS, USDA

Discussants
T. T. Williams, Southern University, Baton Rouge
William Saupe, Wisconsin Poverty Institute, Madison

SUB-SESSIONS OF SEMINAR SESSION IV

Monday, August 10, 1970
3:00-5:00 PM

Sub-Session IVa
POVERTY PROGRAMS: WHAT HAVE WE LEARNED FROM THE LAST SIX YEARS ?
Chairman
Tom Glennan, Research Planning and Evaluation, OEO
Discussants
Robert Levine, Rand Corporation, Santa Monica
Emil Owens, University of Minnesota

Sub-Session IVb
ECONOMIC DEVELOPMENT: IS THIS A SOLUTION FOR RURAL POVERTY?
Chairman
John Bottum, Ohio State University
Discussants
John Nixon, University of Georgia
Gene McMurtry, Virginia Polytechnic Institute
John Baker, Community Development Service, Arlington

Sub-Session IVc
INCOME MAINTENANCE: ALTERNATIVES AND IMPLICATIONS
Chairman
Max Jordan, ERS, USDA
Discussants
Lee Bawden, Wisconsin Poverty Institute
Nelson McClung, Urban Institute, Washington, D.C.
Michael Mahoney, Offices of the Secretary for Planning & Evaluation, HEW

POVERTY AND OUR SOCIAL ORDER: IMPLICATIONS AND RESERVATIONS*

by

James H. Copp, Chief, Human Resources Branch,
Economic Research Service, USDA

INTRODUCTION

When I was originally asked to speak on "The Changing Nature of Rural Poverty," I expressed some hesitancy. I couldn't say I had noticed any change. I also voiced some honest reservations concerning my dilettante status as an expert on rural poverty. As I demurred, the real reason for the request emerged. I was a sociologist, and the planners of this session felt it would be nice to have someone say something sociological about poverty. Accordingly, I will proceed to ask the blessing.

To repeat, I am not sure whether or not the rural poverty problem is changing. Neither am I sure whether or not our conceptualizations of the nature of rural poverty are changing to any great extent. This afternoon I propose that we retrace our steps and look at the origins of poverty in our society. Perhaps there are some structural clues in our social and economic systems that throw light on the poverty problem and our human dilemma in trying to do something about it.

After six years of war on poverty, the outcome remains indecisive. We know where the enemy is (although we continue to find new sanctuaries) and we know his numbers (although these numbers are always changing). We have won a few skirmishes and we have devised some grand strategies. We have appropriated funds, mobilized the troops, and shelled the enemy's positions. We have had many fine reports from the field and victory has seemed within our grasp. Yet, the war on poverty has become stalemated and the early optimism moderated. What went wrong?

I will try to propose a few answers. Among the points I would like to suggest are these: (1) Our failure to conceptualize poverty in terms of social stratification; (2) our failure to recognize that American Society is based to an important degree on inequality; (3) our unwillingness to face up to certain basic premises of our capitalistic social order; (4) our failure to get overwhelming commitment to the war on poverty from the body politic; and (5) our unwillingness to admit the true nature of our national priorities. These points certainly will not solve our problem, but facing up to these realities may be helpful, if we really want to do something about rural poverty.

POVERTY AND SOCIAL STRATIFICATION

All societies are stratified, Soviet society no less than ours. All societies involve systems of structured social inequality 1/; in George Orwell's terms, some pigs are more equal than others. When we talk about poverty in rural America, we are talking about those who are at the bottom of the heap, the have-nots and those who don't have much more. When we are talking about eliminating poverty, we are talking about eliminating or moving up those who are at the bottom, those below some cutting point. If we succeeded in doing this, the group immediately above would lie at the bottom and soon become a target for remedial action.

Therefore, when we are talking about poverty, we are talking about our stratification system, we are talking about a system of organizing political, economic, and social inequality. To understand poverty we must examine the nature of our stratification system -- the mechanisms whereby some people are arrayed at the top, others at the middle, and still others at the bottom. To alter the condition of those in poverty is to alter the way the functioning of our society is organized. Thus a genuine war on poverty involves fundamental changes in the organization of a society. I don't think we have been looking at the poverty problem in this way. Instead, we have been trying to help people move up in rank rather than changing the basic nature of the ranking system.

As some critics of stratification research by American sociologists have pointed out, the field is underdeveloped. Some social scientists deny that stratification even exists. The raw truth is that we don't understand the American stratification system. We have concentrated on status and life styles rather than on the bases of social class. 2/ In recent years, sociologists have tended to study poverty as a special problem rather than as a product of the underlying structure of our stratification system. We have studied poverty as an individual symptom rather than as a societal phenomenon. Sociologists have opportunistically taken the problem as defined by policymakers and granters of research funds.

I maintain that if we want to understand poverty we must begin looking at the American stratification system. How, in reality, is political power distributed? How in reality, are control of property, access to jobs, and distribution of rewards allocated? How, in reality, do we socially evaluate the worth and desirability of people? Let us look to our institutions. Let us look to our notions of property, government, and welfare; let us look at our basic notions about human nature, human potentialities, individual achievement, and free will. Let us look at the ways the products and rewards of our economy are distributed. Let us look to our notions of social worth. In brief, I am arguing that poverty is a logical outcome of our social order. I am arguing that our social order is premised on inequality, discrimination, and the preservation of privileges.

*This paper expresses the views of the writer on the questions considered and does not, thereby, necessarily reflect the official position of the U.S. Department of Agriculture. Special acknowledgement is due William B. Back and Robert B. Glasgow, Economic Development Division, ERS, for criticism and suggestions regarding certain sections of the paper. However, responsibility for errors of statement remains with the author.

1/ This apt descriptive term is taken from the title of Celia S. Heller's book Structured Social Inequality: A Reader in Comparative Social Stratification (New York: Macmillan, 1969).

2/ John Pease and William H. Form, "Ideological Currents in American Stratification Literature," The American Sociologist, Vol. 5 (May, 1970), pp. 127-137.

I say this not in criticism of our social order, but as a point of fact. I don't believe there is any social order which can avoid the dilemmas of stratification. However, I do believe we can profitably examine our institutions and consider alternatives with the goal in mind of reducing the severity of conditions for those at the bottom and of opening up channels of mobility so that those at the bottom, and their children, and their children's children shall not be doomed to an endless "cycle to nowhere." 3/ Not only that, we want to reduce the chances of others falling into this same abyss.

INEQUALITY IN AMERICAN SOCIETY

Equality is a common shibbolith in popular discussions of American Society. We tell schoolchildren and foreign visitors that our country is based on equality, that all men are equal. This is not true and never has been. I would contend that one reason we can't win the war on poverty is because we really don't believe in equality. Neither did the Founding Fathers of our Republic.

Thomas Jefferson, a slaveholder, asserted in the Declaration of Independence that all men are created equal. The framers of our Constitution, in apportioning representation, referred to "free persons" and "those bound to Service for a Term of Years," excluded "Indians not taxed," and alluded to "other persons." "Other persons" were allocated at three-fifths the rate for free and indentured people in congressional apportionment. 4/ Scattered references in the Federalist Papers suggest that the notion of equality was a delicate point. Madison seems to assert the men should be free to exercise their inequality 5/ and that governments represent property as well as persons. 6/ John Calhoun, sixty years later, stated the case for inequality very well.

> It is, indeed, this inequality of condition between the front and the rear ranks, in the march of progress, which gives so strong an impulse to the former to maintain their position and to the latter to press forward to fill their files. This gives to progress its greatest impulse. To force the front rank back to the rear, or to attempt to push forward the rear into line with the front, by the interposition of the government, would put an end to the impulse and effectively arrest the march of progress. 7/

Today, we still hedge our assertions about equality. We speak of "equality of opportunity," and "equal opportunity." We speak of "equality before the law" in an abstract, idealistic sense, rather than in fact. In point of fact, we are reminded that our people do not have equal opportunity and we rediscover that we don't have equality before the law -- some people are able to secure more skillful legal counsel and the severity of punishment appears to be influenced by social position. In the economic sphere the rewards of our society are distributed very unequally; the lowest 40 percent of our families receive 18 percent of all personal income and the top fifth of our families receives 43 percent of all personal income. 8/

I don't want to labor the point, but I believe it can be demonstrated that American society is not based on equality and does not seek to achieve equality. The best we try for is to make the rules fair in the race for inequality. We have employed competition and the fear of failure as major sources of motivation in our economic system; and there are no consolation prizes for the losers. We judge our success in terms of how far we stand above others. In sum, Americans seem to need inequality.

If our society is premised on inequality, how can we seriously win a "war on poverty?" Perhaps, we don't want to win the war; we only want more humane treatment for the losers and those who can't run the race.

The reference to those who are unable to run is an embarrassing point for a system based on the notion that people have a chance to compete and strive. Yet our research, again and again, demonstrates that many poor people can't run. For instance, in the Coastal Plains area of South Carolina 40 percent of the rural poverty families are headed by people over 65 or under 65 and disabled. 9/ In the Ozarks, we found the corresponding figure was over 70 percent. 10/ Thus, it is beginning to look as if over half our rural poverty families are in such circumstances that they really can't do anything to improve their situation. Even if we believe in the opportunity to become unequal, over one-half of our disadvantaged families don't have this opportunity.

3/ Paul Good, Cycle to Nowhere. Washington, D.C.: U.S. Commission on Civil Rights Clearinghouse Publication No. 14, 1968.

4/ Constitution of the United States, Art. 1, Sec. 2.

5/ The Federalist Papers (New York: Mentor Books, New American Library, 1961), No. 15, p. 78. "The diversity in the faculties of men, from which the rights of property originate, is not less an insuperable obstacle to a uniformity of interests. The protection of these faculties is the first object of government. From the protection of different and unequal faculties of acquiring property, the possession of different degrees and kinds of property results; and from the influence of these on the sentiments and views of the respective proprietors ensues a division of the society into different interests and parties."

6/ Op. cit., No. 54, p. 339. "We have hitherto proceeded on the idea that representation related to persons only, and not at all to property. But is it a just idea? Government is instituted no less for protection of the property than of the persons of individuals. The one as well as the other, therefore, may be considered as represented by those who are charged with the government."

7/ As quoted in Richard N. Current, John Calhoun (New York: Washington Square Press, 1963), pp. 46-47.

8/ U.S. Bureau of the Census, Income Distribution in the United States, by Herman P. Miller (A 1960 Census Monograph. Washington, D.C.: U.S. Government Printing Office, 1966), Table I-1, p. 3.

9/ Jackson V. McElveen and Buddy L. Dillman, A Profile of the Rural Poor (Manuscript submitted for publication by the Economic Research Service, U.S. Department of Agriculture, 1970). Also see Jackson V. McElveen, Characteristics of Human Resources in the Rural Southeast Coastal Plain ... With Emphasis on the Poor, Agricultural Economic Report No. 155 (Washington, D.C.: Economic Research Service, U.S. Dept. Agr., 1969).

10/ John L. McCoy, Rural Poverty in Three Southern Regions: Mississippi Delta, Ozarks, and Southeast Coastal Plain, Agricultural Economic Report No. 176, U.S. Department of Agriculture, 1970). The synopsis on p. 18 makes the point about the inability of a large portion of the rural poor to alter their condition unmistakably clear.

This is not to deny that a large portion of Americans are concerned with securing equality, perhaps never before in our history has this proportion been as large. Neither will I deny that much progress has been made. I am making the above point about inequality in American Society only to introduce a degree of realism to the appraisal of the obstacles to a successful war on poverty. Our thinking about rural poverty has tended to be dominated by indifference and fatalism on the one hand, and perhaps equally undesirable, an unmitigated idealism on the other.

SOME BASIC PREMISES IN OUR CAPITALISTIC SOCIAL ORDER

As a sociologist with amateur standing as an analyst of the capitalistic system, I do not presume to undertake a profound discussion of the basic premises of a capitalistic order. However, I would like to point out a few obvious things about our capitalist system that, on the one hand, contribute to poverty, and on the other, make it difficult to deal with poverty. By taking a few basic premises of capitalistic philosophy, and taking them in a strict constructionist sense, I hope to show how they entail particular difficulties for dealing with poverty.

In all fairness, I must admit that all societies based on free enterprise do, in practice, modify these premises. In our society we have charitable organizations, social welfare programs, income transfers, labor relations legislation, and many other practices which mitigate the severity of these premises. Yet despite these deviations in practice, our capitalistic philosophy has not been affected to any great degree. In the discussion which follows, I am concentrating attention on the philosophy rather than on the mitigated practice of our free enterprise system. It is my contention that our dealings with poverty are definitely affected by these basic premises. Let me illustrate. 11/

1. Free agency. The individual or firm, under capitalism, is a free agent. As a free agent, he has the right to enter into and terminate any contract at any time, though exposing himself to the penalties of the contract and the legal sanctions imposed by society. Thus one is free to do those things which make him rich and free to do things which cause him to become poor. From this premise it is easy to suppose that the poor have earned their disadvantaged status through mismanagement of their affairs. Having done those things, as free agents, which have made them poor, how can society feel any responsibility for the outcome?

If an individual agrees to an inequitable contract, that is his hard luck. He could accept or reject, couldn't he? This premise overlooks the possibility that the weaker bargainer may have had little alternative but to agree to a one-sided contract.

Our practices in consumer credit and labor-management bargaining illustrate the premise of the free agent very well. The premise implies that people are free to make bad bargains, and consequently the poor have voluntarily chosen to place themselves at a disadvantage. And if they have, of their free will, placed themselves in a disadvantageous situation, there is no reason why society should seek to remedy this outcome.

The principle of the free agent is illustrated in the labor market. Other than precluding physical violence and fraud, capitalism is silent on the parity of the relationship between the hirers and the hired. No equality in the bargaining relationship is implied. If wages are low and working conditions are poor, that is the laborer's hard luck. He is free to refuse the offer isn't he?

In this way, the low wages prevalent among a large segment of our society, and the collateral phenomenon of the working poor, can be justified as the legitimate outcome of free agents bargaining. The price of labor is to be bargained just like any other commodity. Employers should not be blamed for other people's bad bargains.

2. Individual responsibility. Under capitalism, the individual is responsible for himself and his family. We have no responsibility for the welfare of others. Morally and ethically, of course, we are, but capitalism is silent on this issue. The corollary is that natural disaster, illness, misfortune, and failure are the responsibility of the individual and his family. Capitalism is silent on society's responsibility.

Thus, through the vicissitudes of fate and human frailty, some people will be poor. Furthermore, the poor are not the responsibility of others. Our premise makes poverty possible, and when it occurs, disclaims any responsibility for doing anything about it.

The effects of the above premise and its corollary are exacerbated by a widely held belief that has nothing at all to do with capitalism, but which contributes mightily to the difficulty. This belief is in the natural inequality of men. 12/ The belief goes back at least as far as Aristotle. Some men are born to command and others to follow. At its most extreme, this belief expresses itself in racism. In its vulgar sense, the belief in natural inequality provides a convenient ex post facto explanation for poverty. If people are poor they must be inferior. If inferior, they deserve to be poor.

Let me repeat, capitalism says nothing about natural human inequality. It is the ill-starred union of the premise of individual responsibility and the folk belief in inequality that creates the mischief in our society. Poverty is seen as a morally deserved fate, and who are we to tamper with the working of natural principles? I need not remind you of how widely this belief is held within important segments of our society and the degree to which it informs the body politic.

