# ORGANIZING FOR CHANGE: THE PHILIPPINE RAINFED UPLAND RICE PROJECT, A TEMPORARY COOPERATIVE SYSTEM FOR DEVELOPING AND DIFFUSING AGRICULTURAL KNOWLEDGE

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## ABSTRACT

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By

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This has been a case study on a non-formal education project, the "Rainfed Upland Rice Project" (RURP), in the Philippines. The project was a cooperative undertaking of three organizations, namely: the International Rice Research Institute (IRRI), the Bureau of Agricultural Extension (BAE), and the National Food and Agricultural Council (NFAC). The need for the project stemmed from: the recognition of the potential for additional rice production on rainfed and upland areas which were about four times larger than the irrigated areas in which most rice had heretofore been produced in the Philippines; the inability of farmers on irrigated areas to supply the food requirement of the country; and the need for innovative institutional arrangements to facilitate knowledge development and dissemination required by the changing nature and pressing problems of the time.

The subject of the study had been conceptualized as an instance of cooperative, temporary and open systems. It was cooperative because three organizations created and managed it, and provided its resources. It was temporary because it had a brief, predetermined life span. And it was an open system because it carried on input-output transactions with its environment.

The purpose of the study was exploratory and descriptive. Through a normative analysis, it investigated goodness of fit between a pre-constructed theoretical framework and a living case. The research problems of the study were expressed in the following questions:

1. What are temporary systems and what are their characteristics?

2. What is organizational cooperation, what are its characteristics, and what are the inducements or stimuli for its occurrence?

3. What are open systems and what are their characteristics?

4. What are likely consequences of a cooperative temporary system to its parent organizations and to other systems as well as to individuals involved?

5. Why are temporary systems resorted to by formal organizations?

6. Why is a cooperative arrangement employed by formal organizations?

A combination of literature and field research was employed to obtain answers to the research problems. In the field work, research techniques included in-depth personal and panel interviews, content analysis of printed materials, personal and participant's observations, and use of questionnaires.

The findings and conclusions of the study are of two parts: those that reflect the degree of correspondence between the prior normative framework and the field observation, and those that reflect on the deviations.

Correspondence Between Theory and Case

1. The RURP has manifested the basic defining characteristics of temporary systems such as: (a) a definite tenure; (b) a competency and expertise-based personnel recruitment; (c) a specific and narrowly defined problem; (d) a limited size and territoriality; and (e) a free and open communication pattern within the system.

2. The RURP has displayed characteristics of organizational cooperation. It was jointly created and managed and resources were jointly provided by the parent organizations.

3. Two types of inducements or stimuli for cooperative arrangements between organizations were identified: (a) environmental -- other organizations, a perceived rice crisis and a shift in rice research emphasis; and (b) organizational -- shared organizational missions, resource and function complementarities, perception of mutual benefits and promoters or change agents.

4. Six information categories have established RURP as an open system: (a) statement of end-state; (b) specification of domain; (c) supra-system; (d) inputs; (e) transformation component; and (f) outputs.

5. As a cooperative temporary system, the RURP has yielded both functional and dysfunctional consequences on its parent organizations, other systems, and on itself. The functional consequences have included: generation of rice production knowledge and technology, development of production prototypes and training of personnel. The dysfunctional consequences have included conflicts in personal and organizational relationships.

6. The RURP was established as a temporary system for the following reasons: (a) to generate institutional innovation, (b) to tap external temporary funding, and (c) to test and teach a dynamic novel technology.

7. The RURP was established by the three organizations as a cooperative arrangement in response to common opportunities in and demands of their task environments.

<u>Deviations Between Theory and Case: Additional Conclusions</u>

1. Certain cultural factors affected formation, behavior, and consequences of RURP.

2. The need to observe international rules of propriety influenced an international organization to establish cooperation with local agricultural agencies.

3. Attention to and concern for attainment of individual needs within the organizational system was an inducing force for adaptive organization behavior.

4. Change agents' effectiveness was related to: nationality of the change agent, his access to resources, personality, dedication, access to influential networks for communication and change agentry skills.

These findings suggest application to agricultural and other non-formal education of what organization development scholars and practitioners are saying concerning the need for, consequences of, and conditions for creating temporary systems and interorganizational cooperation. In this information, knowledge and technologically-riched time, environmental facets of organizations are in constant motion. Under this condition, the existing bureaucratic formal organizations are inappropriate because their value system is oriented to stability and they tend to develop lives of their own. Currently, flexibility and adaptability are required for effective functioning of organizations.

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The cooperative temporary pattern of organization represents an emerging alternative in domestic and international technical assistance. In this pattern, new knowledge resources can be generated and old ones more fully utilized; organizational innovation developed and adopted; organizations mutually supporting each other hence organizational goals mutually achieved; individual's needs satisfied and in the ultimate overall institutional performance enhanced.

In summary, this study provides empirical support to the notion of ad-hoc systems and to the establishment of interorganizational interfaces, linkages, and cooperatives for generating and diffusing knowledge and technology toward developmental ends. This emerging organizational strategy presents an innovative organizational tool for helping solve mankinds mounting problems of meeting the food and educational needs of the growing population.

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## CHAPTER I

## INTRODUCTION

### Nature, Purpose, and Problem of the Study

> Our society is an organizational society, we are born in it, educated by it, and spend much of our leisure time paying, playing, and praying in it.
>
> Amitai Etzioni[1]

> The more rapidly the environment changes, the shorter the life span of organizational forms. In administrative structure just as in architectural structure, we are moving from long-enduring to temporary forms, from permanence to transience. We are moving from bureaucracy to adhocracy.
>
> Alvin Toffler[2]

> At the same time that specialization is destroying the common conscience, it creates the possibility of a new "organic" solidarity based upon mutually recognized interdependence . ... In the modern period of specialization, the one desideratum that overshadows all others in importance is cooperation.
>
> Victor A. Thompson[3]

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[1] Amitai Etzioni, Modern Organizations (Englewood Cliffs, N.J.: Prentice-Hall Inc., 1964), p. 1.

[2] Alvin Toffler, Future Shock, (New York: Bantom Books, 1970), p. 136.

[3] Victor A. Thompson, Modern Organization (New York: Alfred A. Knof, 1961), pp. 178-179.

One of the imperatives of modern living is that we maintain flexibility and adaptability in our social organizations. We create organizations to facilitate work, to become more efficient in producing necessities, and to serve as settings for fulfilling life's aspirations. We become increasingly dependent upon them. But once created they tend to develop lives of their own. They have maintenance needs. They consume resources. They come to govern the lives of people. And they resist change. In a rapidly changing world, as new problems and possibilities emerge and old ones become newly urgent, the life-dominating, energy-consuming, change-resisting tendencies of agencies and institutions must be countered.

In the recently revived field of non-formal education,[1] adaptability of institutions and programs is recognized as essential. Kleis et al note that non-formal education is distinguished from formal education not by the absence, but by the non-centrality and non-fixedness of form -- by the subordination of form to other

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[1]Kleis et al, define non-formal education as "any intentional and systematic learning enterprise, usually outside of traditional schooling, in which content, method of instruction, time units, admission criteria, staff, facilities and other system components, are chosen or adapted to maximize attainment of specific learning missions."

considerations such as student needs and interests and the maximum attainment of learning missions.[1]

In technical assistance, either domestic or international, changes in policy and structure of organizations are often as necessary as changes in technology. Shortfalls in development are frequently due more to organizational than to technological factors.

Perceptive social analysts like John W. Gardner[2] and Peter F. Drucker[3] have suggested that innovation and adaptation should be the way of life of contemporary social organizations because of the increasing complexity and changing nature of society. As Drucker says, "today the old basic institutions of human society - the government, the armed forces, the school - have been converted from organs of preservation into organs of innovation ... Innovation is more than a new method. It is a new view of the universe."[4]

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[1]Russel J. Kleis et al., "Toward a Contextual Definition of Non-Formal Education," Non-Formal Education Discussion Papers No. 2, Michigan State University, 1973.

[2]John W. Gardner, Self-Renewal: The Individual and the Innovative Society (New York: Harper Colophon Books, 1963).

[3]Peter F. Drucker, Landmarks of Tomorrow: A Report on the New "Post-Modern" World (New York: Harper Colophon Books, 1957).

[4]Ibid, p. 18.

It is one thing to require adaptation; it is quite another to achieve it. Two general strategies have generally been employed in pursuit of it. The first involves direct efforts to change missions and practices of established institutions. The second involves establishment of new institutions. Either strategy may succeed; the incidence of conflict, inefficiency, excessive cost and failure has been high for each.

A third alternative is emerging. It applies two notions in the field of organizational development: temporary organizations (systems)[1] and organizational cooperation. It involves creation of special temporary units, often through cooperation of two or more established organizations, to perform such functions as exploration, experimentation, development of prototypes and testing and demonstrating of new models.

Instances of this third alternative led Warren G. Bennis to predict, in 1965, that social organization in the next twenty five to fifty years would be characterized by adaptive, rapidly changing temporary systems.[2] He based his prediction on the "... evolutionary principle that every age develops an organizational form

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[1]In this study an organization is treated as a system, therefore the word system is often used when referring to organization.

[2]Warren G. Bennis, "Beyond Bureaucracy," Trans-action, June/July, 1965, pp. 31-35.

appropriate to its genius." In 1969, only four years later, Bennis wrote that what he had predicted in 1965, had become a routine visible in the aerospace, construction, drug, and consulting industries, as well as professional and research development organizations.[1] It is beginning to appear in education and international development enterprises.

This dissertation is a report of a normative analysis of such a model as it was applied for facilitating adaptation in formal organizations concerned with economic development and extension education. Two adaptive strategies were employed and have been examined: (1) creation of a temporary or ad-hoc organization and (2) cooperation among established organizations in the process. It has been assumed that adaptive behavior is characteristic of, though typically resisted by, open organizational systems.

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[1] Warren G. Bennis, "Post-Bureaucratic Leadership," Trans-action, July/August, 1969, pp. 44-51.

## The Rainfed Upland Rice Project (RURP)[1]

The subject of this study The Rainfed Upland Rice Project (RURP) of the Philippines has been treated as a case of a temporary, cooperative, open organization. Its creation is posited to have been an adaptive behavior of its parent organizations. It was selected because it represents an instance of organizational innovation, the instrument for which was a cooperative temporary system.

The RURP has been regarded as an important innovative arrangement in the agricultural sector in the Philippines. It was a cooperative or joint undertaking among the International Rice Research Institute (IRRI), the Philippine Bureau of Agricultural Extension (BAE),[2] and the Philippine National Food and Agricultural Council (NFAC). It has performed the functions of: (1) testing emerging rice technology under actual farm conditions; and (2) developing an effective non-formal education scheme to promote the

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[1]Originally the project was called "International Rice Research Institute and Agricultural Productivity Commission Cooperative Rainfed Rice Project." The Memorandum of Understanding which formally created the project stated that the project will take effect on April 1, 1971 and will terminate on April 30, 1976, unless extended for a longer period by the parties concerned.

[2]In 1970 when the project was initiated, this agency was called the Agricultural Productivity Commission (APC). It was given its present name in the early part of 1973.

adoption of tested technologies. Thus, this project has great potential significance for increasing food production, for the role of non-formal education in attaining this end, and for other innovative efforts in developing countries.

The objective of RURP was twofold. First, to evaluate the transferability of a number of emerging rice technologies previously tested under canal-irrigated condition into rainfed and upland conditions. The second objective was to use the information obtained in the experimental phase in a pilot extension scheme to be conducted in one province. Eventually, the proven practices will be recommended to other rice-growing areas.

The need for this cooperative pilot project grew out of: (a) the recognition of the potential of rainfed and upland farms which constitute a larger area than the canal-irrigated farms as additional rice producing sectors, (b) the inability of the current Philippine production areas and practices to meet the national requirement, and (c) the need for a prompt and specific thrust which required significant changes in both technology and institutional arrangements. Until this project, the thrust of Philippine rice research and action programs was largely on the canal-irrigated farms where pay-off was believed to be higher and more predictable and immediate.

The cooperative structure of the project lies in the contributions of and the allocation of responsibilities among the organizations involved. The IRRI provided: (1) operating funds for research supplies, equipment, vehicles, incentive pay to technicians, and insurance and (2) applied research leadership in preparation of project plans, management of field experiments and data analysis. The Philippine government, represented by the BAE and the NFAC, provided: (1) the applied research and extension personnel and (2) field office space. Field leadership and supervision were shared between designated IRRI junior level staff and representatives of the Philippine government agencies.

The specific project activities were accomplished in four phases. First, a number of field experiments were conducted in five municipalities. These were done on farmers' fields under direct management by field technicians, and with the help of farm operators. The second phase was a pilot extension effort. The practices in phase one which were considered superior were promoted in phase two. Technicians for the phase two operation were trained on the technology developed in phase one. More municipalities were targeted for this phase and the objective was extensive farmer adoption. The final phase was technology dissemination to other regions of the country. This was, however, contingent on the acceptance of the package of technology and the extension scheme originating from the first two phases, by the national policy makers in the agricultural sector. Thus the third phase was a communication campaign directed at the policy makers by the project management with assistance from a pesticide company. In the fourth and last stage some project personnel were used in: (a) training of technicians in other regions, (b) packaging of information into suitable forms, and (c) feeding information to popular mass media channels.

RURP has represented a special type of temporary system, namely a cooperative temporary system. It was cooperative because it was created by the three organizations following a process of negotiations in which they agreed to do the project jointly and in which responsibilities and obligations were shared among themselves. It was temporary in the sense that its life span was pre-determined, personnel were assigned to it on special detail basis, and the problem that it worked on was specific and limited. Also, it was an open system because it carried on transactions with other systems in the environment by taking in inputs from them and also by producing outputs to be used by other systems.

## Need for the Study

This subject has been regarded as significant in view of the increased emphasis on new alternatives for structuring and organizing technical assistance, both in the domestic and international scenes. In the past, two strategies have been mostly employed. First, is the use of existing organizational systems to undertake a mission or mandate. Second, is the creation of new institutions. Both strategies have proven costly and only partially effective, due to change resistant tendencies of bureaucratic organizations. Recent experience, as reported in the literature on organizational development, points to a third alternative - the employment of cooperative temporary structures. The defining features of this alternative are: (1) the scheme is ad-hoc in nature and based on a delimited problem or issue; and (2) it is set up by at least two organizational systems which jointly and cooperatively provide resources and manage the system.

The need for this investigation on cooperative temporary system has been seen from two perspectives; the theoretical and the practical. On the theoretical front, it was recognized that in spite of the relative commonness of temporary systems in the modern world, they have remained relatively unexplored.

Seymour B. Sarason in writing about the "creation of settings" which he defined provisionally as "any instance in which two or more people come together in new relationships over a sustained period of time in order to achieve certain goals," said:

> This book is about a set of related problems which, despite their frequency and importance has remained relatively unrecognized, and undiscussed to a surprising, if not amazing degree. This is not because individuals have not experienced these problems in the most poignant ways or because society does not consider them to have fateful significance.[1]

More investigation is needed to increase our understanding of this currently expanding trend of organizational structure. We need to develop this as a theoretical area in order to generate testable propositions. There is a need to enhance our understanding of its genesis, the elements vital to its performance, performance criteria and the means for measuring performance.

The rich literature on the traditional bureaucratic organization model as put forth by Weber and many others, and the growing literature on the more recent Institution Building model as activated by the Inter-University Research Program in Institution

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[1]Seymour B. Sarason, The Creation of Settings and the Future Societies (Washington: Jossey-Bass Inc., 1972), p. 1.

Building,[1] are not adequate to analyze and explain the current trend of temporary and cooperative systems. E. G. Bogue has argued that the Weberian model of bureaucratic organization is not appropriate for analyzing and explaining "disposable organizations" (another label for temporary systems).[2] He has offered the following reasons: (1) the traditional models do not account for informal structure, they assume static patterns of line and staff relationships, and (2) they do not encourage an open system view of the organization and its environment.

In industry, William H. Read has pointed out that the bureaucratic tradition is becoming outmoded in the midst of present technological changes. He has said:

> The contemporary modern executives should now be willing to entertain the idea that the current system or pattern of managerial action (bureaucratic model) is rapidly becoming outmoded

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[1]The universities involved in this undertaking are: Indiana, Michigan State, Syracuse, and Pittsburg. The research headquarters is located at the University of Pittsburg. Two important books have been published with some connections to this project: Joseph W. Eaton (ed.), Institution Building and Development: From Concepts to Application (Beverly Hills: Sage Publications, 1972); and Melvin G. Blase (ed.), Institution Building: A Source Book, (Agency for International Development, US Department of State, 1973).

[2]E. G. Bogue, "Disposable Organizations," Phi Delta Kappan, October, 1971, p. 94-96.

> and considerably overemphasized. Irresistible pressures are now being exerted on corporations, even moderate-size ones, to change. The pressure stems chiefly from technological change.[1]

The Institution Building (IB) model is relevant but not entirely applicable to the basic concerns of this study. The relevance rests on its preoccupation with innovation and institutional reform. Central to the IB argument is that induced innovation requires the vehicle of formal organization.[2] It is in this spirit that IB is unsuitable as a model for studying temporary systems. As William J. Siffin points out, IB _is_ organization building, and its success is partly measured in its survival ability in the environment.[3] This presents an additional handicap of IB as a model for this study because the nature of the social organization with which we

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[1]William H. Read, "The Decline of the Hierarchy in Industrial Organization," _Business Horizons_, Fall, 1965, p. 71.

[2]Milton J. Esman, "The Elements of Institution Building," in Joseph W. Eaton (ed.), _Institution Building and Development: From Concepts to Application_ (Beverly Hills: Sage Publications, 1972), p. 25.

[3]William J. Siffin, "Institution Building As Vision and Venture: A Critique," in Eaton (ed.), _op. cit._, p. 44.

are concerned is transience rather than stability; adhocracy rather than bureaucracy.

Quite separate from the issue of the nature of temporary systems is the problem of inter-institutional relations, particularly inter-institutional cooperation. Victor A. Thompson has pointed out that specialization creates a situation demanding interdependence among organizations.[1] Burton R. Clark, after studying inter-organizational patterns in education expressed the need for a theory of confederative organization or organizational alliance.[2]

On the practical front this investigation is aligned with alternative patterns of organization for developmental purposes along lines of institutional reform that have characterized technical assistance since the 1950s. Thompson argues for creativity in reforming bureaucracies. He says, "there is a growing feeling that modern organizations, and particularly the large, bureaucratic business and government organizations, need to increase their

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[1] Victor A. Thompson, op. cit., p. 1-9.

[2] Burton R. Clark, "Interorganizational Patterns in Education," Administrative Science Quarterly, Sept. 1965, p. 233.

capacity to innovate."[1] R. S. Milne, after reviewing important works of public administration in developing countries, concluded that public administration in those countries, despite the technical aid and assistance provided by the Western countries, is largely inadequate.[2]

A frequent constraint of development in the lesser-developed countries is the ineffective organizational arrangements for implementing the developmental process. Often, it is the counter-productive processes of institutional conflict, inter-agency bickering, and rigidity that occupy the attention and consume the resources of national agencies. New models of organization are clearly needed for productive working relationships.

The increasing number of international research centers in the world not only in agriculture but in medicine, population, education, and politics as well bring added significance to the effort to increase knowledge of models for effective institutional and organizational arrangements between them and local national agencies.

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[1]Victor A. Thompson, "Bureaucracy and Innovation," Administrative Science Quarterly, Vol. 10, No. 1, June 1965, p. 1.

[2]R. S. Milne, "Mechanistic and Organic Models of Public Administration in Developing Countries," Administrative Science Quarterly, Vol. 15, No. 1, March 1970, pp. 57-68.

The field of international assistance, viewed traditionally as a paternalistic relationship between a donor system and a receiver system should be re-examined. A number of scholars and practitioners have suggested that it should be viewed as a two-way interaction between two systems, each with inputs into the process, and each deriving some form of benefits. This philosophical and theoretical position implies practical avenues of restructuring working relationships between interacting systems which are helping each other achieve certain goals.

A special arena of application for this investigation is the emerging field of non-formal education. There a major concern is the search for organizational and institutional arrangements for its development as a legitimate field of study as well as its employment in the overall development of nations. At the first international conference and workshop on non-formal education held at Michigan State University, April 24 to May 2, 1974, one of the problems was how to develop the field of non-formal education within a given country. Several mechanisms, some of them temporary system type, were presented and analyzed.

This study has touched on the above issues in hope that some light, however modest, might be shed upon them. It has examined one ad-hoc system for enhancing knowledge utilization, particularly through reduction of the utilization gap and hastening the flow of agricultural technology from the point of origin to wider utilization, sometimes called socialization of knowledge.[1] Of particular concern has been the role of temporary and cooperative linkage systems in association with an international research center, in expediting organizational adaptation, an often critical factor in knowledge dissemination and utilization.

## Research Methodology

Blau and Scott, in discussing the study of organizations, summarize appropriate social research methods in terms of:[2]

| | | | |
|---|---|---|---|
| Purpose: | (1) Exploratory | (2) Descriptive | (3) Hypothesis testing |
| Design: | (1) Sample survey | (3) Controlled experiment | (3) Field study |
| Techniques: | (1) Observation | (2) Interview | (3) Examination of records. |

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[1] Yujiro Hayami and Vernon W. Ruttan, Agricultural Development: An International Perspective (Baltimore: The John Hopkins Press, 1971), p. 57.

[2] Peter M. Blau and W. Richard Scott, Formal Organizations (San Francisco: Chandler Publishing Co., 1962), p. 15.

The purpose of this study has been exploratory and descriptive in nature, not to test specific hypothesis but to examine goodness of fit between a pre-constructed theoretical framework and data from a living case. The theoretical framework (which is shown in the next chapter) was formulated using a set of concepts drawn from the fields of social organization, systems, and organizational behavior.

The unit examined in this study has been a case, the RURP. The design of the study can then be considered a field study of a case or, more simply, a case study. A case study is an approach to get multi-observations on a single unit in a relatively thorough manner. It is "an intensive research whose purpose is description or comparative analysis."[1] Blau and Scott point out that field study is a typical research design employed in the study of organizations because this approach is well adapted for providing a map or systematic picture of an organization and provides information about the interdependence of its constituent parts.[2]

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[1]Larry Kincaid and Everett Rogers, "Guidelines for Case Studies of the Information, Education and Communication Components of Population/Family Planning Program," East-West Communication Institute, University of Hawaii, Mimeographed, 1973.

[2]Blau and Scott, op. cit., pp. 15-20.

Blau and Meyer cite four characteristics of case study method of studying organizations. They are: (1) it is not necessarily qualitative; (2) it incorporates a wealth of data about one organization; (3) it does not require the investigator to specify detailed hypotheses in advance; and (4) conclusions are reached by observing sequences of events and imputing causal nexus to them.[1]

The techniques employed have been interviews, direct observation, and examination of documents and records. As Blau and Scott observe, a major advantage of a field study is that it lends itself to combined use of a variety of data gathering procedures such as these. This interlocking of methods provides a cross check on biases by "bringing into juxtaposition two or more sets of data on the same problem."[2] As cited by W. Charles Redding, Daniel Katz declares that "this type of study provides a great deal of information about a community or culture with remarkable economy of effort ... and has potential for discovering significant variables and basic relations ..."[3]

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[1]Peter M. Blau and Marshall W. Meyer, Bureaucracy in Modern Society (New York: Random House, 1956), p. 84.

[2]Blau and Scott, op. cit., pp. 15-20.

[3]W. Charles Redding, "Research Setting: Field Studies," in Philip Emmert and William D. Brooks, (eds.) Methods of Research in Communication, (Houghton Mifflin Co., 1970), p. 148.

In talking about the methodology in their study of the International Typographical Union, Seymour M. Lipset et al., identify two modes of analysis in case study method in social research.[1] The first, they call "particularizing." Here, previously known generalizations are used to make particular statements about a case, concerning its present state, and the dynamics through which it functions as it does. The other they call "generalizing." Here the process is reversed and the researcher attempts to utilize the particular case as empirical basis for generating general theoretical statements. This case study has employed Lipset's first mode. Its approach has been that of normative analysis.

## Theoretical and Operational Research Questions

Basically, the nature of the study has been both descriptive and exploratory. The normative analysis has yielded: (1) a description of the case (RURP) using a normative framework of temporary systems, organizational cooperation, and open systems view of organizations, and (2) an exploration of some theoretical underpinnings about the RURP, as a case of temporary structures, organizational cooperation, and open systems.

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[1]Seymour M. Lipset, Martin A. Trow and James S. Coleman, Union Democracy (New York: Free Press, 1956), pp. 419-420.

The research has had two phases. The first set the norms for analysis of the case. What are temporary systems? Why are they resorted to by formal organizations? What is an organizational cooperative arrangement and why do formal organizations employ it? And what are open systems? The second phase involved the collection of information about the case and the description and analysis of it, using the norms developed previously.

A list of operational questions has directed the gathering of materials necessary to carry out the stated purpose of the study. These questions were designed to yield information for setting the norms and for an expository description and analysis of the subject, as well as to generate data for the exploratory analysis. Mediating the operational questions and the actual data collection has been the theoretical framework found in Chapter II.

## Setting the Norm

Answers to the following questions were derived from the review of related literature.

1. What are temporary systems and what are their characteristics?

2. What is an organizational cooperation, what are its characteristics, and what are the stimuli that influence its occurrence?

3. What are open systems and what are their characteristics?

4. What are likely consequences of a cooperative temporary system to its parent organizations and to other systems and to individuals involved?

5. Why are temporary systems resorted to by formal organizations?

6. Why is a cooperative arrangement employed by formal organizations?

## Description and Analysis

The answers to the following questions were collected from the field study conducted on the case (RURP).

1. What was RURP and what were its objectives, its structure and its principal and relevant characteristics?

2. Under what prevailing general socio-economic-political conditions or setting was the project created?

3. What organizations were involved in the formation of RURP? What were they like on the dimension of history, purpose, functions, doctrine, programs, and scope of work?

4. How was the RURP created?

5. What were the developmental stages that the project went through? What circumstances and forces affected the process?

What significant problems and issues confronted the project and how did these affect the course of events?

6. Why was the temporary pattern of organization created by the organizations concerned to undertake the given task?

7. Why did the sponsoring organizations employ a cooperative mechanism for setting up the RURP?

8. What consequences did the RURP have for its parent organizations and for other systems?

9. What were the inducements or stimuli for its creation?

10. Did the RURP meet the expectations of its parent organizations?

11. How fully did it fit the normative framework derived from the postulates of organizational theory?

## Definition of Terms

The following key concepts and terms are frequently employed in this study.

1. Agricultural Extension Phase - the series of activities such as field tours, farmer's seminars, use of radio, distribution of leaflets, field days, and supervised credit done in designated Bulacan municipalities. These activities were designed to obtain farmer adoption of rice technology based on applied research.

2. Agricultural Production System - a process that is essentially one of facilitating and managing biological growth under varying conditions of climate, weather, plant nutrients, pests, diseases, and other factors.

3. Applied Research Phase - the specific experiments or research activities conducted on farmers' fields in the four municipalities in Bulacan province and one municipality in Nueva Ecija.

4. Bureaucratic Orientation - behaviors or activities of formal organizations that tend to maintain the traditional functioning of the system particularly as related to the internal administrative apparatus.

5. Consequences - the changes that occur within the relevant systems as a result of decisions, activities and products of the project.

6. Cooperative Organizational Strategy - a type of inter-organizational relation in which parties involved agree to (a) exchange elements or do things jointly and (b) share responsibilities in the undertaking.

7. Domain - the specific goals an individual or institution is to pursue, the clientele it is to serve and the function it is to perform.

8. Domain Overlap - similarity or commonality in goals, functions, clientele, or their combinations. Also called convergence of interest.

9. End-State - the goals or objectives set out for an individual or institution as written in documents or from oral statements.

10. Formal Organization - a social system which is formally and deliberately established to achieve certain goals, with designated rules, defined roles, and an identity of its own.

11. Inputs - are the elements supplied to an organization by its parent organizations or other parts of its environment.

12. Irrigated Rice Culture - a system of rice growing in which application of water from an impounded supply, usually through a canal system, can be controlled by the farmer.

13. Mission (organizational) - the end state or articulated set of end-states which are considered desirable.

14. Mutual Benefit - the respective benefits and rewards derived by each interacting organization in an exchange process.

15. Open System - any integrated entity that has purpose, takes-in inputs from its environment, processes the inputs through the coordinated actions of its sub-systems, and produces outputs that are disposed to the environment.

16. Outputs - products of a system which are disposed to its environment. Specifically for the RURP outputs consist of services rendered to supra-systems (parent organizations) and other systems; information generated from field research and experience; new knowledge, skills, techniques, and attitudes gained by project participants; and a prototype or a scheme based on field research and experience.

17. Pilot Project - any temporary program or system, established for the purpose of testing or demonstration and with potential for future extension, transfer and dissemination of findings and recommendations.

18. Antecedent Relationships - prior interactions, dialogues, joint projects, and consultations between organizations. Regarded as a condition that induces organizational cooperation.

19. Promoter/Organizer/Leader - an individual who gets things moving toward the setting up of a venture. Usually perceives the status quo as inadequate and is motivated to do something to improve or change it.

20. Rainfed Rice Culture - a system of rice growing in which the water that supports plant life can not be impounded except in the immediate growing areas, can be supplied only by

intermittent rains and is subject to only modest control by the farmer. Bonds are often built around the growing area to gather and hold rainfall.

21. Supra-System - the organization systems to which the specific system is responsible, to which it reports, and for which it performs functions.

22. Task Environment - elements in the environment of an organization which are relevant to goal setting and goal attainment. For this study, three elements are considered: agricultural production system, agricultural institutions, and the nature of rice production technology.

23. Technology - the process of using knowledge for the physical transformation of things.

24. Temporary System - an organizational unit in which the members know from the outset that the organization is not permanent; it ordinarily deals with a specific problem area or issue; it is usually isolated socially and physically from ordinary operations of formal organizations that support it; and its members are brought-in on the basis of talent and expertise.

