Methods for Diagnosing Research System Constraints and Assessing the Impact of Agricultural Research

Volume I: Diagnosing Agricultural Research System Constraints

Proceedings of the ISNAR/Rutgers Agricultural Technology Management Workshop, 6-8 July 1988, Rutgers University, New Jersey, USA

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International Service for National Agricultural Research

The International Service for National Agricultural Research (ISNAR) began operating at its headquarters in The Hague, Netherlands, on September 1, 1980. It was established by the Consultative Group on International Agricultural Research (CGIAR), on the basis of recommendations from an international task force, for the purpose of assisting governments of developing countries to strengthen their agricultural research. It is a non-profit autonomous agency, international in character, and non-political in management, staffing, and operations.

Of the thirteen centers in the CGIAR network, ISNAR is the only one that focuses primarily on national agricultural research issues. It provides advice to governments, upon request, on research policy, organization, and management issues, thus complementing the activities of other assistance agencies.

ISNAR has active advisory service, research, and training programs.

ISNAR is supported by a number of the members of CGIAR, an informal group of approximately 43 donors, including countries, development banks, international organizations, and foundations.

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STRATEGIC PLANNING—CONCEPTS AND ISSUES

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Abstract

This paper focuses on conceptual and process issues related to strategic planning in international agricultural research organizations. A strategy outlines where the organizations is headed, what course it plans to follow to get there, and why the chosen course is the best. An integrated planning, evaluation, and control framework consists of (1) strategic concerns — any system needs a process and criteria for arriving at a system strategy; (2) operational concerns — a medium-term plan is needed, including a program and budget; and (3) monitoring, evaluation, and control concerns — thorough impact assessment and input monitoring is needed for progress of the system. This framework can be applied at three levels: (1) multi-institute activities, (2) institute activities, and (3) program activities. One of the most important challenges facing research institutions is to find ways of encouraging strategic thinking at all levels of the organization. For organizations that have not gone through the experience, strategic planning helps initiate and motivate strategic thinking.

Introduction

Mission-oriented, nonprofit research organizations such as the international agricultural research centers supported by the Consultative Group for International Agricultural Research (CGIAR) are finding themselves under increasing pressure to justify their continuing existence. This pressure stems, in part, from the increasing scarcity of and competing demands for donor funds for research and related activities. Moreover, the uncertainty of high returns to investments in specific long-term research projects also reinforces the pressure to have a clear rationale for engaging in different research activities. Many such organizations have turned to long-term strategic planning as a means of analyzing their response to these pressures.

Strategic planning (SP) among the CGIAR centers has gained momentum since 1986 as a result of three mutually reinforcing developments. First, CGIAR approval of the recommendations of a system-level strategy and priority paper prepared by its Technical Advisory Committee (TAC) in 1986 served as an impetus to the centers to align or rethink their programs in terms of the newly stated CGIAR goal and objectives. Second, the system-wide move from an annual towards a medium-term resource-allocation system increased the demands on the centers for preparing clear strategic statements as the underlying rationale for their medium-term program and budget proposals. Third, a consensus began to build within the system on the need to focus the external reviews of the centers more towards long-term strategic concerns, as compared with short-term operational matters. This placed added pressure on the centers to prepare or update their strategic plans before the external reviews.

This paper attempts to throw some light on conceptual and process issues related to strategic planning. Although its main focus is on strategic planning in international agricultural research organizations, many of the concepts and generalizations are equally applicable to other nonprofit institutions.

The Concept of Strategy

There is some confusion in the management literature about the precise definition of strategy. Let me illustrate with a few examples.

Von Neumann and Morgenstern (1944) were among the earliest users of the term *strategy* in its modern sense. In their classic study on decision theory, they define *strategy* as a plan, prepared before the start of a game, which specifies the choices a player could make in every possible situation, under all possible scenarios on the amount of information available to him (Von Neumann and Morgenstern 1944: 79). Thus, strategy is seen as a guide to action, prepared after careful consideration of possible moves by other actors and the likely outcomes from these moves.

