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Harold Taylor

93d Congress }
2d Session }

COMMITTEE PRINT

National

1975 U.S. AGRICULTURAL OUTLOOK

Conference

Papers Presented at the National Agricultural Outlook
Conference Sponsored by the U.S. Department
of Agriculture—Held in Washington, D.C.,
December 9–12, 1974

PREPARED FOR THE

COMMITTEE ON AGRICULTURE AND
FORESTRY
UNITED STATES SENATE

December 23, 1974

U.S. DEPT. OF AGRICULTURE
NATIONAL AGRIC. LIBRARY
APR 9 1975



Printed for the use of the Committee on Agriculture and Forestry

U.S. GOVERNMENT PRINTING OFFICE

WASHINGTON : 1974

42-612

Historic, Archive Document

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PRIORITIES FOR USDA RESEARCH TO MEET FAMILY NEEDS

[By Elizabeth Y. Davis, Family and Consumer Services, Cooperative State Research Service, USDA]

I. *Nature of research priorities*

The term priority is easy to define but difficult to apply. It is often an individual work, depending upon the information available to the person and his own values.

Two categories of research priorities can be delineated. One category is the discipline-oriented group of priorities and the other is a public-oriented group.

Discipline-oriented priorities are ordinarily determined by the people in the discipline and therefore there are as many sub-categories as there are recognized disciplines or sub-disciplines. They emerge very largely from the minds of individual researchers, the scientists, and are expressed in journals, professional society meetings and in the yearly, or even more frequent requests for listings of priorities which filter down from administrators to scientists, frequently in a very limited time frame (Please give me your five research priorities for the next ten years by two o'clock this afternoon, double spaced on plain bond paper.) Probably there is agreement that such priorities are valid or that there is sufficient consensus on the importance of these to cause action.

Public-oriented priorities are determined largely by those who appropriate the money to support research, that is by Congress or State legislators. Through formal hearings, informal communications, committees of Congress and State legislation sufficient consensus is reached for appropriation bills to be passed. Again, even with disagreement, there is sufficient consensus to cause action.

A sub-category of public-oriented priorities are those which emerge from "consumer" or "user" groups. These groups often influence legislative decisions important to the research program and they may provide direct financial support.

II. *Setting research priorities*

Administrators in the Department of Agriculture and the State agricultural experiment stations together with administrators of the Extension Service have been involved with identifying research needs and establishing the importance of those needs for many years. In 1966 they published a National Program of Research for Agriculture, which included national goals for agricultural research, but the emphasis was tied closely to old priorities geared to production efficiency and "not enough to future needs geared to 'people' problems." At that time about 2% of the research dollars were allocated to problems of

people as individuals, as members of families and of communities. The 1966 report specifically recommended a permanent, on-going mechanism for coordinated planning of agricultural research. Therefore, setting of priorities for research has continued to be an exercise participated in by various groups of policy-makers and administrators at national, regional, State, and local levels. Many of those groups utilized the *National Program of Research for Agriculture* as a primary source from which to work. The discipline-oriented scientists have been key participants in the on-going system.

III. *Example of a priority process*

A. Background

The criticism leveled at the 1966 report that the future needs were not geared sufficiently to "people" problems—was strong in the thinking of the group charged with development just about a year ago of the *Conference on Research to Meet U.S. and World Needs*.

The approach to the development of research priorities by that group which I shall describe today is an example of directing attention toward a goal of great urgency.

The World Food Conference in Rome a year ago resolved that—

"All governments should accept the removal of the scourge of hunger and malnutrition, which at present affects many millions of human beings, as the objective of the international community as a whole, and accept the goal that within a decade no child will go to bed hungry, that no family will fear for its next day's bread, and that no human being's future capacities will be stunted by malnutrition".

The conference in Rome pinpointed and accentuated the critical need to provide adequate food for people in the United States and throughout the world.

This directed attention to the importance of research in all aspects of food supply and consumption. The capability of research to provide new technology for increasing productivity and efficiency of food supplies is well known. This capability, the inherent responsibility associated with it, and the growing food needs indicated as never before that resources available for research should be targeted on the most pressing food problem.

For these reasons the Department and the National Association of State Universities and Land-Grant Colleges proposed to hold a national conference on food research as a step in setting priority action. The purpose of the conference would be to identify research issues related to the capacity of the Nation to meet its domestic and international food needs. The actual results of the conference are now available in two volumes titled "Research to Meet U.S. and World Food Needs". Much of the process described today appears in one of the two volumes.