25. Transformation (conversion) process - the act of changing an input into a product.

26. Upland Rice Culture - a system of rice growing in which water supply is from rainfall alone, cannot be impounded even in the growing area, and is not subject to control by the farmer.

## Overview of the Dissertation

The dissertation has six chapters. The research subject is briefly introduced in Chapter 1, so are the purpose, problem, need of the study, theoretical and operational research questions, definition of terms, and methodology of the study. The points of departure or the conceptual materials for the theoretical framework are drawn from a review of literature and are presented in the beginning of Chapter II. The normative framework is presented in the later part of the same chapter. This framework has served as the perceptual mold to gather, order, understand, and interpret the data of the study. The research procedures - techniques of data collection, type of data collected, the sources of information, and the overall approach used in the research are presented in Chapter III. Chapter IV presents a description of RURP, particularly its antecedents, genesis, structure, process, further development, and impacts. The fitting of the observations to the normative framework is done in Chapter V, "Analysis and Discussion." There, the observations are sorted out, connected, and explained through the mediation of the normative schema presented in Chapter II. Chapter VI presents the summary, conclusions, and implications of the study. The summary section reviews the dissertation with a condensation of what the study set out to do, the normative framework used, how the research was done, the subject description and other findings. Then judgments are rendered and conclusions presented regarding the fit between the norms and the "reality." Propositions based on the norm-reality fit are to be found in this final chapter, as are the implications for practical application and further research.

# CHAPTER II

## SURVEY OF THE LITERATURE AND NORMATIVE FRAMEWORK

Four major segments of literature are reviewed in this chapter. Three of them contribute to the mainstreams of theory and concept which are later used in the conceptualization of the subject. The first is a selection of works on social organization including formal organization, bureaucracy, bureaucratic orientation of organizations and temporary systems. The second is a set of studies on organizational adaptation including analysis of organizations as systems, and organizational relations. The third is concerned with task environment and the interaction of open systems with it. The fourth deals briefly with elements of agricultural organization, the nature of the agricultural process, and the nature of and advances in rice production technology. These represent the task environment and are important considerations in the creation and behavior of the Rainfed Upland Rice Project (RURP) - the cooperative, temporary and open system under study.

## Social Organization

Blau and Scott define social organization as:

> ... referring to the ways in which human conduct becomes socially arranged, that is, to the observed regularities in the behavior of people that are due to the social conditions in which they find themselves rather than to their physiological or psychological characteristics as individuals.[1]

Talcott Parson views a social system as a pattern of interaction of a plurality of actors, in which the action is oriented to rules which dictate role behavior and sanction. He continues to say that a system has determinate internal organization and determinate patterns of structural change. Roles, to Parsons, are the elementary units of social systems which are differentiated and allocated within it.[2] An organization as a social system is defined by Parsons as follows:

> Organization is a social system which is organized for the attainment of a particular type of goal; the attainment of that goal at the same time is the performance of a type of function on behalf of a more inclusive system, the society.[3]

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[1]Blau and Scott, op cit., p. 2.

[2]Talcott Parsons and Edward A. Shils (eds.), Toward a General Theory of Action (New York: Harper and Row, 1951), p. 190.

[3]Talcott Parsons, Structure and Process in Modern Societies (The Free Press of Glencoe, 1960), p. 56.

Social organization may be either formal or informal. Blau and Scott identify the defining characteristics of a formal organization as follows:

1. The people are organized into social units.

2. It is formally and deliberately established for the explicit purpose of achieving certain goals, i.e., it did not spontaneously emerge.

3. Procedures are designed to govern the relations among the members and duties are formulated which each member is expected to perform.

4. Once firmly established, the organization tends to assume an identity of its own which makes it independent of the people who have founded it or of those who constitute its membership.[1]

### Organizations as Systems: Closed and Open

A most productive analytical mode for viewing organizations is the concept of systems. F. E. Emery and E. L. Trist have this to say regarding the usefulness of such a framework:

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[1]Peter M. Blau and W. Richard Scott, Formal Organizations (San Francisco: Chandler Publishing Co., 1962), pp. 2-5.

> In a general way it may be said that to think in terms of systems seems the most appropriate conceptual response so far available when the phenomena under study - at any level and in any domain - display the character of being organized, and when understanding the nature of interdependencies constitutes the research tasks.[1]

System theorist Allport provides a comprehensive definition of a system:

> ... any recognizably delimited aggregate of dynamic elements that are in some way interconnected and interdependent and that continue to operate together according to certain laws in such a way as to produce some characteristic total effect ... they may be complex; they may be made up of interdependent sub-systems, each of which, though less autonomous than the entire aggregate, is nevertheless fairly distinguishable in operation.[2]

Robert Chin views a system as analogous to drawing a large circle with elements, parts, variables inside it as the components and all components interconnected by lines. The lines may be thought of as rubber bands which stretch as forces increase or decrease. In order to specify what is inside or outside a system, there is need to define its boundary by deciding which variables

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[1] F.E. Emery and E.L. Trist, "The Causal Texture of Organizational Environments," Human Relations, Vol. 18, No. 1, February 1965, p. 21.

[2] F.H. Allport, Theories of Perception and the Concept of Structure (New York: Wiley, 1955), p. 469.

are being focused upon. So the boundary of a system is conceptually determined by the creator of that system.[1]

A system, then, is taken to be (a) a collective body of (b) distinguishable components (c) which are interdependent, and related to the whole by means of (d) functions that they perform towards the attainment of defined goals and (e) possessing a boundary that defines what is and what is not within the collective unity.

Organizations may be viewed as either closed or open systems. The classical organization theories such as that of Weber on bureaucracy, Taylor on scientific management,[2] and Gulick and Urwick on administrative leadership,[3] assume a closed character of organization. This view of organization further assumes that organizations are determinate systems and that the

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[1]Robert Chin, "The Utility of System Models and Developmental Models for Practitioners," in W. G. Bennis, K. D. Benne and R. Chin, The Planning of Change (New York: Holt, Rinehart and Winston, Inc., 1961), p. 300.

[2]Amitai Etzioni, Modern Organizations (Englewood Cliffs, N.J.: Prentice Hall Inc., 1964), p. 21.

[3]Ibid., p. 22.

circumstances of their existence are fixed. This suggests that the variables are few in number, that it is possible to have control over them, or that one can reliably predict all of their relations. Thompson refers to this model of organization as a rational model. A rational model of organization, he says:

> . . . results in everything being functional - making a positive, indeed an optimum, contribution to the overall result. All resources and their allocation fits a master plan. All action is appropriate action, and its outcomes are predictable.[1]

An extreme example of a closed system is the laboratory experiment in a physical science. The elements are not presumed to relate to or make exchanges with their environments.

Von Bertalanffy introduced the concept of openness and closedness of systems as a means of distinguishing living organisms from inanimate objects. He showed that the energic transaction between the organism and the environment makes it possible for living organisms to counter entropy, thus making it possible to maintain a steady state - a necessary condition of adaptability to environmental variance.[2]

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[1]James D. Thompson, Organizations in Action (New York: McGraw-Hill Co. Inc. 1966), p. 6.

[2]Emery and Trist, op. cit., p. 21.

Contemporary organization scholars have generally adopted the concept of open systems because in reality organizations always deal with environmental factors, events and circumstances that are not and could not be fixed and whose outcomes are not totally predictable.

Katz and Kahn emphasize that energic transaction between the organization and its environment characterizes open system organizations. They say:

> Social organizations are flagrantly open systems in that the input of energies and the conversion of output into further energic input consist of transactions between the organization and its environment.[1]

Citing Hearn, Daniel E. Griffith presents a brief summary of the characteristics of open systems:

1. Open systems exchange matter, energy, and information with their environment. That is, they have inputs and outputs.

2. Open systems tend to maintain themselves in steady states. A steady state occurs when a constant ratio is maintained among the components of the system.

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[1] Katz and Kahn, op. cit., p. 16.

3. Open systems are self-regulating.

4. Open systems display equifinality; that is, identical results can be obtained from different initial conditions and by a variety of paths.

5. Open systems maintain their steady state, in part, through the dynamic interplay of sub-systems operating as functional processes.

6. Open systems maintain their steady states through feedback processes.

7. Open systems display progressive segregation or differentiation. Diffuse global patterns are replaced by a more hierarchical order of subordinate systems and specialized functions.[1]

Integrating the above characteristics, Griffiths again cites Hearn:

> There is a dynamic interplay among the essential functional sub-processes or sub-systems in the organismic system which enables it to maintain itself in a homeostatic steady state. Assuming a sufficient input of material from its environment, the organism develops toward a characteristic state despite initial

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[1]Daniel E. Griffiths, "Administrative Theory and Change in Organizations," in Matthew Miles (ed.), Innovation in Education (New York: Teacher's College, Columbia University, 1964), p. 429.

> conditions. All of this is accomplished through an automatic self-regulatory process.[1]

Katz and Kahn identify five basic sub-systems necessary for organizational functioning. They are:

1. Production or technical sub-system--concerned with the through-put, the energic or informational transformations whose cycles of activity comprise the major functions of the system.

2. Supportive sub-system--concerned with environmental transactions by procuring inputs and disposing of outputs. They are in part a direct extension of the production activities.

3. Maintenance sub-system--activities for getting the work done, such as patterned human behavior. Its function is to maintain the fabric of interdependent behavior necessary for task accomplishment.

4. Adaptive sub-system--senses relevant changes in the outside world and translates the meaning of those changes for the organization.

5. Managerial sub-system--controls, coordinates, and directs the many sub-systems of the structure.[2]

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[1] Ibid., p. 430.

[2] Daniel Katz and Robert L. Kahn, The Social Psychology of Organization (New York: John Wiley and Sons Inc., 1966), p. 39.

## Bureaucratization

Formal organizations are generally complex and large. They, therefore, develop administrative machinery for purposes of efficient management. This aspect of formal organization has been referred to by Blau and Scott as "bureaucratic." An organization becomes more bureaucratic as more internal administrative apparatus is developed. Studies, such as that of Anthony Downs on bureaucracies, describe what goes on in this administrative apparatus.[1]

Over time, formal organizations become more bureaucratic. That is, more emphasis is given to the maintenance of the organizational machinery and making it permanent. As Matthew B. Miles observes, organizations that attain this state spend much of their available energy to (a) carry out routine goal-directed operations and (b) maintain existing relationships within the system.[2]

One element of organizational apparatus is ideology. Organizations evolve ideologies through time. Such ideologies serve to build up external support and promote system integration.

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[1] Anthony Downs, Inside Bureaucracy (Boston: Little, Brown, and Co., 1967).

[2] Matthew B. Miles (ed.), Innovation in Education (New York: Teachers College, Columbia University, 1964), p. 443.

As it takes a long time to develop a certain ideology, it may take an equally long time to change it.[1]

As an organization becomes more bureaucratic several factors tend to inhibit change. As Thompson points out, "bureaucratic orientation is conservative ... more concerned with internal distribution of power and status than organizational goal accomplishment."[2] He also observes that bureaucratic conditions are inappropriate for creativity.[3] This is expressed by Miles in terms of organization energy allocation. He asserts that since priority for the organization's available energy is given to carrying out routine goal-directed operations and to the maintenance of existing relationships within the system, the fraction of energy left over for diagnosis, planning, innovation, deliberate change, and growth is ordinarily small.[4] He adds that feedback loops in bureaucratic organizations tend to keep the system in a steady state.

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[1] Ibid., p. 244.

[2] Victor A. Thompson, "Bureaucracy and Innovation," Administrative Science Quarterly, Vol. 15, No. 1, March 1970, p. 1.

[3] Ibid., p. 1.

[4] Miles (ed.), op. cit., p. 443.

Griffiths provides a socio-political perspective of why bureacratic orientation impedes change. He says that because society establishes organizations, or sanctions their establishment, to accomplish specific purposes, the same original sanction gives organizations their characteristic steady state.[1] High system integration can be obstructive of change. The officials of a bureaucratic organization can be the source of resistance to change. Downs claims that established processes represent previous officials' investments of time, effort, and money. These create organizational inertia.[2]

In public administration, formal organizations are commonly referred to as bureaus, ministries or departments. They are bodies legally created to perform the functions of government. Berton H. Kaplan calls these bodies "developmental bureaucracies," because the nature of their purposes, their functions, their clientele, and their clientele needs are oriented to the problems

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[1] Griffiths, op. cit., p. 431.

[2] Downs, op. cit., p. 195.

of national development.[1] Downs reports that bureaus' activities are not only diversified but also highly interdependent. Therefore, as has been observed getting changes accepted in bureaus is extremely difficult.[2]

It is also claimed in public administration that while bureaucracy tends to inhibit social change, it is also an instrument of innovation. For instance, Blau and Meyer claim that "in large and complex societies of today, the implementation of new social policies requires bureaucratic machinery."[3] The works in institution building assume a social engineering bias of organizations as instruments of change. Milton J. Esman's writings typify this position. He says:

> The vehicle of social change is a formal and probably bureaucratic organization, which aggregates the technical capabilities and the value commitments

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[1] Berton H. Kaplan, "A Commentary on Organizations and Social Development," Administrative Science Quarterly, Vol. 13, No. 3, December 1968, p. 484.

[2] Downs, op. cit., p. 195.

[3] Peter M. Blau and Marshall W. Meyer, Bureaucracy in Modern Society (New York: Random House, 1956), p. 105.

> required to innovate and to promote and protect them in the environment that is relevant to the organization.[1]

He continues by claiming that organizations have the ability to infuse new norms, influence individuals within the organization as well as those outside it, act on their environment, and reflect the values of society.[2]

In the Philippine scene, Fred Al. Clemente II, provides an analysis of the contending forces of stability and innovation within the bureaucracy of government.

> The bureaucracy, of course, is more than intermediate machinery between the government and the public. It is also a sub-system within a political system - an entity with an identity and interest to protect. The private world of the bureaucrat, his attitude towards change and the cross-currents of a changing environment, affects not only the effectiveness of the bureaucracy but also the pace of development in general. Thus, the world of the bureaucrat in a developing society has also become one of the intriguing subjects of scholars in administration. Caught between the forces of

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[1]Milton J. Esman, "The Elements of Institution Building," in Joseph W. Eaton (ed.), Institution Building and Development: From Concepts to Application (Beverly Hills: Sage Publications, 1972), p. 26.

[2]*Ibid.*, p. 27.

> modernization and tradition, between authoritarianism of his society and the egalitarian demand of his role, between the reciprocal and personal-oriented decisional premises and the impersonal Weberian model that his training oriented him to, and between the need for bureaucratic survival and the threatening infringement of the military or other strong political centers, how prepared is the bureaucrat in fulfilling his role as an innovator?[1]

The potential of organizations for introducing change has led public administration scholars such as Thompson to urge increased recognition of creativity and innovativeness and strategies for facilitating these contributions by bureaucracies.[2]

## Task Environment

Organizations as open systems carry on input-output transactions with their environment. The notion of environment could refer to "everything else."[3] Therefore, there is a need to be more specific in order to simplify identification and analysis.

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[1]Fred Al. Clemente II, "Philippine Bureaucratic Behavior," Philippine Journal of Public Administration, April, 1971, pp. 120-121.

[2]V. Thompson, op. cit., p. 1.

[3]J. Thompson, op. cit., p. 27.

William R. Dill used the term "task environment" to denote those specific parts of the environment which are "relevant or potentially relevant to goal setting and goal attainment."[1] Thus, it can be reformulated that the task environment of organizations are those parts of the environment in which organizations carry on input-output transactions.

In Dill's study of two Norwegian firms, he analyzed the task environment according to the dimensions of: stable-dynamic, and homogeneous-heterogeneous. Thompson theorizes that these two dimensions of the task environment both act as determinants of organizational behavior. He says that they pose contingencies for organizations and that their relationship could be viewed as one of exchange.[2] Moreover, he says that when the task environment is both heterogeneous and dynamic, organizations create units such as temporary systems, which functionally correspond to segments of the task environment. These units operate on a

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[1] William R. Dill, "Environment as an Influence on Managerial Autonomy," Administrative Science Quarterly, Vol. 2, No. 4, March 1958, p. 410.

[2] J. Thompson, op. cit., p. 28.

decentralized basis to monitor and plan responses to fluctuations in the task environment.

## Organizational Adaptation

Organizations, according to Thompson, are acting entities.[1] Their behaviors are rational and deliberate and there are variables that predictably influence variance in their behavior. These variables include the task environment and the technology employed.[2]

The initial part of this section presents, from the literature, ways of understanding behavior of social organizations. The next part draws upon the literature for ways to predict adaptive behavior of organizations particularly as they react to elements in their environment.

### Temporary Systems

Toffler writes that each age produces a form of organization appropriate to its own tempo.[3] He observes that the age of

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[1] J. Thompson, op. cit., p. 1.

[2] Ibid., p. 13.

[3] Alvin Toffler, Future Shock (New York: Bantam Books, 1970), p. 143.

industrialism brought a quickened tempo to both individual and organizational life. The bureaucratic "machine model" rose because of preoccupation with efficiency and productivity. He observes that there is nothing new about the idea of assembling a group to work toward the solution of a specific problem, then dismantling it when the task is completed. What is new, he says, is the frequency with which formal organizations resort to such temporary arrangements.[1]

Organizations also reflect the values of the time. Bennis claims that the bureaucratic model of organization was developed as a reaction against personal subjugation, nepotism, cruelty, and the capricious and subjective judgment of management during the Victorian era, at the early days of the industrial revolution.[2] He predicts that the rapid general change of contemporary society will lead to the extinction of the traditional bureaucracy. He predicts that the social organization of the future will be adaptive and rapidly changing, organized around problems to be solved by groups with diverse professional skills; organizational charts

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[1] Ibid., p. 134.

[2] Warren G. Bennis and Philip E. Slater, The Temporary Society (New York: Harper and Row, 1968), p. 55.

will consist of project groups, rather than stratified functional groups, and the executive will become coordinator between various task forces.[1]

Zbigniew Brzezinski calls this present period the "Technetronic age." This is the age in which technology and especially electronics, is increasingly becoming the principal determinant of social change, altering the mores, social structures, values, and global outlook of society.[2] F. E. Emery and E. L. Trist refer to a dynamic and rapidly changing environment as "turbulent."[3] This, according to Bennis, is the real coup de grace to bureaucracy, for it is characteristic of bureaucratic orientation to emphasize stability of the internal apparatus rather than adaptation to the environment.[4] He cites the findings of the Center for Organization and Communication Research at the Massachusetts Institute of Technology:

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[1] Ibid., p. 73.

[2] Zbigniew Brzezinski, Between Two Ages (New York: The Viking Press, 1970), p. 14.

[3] F. E. Emery and E. L. Trist, op. cit., p. 21-31.

[4] Bennis and Slater, op. cit., p. 67.

> For simple tasks under static conditions, an autocratic, centralized structure, such as has characterized most industrial organizations in the past, is quicker, neater, and more efficient. But for adaptability to changing conditions, for rapid acceptance of new ideas, for flexibility in dealing with novel problems, generally high morale and loyalty . . . the more egalitarian or decentralized type seems to work better.[1]

The dysfunctionality of the traditional bureaucratic organization to cope with novel problems and with the turbulent environment has led to increasing reliance on temporary systems.

This new pattern of social organization has a variety of names. Miles was one of the earlier researchers to use the term "temporary system" in describing innovative programs and organizational arrangements in education.[2] James Thompson and Robert W. Hawkes, in their study of rescue operations in disaster stricken communities refer to it as "synthetic organization."[3] Recently new labels have emerged. Toffler calls it a "throw-away," or "ad-hoc" organization.[4] E. C. Bogue calls it

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[1] Ibid., p. 5.

[2] Miles, op. cit., p. 437.

[3] James Thompson and Robert W. Hawkes, "Disaster, Community Organization, and Administrative Process," in G. W. Baker and D. W. Chapman (eds.) Man and Society in Disaster (New York: Basic Books, Inc., Publishers, 1962).

[4] Toffler, op. cit., pp. 124-151.

a "disposable organization."[1] In industry it is given different labels - "research and development," "task force," or "project management." "Settings" is the name psychologist Sarason gives it, defining it as "any instance in which two or more people come together in new relationships over a sustained period of time in order to achieve certain goals.[2]

Downs cites as an empirical example of temporary systems, the Polaris and Atlas missile systems. The mission was to undertake an urgent and complex task requiring novel research and many resources, and to accomplish it as fast as possible. Based on their experience, top level officials realized that bureaus were incapable of carrying out the mission. Their cumbersome machinery could not produce results fast enough, and their anti-novelty bias would block the necessary innovation. Downs describes the alternative:

> Therefore, a new organization is set up for this task outside the normal operation of the bureau. It is much smaller than the bureau as a whole, though it may contain many members. These members have

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[1]E. G. Bogue, "Disposable Organizations," Phi Delta Kappan October 1971, pp. 94-96.

[2]Seymour B. Sarason, The Creation of Settings and the Future of Societies (Washington: Jossey-Bass Inc., 1972), p. 1.

> somewhat broader capabilities and are more competent than the bureau's average members, since they have been specially picked for this task. They are also exempt from normal rotation "for the duration," so turnover is low. The new organization is not integrated with the bureau's hierarchy. Moreover, it contains enough specialists and has enough resources so that it is not dependent upon the bureau's regular chain of command for major services ... Finally, it has high priority access to resources.[1]

Downs' example presents key elements in the process of creating temporary systems, Sarason identifies a similar set of vital elements: a perceived need, a defined problem, a desire to solve the problem and satisfy the need, presence of concerned and prime individuals, opinion that the existing settings are inadequate, and a belief that a solution exists.[2]

Clark reports, as an empirical example of how temporary systems serve education, the creation and workings of the Physical Science Committee.[3] Expectations that the school system should serve society had led scholars to closely examine

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[1]Downs, op. cit., p. 161.

[2]Sarason, op. cit., p. 31.

[3]Burton R. Clark, "Interorganizational Patterns in Education," Administrative Science Quarterly, Vol. 10, No. 1, June 1965, pp. 229-230.

the school curriculum. A committee was then formed by a group of professors and secondary school science teachers. The purpose of the committee was to improve the teaching of physical sciences in the secondary schools of the nation. The committee was funded by a federal agency, the National Science Foundation.

Paul L. Dressel has observed that in higher education in the United States, there is a proliferation of nondepartmental units called centers, institutes, and laboratories. He found that some institutes in higher education have resulted from the entrepreneurial efforts of single individuals who obtained grants, initiated income-producing services or sold administrators on ideas. He adds that some institutions are established by joint agreement of several departments. He reports a number of reasons for their existence, including: to launch an inter-disciplinary program, to attract foundation or federal funds, and to attract widely recognized scholars.[1]

Miles advances the thesis that temporary systems in education not only are powerfully educative themselves - adding

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[1]Paul Dressel, et. al., The Confidence Crisis (Washington: Jossey-Bass Inc., Publishers, 1970), pp. 120-131.

new knowledge, skills, practices, or attitudes to a person or group - but also can be a prime mechanism for bringing about innovation in permanent educational systems.[1] Clark comments that in modern organizations, a research and development wing is often created to guarantee an inflow of new ideas and innovations.[2]

In the industrial setting Robert A. Solo identifies two roles of research and development organizations in addition to generation of new ideas, innovations, and inventions: (a) providing built-in evaluative competence for the organization and (b) acting as an instrument of receptivity in seeking out, evaluating and appropriately modifying components of superior technology for the organization.[3]

Miles reports that in his in-depth study of three cases, certain prediсtable process characteristics of temporary systems have emerged. These characteristics are:

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[1]Miles, op. cit., pp. 444-445.

[2]Clark, op. cit., p. 236.

[3]Robert A. Solo, "Technology Transfer: A Universal Process," in Robert A. Solo and Everett M. Rogers (eds.), Inducing Technological Change for Economic Growth and Development (Michigan State University Press, 1972), p. 23.

1. Narrow time perspective leads to a focus on the immediate situation, thus resulting in a greater energy output to the immediate activity ... Specified goals within a defined period of time provide a sense of coherence.

2. As communication increases within the temporary system, participants become more aware of the degree to which their goals are in fact shared, and gradually through joint work one or more superordinate goals gradually emerge ...

3. Clear procedures in a temporary system add to greater predictability, controllability, and compellingness which contribute strongly in bringing about innovation.

4. Focused goals and clear procedures, and vigorous identification with peers as role models, make member socialization effective.

5. Communication among participants is encouraged ... Group sentiments or group "climate" seem to appear.[1]

He summarizes certain inherent structural characteristics which

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[1]Miles, op. cit., pp. 457-476.

at least partly explain the effectiveness of the temporary pattern of organization.

> Generally speaking, the input specifications described above (time limits, initial goal setting, boundary maintenance operation, physical and social isolation, and size and territoriality) seem to enable persons "to escape the restraints of historical time and place" . . . Apparently the restrictions in time, goal, personnel, and space, and the protection from external stress, help to create conditions for vigorous, productive work, a kind of "committed hypotheticality" ensues.[1]

Sarason declares that the most obvious characteristics of the members of a temporary system are: high enthusiasm, sense of mission, stimulated by novelty, challenged by personal and professional growth, and anticipation of consequences of success.[2]

Miles reported that temporary systems have different kinds of consequences for project participants: (a) alterations in the individuals' attitudes, knowledge, or behavior; (b) alteration of quality of pre-existing relationships among members of the system; and (c) bringing agreements to do some specific acts.[3]

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[1]Ibid., p. 457.

[2]Sarason, op. cit., p. 80.

[3]Miles, op. cit., pp. 476-480.

Bennis claims that "temporary adaptive organizations should increase motivation and thereby effectiveness because they create conditions under which the individual can gain increased satisfaction with the task itself."[1] This is one attraction of temporary systems to recruits. As Sarason points out, "a core member is attracted to a new setting because he has concluded that it will provide him the opportunity to work and develop in ways superior to those in his old setting."[2]

Temporary systems like all other social organizations have dysfunctions and problems. Rolf P. Lynton,[3] for example, concludes that there is a heavy incidence of failure for ad-hoc and temporary devices. Miles mentions five specific difficulties or problems with temporary systems:

(1) Input overload - participants may invite or accept an unrealistic amount of stimulus inputs.

(2) Unrealistic goal-setting - the "as if" character of temporary systems invites a feeling of infinite possibility, the sense that "the sky is the limit."

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[1]Bennis and Slater, op. cit., p. 74.

[2]Sarason, op. cit., p. 79.

[3]Rolf P. Lynton, "Linking an Innovative Sub-system into the System," Administrative Science Quarterly, Vol. 14, No. 3, Sept., 1969, pp. 398-415.

(3) Lack of process skills - the interpersonal skills required in this intensive climate may be excessively high.

(4) Alienation - because the members are usually isolated from the surrounding environment, and communicate more with each other than with members of permanent systems, they tend to become alienated, detached, uninvolved.

(5) Linkage failure - the crucial problem is how to link temporary and permanent systems effectively, without vitiating the advantages of temporal-spatial isolation from the recurring demands of durable organizational life.[1]

Thus far it has been suggested that the need for temporary patterns of organization is increasingly being felt in education, industry, military, and branches of civil government. The reason is the apparent inability of bureaucratic organizations to cope with changes in their environment.

Synthesizing the works of Miles, Clark, Bogue, Bennis, Toffler, and Sarason, the generally defining characteristics of a temporary system can be identified as follows:

1. Participants know from the outset that the system is not permanent but will terminate at a time when the problem is resolved or transferred.

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[1]Miles, op. cit., pp. 480-484.

2. It deals with a narrowly focused range of problems and issues.

3. It is isolated socially and physically from ordinary operations of the organizations by which it is created.

4. Its size and territoriality is limited.

5. Its basis of influence is expertise rather than authority of position and role; and participants are selected on the basis of talent and expertise.

6. Delegation of authority and responsibility is largely lateral rather than vertical, voluntary rather than mandatory.

7. There is open and free communication within the system.

One major theme permeates the literature on temporary systems. It is that such systems serve as instruments for organizational renewal and represent one way of taking advantage of social organizations without being frustrated by the dysfunction of bureaucracy.

With the trend shifting from permanence to transience, options will increase . This raises important questions. Brzezinski points out that the real questions are, "how the individuals and <u>organizations</u> (emphasis added) will exploit the options, to what extent they will be intellectually and psychologically prepared to exploit them, and in what way society as a whole will create a favorable setting for taking advantage of these options."[1]

## Interorganizational Cooperation

Eugene Litwak and Lydia F. Hylton view the relationship between organizations in terms of their interdependencies within a given environment. They define organizational interdependency as a situation in which two or more organizations must take each other into account if they are to accomplish their respective goals. They identify two types of organization interdependence. One is competitive interdependence where one agency can maximize its goals only at the expense of another. The other is facilitative interdependence where two or more agencies can simultaneously maximize their goal.[2]

James D. Thompson and William J. McEwen view this interdependency as a matter of strategy of organizations in

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[1] Brzezinski, op. cit., p. 16.

[2] Eugene Litwak and Lydia F. Hylton, "Interorganizational Analysis: A Hypothesis on Coordinating Agencies," Administrative Science Quarterly, Vol. 6, No. 4, March 1962, p. 401.

dealing with their environments which include other organizations. They classify strategies for dealing with the organizational environment into competitive and cooperative. The cooperative strategy consists of three sub-types: (a) Bargaining or contracting - negotiating agreements for the exchange of goods or services between two or more organizations: (b) Coopting - absorbing one organization into the leadership or policy-determining structure of another; and (c) Coalescing - a joint venture between organizations.[1] The emphasis of the present study is on this third type of strategy.

Why Cooperative Strategy?