Another classic definition is the one by Chandler (1962: 13): "Strategy can be defined as the determination of the basic long-term goals of an enterprise, and the adoption of courses of action and the allocation of resources necessary for carrying out these goals." Here the emphasis is on defining where the organization should be headed and identifying the avenues by which can get it there.

The definition by Tilles 1963: 84) also underlines goals: "A strategy is a set of goals and major policies." By goals, Tilles refers to what an organization is aspiring to achieve as well as what it, in its totality, wishes to become in the long term. Major policies, on the other hand, refer to key decision rules that can guide the making of specific choices.

While the three definitions quoted above have a futuristic, planning orientation, the one offered by Mintzberg and Waters (1985: 257) is less temporal: "patterns in streams of (organizational) actions." Thus, according to these authors, what counts in understanding an organization's strategy are actions, some of which may be planned or intended, but others can emerge in an unplanned manner. The organization's strategies can be detected only by a search for consistent patterns in actions.

There are several threads common to these definitions. First, directly or indirectly they have an action orientation (more in the form of a guide to action than specific action steps). Second, they place a great deal of emphasis on the spelling out of a course, a direction, or a consistent pattern of action for the organization. Third, several of the definitions view long-term goals or visions as part of the organization's strategy.

The definition of strategy I use shares many of these features:

> An organization's strategy describes the most desirable vision of its future, outlines the essential elements of a course it intends to follow to realize that vision, and provides a justification for the identified course.

Several aspects of this definition need comment. First, a strategy typically illustrates a course that an organization believes should be followed. One can also have a strategy not tied to an organization—such as an agricultural research strategy for sub-Saharan Africa drawn up by a multilateral agency—but this serves mainly as a *suggestion* to the institutions directly involved because it does not take into account their specific circumstances.

Second, the vision of the organization's future that is summarized by the strategy shows where the organization wants to be in the future. It typically reflects the visions of the leader(s) of the organization (that is, the person(s) accountable for its overall performance) about the kind of institution it should become. Much of strategic planning deals with analysis of the organization's likely future environment, to help the guiding members of the organization determine where the institution should be headed.

Third, the course the organization intends to follow reflects the broad choices made in order to transform it from its present state to its desired future state. In day-to-day usage, the term *strategy* often refers only to the course or direction chosen by the organization.

Fourth, justification of the identified course is necessary in order to clarify the rationale behind the chosen strategy. This is particularly important for nonprofit institutions which need to communicate their strategy to a wide range of stakeholders.

To summarize, a strategy outlines where the organization is headed, what course it plans to follow to get there, and why the chosen course is the best.

Levels of Strategy

In the literature on corporate planning, a distinction is often made between enterprise (institutional), corporate, and business strategy. Enterprise strategy refers basically to what the company as an institution stands for (Freeman 1984). Corporate strategy concerns the determination of the businesses the company should be in and the allocation of resources to these businesses. Business strategy addresses questions of direction and competitive positioning (Hamermesh 1986).

The hierarchy of strategies noted above can be carried further to the sub-business, product, or unit level. However, as one moves further down the hierarchy, the range of strategic choices available becomes narrower and narrower.

All three major levels of strategy mentioned above (enterprise, corporate, and business) are relevant to autonomous research organizations, even if they are not part of a larger corporation like IBM or General Electric. There is a need to answer enterprise-level questions such as "what is our basic character as an organization," "what is our place in the world," and "what values do we subscribe to?" Corporate-level questions such as "what businesses should we be in" and "how should we allocate our resources to our businesses" also need answers. Once these higher-order questions are answered, there is a further need to find answers to more specific questions for each business the research organization is engaged in, such as "where should we be headed in this business" and "what policies or courses of action should we adopt to succeed?"

Our definition of strategy encompasses all three levels of strategy. The vision of the organization's future relates mainly to enterprise- and corporate-level questions. The course to be followed by the organization, on the other hand, covers questions of resource allocation at the corporate level and the specific direction to be pursued in each business. Our stress on the need for spelling out the rationale for the chosen strategy applies to all three levels.

