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## HOW TO CHANGE AGRICULTURAL RESEARCH AND EXTENSION TO MAKE IT A BETTER INVESTMENT

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Grouping public investment issues related to agricultural research and extension as the level of investment, the equity aspects, and the organization, planning, and conduct of research and extension is useful for this discussion.

Two extensions of the equity grouping are useful in interpreting the contemporary scene. One extension is to those in either this country or abroad who are affected by agricultural research and extension done abroad which draws upon the expertise of this country. Varying the mix of commodities and expertise which is exported has different welfare implications. The second equity extension pertains to the producers rather than the consumers of research and extension services.

The welfare of the producers of these services is very much affected by the level of investment as well as the organization, planning, and conduct of research and extension. Most professionals want to do things that they believe they do best and are the most accustomed to doing. The utility and satisfaction they receive from this work is just as real as the satisfaction received from consumption and may be quite influential in the investment decisions which are made.

Society has received a rather handsome return on public investment in research and extension. This evidence about the past suggests that society will be richer in the future if it would invest more heavily in such services at present. Under such circumstances it might be argued that the problem is how to increase the level of investment, not the return on that investment. These two questions may not be independent, and if it could be discovered how to improve the rate of return, some insight might be gained as to how the level of investment might be increased. This paper focuses on five ways that the rate of return to agricultural research can be improved.

*1. Improve understanding and then act on that understanding of the comparative advantage and relative efficiency of the public versus the private sector in providing research and extension services.*

In sorting out what might be best performed by each sector, it will be most efficient to first look at the extremes and then work through the rather substantial middle ground which will remain. It is clear that certain basic research is unlikely to be undertaken by the private sector because of the public goods nature of many basic discoveries. It is also clear that the private sector is not likely to devote many resources to certain social problems unless the benefits of a solution will go mainly to particular interest groups. The growth and decline of communities, what constitutes adequate nutrition, and provisions for conservation and the environment are examples of problems for which the market is unlikely to find solutions.

At the other extreme, sizable firms can be expected to develop, collect, or otherwise obtain new knowledge when it is in their financial interest to do so. Between these two extremes there are many problems where it is far from obvious where the advantage lies. Machinery research and the development and extension of certain kinds of farm management information are examples of in-between problems.

The private sector cannot be expected to be very enthusiastic about such a reexamination. Obviously, it is to the advantage of an industry if it can get the public sector to do its research. Yet, when the main objective of the research becomes feasibility and practicality, as compared to discovery, the industry which stands to benefit the most may well conduct the research more efficiently than the public sector.

This sorting out activity should be a high priority. Tough analytical work will be needed to facilitate the process. A consensus within the public sector, as well as between the public and private sectors needs to emerge if public policy is to be affected. Once general principles and guidelines are established there is a need to work through the organizational implications.

One of the major reasons for the past vitality of agricultural research and extension has been a remarkable partnership between the public and private sectors. Yet, the state of scientific knowledge and the structure of the industry has been changing rapidly. It is not clear that the present division of responsibility for conducting agricultural research and extension reflects these changes.

*2. Agriculturalists and agribusiness interests should attempt to cooperate with nutritionists, conservationists, environmentalists, and others to obtain public support for agricultural research and extension.*

In return for this support these groups will expect something to be done for them. Research and extension programs will need to reflect their concerns and to establish with them the same credibility as it has with agriculture and agribusiness interests. It is un-

reasonable to expect research and extension to reflect these concerns if its principal clientele (farms and agribusiness) is hostile to such efforts. But, if a smaller and smaller base of support continues to be fragmented among a larger number of problems, the rate of return to social investment in these services is likely to decline.

It would be to the advantage of farmers and agribusiness to recognize these broader interests and enlist their support in attempts to increase the level of investment in agricultural research and extension.

*3. The historic USDA-Land Grant relationship should be preserved. Furthermore, the cornerstone of this historic relationship — considerable decentralization with numerous access points — should continue as the fundamental building block.*

A geographically large, diverse, democratic nation such as the United States will not be well served by a highly centralized research and educational system. Nevertheless, there are problems which are uniquely national in nature and for which federal funding is necessary. Productivity of the system would be enhanced if the historic partnership and the principles upon which it is based were reaffirmed.