Thompson theorizes that drive to reduce uncertainty in organizations explains why they establish cooperative relationships. He says that organizations need power, that is, capacity to satisfy need for the elements of material resources or information. No organization, however, is totally self-sufficient. They always have constraints and contingencies which cause

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[1]James D. Thompson and William J. McEwen, "Organizational Goals and Environment: Goal-Setting as an Interaction Process," American Sociological Review, Vol. 23, February, 1958, pp. 23-31.

organizational uncertainty and reduction of power. Given these limitations, one way for an organization to acquire power is to enter into interdependent or cooperative arrangements with another organization, thus reducing uncertainty for both.[1] Thompson articulates his proposition as follows:

> Using cooperation to gain power with respect to some element of the task environment, the organization must demonstrate its capacity to reduce uncertainty for that element, and must make a commitment to exchange that capacity ... Thus an agreement between A and B, specifying that A will supply and B will purchase, reduces uncertainty for both.[2]

Merton W. Ertell has studied interinstitutional cooperation in higher education in the State of New York. In assessing the significance of interinstitutional cooperation he says:

> We all know that resources for providing high quality educational opportunity will be in short supply. Does cooperative activity ... provide a feasible means of achieving better utilization of the limited resources which will be available? Does it recognize that in future institutions of higher education will be unable to "be all things to all men" and that it may well

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[1] J. Thompson, Organization in Action, op. cit., p. 34.

[2] Ibid., p. 34.

> become essential that each institution should concentrate its resources in certain fields and share its specialties in various ways.[1]

Writing on specialization and cooperation, Thompson says: "In this modern period of specialization, the one desideratum that overshadows all others in importance is cooperation."[2] He suggests that the test of social institutions cannot be only their productivity but also whether they promote cooperation.

Michael Aiken and Jerald Hage mention another advantage of organizational cooperation. They say that the involvement of staff in interorganizational relationships introduces them to new ideas, new perspectives, and new techniques for solving organizational problems, thus reinforcing professional standars of excellence.[3] Bennis provides additional justification for cooperative action. He argues that building synergetic and collaborative cultures will become essential in this day and age because

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[1]Merton W. Ertell, Interinstitutional Cooperation in Higher Education: A Study of Experiences with Reference to New York State, p. 1. (No date).

[2]Victor A. Thompson, Modern Organization (New York: Alfred Khopf, 1961), p. 179.

[3]Michael Aiken and Jerald Page, "Organizational Interdependence and Intra-Organizational Structure," American Sociological Review, Vol. 33, 1968, p. 927.

modern problems are too complex and diversified for one man or one discipline.[1]

Stimuli for Interorganizational Cooperation

An issue related to why organizations form cooperative alliances is the question of what forces stimulate such action of organizations. This question implies that there are stimuli or forces impinging on organizations that influence them to go into cooperative activities.

Shirley Terreberry presents two hypotheses central to the issue raised. She postulates that: (1) organizational change is increasingly externally induced; and (2) organizational adaptability is a function of ability to learn and to react to changes in the environment. She argues further that the organization's environment itself is constantly undergoing an evolutionary process.[2] Emery and Trist concluded that the main problem in the study of organizational change is that the environmental contexts

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[1]Warren G. Bennis, "Post Bureaucratic Leadership," Trans-action, July/August, 1969, pp. 44-51.

[2]Shirley Terreberry, "The Evolution of Organizational Environment," Administrative Science Quarterly, Vol. 12, No. 4, March 1968, p. 590.

in which organizations exist are themselves changing. They formulated what they call "causal texture of the environment," which attempts to distinguish the different levels of complexity of the environment. Their fourth typology which they call the "turbulent field" is relevant to this discussion. This type is the most complex. It is dynamic. The dynamic properties arise not simply from the interaction of identifiable components of the system but from the field itself. In the "turbulent field" individual organizations, however large, cannot adapt successfully simply through their direct interactions. They need to enter into cooperative relationships with other organizations whose fates are positively correlated.[1]

Rolf Lynton in elaborating this fourth type of environment says:

> This model treats the system and its environment as in continuous interaction in uncertainty and as aiming to achieve and maintain a steady state in and through interaction. The spontaneous response to a turbulent environment is to reduce the turbulence.[2]

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[1] Emery and Trist, op. cit., pp. 21-31.

[2] Lynton, op. cit., p. 399.

Dill in his study of two Norwegian business firms, found that management behaviors depended on the structure of the environment, the accessibility of information about the environment, and managerial perceptions of the meaning of environmental information. He found further that the task environment of the two firms consisted of four major sectors: (1) customers; (2) suppliers of materials, labor, capital; (3) competitors; and (4) regulatory groups.[1]

Thus far we have turned to the organizational task environment as the source of incentive or stimuli for organizational alliance. There are other kinds of forces that help bring about this organizational behavior. Certain internal organizational features, can also be a source of influence.

In reviewing the literature on the inducements for organizational cooperation, five factors seem to emerge as organizationally related. These factors are: domain consensus, domain overlap, resources, mutual benefit, and antecedent relationship.

Domain consensus - Sol Levine and Paul E. White conceptualize organizational domain as consisting of the specific goals that an

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[1]Dill, op. cit., pp. 410-413.

organization wishes to pursue and the functions it undertakes in order to implement its goals.[1] Thompson declares that organizational domain identifies the points at which the organization is dependent on inputs from the environment.[2] In their study of community health and welfare agencies, Levine and White identified three kinds of organizational domains: (1) diseases covered; (2) population served; and (3) services rendered. They concluded that the exchange agreements between community health and welfare agencies rest upon prior consensus regarding domain. Organizations that are engaged in a cooperative venture need to recognize and accept each others' domains.

Domain overlap - Warren concluded that coalitions base their existence solely upon a convergence of interests around some particular issues.[3] William Reid in his study of coordination of

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[1] Sol Levine and Paul E. White, "Exchange as a Conceptual Framework for the Study of Interorganizational Relationships," Administrative Science Quarterly, Vol. 5, No. 4, March 1961, p. 597.

[2] J. Thompson, op. cit., p. 27.

[3] Roland L. Warren, "Interorganizational Field as a Focus for Investigation," Administrative Science Quarterly, Vol. 12, No. 3, December 1967, pp. 396-419.

agencies dealing with delinquency prevention and control, discovered that when agencies are seeking similar or identical goals, a major force for coordination is brought into play.[1] Common institutional aims and objectives were observed by Ertell as important in initiating cooperative relationships among institutions of higher education in the State of New York.[2]

Resources - Disequilibrium in organizational resources leads to organizational interdependence. Disequilibrium here consists not only of disparate possession of funds but of technical-professional expertise and specialization of functions. Aiken and Hage in citing Levine's study of organizational problems of providing medical care and social services, expressed the view that organizations are pushed into interdependencies because of their need for resources - not only money, but also such resources as specialized skills, access to particular kinds of markets, and the like.[3]

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[1]William Reid, "Interagency Coordination, in Delinquency Prevention and Control," Social Services Review, Vol. 38, December 1964, p. 421.

[2]Ertell, op. cit., p. 106.

[3]Aiken and Hage, op. cit., p. 915.

Interdependence also has its costs. As an exchange process, organizational interdependence assumes that those engaged in it should have something to exchange. As Aiken and Hage comment, organizations must utilize some of their own resources in order to perform whatever coordination is necessary. Hence, an organization with no surplus resources available could hardly afford a joint program.[1] Reid suggests that an increase in agency resources may stimulate coordination, as the agency then has more value to exchange. He further suggests that for interagency exchange to take place, each agency must be able to provide the other with resources it needs to achieve its goals. That is, "there must be complementarity of resources."[2]

Mutual Benefit - In an exchange process, each party incurs costs and also derives benefits. Gouldner proposes "that a social unit or group is more likely to contribute to another which provides it with benefits than to one which does not."[3]

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[1] Ibid., pp. 912-930.

[2] Reid, op. cit., p. 425.

[3] Alvin W. Gouldner, "The Norm of Reciprocity: A Preliminary Statement," American Sociological Review, Vol. 25, No. 2, April 1960, p. 164.

Process (antecedent relationship) - There is a communication dimension to interagency cooperation. Ira Sharkansky, in his analysis of interagency relations, states that each major instance of intergovernmental relations is not one event but a series of meetings, telephone conversations, memoranda, informal or formal accords.[1] Ertell observed that most of the cooperative practices he studied have evolved over time to their present scope. He suggests that in contemplating cooperative relationships it might be well to consider moving from specific practice to more general cooperative relationships.

Promoter or Change Agent - One other condition for organizational cooperation is the presence of an individual "who is and remains for sometime, the leader, the organizer, the mover (the promoter)."[2] This is particularly true in the cultural setting of the project studied. This has been confirmed in the studies

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[1]Ira Sharkansky, Public Administration: Policy-Making in Government Agencies (Chicago: Markham Publishing Co., 1970), p. 311.

[2]Sarason, op. cit., pp. 24-46.

conducted by Iglesias,[1] Arcega,[2] Dans[3] and de Guzman.[4] They report that the leadership ability and charismatic ways of one man (Rafael Salas) was a major factor in the success of an interagency coordinating mechanism in the Philippine's breakthrough in rice self-sufficiency in 1968.

## Summary

This review of the literature on organizational behavior has sought answers to the general question of why organizations relate as they do. There are two major components in the section, namely: different perspectives of organization and interorganizational linkages. The perspective part has explored the utility of the open

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[1]Gabriel U. Iglesias, "The Implementation of the Philippines' Four-Year Rice Self-Sufficiency Programme: 1966-1970," College of Public Administration, University of the Philippines (Mimeographed), 1972.

[2]Victoria M. Arcega, "Mobilizing the Bureaucracy: The Case of the RCPCC," Solidarity, September 1969, p. 10.

[3]Albina Manalo-Dans, "The Coordinating Councils: Rice Production Coordinating Council and the Infrastructure Operation Center," Philippine Journal of Public Administration, Vol. XIII, No. 2, April 1969, p. 195.

[4]Raul de Guzman, "Achieving Self-Sufficiency in Rice: A Study of the Philippine Experience in Program Implementation," Philippine Journal of Public Administration, Vol. XIV, No. 2, April 1970, p. 164.

systems framework as an analytical model for the present study. Different characteristics of systems have been identified, including an analysis of organizations as social systems, closed and open.

In the section on organizational cooperation two issues have been discussed: (1) Why do organizations establish cooperative strategies? and (2) What are the inducements or stimuli for organizational cooperation? The studies cited above - Thompson, Aiken, Levine, Levine and White, Warren, Clark, Ertell, Gouldner and Sharkansky all lead to the conclusion that organizational alliance is a rational act which is in part motivated by the desire for attainment of organizational needs and goals of the parties involved.

## The Subject's Task Environment

The purpose of this section is to explore the particular task environment of the subject being studied. For purposes of the present study three aspects of the task environment in the agricultural sector in the Philippines will be examined. These are: (1) the agricultural production system; (2) the agricultural institutions; and (3) the nature of the rice production technology, including the advances in rice technology. It is assumed that these are the task environmental aspects in which the organizations concerned have interacted resulting in the adaptive behavior - the formation of a cooperative temporary system (RURP).

## The Agricultural Production System

There are certain unique features of agriculture as a production system. Forest F. Hill and Arthur T. Mosher aptly describe them as follows:

> An agricultural production system is not a mechanical process but one of facilitating biological growth under almost infinitely varying conditions. It is very different from factory production in which it is possible to control within narrow limits the quality and quantity of its input and output. Instead agriculture is carried on in varying climates under fluctuating weather conditions, drawing upon the supply of the variables of plant nutrients and soil moisture wherein crops and livestock that are grown and raised therein are subject to pests, diseases, and other hazards. The basic process then in agriculture is the management of biological growth.[1]

Ruttan says, "rice production differences are due primarily to environmental and technological factors that are, by and large,

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[1]Forest F. Hill and Arthur T. Mosher, "Institutional and Social Aspects of Agricultural Development," USA papers prepared for the UN conference on the application of science and technology for the benefit of the less developed areas. (No date).

beyond the control of the individual cultivators."[1] The significance of this insight in the basic processes of agricultural production is not well attended to by most people, as observed by Yujiro Hayami and Vernon Ruttan. They say:

> The implication of these biological and chemical processes for the economic development and organization of agriculture are generally not well understood by social scientists, planners, and political leaders.[2]

In order to enhance the process efficiency of agricultural production, certain factors have to be considered. Ralph W. Cummings, one of the well-known agricultural scientists and agricultural research administrators, suggests that for increasing the level of productivity the following elements are needed: (1) more precise modification of the environment toward the requirements of the plant for high production; (2) increases in the levels of physical inputs having their origin off the farm; (3) selection and design of new biologically efficient crop varieties specifically adapted to respond to fertilizers and other physical inputs; and

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[1]Vernon W. Ruttan, "Planning Technological Advance in Agriculture: The Case of Rice Production in Taiwan, Thailand, and the Philippines," in Robert A. Solo and Everett M. Rogers (eds.), Inducing Technological Change for Economic Growth and Development (East Lansing: Michigan State University Press, 1972), p. 73.

[2]Yujiro Hayami and Vernon W. Ruttan, Agricultural Development: An International Perspective (Baltimore: The John Hopkins Press, 1971), p. 50.

(4) greater protection from natural hazards.[1] He continues by saying that certain specific conditions have to be met within a prevailing social, cultural, economic, and physical environment if substantial productivity gains are to be realized. He listed these conditions as follows:

1. The availability of technical information which will provide the basis for change in agricultural practices.

2. There must be a group of trained people who have a good understanding of the elements of this technology.

3. The economic climate must be such that the changed practices are profitable.

4. Physical inputs necessary to put the practices into effect must be obtainable and readily available.

5. There must be incentives to the producer in terms of availability of products and/or services which the producer wants.

6. The program must be structured so as to be acceptable and desirable to the people concerned.[2]

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[1]Ralph W. Cummings, "Agricultural Research and Technology," in J. Paul Leagans and Charles P. Loomis (eds.), Behavioral Change in Agriculture (Ithaca: Cornell University Press, 1971), pp. 79-93.

[2]Ibid., pp. 79-93.

Institutions in Agriculture

On the importance of institutions to induce agricultural transformation, Ruttan provides a basic concept. He says that the capacity of agricultural producers to respond to the technical and economic opportunities available to them, depends significantly on the level of institutional infrastructure development which he further defines as inputs and services which are organized and controlled by the wider community rather than by the individual producer.[1]

In general, the agricultural institutions that are being referred to in this study are those engaged in agricultural research, in agricultural extension, in national planning and coordination, in credit, marketing and production and in distribution of production inputs. J. K. McDermott points to an important relationship between agricultural research and extension in the United States in modernizing her agriculture. He says: "Extension in the U.S. was as important to research as research was to extension."[2]

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[1] Hayami and Ruttan, op. cit., p. 274.

[2] J. K. McDermott, "Extension Institutions," In Melvin G. Blase (ed.) Institutions in Agricultural Development (Ames, Iowa: The Iowa State University Press, 1971), p. 155.

Paul Leagans, in his analysis of agricultural extension all over the world, concluded that one of the causes for the dysfunctionality of agricultural extension, wherever it may be located, is the lack of effective linkage and functional interrelationships between the research and the extension systems.[1]

The Nature of the Rice Production Technology

Thompson argues persuasively that technology is an important variable in understanding the actions of complex organizations.[2] Robert A. Solo defines technology as "the organized capability of a social group to perform some purposeful activity."[3] James Shaffer views technology as a process of using knowledge for the physical transformation of things.[4]

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[1] J. Paul Leagans, "Extension Education and Modernization," in Paul Leagans and Charles Loomis (eds.), Behavioral Change in Agriculture (Ithaca, N.Y.: Cornell University Press, 1971), p. 155.

[2] J. Thompson, op. cit., p. 15.

[3] Robert A. Solo, "Technology Transfer: A Universal Process," in R. A. Solo and E. M. Rogers (eds.), Inducing Technological Change for Economic Growth and Development (East Lansing: Michigan State University Press, 1972), p. 3.

[4] Writer's notes in a course - "Institutional Performance," taught by Dr. James Shaffer of Michigan State University's Department of Agricultural Economics.

The rice technology which is one concern of the study is, in a narrow sense, basically a biochemical transformation process. It is based on the biological characteristics of plants. Mosher has this to say about the plant system:

> Plants are the primary factories of agriculture. They take in carbon dioxide from the air through their leaves. They take in moisture and chemical substance from the soil through their roots. Out of these, using the energy of sunlight, they make seeds, fruits, fibers and oils that man can use.[1]

Rice scientist T. T. Chang says that the behavior variation detectable in plants arises from the joint action of the genetic constitution of the organism and its environmental factors.[2]

The advancement in rice technology may be described in terms of the available new and productive inputs - new seed varieties, chemical fertilizers, more effective herbicides and insecticides and the culture management practices.

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[1]Arthur T. Mosher, Getting Agriculture Moving: Essentials for Development and Modernization (New York: Praeger, 1966), p. 15.

[2]T. T. Chang, "Field Experiments with Rice in the Tropics," February 20, 1968, mimeographed, (IRRI).

In spite of the dramatic success of rice technology in causing rapid increases in rice yield in many countries, many rice scientists warn against universal untested dispersion of the present technology because of the location specificity of the rice plant behavior. T. T. Chang captures the problem in these words:

> Rice is mainly grown as an annual crop. In this context, and when grown as a spring-grown upland crop in the temperate zone, the response of the rice plant to its immediate environment is not radically different from those of the other small grains, e.g., wheat, barley, and oats. However when the crop is grown in flooded soils, as is mostly the case in the tropics, rice growth and grain production deviate quantitatively from those of the other small grains in several physiologic and ecologic aspects. Under a fully irrigated culture, the continuous water supply not only supports vigorous vegetative growth but also alters the immediate environment of the rice plant in terms of sunlight penetration, nutrients availability, microbial activities in the soil, build-up of toxic substance in the soil, the micro-climate around the plant, and interactions among the above factors.[1]

There is, therefore, a concern whether the present state of rice technology which is largely developed for and tested under

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[1] Chang, op. cit.

flooded condition would be transferable to the upland and rainfed conditions. One social scientist says that the Green Revolution is really a "small rebellion" rather than a revolution.[1] He considers the appropriateness of the IRRI rice varieties in Bangladesh, India, and elsewhere as a case of ecological luck. Cummings expresses concern about the assumption of a technological backlog, also for the same reason - that plant technology is location specific.[2]

To sum up this section of the "subject's task environment," three elements of the subject's task environment are identified and discussed. In the first one, the agricultural production system, its unique features are highlighted and certain factors and conditions for its process improvement are identified. In the discussion of the second element, namely - agricultural institutions, several works are cited to show that institutional

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[1]Everett M. Rogers, "The Green Revolution in Southeast Asia," in R.A. Solo and E.M. Rogers, Inducing Technological Change for Economic Growth and Development (East Lansing: Michigan State University Press, 1972), pp. 78-82.

[2]Cummings, in Leagans and Loomis, op. cit., pp. 79-93.

infrastructure is an imperative component for widespread transformation of the agricultural production system. Finally, in the discussion of the third element - the nature of the rice production technology, works are cited to show the distinguishing processes of rice production and state of the art.

## Normative Framework

> For many reasons, permanent systems - whether persons, groups, or organizations - find it difficult to change themselves. The major portion of available energy goes to (1) carrying out routine goal-directed operations and (2) maintenance of existing relationships within the system. Thus the fraction of energy left over for matters of diagnosis, planning, innovation, deliberate change, and growth is ordinarily very small.
>
> Matthew B. Miles[1]

> ... turbulent fields demand some overall form of organization that is essentially different from the hierarchically structured forms of which we are accustomed ... turbulent environments require some relationship between dissimilar organizations whose fates are, basically, positively correlated.
>
> F.E. Emery and E.L. Trist[2]

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[1]Miles, op cit., p. 443.

[2]Emery and Trist, op cit., p. 29.

In Chapter I, it was assumed that the case examined in this study, the "Rainfed Upland Rice Project" (RURP) is an open system. Since it manifests characteristics of temporary systems and is a cooperative undertaking, it was further assumed that it might appropriately be taken as representative of cooperative temporary systems.

In this section, the norms against which later description, analysis, and discussion are referred are laid down and explicated. Attempts are made in Chapter V to answer questions relating to the _what_ and _why_ of the project under study. This has constituted an expository and exploratory analysis of the case, especially as it relates to theoretical underpinnings of temporary systems, organizational cooperation, and open systems. In setting the normative framework, concepts and theories have been drawn from the literature reviewed.

The normative framework has two parts. The first deals with a set of questions that have guided the expository analysis. The second deals with a set of questions employed in the exploratory analysis.

## Norms for Expository Analysis

The following are descriptive questions formulated to set the norms of temporary systems, organizational cooperation, and open systems.

1. What are temporary systems and their characteristics?

2. What is organizational cooperation and what are its characteristics? What are its inducements?

3. What are open systems and their characteristics?

4. What are the consequences of establishing temporary systems on their parent organizations and other systems?

5. What are the consequences of establishing cooperative arrangements on the parties involved?

## Temporary Systems

Temporary systems are viewed as a class of social organizations that are created by formal organizations to carry out designated tasks. The term is a generic one that also includes such other terms as: "_ad-hoc_," "disposable," "settings," "adaptive," "synthetic," "collateral," and "research and development projects."

The defining characteristics of temporary systems are:

1. The actors in them know from the outset that the system will be terminated when their designated problem has been resolved;

2. They ordinarily deal with a sharply-focused range of problems and content; and are issue- or problem-centered rather than function-centered;

3. The distinguishing characteristics of such systems are innovativeness, pace-setting, exploratory, and experimental. As a consequence, they are usually isolated socially and physically from routine operations of their parent organizations;

4. Their size and territoriality are limited and generally small;

5. Personnel recruitment is primarily based on competence and expertise. This rather than authority of position or role in the hierarchy is also the basis of internal influence.

## Organizational Cooperation

Organizational cooperation is an interdependent relationship between two or more organizations in which the parties agree to do things jointly and share responsibilities in providing resources and management to the joint undertaking.

Organizational cooperation is patterned organizational behavior stimulated or induced by forces internal or external to the system. It is, therefore, a response or adaptive behavior evolving from identified organizational needs. The creation of a cooperative arrangement between organizations could be influenced by environmental factors such as: needs, demands, and opportunities in their task environment. In addition, previous relationships between organizations condition cooperative efforts. There are also internal organizational factors that induce or stimulate cooperative behavior:

1. The missions and goals of the institutions;
2. The lack or the abundance of organizational resources;
3. The perception of mutual benefit by the interested parties; and
4. The presence of individuals in one or both organizations who act as the catalyzers, the leaders, the organizers, the movers, (the promoters).

## Open Systems: Their Nature and Characteristics

A system is generally regarded as (a) a collective body of (b) distinguishable components (c) which are interdependent and related to the whole by means of (d) functions that they perform towards the attainment of defined goals and (e) possessing a boundary that defines what it is and what it is not.

Additional features are emphasized in the notion of open systems:

1. They exchange matter, energy, and information with their environment;

2. They tend to maintain themselves in steady states;

3. They are self-regulating; and

4. They display progressive segreation or differentiation.

A framework for describing the RURP as an open system is presented in Figure 1. It heuristically projects the subject studied along the lines of an open system. There are seven general categories of data in this model. They are (1) statement of end-state; (2) statement of domain; (3) the supra system; (4) the task environment; (5) the inputs; (6) the transformation process and its sub-systems; and (7) the outputs.

## Consequences of Establishing Temporary Systems

There are two kinds of possible consequences of establishing temporary systems: the functional (perceived as desirable) and the dysfunctional (perceived as undesirable). The consequences of

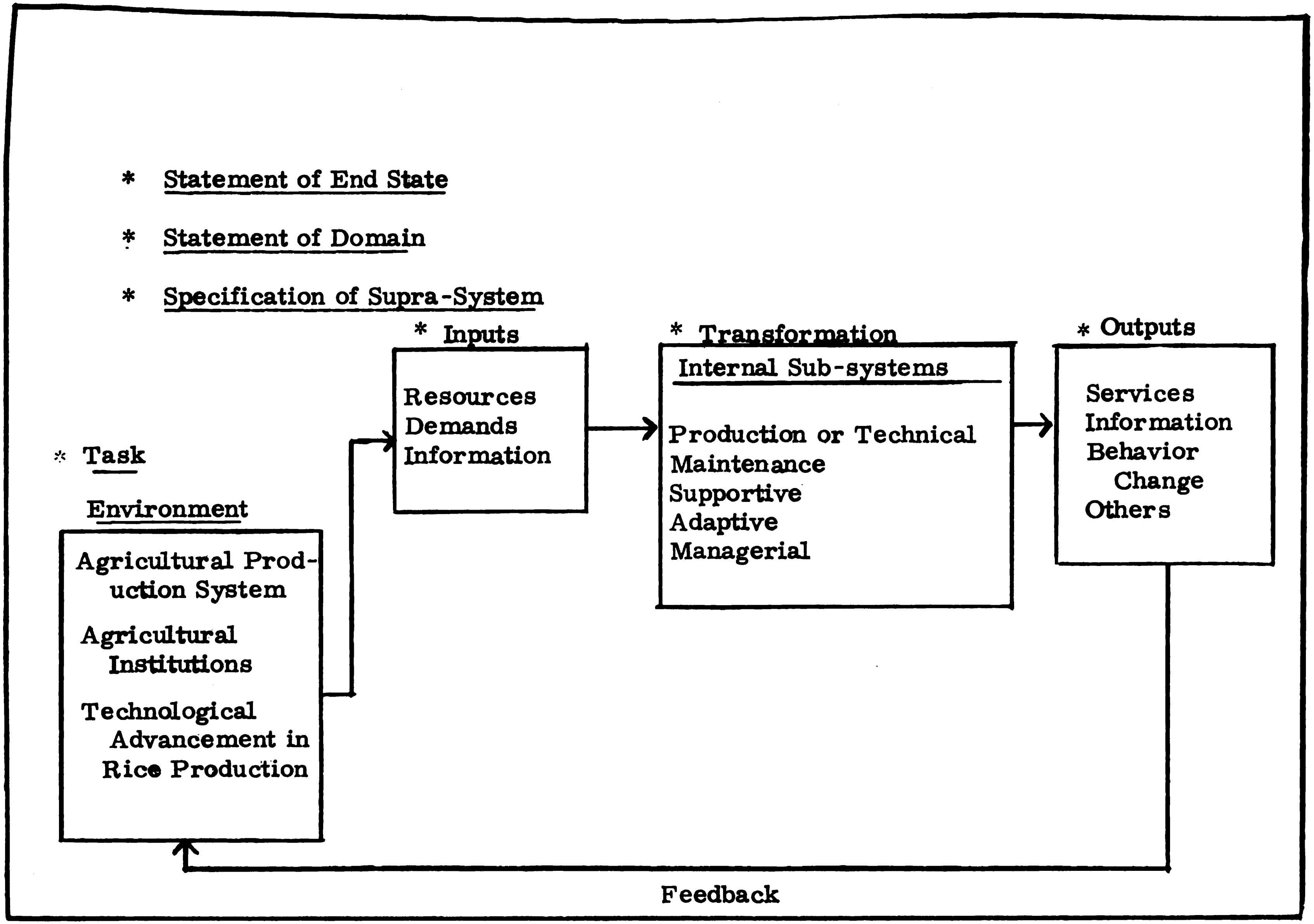


Figure 1

The Cooperative Pilot Project (RURP) As An Open System: A Paradigm establishing a temporary system are assumed to be felt either by parent organizations, by the temporary system itself, or by other systems.

Possible functional consequences could be any or all of the following:

(1) educative experience to their parent organizations, their members, and other systems;

(2) innovative prototypes to their parent organizations and other systems;

(3) new knowledge and ideas for their parent organizations and other systems;

(4) feedback information to their parent organizations and other systems; and

(5) new resources to parent organizations.

Possible dysfunctional consequences could be any or all of the following:

(1) strain on the resources of the parent organizations or curtailment of their operations;

(2) fragmented and complicated management of their parent organizations; or

(3) incongruencies and personal animosities among actors resulting in separations within their parent organizations or

conflict between the parent organizations and themselves, thus seriously affecting the usefulness for which they were primarily created.

### Consequences of Establishing Cooperative Arrangement

The establishment of cooperative relationships among organizations also have functional (perceived desirable) and dysfunctional (perceived as undesirable) consequences to the organizations involved. The functional consequences are the benefits derived by the organizations in the relationship, those that contribute to goal or function attainment. These could be in the form of goods, services, information, knowledge, or material resources.

The dysfunctional consequences are the products of the relationship that impede, strain, or constrain the operations and activities of an organization.

### Norms for Exploratory Analysis

The expository analysis is directed to answering the what questions; the exploratory analysis addresses the why questions. The exploratory part of the normative framework sets two questions: (1) Why are temporary systems resorted to by formal organizations? (2) Why do organizations employ cooperative strategies?

Before developing the specific theoretical issues just raised, a general assumption about the scope and problem of the study is in order. As open systems, organizations (in this case, the parent organizations of RURP) carry on input-output transactions with their task environment. Formation of temporary systems and organizational cooperation, which are the foci of the theoretical thrust in this study, are regarded as principally adaptive acts of organizations. They are viewed as responses to demands of and opportunities in the task environment to extend the life of the system or maintain symbiotic and normal relationships with other systems in the environment.

It is assumed that organizations as social systems have functional requisites: (1) goal attainment - activities that are directed to the production of goods, services, knowledge, and other specified goals; (2) pattern maintenance - activities that are directed toward conformity to the belief-value (cultural) system; (3) integration -activities designed to preserve the internal relationships; and (4) adaptation - sensing of relevant changes in the outside world and making adjustments in accordance with these changes. The present problem is viewed as an instance of adaptation.

In a system, adaptive behavior is not isolated from the other three functional requisites. In fact, it will have reverberations and ramifications on the other functional requisites because they are all integral parts of the system. As interlinked parts, what happens to one affects the others. Furthermore, the concept of task environment is relative to the functional requisite involved.

## Why are Temporary Systems Resorted to by Formal Organizations

Four arguments are proposed in answer to the questions of why temporary systems are resorted to by formal organizations: (1) It is an innovative way of countering the dysfunctionality of bureaucratic formal organizations; (2) It is a means of tapping an external resource that is temporary in nature; (3) The technology involved in the process is changing and is subject to environmental variation; and (4) The designated problem is relatively novel to the organizations involved.