Components of Strategy

A well-articulated strategy summarizes two types of information. First, it provides contextual information of relevance to the future of the organization, including analysis of its implications. Second, it outlines the basic strategic choices made by the organization at the enterprise, corporate, and business levels, along with their rationale. In what I list below as major components of strategy, some of the items relate mainly to information, some to aspects of strategy, and some to both. Although it could be argued that the information items should not be considered part of the strategy, the rationale for the strategy becomes clearer if these are included.

Clients and Beneficiaries

A strategy should clearly identify the direct clients of the organization, i.e., those who would be benefitting directly from the products or services generated by the organization. It should also identify the clients of the organization's clients (or the indirect beneficiaries). In the case of the international agricultural research organizations, the former typically includes national agricultural research systems and the latter includes population groups such as poor farmers and women.

Merely listing future clients and beneficiaries by type and location is not sufficient. What is important is to determine the characteristics or aspects of the clients the organization would wish to influence or change through its own activities (such as the scientific research capabilities of national agricultural research systems). Knowledge of the needs of the clients' clients often helps better define the needs of the organization's clients. For international agricultural research institutions, the strategy should reflect a good understanding of the factors contributing to the effectiveness of national agricultural research systems so that, through its future activities, the international center can zero in on those factors that can provide the greatest leverage.

External Environment

A strategy should describe a vision of the organization as it is seen to operate in the future. Development of this vision requires having an understanding of the organization's likely future external environment and the opportunities and threats likely to be presented by this environment.

Several aspects of the external environment are important. First, it is important to have a clear understanding of the interests of the organization's major external stakeholders so that the strategy is formulated with stakeholders' views taken into account. A stakeholder is "any group or individual who can affect or is affected by the achievement of the organization's objectives" (Freeman 1984: 46). (The clients of the organization also constitute a stakeholder group, but because of their importance I cover them separately, above). In the case of the international agricultural research centers, stakeholder analysis should cover, at the minimum, groups such as major donors, the CGIAR and TAC, other international centers with competing or complementary mandates, and the governmental and nongovernmental institutions in the major countries in which the center operates.

Second, it is important to understand world or specific market trends in areas of interest to the organization. For agricultural research institutions, these include matters relating to the organization's beneficiaries (population, nutrition, other socioeconomic trends), the physical environment (such as increasing concern over environmental sustainability), the institutional environment (such as increasing use of organizational forms like networking), the technological environment (such as trends in information technology), and the scientific environment (such as trends in basic research or research methodology).

Internal Environment

An understanding of the organization's internal environment is necessary in order to formulate a strategy that builds on institutional strengths and overcomes weaknesses. Several aspects of the institution's internal environment are important. First, the interests of internal stakeholders (such as managers, staff, and the members of the governing body) are important. Second, the culture of the organization (commonly defined as shared patterns of values, beliefs, norms, and behaviors in an organization) needs to be understood. Third, the organization's past achievements and important competencies and limitations need to be described and analyzed.

Current Strategy

An organization's future strategy should make reference to its current strategy and provide a rationale for changes, if any. The current strategy, or "strategy-in-use," can be described essentially in the same way as the future strategy. An organization's strategy-in-use can be deduced from its past actions (Mintzberg and Waters 1985), regardless of whether the organization has followed a written strategic plan. What is important, though, is a critical assessment of the current strategy.

According to Tilles (1963), the following criteria can be used in assessing current strategy: evidence of impact; internal consistency with values and culture, competencies and resources, and organizational structure; external consistency with client needs, stakeholder interests, and other important aspects of the organization's environment; and appropriateness of the time horizon of the strategy.

Mission

A strategy needs to state clearly the mission of the organization, that is, why it exists and what goals it should pursue. This would reflect the vision of the organization's leadership about where the institution should be headed in the future.

The organization's formal or constitutional mandate often defines the constraints and parameters within which the institution should operate. The mission spelled out in the strategy, on the other hand, serves as the operational mandate for the period under consideration. Conflicts between the formal mandate and the mission need to be resolved by introducing changes in one or the other.

