

# **Consultation Processes in Research Priority Setting: Lessons from experiences**

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## **Introduction**

In an attempt to update the ways of deciding which criteria to use in the allocation of resources, the CGIAR has embarked in a process of reviewing and clarifying its priority setting approaches. For this purpose, it is useful to look at how other institutions proceed. In this paper, we look at how major research institutions and centers across the world and primarily in the United States, are establishing their priorities and strategies.

Theories and suggestions on how to approach priority-setting exercises are abundant. ISNAR itself dedicates much of its work to this topic. It is commonly accepted that a few basic questions need to be addressed in every priority setting exercise. Among them are the identification of participants; the structure of the process. Also, it is important to distinguish suppliers and demanders of research. A major component of priority setting includes the evaluation of agricultural research. However, this implies that one has to measure the benefits and costs of such research in order to rank the projects and programs. In the case of agriculture, scientists agree that the quantification of a number of factors is sometimes not possible, making it difficult for them to be compared. The problem of measurability of factors determining the relevance of agricultural research can be found back in the two main approaches currently used in priority setting exercises.

The first one uses economic surplus to measure the relevance of research. This is the theory as explained in detail by Alston, Norton and Pardey in "Science under Scarcity: Principles and Practices for agricultural research evaluation and priority setting". It acknowledges that this method is best suited for sectors that produce traded commodities. It is however of limited use when quantifying costs and benefits is problematic. It is for this reason inappropriate when non-commodity research, including natural resources management, policy and socio-economic research is considered.

The other approach criticizes the shortcomings of the previous one, and in response, offers a theory that bypasses an economic approach to agricultural research evaluation. It thereby focuses on qualitative decision making methodologies, such as scoring, focus groups etc. However, this approach has its own problems, since it faces issues, among others of representation. Also, the possible lack of consensus on a clear definition of the problem adds to its shortcomings.

So, we need to find a middle road in which both economic value and socio-economic methods are taken into consideration. In this paper, we analyze various existing approaches as used by research institutions in order to draw lessons as to how to implement a priority setting exercise that uses the best of both approaches.

The results presented here were gathered from the Internet as well as from interviews with participants in strategic planning commissions at some of the institutes. In our choice of case studies, we tried to select organizations that do reflect the concerns raised around measurability of non-commodity research, and that address or at least recognize the specificities of agricultural research. We looked at the Agricultural Research Service of the United States Department of Agriculture (USDA), the Division of Agriculture and Natural Resources (DANR) of the

University of California, the National Institute of Health (NIH), and the National Science Foundation (NSF). For these case studies, depending upon available information, we looked at the following questions:

1. What are the sequences in the decision-making process?
2. Who participates at what level?
3. What are the techniques used to rank the projects in terms of priority?

For each organization, we tried to answer concisely the above-mentioned questions. The appendices for each case include a more extensive description of strategic plans and other documents.

All of the institutions we investigated are US-based. Their strategic plans have been crafted recently, generally in the past 5 to 6 years. Reason for this is the Government Performance and Results Act (GPRA) of 1994, which required all federally operating agencies to be more accountable towards the public in terms of how the allocation of their funds serve the national interest. As a result, many of the agencies used the opportunity to rethink their strategic plans as well as the process leading to them. Most of the institutions now publish their strategic plans on the web. Some of them include a more or less detailed explanation on both the planning and outreach processes they use.

## 1. Agricultural Research Service of the USDA

The Agricultural Research Service (ARS) is the principal in-house research agency of the United States Department of Agriculture (USDA). It is one of the four component agencies of the Research, Education and Economics (REE) Mission Area, together with the Cooperative State Research Education and Extension Service, (CSREES) the Economic Research Service (ERS) and the National Agricultural Statistics Service (NASS). The Strategic Plan of the ARS is submitted to Congress for Approval as part of the USDA Strategic Plan.

The National Program Staff (NPS), composed of National Program Leaders drawn from various scientific disciplines manages the research at ARS. The NPS defines critical issues in American agriculture and executes the strategies needed. Research is organized into 22 National Programs. They are divided into three categories: Animal Production, Product Value and Safety; Natural resources and Sustainable Agricultural Systems; and Crop Production, Crop Value and Safety. Each of these categories includes various National Programs, which in turn are divided into projects.

The Program cycle is as follows (fig 1.):

1. National Program Staff, working through multi-disciplinary National Program Teams (NPT), define and articulate the scope of each program - with input from customers, stakeholders, partners, and ARS scientists. The National Program Teams and key scientists organize one or more National Program Workshops for each program.
2. National Program Workshops include customers, stakeholders, partners, and ARS scientists and managers, identify problems/issues that can be addressed through research. They are sponsored by both the ARS and lobby organizations relevant to the topic. Other federal agencies that mostly fall under the competence of the Research Education and Economics mission also participate in the Workshops.
3. National Program Teams, working with field scientists, define the National Program research agenda and develop a detailed 5-year Action Plan for each program.
4. The work of each research project (aligned with this National Program) is revised, if needed, to support the National Program Action Plan. The Office of Scientific Quality Review (OSQR) conducts a rigorous peer review for each project in the National Program.