3. Centrality of property rights. Under capitalism property rights are central. It is difficult to conceive of a working capitalistic order that did not put property rights first. Individual and firm rights in property are, therefore, to be protected. Public responsibility to protect property rights takes precedence in our institutions over the need to protect people. A psychological mechanism may also be operating here. Property is concrete and visible; human rights are abstract and invisible. Property rights have substance, human rights lack substance.

Consequently, a capitalistic social order is oriented to the protection and augmentation of property and associated rights. Capitalism has little to offer those without property rights, other than to encourage them to acquire property. Thus capitalism, narrowly conceived, has nothing to offer the poor because the poor have very little property. Capitalism is for those who have wealth and for those who can acquire wealth; it is not for the poor and those who have nothing to trade.

The point I am making is that capitalism, as capitalism, can do nothing for the poor. In point of fact, all capitalistic societies do have welfare concerns for the poor, but these concerns stem from humanistic, not capitalistic, roots.

Parenthetically, I should add that in American Society, particularly in Agriculture, public programs for redressing disequilbriums are generally oriented to the property owner rather than directly to the people in distress. The assumption is that the benefits of the aids will flow, in turn, from the property owner to his collaterals. This pattern tends to create inadvertently a politically powerful client structure with interests distinct from those in distress.

4. Freedom of property. Deriving from the earlier premise of the free agent, there is another important premise on the freedom of property that has significant implications for the problem of poverty. Property rights are to be exploited by property holders in any way they see fit. Secondary effects of such exploitation are irrelevant. It is the right of the property holder to determine what actions will be to his advantage. Thus mineral operators are free to do whatever they wish with the surface and landscape and industries are not responsible for pollution of air and water. Neither are firms, public or private, responsible for the kind of communities that grow up around their installations. Thus, if an installation indirectly creates a substantial pocket of poverty or a disadvantaged population, such conditions are the burden of the affected people or the general society, not the firm.

This premise melds powerfully with the prior premise on the centrality of property rights. According to these premises, the exercise of property rights need not take into consideration the well-being of others in the society.

5. Priority in appropriation. Under capitalism the property rights of first-comers take precedence over the interests of those who come later. Thus mineral rights are upheld over surface rights, and in Western United States water law the principle is "first in time, first in right." In regulating nuisances and abuses in our society the prohibitions are against subsequent entrants rather than early despoilers. In actual fact, this results in windfall gains for the early exploiters. The effect of this right of appropriation or priority principle is that the status quo is legitimized rather than eliminated. The advantage is granted to the aggressive and inconsiderate and the indirect costs of their self interest are passed on to the general public. Thus the resources of an area may be successfully exploited without concern for the consequences and continue to be exploited until countervailing public pressure builds up.

The priority principle has led to a good deal of regional poverty in the United States. Natural resource exploiters and polluters have rarely been held responsible for the aftermath. Our capitalistic system puts a premium on exploitation of resources in the present and sets no penalty for subsequent consequences.

6. Allocation of windfall gains. Under the capitalistic system windfall gains and other unearned increments accrue to the holders of the property rights. The operation of this premise can be observed in land specualtion, real estate developments, and the stock market. This premise leads to a very uneven sharing of the gains from economic growth in our society. The recipients of these unearned increments tend to rationalize their good fortune in terms of their own personal worth and ability. 13/ Consequently, they feel they made good because they deserved to, and that the less fortunate have not made it because they lacked the necessary acumen and moral fiber.

The end result of this premise is an intensified disproportionate distribution of wealth and an uncharitable attitude toward the disadvantaged. The gainers have no reason to feel responsible for the poor, even though the balance of the population may have indirectly contributed to their wealth.

7. Employers' limited responsibility. Employers hire workers to get a job done. The employer has no further obligation to the laborer after the work has been completed, the need for labor disappears, or the employer discharges the worker for any reason. The employer, as a free agent, has the right to hire and fire at will. The employee has no rights in the job other than those transferred by the employer.

11/ Lest the following discussion of basic premises in capitalism be misconstrued by my economist colleagues as a sociologist's indictment of the intellectual foundations of their discipline, I wish to set the record clear. Perhaps the least temperate development of these premises into an intellectual system has been effected by sociologists, not economists. The sociological ideas of Herbert Spencer, William Graham Sumner, and the Social Darwinist school come to mind. In other words, we are really involved with a basic position in Western social philosophy, rather than the creed of any particular intellectual discipline. It is as elements of a creed subscribed to by the public and evoked in the political arena that these premises derive their significance for policy development.

12/ Contemporary behavioral scientists are rather squeamish about individual differences and the question of equality. Objective consideration of the question has been clouded by preoccupations with group superiority and inferiority. Rather than denying differences in order to justify equality, it might be more profitable to justify equality on the basis of the social value of individual differences; i.e., the notion that human beings are equally inequal and thus all are to be valued on their uniqueness, rather than their dissimilarities, as individuals.

13/ A delightful discussion of this genus may be found in Irwin G. Wylie, The Self-Made Man in America: The Myth of Rags to Riches (New York: The Free Press, 1966). The phenomenon of the self-made man may be even more of a problem than parthenogenesis, and it is not too hard to understand the elaboration of various rationales to reduce the dissonance - psychological dissonance in the sense of Leon Festinger, A Theory of Cognitive Dissonance (Evanston: Row, Peterson, 1957).

This premise is powerfully implicated in the problem of poverty. The employer contracts to get a job done, not to adopt a dependent. As demand changes, the employer has the right to adjust his labor force. Governments observe the same practice. Under capitalism, the ex-employee and the unemployed are no one's responsibility. The social costs of seasonal unemployment, structural unemployment, and technological unemployment are passed on to labor and the general public. The migrant labor problem illustrates this dilemma beautifully. Who is to sustain the migrant laborer between the seasons of employment? Who is to house him? Who is to feed, clothe, and educate his family? Capitalism is silent.

The technological unemployment of former cotton choppers and cotton pickers is another easy illustration. If there are no longer any takers for such labor, whose responsibility? There is no reason why the planter should be responsible for their housing and for staking them with food. The same illustration could be carried on to other agricultural enterprises throughout the country where technological developments and agricultural mechanization have made labor redundant.

Whose responsibility are the unemployed, those who have never worked, and the unemployable? Capitalism is silent. There is no answer, taking a strict constructionist view of capitalism.

8. The servomechanism of competition. Competition is the unseen hand controlling capitalism. If problems arise, competition among free agents will set up countervailing forces leading to a resolution of the problems. The intervention of agencies outside the marketplace is seen as an interference with the natural forces of supply and demand, leading to numerous undesirable side effects.

Thus in capitalistic economies there is a mighty inertia resisting outside interference with the workings of the free enterprise system. Social welfare policies and programs dealing with poverty are seen as inept meddling or downright threats to the capitalistic foundations of a society. Given such a climate, it is not hard to understand the resistance to antipoverty programs.

I have enumerated only a few of the basic premises of capitalistic theory, narrowly construed -- free agency, individual responsibility, centrality of property rights, freedom of property, priority in appropriation, allocation of windfall gains, employers' limited responsibility, the competition servomechanism -- but I think I have enumerated enough for an argument that the central principles of capitalism lead to poverty conditions for a part of the population for which capitalism as capitalism can do nothing. Furthermore, the basic principles of capitalism lead to a state of public opinion where it becomes difficult to mount social programs for the elimination or relief of poverty.

By this time, I am sure some of my listeners may be convinced that I believe capitalism should be eliminated. Nothing could be farther from the truth. I cannot recommend any other system, and I know of no other system, which is better adapted to the essential nature of Western man. My position is that capitalism is good for our society, but that it is not enough. We must bring our concerns for the well-being of all the population of our society and our concerns for the full development of human potentialities into the calculus of choice. Capitalism is good, but incomplete in itself -- that is the thrust of my argument. We will never be able to do much about poverty if we include nothing more than the basic premises of capitalism which I have enumerated. The point of my argument is the insufficiency, not wrongness, of capitalism. If there is any error in capitalism it may lie its assumption of the freedom of the individual to choose and its disregard for parity among bargainers.

PUBLIC COMMITMENT TO THE WAR ON POVERTY

Perhaps at no previous time in the Nation's history has there been such a strong public commitment to do something about poverty. Personally, I find the public opinion poll results astounding. The continuation of the war on poverty despite a change in political party in the National Administration is no less impressive. The depth of support for OEO in the Legislative and Executive Branches well documents the depth of commitment to do something about poverty.

Yet despite the depth of this public commitment, all is not well. I seriously question whether this country is ready to accept the costs, in terms of a redistribution of political and economic power, that a successful war on poverty would bring about. Our society is emotionally ready to deal with poverty, but I question whether we are ready, rationally, to accept the consequences. We can be very humanistic until our pocketbooks and our power positions are affected.

If we look closely at the antipoverty efforts we see there has been a concentration in those areas which least affect the position of those safely above poverty. Headstart is good; better learning opportunities for the children of the poor is no immediate threat to us. Fortunately, the Headstart children are not excelling our own children in school. Food distribution, nutrition, and health programs pose no threat. Manpower training programs are no threat because they hold the promise of making the poor a part of the middle class -- it helps them become like us in self-sufficiency and work orientations. Manpower training is fine for those lines of work where there is a shortage of labor.

Community Action and welfare militancy are something else because they challenge our notions of appropriateness and our power in the social order. There has been a noticeable softening in Community Action's challenge to existing power centers and a corresponding public sense of indignation over welfare militancy.

It is equally unclear as to how far the public will accept income maintenance programs, once the cost has been reckoned. The President's welfare program has languished in Congress for almost a year, and the President's proposals are most modest in terms of needs. There is a definite hesitancy in our society to guarantee the incomes of people lest they do no work. 14/

14/ A timely examination of the various ramifications of this issue on the basis of extant research and insights can be found in David Macarov, Incentives to Work (San Francisco: Jossey-Bass, 1970).

If we were to bring up the family income of the poor to the "lower budget" standards outlined by the Bureau of Labor Statistics eight months ago, 15/ the income of one-third of the Nation's families would have to be supplemented. Are we, the other two-thirds of the Nation, willing to subsidize, with our taxes, the income of the first one-third? How will we strike a balance between our emotions and our pocketbooks and political power? There is some room for uncertainty.

OUR NATIONAL PRIORITIES

What are our National priorities? Where do antipoverty efforts rank? The answers to these questions would help much in explaining the extent to which the war on poverty has foundered. I am going to argue that the war on poverty, although it is generally ranked as a good cause, does not rank at the top.

We don't have any document listing national priorities, and if such a document existed, I doubt if we could get wholehearted acceptance of it. The closest thing we have to such an outline is the Federal budget, as proposed by the President and approved by Congress. I am certainly not arguing that it is an infallible index; it is very imperfect. But at the same time, it is a product of men whose occupational survival depends on keeping a finger on the pulse of the nation and making shrewd guesses about the heart. I would argue that it can be a far better indicator than public opinion polls, because of the politician's skill at clinical interpretation of signs. The poor diagnostician is not reelected.

An examination of the Federal Government's spending program does show a concern for the welfare of the disadvantaged. The problem is that this cause has to be weighed against international affairs and finance, space research and technology, farm income stabilization, urban transportation systems, urban community development, housing needs, education, basic scientific research, veterans' benefits and services, and the interest on the public debt. Present outlays suggest that to effectively combat poverty we would have to give it at least double the emphasis we give many of these other worthy causes. We could if we so willed. Do we will it?

In going over these outlays I have deliberately ignored what appears to be our overwhelming first priority -- national defense. I think, in realistically considering these priorities, we have to ignore defense outlays. If defense outlays were to be greatly reduced, these other causes would severely compete for the antipoverty dollar. How good a case can we make for antipoverty appropriations? Seriously, I don't think the evidence or the sentiment presently exists to reweight our priority for antipoverty efforts. Where is the evidence that aid to the disadvantaged pays off twice as well in the political calculus as space research, farm income subsidies, aid to education, veterans' services, or improving transportation systems?

If we are going to drastically alter our national priorities we are going to have to develop much stronger arguments than we now have for dealing with poverty. I would argue that our present case for poverty is based on humanitarian concerns. I am proud of my Nation for its humanitarian concerns, but we need more to go on. Can we show that if we invest at least twice as much in antipoverty efforts of all kinds, taxing ourselves more in the process, we as a Nation will be better off? I suspect a convincing argument can be developed; my point is that it hasn't been developed up to this time. Can we go beyond altruism, or are we restricted by our altruistic resources?

* * * * *

Poverty, then, is not a simple thing. Its roots lie at the heart of our social and economic order. The war on poverty is not going to be brought to a conclusion by treating the symptoms of those people who are now poor, even if we could effectively do that. In terms of our commitment to antipoverty efforts, and the priorities we give them, I have cast doubt on our prospects for even alleviating symptoms.

If we are to successfully confront poverty in general, and rural poverty in particular, we are going to have to undertake bold, unpopular, and professionally precarious research on our social stratification system, reanalyze the implications of our free enterprise institutions, and propose revisions and additions.

Beyond this, our proposals must get the attention of the policymakers and those in the political arena. I have faith that some will listen if they feel we have something to say. Too often we have said nothing, played the old songs, or told them what we thought they wanted to hear. Our solutions have been trivial because our ideas have been trivial and our spirits meek.

15/ Bureau of Labor Statistics, Three Budgets For an Urban Family of Four Persons: Preliminary Spring 1969 Cost Estimates (Washington, D.C.: U.S. Department of Labor, December 1969). A more extensive discussion of the methodology of these cost estimates may be found in Bureau of Labor Statistics, Three Standards of Living for an Urban Family of Four Persons: Spring 1967 (Bulletin No. 1570-5, Washington, D.C.: U.S. Department of Labor, 1969).

SEMINAR SESSION V

Tuesday, August 11, 1970
1:15 to 2:45 PM

LARGE SIZE FARMS IN THE UNITED STATES

Program Organizer
Charles Beer, USDA

Major Paper
"Economic Factors Underlying the Growth of Large Size Farms, The Current Situation and Probable Trends"
by Leonard Kyle, Michigan State University and Kenneth Krause, ERS, USDA

Discussants
Eugene Pickler, Springdale Farms, New London, North Carolina
Willard Williams, Texas Tech. University
Arlie Waldo, University of Minnesota

SUB-SESSIONS OF SEMINAR SESSION V

Tuesday, August 11, 1970
3:00-5:00 PM

Sub-Session Va
THE IMPLICATIONS OF LARGE SIZE FARMS FOR RESEARCH AND EXTENSION PROGRAMS
Chairman
Jean Evans, Oklahoma State University
Discussants
James Martin, Virginia Polytechnic Institute
William Woods, University of California, Riverside
Thomas T. Stout, Ohio State University

Sub-Session Vb
THE IMPLICATIONS OF LARGE SIZE FARMS FOR INPUT AND OUTPUT MARKETING ORGANIZATIONS
Chairman
Dale Butz, Illinois Agricultural Association, Bloomington
Discussants
Eric Thor, Farmer Cooperative Service, USDA
Arvid Knudtson, Northwest Bank Corporation, Minneapolis
Robert Hampton, National Council of Farmers Cooperatives, Washington, D.C.

