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PUBLIC SUPPORT FOR AGRICULTURAL RESEARCH AND EXTENSION — POLICY ISSUES

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Numerous individuals and groups are now concerned about the character of U.S. agricultural research and extension policy. Research and extension were among the issues raised by individuals and groups who penetrated the traditional agricultural political subsystem in the 1960s and 70s. This penetration led to what Paarlberg labeled the "New Agenda". Environmentalists, nutritionists, conservationists, consumers and small farm advocates are active in the politics of public support for research and extension as are research and extension organizations, farmers, farm organizations, and agribusiness.

The goal of this paper is to identify and define some of the major policy issues concerned with research and extension. A number of increasingly important and often overlapping policy conflicts must be addressed and resolved at the federal level by the Congress, the Administration, administrators of research and extension units, and the various agricultural research and extension constituencies. The resolution of some issues requires action by Congress and the President; others can be dealt with by the federal administrative agencies and by state research and extension administrators, either singly or in combination.

These issues are presented under three main groupings: the level and source of public investment in agricultural research and extension; equity aspects of publicly supported agricultural research and extension; and organizing, planning, and conducting publicly supported agricultural research and extension. These groupings are not necessarily mutually exclusive.

Level and Source of Public Investment

The level of public investment in agricultural research and extension is a major public policy issue. The total public funding for research and development through the USDA and State Agricultural Experiment Stations (SAES) increased 204 percent in current dollars during the 1966-79 period. Total research expenditures in the

SAES increased 245 percent during this period, while USDA expenditures increased 149 percent. Constant dollar expenditures by USDA increased only 1 percent during this period, while those in SAES increased 40 percent. The policy issue is whether the United States, through federal, state, and local governments, is investing sufficient funds to meet future needs for food and fiber.

Much research and extension does not have an immediate payoff, especially basic research or even applied research and extension where current economic conditions do not lead to immediate adoption. Both kinds of efforts have the potential to generate high payoffs in the future. Had the public not decided to invest in agricultural research and extension in the past, the current well-being of the nation would be greatly decreased.

Unfortunately, we do not know with certainty how much the well-being of the nation will be jeopardized in the next decade and beyond by not investing more in agricultural research and extension currently. By the time this information is available, it will be too late to make the investment. What should be the overall level of public investment in agricultural research and extension?

Analyses by economists of past research and extension efforts indicate a very high payoff to society from agricultural research and extension. Minimum annual returns of 50 percent are commonly reported. The 1980 evaluation of extension cites Evenson's estimate that public sector agricultural research and extension and the level of education of farmers may account for nearly 50 percent of the agricultural productivity increase between 1948 and 1979. These rates are high compared to almost any other form of public sector investment, e.g., water resource investment.

A related policy issue is the distribution of funding between levels of government. U.S. agricultural research and extension is unique. Most countries in the world do not fund research and extension from a combination of federal, state, and local sources. Research and extension can be performed efficiently at the state and local level, but the benefits to consumers and producers accrue to a broader area than the originating state or region.

Even applied research programs and extension projects designed to solve specific problems in a state or county may result in spillovers to other areas. These spillovers have been called geographically external benefits which raise the issue of the best source of funding. The existence of spillovers may lead to state and local government underinvestment in agricultural research and extension. Their existence does not lead to the conclusion that all or even most of the applied production research and extension should be funded at state and local levels. It also seems clear that basic research and post-harvest research and extension have large amounts of geographically external benefits and should be largely funded at the federal level.

A related set of questions resolves around the relative roles of publicly and privately supported research and extension. How much agricultural research and extension should be funded by public support and how much by the private sector? In general, the private sector conducts research which is likely to lead to proprietary products such as machines or processed food products.

The public sector gives more attention to non-proprietary products such as cultural practices, livestock production, and better management and marketing. Changes in patent law have expanded the range of research and extension efforts which yield a profit for the private sector. What research and extension should be done by the public sector and what by the private sector? Under what conditions should the public sector accept funds from the private sector for agricultural research and extension?

Equity Issues

Who benefits from and who pays for publicly supported agricultural research and extension? Much of the New Agenda's criticism of past and current agricultural research arises out of these equity issues.

Most research and development is scale neutral, i.e., equally applicable to small and large scale producers. However, large scale producers tend to adopt new technology based on agricultural research and extension faster than small scale producers. Thus, small scale producers are less competitive with the development of new technology from agricultural research and extension even though the efforts are not directed specifically towards the problems of large scale producers. The evidence supports the position that public funding for the development of agricultural technology is not socially neutral among producers.