Every National Program has its own way of organizing the workshops to gather information that will lead to the setting of priorities. Two examples give some insight into the process.

1. For the Program on Animal Agriculture (fig 2.), goals and objectives were developed at the FAIR 2002 (Food Animal Integrated Research) meeting, organized by the Animal Agriculture Coalition and the Federation of Animal Science Societies. The USDA Stakeholder workshop on Animal Agriculture was held shortly afterwards, to discuss progress on the implementation of these goals.

Methodology: participants are organized into workgroups, which focus on the specific goals set in the previous meetings, and come up with recommendations for the implementation of these goals. Workgroup moderators are drawn from various coalitions/federations of producers and customers. An ARS/CSREES team meets at the end of the day to coordinate the different outcomes. Later on, all recommendations are merged. On the last day of the workshop, federal agencies discuss the recommendations and identify the areas which can be implemented jointly with other agencies (versus single agency response). Finally, separate meetings for each goal are held to identify specific follow up actions to enhance implementation. The recommendations made during the workshop set the path to prepare the 5-year Action Plan, which is specific to each National Program.

2. The Workshop on Aquaculture-Biotechnology focuses on identifying major issues in Biotechnology-Aquaculture research that have commercial potential. It is sponsored by the ARS and the Oceanic Institute.

A Steering Committee and a Planning Committee make suggestions for a list of participants and issues that deserve special attention in terms of R&D. The workshops are organized into a number of roundtable sessions, and chaired by scientist from the ARS, the public and the private sector. Panel and discussions are held afterwards. A closing session summarizes all recommendations, which are then prioritized. There is no indication on what the process used for this is.

The output of the workshop is a so-called “white paper” that will set the stage for further discussions among participants. It is also being used for the report on recommendations to the ARS, which will in turn use it for its 5 year Action Plan.

### Conclusion

The National Program Workshops are clearly the place where strategies and priorities for the research agenda are set. The workshops act as fora for discussion, after which meetings are planned with the ARS. The ARS then produces a 5- year Action Plan for each National Program. We can consider it a 2-step process, where the first step involves a broad consultation of a variety of experts in the field including stakeholders, customers and scientists. The second step involves the review of those recommendations by the ARS.

However, there is no clear indication as of the internal procedures that lead to the priorities as we find them in the strategic plans.

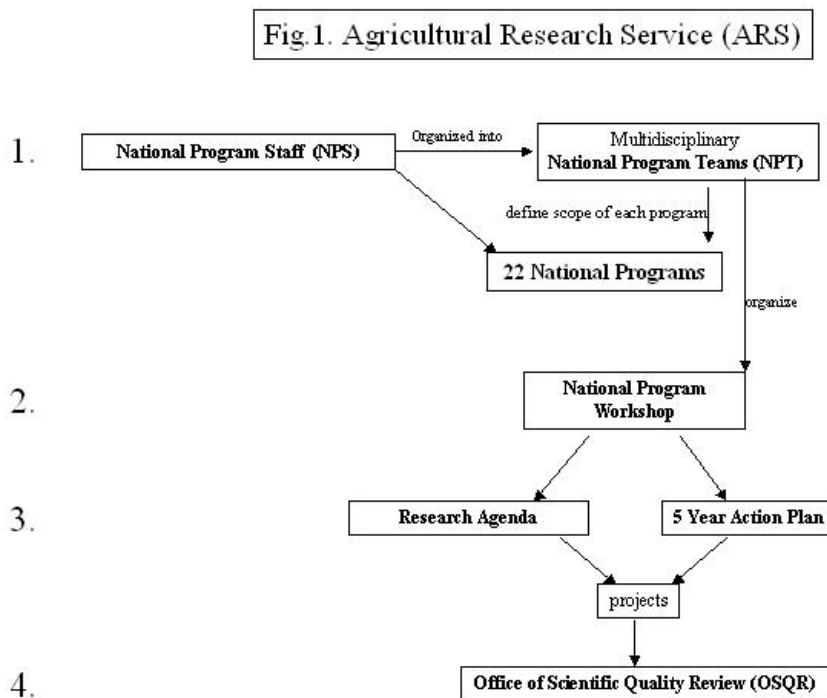
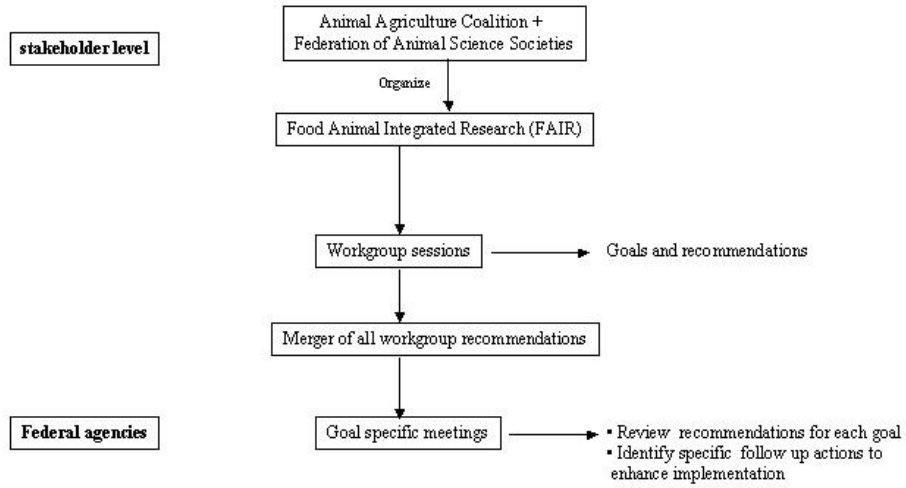