Sub-Session Vc
THE IMPLICATIONS OF LARGE SIZE FARMS FOR U.S. PRICE, INCOME AND TRADE POLICY
Chairman
George Brandow, Pennsylvania State University
Discussants
Carroll Brunthaver, ASCS, Washington, D.C.
Orin Staley, National Farmers Organization, Corning, Iowa
Charles Rust, Montana State University

ECONOMIC FACTORS UNDERLYING THE INCIDENCE OF LARGE FARMING UNITS, THE CURRENT SITUATION AND PROBABLE TRENDS

Kenneth R. Krause and Leonard R. Kyle *, **, ***

For presentation before the American Agricultural Economics Association Annual Meeting, Columbia, Missouri, August 11, 1970

There is now more awareness of and concern about the gradual increase in the number of and concentration of production on large farms. Some of the concern is expressed by traditional agrarian fundamentalists. Part is a genuine appreciation of the changing structure of agricultural production and the resulting impact on individuals, communities, and society.

Farm management economists have been preoccupied with family size farm operations. Farm input and marketing economists have focused upon traditional marketing firms and functions. Only recently have these two groups become interested in large production units, marketing interrelationships, and the structural impacts. Farm policy economists have focused their attention on farm commodity legislation designed for family farms. The need for special treatment of large-scale units is now emerging in the proposals to limit commodity program payments to large producers.

Problems of understanding and documenting "large farm" phenomena result in part from the professions' inability to plan and conduct improved statistical data gathering and economic analysis as fast as the industry is changing. The U. S. Census has held to old classifications and frequency distributions which tend to count people, acres of crops, and number of livestock. These classifications are ill-designed for research about operating business units, especially those that are non-land based or which are contractual in nature. Similar problems are encountered in using these classifications for studies of farm size. Now the extremes, which need more understanding and attention, are equally as important as the average. Development of improved knowledge of the farming activities of large nonfarm businesses is equally as important as knowledge about typical farm situations.

The scope of this paper does not allow us to bridge all of the gaps in classification, and without adequate research to explain the increase in number and output of large farm units, or to document increased integration between production and marketing firms. Instead, the intent is to advance awareness of some issues and to motivate future research and extension efforts. An attempt is made to document the growing concentration of production on large farms, briefly review some relevant theory an and past research, and explain some of the incentives for establishment and operation of very large farm firms. In addition, the potential future growth in numbers of large units is examined and some of the possible implications for professional and industry consideration are covered.

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**The opinions expressed in this paper are those of the authors and do not necessarily represent the views of the U. S. Department of Agriculture or Michigan State University.

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Number and Concentration of Production on Large Farms

Numbers of Large Farms as Measured by Output

In 1930 there were 6,228,648 farms most of which were relatively small, unmechanized family owned and operated units. Now production of many products is dominated by a relatively few farm firms. In 1964 the U. S. Census of Agriculture enumerated only 141,914 Class I farm units (those with gross sales of over $40,000) which provided nearly 44 percent of the value of all products sold (table 1) [17].[1/] Class I farms probably produced over half of the output in 1969. Many of these units can be classed as "part-income" because of operators' off-farm income from salaries and investments [11, pp. 23-24].

There has been a 16 fold increase in large farms in 35 years. This measurement is supported by the work of R. D. Jennings using the 1929 agricultural census [6]. He isolated only 7,875 farms with over $30,000 value of products sold. This is equivalent to sales of $48,450 per farm in 1964 when adjusted by the index of farm prices received. So all 1964 Census Class I units were not quite this large. It is estimated that perhaps at least 126,000 were.

A special tabulation of the 1964 Census of Agriculture showed only 31,401 "large scale" farm units with farm product sales of over $100,000; an increase of 10 percent per year between 1959 and 1964 [10]. In 1969 there were probably about 45,000 units with sales of over $100,000. There were 919 units with over $1,000,000 in sales in 1964. This was an increase of 12.5 percent per year from the number in 1959. Some modern "family type" farms (two-man) are productive enough to have over $100,000 of sales per year.

1/ Bracketed numbers refer to the references starting on page 32.

Table 1.-Number of large farm firms, by U. S. farm census type and size, 1929, 1959, and 1964

Type of farm	1929 large size 1/	1959 Class I 2/	1964 Class I 2/	1964 large size 3/
	Number			
Vegetable	785	2,730	3,577	1,590
Other field crop	699	4,011	7,334	2,237
Poultry	225	11,151	19,249	4,744
Fruit and nut	1,924	6,547	8,103	2,511
Miscellaneous	101	3,830	5,034	1,644
Ranches	1,829	6,757	5,921	1,815
Cotton	441	13,171	13,033	3,465
Livestock	453	29,439	35,116	6,692
General	50	4,775	8,783	1,884
Cash grain	486	10,828	19,301	2,141
Dairy	882	8,538	15,463	2,576
Tobacco	--	322	1,000	102
Total	7,875	102,099	141,914	31,401

Table 2.-Concentration of farm production by U.S. farm census type, value of products sold, and size, 1929, 1959, and 1964

Type of farm	1929 large size 1/	1959 Class I 2/	1964 Class I 2/	1964 large size 3/
	Percent of total production			
Vegetable	20.0	73.3	81.4	67.1
Other field crops	5.1	55.8	73.7	49.1
Poultry	3.3	55.4	67.9	38.0
Fruit and nut	19.9	45.1	67.6	46.7
Miscellaneous	1.0	62.1	65.4	44.6
Ranches	29.2	59.8	64.0	46.5
Cotton	1.4	46.8	55.2	31.3
Livestock	2.1	33.9	46.8	26.8
General	.2	20.7	33.6	18.3
Cash grain	1.8	16.7	23.9	6.4
Dairy	3.0	15.3	23.4	9.9
Tobacco	--	3.9	8.2	3.9
Total	5.0	32.8	43.7	24.8

1/ Farms with over $30,000 value of products sold in 1929 which is comparable with $48,600 in 1959 and $48,450 in 1964 [6].
2/ Class I, U. S. Census of Agriculture farms with over $40,000 of gross farm product sales [16, 17].
3/ Farms with over $100,000 of gross farm product sales. [10].

Internal Revenue Service data for 1966 show 597 individuals and 676 farm corporations with over $1,000,000 of business receipts. This is schedule F farm income for individuals and partners and all corporate income for corporations. If the size bracket is lowered to $500,000 and above, 1,479 sole proprietors, 462 partnerships and 1,843 corporations or a total of 3,784 operations, are reported for 1967. When the size bracket is lowered to only $50,000 business receipts, 132,497 tax schedules were reported [18].

Concentration by Type of Farm

Concentration of production on large units is not uniform by type of farm. In table 2, the concentration of production on large farms by type is shown for 1929, 1959, and 1964. In 1964, for 6 out of the 12 census types of farms, over 60 percent of the output was produced by farms with gross sales of over $40,000. In descending order of concentration these were vegetable farms 81 percent, other field crops 74 percent, poultry 68 percent, fruit and nut 68 percent, miscellaneous 65 percent, and ranches 64 percent. The same types of farms with over $100,000 sales produced from 38 to 67 percent of the production.

In 1929, all types of large size farms, as defined by Jennings, accounted for only 5 percent of total production; in 1959 Class I farms accounted for 33 percent and in 1964, 44 percent of total production. Farms with over $100,000 gross sales accounted for nearly 25 percent of all commercial farm production in 1964. Tobacco, dairy, and cash grain Class I farms accounted for less than 25 percent of the production by their type and those units with over $100,000 sales for less than 10 percent of production in 1964. The increase in concentration was apparent for all types of Class I farms from 1959 to 1964; however, the farm types with the smallest percent of concentration in 1959 showed the largest percentage increase in concentration by 1964.

Concentration by Commodity

Data are not available to summarize the increasing concentration of production for all commodities; however, the trend toward large production-processing-marketing units has been dramatic in the poultry and beef sectors in the last decade. In 1964, farm units with over $100,000 sales accounted for 58 percent of the turkeys and 21 percent of the broilers. Thirty-two firms produced 8 percent of the turkeys or an average of 254,000 birds per firm. Thirty-two firms produced an average of 2,922,000 broilers per firm or 5 percent of the total production [10, pp 14-16]. Larzelere estimates that 10 percent of the poultry flocks have over 50,000 hens per firm and 43 percent of the total hens. Twenty-one firms processed 70 percent of the turkey production in 1968. Eighty-one firms handled the other 30 percent of the turkeys processed. Forty-eight firms processed 70 percent of the broilers in 1968; 105 firms processed the remaining 30 percent [4].

In 1969, 2,066 feedlots (1.1 percent of total) with over 1,000 capacity finished 12,327,000 cattle or 52 percent of the total [14]. Feedlots with over 1,000 head capacity fed 47 percent of the total number of fed cattle in 1968 and only 36 percent in 1962. Cattle feedlots with over 32,000 head capacity increased from 19 in 1968 to 34 in 1969. Their average marketings were over 67,000 head.

In 1964, 195 farm units produced about 4 percent of the total cotton output, an average of 3,377 bales, on about 2,200 acres for each [10, p 16]. Fifty-five percent of the total output from cotton type farms was produced by 13,134 farms in 1964 [17].

In 1968, 1,994 individuals and firms with a feedgrain base of over 1,000 acres participated in the ASCS program [7]. This is much less than the total because many large units, especially those with livestock, do not participate. Nearly 45 percent of the large acreage participants were located in the Southern Plains, 25 percent in the Northern Plains, and only 14 percent in the Corn Belt. Of the 1,994 units, 1,398 produced

over 50 percent grain sorghum on their feedgrain base and only 596 produced over 50 percent corn. Only 264 of the 596 units classified as corn producers were located in the Corn Belt States.

Size Theory and Past Research

The models used by agricultural economists to analyze firm size relationships have focused upon cost curves and market prices. The models have been relatively devoid of several important variables. Results from empirical testing of the models have not been complete enough to explain the potential for growth to, or the establishment of, very large units.

Cost model concepts as applied have focused upon a U-shaped cost curve in the short run, and an envelope type curve for long run analysis [9, pp. 2-6]. Numerous applications have been made of these concepts in farm firm research and extension work. In past analyses of farming situations, the conclusions were that most economies of size could be achieved by fully mechanized one and two-man family units. Larger units may, however, operate with constant or slightly higher costs and still obtain an increase in total profits. However, some recent cost studies of commercial beef feeding in the Western States have concluded that units much larger than one or two-man labor requirements are needed to exhaust economies of size [9, pp. 55-62].

Several criticisms can be made of past cost studies and to subsequent policy interpretations: (1) Economies of buying and selling larger volumes have usually been ignored [1, p. 43]. Sometimes these offset increasing internal operating costs. (2) Many past studies have focused mainly upon internal, engineering, and technical economies. (3) The studies have focused upon the farm firm and have excluded contractual input and marketing arrangements. Thus, commonly quoted market prices have been used for inputs and products sold. (4) Single product analysis has been predominant at the expense of multiple product analysis. (5) The research focus has really been on family size units to the exclusion of very large units. Also, little attention has been given to possibilities for farms to start operations at a large size rather than grow gradually over time. (6) The studies have not considered common ownership of farm and nonfarm activities and the potential advantages to the entrepreneur or conglomerate business.

Cost theory has not been used to analyze the development of and application of new technology for very large farms or integrated firms. Cost concepts still have important applications in analyzing large farm firms. However, cost theory should be supplemented with concepts of entrepreneurship, ownership structure and rates of return on investment after income tax considerations.

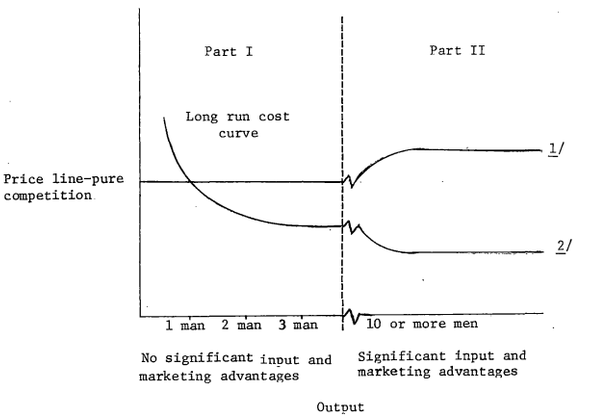
Hypothesized Cost and Income Models

Economists have generally tried to explain business costs and income in a model which can be defended as theoretically accurate and realistically complete for any type or size of farm. Such models may not be particularily useful with large businesses. So far, concepts and methodology are better developed for single-product firms than for multiple-product firms. However, cost and income models become difficult to use with integration or contractual arrangements and other emerging institutions even for large single-product firms. Moreover, concepts and methodology are better developed for these firms engaged in farming only than for these firms which, through common ownership, have both farm and nonfarm involvements. Perhaps research should concentrate initially on case studies of what is happening and then use deductive procedures to develop workable models.

Farm Firms Only

An attempt is made to explain costs and income for large single-product farm firms in figure 1. Part I of the model has been used in many cost studies for family farms using up to three-man labor equivalents. It is hypothesized in Part II that for large units the price per unit of product sold may gradually increase by eight to ten percent with improved marketing and selling arrangements. Also, cost per unit of output may decrease by eight to ten percent for very large units which are efficiently organized and operated. This decrease in cost is obtained through purchasing economies. Some economies in input purchase and marketing are possible for well-operated smaller farms, but the potential cost reductions and product price advantages for large units are thought to be greater and more feasible to achieve. The magnitude of buying and selling economies can also be greater than the magnitude of potentially higher internal costs for individual firms.

Figure 1.-Hypothesized farm production cost and income model



1/ The increase in price in part II is accomplished through a change to a different point in the marketing system. The farm firm provides the services and obtains the marketing margins of established local marketing firms. An improved price may result from practices resembling monopolistic competition.

2/ The lower cost curve in part II results from volume discounts for some inputs which are greater than other costs which may increase with larger size.

Several models have been developed that are proxy attempts at guiding multiple product economies of size studies. 1/ Since cost curve and income analysis should involve both technical and pecuniary economies, analysis could be done by starting with a single product model and then use functional accounting to estimate costs for each product in a multiple-product firm. From this it may be possible to estimate the economies of size for the total firm. A major challenge is to allocate each joint cost and marketing economy to specific products and then to develop separate cost and income curves for each product. The difficulty appears to vary by the product mix and total size of firm. However, functional accounting should permit research on costs for each product and production step which can be aggregated to study the results from several large firms producing similar products. The problem of allocating cost for use of machines and labor tend to disappear for some very large units. Some large industrialized units have separate production departments with pre-assigned labor and machinery compliments. Management, supervision, and office over head costs are the major internal costs which need prorating for large units.

1/ Carter and Dean used total revenue as an output measure and total cost per dollar of total revenue as a measure of cost [3]. One problem with the approach is that as prices for each commodity vary, total revenue varies. Second, internal and external economies are not isolated. Faris and Armstrong in studying multiple crop production firms, used acres as an index measure of output for constant production mix firms. Dollars per acre was the measure of unit costs. Output was expressed in terms of average net revenue per acre. The resulting curves cannot be considered economies of scale curves but rather net revenue change associated with size and include a combination of the effects of technical economies and changes in product mix [5].

Farm, Agri-business and Conglomerate Firms

Cost and income models for farm and nonfarm firms under common ownership should be similar to multi-product farm firms. Functional cost accounting would need to separate those costs for the farm and nonfarm parts of the business. The commonly owned farm and nonfarm businesses do not usually have direct internal transfers. The relationship occurs at mainly the financial and tax accounting level. As in the case of multiple product farms, the costs to be allocated are mainly management, supervision, and business overhead.