There is evidence that the partnership is in danger of dissolution. The land grants and the USDA frequently compete for federal funds. State appropriations are increasing which have the effect of making state institutions less dependent on federal funds. State oriented organizations will inevitably neglect national problems, but national research and educational organizations are unlikely to be very effective on many national problems unless cooperation exists at the state level.

There seems to be a major lack of leadership from the agricultural research and education system. University presidents have concerns far different than they had one and two decades ago. Deans and directors behave as if their enemy is the USDA, while the USDA cannot quite decide either on its mission or organization. There seems to be an inability to identify and then work with the major trends which are shaping the social environment.

Those engaged in commercial agricultural activities are declining as a percentage of the total population. Those who have concern about human nutrition, the rural community, and the environment are increasing and demographics suggests this will continue to be the case into the foreseeable future.

*4. The cost of coordinating the diverse parts of the federal-state systems should be minimized.*

Coordination is necessary to prevent excessive duplication and to minimize the stagnation and provincialism which may result from a highly decentralized system. But some seem to believe it is possible to optimize the output from the system by joint planning and establishing research and educational priorities. Such expectations

are unrealistic. Joint planning efforts are often counterproductive. Nevertheless, it is essential that there be information retrieval and sharing. The continued rigorous review of research and educational efforts by both peers and users is essential.

Research and extension workers are much better informed about activities across the country than they were three decades ago. This has occurred despite the rapid growth in the amount of information. Forces working in favor of better information exchange include a higher level of formal education, which often provides a common intellectual base among research and extension workers, and greater travel and seminaring across state lines. The Farm Foundation deserves great credit for using its limited resources to stimulate highly productive activities of this nature.

Few significant benefits come from mandatory coordination. This is going against the trend of the times; the powers in Washington seem to be requiring at least *pro forma* coordination in return for financial support. Yet, if too much is wrung from such devices, the productivity of and hence the rate of return to the system will be decreased.

*5. Decrease the isolation of agricultural research and extension from research and education generally.*

Writers on this subject have deplored the gap which exists. Our society is paying a cost for this gap. Costs may be even higher in the future if food and agricultural policy is influenced greatly or determined by people who are unaware of and do not take advantage of agricultural research and extension.

For example, no agricultural economist who has studied the data believes that the U.S. capacity to produce food is being reduced significantly by the loss of farmland to urban uses. Yet, a National Agricultural Lands Study has just been completed which issued recommendations that ignored the findings of its research unit, and which used the terms "agricultural land," "farmland," and "cropland" in quite misleading ways. As a result, many editorials and articles have been written in highly influential places about the seriousness of this problem. The *Saturday Review*, The *Washington Post*, and the *Christian Science Monitor* are examples.

Philanthropic efforts are being organized to protect farmland and laws are being suggested to prevent such loss. These efforts are making little use of the information and knowledge that has been produced by the agricultural research and extension system on this subject. This is not to deny that there are major problems of land use on a local or state basis, nor to disparage some of the innovative policies that have been developed at those levels. But it is to express concern about so much attention being given to disappearing farmland and its effect on food production at the very time when we are flirting with a disastrous gasohol program, when soil erosion seems to

be a most significant problem, when the current emphasis on agricultural exports will bring into production acres which are quite vulnerable to even greater erosion, and when we are neglecting agricultural research and extension.

There is also the very real possibility that part of the establishment will be bypassed by significant scientific breakthroughs that may occur outside the traditional agricultural research organizations. That which is occurring at Harvard and Stanford may be more important than what is happening at Beltsville, Ames, Corvallis, Raleigh, or Gainesville.

The cost of continued isolation will be high, or, conversely, the benefits of reducing isolation will be quite great. Yet, the costs of reducing such isolation would appear to be quite low and the means of doing so are fairly obvious. The main requirement is that appropriate intellectual activity be utilized wherever it occurs.

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In conclusion, these five measures would increase the return to agricultural research and extension. None is revolutionary. Some are reactionary and others are not politically feasible. In fact, I am not terribly optimistic about the prospects for any of them. But I am confident evidence could be assembled to at least make a plausible case for each of these recommendations and that by your observations you will begin to assemble that evidence.