Fig. 2. National Program on Animal Agriculture



## 2. University of California- Division of Agricultural and Natural Resources

Within the University of California, the Division of Agricultural Resources plays a major role in the setting of agricultural research priorities. DANR is the parent-organization of the College of Natural Resources (Berkeley), the College of Agriculture and Environmental Sciences (Davis), the School of Veterinary Medicine (Davis) and the College of Natural and Agricultural Science (Riverside).

DANR has recently engaged in a new priority setting process. Information from the web as well as an interview with the Associate Vice President of DANR and his assistant provided us with useful insights on their strategy. The slides in the appendix were obtained through them.

Funding from the State of California is not earmarked, with the exception of a few projects. This allows UC to allocate its budget without prior constraints.

### Priority setting at DANR (fig 3.)

Priority setting occurs through the Program Planning Advisory Committee (PPAC). The PPAC is divided into 3 subject area committees: Human Resources, Natural Resources and Agricultural Resources, each with 15 committee members. Committee members are all drawn from the UC system, spread over the Cooperative Extension (CE) and the Agricultural Experimental Station (AES) and are reflective of the diversity of the various Agriculture and Natural Resources disciplines, units and locations. A Chair is appointed at the beginning of each PPAC cycle, from among members who served in the previous cycle. Decision making within the PPACs is not standardized. This allows for some flexibility in the decision making process.

In a **first** step, the committees make an inventory of issues within California agriculture, through a so-called environmental scan (a.). External clientele and stakeholders also participate in this process. The Planning Committees also analyze program evaluation data from workgroups and other sources to assess achievements on previously identified intended outcomes.

Of all those issues, only a specific part will be relevant for ANR. Criteria for identifying these are:

- Importance to the state of California and /or its local communities.
- Consistency with ANR mission and core values.
- ANR has the capacity or can develop the capacity to address the issue.

Considering both environmental scan data and program evaluation findings, the committees identify “**critical issues**” for ANR – issues important for ANR to address - and intended outcomes for these issues.(b.) Criteria for considering an issue critical are:

- Significant environmental, economic and/or social implications.
- Importance is attested to by external and/or internal stakeholders.
- ANR has a comparative advantage in addressing the issue; the issue draws on the individual and organizational strengths of ANR.
- ANR efforts are likely to have measurable outcomes (short or long term frames).

To assess the relative importance of the identified critical issues, the Planning Advisory Committees will seek the opinion of scientists. For that purpose, a survey in which one has to check 10 issues that are important is disseminated and analyzed. PPACs identify gaps between current levels of resources committed to each of the critical issues and levels needed to achieve intended outcomes. For each of the three ANR program areas (Agriculture, Human and Natural Resources), the Planning Advisory Committees will recommend a prioritized list of “**target**

**issues"** – defined as critical issues where additional ANR resources are most needed in order to address them more effectively (c.). Target issues are mid-term priorities. Criteria for an issue to be categorized as a Target issue are:

- Existing level of ANR resources is inadequate to achieve the measurable outcomes given the significance of the issue.
- The issue has high potential for achieving measurable outcomes within three to five years.
- Seed money could leverage additional resources.
- Opportunities for synergetic collaboration with other organizations.

### **Step 2.**

The **Program Council**, consisting of the Vice-President for Programs, the 4 associate deans from the four colleges, the Regional director of UC Cooperative Extension and the Program Leaders receives recommended critical issues and target issues from the PPACs and refines/expands as needed. The Program Council will prioritize the target issues across the three program areas (Human, Agricultural and Natural Resources) to produce a consolidated list of target issues for adoption and use by Division Administrators and ANR members at large.