Incentives for Establishment of or Growth to Large Scale Farm Units

The incentives for the establishment of or growth to large scale farming units either independently of, or in conjunction with, nonfarm businesses have not been adequately researched. The incentives can change rapidly due to changes in income tax and other governmental rulings, availability of credit, or development of new production or marketing techniques, etc. In addition, incentives vary by commodity and geographical location.

It is easy to understand the gradual growth and increasing concentration of production found on most Class I farm units of up to about $250,000 of output if they have grown directly from traditional family-like farm units. The growth and production goals are reasonably well documented and understandable. However, the increasing use of "tax loss farming" along with off-farm income from other business investments, securities investments, and salaries or wages to reduce Federal income tax liability and speed financial accumulation needs more investigation. Such strategies appear to be practiced primarily by individuals with an equity in Census Class I and II farms.

A relatively new set of technological, financial, tax and other institutional variables apparently provide increased incentives for units with over $250,000 of farm output. It is now easier to find very large farms operating on a scale not thought practical ten years ago, but perhaps this is part of the gradual industrialization of agricultural production. No longer is the belief tenable that weather, biological processes, and superior incentives of unpaid family members provide impossible barriers to a large scale industrialized agriculture.

In the following sections some incentives are discussed which apply to relatively large scale, specialized farming firms. These incentives are presented both for farm firms only and for large scale production activities that are commonly owned by agri-business or conglomerate interests.

Higher Price

The ability of large scale units to obtain a higher net product price hinges on elimination of some of the marketing steps and resulting marketing costs, or reaching a special or higher priced market. Contract production is used by large scale units to increase market price or product revenue over several production years. Middlemen handlers can be eliminated, and production, handling and processing of products can be prescheduled for greater overall efficiency.

The gradual industrialization of production is being forced by industrialization of the processing, handling, and distribution of food [12]. Production units which are large enough to "fit the system" participate in the profits generated. The same type of result is possible when a marketing firm owns a farm producing unit or vice-versa. The ability to deliver a uniform product on a year-round basis increases the suppliers ability to influence price and may eventually permit annual delivery contracts with formula pricing. This is illustrated by the wholesale carload carcass market for beef or fruit and vegetable firms which combine production from different seasonal areas into a year-round marketing operation. These types of firms move products rapidly to any area where the price is most favorable after adjusting for transportation and handling costs.

Decreasing Costs. Very large farm units because of amounts purchased, obtain volume discounts by using purchasing agent techniques. They negotiate directly with the manufacturer, jobber, or distributors of such items as fertilizer, seeds, crop chemicals, feed, petroleum products, machinery, equipment, and parts. This method of purchasing often involves bids by suppliers which can substantially reduce or eliminate distributor and dealer margins.

For some firms, certain fixed costs such as management, supervision and costly machinery and equipment can be used over more units of output. For integrated firms, middleman's margin and handling costs can be reduced or eliminated through the input firm providing inputs for its own farming operation.

Increasing Costs. Realistic evaluation of the total costs for large farm units must include those costs which may increase with size. Increasing cost items usually involve the internal operating efficiency and costs for labor, management, supervision, and office overhead. Management and labor costs are usually considered as a residual or not included on small farms, but for large units top management and supervision must be hired in a competitive wage market. An exception is the owner who is directly involved with his own large business. Even so he is apt to feel the opportunity costs for his skill and management are high.

Historically, interest rates have been lower for large units as compared with smaller units. However, recent increases in interest rates conflict with some State usury laws for individuals. This seems to favor smaller units from an interest rate standpoint. In some cases long-term credit has not been available to either small or large units from insurance company lenders, due to interest rate ceilings imposed by State usury laws and better investment alternatives. This has caused an increase in profit sharing by some credit institutions as a condition for a large loan.

Corporations, the legal form of business organization used by larger units, have been able to avoid State usury laws and pay higher rates to lenders or turn directly to equity markets. They also have borrowed from large city banks, a different credit market than used by smaller units which typically borrow from country banks. Currently, interest rates for short and intermediate term credit may be one to two percentage points higher and a ten to fifteen percent compensating balance may be required for large loans from city banks.

Out-of-Season Use of Labor and Equipment

Large crop farms must keep key employees on the payroll on an annual basis. Even though these people and related crop production equipment are highly specialized there is an opportunity for entrepreneurs to organize off-season supplementary business activities which may lower the annual use cost of labor and machinery. A seasonal grain handling and marketing business is a natural winter operation for a 3,000 acre or larger cash corn farm. The pre-season handling and storing of crop production inputs is also feasible. Machinery assembly and overhaul in the winter also fits. Land formation, clearing, draining, and development is possible. Building construction and maintenance can be geared to miss crop production peaks. The opportunities expand when off-farm seasonal business opportunities are explored. Sometimes very large farm firms move machines and key workers from one production area to another. It's not that small farms can't do the same thing. It's the size, quality, and variety of complementary ventures which become possible. Also loss minimization may be more important than actual profits in an absolute sense.

Business Management

Business management has become more complex and scientific. Members of a business management team in a very large firm tend to be directed

toward firm expansion and growth. Where the business management team is highly trained it tends to seek more activity in each of it's specialities which in turn encourages firm growth. Equity owners in business firms with farming activities tend to pressure the business management team to continually expand to increase company earnings. When earnings accumulate, the incentives increase for mergers or new ventures to manipulate income tax liabilities. Thus the lawyer-tax accountant specialist is an important member of the management team either on a full time or retainer basis. Very large units can employ capital and credit procurement specialists to obtain the use of the large amounts of money needed at the lowest cost.

Federal Income Tax Incentives

Because of progressive income tax rates, large profitable corporations or individuals in high income brackets may pay more income tax per unit of production than is paid by operators of small farms. However, large scale units usually take steps to manipulate and delay the tax bite [15]. In recent years, brokers of tax delaying schemes and income tax consultants who advise investors, have become much more knowledgeable about opportunities in large agricultural businesses. There are many involved forms which these activities take, one of which is illustrated in a following section.

Capital Accumulation and Business Practices

Part of the incentive for expansion and formation of very large farm units comes from outside the traditional farm sector. With the large amounts of capital accumulation in the United States in the last ten years, many high-income individuals and growth-oriented business firms are looking for new ventures. There are several aspects of farming and farm resource ownership which are attractive to these people and firms.

Present income tax rate schedules and regulations encourage manipulation and new investment ventures. Prospects for population increase and long-term inflation encourages ownership of land, especially property in the "path of progress." Such land must often be farmed, either by direct operation or leased, to decrease the annual holding costs. Also there is the possibility to engage in speculation by buying low-priced property and achieving high capital appreciation through land development. This fits neatly with ACP cost sharing and the opportunity to write off land clearing and development costs against other taxable income. There are many regional examples, such as land clearing for soybeans in the Delta, irrigation in the High Plains and citrus orchards in California.

Some investments are for long term ownership and operation of farmland as a holding action against the time of higher value use. The 1969 Tax Reform Act modifies the rules of the game, but will not shut off most of this development. The land owned need not be operated if development is the objective. It can be contracted to tenants. However, offsetting a higher portion of expenses as a tax reduction is made possible by doing development work with regular farmworkers and equipment in the off-season from crop or livestock production. Thus each year more individuals and firms, who have financial situations and objectives which are not typical of ordinary farm families, acquire farmland or take on financial contracts in agriculture.

Separate Ownership of Specialized Functions

Recent developments of large scale commercial feedlots are structurally quite different than typical farmer feeders of the Midwest. The ability to operate large units efficiently and to contract for feed and stocker cattle changes the cattle feeding business. The ability to sell services to outside investors permits the feedlot company to operate a "cattle hotel" and maintain a regular cash flow. A few very large feedlots can essentially supply one modern slaughter and processing plant. No longer are large ranchers forced to sell stocker cattle. Ownership of cattle with proven ability to gain can be held by ranchers until slaughter weight or even until processed into carcass beef. Ranchers or crop farmers can participate in large feedlot operations by stock ownership or contracting to supply inputs. They can also contract to have cattle fed. Competing as farmer feeders on a smaller scale is not necessary.

Conglomeration

With increasing mergers and acquisitions in the general economy, there seems to be an increase in the ownership of very large farms, processing and marketing firms by conglomerate firms that previously did not provide inputs or process the products of farming. The incentives for conglomerate ownership appear to resemble those of ordinary agri-business firms that own farm units. However since there is no product tie, by definition of a conglomerate, the incentives narrow down to three areas: (1) spreading of risk into dissimiliar businesses, (2) financing including taxation avoidance, and (3) business organization and management [19].

Conglomerate firms start with acquisition of large-scale units that engage in any activity. Perhaps some of the incentives for ownership of large-scale farm production units are tied to the belief that the products of farming have a growing demand, require relatively low inputs of unorganized labor, and provide opportunities for large-scale control and integration of production, processing, marketing, and advertising promotion.

Also of importance is the ability to control large blocks of rapidly disappearing open farmland for future development and use in key geographic areas. This preempts use by competitors and allows maximum flexibility for future use by the conglomerate as raw materials, industrial sites, urban development, etc. Considering the inflation in the value of real estate in the last thirty years, it is reasonably easy to hold title to large blocks of land, if it can be farmed in the interim. Some States even grant special property tax privileges for agriculture. Conglomerates with publicly traded stock are the most logical buyers of very large tightly held farm businesses when the latter wants to sell.

Empirical Evidence of Economies of Size for Corn Production

For illustration purposes, the following section of this paper presents empirical work on large corn units in the Corn Belt. Feasibility plans have been prepared for corn production units with over 1,000 acres and are based upon interviews with managers of 48 corn production units and as many farm input and marketing firms [7]. In table 3, a one-man viable, family size unit with 500 acres of corn is considered as a reference size and decreasing and increasing cost items are presented for larger units under the assumptions of constant technology, land quality, and yield objectives. Machinery depreciation, through lower per unit costs of machines and less machinery per acre, and fertilizer costs appear to offer the largest opportunity for decreasing per unit costs. Compared with a 500 acre unit, a 5,000 acre unit may be able to reduce input costs by about $14.00 per acre. Reductions of about $5.60 and $10.50 were estimated for 1,000 and 2,000 acre units. The actual reduction in the cost of seed, fertilizer, chemicals, fuel and machinery repairs and interest is about $3.75 per acre for 1,000, $6.80 for 2,000 and $9.50 for 5,000 acres as compared with a 500 acre unit. The remaining saving is in machinery depreciation. On the marketing side a 5,000 acre unit may be able to obtain a $5.75 per acre (5.2 cents per bushel) net product price advantage.

Large units encounter some input costs that are higher than smaller family-labor only units. Labor and management costs are the major items. A wage rate including fringe benefits of $1.82 vs. $2.34 per hour for 3.5 hours per acre and management charges of $5.00 vs. $7.00 per acre were used. Wage rates and management charges were based upon data obtained in farmer interviews. Even with labor and management costs which were 34 percent higher, only $3.82 of the advantage of 5,000 acre units over 500 acre units is lost. Although large units currently pay a higher interest rate for short-term operating capital and machinery purchases, the amount of this disadvantage is offset by smaller per acre expenditures for those items so the larger unit actually pays less interest per acre. The net advantage of a 5,000 acre unit over a 500 acre

unit could amount to $15.95 per acre. The difference after tax, assuming a 30 percent equity for each is $7.34 per acre.

The estimated return (ratio of net return to current value of assets owned) after deduction of all costs including an opportunity charge for unpaid family labor and management was 5.6 percent for the 500 acre unit and 7.9 percent for the 5,000 acre unit, if 100 percent equity is assumed. If 30 percent equity is assumed and a 5 percent inflation in the value of the property is added to the return, the 500 acre unit has a return of 18.7 percent and 5,000 acre unit a return of 26.9 percent. Adjustment to an after tax position lowers these returns to 18.0 and 21.8 percent [7].

An interesting comparison is between the choice of owning a 500 acre corn unit with 100 percent equity or owning a 2,000 acre unit with 30 percent equity. The after tax net return, which includes a 5 percent appreciation in the value of land, gives a return of 8.7 percent for the 500 acre choice and 21.0 percent for the 2,000 acre unit. If land values decreased by 5 percent per year the 500 acre unit has essentially a zero return and the 2,000 acre unit a -9.0 percent return. Other comparisons can be made. The after tax advantage of operating a larger unit with lower equity is very pronounced during periods of rising land values.

An Income Tax Avoidance Example for a 5,000 Acre Corn Farm

A profitable large incorporated unit can hardly afford to incur the $8.60 to $15.51 disadvantage, depending on equity levels, caused by higher income tax (col. 4 minus col. 1, table 3). Thus there is a real incentive to find legal methods of tax avoidance. The feasibility plans discussed in the previous section were analyzed for returns after Federal income tax was paid. This showed that a profitable 5,000 acre incorporated corn farm would have a taxable net income of $119,200 and an annual tax of $50,716, if it had only a 30 percent equity in the assets used. If the taxable income of $119,200 was "used up" in annual development costs on an additional 1,000 acres, it is possible to eliminate the tax liability for three years, generate a net financial gain of $219,488, and avoid payment of $153,598 of tax in three years. This gain is partly derived by generating $400,000 of untaxed capital gains through improvement of the property [7].

Table 3.-The magnitude of decreasing and increasing cost items, net difference, net marketing advantage and net total returns, 500 acres reference size to 5,000 acres of corn production unit 1/

Item	Acres per unit			
	500	1,000	2,000	5,000
	Dollars per acre			
Decreasing cost items	Savings			
Seed	0	.72	1.47	1.84
Fertilizer	0	1.10	2.32	3.52
Crop chemicals	0	.89	1.34	1.79
Petroleum products	0	.37	.76	.98
Machinery depreciation	0	1.87	3.67	4.56
Machinery repairs	0	0	.19	.37
Interest 2/	0	.65	.71	.98
Total	0	5.60	10.46	14.04
Increasing cost items	Increased costs			
Labor (production)	0	.45	1.36	1.82
Supervision and consultants (production, business and office)	0	1.00	1.00	2.00
Total	0	1.45	2.36	3.82
Net advantage to larger units	0	4.15	8.10	10.22
Net marketing advantage per acre 3/	0	2.20	2.20	5.72
Total net advantage per acre before Federal income tax	0	6.35	10.30	15.94
Income tax cost 4/				
100 percent equity	8.54	10.24	18.89	24.05
30 percent equity	1.54	2.65	4.88	10.14
Increased tax costs, 30 percent equity	0	1.11	3.34	8.60
Net advantage per acre after payment of Federal income tax with 30 percent equity	0	5.24	6.96	7.34

1/ Assumes equal quality and price of land, equal yields and quality of product. Data presented in the table are for illustrative purposes.
2/ Assumes that interest is paid on the market value of all physical assets and money used and that the interest cost is constant for real estate but increases from 8 percent for 500 and 1,000 acre units to 9 percent for 2,000 and 5,000 acre units, respectively, for variable cost items.
3/ Approximately 300,000 bushels of corn is required to generate a selling advantage. Some 1,000 and 2,000 acre units achieve quantity marketing advantages by combining their production with other farm units.
4/ Assumes sole proprietorship, $5,000 of deductions and no carry forward or back provisions for the 500 acre unit, two partners for 1,000 acre unit and subchapter C corporations for the 2,000 and 5,000 acre units.