## Why Do Organizations Employ Cooperative Strategy

To answer this question we draw upon the writings of Levine and White, Ertell, James D. Thompson, and Victor A. Thompson. A pervasive theme in these writings is, that resource limitation and specialization constrain organizations and consequently cause uncertainty. One way to reduce uncertainty and maintain order, is for an organization to enter into an interdependent relationship with other organizations which are willing to exchange elements with it. As resources are in short supply for high performance, cooperation provides a feasible means of resource acquisition and for better utilization of the limited resources.

## Summary

There are two parts in this chapter : the review of relevant literature and the normative framework. The review section examines related literature on social organization and organizational adaptation. The former specifically deals on organizations as systems, bureaucratization of formal organizations, and the notion of task environment of organizations. The latter presents materials on temporary systems, interorganizational cooperation and the specific task environment of the subject of study (RURP).

In the normative framework section, the research questions are reintroduced and answers formulated using concepts and relationships drawn from the review of literature. The normative framework will serve as the frame of reference for describing, analyzing and explaining the features of the case.

# CHAPTER III

## DATA AND DATA COLLECTION PROCEDURE

This chapter describes the fieldwork which includes the general approach to data collection, the types of data gathered, the methods and instruments used, and the sources of information.

The field research was based on the normative framework explicated in Chapter II. There, the frame of reference for data collection, data processing, and inference was set.

The subject of the study, the Rainfed Upland Rice Project (RURP), has been regarded as a representative of a cooperative temporary open system. Hence, the research expedition focused on the concepts of: (1) organizational cooperative arrangements; (2) temporary systems; and (3) open systems. Evidences were sought to employ in an expository and exploratory analysis of the RURP as a cooperative temporary open system.

Briefly, information gathering consisted of looking for answers to the following questions: (1) What indicates RURP as a case of a cooperative temporary open system? (2) What are the consequences of RURP as a cooperative temporary system to its parent organizations, itself and other systems? and (3) Why was a temporary organizational pattern and a cooperative arrangement employed for RURP?

## General Approach

In order to present a process view of the subject, four time periods were set as the focal points of the study. These time periods were: (1) the "before the beginning" phase (antecedent); (2) the setting-up of the project phase; (3) the project implementation phase; and (4) the results and further development phase. The entry point of the research was in the last two phases. Data were collected firsthand and at "close range" when the project was in its terminal phase, and as spin-offs were being generated from it into other organizations, institutions, and situations.

The historical approach was used to piece together events of the past. This activity was conducted with the guidance of previous assumptions and by the theoretical schema. The research was, therefore, a selective process, as all historical researches are. In the words of J. Barzum and H. F. Graff:

> The historian must select information. To be successful and right, a selection must face two ways: it must fairly correspond to the mass evidence, and it must offer a graspable design to the beholder.[1]

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[1]Jacques Barzum and Henry F. Graff, The Modern Researcher, (New York: Harcourt, Brace and World, Inc., 1970), p. 175.

R. F. Berhoffer declares that "historical synthesis is a highly selective account of a postulated past-reality."[1]

Flexibility was generally exercised throughout the fieldwork. No rigid set of methodologies, questionnaires, list of respondents, nor specific procedures were followed. The research activity progressed as a developmental process. One activity led to another. For instance, the questionnaire instrument was not developed until the feasibility and relevance of information were determined. The list of respondents was prepared only after the investigator spoke with a few key informants. Also, the kind and number of research methodologies/techniques were decided after understanding the nuances of the subject, its relevant internal parts and their interrelationships as well as its relationship with other systems.

Flexibility was, however, balanced by responsibility. That is, responsibility to the normative frame of reference. Every use of a research methodology, an observation, or a question was always related back for relevance to the normative framework.

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[1]Robert F. Berhoffer, A Behavioral Approach to Historical Analysis (New York: Free Press, 1969), p. 23.

Whenever feasible, a number of research methods/techniques were employed to collect pertinent information about a source (see section on sources of information). This norm was used to cross-check information, thus increasing data reliability. For example, data from interviews were expanded and validated, wherever possible, by reference to publications, reports, documents or newspapers/magazines. As the cross-checking proceeded and as the great mass of associated facts merged, the pattern became more and more established.

## Types of Data Collected

In keeping with the general approach of the investigation, a variety of data was collected. The evidence consisted of:

a. Testimonies of actors who were involved in the project.

b. Testimonies of expert observers.

c. Published and/or recorded accounts of what was done, who did it, when, and what happened.

d. Statistical data of program accomplishments and activities.

e. Personal observation of field operations.

f. Relevant documents in official and personal files.

g. Responses to questionnaire.

h. Professional opinion, analysis and interpretation on a number of issues.

i. Verbal comments and reactions of program actors and clientele.

## Sources of Data, Research Methods/Techniques and Instruments Used

Table 1 presents a structural device to guide description and analysis of three aspects of the data collection procedure: sources of data, the research methods/techniques, and the instruments.

### Sources

The sources consisted of: (1) Parent organizations - the International Rice Research Institute (IRRI), the Bureau of Agricultural Extension (BAE), and the National Food and Agriculture Council (NFAC); (2) the RURP itself; and (3) other systems - other agricultural agencies, pesticide companies, credit institutions, participating farmers, and the local communities where RURP projects were located. These sources were treated as the

Table 1

Sources of Data and Research Methods/Techniques Used in the Study

| System Source | Methodology/Technique | | | | |
|---|---|---|---|---|---|
| | Personal Interview | Panel Interview | Questionnaire | Personal Observation | Content Analysis |
| Parent organizations | | | | | |
| (a) IRRI | X* | | | X | X |
| (b) BAE | X | | | X | X |
| (c) NFAC | X | | | X | X |
| RURP | X | X | X | X | X |
| Other systems | X | X | | X | X |

* The "X" mark shows that the method/technique was used for the corresponding system source.

relevant systems without which understanding of a cooperative temporary system, such as the RURP, is inadequate.

From the parent organizations, indications were sought with respect to their role in the creation of the cooperative temporary system (RURP); the inducements and stimuli that influenced the formation of the RURP; their contribution to the joint venture; and the consequences (both functional and dys-functional) that RURP has brought them. The evidence on these issues was sought by interviewing key informants from the parent organizations, personal observation by the researcher and content analysis of printed materials (Table 1). (See research methods/techniques and instruments section).

As for the RURP system, data on its history, its further development, its structure, its inputs, its internal sub-system and their interrelationships, and its outputs were solicited. Also, information about its relationships with parent organizations and other systems was extracted. The evidences for these questions were obtained using personal interview with key informants, questionnaires, personal observation, and content analysis of printed matters (Table 1) (See research methods/techniques and instrument section).

Other systems were important sources of information because they reflect the character of the subject as a cooperative temporary open system and as a pilot project in agricultural development. The research interest here included: the inputs of other systems into the RURP and the consequences (both functional and dysfunctional) that the systems had derived from the RURP. Interviews, personal observation, and content analysis were employed to obtain needed data about other systems (Table 1). (See research methods/techniques and instruments section).

Research Methods/Techniques and Instruments Used

The research methods/techniques used were: personal and panel interviews, questionnaire, personal observation, and content analysis. The research instruments were the tools used in data collection. They determined the information recorded and by what means. They included the questions asked in the interviews and in the questionnaires, the systematic plan for gathering data from documents, publications and newspapers/magazines and the scheme for guiding personal observation of the researcher.

Personal Interviews

The most significant source of information was the fifty-nine unstructured personal interviews with key informants from the parent organizations, from within the RURP system itself, and from other systems. Although unstructured, flexible, and free-wheeling, the interviews were purposeful and systematic. They were guided along the specific patterns of an interview model. Most were recorded by use of a portable battery operated Sony tape recorder. There were a few exceptions as in those instances where the "interviews" were informal conversations with resource persons in the snack bar at break time or when the researcher made social calls on acquaintances.

The interviews totalled approximately sixty hours, an average of approximately an hour per interview. The longest lasted about an hour and a half while the shortest lasted about half an hour. The interviews were immediately transcribed from the tapes to a notebook to avoid backlog. This served the additional functions of repetition of the interview and identification of significant facts. Information gathered from unrecorded conversations were immediately recorded on paper and filed.

All of the interviews were prearranged either by telephone, letter, personal contact or through an emissary. As a rule the investigator tried to schedule the interviews at the convenience of the interviewees. At the field operations, a number of interviews with the workers were done en route to scheduled activities in cars, jeeps, motorcycles, and on foot. This turned out to be advantageous in that respondents were more relaxed, less self-conscious, and less inhibited by presence of the tape recorder; and there was less interruption of their time schedules.

The researcher introduced himself as currently a Ph. D. candidate at Michigan State University, collecting data for his dissertation, as administratively attached to and partly supported by IRRI for the duration of the study, and as a faculty member on leave from his teaching position at the College of Agriculture.

Twenty-eight of those interviewed (nearly half) were previous acquaintances of the investigator either as colleagues, associates, classmates, or friends. This was a big factor in getting interview appointments. Without these previous ties it would not have been as easy to get appointments and it would have taken more time to complete the study. Furthermore, these former ties probably led to fuller cooperation and willingness to provide sensitive information. For those with whom the researcher was not previously acquainted, his informal association with the IRRI and his identity as a member of the faculty of the College of Agriculture, University of the Philippines, were favorable factors for getting appointments and gaining cooperation.

Thirteen interviewees (about twenty-two percent) can be considered as having some degree of hesitation, reservation and unopenness. Answers to queries were prefaced with qualifying statements such as "this is not to underrate this project . . ." or "I have nothing against . . . ," or "with due credit to the IRRI . . . ," or "I'm all for this, but . . . ," or "I don't want to get into conflict with . . . , ". On a number of interviews, the researcher sensed that the guarded responses to sensitive questions were due to: (a) deference to a person involved with the issue; (b) desire to avoid open conflict with a colleague or with another agency; or (c) effort of respondents to protect the image of the institutions they worked for. However, there was no instance when it appeared that the interviewees were fearful of ill consequences to their position for speaking out on the issues.

As shown in Table 2, the fifty-nine interviewees could be classified by organizational affiliation and position. The administrators were those at the administrative helm of the organization. They were either organization heads, deputy officers to organization heads, directors for certain operations, or in-charge of a geographic unit. The scientists were those doing research on an aspect of the

Table 2

Number, Organizational Affiliation and Positions of Key Informants Interviewed

| Organizational Affiliation and Position | Frequency |
|---|---|
| Parent Organization (3)* | |
| (a) Administrator | 11 |
| (b) Scientist | 9 |
| (c) Information Specialist | 3 |
| RURP System (1)* | |
| (a) Field Technician | 19 |
| (b) Field Management Staff (coordinator and supervisor) | 4 |
| (c) Ex-project field technician | 4 |
| (d) Project Manager | 1 |
| Other Systems (10)* | |
| (a) Private Industry Representative | 8 |
| (b) Local Leader | 4 |
| (c) Scientist | 3 |
| (d) Administrator | 2 |
| Total .................... | 59 |

* Numbers in parenthesis refer to the number of organizations involved.

rice commodity such as (a) development of new plant materials; (b) development of techniques for growing and managing the new plant materials; (c) the economics involved in the techniques; and (d) the administrative and organizational aspect of the industry. Information specialists were those who managed information assembly, production, and transmittal operations.

The field technicians were those that implemented field operations. They worked with and taught farmers, conducted the experiments and carried on day-to-day activities of the project. There were three categories of field technicians: (a) RURP applied research technicians, (b) RURP extension technicians, and (c) non-RURP extension technicians.

The field management staff were those given responsibility and authority to deal with field operation matters. The ex-project field technicians were those who had left the pilot project and had taken other positions, some with the same organization from which they had been recruited for the pilot project and some with another organization. The project manager was the person assigned by the parent organizations of RURP to administer the project. The private agri-business industry was represented by senior and junior level personnel. The local leaders category included a municipal mayor, two local bankers, and a parish priest.

The fifty-nine key informants were selected because it was believed that they could provide information about parent organizations, RURP and other systems as these elements relate to the normative framework and problem of the study. These informants played key roles in the negotiation and planning of the pilot project, were personally involved with the project in some capacity and/or had personal knowledge of the project.

The kinds of information sought in the interviews were as follows:

Administrator - Need for the project. History, organization, and funding of the project. Why temporary and cooperative system was employed for the project. Agency's commitments to the project. Previous relationships between his institution and other participants in the project. Distinction between this project and previous ones in terms of organization and results. Bottlenecks of agricultural development in the country. Organizational obtacles. Impacts of the project. Benefits that project has brought to the agency. Personal comments.

Scientist - Personal and institutional inputs to the cooperative project. Influence of this project on the institution research program. Communication between the scientist and colleagues in his organization and other pilot project personnel.

Interdepartmental relationships. Impacts of the project; Trends in his own unit's research. His concept of research utilization. His assessment of the state of rice technology. Personal comments about the project.

Information Specialist - His concept of research utilization. Functions of office. His knowledge of the cooperative project's history, genesis, programs, relationship problems, impacts, and inputs from scientists and others. Nature, function, and role of international research centers; their relationships with national governments. Personal comments about the project.

Field Technicians - How he was selected for the project. Differences between the pilot project and his previous one in terms of job requirements, remuneration, morale, satisfaction, roles, activities, internal organizational relationships, results, problems and technical information fed to him. Plans, expectations, aspirations, concerns when the project terminates.

Field Management Staff - Duties and responsibilities. Sources of directions and instructions. Remuneration. Problems encountered on the job. Perception of problems encountered by the project. Relationships and communications within the RURP. Communications and relationships between RURP and parent organizations including other systems. Job satisfaction. Difference in job outlook before and on RURP assignment. Anxieties and concerns. Behavioral changes since connected with the RURP. Description of programs, activities, outcomes, and further developments. Personal comments about the project.

Ex-Project Field Technicians - Reasons for leaving the project. Current position and activities. What he learned from the project. What benefits he derived from the project.

Project Manager - State of rice technology. History of the project. How it was set up. Need for the project. Who were the prime movers, earlier actors, participants. Why temporary and cooperative arrangements were employed. Description of programs, activities, outcomes, and further developments. His previous work experience. His relationship with scientists and administrators at different institutions. Problems encountered. Funding, organizational structure of project, and inputs from scientists, other participating agencies and support institutions. His concept of research utilization and extension, agricultural development bottlenecks, agricultural development and how to facilitate it. Trends in rice research. Future of the cooperative pilot project.

Private Industry Representative - History of firm's involvement with the project. Firm's reasons for participation. Firm's inputs into the project. Benefits obtained by firm from its participation in the project. Differences in firm's participation between this project and previous ones.

Local Leader - The person's involvement in the pilot project. History of his involvement. Differences between this and previous programs. The person's judgment on impact of the project.

Panel Interviews

Two kinds of panel interviews were conducted. One was an interview with applied research team leaders and the other was a set of three interviews with groups of farmer cooperators. The team leaders were interviewed at the project's field office according to a prearranged plan. The three separate farmer panels were drawn from seminars of farmers to discuss applied research results and future plans and were not arranged in advance with the farmers. As in the personal interviews, the Sony tape recorder was used to record the proceedings of each panel interview.

The general questions asked at the panel interviews were (1) to team leader - same as in field management staff (personal interview), with slight modifications; and (2) to farmer applied research cooperators - describe specific participation on the applied research and other sharing arrangements with the project. Describe activities of field technicians and relationships with them. Changes in farming practices which originated from the applied research. Relationship and communication with neighboring farmers.

Questionnaire

Four sets of questionnaires were prepared and administered to four sets of field workers. They were: (a) the pilot project team leaders, (b) pilot project applied research technicians, (c) pilot project extension technicians, and (d) non-pilot project extension technicians. All four sets were administered to the groups during regular bi-weekly or monthly meetings. In each case it took approximately one hour to complete the questionnaires.

The questionnaires were developed after the researcher had examined project records and documents, had become familiar with the field and headquarters operations, and had established rapport with field workers. Drafts of the questionnaires were examined by two project leaders for face validity and clarity of language. The basic questionnaire as used is located in the appendix (Appendix A).

Content differences in the questionnaires were minor. They were mostly linguistic or structural, or involved dropping questions that were not deemed relevant. In each set the following information was solicited: educational background, work experience, previous training, differences between present programs and previous programs in terms of - job requirements, activities, remuneration, satisfaction, roles, results, technical information flowing to him, problems faced and what he was learning in the program.

Personal Observation

There were three general occasions for on-the-scene personal observation: (a) during field trips to the project plots, (b) during meetings of field technicians and farmers, and (c) when actively participating in some project field activities (participant observation).

(1) Field Trips - A total of five field trips were joined by the investigator: (a) for industry representatives, (b) for scientist from IRRI, (c) for chief administrators (Secretary of Agriculture and IRRI administrators), (d) for IRRI international

rice production trainees, and (e) for scientists, administrators, and field technicians from the College of Agriculture, University of the Philippines (Los Baños).

These trips followed a more or less uniform format. That is, while in the vehicle en route to the site, an advance briefing about the project was provided by the tour leader. Upon arrival at the designated site the guests were introduced to the technicians and to the host farmer cooperator. The technicians and the farmer then took turns in explaining what was done in the field. The technicians usually covered the research objective, design, and observation part; while the farmer explained his experiences with the project, told of his judgments of which trials appeared to have promise, and pointed out the demerits of certain practices.

(2) Meetings -- A total of six field meetings were attended. Three of these were farmers' meetings and three were meetings of technicians. The farmers' meetings were of a seminar, group discussion type. All the farmer cooperators with the project in a given municipality were invited along with their friends. During these meetings, field problems were discussed and solutions proposed. The technician used this occasion to emphasize important observations, findings, and recommendations. Through

the process of give-and-take among farmers and technicians, certain consensus about farming ideas and practices generally emerged.

The technician meetings were regular bi-weekly meetings at which field, technical and procedural problems were reported and shared in the group. New sets of instructions were given on these occasions too. Sometimes speakers were invited to speak on aspects of agriculture and extension. With the emphasis placed on rice, this subject always dominated the agenda of these meetings. The researcher was introduced at the meeting during his first appearance and was asked by the chairman, the head of the provincial extension agency, to explain what he would be doing in the days to come.

(3) Participant Observation -- The researcher's familiarity with the subject of rice technology and his knowledge of extension and communication, plus the fact that he had previous working relationships with the leaders of the pilot project, made it possible for him to participate in a more useful and active role. He helped organize one field tour, acted at times as interpreter between non-Filipino speaking guests and farmers, answered technical questions, volunteered technical information, explained certain

concepts to technicians, and provided feedback information to the leaders of the project based on his field observations.

Due to the design of the study, the researcher, in a way, was also one of the research instruments. He believes that his own background and experience in rice technology and extension work, as a former rice production trainer and specialist, as a former field extension worker and later supervisor, were assets to the investigation. In the first place he already knew the technical language used by the people in the field and was familiar with the participating organizations and the nature of the project itself. All along, however, the researcher was also aware that his closeness to the people involved in the project and his professional interest in these activities may have introduced some bias into the research such as in the assessment of the project performances and consequences.

During field trips, meetings, staying in the field watching the operation, living with the field workers, and participating in some activities, he picked up valuable verbal and nonverbal information that verified, clarified, or balanced information from other sources. In some cases he discovered added dimensions which were overlooked in other methods of data collection. The personal observations were focused on: (1) internal relationships within the project; (2) input-output relationships between RURP, parent organizations and other systems; and (3) behavioral changes of and other consequences for members and other project participants.

Content Analysis

With the invoking of Martial Law in the Philippines on September 21, 1972, commercial newspaper and magazine publications were suspended temporarily. A limited number of newspapers and magazines resumed publication at the start of the year, 1973. These newspapers and magazines carried extensive news and feature articles about the cooperative pilot project and its results from the time they resumed publishing and were continuing to do this during the time that the investigator was in the country from July to September, 1973. The IRRI library had complete clippings of newspaper coverage about this pilot project. This collection was made available to the investigator, Additional newspaper and magazine clippings from the Department of Agriculture Information Office, private industry, and project leader's collections were inspected. Three agency "in-house", newsletter-type publications that carried items about the cooperative project were also examined.

Documents were also analyzed. Documents, as used here, were materials considered as authoritative references and were available only from official and personal files. One was supplied by a pesticide company that had become involved in the cooperative pilot project. Another was from the office of a key person in the project. The last two consisted of materials about agency objectives, programs, organizational structure, budget, and personnel classification, and were supplied by the agency heads at the researcher's request.

Publications and reports were included in the analysis. They revealed professional and scholarly assessment of the rice situation in the Philippines and the world, status of and developments in rice technology, progress reports about the cooperative pilot project, proceedings of important conferences on rice, and portions of agencies' annual reports.

Printed materials such as documents, reports, publications, and newspaper/magazine articles were examined for whatever information they could provide on: need for this cooperative project, its history, how it was set up, institutional commitments, organizational structure, its implementation, further developments, impacts, significant activities, and events. The investigator was also alert to happenings, circumstances and issues in the country, as they were recorded in print, especially those that might have related to the formation, conduct, and performance of the pilot project. These printed materials also provided information on the state of rice technology, its trends, future direction, and the influences impinging on the current state of the rice technology.

## Data Processing

The variety of data obtained from the field work were sorted out, ordered and processed in two different forms as contained in Chapters IV and V. Chapter IV presents the subject (RURP) historically. Facts, events, developments and processes are presented as they unfolded. Chapter V attempts to construct the subject according to the normative framework. Relevant data from the field work are pulled out and reconstituted in an effort to articulate theory and reality.

## Limitation

As a final note, on limitation, we quote Everett M. Rogers on research report and reality:

> I: am frustrated by how little of reality actually survive the data gathering, quantification, analysis, and interpretation process to find its way in the resulting research report. [1]

No doubt this study will not be an exception to Rogers' observation. It can be added here that in spite of the thoroughness and comprehensiveness with which the research was intended, it is admitted that the study does not do complete justice to the reality being described.

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[1]From Everett M. Rogers' review of Diana Crane's book, Invisible College: Diffusion of Knowledge in Scientific Communities (University of Chicago Press, 1972), mimeographed.

# CHAPTER IV

## THE SUBJECT: "THE RAINFED UPLAND RICE PROJECT" (RURP) IN THE PHILIPPINES

### Introduction and Overview

This chapter presents in detail this case study done on The Rainfed Upland Rice Project (RURP). The facts were obtained through a variety of data collection techniques and from a number of sources described in Chapter III. The normative framework of the study has not been used as the organizing device in the presentation. Instead the subject is historically presented; events are described as they occurred in the process. Also, attempts have been made to reconstruct past situations, events and processes.

### The Participants

Three organizations created and managed the RURP. They were: (a) the International Rice Research Institute (IRRI); (b) the Bureau of Agricultural Extension (BAE); and (c) the National Food and Agriculture Council (NFAC). Each of these institutions is described below.

The International Rice Research Institute (IRRI)

Dr. Robert F. Chandler Jr., the first director to serve the Institute provides a succinct summary of the IRRI. In a seminar on "National Agricultural Research Systems in Asia" held in New Delhi, India in March, 1971, he says:

> The International Rice Research Institute conducts a comprehensive research programme on the rice plant and its management, maintains a library and documentation center to collect and provide access to the world's technical literature on rice, operates an information service, conducts regional rice research projects in cooperation with scientists in other countries, offers a resident training programme where scientists and extension workers from rice-growing countries of the world may carry out studies of the rice plant and learn techniques of rice production, and conducts international seminars and workshops to allow participants to pool their experience, and to identify important unsolved problems.[1]

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[1]Robert F. Chandler Jr., "The International Rice Research Institute," in Albert H. Moseman (ed.), National Agricultural Research Systems in Asia (The Agricultural Development Council, Inc., 1971), pp. 163-172.

The IRRI was the first of six current international agricultural research centers in the world.[1] According to Harry E. Wilhelm of the Ford Foundation in India, it "has set the pattern in terms of organization and performance for the other centers created until now."[2] Speaking of international research institutes at the New Delhi seminar in March 1971, Dr. A. T. Mosher, then President of the Agricultural Development Council says:

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[1]Sterling Wortman, Vice-President of the Rockefeller Foundation, reported at the 10th anniversary celebration of the IRRI on April 20 and 21, 1972 that there are now six international research centers in the world. They are: (1) the IRRI in the Philippines; (2) the International Maize and Wheat Improvement Center (CIMMYT) in Mexico; (3) the International Institute of Tropical Agriculture in Nigeria; (4) the Centro Internacional de Agricultura Tropical (CIAT) in Colombia; (5) the International Crops Research Institute for the Semi-Arid Tropics in India; and (6) the International Potato Center in Peru. Discussion is underway for establishment of the 7th international research center to be called International Laboratory for Research on Animal Diseases.

[2]Harry E. Wilhelm, "The International Research Centers," in Albert H. Moseman (ed.), National Agricultural Research Systems in Asia (The Agricultural Development Council, Inc., 1971), pp. 160-162.

> The international research institutes are working organizations which carry on problem-oriented, inter-disciplinary, basic, and applied research to provide materials and information designed specifically to fit the agricultural environment of the region. In this respect they differ from many other international programmes which tend only 'to make availabel' germ plasm materials, or information and resources developed largely under temperate zone conditions.[1]

Sterling Wortman, former Associate Director of IRRI, spells out the Institute's straightforward and unequivocal objective: "to help the nations of Asia to increase their national average of rice yields."[2] The Institute is organized around three basic functions: research, training, and international extension. The research activities are organized by departments around a senior research staff. The small size of the senior staff and the comparatively narrow focus of the research activities facilitate communication between disciplines, thus bringing about high integration within the Institute.

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[1]Arthur T. Mosher, "Highlights of the Seminar," in Albert H. Moseman (ed.), Ibid., pp. 259-267.

[2]Sterling Wortman, "International Agricultural Research Institutes: Their Unique Capabilities," in Rice, Science and Man (Los Baños, Philippines: International Rice Research Institute, 1972), p. 69.

The training activities at IRRI have been designed to enhance the capabilities of rice workers in research and extension throughout the region. The research and training components develop teaching and research skills. The extension training component is geared to specialist level proficiency in rice production, planning and managing applied research, and designing and managing instructional programs in rice production.

On IRRI's role, Wortman explains:

> The responsibility for increased production in any nation is that of the nation itself; only the individual nation can set the policies, organize the institutions, and reach the farmers in an effective way . . . but the institute can help with the solution of the problems, train the personnel, provide services of various kinds, and demonstrate and argue for new approaches to the improvement of farming. [1]

The IRRI's third function, international extension, is therefore carried out cooperatively, through joint projects. The institute's work with the Philippine agencies illustrates this point. A. Colin McClung, former Associate Director of IRRI, has this to say about the IRRI-Philippine tie-up:

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[1]Wortman, op. cit., p. 69.

> The Government of the Philippines has cooperated with IRRI in many ways additional to the paramount one of allowing the Philippines to be IRRI's headquarters. ... For a number of years, cooperative work between IRRI and the University of the Philippines College of Agriculture, the Bureau of Plant Industry, the Agricultural Productivity Commission (the extension service), and other agencies was funded by a special Ford Foundation grant. More recently, funds from the Philippine National Science Development Board have been channeled in support of cooperative work with the Bureau of Plant Industry.[1]

### The Bureau of Agricultural Extension (BAE)

The BAE is the agency of the Philippine government responsible for

> Providing informal, out-of-school, educational service for training and influencing farmers and their families to adopt improved practices in crop and livestock production, management conservation and marketing ... through the field demonstrations, lectures and conferences, publications and other means of imparting information.[2]

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[1]A. Colin McClung, "IRRI's Role in Institutional Cooperation in Asia," in Rice, Science and Man (Los Baños, Philippines: International Rice Research Institute, 1972), p. 36.

[2]Francisco Saguiguit, "Extension Service in a Developing Economy," August 6, 1966, paper presented in a seminar at IRRI.

This agency of the government has a long history of evolution by legislation. It has undergone changes in name, function, and organization over the span of two decades. After several transfers from one organization to another in the early 1900's, the agricultural extension function finally found a home of its own when the Bureau of Agricultural Extension was formally organized on July 16, 1952. and was placed under the Department of Agriculture and Natural Resources (DANR). Its function as established by law was to undertake a three-phase program of farm improvement, home management, and youth development for the purpose of increasing farm income and improving rural family life.

In 1963, with the passage of Republic Act No. 3844, otherwise known as the Agricultural Land Reform Code, the name of the agency was changed to Agricultural Productivity Commission (APC). Section 119 of the law stipulates the changes:

> For the purpose of accelerating progressive improvement in the productivity of farms, the advancement of farmers and the strengthening of existing agricultural extension services through the consolidation of all promotional, educational and informational activities pertaining to agriculture, the present Bureau of Agricultural Extension of the Department of Agriculture and Natural Resources is hereby placed directly under the executive supervision and control of the President and hereinafter renamed Agricultural Productivity Commission.

With this change, an additional function was placed on the extension organization -- to help implement the provisions of the agricultural land reform code, particularly in helping tenants become agricultural leaseholders and finally, converting them to free farmers and landowners.

To many outside observers of the organization, and some insiders to whom the investigator talked, this period was probably the golden era for the organization. APC had the backing and support of then President Diosdado Macapagal who appointed as its head one of his closest and trusted friends. During this period the organization received preferential treatment from the Executive Branch of the government in terms of resource allocation and program responsibility.

When Macapagal left the presidency after the 1965 national elections, the extension organization was once again to be affected. What was acknowledged as source of strength of the organization became a source of uncertainty and anxiety. Iglesias, in his review of the national rice programs under three Presidents, reported that the separation of APC from DANR "created strong resentment from other bureaus in the DANR."[1]

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[1] Gabriel U. Iglesias, "The Implementation of the Philippines' Four-Year Rice Self-Sufficiency Programme: 1966-1970," College of Public Administration, University of the Philippines (mimeographed).

A report by a foreign agricultural scientist who had been observing the organization at close range indicated that:

> As a result of this separation, very little of the results of applied agricultural research developed by the Bureau of Plant Industry (BPI) or the Bureau of Soils, both DANR agencies, became available to APC for implementing aggressive crop production extension program.