### **Step 3.**

The prioritized list of critical and target issues will be presented to the Office of the Vice President who will disseminate the final results. The Vice President is assisted by the **Executive Council**, consisting of the Vice President, the Deans of the 4 colleges who serve as associate directors of the Agriculture Experimental Stations, the associate Vice president and the Assistant Vice-President for Programs.

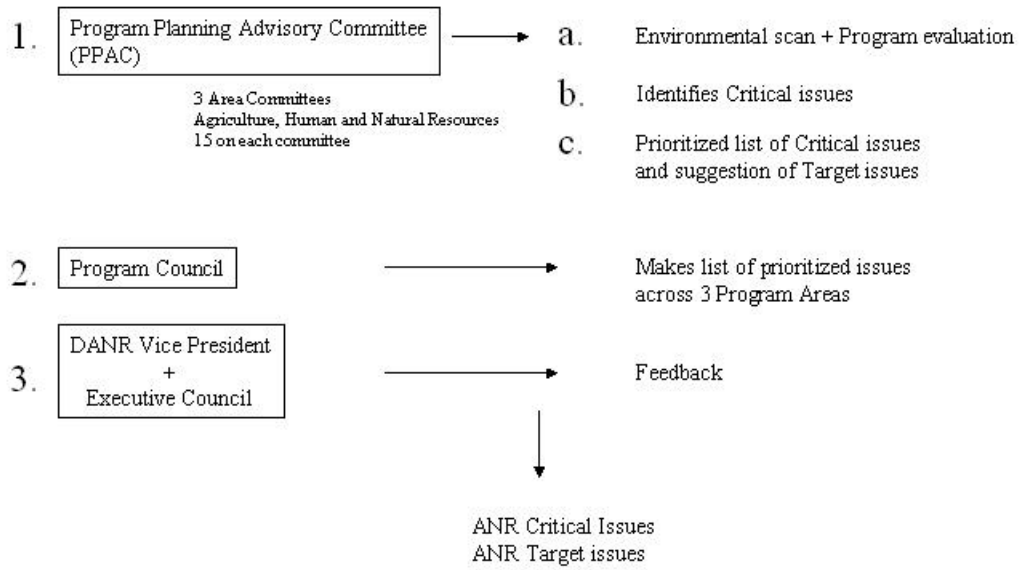
### **Conclusions**

The University of California is constitutionally autonomous, and has a decentralized decision-making structure. It is also considered as a top of the line research institution. This culture affects much of the planning process. For instance, it did not look at how other universities operate. Also, it relies heavily on the input of faculty and scientists.

We can note that although the criteria that transform a critical issue into a target issue are clear, the specific process used in this stage remains vague; it is not formalized, thereby providing administrators and scientists room to maneuver.

One of the questions with the mechanism presented is the representation of different parties in the whole decision making process. Questions arise around the choice of people that are being consulted by the planning committees, which appears to be scientists for the vast majority. Stakeholders for that matter have a limited role in the process. They are involved during the step of identification of critical issues, so they are important for short-term priorities. However, their role is limited when it comes to identifying target issues. Stakeholders are in practice kept at a distance when it comes to long-term goals. Their role is more important for short-term goals. For instance, the majority of consultations take place between administrators and scientists drawn from the diverse disciplines. The diversity of stakeholders, with a heavy emphasis on the scientific community, also ensures that expectations on the outcome of the process are not too high.

Fig. 3. Division of Agriculture and Natural Resources (DANR)



### 3. National Institute of Health (NIH)

The NIH is the agency carrying out research on all matters concerning health of the American people. It is made up of 27 institutes, each investigating a specific topic. This can be a disease, a specific organ, or a special area of technology. Each institute has a mission statement established by Congress and a separate annual budget determined by Congress. Each institute is by law entitled to annual funding. Although the NIH is closely related with the Department of Health and Human Services, it also works closely with other departments such as the Department of Defense for some of its projects. Programs and projects can also be the result of a joint demand from various departments.

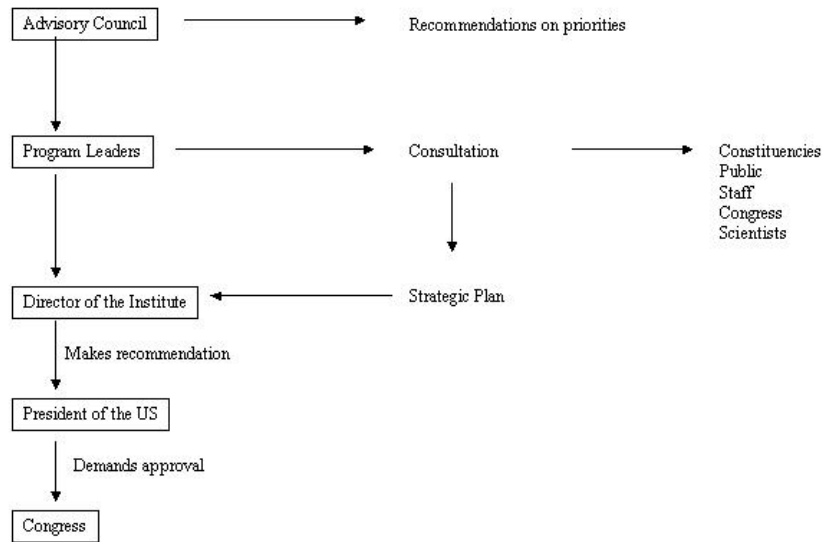
Research is conducted through extra- and intramural research. Intramural research is conducted mainly at the headquarters in Maryland. Extramural research is carried out by hundreds of scientist at various locations. In FY 2000, 10% of funds were used for intramural research, and 83% were used to fund scientists in the extramural programs. Extramural Projects are funded through a competitive grants mechanism.