The term "mission statement" is used frequently in the literature on strategic planning to refer to the mission as defined above, plus a synopsis of the major aspects of the organization's strategy (Pfeiffer et al. 1985). Having a short statement that summarizes the chosen strategy is very helpful in communicating the strategy to the staff and the stakeholders.

Guiding Values

A strategy clarifies and reinforces the values the institution stands for. Guiding values reflect the business philosophy of the organization and illustrate the broad principles the institution subscribes to. They serve as a guide to operations and can be used as criteria in making strategic choices.

Incongruities between the present culture of the organization (which is being studied by CIMMYT as part of its strategic planning effort) and the guiding values selected for the future requires taking measures for culture change. This is one of the least understood aspects of organizational change, and one for which there are no "cookbook" solutions (Kilmann et al. 1985; Tichy 1983; Deal and Kennedy 1982).

Guiding values typically cover areas such as how the organization relates to its clients (that is, how it views its role vis-a-vis its clients), other external stakeholders, and its staff (which reflects how much the staff are valued by the organization). Other possible areas for guiding values include the organization's philosophy regarding the characteristics of the product or service provided (such as quality of service) and its views on risk taking and use of resources. The actual contents of what might be called a "value map" for an organization depends on the specific circumstances of that organization.

Business Areas

I use the term "business" in the corporate planning sense, i.e., referring to the major strategic areas the organization wishes to work in. These are normally specified in the formal mandate and the mission statement.

The criteria for defining business areas relate mainly to aspects of the organization's environment, not its internal structure. Categories of clients or their needs, geography, or type of product/service are commonly used as criteria (Hanna 1985). Most international agricultural research centers have two major businesses: research and strengthening national agricultural research systems (NARS). The former can be partitioned into smaller businesses such as "germplasm development" and "crop management" and the latter into "improving research capabilities of NARS" and "meeting the information needs of NARS." These need not correspond to the organization's existing departments or units.

This partitioning into smaller businesses is necessary because the organization may wish to follow a distinctly different course in each business. Strategic issues relevant to the institution's training "business," for example, would be different from those relating to its germplasm-development activities.

A strategy identifies both the business areas the organization should work in and also the goals to be pursued and the direction to be followed in each business. Business-area goals should be derived from and substantively linked with the organization's overall mission. That is, the rationale for each business and its goal must be made explicit.

Strategic Issues

These are fundamental policy questions about directional choices the organization needs to make. A strategic issue often reflects a current or forthcoming development, inside or outside the organization, which has an important bearing on what the organization should do or how it should do it. Strategic issues often relate to the major strengths and weaknesses of the organization and the threats and opportunities it faces (Ansoff 1980; Bryson 1987).

Analysis of strategic issues represents the "guts" of a strategy as they throw light on the courses to be followed by the organization in accomplishing its overall mission and business-area goals. Analysis of the needs of clients and beneficiaries, assessment of the internal and external environment, and evaluation of the current strategy all lead to identification of the major issues to be addressed by the strategy.

Examples of strategic issues currently confronting international agricultural research institutions include the balance between basic and applied research, ways of addressing sustainability concerns, modes of collaboration with NARS, general versus specialized training, centralization versus decentralization of activities, and ways of financing the implementation of the strategy.

Priorities

Priorities are part of an organization's strategy. A strategy needs to reflect corporate-level strategic choices, i.e., the relative priorities assigned to major business areas and subareas. This is often expressed in terms of a planned flow of financial or manpower resources (or both) to business areas over time. The rationale for the chosen pattern of resource allocation also needs to be spelled out in the strategy or its supporting documents.

Operational Implications

A strategy represents a scenario for organizational change, i.e., moving the organization from its present state to a desired future state (Egan *forthcoming*). There is no universal rule that can be used to differentiate strategic from operational concerns. Strategies cannot be formulated without taking into account implementation considerations, and some degree of overlap between the two plans (strategic and operational) is both unavoidable and desirable. A scenario for change that focuses only on the business aspects of the organization would be incomplete without reference to the implications of the strategy for other institutional changes, such as in the organizational structure, staffing mix, and physical infrastructure. A strategy should draw only the broad outlines of the changes planned in these areas.