When President Marcos took over in 1966, a new national rice program was launched. On October 7, 1966 he issued Executive Order No. 50 which created the legal basis for another national rice organization. The executive order gave the Rice and Corn Production Coordinating Council (RCPCC) the "sole power and responsibility of implementing the Rice and Corn Production Programme." Under the RCPCC structure, the APC act as one of the member agencies of the council and coordinated its activities with the RCPCC. Under this set-up, all rice programs for the country were acted upon by the council.[1] This was a major change from the previous influenced enjoyed by APC under the Macapagal administration. Whereas before, it was the

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[1] Ibid.

center of decision-making in rice production programming, it had become merely a part of a decision-making council.

In 1973, the APC was restored to its former name, BAE, with the return of the extension organization into the folds of the DANR.

As an organization, the APC had special problems. Justly or unjustly, it became the butt of criticism by the general public for poor performance of its technicians, organizational inefficiency, poor national leadership, etc. In fact, it was blamed for the country's nagging problem of rice insufficiency.

A number of organizational constraints have befallen the BAE which, put together, have affected its performance. In interviews conducted by the investigator with rice scientists, development administrators, outside observers, farmers, and extension workers, the following organizational constraints emerged:

1. Lack of financial resources to (a) provide salary levels that would attract ambitious, energetic, highly motivated and professionally prepared people, (b) cover travel expenses of national, regional, provincial, and local level personnel in order to increase direct contact with actual situations, with clientele, and with other complementary institutions, (c) provide appropriate

transport facilities to increase the mobility of personnel at all levels, and (d) buy needed supplies, materials, and equipment for effective implementation of programs and operations;

2. Lack of effective organizational linkage with agricultural research and educational institutions that could have been a source of continuous inflow of technical information;

3. Need to strengthen subject matter leadership at the top by hiring commodity specialists and by supporting programs that they might develop;

4. Inadequate preparation of field personnel, including lack of practical training in farming and the absence of pre-service training in subject matter and extension teaching, to effectively function with clientele at the field level;

5. Reduction of the professional organization to the status of tool to serve the purposes of politicians, which has hindered its professionalization;

6. Internal problems associated with recent blurring of policy formulation and program implementation by the National Food and Agriculture Council (NFAC) (lack of personnel control, lack of agency pride and identification, and lack of internal cohesion);

7. Lack of position stratification within the organization to allow members to advance in role and status, and lack of opportunities for members to advance professionally.

These problems are not endemic to the Philippine extension organization. The E. B. Rice study of the thirty-year old effort of the U.S. to help build agricultural extension institutions in twelve countries in Latin America has disclosed similar conclusions.[1] Fred Al. Clemente II, arrived at similar explanations for poor performance of agricultural bureaucracy at the local level. He based this conclusion on the attitude of the people being served, which to him, is "at best apathetic, if not antipathetic" to the bureaucracy:

> The failure of Philippine public administration in innovation and development at the local level can be blamed upon all actors. On the part of the local bureaucracy, it has been overwhelmed by the challenges in the context of limited resources that it has not really worked up to its potentiality. A great deal of time has been wasted sitting in offices instead of going out into the field. Interrelated with the failure of the local bureaucracy is the failure of the national bureaucracy and the political elite to support the logistical needs of the local administrators.[2]

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[1]E. B. Rice, "Extension in the Andes," April, 1971, USAID Evaluation Paper 3A.

[2]Fred Al. Clemente II, "Philippine Bureaucratic Behavior," Philippine Journal of Public Administration, April 1971, p. 14.

Appendix B contains facts about the BAE organization.

The National Food and Agriculture Council (NFAC)

The establishment of coordinating councils in the Philippines, of which NFAC is an example, had been done in the Philippine government since 1954, during the time of President Ramon Magsaysay. Dans noted that "coordinating councils have been formed one after another in the nature of ad-hoc committees designed to offer instant palliatives to existing ills and problems of government."[1] Arcega in her study of the RCPCC, the institutional precursor of NFAC,[2] implied that the RCPCC is a means to "beat the cumbersome red tape of bureaucracy."[3] She noted that in the Philippines in the late sixties, "bureaucracy may refer to delays, red tape, inaction, or a slow-moving government personnel." Rafael Salas, considered by many as one of the architects of administrative reform of the governmental machinery in the

[1]Albina Manalo-Dans, "The Coordinating Councils: Rice and Corn Production Coordinating Council and the Infrastructure Operations Center," Philippine Journal of Public Administration, p. 195.

[2]The RCPCC was renamed NFAC on May 6, 1969 and its function was expanded from the planning and coordinating of just rice and corn to the planning and coordinating of all commodities dealing on food production. This includes fisheries, livestock and all crops.

[3]Victoria M. Arcega, "Mobilizing the Bureaucracy: The Case of the RCPCC," Solidarity, September 1969, p. 10.

Philippines, commented that one constraint and limiting factor of the development effort in the Philippines is government administrative deficiency.[1]

Dans explains the proliferation of coordinating councils in this manner:

> Where it is no longer possible to contain by departmentalization in the reliance of one function upon another, it has become necessary to create an extra body, a council or a committee, to undertake the remaining coordination.[2]

Salas provides the rationale for creating coordinating councils in the Philippines as part of the government's administrative infrastructure. He says:

> The modernization of the administrative infrastructure has not kept pace with the modernization of the community; the government has grown to be a complex organization without coordination and synchronization in its operation, and characterized by a narrow-minded, compartmentalized viewpoint. Thus while it is sometimes impossible to avoid duplication in the function and operations of

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[1]Rafael M. Salas, "Administrative Aspects of Philippine Economic Development," Philippine Journal of Business and Finance, Vol. 1, No. 4, pp. 241-257.

[2]Dans, *op. cit.*, p. 195.

> certain government agencies the circumstances have simply aggravated the inherent tendency in most government agencies to compete with each other, so that conflict rather than consensus, comes about, to the detriment of the development effort.[1]

The NFAC is one of several coordinating councils that have been created in the Philippines during the Marcos administration, from 1966 to the present. Its structure, internal dynamics, roles and functions were based upon those of its immediate forerunner, the RCPCC (See Appendix C).

The transition from RCPCC to NFAC is documented by de Guzman. He says:

> Just as the rewards of the rice program were being reaped, the RCPCC started to expand to other areas of agriculture. As early as 1968 the RCPCC embraced not only rice and corn production but also vegetables, fruits, fish products, livestock, poultry and meat products, and other prime food commodities. The focus shifted to practically all food products which are insufficiently available in the country.
>
> By virtue of Executive Order No. 183, on May 6, 1969 the RCPCC was changed to National Food and Agriculture Council (NFAC) to compose of twenty-one members. The NFAC coordinates, oversees, unifies and integrates the administration and implementation of the food

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[1]Salas, op. cit., pp. 241-257.

> production program of the country. Immediately upon its creation, Executive Secretary Salas issued Memorandum No. 126 which prescribed its organization and defined the distribution of its functions. ... it will use extensively the field organization developed by the former RCPCC.[1]

It can be added that NFAC now controls a major portion of the funds for agriculture and that a considerable share of the support funding of NFAC comes through the Philippine Government from the United States Agency for International Development (USAID).

## Project Genesis

In this section two items will be treated. One deals with what Sarason refers to as "before the beginning phase," and the other is the creation or establishment of the RURP.

### Before the Beginning Phase

Social organizations do not just emerge from nowhere. There are happenings "on the ground" and "in the air" that create a need to organize effort and mobilize resources. As pointed out

[1]Raul de Guzman, "Achieving Self-Sufficiency in Rice: A Study of the Philippine Experience in Program Implementation," Philippine Journal of Public Administration, Vol. XIV, No. 2, April 1970, p. 164.

by Sarason, need usually arises when the present devices for coping with a situation come short of expectation.[1] This section provides the "natural history" of the RURP indicating the role played in its creation by: (a) the technological advancement in rice, (b) the linkages that already existed between research, extension, and planning-coordinating organizations, and (c) the state of the rice situation in the country around 1969 and 1970.

Technological Advancement in Rice Production

> Many people now believe that the 'Green Revolution' has failed. I do not believe so, indeed if it were not for the new high-yielding varieties in use in India, Pakistan, and the Philippines, the adverse weather would have meant severe shortages rather than tight supplies and higher prices.
>
> Dr. Dale E. Hathaway
> Program Adviser in Agriculture
> The Ford Foundation
> July 31, 1973

At a conference on rice research and training held at IRRI on September 30 to October 3, 1969, at the opening of the second decade of IRRI's existence, there was a feeling of satisfaction about what had been accomplished and an optimism regarding the role of rice technology in the next decade. A portion of the conference report says:

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[1] Seymour B. Sarason, The Creation of Settings and the Future Societies (Washington: Jossey-Bass Inc., 1972), p. 1.

> The conference ... was held in an atmosphere of hope and against a background of solid achievement by rice scientists. Over the previous 5 years scientists had shown that tropical rice yields could be raised several fold. ... if a crisis would result it would be (underline is this writer's) less from technological weaknesses in production than from neglected opportunities, now presented for the first time, for modernizing agriculture.[1]

Barker, in an essay about the IRRI and the evolution of rice technology, assessed the accomplishment of the Institute in this manner:

> The initial objective of the International Rice Research Institute was to increase rice production throughout tropical Asia. Few observers believed that the goal could be reached quickly. However, in a period of only five years scientists showed that rice yields comparable to those found in the temperate zone could be achieved in the tropics.[2]

The technology responsible for this accomplishment consists of a package. Barker in another article says:

> A highly complementary package of inputs is associated with the new rice varieties. This package includes irrigation and water control, fertilizer, and methods to control weeds, diseases, and pests (insects, rats, and birds). Without the

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[1] Rice Research and Training in the 70's (Los Baños, Philippines: International Rice Research Institute, 1970), p. 9.

[2] Randolph Barker, "The International Rice Research Institute and the Evolution of Rice Technology," (Los Baños, Philippines: International Rice Research Institute) mimeographed.

> use of these inputs the grower cannot expect a good yield. The difference between the high-yielding varieties and traditional varieties is their response to inputs.[1]

Despite this achievement, it was recognized around 1969 and 1970 that more needed to be done. It was noted that the biggest gains from the new technological package had occurred in the more favorable, but limited in area, rice lands -- the irrigated areas. This was not unexpected, for the earlier emphasis of IRRI's research strategy was to concentrate on the area where pay-off would be soon and great, where growing conditions were more predictable, manageable and favorable. This policy was recognized and accepted by IRRI's scientists. In an interview with the researcher, one IRRI administrator says: "As a matter of policy the initial emphasis of our research was on irrigated land. This was where we expected to get maximum pay-off due to good control of water."

At the 1969 rice research and training conference, considerable impetus was exerted by scientists coming from Latin America and

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[1]Randolph Barker, "The Evolutionary Nature of the New Rice Technology," Food Research Institute Studies in Agricultural Economics, Trade, and Development, Vol. X, No. 2, 1971, pp. 122-130.

Africa (where rice is grown mostly in upland) as well as by the headquarters officials of the Rockefeller Foundation, to shift the research priority to the less favorable growing conditions, namely the upland and rainfed areas. It was argued at that conference that even if the potential yield from these less favorable growing conditions would always average low and would always be less reliable than those from the irrigated areas, the land area involved was so great that doubling average from a ton to 2 tons would have a great impact.[1] Barker and Huke estimated that 60% of rice land in South and Southeast Asia are rainfed and 20% are in upland.[2]

The research on upland rice actually started as early as 1962 when the Institute first opened its laboratories and experimental fields. An IRRI scientist told this researcher that in 1962, agronomist Dr. James Moomaw, started work on weed control in the upland at the IRRI field. He continues:

> We have learned that weeds constitute the most limiting factor for upland. Management using traditional varieties contributes less to yield. The variety IR 5 has shown

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[1] Rice Research and Training in the 70's, op. cit., p. 62.

[2] Ibid., p. 10.

> that it is capable of giving yields of as much as 5 to 6 tons against the national average of about 1 ton under upland condition. IR 5 is suitable because it's taller than the other IR varieties. Hence it suffers less from moisture stress. In 1966 we have included upland locations for our variety testing program. The University of the Philippines College of Agriculture and the Bureau of Plant Industry have developed so-called upland varieties.

Another scientist told this investigator that even before the 1969 rice research and training conference, Dr. Sterling Wortman had asked the Board of Trustees for additional funds for rainfed and upland research. Dr. Richard Bradfield had also talked about it. One IRRI administrator told this researcher that in addition to the works of the agronomists, the plant breeders and soil chemists have made some contributions to the building of a knowledge base in upland rice culture. It was generally conceded, however, that there was a dearth of basic information in upland rice culture. The situation in rainfed was however, not that bad.

All of the scientists and administrators interviewed were in agreement that the so-called "irrigated technology" is transferable to the rainfed condition provided water is not limiting. As one plant breeder told this researcher: "There is not much difference between irrigated and rainfed, variety-wise. There might be a difference in weed control management." An agronomist comments:

> As long as there is enough water to flood the growing field, the following advantages are realized: (a) the problem of land preparation is minimized, (b) the weed problem is minimized, and (c) it is more convenient and effective to apply granulated materials like fertilizer, insecticide and herbicide.

In a paper read at the tenth anniversary celebration of IRRI on April 20 and 21, 1972, Dr. D. S. Athwal, IRRI's present Associate Director says:

> In areas with good rainfall distribution essentially the same technology can be used on both irrigated rice and rainfed rice.[1]

To sum up, it can be said that the technological advancement in rice in the period 1962 to 1970 had made a substantial impact on productivity. The benefits of the package of technology had been largely felt, however, in the more favorable growing condition, namely -- the irrigated farms where water was more reliable

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[1]D. S. Athwal, "IRRI's Current Research Program," in Rice, Science and Man (Los Baños, Philippines: International Rice Research Institute, 1972), p. 56.

and manageable. In the seventies, the objective of rice research has been shifted to production in the more unfavorable environments -- the upland and rainfed areas.

## The Philippine Rice Situation From 1968-1970

> The result of all this was a rice-production revolution that made us self-sufficient in rice in the brief period of two years. The original programme was aimed at self-sufficiency in four years -- 1966 to 1969. By June 1968 self-sufficiency had been achieved, and in fact, we re-exported some of the rice which we had earlier brought in as buffer stock. We also exported roughly 6,300 tons of certified seed of the improved varieties in 1968. Where, before, we were able to achieve only small increases in production, mainly by additional hectarage, we now had increased production by increases in yield. Our national average jumped from 30 cavans per hectare in 1966 up to 43 cavans in 1968. As a result of the additional increase in production in 1968 we stabilized rice prices, even in the traditionally lean months of the year which were hitherto characterized by sudden fluctuations in prices. The fluctuation in 1968 was 14 per cent instead of the 44 per cent in the previous year. We also ended up in 1968 with the largest government buffer stock ever in our history, with some 10.3

> million cavans, representing more than 10 per cent of actual consumption in that year.[1]
>
> Arturo Tanco, Jr.
> Philippine Secretary of Agriculture
> March 1971

The above quotation succinctly summarizes the rice production breakthrough that the Philippines experienced for the first time in many, many years. The country enjoyed rice self-sufficiency the following year, 1969-70, a bumper year. Production rose to an unprecedented 118.9 million cavans.[2] The Philippine success was not caused by a single "miracle" factor. It was a compound effect of a host of complementary factors that happened to converge. A review of literature available in the Philippines on this subject, reveals a number of factors which have provided the impetus for this achievement of rice self-sufficiency:[3]

1. The availability of high yielding varieties (HYV's) which respond efficiently to application of inputs,

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[1]Arturo Tanco, "The Agri-Business Approach - The Philippine Experience," in Albert H. Moseman (ed.), National Agricultural Research Systems in Asia (The Agricultural Development Council, 1971), pp. 246-247.

[2]Mahar Mangahas and Aida R. Librero, "The High-Yielding Varieties of Rice in the Philippines: A Perspective," Institute of Economic Development and Research, School of Economics, University of the Philippines, June 15, 1973.

[3]*Ibid.*, Tanco, *op. cit.*, de Guzman, *op. cit.*, Iglesias, *op. cit.*

particularly fertilizer and modern cultural practices. This factor, in the view of observers, served as the catalyst to activate the other components.

2. Effective organization and administration of the national rice program -- The creation of the RCPCC brought all of the rice agencies of the government, including the private sector, into a working and coordinated team, thus preventing the encumbrances of interagency jealousy, bickering, and rivalry. In this set-up, agency interdependence rather than independence was the theme. The credit institutions -- The Philippine National Bank, the Development Bank of the Philippines, and some 300 to 330 rural banks -- relaxed their loan requirements and tied up credit with technological inputs and technical supervision. This technique made credit become more effective as the chances of misuse is considerably reduced.

3. Effective foreign assistance -- The United States Agency for International Development provided substantial sums of money to help establish the Agricultural Loan Fund to support rural banks and other credit institutions.

4. Leadership ability and commitment -- President Marcos himself was committed to the rice self-sufficiency goal. He won the presidency on this platform. Upon assuming office, he actualized his commitment by creating the RCPCC and appointing his Executive Secretary to administer the rice program. The dedication, the organizational and administrative ability, the charismatic leadership and the political influence of Executive Secretary Rafael Salas was considered a key element in the success of the national program. It is claimed by some analysts that it required a Salas to "de-bureaucratize" and activate the whole agricultural sector.

The decade of the 1960's closed with a flourish. The decade of the 1970's,however, unfolded into a bad start. As President Marcos began his second term there were unrully demonstrations in Manila leading to rioting in which several students were killed. Adding to this chaos was the de facto devaluation of the peso which was resorted to by the government to relieve the balance of payments pressure brought about by an external debt crisis.[1] With the devaluation of the peso, rice became a relatively cheaper commodity than other foods. As a consequence rice consumption rose by 23 percent.[2]

Then, in November 1970, typhoon Yoling struck with the strongest wind velocity experienced by the country. Luzon was the hardest hit and the main wet season crop, in the middle of harvest, was severely damaged. As if these were not enough, tungro disease[3] flared up, damaging the rice crop in Cotabato province and a portion of the Bicol region in 1970. Mangahas and Librero document the prevailing atmosphere in the country's rice sector at this time:

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[1]Mangahas and Librero, op. cit.

[2]Cited in Reeshon Feuer's situation report "Philippine Outreach Project," International Rice Research Conference, April 30, 1973.

[3]Tungro is caused by a plant virus which is transmitted from plant to plant through the feeding activity of green leaf hoppers. The rice plants affected with this disease show stunted growth and discoloration of the leaves. Panicles are usually developed later than in normal plants and become damaged. (From "Tungro: Its Symptoms and Control," produced by the Bureau of Plant Industry in cooperation with the U.P. College of Agriculture, IRRI, and BAE).

> In the meantime, less government attention was being given to the rice sector. In the first place, there was a loss of leadership when Rafael Salas resigned from the government just before the election in November of 1969. The level of coordination exemplified by the former RCPCC may have been difficult to match. The previous successes in the rice program may also have led to a feeling of complacency about rice. The RCPCC was converted into the NFAC, thus spreading the concentration of the administrators to other food products too, particularly fish and vegetable production.[1]

## The Early Interagency Cooperation in the Philippines

> As early as 1954, during the time of President Ramon Magsaysay, this coordination mechanism was given ample attention, as exemplified by the creation of the Community Development Planning Council.[2]
>
> Albina Manalo-Dans

Cooperative relationships between government agencies or between government and private organizations in the Philippines existed long before the establishment of the RURP in 1970. The RURP was not the first joint project of the three organizations concerned. The two Presidents prior to Marcos created cooperative mechanisms between rice agencies. Thus when RCPCC was created

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[1]Dans, _op. cit._, p. 195.

by President Marcos in 1967 he was continuing the practice of interagency coordination employed by his two predecessors -- Presidents Garcia and Macapagal.

The linkage between IRRI and the BAE started back in March 1964 when then Associate Director, Dr. Sterling Wortman, and then Chief of BAE's Information Division, Mr. Oscar Lazo, met and explored the possibility of sending BAE personnel to IRRI for a year's rice specialist training. This overture culminated in a formal agreement that sent five trainees to IRRI on June 1964 to start a 12-month training in rice production, applied research, and communication. Upon completion of their training, the five rice production specialists were sent to different regions to train second generation rice production trainees.[1] For the next three to four years the Alumni of the IRRI rice production and communication training program were conducting applied research in different locations all over the country in cooperation with IRRI.

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[1]Diosdado V. Castro, "The Filipino Graduates of the Rice Production Training Program: A Follow-up Study," College of Agriculture, University of the Philippines, Master of Science thesis, 1971.

During this period, a former trainee served as a liaison between the BAE and IRRI. His function for BAE was to insure in-flow of technical information from IRRI to the organization. The IRRI, on the other hand, was interested in his coordinating the various applied research which was being conducted by former trainees all over the country. This relationship was later disrupted, When IRRI and BAE, therefore, entered into an agreement to establish a pilot applied research and extension project in November 1970, it was a renewal of the disrupted cooperative relationship.

The IRRI's relationship with Philippine institutions is carried out in line with the philosophy that its role must be to foster improvements in the host countries' research and development programs. From its inauguration in 1962 to the present time, IRRI has had joint projects with a number of Philippine agencies.

The National Food and Agriculture Council has always referred to IRRI for technical information, program ideas, and professional positions on policy issues related to rice. In fact, IRRI appears in the organizational structure of NFAC as a member institution of the council, however without official obligation. The link between NFAC and IRRI is further augmented by the membership of the Secretary of Agriculture, who also heads the NFAC, on the governing board of the IRRI. As the Secretary told this researcher in an interview:

> Because of my being a member of the Board of Trustees of IRRI, I am continuously informed about technological developments there. Frequently I get invited to see a stand of promising varieties in the field or of a new cultural practice, just like the one you and I saw the other day.

## The Birth of the RURP

The preceding exposition of the technological advancement in rice, the rice situation in the country in the period from 1968 to 1970, and the early interagency cooperation in the Philippines represents the scenario within which the RURP was created in November 1970.

In the "Memorandum of Understanding" to establish the RURP, it was pointed out that in the Philippines, 74 percent of the rice area is planted to upland and rainfed rice. It was further pointed out that yield in the rainfed areas in the Philippines averaged only one ton per hectare as contrasted to over two tons in the irrigated areas. Another rationale used in establishing the project was the earlier indication that high yields under upland and rainfed conditions are possible as shown by research at the IRRI, U.P. College of Agriculture and the Bureau of Plant Industry.

How was the RURP created? Who were its architects and actors in its formative stage? What were its objectives? What was the organizational structure? These are some of the questions to which this portion of the study will be addressed.

## The Creation Process

At the international rice research and training conference held at the IRRI from September 30 to October 3, 1969, there was indication that new resources could be provided for new programs designed to increase the knowledge of (a) why yields on upland and rainfed farms are low and (b) how yields there might be enhanced. Subsequent follow-up discussions within the IRRI, between the head of the Office of Rice Production Training and Research (RPTR) and the then Associate Director and some scientists, intensified the interest and the possibility of grant money from the Rockefeller Foundation for work in upland and rainfed areas. It should be noted that even before the 1969 rice conference, interest in upland and rainfed was already starting within IRRI.

The challenge to work in the upland and rainfed areas was also not new to the head of RPTR. Before he was hired by IRRI, he was farm advisor for eight years in India, where the rice growing condition is mostly upland and rainfed. In the Indian states of Pamilaidu and Mysore,. he had headed an area development project which resulted in marked increases in yields using the new IRRI rice technology. The opportunity to test, in another setting, concepts and schemes that developed in his work in India, therefore, excited him.

A special project in upland and rainfed rice production became close to reality sometime in October 1970 when the RPTR started to work on the project proposal. A former assistant at the RPTR who had resigned earlier to work overseas as rice advisor and trainer, was rehired during this period. He was immediately assigned by the head of RPTR to work on the proposal. He went about his assignment by reviewing the published works on upland rice and talking with different scientists about their past and current works in the area. In his investigation he found out about the work of the agronomy department at IRRI on (a) the role of weeds as the factor limiting yield; (b) different weed control measures; (c) varietal response to fertilization; (d) insect control; and (e) indication of high yield potential. He also saw the earlier work on varietal improvement on upland rice by scientists at the U.P. College of Agriculture and the Bureau of Plant Industry.

In the meantime the search for institutional partners was on. The special project had to be undertaken in cooperation with local institutions. The criteria set for the choice of institutional partners consisted of: (a) availability of a large number of field personnel which could be recruited for the project; (b) availability of personnel who had previous training in applied research work; (c) compatibility and positive working relationship in the past; and (d) prospect of creating national impact based on this pilot work. A mixed-agencies composition of field personnel was ruled out in the interest of ease in coordination and supervision. It was felt that working with personnel from many agencies would complicate relationships and management.

In a chance meeting between the IRRI-BAE former liaison officer (when the two institutions were still having joint projects in the mid-sixties), the head of RPTR and the newly rehired assistant, the subject of a joint project on upland and rainfed rice production was broached. The thought of again having a working relationship with IRRI, after the first one had been

disrupted two years earlier, intrigued the BAE man. He promised to bring up the subject with the top administrator of his agency.

Back in the Quezon City headquarters of the BAE, the BAE man relayed the IRRI proposal to the Commissioner and Deputy Commissioner of BAE. The idea was received favorably by the two top officials. A message was then sent to IRRI indicating that the BAE was willing to go into further discussions on the subject of a pilot project on upland and rainfed applied research and pilot extension.

Following the above initial round of negotiation, a meeting was held in IRRI. At the meeting were five officials from BAE, two from IRRI's RPTR office, and two from the Unified Rice Applied Research Training and Information Project (URARTIP)[1]. The concept of a cooperative or joint pilot project to test the performance of a package of technology suitable for upland and rainfed conditions on farmers field and concentrated on a single

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[1]URARTIP is an interagency network within NFAC. It was formed to coordinate interagency activities in rice applied research, personnel training, and publication production. The active member institutions of URARTIP are: The U.P. College of Agriculture, the IRRI, the Bureau of Plant Industry, the Bureau of Soils, and the BAE.

area was high on the agenda. Further along in the meeting personnel requirements, agency allocation of responsibilities and contributions, organizational structuring and administration, plan of work and the project site were discussed. The meeting concluded with a decision to go ahead. The RPTR assistant and the BAE liaison man were assigned to draw up the details of the proposal.

Soon after the meeting at IRRI, while the committee was working on the proposal, a team of IRRI, BAE, and URARTIP staff members were exploring areas around IRRI and Manila in search of a suitable site. The team was guided by the following set of criteria: (1) it should have an area of about 20,000 hectares on rainfed and about 10,000 hectares on upland; (2) it should have a wide variety of soil type, (3) it should be easily accessible and proximate to IRRI; and (4) it should afford a guarantee of cooperation from local agencies functioning in the area as well as the local government. Using these criteria, the team chose four municipalities in Bulacan province and one in Nueva Ecija with headquarters to be established at the BAE Bulacan provincial office. An additional factor that favored Bulacan province and Nueva Ecija was the fact that the appointed project coordinator from APC was the son of the head of the provincial extension office of Bulacan. This factor was important because, as the coordinator commented, "in Bulacan, we can be assured of unqualified cooperation from the provincial extension office."

The committee working on the project proposal went about its assignment by going from one IRRI department to another consulting with scientists, on specific experimental treatments and experimental design. The committee was assisted in the writing of the work plan by a Peace Corps Volunteer who had just completed the IRRI six-month rice production specialist training course. At this time the Assistant Director of IRRI and an NFAC representative who is a personal friend, former colleague and former school-mate of the IRRI Assistant Director, were preparing the Memorandum of Understanding. The NFAC later came aboard in the negotiation due to the fact that it had some jurisdiction over BAE and was in charge of the overall rice program of the country. The Undersecretary of Agriculture, formerly the Executive Officer of IRRI, was favorable to the idea and made some modifications in the proposed organizational structure.

In November, 1970 the Memorandum of Understanding between IRRI, BAE, and NFAC was signed. The signatories of the document were the Secretary of Agriculture and Natural

Resources, the Director of IRRI, the Commissioner of the BAE, and the Head of the office of RPTR.

Objectives, Organizational Structure and Institutional Contributions

The purpose of the project, as conceived by its proponents was to "evaluate the contribution of important factors to rice yields under upland and rainfed conditions and to use the resulting information to develop recommendations for farmers."[1] The more specific operational objectives of the project were:[2] (1) "to field-test emerging technology, including new promising selections and varieties, herbicides, insecticides, rates and timing of fertilizer application, methods of stand establishment, and different management levels"; (2) "to determine the economic feasibility of growing crops other than rice in rainfed and upland rice areas"; and (3) "to train government technicians in conducting applied research trials."

The original project design proposed three phases. The first was the generation of a rice technology for the project area,

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[1] From the project's Memorandum of Understanding.

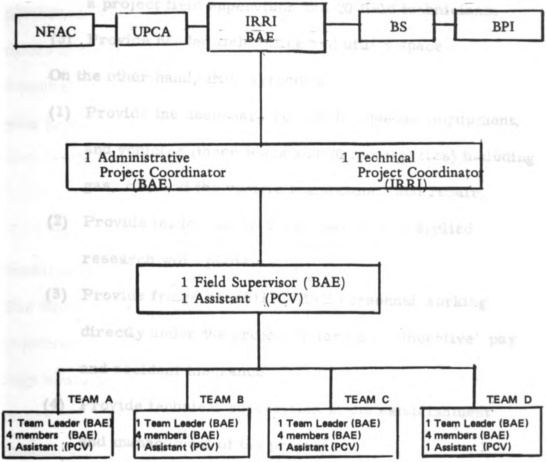
[2] International Rice Research Institute, 1973. Annual report for 1972. Los Baños, Philippines.

through a comprehensive applied research program for a two-year period. The second, the pilot extension phase, was supposed to be initiated in the third year and was to attain a mass adoption of the recommended technology by farmers in the target areas. The third and final phase was to be the dissemination of the technology and the agricultural extension lessons and experiences found successful in the pilot extension phase into other upland and rainfed rice growing regions.