Following the Rome conference the Agricultural Research Policy Advisory Committee (ARPAC) which serves as an advisor to two branches of publicly supported agricultural research in the United States—USDA and the Land-Grant Universities and Colleges, through the National Association of the State Universities and Land-

Grant Colleges, was made responsible for developing the basis for cooperation in planning and implementing national regional and interstate research programs. To implement the conference, a committee, a core working group, was developed with representation from the three primary research agencies in the department of Agriculture—the Agricultural Research Service, the Cooperative State Research Service, and the Economic Research Service—and from the Land-Grant Institutions and the Office of the Secretary. Dr. M. L. Peterson, representing the Land-Grant Institutions, Department of Agronomy and Range Science, University of California-Davis served as chairman. Dr. Ned Bayley, staff assistant to the Assistant Secretary for Conservation, Research and Education and one representative from each of the three Services developed the conference. The committee mix included people from several disciplines—agronomy, animal science, science, economics, and human nutrition. Others joined the core working group as needed.

The outline of research priorities which evolved from the conference differs from the original outline prepared in the first few meetings of the committee.

During the first meeting of the working group a statement on the *needs of people* was written which said that the rightful needs of all people and nations include an adequate supply of healthful foods, clothing and shelter. The purpose of the study would be to identify those problems that limit the achievement of goals, to arrange these problems in priority, and propose the kinds of research approaches that can lead to solutions. This study would not be concerned with resources for research, the agencies that conduct research, or scientific personnel. Rather, its purpose is to provide policy guidelines and direction to all agricultural research efforts in the next decade.

Some of the problems which the committee attempted to overcome dealt with limitation of thinking “within our program”, “our current expenditures”, “our legislative mandate”. Efforts were to be concentrated on what research is needed? What do we need to know in order to achieve the goal of meeting U.S. and World Food Needs? Not, how do we allocate the funds we have.

It was appropriate that policy questions would focus first on peoples’ needs and the quality of living. Secondly, consideration would be given to the management of physical and natural resources to achieve these needs now and for future generations. Lastly, the study would address the problems of the various private and public agencies, through whose means, resources are converted to human needs.

These statements as such do not appear in the published report of the conference. However, the concepts were incorporated into many of the research needs that were identified.

B. The Technique

The process for arriving at the priorities was an adapted, modified Delphi technique. The 1939–45 World War, with its proliferation of scientific methods, gave planners a new kit of tools, such as electronic calculators, advanced mathematical techniques, and game theory. Technology forecasting techniques were early spin-offs from these methods. In the Delphi technique, developed at Rand Corporation by

Olaf Helmar, Norman Dalkey and their co-workers, the opinions of a panel of experts were utilized in ways designed to minimize personal persuasion and to make the most of convergence of views. In recent years the method had been extended to social, political and economic fields.

Opinions of over 1,000 individuals in three groups, scientists and extension personnel, administrators and policy makers at various levels, and consumer and ultimate users of research, were incorporated into the final decisions.

C. Steps of Organization

The core working group developed a comprehensive outline of researchable areas within three main divisions—(1) dealing with human needs, (2) organization of resources, and (3) management of resources. Nearly 50 areas and subareas were included in the three divisions within each area, a situation statement was written, covering world and U.S. situation and the state of the research, the objectives of the area, elements for achievement of objectives and sub-objectives and research needs for the elements.

Over 900 scientists and extension personnel throughout the U.S. received one or more of these statements. These scientists were requested to help prepare the materials for the Conference by considering the situation statement, objectives, elements and needs, revising as desired, and listing important problems in the area.

From the replies statements were revised to incorporate the scientist's input. These revised statements were mailed again to the scientists for additional review and listing of all proposed research problems in priority order. Input was received from over 700 people.

D. Preconference Review

A final synthesis of the situation statements was made and three volumes were printed for the Preconference Review scheduled at the National Agricultural Library in late May, 1975. Sixty persons attended the Preconference Review including those who would be serving as chairman or secretaries at the Conference in July, the Regional Directors of the State Agricultural Experiment Stations, the ARS assistant Administrators, a few key individuals from the Extension Service, Universities and the private sector and the Core Working Group.