At least in the long run, it is generally agreed that consumers, in the aggregate, are one of the major beneficiaries of agricultural research and extension. However, benefits to the individual consumer are relatively low, perhaps on the order of $25 per family per year.

A recent analysis in an Office of Technology Assessment draft report demonstrates that low income consumers benefit relatively more compared to their tax costs than high income consumers from agricultural research. While the average annual benefits from agricultural research per family with over $20,000 income were nearly twice as high ($31) as for the under $5,000 class ($16), the ratio of benefits to state and federal taxes paid was 10 times higher for the lowest income class (12.4) as for the highest income class (1.2). These results support the hypothesis that agricultural research tends to modify the existing consumer income distribution in favor of the lower income strata.

If less technology is developed and adopted, both lower income consumers and large scale producers will receive less benefit. Thus, directing research and extension to problems of small scale producers would produce relative benefits to high income consumers if less technology is developed and adopted.

An issue of distribution of benefits over time also exists. How much research and extension should be devoted to increasing short run productivity of agriculture as compared to that designed to protect, preserve, and enhance the nation's soil, water, energy and other natural resources, i.e. protect the environment? To what degree should research and extension be aimed at achieving immediate economic gains for producers (higher yields and increased income) and consumers (lower food bills) as opposed to resource and production management geared to the long term needs of future generations?

Organizing, Planning, and Conducting Research and Extension

The organizing, planning, and conducting of publicly supported agricultural research are important policy issues. These concerns, in comparison to the first two outlined, are more subject to the control and resolution of agricultural research administrators.

The political system — Congress, USDA, and other interested groups — determine the level of public investment in agricultural research and extension. How can the agricultural research and extension system better relate to that political system? The individual educators, scientists and administrators would, of course, prefer to have large amounts of unrestricted funds. But there must be limits on both. What are the "rules of the game" for the linkages between the research system and the political system?

The partnership between the Land Grant Universities and the USDA agencies is a long-standing relationship. Legislation establishing the Land Grant Universities occurred the same year the USDA was established. While most people agree that the partnership has been useful and should be maintained, the policy issue of the relative roles of the USDA research and extension agencies and Land Grant Universities continues.

Related is the policy issue of the degree to which agricultural research and extension should be centrally planned as opposed to decentralization where educators and scientists, in proximity to users of research and extension, make the critical decisions on what is to be done. Defenders of central planning argue that such a system helps to focus on national priorities and avoids overlapping and duplication. Defenders of a decentralized system argue that the central planners are too far removed from the users of research and extension and the research scientists and educators and that sufficient coordination does occur.

Much political capital and energy of the agricultural research system has been expended on this issue. Hayami and Ruttan have argued that the U.S. and Japanese research systems with overlapping and apparent duplication have produced better results than systems dominated by a federal unit. How much centralization should occur? How can coordination be achieved? The Joint Council for Food and Agricultural Sciences, created in the 1977 Food and Agricultural Act, has a major objective, the fostering of coordination. Its accomplishments have been preceived as modest, and the issue of how best to plan and coordinate remains alive.

For many years, most USDA funds for research and extension allocated to the Land Grant Universities have been distributed through the use of formulas. This method excludes the possibility of non-Land Grant Universities with agricultural competency from participating in agricultural research and extension funded by the USDA. This method has also placed the major focus of decision making for the use of research and extension dollars at the state level. The concept of competitive grants which are open to Land Grant, as well as non-Land Grant Universities, was included in the Food and Agricultural Act of 1977 and is a continuing policy issue.

Research and extension in food and agriculture is a never ending process. If the consumers of food and fiber products are to maintain current consumption levels, research and development must rapidly generate new and improved technologies. Included among the many reasons for this situation are: (1) the increased scarcity of certain inputs such as petroleum based products; (2) the rapidly growing world population; (3) the incidence of new plant and animal diseases, and (4) the mounting problems of water and air pollution.

The level of food consumption by the average consumer, both here and abroad, depends upon the uninterrupted flow of new technology. The changing character of U.S. agricultural research and extension policymaking, coupled with the emerging issues and constraints outlined earlier, make decisions regarding the development of new agricultural technology increasingly difficult and important.

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