The organizational structure of the project had four levels, namely: (a) institutional, (b) field coordination, (c) field supervision, and (d) field operations (see Figure 2). Administration of project funds and preparation of work plans were to be done through the IRRI organizational structure. The applied research activities were to be carried out by five teams of four members each, supported by a field supervision and coordination staff.

The responsibilities and obligations of the cooperating institutions were spelled-out in the Memorandum of Understanding that was entered into. The NFAC, also acting for BAE, agreed to:

(1) Appoint and oversee the BAE in managing and implementing the project.




| | | | |
|---|---|---|---|
| **Legend:** | **NFAC** | - | **National Food and Agriculture Council** |
| | **UPCA** | - | **University of the Philippines, College of Agriculture** |
| | **IRRI** | - | **International Rice Research Institute** |
| | **BS** | - | **Bureau of Soils** |
| | **BPI** | - | **Bureau of Plant Industry** |
| | **BAE** | - | **Bureau of Agricultural Extension** |
| | **PCV** | — | **Peace Corp Volunteer** |

**Figure 2**

**The Original Organization Chart of the Applied Research Program ***

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*** From the Memorandum of Understanding**

(2) Provide through the BAE a project coordinator, a project field supervisor and 20 field technicians.

(3) Provide needed field office and utility space.

On the other hand, IRRI agreed to :

(1) Provide the necessary research supplies, equipment, and vehicles (three jeeps and 20 motorcycles) including gas, oil, and the vehicle maintenance and repair.

(2) Provide leadership in the preparation of applied research work plans.

(3) Provide fringe benefits to BAE personnel working directly under the project in terms of "incentive" pay and accident insurance.

(4) Provide technical supervision in the establishment and management of the project.

(5) Analyze all the data obtained from the project and prepare project reports.

The Memorandum of Understanding also specified the technical assistance inputs from the University of the Philippines College of Agriculture, the Bureau of Plant Industry and the Bureau of Soils.

In summary, the allocation of institutional obligations consisted of the Philippine government, through the NFAC and BAE,

providing the manpower and legitimization requirements of the project, and the IRRI providing the financial and technical requirements of the project. A grant of $90,000 from the Rockefeller Foundation was solicited by IRRI to finance this three to five year project.

## The Applied Research Phase

The difference between the RURP and previous applied research efforts lay in the distribution of the project locations. The earlier projects were scattered all over the country. The objective then was to get a reading of how the package of technology would fare under varied agro-climatic conditions. The RURP on the other hand, was initiated in only one growing area and its objective was area development oriented. The Project Manager told this investigator in an interview: "Our strategy was to create a critical mass of technicians and operations in order to create a real impact in the area."

### First Year of Operation

The RURP became a complete reality when the first rice seedling was transplanted sometime in June 1971, the beginning of the wet season planting. The preparation for this first season of the project, however, began as early as December of 1970 when five BAE field extension agents were recruited from all over Central Luzon and Southern Tagalog regions for a six-week course in rice field experimentation at the IRRI. These five select technicians became team leaders of the applied research. They were selected because: (1) they were recommended by their supervisor; (2) they were technically competent (all had previously attended at least a two -week course in rice production from either the IRRI or the U.P. College of Agriculture); and (3) they showed communication ability and leadership qualities.

Early in March 1971, sixteen additional field technicians were selected from the same list the team leaders were drawn from. They were also sent to the IRRI for a three-week training program to learn: (a) applied research skills -- plot layout, application of granulated materials, spraying, data collection, and (b) rice production. The two groups of trainees spent one week of overlapping training at IRRI and they were formed into teams. This period was designed to enable team members to know each other personally and to prepare for their field work.

In April 1971, the five teams took to their field assignements -- four municipalities in the province of Bulacan and one in Nueva Ecija province. A total of 150 applied research plots were established in 24 barrios[1] in these five municipalities during the first season. (See Appendix D for the kinds and number of trials established).

After the specific sites were pinpointed and the farmer cooperators identified, a two-day seminar for the farmer cooperators was held. The following report describes this seminar:

> An orientation seminar given to all farmer cooperators was designed to present the concepts and objectives of the program, procedures in running the experimental plots, the benefits derived from the project and roles and responsibilities in the program. It was conducted in three different locations for two days by members of the team and the staff of the project.
>
> The orientation seminar also focused on problems that would arise in the management of rice crops under rainfed and upland conditions. The farmers were asked to contribute important first-hand information which were needed to readjust applied research trials.
>
> The seminar session was culminated by a trip to IRRI, Laguna. The idea of the trip was to offer them the opportunity

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[1]The smallest political unit of government in the Philippines is called a barrio. A town or municipality is made up of barrios numbering anywhere from 10 to 30.

> for a close-hand observation of the development of technology and research work on rice at the institution.[1]

Organizational Structure

Functionally and operationally, the line of authority and flow of function appeared like the one shown in Figure 3. There was a deviation between the original organization drawn up in the Memorandum of Understanding and the actual implementation of the project. As implemented, the head of IRRI's RPTR office served as the project manager. He administered the funds, generated additional resources, maintained personal linkages with supporting institutions, initiated project ideas, personally monitored field problems and activities, brought visitors – local administrators, scientists, foundation officials, private industry representatives and mass media people to the project, and was chief spokesman for the project. As a staff member of IRRI he received more inputs from IRRI than from any other source.

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[1]Information Division, Bureau of Agricultural Extension, "Report on the APC-IRRI Cooperative Applied Research Project on Upland and Rainfed Rice in Bulacan and Nueva Ecija, (1970-71)."

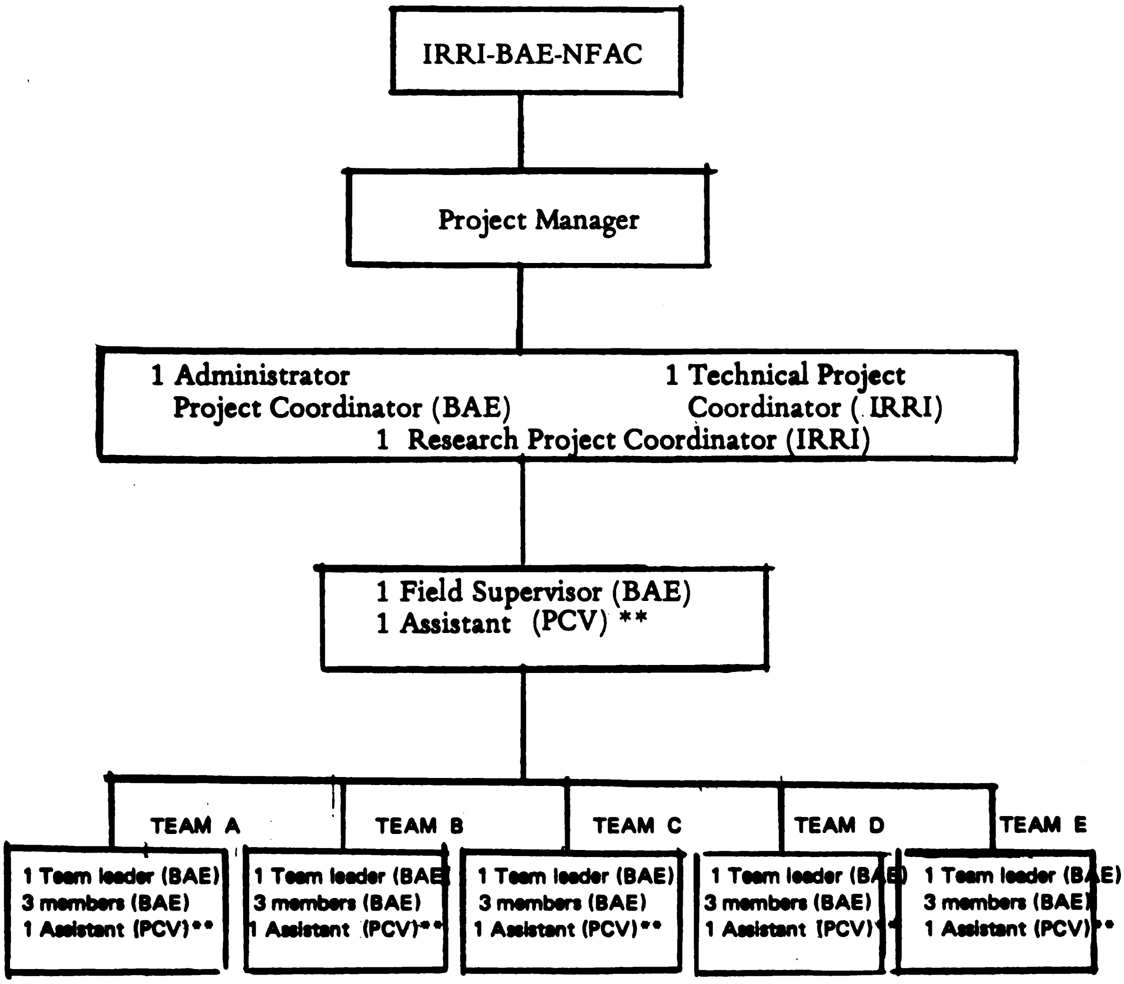


Figure 3

Operational Organization Chart of the Applied Research Program*

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* Based on the investigator's perception of the project's roles and role relationships and the organization hierarchy. This perception was arrived at through personal observation and interviews with project personnel at different levels.

** Peace Corps Volunteer

Field coordination was provided by three people. Originally, there was an explicit differentiation in the roles of the three coordinators. The administrative coordinator was to handle matters pertaining to personnel -- conduct, team composition, replacement in case of turnover, conflict resolution, supervision, complaints, and facilitating delivery of salary and allowance checks. He also was to serve as liaison between the project and the BAE. He was expected to keep the top BAE officials informed of field developments. The technical coordinator, a junior level staff member of IRRI, was designated to see to it that the technical requirements of the operation, namely, the preparation of project work plans, and the establishment and maintenance of the various field experiments were attended to. The research coordinator and a statistical assistant at the RPTR took care of coordination with respect to data sheet preparation, data collection, analysis and reporting.

As the project progressed, the distinct role differentiation between the coordinators became less clear. The individuals found themselves bumping into each other's prescribed roles due to the exigency of the applied research operations. There was more division of labor by activity or operation than by function.

During work peaks, the coordinators had to help each other. When personnel and human relations problems cropped up, all three coordinators became involved in their resolution. In the second and third year of the project when the technical and administrative coordinators had to spend a lot of time extending the project to other regions and speaking about the project, the research coordinator had to take an overload and perform functions that the two would otherwise have done.

The field supervisor directed the day-to-day field activities. He saw to it that experimental supplies and materials were available when they were needed; that vehicles were available to transport equipment and supplies to the experimental plots; that the work plan was followed reasonably; that emergency measures were carried out when the situation called for them; and during peak labor periods, he himself entered into the act by helping teams that were shorthanded. During the first year of operation, the field supervisor was assisted by a Peace Corps Volunteer.

The applied research activities, laying down the experiments on the ground, maintaining the plots, managing the experiment, and collecting the data, were performed by five teams. Each team had a leader and three members. The leader acted as chairman who received assignments for his team from the field supervisor, who in turn, received them from the coordinator. The team as a group operationalized the work plan into a work schedule, complete with time lines, personal assignments, and locations for the specific experiments. During peak labor periods, such as when establishing the experiment on the ground and making measurements, the team members, including the leader, helped each other. On all other activities, however, each team member attended to his assigned plots. Each team member was assisted by the farmer cooperator from beginning to end of the crop season. The farmer cooperator provided the land, helped in the conduct of the experiment, and received all the produce. All of the supplies needed for the experiment were provided by the project.

RURP technicians were compensated more than the regular technicians. They received an additional monthly ₱100 as incentive pay over and above their ₱316 basic salary. They were provided with motorcycles, fuel allowances, accident insurance, and free vehicle maintenance. The use of the motorcycles not only increased the technicians' mobility and coverage, it also served as an incentive for technicians to work with the project. This is indicated in a letter by the project manager to the former Associate Director of IRRI. He says:

> I appreciate your suggestion to give the motorcycles to each of the technicians at the end of the project. This has worked exceedingly well. The technicians have babied their motorcycles and the cost of operation including maintenance has averaged only around ₱50 a month.

## Internal Dynamics

For purposes of this description the term internal dynamics is used as a general category to refer to the internal communication, relationship problem, conflict and its resolution, and those activities that were designed to boost morale and to increase integration within the project.

Communication at the team level was immediate, frequent, face-to-face, and open. This was because the technicians lived together in one boarding house and because of the need for interdependence among themselves to carry the work of applied research. This living arrangement allowed for practically nightly team meetings in which the technicians and the leader informed each other of developments and happenings in the various plots. Activities for the following day were also determined at these meetings.

Messages from the field headquarter (the Agricultural Extension Provincial Office) were received by the team through personal deliveries from members of other teams, by the field supervisor, or by any of the three coordinators. The Agricultural Extension Provincial Office was hooked up by radio communications with the BAE, NFAC, and IRRI central offices. Urgent messages from any of the three cooperating institutions were transmitted and received within minutes.

Meetings of all the five teams were called periodically to explain new instructions, deal with emergency field and organizational problems, and make progress reports to each other. Plot intervisitation was also an important project activity. It prvoided continuing learning opportunities to the technicians and helped promote esprit-de-corps. Picnic parties, trips, and other socials were held either for relaxation during off season or to break tension generated during the peak working periods.

Team conflicts were generally resolved by discussing points at issue with the field supervisor or with any of the three coordinators. Gripe sessions within the team, or across teams, or between coordinators and the teams were frequent occurrences to vent hard feelings, complaints and disappointments.

The morale of the technicians appeared high. Five out of twelve RURP technicians that filled out the questionnaire, said that their satisfaction level was five, on a five-point scale. Four said that their satisfaction level was at point four. The reasons given for high job satisfaction were: (1) "I am learning a lot here"; (2) "I like the work" and (3) "I enjoy working with the team."

A high degree of technician dedication and energy input on the job was indicated in this statement of the project manager during a field trip joined by this investigator: "It is satisfying to see these boys work so hard." This researcher had witnessed technicians working in the field as late as six in the evening and on weekends. When technicians were asked why they work harder than usual, the responses were: (1) "I can't explain why we work this hard"; (2) "The work of applied research is very demanding"; (3) "We were handpicked for this job, we want to show that we deserve it"; and (4) "I like the work of research -- you have more control over what happens, the activities are more predictable and are scheduled, and you continuously learn on the job, thus you end up more technically competent."

Up to the third year of the project six technicians had left. Two were asked to leave because of delinquency. One left to accept a one-year fellowship to train in rice production and

extension in Japan. Another returned to his former position in BAE (he was later promoted to a national specialist position). Two transferred to another organization -- one to the Bureau of Plant Industry and another to a private agricultural chemical company. Three of the six ex-RURP technicians expressed some criticisms. One said he resented the lack of sensitivity of and the harsh treatment by a top project official. Three ex-technicians were critical about the way one coordinator treated technicians, his inability to "deliver the goods", and his neglect of his responsibilities.

### Results of the First Year of the Project

The result of the first year of the project is summarized in the 1971 IRRI annual report as follows:

> This year's results indicate the great potential for increasing the yields of rice under rainfed conditions. Average yields between 4 and 5 t/ha were consistently obtained from rainfed paddies when the crop was adequately fertilized and when weeds, insects, and diseases were effectively controlled. These yields were obtained in spite of a serious drought in the area and an outbreak of tungro virus which reduced yields of farmers' crops to less than 0.5 t/ha. The amount of rainfall throughout the project area was much less than average. During an extended dry period in August and early September, the soil in

> farmers' fields cracked, the roots of the crop were pruned, and serious damage occurred. The soils in the trial plots, however, remained moist in most locations.[1]

A summary report by the RPTR Office brings out a number of highlights of the 1971 wet season crop.[2] It says:

1. Results of the variety trials conducted in 24 locations indicated the high yielding potential of several varieties under rainfed condition. Highest yields were obtained from IR22, IR577, and IR20 with yields of 100, 100 and 98 cav/ha respectively.

2. Fertilizer tests conducted in 31 locations indicated excellent returns from the application of fertilizer under rainfed conditions. Optimum yields were obtained with an application of 900 kg/ha N (4 bags urea/ha). At this rate, a net return of ₱903/ha was obtained.

3. Insect control trials conducted in 11 locations points out strongly the need for effective control measures in Bulacan to obtain high yields. The tungro virus, a disease transmitted by the green leafhoppers, has reduced rice yields during the 1971 wet season to as low as 5 cav/ha in many areas.

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[1]International Rice Research Institute, 1972. Annual Report for 1971. Los Baños, Philippines.

[2]Office of Rice Production Training and Research, "Summary of the Results of the Applied Research Project in Bulacan and Nueva Ecija During 1971 Wet Season."

Results of the trial indicate the high economic benefits of effective chemical control. An average yield increase of 24-35 cav/ha over the untreated control plots were obtained from the plots treated with Furadan. The highest return per hectare was obtained from the two applications of Furadan in the field at 20 and 40 days after transplanting with a net return of ₱861 on IR22 and P606 on IR20.

4. Results from the management level trials conducted in 10 locations demonstrate the need to use a package of cultural practices which provides effective control of weeds, insects, and diseases and the application of sufficient fertilizer to produce high yields and minimize risk.

After the wet season crop was harvested, 15 of the 24 sites were used to put up the multiple cropping applied research. During the dry season of 1971, a series of seminars for farmer cooperators including non-cooperators were held in each of the five municipalities. The findings from the wet season crop were presented.

## Further Developments

There were major and minor changes in the second and third year of the project. The major one was the decision to proceed to the second phase -- Pilot Extension Phase -- two years ahead of schedule. The minor changes were: (1) changes in personnel due to turnover; (2) changes in technicians' barrio assignments; (3) changes in team composition; (4) changes in farmer cooperators; and (5) some changes in the research treatments and design. Although the Memorandum of Understanding stated that the project would terminate in 1976, it was the feeling within IRRI that the project should end after its third year, i.e., 1973.

## The Pilot Extension Phase

### Justification

In March of 1972, the beginning of the second year of the project, it was decided after consultations between the Project Manager and officials of IRRI, BAE, and NFAC, to proceed to the second phase of the project -- the Pilot Extension Phase. The justification for this decision can be found in the extension program for the province of Bulacan for the wet season of 1972.[1] The document says:

> There is an urgent need to increase rice yields in Bulacan to meet the ever increasing requirement of rice in the province. The province will have a deficit of 113,904 cavans of palay by 1977

[1]The complete title of the document is: "Masagana 99 Rice Production Extension Program for Bulacan Province, 1972 Wet Season."

> and 490,685 cavans by 1980, if production levels remain at a low average of 45.50 cavans per hectare.
>
> In 1971, a serious outbreak of the tungro virus disease has destroyed rice crops in the major rice producing municipalities including San Ildefonso, San Miguel, San Rafael, Baliwag, Guiguinto and Calumpit. Rice yields were reduced to as low as 5 cavans per hectare in many areas. Thousands of farm families, especially in the rainfed areas who could grow only one crop of rice in a year will undoubtedly have a difficult time in 1972.
>
> There is a threat for another widespread outbreak of the tungro virus in 1972. The disease has been observed recently affecting the ratoons of last year's crop in San Miguel, San Ildefonso, Calumpit, Sta. Maria, Pulilan, Plaridel, Bocaue, Baliwag, San Rafael and Guiguinto.
>
> Results of applied research trials during 1971 conducted to Sta. Maria, San Rafael, San Ildefonso and San Miguel indicate a great potential for increasing rice yields in Bulacan. The results show that virus can be effectively controlled and that high yields up to 80 or 100 cavans per hectare could easily be obtained, if farmers plant a disease-resistant rice variety like IR-20, if weeds and insects are effectively controlled and if sufficient amount of fertilizer is used.

A similar justification for the decision to proceed to the next phase, other than following the original time schedule, is found in the IRRI 1972 annual report:

> The field testing program was planned for three years to develop a satisfactory package of cultural practices but the high rice yields obtained in 1971 under conditions of rather severe drought and a serious outbreak of tungro[1] virus convinced the research workers and the agriculturists of Bulacan province that the results could be safely recommended immediately for adoption by farmers.[2]

## Objectives

The second phase of the project, which was initiated in the wet season of 1972, was intended to determine the effects of the package of technology generated from the 1971 wet season crop, when applied on a whole-farm basis. The program was designed to promote rapid widescale adoption of the package of cultural practices using a small number of skilled and highly motivated farm management technicians. The goal was to increase rice

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[1]There was conflicting opinion about the heavy tungro infestation, the apparent protection that one chemical was able to provide to the crops, and whether on this basis it was wise to recommend the chemical. The project personnel said: "This proves how good the technology is." On the other hand, some warned against over reaction to the crisis. As one scientist said: "The marked benefit of insecticide during 1971 wet season might be somewhat misleading due to the unusual situation created by the outbreak of tungro virus. As most of the varieties were susceptible to tungro they gave very low yield without insecticide treatment and the investment in insecticide appeared to be highly profitable."

[2]IRRI 1972 Annual Report, op. cit., pp. 229-230.

yields to an average of 4.5 tons/hectare over the entire project area within three years. Twenty-thousand hectares (15,000 for irrigated and 5,000 for rainfed) were targeted for the first season of the pilot extension project.

### Relationship Between Applied Research Activities and the Pilot Extension Program

As previously suggested the applied research activities in Bulacan and Nueva Ecija served as an intermediate step in the process of research utilization of rice technology developed at the IRRI experiment station. Essentially, what was done was to first identify the specific technological elements that had been known to increase crop yields in rainfed and upland conditions. Then these elements were put in an experimental package. This experimental package was then tested under farmers' field condition, replicated in several locations.

The field testing produced a set of technological elements that gave high yields even under unusually unfavorable conditions.[1]

---

[1]There is some disagreement within the scientific circle in the Philippines as to how bad the 1971 drought really was. One scientist said, "I don't think 1971 was the driest. The cracking of the soil is not very rare. What I'm saying is that this was not really a bad year. Wait until we'll get a real bad year. We really don't know yet what a bad drought is like. The Bulacan project people are saying 'we got this in a bad year, look what it will be in a good year'. What I'm saying is, look what you got in a good year. Wait when you really have a bad year -- we will be in real trouble."

This particular set of technology was translated into a simplified 16-step recipe for mass dissemination to the targeted area. Aside from the set of technology, there was another input that the applied research phase made into the pilot extension phase. This was the expertise gained by the RURP technicians from one year of experience with the technology. Because of this expertise the RURP technicians were asked to provide technical backstopping, training, and advising to the pilot extension technicians.

"Masagana 99"

It is quite common to label rice programs in the Philippines with a catchy name for budgetary and publicity purposes.[1] Funds are allocated and new resources generated and deployed to these creash programs or special projects. In a single crop season it is quite possible to have two to three simultaneous "operations," as

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[1] Some names of rice programs are:
"Masagana Way"
"Margate System"
"Eloy Baluyot System"
"Operation Rice Bowl"
"Operation Palagad"
"Operation Century"

they are commonly called. These names usually do not last more than a year before they are replaced with new ones.[1]

The Bulacan pilot extension project was also given a name to serve as its "password." The criteria used to select the project name were: that it should be a local name, a catchy phrase, and symbolic. After some searching, collecting, and deliberations the phrase "Masagana 99" was chosen. "Masagana 99," as one coordinator told this investigator, "is just an ideal phrase ... The word masagana had been around before,[2] it connotes bounty, and 99 is a good merchandising gimmick ... it draws people to it ... it also sounds sexy." "Masagana 99" translates and implies in English, "A bountiful harvest of 99 (cavans per hectare)."

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[1] In the observation of this researcher, this practice has served a useful function of serving as a memory marker for identifying "good" and "bad" lessons of Philippine rice programs. These lessons are retrieved during planning of a new operation by referring to the names of particular programs.

[2] In 1957 the Bureau of Agricultural Extension published a booklet called, "You Can Produce 100 Cavans Per Hectare (Masagana System)", written by Mr. Cayetano Pineda, a former top official of BAE. The publication stressed straight row planting, fertilization, weed control, insect control, seed selection and treatment, and use of healthy seedlings.

## The "Masagana 99" Program and Activities

The IRRI 1972 Annual Report documents the program and activities of the first year of the pilot extension project in Bulacan. A relevant portion of the report is quoted below:[1]

> Eleven farm management technicians from Bulacan were selected and trained at IRRI for 3 weeks. Results of the pre-training evaluation of the technicians showed that without training they would have been poor advisors to farmers. The group had an average score of only 32 percent. They would have been wrong seven out of 10 times in identifying the major field problems. Few had the necessary skill to effectively demonstrate the new technology to farmers. The technicians improved considerably during the 3 weeks of intensive classroom laboratory and field instruction.
>
> Food and agricultural councils were formed at the provincial, municipal, and barrio levels to serve as the coordinating and implementing bodies.
>
> A detailed program of work was developed which included (1) Developing a sample work plan for a municipality, including selection of pilot barrios, organizing barrio seminars and organizing field demonstrations and field days; (2) Developing cultural recommendations for growing rice based on the results of the 1971 applied research trials and previous trials conducted by the Bureau of Soils in the area; (3) Developing an ample farm

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[1] IRRI 1972 Annual Report, op. cit., pp. 229-230.

plan and budget for a 1-hectare rice farm; (4) Outlining responsibilities of members of the food and agricultural councils in supporting the program.

Posters, banners, leaflets, newsletters, radio programs, signboards on model farms, and other means were used to create awareness in farmers of the new technology and to develop interest in adopting it. The technicians made continual field visits to guide farmers in the proper application of inputs and to maintain their interest. Field days were conducted for farmers, rural bank officials, and others.

A "flagging system" was adopted to inform farmers of problems in their fields and what they should do about them. The technician in cooperation with a member of the food and agricultural council of the barrio finds problems in the field and alerts the farmer by putting up a flag in his field. Instructions are written on the flag indicating what to do about the problem.

The technicians were assigned to five of six barrios selected from each municipality covered by the program. Barrios whose potential for development was great and whose farmers and barrio officials indicated an interest were selected. The plan is to make the first five or six barrios models for the municipality.

Incentives and transportation are provided each technician who is expected to work long and hard. The incentive pay is necessary in addition to regular monthly travelling expense to partially compensate the technicians for the extra work performed. A motorcycle, with gasoline, oil, maintenance, and insurance provided free, is made available to each technician so he can easily cover his assigned area.

Production loans are made to selected farmers through the Agriculture Loan Fund (ALF) of the rural banks to enable them to participate in the program. The loans have averaged ₱700/ha. Loans are released in three installments. All loans are given in kind except the amount allocated for land preparation and transplanting which is given in cash. Any deviation from the recommended package of practices was considered a risk so rural banks were encouraged to provide the full loan. The rural banks in the area cooperated in granting ALF loans to farmers, but only two banks lent more than ₱100,000. Other bankers were skeptical about granting loans to farmers because of the history of very low repayment. By November ₱1,425,000 had been released to farmers to finance the production of 2,600 hectares of rice.

Arrangements were made with pesticide and fertilizer companies to ensure the availability of sufficient stocks of all recommended inputs. Private industry gave unprecedented support in the form of printed information materials and motorcycles and other transportation facilities for use by the technicians. It has also provided immeasurable assistance in gaining the cooperation of different support services to the program.

Involvement of Private Industry

Two agricultural pesticide companies were actively involved in the first year of the pilot extension program. The involvement consisted of financial donations, donations of chemical materials for research and demonstration purposes, production of promotion

materials such as leaflets, posters, buntings, publicity for the project (handled by the advertising firm of one of the two companies) and putting the project in touch with their units of government.

The pesticide companies concerned will be referred to as Company A and Company B. The interest of Company A in the project was prompted by the good showing of one of its products tested in the 1971 applied research trials. At the start of the pilot extension phase the general manager of Company A was invited by the project manager for a conference at IRRI. Before the meeting this general manager was already aware of the performance of his product from field reports of his men. At the meeting project and private industry cooperation was explored. Soon after the meeting the company machinery started to move. In a position paper prepared by a field supervisor, it was projected that the total volume of sales from four company product lines would amount to ₱550,000, provided the project goal of 20,000 hectares in Bulacan was met. An executive of the Company declared to this researcher that the company's primary motivation was profit but also pointed out that it acted in response to a good opportunity to "provide a social contribution" to the country. The company's manager for marketing told this researcher,

> there is a lack of farmer education in this country about pesticides ... I can tell it, based on low volume of sales of pesticides in general... This extension project will allow us to help in the educational effort related to the use of pesticides ... besides success of the program will mean more rice for our people.

Of the two companies, A was more involved, historically, materially, and in programming. Throughout the first year of the pilot extension operation the general manager of the company was himself a part of the cast in the field, behind the scene, and in selling the program to leaders in government. The company's marketing manager and a field supervisor were assisting the general manager in demonstrating the firm's support of the project. To provide promotional and publicity expertise to the project the company's advertising and public relations firms were commissioned by the company. Their specific assignments were: (a) production of an illustrated leaflet for us in teaching the 16-step "Masagana 99" rice growing system; (b) designing and producing posters, buntings and other promotion materials; (c) planning and doing the publicity during field visits of important personalities through their usual mass media outlets.

The total cash expenditures of the company in support of the project in 1972 operation amounted to ₱53,900.

In addition the company also lent the project two cars for use by the project coordinators.

The association of this company to the project was so intimate that at times it was perceived by the public as mainly a joint project between the IRRI and the company. This created uneasiness within the IRRI and the scientific circle. The IRRI scientists did not want to give the impression that they were favoring one company over another for experimental results showed that products of other pesticide companies were also effective. In fact, other pesticide companies have expressed concern over the seeming inclination of the project toward the products of Company A.

Within the scientific circle in the Los Baños Complex there was a negative reaction against the publicity. Company A was gaining good exposure all this time because of its identification with a project that was sponsored and heavily supported by the internationally prestigious scientific institution, the IRRI. The reaction of the scientific cirlce can be summed up in this letter received by this investigoator from a worker in the Los Baños Complex:[1]

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[1]The Los Baños Complex is a campus where the U.P. College of Agriculture, the IRRI, the U.P. College of Forestry and four other research institutes are located. Now it is an autonomous unit of the University of the Philippines System called, University of the Philippines, Los Baños.