The purpose of the Preconference Review was to review the background materials for the July Working Conference, to gain some experience in the organization and management of the work groups for the conference and to test research needs rating procedures within and between work groups. The Preconference Review was also a means of incorporating the opinions of administrators and policy makers.

Each person had three documents consisting of (1) the purpose of the preconference, the current world food situation, policy relating to food and the research capabilities of the country, both public and private; and (2) a resource and reference document describing the current situation in the 44 subject areas. This document was organized

similarly to document three and provided background for the research needs. The third document described specific research needs in the same 44 research areas in Document 2; the problems listed were those identified by the scientific community and organized under each subject area according to subobjectives. Individuals invited to the conference were asked to write specific comments and revisions on the documents prior to the conference. Document three was discussed in detail during the preconference review.

Work groups reviewed and discussed research needs within the various areas for which they had responsibility, and rated the research needs as to their importance. As the problems for each subject area were rated, the ratings were entered into the computer and a new list of research needs was prepared. Low priorities problems were thus eliminated. Presentation by group chairmen with their reasoning for priority topics listings culminated in a rating of all the high priority problems arising from the day's work by all members. These ratings were then again placed in the computer for future checking. The actual organization and procedures for the July Working Conference resulted from this May Preconference Review.

E. Working Conference

The Working Conference took place July 9, 10 and 11 in Kansas City, Missouri. One hundred sixty-seven delegates representing the wide ranging needs of those who use or are affected by research results related to food were present for the conference. Two hundred fifteen other participants including research, extension and university administrators, government administrators, individual researchers, farmers, representatives of agri-business, and others were present. Members of the public and press were invited. The first task of the Conference was to identify food-related problems requiring research. The second was to judge their relative importance.

The Conference did not attempt to suggest research approaches for solving the problems or to recommend funding or organizational changes.

The delegates were selected by a process to bring about a balanced presentation of groups and organizations with interest in food supply and consumption. The procedure was to (1) identify agencies or organizations with food interests that were national in character insofar as possible, (2) to achieve a balance among groups such as consumers, nutritionists, farmers and farm organizations, agricultural and food industries, marketing firms, conservation groups, labor unions, government agencies, international development organizations, scientists and others, (3) request that the organizations name their own delegates and (4) distribute delegates among the 16 work groups at the conference so that each included an appropriate representation of interest. This was an effort to broaden the background and interest of the members of the conference. Execution of these procedures was imperfect because of late cancellations and failures of some organizations to send delegates. Nevertheless the overall balance of delegate interests among work groups and in the conference was within reasonable limits. The distribution of the 167 delegates resulted in attendance of 12 delegates directly related to consumer needs, 7 on human re-

sources and rural development, 10 on international development, 11 on nutrition and food service, 4 food regulation, 33 food processing, and marketing 33, for example. In addition to delegates the other participants to the conference were given opportunity to suggest research needs and participate in the rating procedures. Evaluations by participants are reported separately in conference proceedings.

Delegates and participants in the conference were asked first to suggest and evaluate specific research needs or problems within the 49 research need areas listed by that time. Identifying and assigning priorities to individual problems requires technical judgment based on specialized knowledge. Therefore for this part of the conference delegates were divided according to their interest and expertise into 16 working groups. Each group was concerned with no more than 4 or 5 related areas and with identifying and evaluating the most pressing needs or problems within those areas. To help make their decisions delegates and other participants had at hand several sources of information (1) the detailed situation statements on the various research needs areas (2) a list of specific research needs or problems suggested by the more than 700 agricultural researchers, extension personnel and other scientists within the United States. These had also been reviewed intensively by the several delegates and scientists and administrators in the Preconference Review. These research needs statements were presented to the delegates and other participants. Background information on the world food situation in the U.S. and the U.S. Agricultural Establishment was also given to the delegates.

A list of up to 40 problems pertinent to a research area was developed in each of the 16 groups. Each group then rated each problem according to its importance for meeting the stated objective of the area. The delegate ratings permitted the problems to be ranked so that the top 20 could be included in the final report of the conference. A total of 1011 problems in 49 areas and subareas were selected. After the conference the most important 10% of the 1011 problems were selected by a procedure that considered both area rating and the relative rating within each area. As it turned out about 55% of the special needs as identified by the Conference delegates were very similar to those suggested in the first listing by the scientists.