Large Farms from a Social Viewpoint

Since the advent of increasing scientific inputs into the production and distribution of food and fiber, the United States has gone through approximately 40 years of emphasis on growth and efficiency. The application of technology was made financially feasible by the formation of larger farms, processing and marketing units. This paralleled large scale firm developments in the general business sector. Many legal and institutional features, such as income tax laws, favored the developments or were at least not adverse, to these developments. The general public may now be less oriented to growth and efficiency and wish to modify some of the present growth trends. At least, public pressure is developing to make very large, high technology business operations incur all of the costs of operation, including maintenance of environmental quality and some costs which are now paid for by public funds. What are some of these concerns?

Pollution is the most popular issue. Do the large poultry and livestock operations cause more pollution than smaller units because of the increased concentration of animals in a small area? Do their production costs adequately reflect the costs of disposing of animal wastes? Do the large crop farms, especially fruit and vegetable, achieve their efficiency by using chemicals which contaminate the air, soil, and water? Are the residues left on the product harmful to the consuming public? Is the problem more severe for very large farms than for smaller units? Will enforcement of tighter controls affect large units more than small units?

Another issue centers around wages, fringe benefits, and working conditions for hired workers. Large farm units can only exist by use of hired labor. Traditionally they have used many workers who were marginal for an industrialized society. Has the very large unit prospered because it did not pay enough of the cost of providing what society considers an equitable wage for workers?

Some observers believe that rural communities and institutions suffer economically and socially as fewer but larger farm units take over most of the production in a given area even though the transition is slow. However, the general public does not seem concerned as increased industrialization and urbanization take over and transform a given community from its agricultural past. Business leaders and property owners don't seem to object to a shift to a higher value use of land. In communities where there has been increased land clearing and development or increased irrigation, total jobs may increase and all business may improve. Gradually a higher proportion of rural communities are being industrialized and urbanized. Thus more concern is expressed about more nonfarm community requirements. Research on the impact of large farms on communities and trade areas is rather meager.

Often some groups raise the question of monopoly power as an argument against the continued formation of fewer, larger farm production units. This may be more of a rural, traditional view than a concern of big city consumers. For all practical purposes the public has accepted large size and concentration in business and industry. Apparently the general public is now more concerned about other issues.

The Public Institutional Dilemma

Most of the publicly supported agricultural institutions were developed in an era when small family type farms were predominant. Rural people needed technical assistance to improve their business operations and family life. The public needed assurance of an ample and reasonably priced supply of food. Public agricultural programs have been successful in achieving most of the major objectives for which they were developed. Now the question

keeps looming larger each year; is the public obligated to continue to provide relatively free research output and extension activities which may mainly benefit consumers and the large scale industrialized firms which produce, process, and distribute food and fiber? Can the agricultural industries now support their own research and educational needs? If so, how does this affect current public institutions, programs and budgets? Should they charge for services at cost? What is still in the public interest? What about the "people left behind?" How does the USDA balance its objectivity in representing large commercial farm businesses as compared with consumers and the rural disadvantaged? Can it operate a program with competing objectives?

About 400,000 farms now supply about two-thirds of all farm products produced. It is possible that half of the entrepreneurs for these units have more taxable income from off-farm investments and wages than they have from farm income. The total number of these firms may not decrease in the 1969 Census, but their share of production will increase. The commercial farmer depending mainly on farm income has diminished greatly in numbers, partly because he has shifted assets and energy to off-farm ventures. Many important agricultural States have less than 5,000 commercial farmers without considerable off-farm income. The remainder are affluent business entrepreneurs and professional workers with off-farm jobs and investments, large farm corporations, or they are Census Class III and smaller part time, subsistence and retirement units.

As public understanding of the present nature of farm entrepreneurs increases, a dramatic change in public support for some types of research and extension programs could occur **[2]**. This could also alter future public income, price and trade policies by the Federal Government.

Implications for Research and Extension Programs

Publicly sponsored research and extension activities relating to farm production and food processing are centered in the activities of USDA and the Land Grant universities. Both research and extension were originally organized to serve the needs of about 6,000,000 family farms. The very few, very large farms received little attention until just recently. Based upon IRS data, there are only about 30,000 farms with from $100,000 to $200,000 sales per farm and perhaps 15,000 very large units, which average $620,000 in sales [18]. Public expenditure for intensive research and complete description of these firms is necessary if the public really wants to know what large farms are doing and if economists really want to do an adequate research job.

The 45,000 large units and the changing nature of the entrepreneurs who operate all Census Class I farms represent a different challenge to the Cooperative Extension Service. The Extension Service has historically worked with farmers who operate the larger more efficient family farms—but who were not involved in many nonfarm ventures. The old "County Agent" system, which fitted so well in the past, is having difficulty. How can it be changed and specialized fast enough to keep up with the top farm operators when the public questions if such educational activities are necessary. This comes at the same time when more extension effort is needed to help those "left behind."

What are some of the specific questions which focus on the future research implications of fewer but larger farms [13]?

1. Should research attempt to enumerate, classify, study, explain and publish for public consumption as much information as possible about the largest 15,000 farms? What should be included? How frequently should this be done? Would it be desirable to require very large farms by law, to make an annual business report similar to an SEC disclosure?

2. Should activities of the Statistical Reporting Service be expanded to accurately report numbers of firms and output for the largest units controlling perhaps 25 percent of the output of every product? Should these be identified by name and location including the tie to parent organizations or holding companies? What are the consequences of not obtaining and publishing the information?

3. How can agricultural economists improve the research classification of large firms involved in agricultural production and related business activities to permit better analysis of incentives and trends in business practices and concentration of production?

4. How can research team members be better trained, organized and supported to study very large scale industrialized agricultural production, processing and distribution, especially on a regional or national basis?

5. Does modern large scale production and distribution of food and fiber need continued free research because of the benefits to consumers or can the industry now finance its own research or certain types of research?

6. What is the view of various commodity groups about continued public sponsored research? Is it germaine to their needs? How can it be made more productive to the businesses involved?

7. Should the emphasis of publicly sponsored research be from the consumers viewpoint rather than to help the industry? How can this be evaluated? Is the agricultural establishment really consumer oriented?

8. What constitutes a monopoly or restraint of trade position in the production and marketing of a specific agricultural product? For which products is the possibility of a monopoly position coming the quickest?

9. Should research be started to determine what external or institutional factors will slow the development of more very large farms? Should the consuming public be concerned about increasing concentration of production, processing and marketing in the hands of fewer business interests?

10. What obligations do we have to study the impact of large scale farm developments on communities and trade areas? Where do we start on such work.

What are some of the key implications for the Cooperative Extension Service which grow out of an increasing concentration of agricultural production on fewer but much larger farms?

1. What share of the Extension budget should be used for educational activities for people involved with Census Class I farms especially the largest 45,000? Will this be free to the users?

   a. If the answer is none or a charge system for the largest 45,000, how will this be related to the "County Agent" system? If all activities should be turned over to consultants, does this mean an eventual end to the ability of the Extension Service to work with the most efficient 60 percent of agricultural production?

   b. If the answer is 40 percent of the budget for people with Class I farms, how long will this be supported by consumers through their elected representatives? How can those who work with large commercial farms be efficiently organized, trained and related to a highly specialized industry outside of the "County Agent" system? In some cases relatively few specialized people could organize programs which cover types of farms and industries which cross State and regional lines. How can this be done?

2. What share of the Extension budget for agriculture should be used for farm units with less than $40,000 of output? How much for those with under $10,000 of output? Can the operators of these units be reached by the same program and agents as the largest 45,000?

3. Should a nonprofit organization be set up in every College of Agriculture to handle all service projects for farmers at "cost" to the user? This could include soil testing, DHIA, farm record projects with income tax reporting, EDP style farm planning activities, chemical feed analysis, plant tissue analysis, personalized farm and estate planning, building plans and related site plans for construction, financial feasibility plans for business expansion, etc?

4. Are Colleges of Agriculture willing to put most of their educational activities and services for large farm units on a cost of services basis? Would it be a help if a reasonable profit was included in the charge to avoid complaints of an unfairly low competitive price? How can the dividing line be drawn between large and small farms for charging?

5. Are the benefits to consumers from extension programs large enough so that free and expanded consulting service should be promoted for very large farms?

Implications for Public, Price and Trade Policy

Any consideration of implications of large farming units on price, income, and trade policy must be tied to specific commodities and the situation for each. Federal commodity programs have been developed within the "family farm" context and a general objective of maintaining or improving farmers income. At the same time the system was supposed to supply food and fiber at an acceptable domestic price and for export. Currently public concern about the size of payments to very large farms has cast some doubts about the system. Increasingly professionals have been aware that some program objectives are not being met because of the increasing differences between ordinary Census Class II and smaller farms and the largest 15,000.

Foreign trade in farm commodities is not operated in a vacuum from products of other industries and U. S. balances of payment needs. The export of farm commodities and farm production technology will remain as important ingredients in U. S. trade policy. One prerequisite for trade

policy is a knowledge of cost of production or comparative advantage. Policies and negotiations then proceed to more complex levels [8, pp 1-15]. If cost of production for negotiation purposes for some products continues to be based upon the highest cost producer and that is established by many small producers, possible low-cost production by very large units may have little influence on the volume of farm production that is exported in official channels.

What are some of the questions?

1. Why should income payments to farmers be tied to a specific commodity? If they are not, how can production be controlled except by the price in the domestic or export market? Should commodity producers be told to control their own production?

2. How will the programs in agriculture be modified to better reflect social concern in laws on minimum wages, working conditions, unions, pollution, environment, etc?

3. Can and will very large units produce corn, cotton, tobacco, rice, wheat, and soybeans for a lower price than smaller units for export? Who benefits from rules designed to protect small producers?

4. Should very large feedlots and ranchers be protected from increased importation of beef? At what relative level of price to consumers? Should large producers be allowed to hide behind the statistics produced by including the small producers?

5. Should the USDA take an active role in seeking changes in estate, gift and Federal income tax laws which permit manipulation by wealthy farmers and business entrepreneurs to the disadvantage of small family holdings?

6. Very large farm firms are interested in and are capable of exporting technological assistance or establishing branch units in foreign countries. Should this be encouraged?

Implications for Farm Input and Marketing Organizations

Specific implications of the development of more larger farms on farm input and marketing organizations must be tied to specific inputs, products marketed, and geographic areas. Often a clear distinction can be made between activities with very large farms and with units of moderate size. Increasingly, it will become more difficult to serve both equally well. There is also a more fundamental underlying issue. Manufacturers of inputs and processors of products have tried to foster an image which favors "free enterprise." This means independent dealers for distribution and independent farmers to produce the products needed. Now machinery manufacturers have been establishing company owned stores to compete and processors have the technical option of producing their own raw materials through large scale production units. In both cases this may better fit modern business management and financing. What then happens to their image? Does it matter what small farmers think? Does the general public care about this issue?

1. Should more manufacturers move more aggressively to establish company owned or shared outlets for their production? Will this make it easier to sell, service and finance their sales? What happens to small manufacturers who are not large enough to do this alone? Will this encourage new ownership combinations at the manufacturing level to match more of the products needed in a sales outlet?

2. Should manufacturers sell directly to very large units on a special, price contract basis outside of their dealer distribution system?

3. How do manufacturers improve long range product development designed to fit operations of different sizes? Is there a market difference between "part income" farms and commercial farms whose owners have no other investments or source of income?

4. Should more food processors own or cash rent land on which they control their own farm production units or contract out much of the needed farming services?

5. What happens to the ability of small farmers to sell products as large farms sell more directly or integrate and the public market disappears?

6. How can small farmers compete in a highly integrated industry? Should the Government or consumers intervene? At what point?

7. As more and more larger farm units are financed directly out of big city banks and equity markets, what happens to small country banks? Do the Federal Land Bank and The Production Credit Associations change their policies and stay competitive by servicing the very large units or do they stay with only the type of clients they were originally set up to serve (family farmers)?

8. Will financial institutions increase their direct participation in profit sharing with very large farm units as a requirement for making long term loans? If so, how deeply will they become involved in decisionmaking? Will this divert mortgage money away from smaller farm units?

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SEMINAR SESSION VI

Tuesday, August 11, 1970
1:15-2:45 PM

POPULATION, SETTLEMENT AND GROWTH PATTERNS

Program Organizer

Lynn Daft, USDA

Major Paper

"Population, Settlement and Growth Patterns"
by Marion Clawson, Resources for the Future
Washington, D.C.

Discussants

Ralph Widner, Appalachian Regional Commission, Washington, D.C.
Sam Jackson, Housing and Urban Development, Washington, D.C.

SUB-SESSIONS OF SEMINAR SESSION VI

Tuesday, August 11, 1970
3:00-5:00 PM

Sub-Session VIa
PATTERNS OF POPULATION SETTLEMENT AND ECONOMIC ACTIVITY:
WHERE ARE WE HEADED?
Chairman
George Tolley, University of Chicago
Discussants
Cal Beale, USDA
Joseph Coffey, USDA
Bruce Gardner, North Carolina State University

Sub-Session VIb
IN SEARCH OF A BETTER DISTRIBUTION OF POPULATION:
WHAT ARE THE KEY DETERMINANTS?
Chairman
Linley Juers, USDA
Discussants
Peter Halpern, White House Staff
Charles Gratto, Iowa State University
Don Epp, Pennsylvania State University

Sub-Session VIc
PUBLIC POLICIES NEEDED TO AFFECT
EMPLOYMENT AND POPULATION DISTRIBUTION
Chairman
James Maddox, North Carolina State University
Discussants
Hank Wadsworth, Purdue University
Howard Ottoson, University of Nebraska
Jerry Waters, Administrative Assistant to Senator
Pearson, Washington, D.C.

POPULATION, SETTLEMENT, AND GROWTH PATTERNS

by

Marion Clawson*
Resources for the Future
Washington, D. C.

A paper prepared for the Annual Meeting of the American Agricultural Economics Association Columbia, Missouri, August 11, 1970.

Man, as a species, is everywhere in the world redistributing himself, into new geographical patterns. Urbanization is proceeding rapidly in every country, as far as I know; and it is the largest cities which are growing the fastest. Concern and alarm are expressed by some observers in every country, some of the population concentration is proceeding in spite of substantial governmental efforts to reduce or control it, and yet the movement to the cities continues. Is it inevitable? Can its obvious problems be alleviated while at the same time retaining some of its strengths? Can a new and more attractive form of urban life be developed? What should be national policy in the United States on population distribution?

*In the preparation of this paper, I have drawn heavily upon a statement which John A. Schnittker and I prepared together, and which was discussed in early May of this year by a group which included Calvin L. Beale, David B. Carlson, Vernon Carstensen, B. Delworth Gardner, Jarvin Emerson, R. J. Hildreth, Paul Kelly, Wilbur R. Maki, Wayne Rohrer, K. Bruce Ryan, Robert H. Salisbury, Howard A. Stafford, T. N. Tideman, Michael F. Brewer, and Lowdon Wingo. Naturally, the discussion which follows is mine alone and others should not be held responsible for it.

