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AN ANALYSIS IN SUPPORT OF AGRICULTURAL RESEARCH FUNDING

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There is increasing evidence that research funding sources are requiring additional assurances that the expenditure of their resources is in the "highest and best use." Legislative calls for sunset provisions and mandated evaluations plus administrative moves toward grant rather than formula funding emphasize the push for more direct accountability. The objective of this paper is to outline the work of a committee charged with assisting the directors of agricultural research and extension in the nation's land grant universities in their requests for funds for high priority research.

BACKGROUND

In 1975, a committee of four agricultural economists (one from each of the four regions in the U.S.) was appointed by the administrative committee of ESCOP and ECOP¹ to provide background material for support of budget requests to the Office of Management and Budget and for Congressional hearings. The communication channel for the committee is through the chairmen of the legislative subcommittee of these organizations.² Additionally, the four regional experiment station coordinators provided general guidance for the committee's activities.

The role of the committee can be categorized generally as one of staff support; the main thrust of the work has been of an advocacy nature. The approach used, for the most part, has been limited to the development of information to support the previously determined funding requests of the experiment station directors. However, the selection of this approach to the problem was primarily self-imposed by the committee members because of the very limited time available. As more resources are allocated to the committee, the directors have requested a shift of activities to focus on research evaluations and, ultimately, to *ex ante* studies of research priorities.

Current Activities

The areas of research currently being investigated are: 1) update of previous work on crops, livestock and poultry; 2) integrated pest management; 3) rural development; 4) energy; 5) consumer competence and family resources; 6) timber supplies; 7) food and human nutrition; and 8) food and crop losses. It is obvious that these broad categories of research can only be examined superficially when the total commitment to the project is in the 2 to 3 SY-equivalent range. In addition, each research area is approached somewhat differently because of the diversity of the subject matter and the methodological preferences of the individual researchers.

As the representative of the Northeastern Region, my current assignment is to examine two areas of research: 1) food and human nutrition and 2) food and crop losses. The reasons for selecting these areas for investigation are that they meet several

criteria for being categorized as high priority research. First, ARPAC³ ranks food and nutrition third and food and crop loss eighth in their rating of the 13 research priority areas (National and Regional Planning Committee). Second, the budget requests to OMB show a major expansion of the funds requested for work in these two research areas. Third, the directors of SAES's (State Agricultural Experiment Station's) have projected major increases, as discussed in the next section, to the SY assignments in these research areas.

ADMINISTRATIVE PROJECTION

The directors of the SAES's prepare, on an annual update basis, projections of how an assumed 20 percent increase in funds would be allocated among research areas over the next five-year period. Data in Table 1 compare the administrative projections (column 2) and an "across the board" increase of 20 percent to each research area (column 3). An examination of the administrative projections minus the straight 20 percent estimate (column 4) provides some insights into the research areas slated for relative increases or decreases in emphasis. For example, the largest relative decrease in SY's planned for the Northeast region is in livestock related research, while the largest relative increase is in the area dealing with people, communities, and institutions. The data for the United States show a somewhat different pattern of proposed allocations with natural resource research a major gainer and crops research receiving relatively less emphasis. (The decrease in General Class 7.00 is generally due to improvements in the classification system.)

Using the same format, data in Table 2 are designed to provide more detailed information on the research most applicable to the social scientists. For example, research in the general category of people, communities, and institutions is projected to gain SY's at above the overall rate of 20 percent. However, it is planned that most of these SY's will be allocated to food and nutrition research, with a very slow rate of growth in research focusing on questions of rural development and the quality of living.

It should be emphasized that these data are administrative projections which are subject to change. However, they provide an indication of the current emphasis being placed on specific research areas by the experiment station directors in the Northeast.

Methodology

The general approach being used to develop an analysis of the food and nutrition and food and crop loss research areas is to:

1. discuss the magnitude of the problem;
2. show the current effort on the problem in the SAES's;
3. integrate the material on magnitude of problem and current effort, i.e., emphasize why research is important and why it should be done at SAES's; and
4. develop 2 or 3 examples of quantitative estimates of benefits and costs of specific research activities.

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¹ ESCOP is the acronym for the Experiment Station Committee on Policy and ECOP, the Extension Committee on Policy.

² Operationally, the majority of the committees work was for the representative of the ESCOP group.

³ ARPAC is the acronym for the Agricultural Research Policy Advisory Committee.

TABLE 1.
Analysis of Projection of SY's of Research, by Research Area, Northeast Region and United States.