The area ratings took place later in the conference when delegates and other participants rated the 89 need areas and subareas according to the importance each area had as a means of increasing domestic and world food supplies. The findings of the conference related to three broad categories (1) Human Needs for Food, (2) Organization of Resources to Provide Food and (3) Management of Resources to Provide Food.

Of the 101 most important problems 17 were in the category dealing with human needs.

The research need areas in the category of organization of resources to provide food had the highest average rating of the three categories. The areas that contributed to that high average were: human resources, social institutions, public policy, finance, international development, production inputs and services, production systems and marketing systems.

Sixty-six problems were in the third category dealing with natural resources, crop production and livestock.

The final publications listing specific research problems considered important within each of the research need areas list the 20 problems selected by the delegates to the conference from the up to 40 which each group developed.

In addition, the lists identify the recommendations of other participants at the Conference and of the scientists who made their suggestions prior to the conference. If all three groups placed the need in priority then it is so designated.

Logistically the July Conference was a "first of its kind" for the Department of Agriculture. Secretaries worked three shifts to type lists of research needs as each group prepared them. Computer programming made it possible to use scan sheets for voting on priorities within each area. As soon as the voting concluded, the scan sheets were taken to the computer center by car. Results of processing were phoned to the Conference center so that the next stage of typing could begin. A complete print-shop was set up in the Conference center next to the typing and analysis section. By 8 A.M. of the last day of the Conference the twenty most important research needs in each of the areas were given to each delegate and participant. The vote on the importance of research need areas and subareas was recorded that morning on scan sheets by all attending the Conference and before the close of the Conference the results of the voting were given each conference attendant. Hardcopy, that is, printed sheets of the results were available.

F. Evaluation

An evaluation of the process places several items in the "good" and several in the "not so good" groups.

The process did:

- (1) involve scientists knowledgeable in the fields
- (2) involve individuals charged with administering research programs
- (3) involve the consumers, the users of research
- (4) utilize a mechanism whereby results of the voting on priorities were available to attendants by the close of the Conference.

Critics of the priority process say that: (1) research needs important to an individual or group will drop out unless identified as important to a large number of voters, (2) the process is expensive and time consuming and (3) the results are similar to those scientists themselves may have identified anyway.

What is the next step?

In June, before the Working Conference convened, ARPAC appointed two committees to develop follow-up plans.

One committee is to ensure that the publicly-supported research systems are: fully appraised of the Conference results; systematically consider the products of the Conference in terms of applicability to and implications for current and future research progress; and to continue dialogue with delegates and other participants in the Conference.

The second committee is to establish an acceptable data base regarding on-going research as related to the priorities.

In January a team of eight people is to convene to screen the 101 research problem areas and make specific and detailed recommendations for action.

IV. *Relationship of priorities to program responsibilities*

Arriving at priorities is a constant process. There is need to continually purge the system of unneeded activities, to redirect research effort from low to high priority areas, minimize fragmentation of research effort, create a sense of urgency, focus the research effort so that the "right" resources can be brought to bear on the "right" problem at the "right" time, provide adequate evaluation, and disseminate the results of the work. The plans for the follow-up of the Working Conference are an effort to face such problems.

According to Focus II, priority of programs within State Cooperative Extension Services is planned with a high degree of involvement of people at the local level to determine programs to meet local needs. Government officials at the local level are involved in appropriating an average of approximately 20% of the cost of support Extension work.

The policies and missions of State Land-Grant Universities and the intent of State legislatures affect program priorities for each State, and these are different from State to State. Extension personnel from the county level, up to the Federal Extension System are involved in this process.

Those of us who focus attention on human problems are very aware that these human problems are not isolated, discipline-oriented. If we have as an objective the improvement of the quality of life, we are involved in the constant process of arriving at priorities.

Extension personnel have responsibilities far beyond this step, however; they serve as the medium to convey the local and State priorities to the research scientists and administrators at all levels. Their sensitivity to the priorities is particularly important since they also serve as the medium to convey results of research to the users; their programs are based on the research results.

V. *Conclusion*

The results of the process of arriving at priorities which was described today strengthen the idea that any system should include a cross section of all the people involved, that the process should begin at the bottom and go up as well as be horizontal and that priorities developed by an elimination system rather than by addition to existing priorities have merit.

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