In the 19th century, under the twin impacts of the Industrial Revolution and the Enclosure Movement, Great Britain substantially emptied out its countryside and built its large cities. Today, those same cities are spreading outward, in terms of residences and of jobs, under planning controls much more stringent and effective than ours. The Greater London Council area of the London metropolis is now losing residential population and industrial employment, and even is experiencing some outward movement of office jobs. Its outward movement is not to other parts of the country, but to the outer parts of its own metropolitan area, much of which is included in other cities.

In the United States, we are carrying out similar population movements simultaneously. At the national scale, we are concentrating our population into cities and metropolitan areas; at the metropolitan scale, we are decentralizing relatively and sometimes absolutely, as suburbs grow faster than old city centers. The grain or scale of one's observations greatly affects his conclusions. Thus, it is equally accurate to say that we are concentrating our population as it is to say we are dispersing it; the direction of movement depends upon the area one brings under observation.

Population Trends in the United States

I find it helpful to divide the United States into three broad categories, as far as population location is concerned: (1) the 30 Standard Metropolitan Statistical areas with 1 million or more each in 1966, included 38% of the national population; (2) the smaller SMSAs,

each of which had one city with 50,000 or more people and surrounding and economically integrated areas, had 26% of the total population in 1966; and (3) nonmetropolitan America, with no city as large as 50,000 and with most rural territory (all that not closely identified with the larger cities) had 36% of the total. Of the increase in population from 1950 through 1966, the larger SMSAs received 48%, the smaller SMSAs 34%, and the nonmetropolitan areas 16%. The rates of growth from 1950 to 1966 were 39% for both the largest and smaller SMSAs, but only 11% for the nonmetropolitan areas. In 1950, the nonmetropolitan areas had a larger share of the total than did either of the SMSA groupings; by 1966, the largest SMSAs had passed them, and if trends of the past several years continue by 1990 the smaller SMSAs would pass the nonmetropolitan areas.

It is not necessary, or possible, here to explore these demographic trends in detail. In the 1950's, more than half of all counties in the United States lost population; some had lost in the 1940's, many will be shown to have lost in the 1960's, when the 1970 Census data are available; and in many other counties the rural parts lost population but the largest town gained. At the other end of the scale, many of the largest central cities also lost or were essentially stagnant. Comparisons of population changes in cities often do not mean what they seem to mean; city boundaries have not been constant over the years, and the usual comparisons are for changing areas. Nevertheless, real losses have occurred in many older cities, especially in their older parts. The great gainers have been the suburbs, including the satellite cities around the larger ones.

In as large and diverse a country as the United States, trends are not everywhere the same, and trends of one decade may change by another decade. While the national picture is for slow growth or stagnation of nonmetropolitan areas, there are many small cities and largely rural areas, not within an SMSA, which are growing in population. By the same token, there are others which are growing slower than the average rate or are declining. In the 1950's, all of the 30 largest SMSAs gained population; between 1960 and 1966, Pittsburgh alone among these largest SMSA actually lost population. In a short paper, it is impossible to consider regional or other localized population patterns; we shall discuss only national totals and trends, but both of us must remember that much diversity underlies these broad comparisons.

In the past, migration from rural areas to the cities has been an important factor in building the cities, and in lowering population growth rates in the rural areas. A farm-to-city migration is older than our national government; it has been heavy in recent decades. But it is no longer a major city-building force -- there simply are not enough people left in all of nonmetropolitan America to populate the cities of the future. On the contrary, every SMSA now has a demographic momentum of its own; each is growing much more by an excess of births over deaths than it is by net inmigration. This is not to deny the numerical importance of the latter, nor the importance of the considerable migrations among cities, as well as between cities and rural areas, which are offsetting in numbers. But if there were no more net migration from nonmetropolitan areas to the SMSA, the latter would continue to grow and at almost the same rate as may be attained with any reasonable projection of migration flows.

However, migration from nonmetropolitan areas to the SMSAs continues to be highly significant to these smaller cities and rural areas. The flow is still away from them; conceivably it might be reversed -- that is one of the policy issues we shall discuss later. Unless the outmigration from nonmetropolitan areas is diminished or reversed, it will keep such areas as a whole from growing very much in population, and will lead to further reductions in population in extensive areas.

Migration is always age-selective. It is the young adults who move easiest and in greatest numbers. This was true throughout the frontier period in western history; the Gold Rush to California more than 100 years ago was very largely young unmarried males. In modern times, the young girls move as quickly and as easily, or more so, than the young men; a high school typing course is more likely to admit a girl to a city job than is a high school vocational educational course likely to open up a city job to a rural or small town boy. Many modern migrants are married, some will have children. There has always been, and is now, some proportion of older adults in the migrant stream; and the young families obviously often include very young children. While there are many strange and interesting migration patterns in the United States, the age factor is everywhere important and usually dominant.

Where migration from nonmetropolitan areas is relatively high and heavily young-adult dominated, it produces a marked effect upon the age distribution of the nonmigrant population. The latter acquires an age distribution different than would have resulted from its birth rate and its age-specific death rates; to this extent, and in this sense, the age distribution is "abnormal." Areas experiencing a heavy outflow of people nearly always have relatively deficient numbers of young adults, and of younger middle-aged adults; they will nearly always have relatively high proportions of old people; if birth rates are high, they will have large numbers of children as well. Social services required for the young (as schools) and for the aged (as hospitals) are thus in large demand and likely to be expensive; contrarily, the number of workers in the productive age groups is low, hence economic output of the area will be low. For instance, the nonwhite population of Arkansas in 1960 had twice as many people under 20 years and 60% more people over 60 years, in relation to those in the 20 to 39 years bracket, than did the total population of all the SMSAs. Different, and more extreme, variations could easily be found for smaller areas than a whole state.

Settlement Pattern

Population is never evenly nor randomly distributed over an entire land area, but always displays a degree of nucleation which had a solid economic, social, and/or political base at some past date and usually still has such a base. Small nucleations are villages, larger ones are cities, and still larger ones are cities, and the largest of all are metropolitan complexes. Each has its own functions, and there is a hierarchy among such centers of population. Numerous theories of city location and city size have been propounded, and most are valid under some circumstances or for some sizes of cities. A theory which seeks to be universal in its application must include many variables. Some cities are transportation nodes or break points, some are resource-oriented, others have governmental or religious significance, and increasingly in much of the world today cities grow from momentum. A large urban population has its demographic reproductive capacity, and acts as an attractant to rural and smaller urban areas.

The dominant fact about settlement pattern at any date is its own past. That is, where people live today, in relation to where others live, is determined more by where they or their forefathers lived in relation to others yesterday, than by any current force. There is an immense inherited settlement pattern. This is not to deny that change does occur, but the amount of change each year is normally only a fraction of the existing situation; annual additions to housing stock, for instance, rarely exceed 2%. Moreover, the tyranny of the incremental decision is nowhere more marked than in settlement pattern. When I come to build my house or my business establishment, a major part of my environment is where you have your house and business and where the pub-

lic services (such as water and sewerage) are located; but you in turn are influenced by me, and the governmental services by both of us. The influence is not merely physical, but social and institutional as well; many cities bombed out during war, or destroyed by some natural catastrophe, are rebuilt along previous lines, regardless of the suitability of the latter, largely because all concerned have some incentive to restore lost social and institutional arrangements.

Among influences of the past, none is more important on city location and form than is transportation. Older large cities are almost invariably on navigable water, for instance; but, having become established under the influence of water transportation, they draw to themselves railways and highways, when the latter provide major methods of transportation. The nonmetropolitan areas of the United States were originally laid out and developed with horse-drawn vehicles which travelled 2 to 4 miles per hour; today, their roads permit travel at average speeds up to 50 miles per hour, but the road network is still that of the past.

Many institutional aspects of settlement pattern have roots in the past also. In much of the United States, the rectangular cadastral survey which was basic to the transfer of land from public to private ownership has continued, and likely will continue indefinitely into the future. Even the most casual observer can see it from his plane or car window, if he looks at all. It has sometimes been criticized as a square network in a naturally rounded countryside. One could easily indulge in "might have been" dreaming about other patterns; one can equally well defend the land survey system. In any case, it exists and is deeply imbedded in private property ownership in two thirds of the United States. Closely allied to it is the system of rural roads; typically, in the more intensively farming areas, a road on every section line, at intervals of a mile in every direction. In the farming areas of lower productivity, roads are likely to spaced further apart, but the section line influence is still persistent. Flying over many arid western areas, not farmed at all, with no fences, one is struck by how often roads follow straight lines, usually on section lines.

Farming in the United States mostly developed on the basis of the farmer's home and his farmstead located on his land -- and often on the road which ran along it. This was the dominant pattern when farms typically consisted of a single piece of land. Today, some 12% of all farmers live in town, but are likely to still have one or more farmsteads on their land; but their farm today is far more likely to consist of two or more spatially separated tracts of land, perhaps held under different tenure arrangements. Farm numbers today are less than half their peak, nationally and in many farming areas, yet rural road mileages have decreased little. Such observation as I can make from travelling by plane or by car through farming areas convinces me that rural road mileage could be cut to half or less in many farming areas, by moving a few farmsteads and closing many roads to all traffic except internal farm movement of machinery and livestock. The cost of a great many social services, such as mail delivery, school bus service, electric power line service, and others are determined more by road length than by numbers of customers; were road mileages to be reduced the savings would be greater than the not inconsiderable savings in road maintenance cost.

In the farming areas of the United States, small towns developed to provide the business, social, and governmental services required in their day, and so located as to provide an optimum trade-off between costs of transportation from farms to them and economies of scale in the towns themselves. The transportation costs in early days were often not primarily money, but time and effort; the farmer hitched up his team to the wagon and went to town, wihout cash cost but at the cost of a large expenditure of time and energy. (I know; I did, as a boy.) The economies of scale were often variety and quality, more than price; the small town general store might sell its groceries at the same prices as the larger stores in the larger towns, but with vastly less variety and freshness. The volume of government and social business in the town forming period was slight; mail an occasional letter, rarely consult a lawyer about a title, see a doctor when seriously ill, and a few others. All of this developed under horse-drawn transportation.

My thesis is that this settlement pattern, developed under one set of conditions of land tenure, farming methods, transportation technology, social institutions, and other framework, is no longer suitable today when vastly different conditions prevail. Indeed, the old pattern is changing, as farmers by-pass the small village to trade in the larger but distant city. Strictly rural churches are relatively rare today, compared to their former numbers, rural one-room schools are rapidly being eliminated, and many other changes are underway. But the lag is very great. One result is that social and economic services in rural and small town areas are nearly always substandard. Moreover, the situation in the small cities, up to 10 or even 25 thousand population, is often little better. Electricity, with the radio, television, and other household services it makes possible, is a great equalizer, as between remote farmstead and city center; but many other services are more unequal.

Income and Economic Growth, in Relation to Settlement Pattern

National incomes estimates are available on a state basis, but not according to my categories of large SMSAs, small SMSAs, and nonmetropolitan areas. However, some useful and interesting inferences can be drawn, by use of State income data as related to proportion of population in nonmetropolitan areas.

First of all, there is a large and persistent difference in average per capita income among the states. The correlation between average per capita income per state in the 1919-21 period and in 1950 was 0.9 or higher; between the latter year and 1967, even closer. There has been some levelling-up; for each of these periods, the line of least squares relationship shows somewhat higher incomes at the latter period for the low income states than the average percentage relationship for all states between the two periods. The unweighted average income for the five lowest income states was 34% that of the unweighted average for the five highest income states in 1919-21, but rose to 43% for 1950, and to 57% for 1967. Nevertheless, the four lowest income states are the same for all periods, and in almost exactly the same order -- Mississippi at the bottom, Arkansas next today, followed by Alabama and South Carolina. There has been a little turnover among the top five, but New York and California have always been there, and Connecticut and Delaware have appeared frequently.

Much more significantly for our purpose, there is a fairly high correlation between the percentage of the total population living in SMSAs and the average per capita income. In 1960, the 14 southern states were a separate statistical universe, but among them the correlation between per cent of population in SMSAs and average per capita income (ignoring all problems of small number of observations and probably non-normal distribution) probably exceeded 0.8. Each increase of 10% of the population living in SMSAs was associated with an increase in average per capita income of $128. For the nonsouthern states (omitting four which has no SMSAs in 1960) the correlation was roughly as high, but the increase in average per capita income associated with an increase of 10% in SMSA population was somewhat less -- $91.

Correlation never proves causation. The foregoing does not prove that incomes are high because people live in SMSAs, nor does it prove

that people live in SMSAs because their incomes are high. It simply says variations in these two factors are associated. We surely know that many other aspects of life are different when more people live in relatively large urban agglomerations than when they live in small towns and villages. Comparison of money incomes does not exactly measure differences in real income; but corrections to make such comparisons are far from simple. Cost of existence -- food, shelter, clothing, etc. at a minimum level -- may reveal that small towns and rural areas are cheaper to live in; will cost of modern living, with all the social and cultural aspects we believe nowadays to be necessary, possibly show a reverse relationship?

Income disparities persist largely because they are self-perpetuating and self-fulfilling. A low income area is unable to spend as much for schools as a higher income area; as a result, its young people are not as well-trained; being poorer trained, their productivity is lower; and hence income for the area or state is less. Moreover, lower income areas are often able to provide significantly poorer economic opportunities for their young people, and the abler ones migrate elsewhere, in turn lowering average incomes in the future. Still further, low income areas are able to accumulate less capital than higher income areas; in spite of considerable fluidity of investment capital, much capital is local and outside capital tends to flow in where it can supplement local capital. Moreover, low income areas often experience net outflows of such capital as they do accumulate.

Social Service and Settlement Pattern

Information about social services in general is much less satisfactory than information about income, and has almost never been summarized according to my large SMSA, small SMSA, and nonmetropolitan classification. One basic difficulty is to define quantity of a social service; how does one compare different amounts and kinds of education, for instance? Comparisons among kinds of social services -- education versus health services, for instance, -- are still more difficult. And how do the people concerned rate the still less tangible aspects of their lives? How does one balance the opportunity to walk to work against the excitement of a large city, for instance? Conceptual problems here are very difficult, data are notable for their absence or unreliability, and geographic comparisons are difficult. Nevertheless, any consideration of public policy must consider these extremely important if intangible aspects of modern life. Nearly every study has shown that rural and small town schools are inferior judged by the standard of the better schools in their state; rural and small town health services are likewise nearly always much inferior to those in large cities; libraries, arts, music, sports, and many other aspects of life are always or usually inferior in the rural areas and small towns. Water supply is often cheaper but of more dubious quality; likewise, waste disposal of all kinds is easier and cheaper in rural and small town areas, and pollution is likely to be less or at least less obvious, in large part because the natural absorptive capacities of the environment are less likely to be overloaded. Surface transportation facilities are relatively more generous and less congested in small towns and countryside, but air transport is likely to be inferior.

In making the foregoing very general comparisons, one must emphasize again that enormous variation exists in the United States, and that all parts are not the same. That is one reason I have referred to services in small towns and rural areas in comparisons with larger cities in the same state, rather than on a national comparison. Moreover, since personal incomes vary greatly, many wealthier persons in comparatively disadvantaged areas may be much better off than poor people in generally richer areas. However, one major characteristic of social services (as the term is used here) is that the individual or family cannot well provide them for themselves; the unit of supply must be far larger. One can have a private library which in considerable degree can make up the deficiencies of the public library; but the cost is higher, and rarely is the deficiency fully made up. When one comes to opera, or to organized baseball, to use but two examples, the group aspect is yet more important.