> Not knowing what you have received from other people here makes me hesitant to write what may be critical comments, but you might as well be warned that the program does not have everyone's support. By some it is viewed as an attempt to set up still another extension service in a place that has too many already. Quite a lot of professional promotional effort has been put into the program - something which the scientific community finds rather repulsive.

The role of Company B was more low key than that of Company A. Its involvement came later. Like Company A, it had several products under test in the applied research phase. It also saw the marketing possibility that could be developed through identification with the project. Its contributions to the project in 1972 consisted of ₱24,000 donated for the purchase of eleven motorcycles for the use of "Masagana 99" technicians, and additional expenses for promotional materials.

## Results of the First Year of the Pilot Extension Phase

The success of the pilot extension phase in its first year was dismal, based on intended goals of coverage. Two factors affected the ability of the project to reach the intended goal of 20,000 hectares: (1) Natural - the heavy rains in July and August resulting in the biggest flood ever recorded in Central Luzon and totally damaging the wet season crop; and (2) Institutional - all but two

of the rural banks in Bulacan declined to support the project. One rural banker explained,

> There is more risk in rainfed. If rains do not come, the farmers are unable to prepare the land; his seedlings in the meantime are getting older ... They may not be able to plant at all. ... How can you then expect them to pay their loans?

On top of this, the farmers have not had good records for repaying their loans in the past.

The IRRI 1972 Annual Report, however, presented the brighter view of the first year's operation of the pilot extension program.

> It is difficult to assess the impact of the program with experience from only one cropping season. Evaluation is based mainly on the reports of yield obtained by farmers who participated. For example, in Pandi, Bulacan, of the 100 hectares reported harvested, 90 hectares had yield of over 4 t/ha. Average yields of farmers who did not use the recommended package of practices ranged from 2 to 3 t/ha. Poor weed control, heavy insect damage, high incidence of diseases, and improper application of fertilizer contributed to low yields. ... The results of the pilot program show that it is feasible to increase rice yield substantially. It has been demonstrated that well-trained and highly motivated technicians, with transportation and incentive pay, can effect a rapid adoption of new technology if farmers have sufficient capital with which to purchase the required inputs. For the farmers, the

> experience they have had in harvesting, for the first time, over 5 t/ha has created new confidence in their capacity to produce. With the cooperation of administrators, bankers, agro-business firms, and community leaders the same yield increases are possible in other areas.[1]

A more comprehensive result is presented in Table 3.[2] The significance of the average yield of 4.2 tons in the first crop can be even more appreciated if one considers that drought hit the area from the middle of September to the month of November.

## Communicating Pilot Extension Technology to Policy Makers

Communicating the lessons from the pilot extension program to government policy makers represented a crucial key to the diffusion of the lessons of the project to other rice growing areas in the country. The people that made and unmade programs related to food production were the top officials of the NFAC.

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[1] IRRI 1972 Annual Report, *op. cit.* pp. 229-230.

[2] Inocencio Bolo, "Masagana 99 -- An Approach for Rapidly Increasing Rice Yields in Rainfed and Irrigated Rice Areas in the Philippines," paper presented at the Regional Conference on, "Communication and Change in Rural Asia," held in Bangalore, India, August 27 - September 3, 1973.

Table 3

Results of Masagana 99 Pilot Extension Program
Bulacan, Philippines, 1972

| | 1st Crop 1972 | 2nd Crop 1972 |
|---|---|---|
| Area (hectares) with credit support | 1843 | 1476 |
| No. of farmers | 864 | 796 |
| Average production* (ton/ha) | | |
| Before Masagana 99 | 2.1 | 2.7 |
| Under Masagana 99 | 4.2 | 4.4 |
| Percent increase in yield | 100 | 63 |
| Net earning per hectare | | |
| Before Masagana 99 | US $ 65 | US $ 112 |
| Under Masagana 99 | US $ 202 | US $ 215 |
| Percent increase in earnings | 201 | 92 |
| Repayment of loans (%) | 96 | 98 |

*Based on 916 hectares on first crop, 308 hectares, second crop.

Specifically they were the Secretary of Agriculture, his Undersecretary, his program directors, and the technical staff. These people initiated, evaluated, recommended, or decided programs.

After one year of applied research work and one season of pilot extension activities, the project leaders contended that they had results that could be communicated to agriculture policy makers for consideration in national programming. Project leaders were confident that what they had could make national impact at the time when overall production was low and rice crisis was imminent. It was decided then that the third phase of the project should be immediately initiated.

## Development Package: The Message Content

In this discussion, development package and pilot extension technology are used interchangeably. They both refer to the set of elements which, when used together as a package as recommended by the Bulacan project people, would result in rice yields of no less than 99 cavans per hectare. This, in a way, represented the message content of the communication directed by the Bulacan project people to the agricultural policy makers.

There were four specific elements in this development package that the Bulacan project people were trying to sell to the policy makers: (1) the rainfed rice technology -- the new high yielding varieties, the physical inputs of production and the cultural management practices; (2) the expertise -- the knowledge and skills of the technicians on the new rice growing technology acquired from a systematic training program and through the learning-by-doing process; (3) the organizational and administrative arrangement -- incentives to technicians, compensation, fringe benefits, type of supervision, program planning and implementations; and (4) institutional -- support from various institutions such as credit, marketing and communication.

## Communication Objective

The intended receivers of the communication effort were the key decision makers within the agricultural sector, namely, the Secretary of Agriculture, his Undersecretary, the NFAC Directors, and the NFAC technical staff. The communication goal was to persuade the agricultural decision makers to accept the development package and to make it the basis of a national rice program.

## Communication Strategy and Techniques Used

The communication strategy employed to achieve the stated goal can be gleaned from the script of the slide-tape presentation given by the project management and other promoters to high officials of the government. The presentation was professionally designed and prepared by a commercial advertising firm. It was done in cooperation and consultation with the applied research and pilot extension project staff. The actors at this presentation were: (1) general manager of Company A; (2) the project technical coordinator; (3) a rural banker; and (4) the president of the Agricultural Pesticide Institute of the Philippines. Appendix E presents in detail the script of the slide-tape presentation.

The strategy employed can be summarized as follows: (1) Get the policy makers excited about the severity of the rice crisis. (2) Present a development package that has been tried and tested under the most unfavorable growing conditions and actual farm size. (3) Emphasize the economic value of the recommendation. (4) Extrapolate the Bulacan project to national proportion. (5) Stress that the development package can bring the country back to self-sufficiency.

The account executive handling the project explained to the investigator that the slide-tape presentation was employed because the high government officials were unable to see the crops in the field due to heavy office workloads.

The presentation was well covered by both television and press. At the same time the mass media in the country were covering more development-oriented news. This was in accord with the public information guidelines under Martial Law declared by President Marcos on September 21, 1972. The presentation was jointly planned by the Secretary of Agriculture, the project manager, and Company A executives.

The slide-tape production was also presented in four other important kinds of settings: (1) to the NFAC national and provincial directors and officials; (2) during the rural bankers' national convention; (3) to the members of the Presidential Cabinet; and (4) to visiting foreign investors and diplomatic representatives.

After encouraging initial reactions by NFAC officials to the proposal, a period of inaction and lukewarm treatment ensued. This prompted the project leaders and officials of Company A, who at this point were acting as partners in the promotional campaign, to intensify their persuasion campaign. In the months that followed, the campaign was directed at the Cabinet level.

The General Manager of Company A had several friends in industry who know some members of the Cabinet. They decided to use the informal network to transmit the message of "Masagana 99" during some official functions as well as social gatherings in private homes. The strategy was primarily designed to influence the Secretary of Agriculture and his staff by seeking legitimation and support from his colleagues in the Cabinet. Meanwhile, extensive newspaper coverage of the project's results in Bulacan continued.

On January 24, 1973, the wife of the Executive Secretary, accompanied by Asian bankers and foreign dignitaries, made a field visit to one project location. The project management and the general manager of Company A had invited the Secretary himself, but on late notice, he sent his wife who hails from Bulacan province. Through arrangement made by the public relations firm of Company A this affair received extensive publicity both on television and in newspaper. The VIPs who went with the party made the occasion especially newsworthy. According to the Manager for marketing for Company A, the wife of the Executive Secretary was highly impressed during the visit. He said, "With her reaction, we were confident that 'Masagana 99' would become a national program for 1973."

Following this field visit, the Executive Secretary called and said he wanted to show the slide-tape presentation to U.S. Senator Inouye and party. Senator Inouye was visiting the country at that time to look into the disaster areas created by July and August 1972 flood and also to see how the U.S. government could help in the rehabilitation. At the invitation of the Executive Secretary, Senator Inouye visited one of the project locations in Bulacan. His visit also received extensive news coverage.

On February 13, 1973, the Secretary of Agriculture made a field trip to several project locations accompanied by the Project Manager and an NFAC Director. During this trip he asked several farmers what they thought of "Masagana 99." The project technical coordinator told this researcher that he heard the Secretary comment, "Masagana 99 will be a national program."

During January and February 1973 the Bulacan project was in the news media. A report received by Company A from its public relations firms documents the extensive coverage. (A portion of the report is reproduced in Appendix F).

## The Role of the Promoters or Change Agents

Two men played prominent roles in the "Masagana 99" undertaking as promoters or change agents. They pushed ideas, advocated certain positions, deliberately took action that changed the course of events, and catalyzed individuals, groups and institutions to act. The importance of their roles can be seen in this statement by the project technical coordinator:

> Perhaps some of the most significant events were the activities of the people behind the scene. Two men worked silently and efficiently to establish the much needed linkage to remove many of the bottlenecks. They are the <u>Project Manager of the RURP</u> and the <u>General Manager</u> of Company A. (Underscored are the Writer's). They worked together to bring the message to the Cabinet, to the Secretary of Agriculture, to the Bureau heads, and to others at the top ... They have brought several of the VIP's to the project area to witness for themselves the results of the program. They have worked together to establish linkages with the right people at the proper time. They have succeeded in the role. Now, Masagana 99 is a national program, with the support it needs to succeed. [1]

The Project Manager figured prominently in the creation process of the whole project, i.e. generating resources, getting institutional sponsorship, obtaining cooperation and joint commitment from local agencies and doing everything to take the project off the ground. The following are some statements made by respected individuals about the Project Manager and the role he played in the project and in the "Masagana 99" program:

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[1] Bolo, <u>op. cit.</u>

> I have a great deal of respect for his vigor, enthusiasm and sympathy for the small farmers. If not for him this current program would not have been pushed up to the policy level. He is about the only guy at IRRI that has done something tangible in extension.
>
> -A scientist at IRRI

> Within the Philippine system success or failure of a program rests on personalities a lot. In this project he (the project leader) is providing that element.
>
> -A scientist at IRRI

In a letter to the Project Manager, an executive of Company A said:

> With the fruits of your labours firmly established as the nation's rice production programme, I thought it only appropriate that you should have a copy of the enclosed album. You will see that the album records the presentation made to various groups in the early stages of the project and that the "message got through" is plainly evident in the light of current widespread activity on Masagana 99.
>
> I learned with regret that you were away on home leave when President Marcos launched Masagana 99 last 21st May with the Cabinet, Provincial Governors, Government and Private Bankers, AID officials, etc. in attendance at Malacañang. As the principal author and architect of the package, I am sure you would have felt pleased, and even a little proud as we are, that Masagana 99 had at last taken off.

In January 1973 the Project Manager received a commendation for his effort in this project. Part of the commendation read as follows:

> In recognition of your dedication, resourcefulness and devotion to this applied research project, this Office therefore commends you for your laudable accomplishment.
>
> (Sgd.) Commissioner of BAE

The other key figure, the General Manager of Company A, was active in communicating the development package. With his resources, business contacts, dedication, persistence, and enthusiasm, he got certain key personalities in government, business media, and research institutions excited about the program. The following statements obtained from the researcher's interviews reveal his contribution toward making "Masagana 99" a national program:

> He sold the idea to me. He should be given credit. He kept me informed. He tells me "look at this result." So I said, fine, I'm adopting it.
>
> -Secretary of Agriculture and Natural Resources

> He was going from office to office to get support for the program. Fantastic job he did. He was the catalyst. Without him there would have been a fragmented effort in "Masagana 99" promotion. He was very enthusiastic.
>
> -A business associate

> He was plugging the message - "here's a good idea that the country needs right now." He was unrelenting in his effort. He was doing it with almost missionary zeal. He hammered, pushed, badgered, nagged, intrigued until the message went through. He stirred people. Got people together ... His motivation? He is an ambitious person. He wants to go up. He wants to do a good job. From our corporate image perspective - this involvement won't do us any harm. This is one thing that we in this company can really point to with pride.
>
> -An executive of Company A

The Rice Situation in the Early Part of 1973

After a series of natural calamities such as flood and drought which inflicted havoc on the wet and dry season crops of 1972, a back to back infestation of tungro virus, and aggravated by high consumption rate, 1973 was forecast as a deficit year.[1] The seriousness of the rice situation was summarized in a statement of the Secretary of Agriculture in a television interview sometime in March, 1973. He said: "The situation is bad, very bad."

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[1]Randolph Barker, "The Current Food Grain Situation in South and Southeast Asia," a special report prepared for the Board of Trustees of IRRI, February, 1973.

## The Adoption of "Masagana 99" as a National Program

By early March of 1973, after about three months of debate, deliberations, power struggle, and hard and soft selling, it became clear that "Masagana 99" would be the country's rice program for 1973/74. There was, however, no big public announcement about this decision of the Secretary of Agriculture and his staff. The decision became more apparent in early March, when the Secretary commissioned the advertising firm of Company A to draw up a plan for the promotion of "Masagana 99" nationally.

The delay of the Secretary and his staff in accepting the proposal may have been caused by a number of reasons. In talking with NFAC officials, private industry people, project personnel, and the Secretary himself, the following were mentioned as points influencing the decision-making process:

> At the time we were making noise in late 1972, the government was implementing a flood, drought, and tungro recovery national program. It was called "Palagad 73," So, there was in a way a rivalry between our proposal and the current national program. (An executive of Company A).

> I don't want to downgrade the Bulacan project, but I also don't want to downgrade my own staff who are hard working. The Bulacan project is just one of the many projects we have all over the country which we have to consider in making a policy decision. (Secretary of Agriculture).

I had reservations on the extensive application of our limited resources on rainfed. It is alright to do this on an experimental basis. But if you spend millions of pesos on it, it's different. It is a very risky proposition. (Secretary of Agriculture).

There is a power struggle at the Council (NFAC) One director comes from one bureau and is still loyal to his mother agency. This "Masagana 99" is highly associated with a rival agency of this bureau. So, this particular director was not about willing to put the other agency in the lime-light. (NFAC official).

The name 'ninety nine' has a bad connotation in some parts of the country. In one area when you are called 'ninety nine,' it means something is wrong with you mentally. In another part of the country, 'ninety-nine' translates into the vernacular 'siyam-siyam' which means continuous rain for a period of time. At a time when we just had that devastating flood, nobody wants to risk having another one. (NFAC official).

The 'Masagana 99' is too identified with Company A. There is a risk that adopting the name will alienate the other members of the agricultural industry. (NFAC Director).

There is reluctance by NFAC staff about proposals coming from outside their circle, out of professional and personal pride ... reluctance clothed by imputing profit motive on our part . (An executive of Company A).

The Secretary's advisers must be saying - 'why should we call the national program 'Masagana 99' when my program is basically like it? (An executive of an agro-industrial firm).

The justification for finally naming the 1973/74 national rice program "Masagana 99" is provided by the Secretary himself. In an interview with the researcher, he disclosed that there are a number of things in "Masagana 99" that appeal to him.

> First, there is something in that name. It is a good slogan. It is jazzy, sexy. Second, there is already a lead publicity. The nation is already aware of it. Third, we can point to a successful two years of experimentation in Bulacan. And fourth, we need to have a breakthrough in the rainfed sector. We have saturated our efforts on the irrigated areas. Rainfed is the new potential. The Bulacan experiment shows that it can be done.

## The National "Masagana 99" Program

> This project, "Masagana 99," is a project which launches not only an agricultural project. It launches perhaps a test, an examination of ourselves, of the entire system. If "Masagana 99" fails, we may have to change the entire approach to the revolution which we have instituted ... Why must the President come all the way down from Malacañang to make council about planting rice? Because my friends this is symbolic of everything that we are doing in restructuring our society, in the effort at bringing about a unity of our people.
>
> President Ferdinand E. Marcos
> May 21, 1973

On May 21, 1973 at the Maharlika Hall in the Malacañang Presidential Palace, President Marcos officially launched the national "Masagana 99" program before farmers, high officials of the government, personnel of the DANR, bankers, private industry and the media. The actual program implementation began as early as March and April. In that early part of the program implementation, there were indications that the banking community was not going to give all-out cooperation. One critical element identified in the Bulacan project was precisely this, credit. Also, there was confusion within the NFAC itself and especially among the field people as to what really is the national program for 1973/74. This prompted the Secretary and NFAC officials to call on the President himself to make this public pronouncement and give the program a boost.

RURP expanded into the national "Masagana 99" program. This was manifested in the utilization of the RURP technicians and the supervisory staff in the training of technicians in other regions of the country. When the national "Masagana 99" was underway, twenty RURP technicians (16 from applied research and four from the pilot extension program) were asked by the national organizations (NFAC and BAE) to constitute the mobile training teams to conduct a series of two-day rice production seminars all over the country. There was continuous referring back by the media and "Masagana 99" officials to the RURP, evidence of broad awareness of the continuity.

## Latest Development

On February of 1974, soon after the first RURP grant was exhausted and that project terminated, another Rockefeller Foundation grant was awarded to IRRI's Office of Training and Applied Research, The new $81,000 grant was to be used to continue applied research and pilot extension work on a much more focused problem - to determine how to establish direct seeding of lowland rice, and the most beneficial cropping combinations which include other crops.

In this new grant, about two-thirds of the original RURP field operations force stayed on while the other third were tapped by two parent organizations (NFAC and BAE) to provide field technical guidance to the national direct seeding program which is a product of the first RURP.

## Chronology of Events

| | |
|---|---|
| September 30 to October 3, 1969 | International Rice Research and Training Conference at IRRI to discuss past programs and identify program priorities for the seventies. |

| | |
|---|---|
| Early 1970 | Discussion within IRRI between head of the Office of Training and Applied Research (RPTR), the Associate Director of the Institute, and some scientists on the idea of applied research on rainfed and upland rice. |
| October 1970 | IRRI's Office of RPTR started to work on the project proposal. A review of the knowledge base in upland and rainfed rice culture was undertaken through (a) the search of published literature, (b) personal inquiries from rice scientists, and (c) field trips to nearby upland rice farms. |
| October and November 1970 | Exploratory discussions with interested Philippine agricultural agencies. |
| November 1970 | Signing of Memorandum of Understanding by the Secretary of Agriculture and Natural Resources, the Head of the Bureau of Agricultural Extension, the IRRI Director, and the Head of IRRI's office of RPTR. |
| December 1970 | Survey of prospective project sites. Recruitment of project personnel. Training of five team leaders at the IRRI for six weeks. |
| <u>Wet Season Crop 1971</u> | |
| March | Three-week training at IRRI of sixteen technicians on applied research procedure and rice production skills. |
| April | Trained technicians were fielded to five towns in Bulacan province and one town in Nueva Ecija province. |

| | |
|---|---|
| June to October | Wet season crop. A total of 150 rice applied research plots were established in 24 villages. Tungro virus disease was rampant in this season. |

Dry Season Crop, 1971-72

| | |
|---|---|
| October to March | After the wet season crop was harvested 15 multiple cropping trials were established on the fields that previously grew the wet season crop. RURP technicians held a series of seminars in the barrios where applied research plots were put up to report findings and discuss observations. Non-farmer cooperators were also invited. |
| March | Cooperating institutions decided that the project should proceed on to the Pilot Extension phase. |
| April | Two cars were loaned to the project by one agricultural chemical company. Presentation of and conference on the rice pilot project, attended by key personnel, agricultural chemical company, local bankers and USAID officials. |

Wet Season Crop 1972

| | |
|---|---|
| May to June | Eleven additional technicians were trained for three weeks at IRRI. Land preparation delayed due to low rainfall. |
| July | Two simultaneous operations in this crop season - continuation of applied research and beginning of Pilot Extension Phase in 17 municipalities in Bulacan province. |
| July and August | Record flood in Central Luzon. Wet season crop totally damaged except small area in the highlands (Pandi town). |

Government launched "Operation Rice Bowl" to replant damaged areas. After the heavy rains in July and August a severe drought followed.

| | |
|---|---|
| September 21 | President Marcos declared Martial Law. |

Dry Season Crop 1972-73

| | |
|---|---|
| October and November | Second planting in the pilot extension project. Government launched flood and drought recovery program - "Operation Palagad." |
| November | A commercial advertising firm was commissioned by its client (an agricultural chemical company) to work on promotional aspect of the rice pilot project. |
| November and December | A series of slide-tape presentations to high government officials, Department of Agriculture and Natural Resources personnel, foreign dignitaries and visitors. |
| January 1973 | Two agricultural pesticide companies donated ₱80,500 to support the project. Field trip to one of the project sites by a wife of a high government official along with bankers and foreign dignitaries. Very good coverage by the newspaper and television media. |
| February 13 | Field visit by the Secretary of Agriculture and Natural Resources. Soon after, it was known that the national rice program for 1973/74 will be named "Masagana 99." |

| | |
|---|---|
| May 21 | President Ferdinand Marcos officially launched the national "Masagana 99" program at the Presidential palace before farmers, agricultural officials, local leaders, bankers and the news media. |

<u>Wet Season Crop 1973</u>

Implementation of "Masagana 99" rice project in forty-three province. The national goal was to put 500,000 hectares of irrigated rice land and 100,000 hectares of rainfed rice land under the "Masagana 99" project.

# CHAPTER V

# DISCUSSION AND ANALYSIS

## Introduction

In the preceding chapter the subject case, The Rainfed Upland Rice Project (RURP) was presented. Specifically the project was described in terms of the following: (a) its parent organizations (the participants); (b) its genesis; (c) its birth including organizational and administrative structure; and (d) the phases of its development: applied research phase, communication phase and adoptive phase.

In this chapter the project is analyzed according to the normative framework presented in Chapter II. There are two levels of analysis: (a) descriptive, which is the exposition of the case as a cooperative temporary system, and (b) exploratory, which is an attempt to make a more theoretical examination of certain issues about the RURP.

## Descriptive Analysis

The RURP was never called a temporary system by anyone associated with the project. Rather, it was referred to as a pilot project. Such projects are limited in operations, carried out by a single organization or jointly by two or more organizations, to undertake initial work on a designated problem or task. Pilot projects are resorted with increasing frequency in the agricultural development sector.

The RURP, by the norms previously set, can be regarded as a temporary system. There was clear understanding among the officials of the parent organizations, the International Rice Research Institute (IRRI), the Bureau of Agricultural Extension (BAE) and the National Food and Agricultural Council (NFAC), that the $90,000 grant was to be used for three or more but not to exceed five years. The setting of the time duration was based on the project's objectives and the characteristics of rice production.

The project was phased into three stages to carry out the objectives of testing technology, training technicians, and recommending proper rainfed and upland rice production. The actual time to produce rice takes about five months, depending upon the variety, from preparation until harvest. Rice is grown twice a year, the regular season and the off-season (dry months) in which irrigation water is required. The planners believed that it would take at least two years to test the technology and another year to demonstrate the practice under actual farm conditions over a wide area.

The project personnel were recruited from their jobs with the understanding that their assignment to RURP was to take them a minimum of three years and a maximum of five.

The problem for the project was to develop a rice production technology for the rainfed and upland condition. The charge was specific and problem oriented: (a) to test the emerging rice technology and develop a set of recommendations for rainfed and upland farms, (b) to identify reasons for low yield under these growing conditions, (c) to explore other crops that might be included in a crop diversification scheme, with rice as the principal crop, and (d) to train government technicians in applied research and effective extension.

The project was exploratory, experimental, and developmental. It was to help shift research emphasis from the heavily-researched, irrigated conditions for growing rice to the neglected rainfed and upland conditions. But while the project was pace-setting and "non-traditional," it was not completely cut-off or isolated from the scrutiny and input of the parent organizations. The project was designed especially to avoid this problem of alienation. It was understood that the technology to be tested was to come from the rice research scientists or discussed with them. The project was also designed for the scientists, development administrators, political leaders, industry representatives, technicians and growers to watch, make an input, study and adopt. There was an extensive program of visitation, seminars, meetings and conferences about the project throughout the three years of its existence. These non-formal education activities were conducted both on and off the project locations and they served personnel of the parent organizations and many others.

There were dissatisfactions, however, expressed by some sectors. A number of rice research scientists observed that as the project progressed, they were not substantially consulted on what should be tested in the field, or on the technology that the project advocated for wider application. The head of one of the parent organizations complained that he had not been as much involved in the project as he had wanted.

Another characteristic of the RURP was its limited size and geographic coverage. Only twenty technicians were working on the applied research program and twenty others were in the pilot extension program. There were four supervisors and a project manager. The applied research program was located in five municipalities with a total of about 150 field trials. The pilot extension program covered between 1,500 - 2,000 hectares and about 800 farmers (Table 3). All of these were in one province.

Relative to previous projects of this type in the Philippines, however, the number of personnel, the area coverage, the number of farmer participants and the total expenditures involved cannot be considered modest.

RURP is also characterized by high technical competence. In the Philippines, the RURP technicians were considered as among the best in overall rice production competence. To begin with, they were a select group, recruited from ten provinces, and selected on the basis of entry qualifications which included previous rice production training and leadership qualities. The pre-service training provided after the recruitment and their experience on the project substantially added to the technician's initial qualifications.

Within the RURP, expertise and ability were recognized and valued. The selection of team leaders, for instance, was largely based on their applied research competence, leadership ability and dedication to their jobs. One of the coordinators was a mere college sophomore but he was accepted and recognized by the technicians with Bachelor degrees in agriculture because of his great competence in statistics, applied mathematics, and overall research expertise. He acquired all of these competencies in his job at IRRI, where he worked as a statistical research associate.

A different communication pattern characterizes temporary systems. In the RURP, it was informal, open, and mostly face-to-face. This was partly due to the strong group pride and identity, the interdependent nature of applied research and extension functions, the team structure of the project, the living arrangement of the teams, the need for periodic exchange and reporting of research findings and field observations, and the close and guided style of supervision.

High job satisfaction for personnel is also a characteristic feature of temporary systems. With RURP, high job satisfaction among personnel was reportedly due to increased professional competence, anticipated opportunities after the project terminated, more attention received from the parent organizations, the agricultural community, and the press, and enjoyment in the work itself. Human relationships within the project, however, were not perfect. Indications of some problems come from the statements of former project personnel who mentioned high-handed treatment from a high official and from the supervisory group. Project technicians also complained of poor performance by one of the coordinators. In addition, a high level of anxiety was reported by some technicians over their professional futures and their material conditions when the project terminated on the third year.

## The RURP as a Cooperative Arrangement

From the initial stage of the project up to the end, the cooperative nature of RURP was preserved. The original title of the project, as it was referred to in the Memorandum of Understanding, was "International Rice Research Institute and Agricultural Productivity Commission (now called the Bureau of Agricultural Extension) Cooperative Rainfed Rice Project." The cooperative arrangement of the project was as follows: The IRRI (1) provided the technical requirements of the tasks, i.e., leadership in the preparation of applied research work plans, supervision of the experiments, data compilation and reporting, and technical training of personnel; and (2) acquired and administered the funds for the operations of the project. The Philippine agencies (BAE and NFAC), on the other hand, (1) provided the personnel requirements of the project; (2) made local arrangements in the project locations; and (3) provided field office and work space.

The overall project direction was to a large extent provided by IRRI. This was expected because of the following reasons:

(1) it had the control of the operating funds; (2) the Project Manager was a staff member of IRRI; (3) it determined the field trials to be conducted; (4) it was the recognized institutional leader in rice research; (5) it had the technical expertise; and (6) it had the greater institutional commitment. Of the three parent organizations of RURP, IRRI appeared to have assumed the most dominant role, with the two others performing supporting roles.

### Stimuli or Inducements for Organizational Cooperation

Organizational cooperation has been assumed as an adaptive behavior of formal organizations. Two types of inducements or stimuli have been suggested as having some influence on this type of organization behavior: (1) environmental and (2) organizational (internal to the structure).

The systems to be analyzed here are the parent organizations of the RURP and not the RURP itself. That is, the influence of environmental and organizational factors in creating the conditions and need for organizations to establish cooperative arrangements, as represented by RURP, are examined. This cooperative project, in a sense, was the "dependent" variable and the environmental and organizational inducements, the "predictor" variables.

<u>Environmental</u>

The analysis of the environmental inducements is focused on its sub-set, the task environment. In this case, three elements composed the task environments of IRRI, BAE, and NFAC: (1) the other organizations, (2) the agricultural production system, including the rice situation in the country, and (3) the technological advancement in rice production.

1. Other Organizations. The IRRI, BAE, and NFAC, constituted the interacting systems in the analysis. Each served as a relevant social system for the others, with whom it continuously interacted in rice production matters, particularly on research, training of rice production personnel, effective dissemination of research results, and national policy issues in rice production. Interaction between these organizations was expected because all three worked in the development of the rice industry. The IRRI was dedicated to the generation of knowledge and technology to increase rice yields. BAE was charged with disseminating and teaching the growers new rice technology; while the NFAC was concerned with policy matters and in the organizational and institutional arrangements that would result in increased yields and more income for the growers.

Their frequent interaction provided stimulation and positive reinforcements for joint efforts. These different organizational systems were, therefore, not mere interacting entities. They were also interdependent systems in their attainment of separate goals which were eventually directed at a common end -- the increased productivity and income of rice growers.