Each institute at NIH sets in owns priority setting and has its own strategic plan. All institutes have a director and an advisory council that is charged with setting priorities.

The steps used in the process are:

- The advisory council / strategic planning committee makes recommendations on priorities to the institute (program leaders).
- The institute asks for input from constituencies, scientists, Congress, staff and the public.
- The institute drafts a strategic plan and gives it for review to the planning committee.
- The planning committee submits it to the director of the institute.

**Fig. 4. National Institute of Health**



Decisions made in the context of priority setting are dependent upon a wide number of criteria. A few of these are:

- The potential impact of particular research areas on human health.
- The critical scientific opportunities.
- Gaps in knowledge that merit special effort.
- The cost of specific research projects and their benefits.
- Economic issues, including the potential effects of the research on quality of life.
- The balance between intramural and extramural research.
- The balance among laboratory research, clinical research, and epidemiological research.
- The specific type of funding to use for various research areas, for example, selecting among grants, contracts, and support of centers

Below are three examples of priority setting within institutes of the NIH.

### **National institute on aging (NIA)**

The NIA maintains a year-round scientific planning process that draws upon interactions with scientists throughout the world, members of Congress, the Institute's National Advisory Council on Aging (NACA) and other advisory committees, constituency groups, and the public. These interactions stimulate internal consideration of potential new research strategies and provide a broad perspective for refining plans. Emphasis is given to novel proposals and collaborative projects that promise to stimulate activities with other research organizations.

The NIA's strategic planning process focuses on a 5-year planning horizon. The most recent strategic plan, developed by the Task Force on Aging Research in 1995, produced a research agenda through fiscal year 2000. The NIA's current strategic planning effort covers a 5-year time frame from fiscal years 2001 to 2005 and addresses goals for research, research training, research resources, and dissemination of health information. Members of the scientific community and the general public have been active in the plan's development.

### **National Institute on Drug Abuse (NIDA)**

To help NIDA develop its Strategic Plan, the Institute called upon a large group of knowledgeable and interested parties to contribute their expertise. The process started with recommendations from the National Advisory Council on Drug Abuse subcommittee dedicated to overseeing the strategic planning process. After obtaining input from its many constituent groups and the Institute staff, NIDA developed a detailed outline of its Strategic Plan for review by the Council subcommittee, an extensive panel of NIDA-funded extramural researchers, and the NIDA staff. Using that review, the Institute developed a draft Strategic Plan that was reviewed by the entire NIDA advisory council and made available for public comment through distribution to NIDA's 67 constituent organizations and via posting on the Institute's Web page.

To help establish the more detailed research agenda that follows, the NICHD convened a working group comprised of scientists (see Appendix) from around the country and asked them to collaborate with Institute staff to identify and prioritize research goals and to suggest appropriate strategies to meet those goals.

## **National Institute for Child Health development (NICHD)**

The working group drew upon ongoing planning efforts, previous emphasis areas, recent forums, workshops, conferences, and research findings to develop a draft of the strategic plan that would guide the Institute's research agenda in bio-behavioral development for the next 5 years. The draft plan was posted on the NICHD Web site to allow members of advocacy groups, nonprofit organizations, the scientific community, and the general public to comment. In addition, the Institute shared the plan with members of the National Advisory Child Health and Human Development Council and with the Friends of the NICHD, a coalition of more than 100 professional and patient organizations committed to the Institute's scientific mission. After consolidating and reviewing all comments, the NICHD revised and finalized the plan. This document is intended as a targeted, but flexible, blueprint that can be modified as new scientific findings, research opportunities, or resources become available.

### **Conclusion**

Considering the NIH, there is a distinct willingness to include a vast number of participants in the process. This is also emphasized through publishing materials on the web. This tendency is probably partly due to the need to comply with the GPRA act, in an effort to make decision-making processes at the federal level more transparent.