Regions/Research Area	FY 1976	FY '81 Adm. Proj.	20% Inc. FY 76	Adm. Proj. Minus 20%	Index Base = 100
			SY's		
Northeast					
1.00 Natural Res.	111.4	28.3	22.3	6.0	104.5
2.00 Forestry	64.9	10.9	13.0	-2.1	97.3
3.00 Crops	281.6	51.8	56.3	-4.5	98.7
4.00 Livestock	156.4	20.9	31.3	-10.4	94.5
5.00 People Com. & Inst.	131.3	33.8	26.3	7.5	104.8
6.00 Comp., Trade, & Adj.	48.9	9.8	9.8	—	100.0
7.00 General	79.5	18.7	15.9	2.8	102.9
9.00 Unclassified	5.7	-0.6	1.1	-1.7	74.6
TOTAL	879.7	173.6	175.9	-2.3 ¹	99.8
United States					
1.00 Natural Res.	767.0	200.2	153.4	46.8	105.1
2.00 Forestry	374.8	77.6	75.0	2.6	100.6
3.00 Crops	2338.0	435.9	477.6	-41.7	98.5
4.00 Livestock	1149.4	227.2	229.9	-2.7	99.8
5.00 People, Com., Inst.	640.3	165.3	128.1	37.2	104.8
6.00 Comp., Trade, Adj.	314.4	76.6	62.9	13.7	103.6
7.00 General	539.1	55.4	107.8	-52.4	91.9
9.00 Unclassified	84.5	9.9	16.9	-7.0	93.1
TOTAL	6257.5	1248.1	1251.6	-3.5 ¹	100.0

¹ Failure to sum to zero due to accumulation of rounding errors.

TABLE 2.

Analysis of Projection of SY's for Northeast Region by Research Program Areas, 5.00 (People, Community, and Institutions) and 6.00 (Competition, Trade, and Adjustments).

Research Program Areas	FY 1976	FY '81 Adm. Proj.	20% Inc. FY 76	Adm. Proj. Minus 20%	Index Base = 100
			SY's		
5.01 Food & nutrition	27.7	18.5	5.5	13.0	139.0
5.02 Food safety	17.8	3.6	3.6	0.0	100.2
5.03 Rural dvl. and quality of living	73.6	9.0	14.7	-5.7	93.5
5.04 Insects affect man.	12.2	2.1	2.4	-0.3	97.7
5.05 Research on admin. research	0.0	0.6	0.0	0.6	0.0
TOTAL 5.00	131.3	33.8	26.3	7.5	104.8
6.01 Farm adj. price and income	14.9	3.3	3.0	0.3	101.8
6.02 Fgn. trd. eco. dvl.	8.4	1.4	1.7	-0.3	97.2
6.03 Mkt. & competitn.	25.6	5.1	5.1	-0.0	99.9
TOTAL 6.00	48.9	9.8	9.8	0.0	100.0

Several studies have been completed in the past few years to emphasize the importance of these research areas. The most comprehensive is the **World Food and Nutrition Study** (National Research Council-National Academy of Science). This study, including especially the supporting papers in studies 1,6 and 9, provide some of the best and most useful information available on the subject. However, several other recent studies also provided useful information on the magnitude of the problem in these research areas. These include an evaluation of research on human nutrition in the United States (Joint USDA-SAES task force) a brief report by CAST (Council for Agricultural Science and Technology), and a home economic study on research planning and projections (Home Economics Research Committee).

Several specific research areas, generally following the delineation of categories developed in the World Food and Nutrition Study, on food and crop losses are being examined. Examples

of the areas being discussed are: 1) harvesting losses; 2) physical losses in storage; 3) quality and quantity losses during processing; and 4) marketing and distribution losses.

A discussion of the magnitude of the problem in the area of food and human nutrition is difficult, but almost in a perverse manner. That is, the magnitude of the potential benefits is so large as to be almost unbelievable. Additionally, there is the fundamental question of how, if indeed one should place values on human life and suffering. The estimates from a joint USDA-SAES task force on the **Benefits from Nutrition Research** provide some general guidelines, however, for discussing the potential returns from food and nutrition research.

In addition to providing information on the magnitude of the problem, it is also necessary to show that the SAES's have a good "track record" in working in these research areas. A review of over 4,000 CRIS printouts selected by keywords provided the "population" from which case studies of specific

research activities were selected. As noted earlier, the committee's role is one of an advocate for additional SAES funding, thus the emphasis was on selecting successful rather than representative examples. Integration of the information on the magnitude of the problem and on current successes of SAES research will be, hopefully, useful in supporting the basic objective of indicating why researchers in the land grant system should receive increased levels of support in their research activities.

In addition to this general background information, an attempt is being made to find or develop quantitative measures of the benefits and costs of specific research activities.

One example is the potential benefits and costs of mechanically deboned meat. A study using a consumer-producer surplus methodology has been completed which shows some significant benefits to society from this technology—even though it will probably have a negative impact on the producing sector (McNeil).

A second example will be related to various aspects of the aflatoxin problem. Economic estimates of specific losses have been made by several groups of researchers with the most work being done in the poultry industry. Although our analysis of these studies are not complete, preliminary investigations show very high benefit to cost ratios.

Finally, an attempt is being made to add a specific example dealing with human nutrition. However, the problem of quantifying "the value of life" makes this extremely difficult. A possible approach is to examine some behavioral research as it relates to human nutrition.

SUMMARY

In summary, the objective of the committee's work is to support the directors' request for additional research (and to a limited extent extension) funding. Although some may question the legitimacy of using an advocacy approach, it seems justified when one considers the purpose for which the material is intended and the methods used by "competitors" in seeking the limited federal funds available.

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