A still more slippery problem is: how do the personal satisfactions that individuals get from life as a whole compare, nonmetropolitan areas versus SMSAs? There is a general feeling that dissatisfaction with life is greater in larger urban centers. Opinion surveys have often shown that people would prefer to live in small towns and rural areas -- but most of those surveyed continued to live in or near large cities; why? Is the apparent satisfaction with life in the small town -- assuming that it really exists -- because people are knowledgable and contented or does it merely prove that they are clods? Should it be the concern of anyone, except the individuals concerned, what the quality of life is? In passing, we may note that the American people long ago decided that it was a proper matter of public concern how long young people should go to schools; and schools are not the only aspect of life where public standards have been established, which are enforced with varying rigor on the individual.

Perhaps a standard or a goal can be advanced here. My own personal objective is to see that every individual has access to personal opportunity for a full and rich life -- full and rich by his standards, but in knowledge of what the world has to offer today. This would include the possibility of getting higher education (but I would reduce the compulsions to go to school), the possibility of a rewarding job, the chance for outdoor recreation, and many others. How far he took advantage of the available opportunities would be his affair. Today, we simply do not know how many people really choose to live and work where they do; in spite of considerable mobility, there still remain real barriers to personal achievement -- of which ignorance of possibilities is surely a major one.

Role of Government Policy, Past and Present

Comparatively little governmental action has been directed specifically toward the settlement pattern of the United States. There have been and are various regional programs, such as TVA, the various regional Commissions, such as the one for Appalachia, and others. They have been established and operated to deal with defined problems within their areas. But there has been no national policy on population distribution. No agency has been authorized to direct population into certain areas, or away from others, or to encourage or to prohibit industrial or other groups in certain or other areas -- nothing, in short, comparable to what there has been in Great Britain and in many other countries during the past two or three decades. People are not only free to move where they wish to go; private business has been primarily responsible for giving them employment and for building them housing, as well as for other aspects of their economic and social life. The U.S. economy and society is a multi-centered one; decisions are made at thousands of places by private business and by government at some level, with a notable lack of single coordination from any one location. This process can be both criticized and defended; I intend to to neither today, but am simply describing a situation which exists.

If federal and state governments have done little directly to affect settlement pattern in the United States, they have carried on many programs or has many laws which have affected it indirectly. The federal government spends many billions of dollars annually on military and space agency procurement, as well as on direct activities for each.

The result has been to provide a powerful economic stimulus to some metropolitan areas. The government carries on scores of other programs directly, chiefly through local offices. There is a range of agricultural programs: extension, soil conservation, agricultural stabilization and conservation, and others which have county or other local offices. But welfare, educational, resource development and many other programs are carried out at the local level also. In many small towns, the payrolls and the activities of federal or federally-financed programs provide a major economic support for the community.

The federal government also makes grants -- for planning, for public works, for water development, for highways, and for many other purposes. It invests directly in resource development -- dams and water control works especially.

All of these activities have a spatial dimension; all take place at some location. They affect some local areas more than others; they are not neutral on this matter of settlement pattern. They might be organized quite differently as far as their spatial characteristics are concerned. If the federal government refused to establish an office, or to fund any activity through any office, which did not serve either 30,000 people or all the people within a 50 mile radius, whichever was smaller, this would have a profound effect on some small rural towns.

Federal income and other tax policy is not neutral between metropolitan and nonmetropolitan areas. Neither are various forms of income maintenance, such as rent subsidies and farm income supplements. Though a program apply nationally, it is often better adapted to the conditions in one area than in another.

Though there is no national policy on population distribution, there are many federal, state, and other governmental programs which markedly affect population distribution. As a society, we are not neutral and aloof from the problem of population distribution; we do intervene in personal decisions. Might we do so more effectively and purposefully?

Future National Policy on Settlement Pattern

Consideration of national policy on population distribution falls into two general categories:

1. National policy might seek to modify the present and prospective future population trends toward concentration in large SMSAs and and toward relative stagnation of population in nonmetropolitan areas as a whole. Various measures might be undertaken to strengthen the position of the nonmetropolitan areas, in their efforts to hold their own youth; or other measures might be undertaken to encourage a reverse net migration -- from the larger cities toward the smaller ones. The objective would be either to limit absolute numbers or to limit growth rates of the large SMSAs -- to put a ceiling on their numbers, or to discourage their rate of growth. This effort to obtain a different national population distribution might well include the building of new "towns" or cities -- to be truly new cities, not merely new suburbs of older cities, they would have to be located some distance away from present large cities, but this would be possible either in presently largely urbanized regions or in presently largely unurbanized ones.

To those who regard large cities with disfavor or suspicion, who feel that large population concentrations are inherently bad, this course of policy has much to comment it. My own feeling is that most persons who hold this view greatly underestimate the difficulty of reversing past trends. Admitting that present governmental policy has not been negative, simply turning policies of the federal and state governments around would be politically and administratively difficult; moreover, it might be insufficient to produce any significant effect upon population distribution. As I have become familiar with British experience, it has become clear to me that redirecting population movements is possible but difficult and that it requires a degree of dedication of governmental efforts which I think the United States is unlikely to achieve. If we really believe that the biggest cities should not be allowed to grow still bigger, and that smaller cities and/or rural areas should be the future home of more people, let us not delude ourselves as to the magnitude of the job we are undertaking.

2. Regardless of the broad pattern of population change as far as large SMSA, small SMSA, and nonmetropolitan America is concerned, national policy might be directed at the spatial pattern of settlement within each. I am convinced that a different pattern of population nucleation within nonmetropolitan ares, than present trends are likely to produce in a generation, would have major economic and social advantages. In particular, a greater degree of population concentration among cities below 50,000, and even more among towns below 5,000, could produce an environment for living which would prove more attractive to the young people than do the present towns. The present pattern has demonstrated its inability to hold many of the young people who grow up there; this in itself might not be serious, but as an indicator of competitive strength it is highly significant. My conviction that something very much better is possible is admittedly largely intuitive.

Significant improvements are also possible within the suburban fringe of the larger cities, and within their older parts which need renewal, but I shall not explore this matter today.

I believe that the spatial pattern of strictly rural living could be changed substantially, to reflect modern technology and modern life and work styles. There could be far fewer roads, more people living in town and working on the land, and more economic and social services in larger towns but fewer in small towns and in open country. The towns themselves could be consolidated, either by actual movement and incorporation of one or more in a larger town, or by gradual redirection of population change within nonmetropolitan areas into the larger and stronger towns.

Although these two lines of national population distribution policy have been separated, actually they could be complementary rather than competitive. That is, if the nation decided to limit the growth of the largest cities and to foster the growth of small ones, there would still be a problem of the optimum spatial pattern of population distribution within nonmetropolitan areas.

Research Needs

It is customary, almost obligatory, for a member of the research establishment to end a paper with a plea for more research, and I do not intend to flout tradition today. The more I have considered the problems discussed in this paper, the more I am appalled at our collective ignorance on this major national problem. We do many things with only limited knowledge or apparently limited concern with their consequences; there is much debate but little light.

Research might take either or both of two major directions:

A. To develop a better understanding of the present situation, as far as the economic and social consequences of spatial distribution of population are concerned. In this paper, I have presented on some highlights, and much more could be done in an extended report. But, at numerous important points, lack of information is far more impressive

than information. Above all, we do not know how demographic, economic, social, and political forces interact; and I am confident that the whole problem is far more than purely economic as this term is usually used.

B. Research could surely develop a wider range of future alternative spatial patterns of population distribution than those we are now moving toward. Moreover, it could provide a degree of testing. Here is a prime place to build some socio-economic-political models, to show the interaction of various components, to present some range of choice. Such models should show or at least suggest the places where intervention in "normal" processes might yield results. Admittedly, researchers should not make final decisions on public policy, but should leave that to the electorate and its elected representatives; but researchers could show what the real alternatives were, so that choices could be more meaningful.

SEMINAR SESSION VII

Tuesday, August 11, 1970
1:15 to 2:45 PM

THE CHANGING PROBLEMS OF THE AGRICULTURAL WORK FORCE

Program Organizer

Dan Stuart, Michigan State University

Major Paper

"The Impact of the Industrialization of the Hired Farm Work Force Upon the Agricultural Economy"

by James Holt, Pennsylvania State University

Discussants

Stan Knebel, U.S. Department of Labor

Varden Fuller, University of California, Davis

SUB-SESSIONS OF SEMINAR SESSION VII

Tuesday, August 11, 1970
3:00-5:00 PM

Sub-Session VIIa
HUMAN RESOURCE DEVELOPMENT AS RELATED TO THE HIRED FARM WORK FORCE

Chairman

Willis Sloan, U.S. Department of Labor

Discussants

James Beckett, University of California, Davis
Frank Bobitt, Michigan State University
David Ruesink, Texas A & M University

Sub-Session VIIb
ORGANIZATIONAL AND INSTITUTIONAL CHANGES THAT ARE NEEDED IN AN INDUSTRIALIZED AGRICULTURE: BARGAINING, UNIONIZATION, UNEMPLOYMENT INSURANCE

Chairman

John Wildermuth, University of Arizona

Discussants

Frank Fernbach, United Steel Workers of America, Washington, D.C.
Ronald Knutson, Purdue University
Bernard Erven, Ohio State University

Sub-Session VIIc
CREATING A WORK ENVIRONMENT IN WHICH FARM EMPLOYMENT IS COMPETITIVE

Chairman

Ray Murray, University of Maryland

Discussants

Carey Moxley, Florida State University
Maurice Voland, University of Kentucky
Allen Shapley, Michigan State University

THE IMPACT OF THE INDUSTRIALIZATION OF THE HIRED FARM WORK FORCE UPON THE AGRICULTURAL ECONOMY

James S. Holt*

Concern over a "farm labor problem" is not new. Employers have always contended that hired farm workers were too scarce and costly while workers have always contended that farm work was too demanding and not sufficiently remunerative. These concerns are a part of the psyche of the economic man; they are fundamental assumptions in our explanation of economic behavior. However, in recent years there has been added to this persistent undercurrent a variety of additional concerns about the social and economic circumstances of migrant workers, earnings and working conditions of farm workers generally, unionization, labor legislation, importation of foreign workers, employer-employee relationships, skill training, and other issues. These are new but interrelated problems--their appearance is one manifestation of the evolving industrial structure of agriculture and the gradual disappearance of traditional rural society. None of these problems can be discussed in a vacuum--none can be fully understood except in the context of the social and economic changes that have produced them. So I am pleased that those planning this program have posed for us the broad farm labor problem and not merely some of its more visible manifestations.

The purpose of this paper as I see it is to assess the changing status of the hired work force in agriculture and to discuss the impact these changes are likely to have on the agricultural economy. I have tried to provide a framework for relating the various topics to be discussed in the subsessions to follow this paper. I have approached this task by first enumerating the factors that are leading to the industrialization of the farm work force and then indicating the impact they are having on farm employers, farm workers, the agricultural industry generally, and the public.

I would observe in passing that the evolution of agriculture and rural society is creating a number of relevant social issues for our profession. Nearly every dimension of agriculture and rural society of concern to social scientists is undergoing fundamental change. In such an environment we can quickly find ourselves curators of an agricultural folklore rather than students of a living social organism unless we are receptive to the evidence of change and astute in discerning its direction and magnitude. Particularly in the case of agricultural labor, I feel that the agricultural industry, government and society at large have recognized and accepted changes that our profession and the agricultural colleges are only grudgingly beginning to acknowledge.

*Associate Professor of Agricultural Economics, The Pennsylvania State University. I am indebted to a number of my colleagues who made helpful suggestions, in particular George E. Brandow and Reuben W. Hecht.

The Changing Rural Labor Market

A host of factors contribute to the industrialization of the hired farm work force. They have their origin in some basic changes taking place in agriculture, rural society and the legal environment of the farm labor market. [2, 7, 9, 11, 12, 14]

Technical and managerial innovations taking place in the agricultural industry are affecting the quantity and quality of hired labor demanded. Many jobs performed by hired agricultural workers now require a high level of skill acquired through experience or formal training. To be sure, there are still many agricultural jobs that are performed in essentially the same manner as they were 25 years ago, and these jobs are the source of some of the industry's most pressing labor problems. But unquestionably the overall skill requirements for agricultural workers are increasing, while the number of workers is declining.

Technological developments are manifesting themselves in rapidly increasing capital requirements for modern competitive agricultural firms and in enlargement of the size of firm. Increasing capital requirements are putting great stress on the entreprenurial structure of the agricultural industry. The last vestiges of the "agricultural ladder" are rapidly disappearing. The ultimate effect of these developments is likely to be the separation of ownership-management and labor. When this occurs, the industrialization of agriculture will be complete.

There are perhaps even more far-reaching changes taking place in the rest of rural society that are leading to the industrialization of the hired farm work force. The increasing mobility of the rural population has opened new employment alternatives to the fomerly captive rural labor force. Many rural workers have permanently migrated to urban centers while others are exposed to urban employment as commuters. At the same time non-agricultural employers have moved out into the countryside, in part in search of those workers unwilling or unable to migrate to the cities.

Mass communication media have reached into rural areas, rapidly urbanizing the rural population. They are expanding the level of awareness and desire of rural workers. Universal public education has altered the characteristics of labor supply. New labor market entrants, even in rural areas, possess better skills, more alternatives, and perhaps most important, a different set of life goals and occupational images than their predecessors. Finally because in many rural areas agriculture is no longer the predominate industry, farm work is no longer a common occupation. The social sanction of farm work and the visibility of this occupation to labor force entrants are rapidly diminishing.

Along with changes in agricultural technology and rural society have come changes in society's attitudes toward labor legislation in agriculture. Agricultural workers were excluded from most labor legislation of the New Deal era, partly because the close relationship between the farm employer and worker was deemed to make legislation unnecessary, partly because of the administrative problems raised by the extremely large number of small rural employers, and partly because of agriculture's political strength. Agriculture's political strength has waned in the intervening years and society is

re-examining the validity of the other reasons for excluding farm workers from general labor legislation. One of the compelling reasons for this re-evaluation is the economic deprivation of farm laborers. Another is that with the declining number of farms and the increasing managerial sophistication of farm operators, the administrative obstacles to farm labor legislation appear less formidable. Most farm workers are now covered by Social Security and some by modest minimum wage coverage. Proposals have been advanced for extending wage and hour legislation, compulsory workmen's compensation, unemployment insurance, protection of collective bargaining rights and other legal aid to hired farm workers. It seems clear that eventually little or no distinction will be made between farm and non-farm workers in labor legislation.

Finally as society becomes more affluent there has been growing social concern about equality of economic opportunity and economic and social justice for members of minority and disadvantaged groups. Society has identified hired farm workers as an economically disadvantaged occupational group. In addition, many hired farm workers are members of minorities. Agricultural employers feel themselves threatened by programs to improve the welfare of these persons because they correctly identify the targets of the programs as their labor force.

The effects of these changes are being felt by employers of both regular and seasonal workers. The great reservoir of farm workers released by the breakup of the southern cotton plantation system and then by cotton mechanization have gradually been absorbed into the local economy and the northern urban ghettos. The flow of foreign workers into the United States for seasonal farm employment has been greatly reduced. Local casual workers are becoming more affluent and less inclined to undertake physically demanding and unpleasant seasonal farm work. With its traditional labor market policies, agriculture finds itself dependent on an ever smaller group of workers who for lack of inclination or opportunity do not move into the non-farm labor force.