A notable difference here is that in the case of NICHD, internal staff and scientists make a draft proposal, and submit it to stakeholders for **comments**, as opposed to other institutions where stakeholders have an actual voice and are allowed to modify the strategic plan. A second round of stakeholder input is solicited after incorporation of the first set of comments collected as a result of publication on the Web. The term "comments" could be a matter of vocabulary, referring to actual input from the consultations. However, it is still a question as to what those comments include, that is: to what extent are stakeholders and other groups allowed through either the first or second round of consultations to add priorities? How does the organization deal with discrepancies? And how are differences between arguments and opinions resolved?

## 4. National Science Foundation

The National Science Foundation (NSF) is an independent U.S. government agency responsible for advancing science and engineering in the United States. Operating no laboratories itself, NSF makes merit-based grants and cooperative agreements and provides other forms of support to educators and researchers in all fifty states and in the U.S. territories. NSF's mission is set out by Congress.

The Foundation is governed by a presidentially appointed director and a National Science Board composed of 24 part-time members such as scientists, engineers, and educators from universities, colleges, industries, and other organizations involved in research and education. Members are appointed by the President and confirmed by the Senate. The NSF Director serves on the Board, ex officio. The Board has dual responsibilities: as a national science policy advisor to the President and the Congress, and as the governing body for NSF.

NSF is structured much like a university, with grant-making divisions for the various disciplines and fields of science and engineering and science education. NSF also uses a formal management process to coordinate research in strategic areas that cross traditional disciplinary boundaries. The Foundation is helped by advisors from the scientific and engineering community and from industry that serve on formal committees or as ad hoc reviews of proposals. This advisory system, which focuses on both program direction and specific proposals, involves more than 59,000 scientists and engineers a year.

### **Strategic Plan**

NSF' strategic plan is setup along "outcomes goals" (people, ideas and tools) and "core values" (developing intellectual capital, integrating research and education, and promoting partnerships). Also, it introduces four emerging areas that will benefit from increased attention in the next several years -- information technology research, biocomplexity in the environment, twenty-first century workforce, and nanoscale science and engineering.

### **Consultation process**

In developing the NSF GPRA Strategic Plan for FY 2001-2006, NSF consulted broadly with the science and engineering community and others who are concerned about the vitality of U.S. science and engineering. Specific comments were solicited from the following groups:

- National Science Board
- House Committee on Science
- Senate Committee on Governmental Affairs
- Office of Management and Budget
- NSF Staff Members
- NSF Advisory Committees.

In addition, NSF solicited the comments of the broad science and engineering community and the public through press coverage and through direct contacts among staff, universities, and professional associations. In December 1999, the draft strategic plan was posted for several months on the NSF Website, with a response form to facilitate suggestions and reactions.

### **Strategic Planning Process**

There were three stages in the development of NSF's current strategic plan, in the sense that major inputs came first from the NSF staff, then NSF Advisory Committees, and finally the

National Science Board. But all these groups kept track of the process; and all were considering planning issues simultaneously.

The **first**, largely internal, stage consisted of the work of two groups. A mid-level staff group from all across the Foundation called the **Strategic Planning Working Group** started the drafting. They reported to an Ad Hoc Committee on Strategic Program Planning, consisting primarily of the Assistant Directors,

The Ad Hoc Committee on Strategic Program Planning will guide the strategic planning process and is specifically charged to:

- Develop vision statement that captures the core values of NSF.
- Develop a mission statement in accordance with the principles enunciated in the Vision Statement and serve in strategic planning and guide the development and execution of NSF programs over the next several years.
- Identify the **central strategic themes** around which the goals, objectives, and deliverables (measures of progress, milestones) can be articulated.
- Develop sets of objectives and related metrics for the strategic themes and criteria to guide priorities.
- Recommend organizational mechanisms and changes to improve overall planning and execution of NSF programs.
- Develop mechanisms to improve interactions with research and education communities and ensure accountability and enhance public understanding of NSF.

The assistant directors worked with the Advisory Committees and the National Science Board, circulating drafts to them. A fairly complete plan was developed by NSF staff, through iterative discussion and drafting. Rather than top-down or bottom-up, the evolution of the document was interactive, although what it was to contain - vision, core values, goals, a set of principles to guide NSF investment strategy - was set out by the Director in a memorandum to the Ad Hoc Committee.

In the **second** stage, the draft was discussed with Advisory Committees to the various directorates of the Foundation. These groups include a variety of stakeholders, such as academic researchers, industrial representatives, and people from other Federal agencies. At that time, the Chairs of those committees guided a lot of rewriting and refocusing.

At the start of the process, mechanisms for the later involvement of the National Science Board were established. The Director and the Chair of the NSB set up a Board Task Force to follow the process and work with NSF staff.