The key stakeholders of research organizations are often as much interested in the broad strategic directions of the institution as they are in the approaches proposed for solving specific research problems. Some of these are project- and program-level "tactic" questions one would ordinarily not include in a strategy. However, if one of the purposes of formulating a strategy is to communicate the organization's thinking about its future to its stakeholders, it is necessary to broaden the scope of the strategy to include some key operational matters.

Components of Strategy — Ten Key Questions

1. Who are our potential future clients and which of their needs can we meet?

2. What are the implications of our likely future external environment on where we should be headed and what we should do in the future?

3. What are the implications of the strengths and weaknesses of our internal environment for our future work?

4. How effective is our current strategy?

5. Where should we be headed in the future; what should be our mission?

6. What should be our guiding values and business philosophy?

7. What businesses should we be in and what goals should be pursued in each business?

8. What are the major strategic issues we are confronted with and directional choices we need to make?

9. What priorities should we assign to our business areas and subareas as we move towards the future?

10. What are the major operational implications of our future strategy, particularly in terms of financing, staffing, physical infrastructure, and organizational structure?

Strategic Planning

Strategic planning is a response to the inadequacies of the planning systems used in the 1950s and '60s. Financial planning approaches, such as the planning, programming, and budgeting system (PPBS) and zero-based budgeting, placed heavy emphasis on short-term efficiency at the expense of the long-term positioning of the organization. Traditional long-range planning, on the other hand, has relied on forecasting based on past trends, often leading to formulation of detailed multiyear blueprint plans which quickly became obsolete (Hanna 1985; Porter 1987).

The origins of strategic planning lie in the private sector of the United States. Its conceptual foundations go back to the work of the Harvard Business School in the 1950s to develop the best "fit" between an organization and its environment. One of the first major applications of strategic planning was the pioneering work in General Electric Corporation in the 1960s on ways of deciding how corporate resources should be allocated to different strategic business units (Hamermesh 1986). Since then several approaches have emerged under such titles as strategic planning systems, stakeholder management, strategic issue management, portfolio analysis, and competitive analysis. The use of strategic planning in the public and private nonprofit sectors, however, has been limited (Bryson and Roering 1987).

The definition of strategic planning follows from the definition of strategy given above. Accordingly, strategic planning refers to a process by which an organization develops the most desirable vision of its future, outlines the essential elements of a course it intends to follow to realize that vision, and provides a justification for the course identified. Regardless of how it is prepared, a strategic plan should include the basic components of strategy described above.

From a management standpoint, strategic planning is one link in an integrated institutional planning process. The strategic plan provides an essential overall framework for guiding the organization, but it is several steps away from action. The courses and directions laid out in the strategy need to be operationalized to set the stage for their implementation. This is usually referred to as operational or program planning. Finally, the implementation of both the strategic and the operational plan need to be monitored in order to learn from experience, to incorporate new developments, and to confirm the continuing appropriateness of the strategy.

Figure 1 illustrates the integrated planning process described above. The process is integrated in the sense that each component influences every other component. The strategic plan, which provides the starting point for the process, takes into account operational considerations, even in the absence of an operational plan. The operational plan follows from the strategy. The monitoring and control systems, on the other hand, help assess results and contribute to reformulation of strategic and operational plans (Below et al. 1987; Morrisey et al. 1988).

The operational plan covers a shorter duration than the strategic plan. In the private sector, strategic plans usually have a perspective of about five years and operational plans are prepared annually. Most of the centers within the CGIAR prepare strategic plans with a 10- to 15-year perspective. Two kinds of operational plans for centers are prepared in the CGIAR: a medium-term program covering a five-year period and an annual program budget.