As the barriers that protected the farm labor market from outside forces diminish, agriculture is increasingly in direct competition with non-agricultural employers for labor. It is increasingly dealing with workers who think in industrial labor market terms. It is being compelled by these competitive pressures, and by legislation and regulation, to apply more of the industrial rules to farm employment. Agriculture, of course, differs from the industrial model in several important respects, including its industrial organization, the biological rather than mechanical nature of its production processes, and the fact that it is spatially extensive. While these differences preclude the direct transfer of the industrial experience to agriculture, they do not absolve agriculture from applying the industrial rules. Workers in the labor market, and increasingly society at large, are growing impatient with the reasons why farm employers can not adapt, and are becoming more insistent that they do adapt to the norms of the current labor market.

These forces are having, and will continue to have an impact on farm employers, other farm operators, present and potential farm workers, and on society as consumers of agricultural products and in the exercise of social policy. The full ramifications of this impact are obviously complex and far-reaching. The remainder of this paper is devoted to discussion of the most direct effects.

The Impact of Industrialization

Farm Personnel Practices

One of the most direct effects of the industrialization of the farm labor market is on the labor management and personnel practices of farm employers. [1, 8] Four aspects of the farm employment relationship are undergoing and must continue to undergo change.

(1) To meet competitive pressure and legislative requirements, the economic returns to hired farm work must increase. Low wage rates combined in many cases with less than a full year of employment have resulted in farm worker incomes that presently compare unfavorably with alternatives in non-agricultural employment, and in some cases with socially acceptable minimum income standards. In addition to wage rates, the hours of work required per week, provisions for overtime and incentive pay and regularly scheduled wage increments are all part of a competitive wage package. Farm employers will be forced to consider a remuneration policy rather than a wage rate in attempting to become and remain competitive.

(2) Closely related to the matter of wage rates is fringe benefits. The paternalistic employer-employee relationship that once was prevalent in industry is nearly gone. This is attributable in large measure to unionization of the work force and the elimination of the economic necessity for the company town and company store. Unwritten (and often unhonored) understandings concerning industrial employer's policies on sickness, injury and old age have been replaced by sophisticated and formal contractual arrangements. The fringe benefit package in industry now emphasizes security of the worker's income flow. It includes workmen's compensation and other insurance protection, unemployment insurance, sick leave, retirement provisions, severance pay and conditions, and seniority rights. This is in contrast to agricultural fringe benefits, which still emphasize goods, particularly food and housing, and often leave to informal understanding questions of illness, injury, and old age. In competing in an industrialized society and labor market, farm employers will be forced to re-think their concept of fringe benefits, and in the process to reevaluate the nature of the employer-employee relationship in agriculture.

(3) Working conditions in agriculture will also have to undergo change. Two aspects of working conditions must be considered--the physical work environment and the employer-employee relationship or psychological work environment.

Considerable progress has been made in non-farm industries in reducing the physical demands of industrial work and improving the safety and comfort of the work environment. This has had impact on worker supply, opening jobs to large numbers of new workers, especially women. There is intense effort in agriculture to develop mechanization to replace labor, some of which is also affecting the nature of the remaining labor requirement. But relatively little attention has been paid specifically to improving the work environment.

The psychological work environment is another important aspect of a job. Non-farm employers devote substantial resources to activities directed at maintaining good employer-employee relationships and worker morale. Through research and experience considerable expertise in this field has been developed. The transferability of this experience to agriculture, where the labor force is smaller and the supervisory relationship is often different, has not been adequately investigated. It is sometimes assumed that the close working relationship between worker and employer on many farms makes this aspect of labor management unimportant. Yet surveys continue to show this to be a major labor problem on farms. There has been little systematic research in agriculture into worker-supervisor relationships.

(4) A final area in which competitive adjustments in farm occupations will have to occur is in the career aspects of farm work. An important element in the career attraction of a job is security. An additional consideration, however, is the opportunity for growth and advancement. Seasonality, the small size of the farm labor force and the entrepreneurial organization of agriculture all undermine job security and career growth. Nevertheless, through proper construction of the fringe benefit package, job classification and remuneration policies, or through the development of suitable farm employer or worker institutions, farm employers are going to have to find ways to enhance the career stability and attractiveness of farm work if they are not to alienate a large segment of the potential work force.

Each of these aspects of farm employment will, of course, not be uniformly important to all farm workers. Such short-run payoff aspects as wages, hours and working conditions will be of primary importance to seasonal workers, while the security and career aspects of the job will be important to permanent workers. Farm employers will have to structure jobs to be most appealing to the type of worker they are trying to attract.

Farm Organization and the Industrial Structure of Agriculture

Many of the measures required to contend with the industrialization of the farm labor market will increase employer's investment and operating costs. This will provide additional incentive for employers to undertake adjustments to improve labor productivity and reduce labor requirements.

In some cases policies of the sort discussed above will be required merely to maintain the present labor force. In other cases a more competitive labor policy will enable employers to attract more productive workers to improve productivity of existing workers. A properly designed incentive payment plan, for example, may improve labor productivity and at the same time improve the worker's income if the worker is capable of greater output. Improvements in farmstead organization, mechanization and labor management techniques may effect improvements in working conditions while improving labor productivity and reducing labor requirements.

Technological developments have resulted in substantial improvements in average farm labor productivity in recent years. These improvements have, of course, not been uniformly distributed among all enterprises or all farm jobs. There are some agricultural occupations, hand harvest of certain fruits and vegetables, for example, that have been virtually untouched by this increase in productivity. There has been far less progress in the development of labor management techniques for improving the efficiency of hired labor use and the productivity of hired workers than in the development of mechanical and biological innovations for increasing labor productivity.

The technological and managerial innovations fostered by rising labor costs will add to the already considerable problem created by the pace of these adjustments, which has been so rapid that the capacity of the agricultural industry to produce has expanded faster than population growth and increased income could absorb the additional production. With the resultant depressed prices and earnings in agriculture, a great deal of family and hired labor that had better alternatives elsewhere has moved out of farming. But this is a difficult adjustment to make, and agriculture is still characterized as an industry with excess resources, in particular manpower. This has produced the apparent paradox we are discussing today--competition for workers in an industry with excess manpower. The excess manpower occurs largely on small and marginally efficient farms with an insufficient resource and managerial base to become competitive in agriculture, but with no viable alternatives for moving out of the industry. The competition for workers, on the other hand, is occurring on the larger more efficient farms, those farms which are the backbone of commercial agriculture.

These considerations lead to the question of the impact of the industrialization of the hired farm work force on size of firm and the industrial structure of agriculture.* Perhaps the cost of labor market competition and legislation will put the farm using hired labor at a sufficient competitive disadvantage relative to those firms supplying most of all of their labor needs from the family that farms depending on hired labor will be driven out of business. Whether this occurs is partly dependent on technological developments and partly on institutional developments. On the technological side, it depends on the magnitude of future economies to large size and on the ability of employers to develop and apply managerial and supervisory innovations to improve the productivity of hired labor and the attractiveness of agricultural work. If the profit incentive is strong enough, it seems unlikely that these innovations would not occur. On the institutional side, it depends on the degree to which legislation, regulation and possibly union work rules affect adversely the labor costs of large employers and the returns small farmers are willing to accept on operator and family labor.

There is no evidence up to the present time that hired labor costs are threatening the competitive position of farms using hired labor. Farm operators and family workers appear nearly as much attracted to the earnings and working conditions of the non-farm economy as their hired counterparts. On balance, it seems likely that in the long run the changes taking place in the labor market will augment rather than retard firm enlargement in agriculture and dependence on hired labor.

National labor legislation and collective bargaining agreements could have considerable impact on interregional competition in agriculture and the competitive position of agricultural imports. There are wide regional variations in wage rates for farm work which would be reduced by the application of uniform national legislation or union agreements. This would cause substantial adjustment problems for employers and workers in low wage areas, particularly the South. On the other hand, there are some indications of increased foreign production of high labor-using agricultural products for import to the United States. [13]

Farm Workers

As employers endeavor to improve their competitive position in the labor market, they will be driven to take actions which will improve the quality of farm employment. Agricultural jobs will increasingly reflect the industrial model in the level of wage rates, duration of employment, fringe benefits, working conditions and job security. Labor legislation and collective bargaining will provide workers with additional protection and a means for improving their welfare. Removing the legal distinctions between the farm and non-farm work force, and the development of agricultural labor unions will give farm work added visibility and status, which may itself have some salutary effects on labor supply. These factors will improve the welfare of those persons remaining in the farm work force.

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*These issues are discussed more fully in [3,4].

However, rising labor costs will lead to further substitution of capital for labor and thus further displacement of hired workers from agriculture. [10] The workers displaced will be those with the least skills and the lowest productivity. These will include the elderly, the disabled, in some instances youth, and the "industrial dropouts" who are not physically or psychologically conditioned to the pace and discipline of an industrialized labor force. These workers will find the range of employment alternatives available to them increasingly restricted.

For many of the workers displaced, the alternative to agricultural work is no work. For these persons the evolution of the hired farm work force will not automatically bring progress. These are not workers who are merely in need of retraining for other jobs. They are persons who are being systematically excluded from employment by the industrial rules. While the existence of such a group does not mean labor policy of the last half century should be abandoned, it does compel society to make a substantial effort to help them. Society does not have a very enviable record of anticipating and solving the problems of workers displaced from agriculture by technology. The events of the past decade have vividly demonstrated some of the cost of this lack of foresight. It is not too much to hope that society will now recognize its responsibility to assist those who are hurt by its efforts to help others.

Consumers

It is unlikely that productivity increases will entirely offest rising labor costs for all agricultural products. Because of the competitive industrial structure of agriculture, the initial impact of increased labor costs will be borne by employers in the form of reduced returns to immobile resources (employer's capital, labor and management and land). In the longer run as employers can make production adjustments, some of these increased labor costs will be passed on to consumers through higher product prices. Rising product prices will be shared by all producers including those relying primarily on operator and unpaid family labor, thus the effect will be to raise the labor returns to operator and family labor on those farms not hiring labor. Furthermore, it is the larger producers depending on hired labor who will face the higher out-of-pocket labor costs, and thus the initial adjustment decisions required by the changing labor market.

The rapidity with which labor costs are reflected in higher consumer prices for any particular agricultural product will depend in part on the organization of the market for that product. In cases where there is substantial concentration of production, and incidentally large employers, sufficient market control may already exist to permit the rapid transfer of increased labor costs to consumers. However, the highly competitive structure of the market for most agricultural products and the large producer-retail price spread suggest that the impact of rising hired farm labor costs will be neither rapid nor of substantial magnitude.

The advent of unionization in agriculture could affect the industrial structure of the industry and the extent and rapidity with which labor costs are passed on to the consumer. [3] Organized labor is watching with interest the efforts to apply collective bargaining principles to price bargaining between agricultural production and marketing firms. Such a development would, if successful, provide at the same time a mechanism for passing on increased labor costs to consumers and the organizational structure for agriculture that would facilitate collective bargaining by labor with employers.

Consumers have been one of the principal beneficiaries of the economic deprivation of farm workers. In the long run, consumers will be the ones who bear much of the cost of improving their welfare, both in higher prices for agricultural products and in public expenditures to assist those who are victims of adjustments created by farm labor market changes. However, it should be pointed out that the present situation has not been maintained without substantial economic and social costs in the form of reduced purchasing power, human suffering and social unrest among hired farm workers.

Institutional Adjustments

The industrialization of the hired farm work force will require changes in come of our agricultural and manpower institutional structures and the creation of new institutions to meet new problems.

The probable development of unions in some sectors of the farm work force will require many institutional innovations. Large scale organization of farm workers will induce organization of their employers as farmers seek to strengthen their individual bargaining positions. Such organizations, once created, could fulfill functions other than that of bargaining with labor unions. With the decreasing orientation of the rural labor market toward agriculture, changing skill requirements and the application of industrial work rules, agricultural employers' organizations could provide a mechanism for achieving some of the flexibility and other advantages of a large labor force such as recruitment, training, provision of group employee benefits, and even the supplying of relief and emergency workers. Or the union itself may be induced to undertake some of these functions. As has already been pointed out, institutional structures developed to undertake bargaining for product prices may also undertake bargaining with labor unions.

Methods for conflict resolution will have to be developed to deal with disputes between labor and management in agriculture. These will be needed both at the firm and industry level. At the firm level, grievance procedures will have to be developed that recognize the rights of workers as well as employers. At the industry level if collective bargaining among farm workers develops, methods for conflict resolution will have to be evolved that will protect the welfare of workers, employers and society and accommodate the unique aspects of agricultural production. This will not necessarily require ruling out the strike, which is, after all, the basic weapon of organized labor. But procedures for implementing the strike threat that will prevent irreparable damage to the instruments of production in the industry will have to be developed.

Unionization, particularly of seasonal workers, if it is to be effective, will require union control of access to jobs. This will probably be implemented through an adoption of the hiring hall principle. Means will have to be developed to insure that the unions operate democratically and that there is no ethnic or racial discrimination in access to agricultural jobs.

Changes are occurring, and will have to continue, in the institutions for the making and executing manpower policy. [5, 11] Until recently, rural manpower policy has consisted principally of income support schemes for farm operators. Much manpower policy seems still to be predicated on the assumption that rural farm and that rural poverty and unemployment problems are principally those of farm workers. Rural manpower programming based on such an assumption is bound for limited success because it is oriented toward the problems of a minority of the rural population.

The Agricultural Establishment

One of the institutions that will have the greatest adjustment to make to the industrialization of the hired farm work force is what has been called the "agricultural establishment." [11] I am referring to the university-government complex of professional agriculturalists in teaching, research, extension and administration which includes most of us participating in this meeting.

We have tended to view labor as a homogenous production input. To the extent that we have been concerned with farm labor, we have identified with the welfare of farm operators. We have, in general, ignored the emergence of and the problems attendant upon a permanent agricultural working class. But the industrialization of the hired farm work force and the social concern for the welfare of farm workers is giving a unique identity to the hired farm work force and making clear the necessity for formalizing the relationship between labor and management in agriculture.

There is a general lack of sophistication concerning farm labor among researchers, policy makers, society, and, for that matter, farm employers. More is known about virtually every aspect of agricultural production, processing and marketing than about hired labor in agriculture. [6] I think it is safe to say that few agricultural colleges have an organized and functioning Extension capability for dealing with farm labor problems. There is little formal instruction available dealing with agricultural labor management. Research resources devoted to farm labor problems, while they have expanded considerably in the past several years, are still pitifully small in comparison to our dearth of knowledge and in comparison to that devoted to other problems including agricultural mechanization. As the evolution of the agricultural industry continues, hired labor must become a recognized part of the educational, research and extension mission.

A serious effort to find and implement solutions to the farm labor problem will entail am ambitious research program. The magnitude of the effort required may, in fact, seem out of proportion to the importance of agriculture in the economy and of labor in agriculture. However, agricultural labor has been, for the most part, ignored both by agricultural scientists and manpower programmers. Thus, a serious backlog of problems has developed which will require a substantial effort to overcome.

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