The NSB Task Force on Planning is charged to:

- Conduct independent reviews of the Foundation's long-range program plans;
- Assess the extent to which the Foundation's overall goals, its specific programmatic goals, and the significant milestones set forth in long-range plans are being achieved;
- Assist in the Board's consideration of the Foundation's budget proposals to the President and the Congress by reviewing the relationship between the Foundation's long-range plans and those proposals;
- Provide to the Board recommendations for Foundation or Board action arising from the Task Force's reviews;

- Identify policy and management issues associated with the long-range plans or with the planning process, and refer them to the Executive Committee for consideration for the Board's agenda; and,
- Provide oversight for the Board's annual long-range planning meeting, including preparation of option papers and other materials related to the meeting.

In the **third** stage of the plan's development, the Board task force guided further redrafting. The Board's input on policy issues is reflected in the final version. For instance, initial emphasis on "strategic areas" of research - a topic that had generated lively discussion in the Washington science community - was placed in the broader contexts of world leadership and service to society with the Board's influence. They stressed broader goals and objectives. The Board also found the international dimensions of science underemphasized, and helped remedy that.

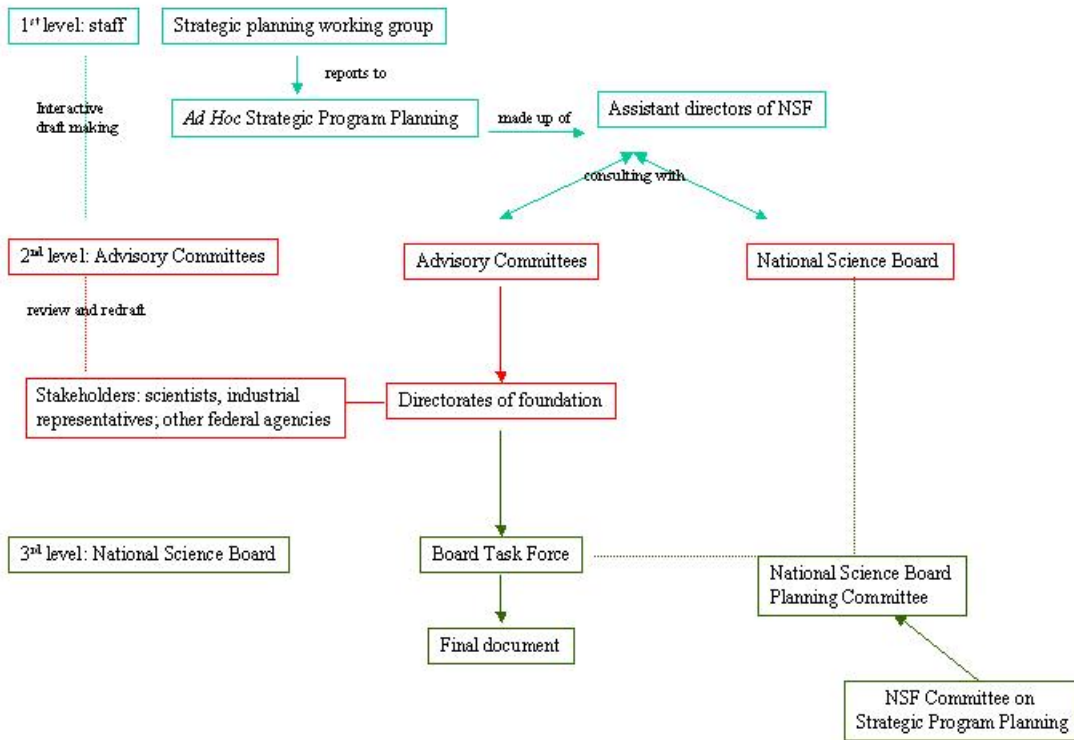
**Interaction with the National Science Board:**

- a. The NSB Chair will announce formation of a small NSB Planning Committee at the February Board Meeting and confer a charge to them. This group will be the major point of contact with the NSF Committee on Strategic Program Planning (CSPP).
- b. The NSF Director will appoint a liaison to the NSB Committee. Optimally, that person will be the Chair of CSPP.
- c. Interaction between the CSPP and the NSB committee will be accomplished via conference calls or if beneficial, ad hoc "teams" of NSF and NSB planners would meet to achieve special objectives. At a minimum the NSB committee would be appraised of CSPP progress at regularly scheduled NSB meetings.
- d. The June NSB meeting would be the major point of intersection of the two groups. Members of the NSB committee would be the logical discussants of the NSF Strategic Plan

**Conclusion**

The description provided by NSF for their Priorities and Strategies exercise is very detailed. Like other institutions, it publishes its results on the Web to make it more accessible to the public, and as a way to collect views from stakeholders. However, whereas other organizations consult only stakeholders and/or scientists before submitting the plan to the administration, NSF consults first conducts an internal consultation with its own staff.

**Fig 5. National Science Foundation**



## Conclusions

### Iterative process

All institutions use an iterative process in their strategic planning and priority setting. Formally, most of them use a 2-step process, according to the information available to the public.