The focus of an operational plan is on action plans and budgets. It translates the business-area goals and strategies contained in the strategic plan into programs and projects with shorter-term objectives. Monitoring and control systems, on the other hand, are designed to generate the information needed to assess performance at the institution, program, unit, and individual levels. In addition, they help assess the implications for the organization of trends and developments in the external environment.

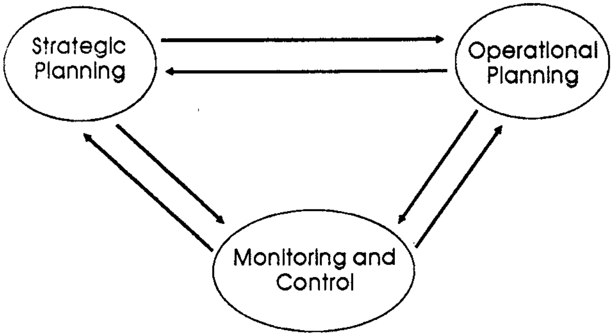

Figure 1. Integrated planning process

A Strategic Planning Process Model

In the final analysis, what matters for an organization is the content of the strategy, not the process used to formulate it. On the other hand, the process used is also important as it can serve purposes other than producing a plan. Also, one process may be more efficient than another. Because strategic planning is as much a crafting exercise as it is straightforward planning (Mintzberg 1987), no single process is likely to suit the needs of all organizations.

There are several useful process models that may be suitable to research organizations. A model by Below et al. (1987), for example, places strategic planning in the context of an integrated planning framework and provides detailed procedures for formulating a strategic plan. Another process model provides useful guidelines and practical advice to managers (Pfeiffer et al. 1985). A third, developed specifically for public and nonprofit organizations, has much to offer to research organizations (Bryson 1987).

The model I advocate, illustrated in Figure 2, captures the main arguments made in this paper. The process can be summarized as follows:

Planning to Plan (Box 1 in Figure 2)

I have singled this out as a separate task because of its importance. All the organizations I have worked with on strategic planning have found it useful to establish a strategic planning team (SPT) from within the organization. The SPT usually includes the top management team plus other key staff. The group should preferably be led by the chief executive officer. The size of the group can vary, but inefficiencies begin creeping in when it exceeds 12.