**First**, broad consultations take place with stakeholders, politicians and scientists on the needs of the sector; subgroups are organized according to themes discuss in roundtables and panels. In-house planning commissions have a facilitating and advisory role at his stage of the process. The outcome of this first step is a prioritized list of issues, ranked with the help of (often unclear) scoring techniques. This list is made up of issues suggested for consideration, and not as specific research topics. Planning commissions usually have a facilitating and advisory role.

**Second**, high administration and directorate level planning committees examine the suggested prioritized list and adjust it according to their own discretion. Although some of the institutions have a distinct list of criteria according to which they will decide on issues, few is known on how the final decisions are made. The outcome of the second step is a list of topics with top-priority in terms of research. Those topics will be integrated in the strategic plan. This is most likely to be inherent to the culture of the organization or its position in the political field. For example, in the last stages of the process, DANR will use rather the input from scientists rather than from stakeholders who were involved in an earlier stage. The ARS discusses final issues with federal staff only.

Whereas some graphics may suggest a multiple step process, we tried to make a clear distinction between the stakeholder/scientist consultations on one hand and the administrators' review on the other hand. Since drafts of strategic plans go back and forth within administrations, and also between stakeholders and administrations, each consultation in itself may include more steps.

In contrast to previous approach, the National Science Foundation uses a three-step consultation process: internal consultation first takes place at staff level, followed by a consultation with stakeholders and the planning committee. In a final stage, the governing board/ administrators will make the last changes.

Whereas some federal institutions formally use a 2-step process, it is very likely that prior to the priority setting process, in-house staff is being consulted and make recommendations. So, in the end, we can speak of an implicit 3-step process: a first in which data is collected and used by staff to make their case. Second, stakeholders and lobby groups are being consulted on the proposed approaches. Scientists offer input. Finally, administrators make the ultimate decisions for the strategic plan.

### Making the process public

Most institutions make the results of the discussions public at some point. This can be either on the internal network or on the Internet. When done at an earlier stage of the discussions, it allows staff not directly involved in the previous stages to make comments. In federal agencies such as NSF, it allows to include the general public in the decision making process, which may be required by law.

### Comments

- Stakeholder involvement

Whereas stakeholders are said to have a say in the priority setting process, it is questionable how important that role is. For DANR, although stakeholders are consulted for short-term decisions, their opinions are not taken exclusively into account for long-term decisions. When a two-step approach is followed, are stakeholders guaranteed influence over the second step? How can they make sure that their opinions are taken into account?

- Confidentiality

In our search, we found that strategic plans are very accessible to the public. In some cases, the planning process is well specified; even meeting proceedings are available, that show the opinions of participants in roundtables, discussions and panels. But there usually remains confidentiality about the ranking methodology used. One interpretation for this is that there is no standardized way to rank programs. Rankings differ from year to year and are organization-specific. But even if there were such standards, then organizations are not eager to share them with others. Managers prefer to keep a say over priorities, and it allows some creativity in the process. Also, they do not want to be held accountable for the results after specific methods are used. So, the very fundamental step of ranking, the one that generates so much debate and alternative methodologies, is left to the discretion of participants and tend not to be fully transparent.

- Gap between precision and scope

There remains a broad unfilled gap between the surplus approach, which offers precise guidance for priority setting but only applies to a narrow range of research issues, and the broad consultative approach, which allows to take into account many aspects of research but lacks precision in ranking research priorities and allocating research budgets. We have reviewed here how different institutions have used the latter approach. In general, while the approach remains the most practical given the state of the arts with more rigorous quantitative methodologies, users of the approach should be cautious of the following potential sources of biases in priority setting which we mention here for the sake of further research on the approach. These potential sources of bias emerged in the interviews we had with scientists and research administrators in preparing this report.

- A bias toward the short run as research administrators and sources of funding may want to achieve visible results within their administrative and political tenures.

- A bias toward safe undertakings as research administrators may not want to be associated with failed projects, displaying more risk aversion than a surplus approach at a social discount rate would imply.

- The role of stakeholders is quite subjective since who should be represented and how opinions represented should be weighted remain arbitrary.

- Potential sources of disciplinary biases at the level of decision-making by research administrators related to their own research trajectories and to direct access by a selected few scientists.

- A bias toward scientific fads, research traditions, prior success stories, and dominance of certain disciplines which are all part of institutions' historical traditions.

- Scientific biases toward high science, as scientists want to secure their career among peer as opposed to stakeholders.

- Donor biases toward social science (the appearance of problems) as opposed to technology (possibly the root cause of problems). These biases are introduced through line items in research budgets that come predetermined relative to an institution's own research priorities.

**Websites:**

<http://www.ars.usda.gov>

<http://ucanr.org/>

<http://www.nida.nih.gov/StrategicPlan/Appendix2.html>

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