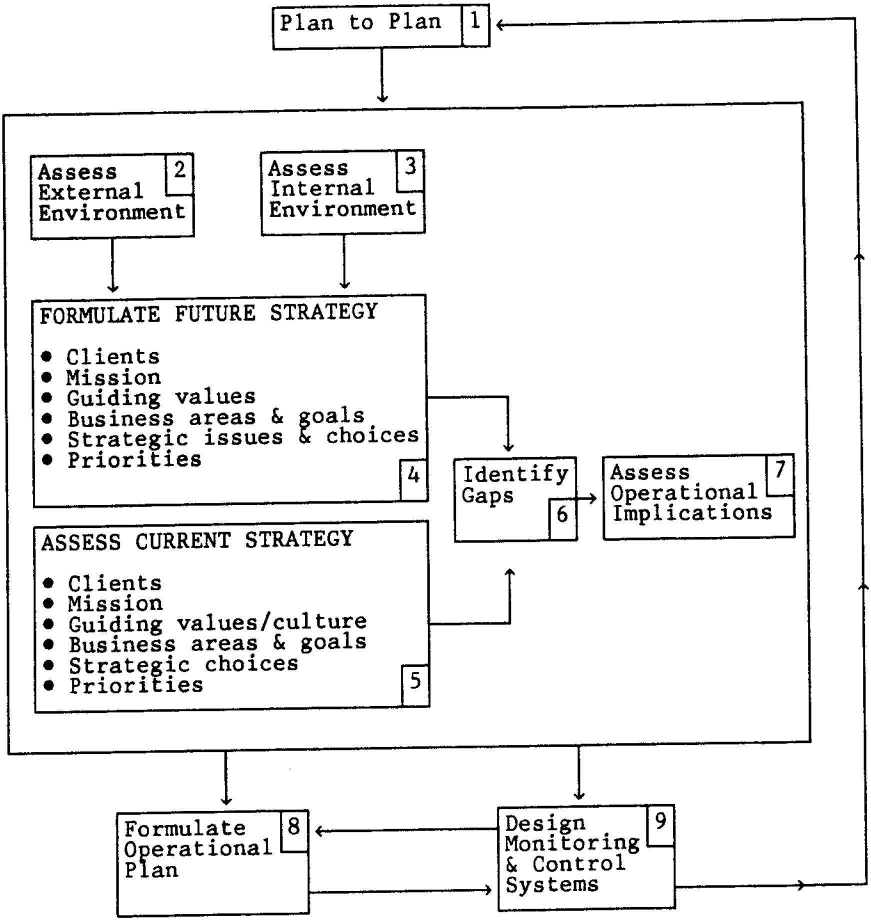

Figure 2. A strategic planning process model

It is useful for the SPT to go through a two- to three-day seminar and brainstorming session on strategic planning with the help of an external consultant. This session should aim at sensitizing the group to the concepts, rationale, and processes of strategic planning as well as establishing a common framework and a communication base. The key tangible output of this task is an organizational framework (including subcommittees and task forces) and an action plan for formulating the strategic plan. An important intangible output is the commitment of the members of the SPT to strategic planning and the roles they will play in implementing the action plan.

Formulating Future Strategy (Boxes 2-4)

I favor an iterative, zero-based approach to strategy formulation, where in the first iteration, the future strategy is formulated without reference to the current strategy. This increases the chances for the plan to be more future-driven than otherwise.

It is also useful for the SPT to consult widely with external groups, such as representatives of the clients, in the formulation of future strategy. Another is a group of outside experts who are knowledgeable about likely future developments in the businesses of interest to the organization and on the strategic issues that should be analyzed. Internal consultation with the staff not involved with the planning is also essential, in spite of the fact that this often increases the pressures for maintaining the status quo.

Assessing Current Strategy (Box 5)

This is particularly important for organizations with no written strategy or a monitoring/control system for assessing the implementation of the strategy. It is helpful to assess the current strategy in terms of the same components as in the future strategy.

Identify Gaps (Box 6)

Analysis of the differences between the current strategy and the first formulation of the future strategy helps identify major strategic changes, so that their organizational and operational implications can be studied.

Assessing Operational Implications (Box 7)

The SPT should study the major strategic changes identified in terms of their implications for financing, staffing, physical facilities, organizational structure, and culture change. These findings often lead to a reconsideration of the future strategy.

Formulating the Operational Plan and Designing the Monitoring and Control Systems (Boxes 8 and 9)

These represent the other two components of the integrated planning process described above and are shown in Figure 2 to illustrate their links with strategic planning. It should be reemphasized that the monitoring and control system needs to address operational as well as strategic concerns.

This would make the strategy a "living" document and alert the organization early on when there is need to reconsider the strategy-in-use.

Concluding Observations

One of the most important challenges facing research institutions is to find ways of encouraging strategic thinking at all levels of the organization. For organizations that have not gone through the experience, strategic planning helps initiate and motivate strategic thinking. This initial impetus should be reinforced and sustained by encouragement of continuous strategic analysis throughout the organization. Supporting the preparation of unit strategic plans can help instill organization-wide strategic thinking.

Formulating a strategic plan is costly; therefore, extreme caution should be exercised in choosing a planning process in order to avoid overplanning. Most decision makers are interested only in the main lines of an organization's strategy. Lengthy strategic planning documents often confuse the readers and could do more harm than good to the organization.

One of the purposes of strategic planning is to clarify and simplify why an organization exists and what would make it successful. This does not require creating a large planning bureaucracy or preparing thick planning manuals. The guiding members of an organization, i.e., those responsible for developing visions of its future, should be seen as its key strategic planners.

CIMMYT and several other international agricultural research institutions are currently engaged in formulating strategic and operational plans. In addition, CIMMYT intends to document the planning process it is using. Because the experiences of the centers is unique among nonprofit international organizations, stocktaking of the lessons learned will add to our current knowledge on planning.

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