The quality of previous interactions between IRRI, NFAC, and BAE also affected the interaction process that resulted in the creation of RURP. The three organizations had had previous cooperative relationships on applied research, training of personnel, research results dissemination, and mutual consultations. These relationships which were promoted or maintained over the years were friendly and mutually goal attaining.

Greatly augmenting this pattern of interactions and paving the way for the establishment of the cooperative project, was the existence of close personal linkages between the three organizations. The two individuals who helped draft the Memorandum of Understanding were former colleagues and personal friends. The Undersecretary of Agriculture and Natural Resources, (and also an NFAC official) was a former administrative officer of the IRRI. The Secretary himself, who was also the head of NFAC, was a member of the IRRI Board of Trustees.

2. The Agricultural Production System and the Rice Situation in the Country. In 1970, when the RURP was initiated, the overall rice situation in the country was considered precarious if not alarming. This was brought about by a combined impact of: (1) natural calamities such as floods, drought, and tungro virus; (2) people factors, like increased consumption, private hoarding, and population increases; and (3) institutional factors, such as declining effectiveness and efficiency of the governmental machinery in agriculture, including the unchecked insidious force of supply manipulation. At that time it was projected that the years ahead were going to be bleak. This prevailing crisis atmosphere in the country brought some feeling of urgency to develop a program that would have short- and long-range successes in the rice industry. The IRRI, on the other hand, was responsive to the need of the moment. With its technical resources, it could provide substantial assistance and impetus to the undertaking. The crisis situation, therefore, by focusing on the urgency of the problem helped bring the three organizations together to form the cooperative project.

3. The Technological Advancement in Rice Production. Up until 1970, the government program was mainly focused on the irrigated sections of the country. The reason was that, with

limited resources the planners had to concentrate on areas where the pay-off was maximal and more predictable. This policy was conditioned to a great extent by the available rice production technology at that time. The efforts of most rice researches then were directed at developing and managing genetic plant materials that would suit the irrigated growing condition. Therefore, what was considered as high pay-off area was the irrigated. Had there been sufficient understanding of the causes of low yields in rainfed and upland, had there been adequate materials and techniques developed to increase rainfed and upland yields substantially, or had there been effective dissemination of findings in the field, the planners and policy makers would probably have considered them in the decision making. The lag in rainfed and upland technology at the time when a rice crisis was imminent, therefore, helped induce the IRRI, BAE, and NFAC to join forces toward the development of the rice production technology in that sector. Further discussion of these relationships is found in a later section of this chapter.

It is further argued that due to the interdependent nature of the rice production system, all three environmental inducements for organizational cooperation discussed above were acting in consort. They were interrelated. The rice situation was influenced by rice production technology, which together, also influenced the interactions between IRRI, BAE, and NFAC.

Organizational

In addition to the task environment, there are also organizationally-related inducements for cooperative action between organizations. In the normative framework, four organizationally-related factors were introduced: (1) organizational mission, (2) resources, (3) perception of mutual benefit, and (4) presence of a promoter or change agent.

1. Organizational Mission. Organizational mission gives directional force to an organization in its behavior toward other systems. Organizations with converging missions would likely have converging interests. And organizations with converging interests are likely to enter into cooperative arrangements. In this case the overall missions of the IRRI, BAE, and NFAC were oriented to increased rice production and the improvement of the growers' living conditions. To carry out this mission certain programs and norms were set out by the organizations concerned. The IRRI's program of activities was directed toward: (a) generating rice production knowledge and technology, (b) training of rice researchers, rice production specialists, and

trainers, and (c) international outreach. The IRRI had set a norm for its outreach programs. It specified that in the nations that were needing and asking for assistance its role would be supportive, consultative, and educative in nature, with the object of enhancing the capacities of local institutions.

The BAE's program of activities was directed toward the dissemination of farming and homemaking information, adoption of improved farming and homemaking practices, and the organization and training of farmers, homemakers, and youth. Its programs were based on education, training and service norms.

The NFAC on the other hand was charged with policy setting, organizational and institutional arrangements, and top coordination of all programs in food production. Its programs were set with and through the implementing agencies.

2. Resources. The differential availability of organizational resources creates a condition for cooperative effort. Organizations with high resource levels or with great resource generating capacity have greater enticing power to court organizational partnerships. In contrast, organizations with low levels of resources are easily tempted to do joint-projects. In the RURP case, IRRI's great capacity to solicit grants, in addition to its existing high level resources and prestige, were factors which

made cooperation attractive to the Philippine agencies. Moreover, these agencies had no funds to do exploratory and developmental projects of this magnitude. The case of this IRRI-NFAC-BAE tie-up was a situation of organizations complementing each other. One had the material and technical resources but were limited in personnel resources, while the other had the personnel resources, but had limited material and technical resources. It is suggested that for any organization to enter a cooperative arrangement, it must have some resources to use for participation. Additional discussion of this point will be given in the section on exploratory analysis.

3. Perception of Mutual Benefit. The act of collaboration between organizations can be viewed as a mutually beneficial process. An organization that perceives some form of benefit for itself from a proposed joint undertaking would likely be more interested in it than if it does not foresee any benefit. When the RURP was proposed, the IRRI's perceived benefits were: opportunities to test its emerging technology, to discover new knowledge in rainfed and upland rice production, to develop a commodity development prototype that could be used in its international outreach, and to continue friendly and mutually rewarding relationships with Philippine agencies. The BAE and NFAC, on the other

hand, had perceived the following benefits: the training of their rice production specialists and technicians, development of a technological package to be used in national programs, and establishment of a continuing linkage with a knowledge and technology generating organization.

4. Promoter or Change Agent. The function of a promoter or change agent is catalytic to the cooperative process. Such individuals bring future participants together, provide vision and enthusiasm to the idea, direct the course of events, provide initial resources, and obtain organizational commitments. These individuals are sensitive to inadequacies in the social order and motivated to do something to alleviate the situation. In the formation of the RURP, this catalytic role was mainly provided by the head of the IRRI's Office of Applied Research and Training (RPTR). He correctly read that the trend in rice work for the next decade was shifting to the rainfed and upland conditions. Within his organization, he succeeded in obtaining institutional backing for the project in spite of initial difficulties with some of his colleagues. Some scientists and administrators felt that more controlled farm experimentation was needed before going into a project combining applied research and extension.

The project could not be implemented without involving local agencies. In line with IRRI's norm, the project had to be conducted with and through local institutions in order to accomplish the dual purpose of research and development and institutional assistance. The enthusiasm of the RPTR head, his dedication, and his compulsion for follow-up secured commitments from the national agencies approached.

### The RURP As An Open System

An open system paradigm was constructed in Chapter II. It is assumed that the case studied is an open system which can be described with the use of the paradigm. The paradigm identifies six points for data gathering, discussion, and to aid in describing the system. The data points are: (1) statement of end-state; (2) statement of domain; (3) specification of supra-system; (4) inputs; (5) transformation component consisting of different sub-systems -- production, maintenance, supportive, adaptive, and managerial; and (6) outputs.

#### Statement of End-State

Broadly stated the end to which the project was directed, was the development of a body of scientific knowledge and technology that would result in greater productivity in the rainfed and upland farms and the communication of that scientific knowledge and technology to individuals and systems.

The specific goals were: (1) to do field tests of emerging technology on rainfed and upland growing conditions, (2) to determine the economics of crop diversification, with rice as the main crop, in rainfed and upland farms, and (3) to train government technicians in conducting applied research trials and extension.

## The Domain

The domain defines the limits and parameters of the system. This is expressed in terms of its functions, services rendered, and its clientele. The function of RURP was two-fold: to conduct field testing or applied research of emerging technology on rainfed and upland acreage and to communicate the same to the planning and extension organizations and eventually to the producers. The project clientele system was varied and diffuse. It included its parent organizations, other agricultural organizations, and farmers who were directly and indirectly involved on the project.

The services rendered by the project included: (1) generating and transmitting information to farmers, scientists, policy makers and extension workers, (2) providing learning opportunities to the researchers and technicians, (3) helping farmers in learning better methods of farm planning, budgeting, crop production and marketing, and (4) diagnosing field problems and recommending technical solutions as well as assisting credit institutions in credit supervision.

The Supra-System

The supra-system of the project were the three parent organizations that created it: the IRRI, NFAC and BAE. As a creature of these systems, the RURP was responsible to them. The project owed its existence and derived its sustenance from the parent organizations. As a sub-system of the parent organizations, the project was expected to contribute to their respective goal attainment.

The Inputs

The inputs into the RURP coming from the parent organizations and two pesticide companies, consisted of three types:

1. Demands. These are demands, expectations, assignments and suggestions from the parent organizations. The IRRI expected it to generate reliable scientific information that would help build the knowledge base in rainfed and upland rice culture. The NFAC expected it to provide practical from-the-farm

information, useful for policy setting, i.e., cost/benefit figures of a practice, a package of technology, and effective communication campaign. The BAE, on the other hand, expected it to train rice production specialists and technicians.

2. Resources. Consisted of professionally train personnel; operating funds; facilities and equipment for planting and growing a rice crop, data collection and analysis, transport of personnel, office fixtures; and experimental materials like seeds and other production inputs.

3. Information. Consisted of scientific knowledge in rice production, experiences of farmers in rice culture, technician's observation of rice technology in the area, past records of climatic and weather patterns in the locale, and the authority structure and communication pattern at the provincial, municipal, and barrio level.

<u>The Transformation (Internal) Component</u>

1. The Production Sub-System. There were three dimensions of the production-technical sub-system: (1) the procedure for applied research work, (2) the series of activities involved in extension work, and (3) the series of steps in rice growing.

Applied research included the activities of plot lay-outing, packaging and application of experimental materials, meticulous management of the experimental crop, careful and disciplined data collection and observation, and reporting of results.

The extension work which came in the second year of the project included helping farmers prepare farm plans and budgets, diagnosing technical problems and recommending solutions; conducting farmers seminars, farmers field trips, field days, and method and result demonstration, training production leaders, and distributing information materials.

Rice growing had seven critical activities - land preparation, growing of seedlings, transplanting, application of production inputs such as fertilizer and pesticide, water management, weed control and harvesting.

2. The Maintenance Sub-System. Included informal face-to-face and open communications between project personnel, frequent team meetings and personal contacts between team members and between the teams and the management staff, gripe sessions within the teams and across teams or between the teams and the management staff, field inter-visitations, taking a day off for a combined relaxation and educational tour, and positive reinforcing communication provided by administrators, scientists, the project manager, visitors, and the mass media.

3. The Adaptive Sub-System. This function was provided principally by the project manager and the coordinators. Adaptive function was indicated when the project management decided to proceed to the pilot extension phase, thus advancing the time schedule of the project. It was an adjustment in response to the opportunities provided by convincing experimental results in the first year and in response to the demand to do something to remedy a crisis situation. Allowing RURP technicians to help in the training of other national extension workers in rice production technology and sending key project personnel to help in the promotion of the national rice program were also adaptive behaviors. All these were designed to insure symbiotic relationships of RURP with other systems in its environment or to respond to disturbances that may upset normal relations.

4. The Managerial Sub-system. The function was provided by the Project Manager. He exercised authority and responsibility for budget preparation and control of funds, purchase of facilities, equipment and materials, coordination of the project with the programs of the parent organizations, provision of technical information into the system, establishment of personal and official linkages with other organizations and monitoring of field activities. He also acted as the project spokesman and salesman.

5. The Supportive Sub-system. Like the managerial function, the supportive function was also provided by the Project Manager. This consisted of activities designed to bring inputs of resources into the RURP to support its internal needs. An example was the acquisition of additional motorcycles for use of the pilot extension technicians as well as of additional funds for incentive pay of technicians.

The Outputs (Products)

The analysis of outputs or products of the RURP system are discussed thoroughly in the next section on "RURP consequences." To summarize, the RURP outputs can be grouped into (1) functional services rendered to its parent organizations and other systems, (2) scientific information generated which contributed to the building of a knowledge base in rainfed and upland rice production, (3) findings on organizational and institutional arrangements and practices for a rice production campaign, and (4) behavioral changes in technicians (increased rice production and research competence) and in farmer participants (adoption of recommended rice production practices and increased understanding of modern rice farming).

## Consequences of the RURP as a Cooperative Temporary System

In analyzing the consequences of this cooperative temporary system, a systems perspective of organizational performance is used. Consequence, in this point of view, is defined as "the changes that occur within a given system as a result"[1] of functions and/or products (outputs) of the performing system. Performance is viewed as "the total flow of consequences"[2] from the performing system. In a systems view of determining project (organizational) performance, it is assumed that the project is capable of achieving functional consequences (perceived as desirable) on other systems, including itself, as well as being capable of inflicting dysfunctional consequences (perceived as undesirable) on other systems including itself. It is further assumed that these consequences could be either intended (the articulated objectives) or unintended (non-articulated objectives). The RURP as a cooperative temporary system had certain inherent

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[1]Everett M. Rogers with F. Floyed Shoemaker, Communication of Innovations: A Cross-Cultural Approach (New York: The Free Press, 1971), p. 319.

[2]Garland P. Wood and James D. Shaffer, "Institutional Perfoermance in Agricultural Development," Michigan State University Agricultural Administration Workshop, October 26, 1971.

structural characteristics that determined what it could and could not do. The focus in this analysis is to report what RURP has done as a cooperative temporary system. These consequences are presented here without a claim that they are definitely products of the cooperative and temporary nature of RURP. While on their face, these consequences are logically attributable to the cooperative and temporary nature of RURP, there is no information to discount the alternative possibility that these consequences might have been caused by the project itself, had it not been cooperative and temporary in nature.

Table 4

RURP Consequences as a Cooperative Temporary System

| Systems Affected | Types of Consequences (1) Functional | (2) Dysfunctional |
|---|---|---|
| A. Parent organization | $A_1$ | $A_2$ |
| B. RURP system | $B_1$ | $B_2$ |
| C. Other systems | $C_1$ | $C_2$ |

Two types of consequences will be discussed: functional (1) and dysfunctional (2). There are three distinct categories of systems on which the RURP has either functional or dysfunctional consequences; (1) the parent organizations (A), namely: the IRRI, the BAE, and the NFAC; (2) the RURP system (B), particularly its personnel and the whole unit itself; and (3) the other systems (C) -- participating farmers, the local communities, and other institutions like the banking system and agri-business firms.

<u>Parent Organizations--Functional Consequences</u> ($A_1$)

The RURP was a joint creation of IRRI, BAE, and NFAC, Hence, they can be referred to as the RURP's parent organizations. As parents, these organizations had certain expectations of what the project should be doing and achieving, including what roles it should be doing for them. There were five apparent roles or functions that the RURP has performed for its parent organizations: (1) change generating, (2) testing, (3) feedback, (4) educating, and (5) resource acquisition.

1. Change Generating. Before-after comparison shows that there were observed differences in the majority of opinions and attitudes of individuals in the parent organizations regarding the importance of developing a rainfed and upland rice production technology and its feasibility and payoff. There was a belief that inasmuch as rainfed and upland areas were marginal, efforts should not be wasted on them but rather that efforts should be placed on irrigated areas where results were expected to be

maximal and immediate. National policy makers in agriculture had practically no program to develop the potential of rainfed and upland rice farms. This is caused by poor communication of existing findings, lack of information on these areas, plus the desire to attain maximum results from limited governmental investment.

At the IRRI, there was already a modest interest and a beginning desire to get started in rainfed and upland work in 1970, when the RURP was initiated. But the interest and desire were not overwhelming throughout the institution. Others would rather "wait and see" before launching into it. The evidence seems to reveal that the RURP has succeeded in, first, reinforcing the opinions and beliefs of staff members who had prior interest in and desire to work in rainfed and upland rice production. Second, for those who were not predisposed, the RURP has won their attention to the potential and opportunities of working in the rainfed and upland sectors.

At the BAE and NFAC, it was clear that the RURP has generated enthusiasm for programs in rainfed and upland, and generated specific institutional arrangements and practices for a successful rice production campaign.

2. Testing. In the knowledge utilization literature, testing is viewed as an intermediate step in the flow of knowledge or product

from a center in which it is generated to the ultimate users. In a sense, it is a quality control device for the product generating system. The RURP has tested emerging technologies developed at the IRRI and some from the University of the Philippines, College of Agriculture, and the Bureau of Plant Industry. These technologies are: weed control, varieties, fertilizer management, insect and disease protection and control, and time of planting.

3. Feedback. A very closely related concept to testing is feedback. Feedback, for an organizational system, is the process of constantly collecting information to monitor the performance and actions of the system so that deviations or faults can be detected and corrections and remedies adapted. In the case studied, information were collected to determine the applicability of certain technologies to the new conditions. For instances, the choice of appropriate variety, use of pesticides, fertilizer management, and weed control techniques were noted to be applicable to rainfed conditions. However, regarding the use of some weed control chemicals, it was observed that there is a difference in their use for rainfed and upland as compared to irrigated conditions. From this test, implications were drawn for future work at the IRRI in the area of varietal improvement, weed control, time of planting, plant protection, and fertilizer management.

4. Educating. The educating function of the RURP is manifested in the training of BAE's rice production specialists and technicians, and in the development of an institutional and organizational arrangements and practices for a successful rice production campaign. Specifically, these organizationally and institutionally related elements were: (1) use of pay incentives for technicians; (2) use of local organization for project management; (3) an institutionally integrated approach involving agri-business, local government, Church, media of communication, and governmental units serving agriculture; (4) provide a motor vehicle to the technician to increase mobility; and (5) a supervised credit scheme.

At the IRRI, the educating function of the RURP lies in the production of new information that contributes to the building of a knowledge base in rainfed and upland rice production. The discovery of the interaction between fertilization and weed control in minimizing the impact of drought, is one example of this.

5. Resource Acquisition. The results of the pilot project (RURP) has demonstrated to the public, to the high officials of government, to the business community, and to a foreign assistance agency (USAID), feasibilities and opportunities in the rainfed area. It further demonstrated some ideas for running a successful rice

production campaign. As a consequence, the NFAC received material and service donations from the business community to help implement the program. The USAID provided a large sum of funds to help in program planning, implementation and evaluation. The BAE, because of the expanded national program, acquired additional funds to hire new technicians. Quite another item, but nonetheless a form of resource, was the recognition and enhancement of prestige that BAE received from the public, and particularly from the high NFAC and Department of Agriculture officials for its participation in the project.

Parent Organizations--Dysfunctional Consequences ($A_2$)

In one of the parent organizations, internal staff conflict between one project personnel and some staff members was observed. It was learned that on a few occasions, the conflict became heated and personal, disrupting normal relationships between the personalities involved. The nature of the conflict was over the question of the appropriate role that the staff member assigned to the project should take. The head of one parent organization revealed to this researcher that he feels he is being alienated from the project. He complained that on a number of instances he was not consulted on personnel pull-out and reassignment matters. It was believed by some technicians that the cutting-off of their travel allowance by their mother agency was related to the high official's reaction to the slight. This is, however, interpreted as not a definite characteristic of all cooperative temporary systems, but in the case studied, it could probably be explained more by conflict of personalities. But it can be assumed that because of the physical and social isolation of temporary systems, whether they are cooperative or not, that the probability of this problem occurring is not remote.

One other problem relates to the relationship between the RURP and its parent organizations. As part of its calling, RURP tried to promote some ideas and products, based on its experiences and findings to one of the parent organizations. This was viewed by the other parent organization with disfavor, claiming that the ideas and the products had not been worked out thoroughly and needed further replications. This has caused another rift between the RURP head and some staff members of one parent organization.

Another dysfunction is personnel turnover and technician's role conflict. Two project technicians had already left the parent organization to accept higher paying positions elsewhere. These new employers have bid for the technician's high qualifications acquired from training and experience at the RURP. There were indications that more technicians will be taking this course of action if the parent organization cannot provide the technicians with higher salary and support. A number of the applied research technicians have developed a preference for applied research rather than extension work. This could create a role conflict for these technicians if they would be assigned, after the project, to a position that did not allow them to conduct applied research.

RURP System--Functional Consequences ($B_1$)

Two elements of the RURP will be included in this analysis: its personnel and the whole unit itself. The functional consequences of the RURP on its personnel were in the form of personal citations, recognitions, and awards for their work in the project. Moreover, the training and experience they had received on this experimental project have substantially increased their professional competence as well as their professional stature in the eyes of their colleagues and the greater community. Materially, the RURP has provided the technicians with higher compensation (₱100 per month in addition to their basic salary of ₱316 per month); a motorcycle, including its maintenance; and accident insurance. In terms of job satisfaction, it was reported that technicians were apparently happy and satisfied within the RURP.

As for the whole RURP system itself, its record for the first year of operation so impressed other systems, particularly the agri-business community, that it was able to secure from this sector a considerable amount of financing, experimental materials and professional services support to help implement its second phase, the pilot extension. Finally, the greatest compliment that the whole project itself could probably obtain was the naming of the 1973/74 national rice program after its own Pilot Extension Program -- "Masagana 99" -- including the adoption of some of its recommendations by the national rice policy making body, the NFAC, which is also one of its parent organizations.

RURP System - Dysfunctional Consequences ($B_2$)

There were debit items on the balance sheet of RURP. First, there was a criticism, justly or unjustly, that the RURP was partial to one pesticide company, resulting in a complaint by another pesticide company. What led to this charge of favoritism was the fact that the technical recommendations of the RURP in its pilot extension program, were predominantly those marketed by the pesticide company which at that point was helping implement the RURP pilot extension program.

Another criticism of the project was that the conditions provided for the project -- large operating funds, highly selected and trained personnel, and limited geographic scope -- was artificial and non-transferable to other regions of the country.

Another kind of sore spot within the project was the high level of technicians' anxiety, in the last year of the project, over their future when the project terminates. The technicians were apprehensive that nothing would be done by the parent organization to increase their salary. They believed that for working so hard for three years with the RURP and with added qualifications, they deserve a raise. Another source of anxiety was their suspicion that the parent organization would reassign them back to their former positions to do the same old things, and not allow them the opportunity to apply what they had learned.

Other Systems - Functional Consequences ($C_1$)

The other systems referred to here are the agri- business firms such as the credit institution and the agricultural chemical companies; the farmer participants; and the communities. Although the profits received by the agricultural chemical companies were not significant during the RURP's three years operation, when the national government adopted "Masagana 99," they were probably the biggest winners. After President Marcos proclaimed "Masagana 99" a national policy, there was all-out participation of all agricultural branches of the government, and the private sector. This resulted in the widest national participation ever known in any rice production program. As an indicator of business growth, there was a shortage in fertilizer and pesticide supply in the country in the months of August and September 1973, in spite of production increases set by the manufacturers. This impact, however, was not a direct consequence of the RURP but an offshoot of its experimental effort which became the source of a number of elements of the national program.

The RURP consequence on the credit institutions in Bulacan, was miniscule. But in the national "Masagana 99" program, the volume of their business picked up dramatically. Judgment must be withheld on whether this was beneficial to the credit institutions or not, pending repayments of the loans. In Bulacan province, the two Rural Banks that participated in the first season of the pilot extension operation received services from the RURP technicians through the supervised credit program.

On the part of the farmer participants, both of the applied research and the pilot extension phase, the functional consequences are reflected in increased productivity and income as reported in Table 3. This was due to farmer adoption of recommended practices such as proper fertilizer management, weed control, use of highly management responsive varieties, and plant protection measures.

On the part of the communities, where RURP had projects, there was an observed community interest toward non-formal education in rice production technology. This was specifically observed in three farmer seminars that were attended by the researcher and on a number of visits he made to some communities.

Other Systems--Dysfunctional Consequences ($C_2$)

The following are the other systems on which the RURP was alleged to have inflicted some negative effects, as well as the nature of the effects: (1) two research agencies claimed that it should have been they who should have been involved in the applied research activities, and the BAE on the pilot extension activities;because applied research is a function charged to these agencies; (2) a respected foreign adviser admonished that the RURP had caused a dislocation and rupture of an existing inter-agency network for applied research, training, and information dissemination; and (3) within the province of Bulacan, the RURP had caused division of the extension force into three -- the applied research force, the pilot extension force, and the regular extension force, There were gripes that the pay, allowances, fringe benefits, supply of motorcycles, and personnel treatments were not equitable.

As a final statement in this section, consequences could either be intended or unintended. The intended are those which were set and articulated in the objectives of the program. The unintended are those that occurred post-facto, incidental, and therefore were not deliberately set for achievement. In this case, those related to the testing and generation of rice production knowledge and technology, professional development through training are the intended consequences. The unintended consequences are those related to relationship problems within the parent organizations, and between the RURP and other systems. The personal recognitions received by project personnel and personnel problems encountered on the project are considered unintended.

There is one group of consequences which cannot be placed neatly in the discrete category of intended and unintended. They can probably be referred to as implied consequences. Examples of this are: those benefits received by farmer participants, agri-business firms, and the community.

## Summary

In summary, consequences of RURP as a cooperative and temporary system have been analyzed using the systems viewpoint of assessing project performance. Here, an action program is assumed capable of performing functional and dysfunctional consequences on other systems and on itself. It is assumed further that as an integral part of a larger system, what it does inevitably has direct and indirect effects on the systems that it has some direct and indirect links. Also, program consequences can either be intended or unintended by the performing system. Finally the reporting of functional and dysfunctional consequences of the RURP may have included those which do not necessarily reflect its temporary and cooperative nature. As a study of a single case there is no way of determining which of the consequences are truly products of a cooperative temporary systems. The connection between these consequences and the cooperative and temporary characteristics of the RURP is merely suggestive and exploratory.

## Exploratory Analysis

In this section two interrelated questions will be explored: (1) why was a temporary system resorted to by the three organizations to carry out the given task; and (2) why was a cooperative strategy employed by the three organizations to set-up the project.

### Temporary System

In the normative framework, four arguments were proposed in answer to the question of why formal organizations resort to temporary systems. The arguments proposed were (1) it is an innovative way of countering the dysfunctionalities of bureaucratic orientations of formal organizations; (2) it is a means of tapping external resource that is temporary in nature; (3) the technology involved in the process is changing and is subject to environmental variation; and (4) the specific problem of the task is relatively novel to the organizations involved.

### Organizational Strategy for Innovation

Given, that the need for developing a knowledge base in rainfed and upland rice production is justified because of the large area and numerous growers involved, still, a question of how to do it, is basic for planning and implementing the project.

It is commonly recognized that formal organizations over time become bureaucratic. The structure of bureaucratic organizations, by their nature, are less capable of initiating innovative programs or of exploring new directions. The more bureaucratized an organization, the more it is constrained from innovating or exploring fresh directions. The reason for this is that, the apparatus of the system is geared to the maintenance of existing relationships in the organization. Of the three parent organizations, the BAE appeared to be the most bureaucratic. Because it was much older, it had more personnel and had more hierarchy levels and a more rigidified administrative set-up. This discussion focuses on the structural limitation of the BAE to perform an exploratory program like the RURP. To begin with, its internal resources were mostly allocated for implementing current nationally determined programs. Furthermore, it did not have the decision-making prerogative to deviate from national programs, especially if it had to rely on traditional allocation. The decision-making function for national programming lies in the NFAC structure. So, aggravating the lack of innovation resources for the BAE, was the lack of independence to initiate new programs that radically depart from the nationally set programs. This externality therefore made BAE all the more status quo bound.

The reason for the BAE participation in this project was conditioned by the fact that it did not require new expenditure of funds. Its contribution to the coalition was in the form of personnel, which was not limiting to the organization. For the BAE, joining the pilot project was a strategy to discover innovations and open up new possibilities for itself without heavy organizational commitments.

As for the NFAC and IRRI, this particular argument was not a crucial explanation for their participation in the creation of the RURP. It is assumed that those two organizations were not as plagued by bureaucratic dysfunction as the BAE.

## Temporary Funding

In the developing countries, the most important factor limiting initiation of innovative programs is probably lack of funds. Funds allocated for the different agencies of the government are committed mostly toward sustaining on-going operations rather than exploring new patterns, new alternatives, or new programs. The only time, therefore, that most bureaucratic organizations in the developing countries are able to undertake exploratory or research-development type programs is when funds are made available to them by a Foundation, a private organization, or a foreign government that encourages work in one area or another. Most of these funds are in the nature of project grants or seed money. Funds are usually cut off at the termination of a project and are seldom renewed. Under this condition the most appropriate organizational structure to carry out the project is a temporary one. Here, there is no need for the grant-receiving organizations to make a long-range commitment or strain its existing funds. Later, when the innovation has been demonstrated, accepted, and adopted, new resources could be provided on a more long-range basis through legislation or by other means, thus allowing incorporation of the innovation into the bureaucratic apparatus.

In the present case, funds in the amount of $90,000 were granted by the Rockefeller Foundation to support this 3-5 year project. It was granted by the Foundation mainly because its supported organization, IRRI, asked for it. In effect, the grant determined that the structure of the project be temporary so that at the end of the undertaking, the personnel involved should return to their mother agencies.

## The Nature of the Technology

The technology in this case was the rice production technology. The nature of the rice production technology is highly dynamic and subject to environmental variation. Technology that is highly dynamic is risky for an organization to adopt. Because organizations require stability for effective internal control and functioning, they try to avoid uncertainties. Organizations therefore subject the more volatile technology to a more critical inspection, trial and evaluation process before deciding to adopt it. This process is commonly undertaken either by an internal research and development unit or by setting up a joint venture with other mutually interested organizations.

In the case examined, it was the consensus among rice authorities that technologies were not as developed on rainfed and upland areas as in the irrigated areas. It was however posited by these rice experts that it was reasonable to expect transferability of "irrigated technology" into rainfed condition as long as rainfall was adequate to keep the field under flooded condition. Further, it was deemed imperative that if the government intends to broaden the rice supply base and include rainfed and upland areas, a testing program should be conducted on farmers' fields where realistic farm-size and farm situation constraints exist. It was reasoned that once the feasibility of a certain technology was established, an action program could then be launched.

<u>Novelty of the Problem</u>

Organizations are learning systems. That is, they incorporate new behavior patterns as they experience them. Behavior of an organization is based largely on its accumulated experience. Such learning often involves time lag. If a new element is introduced into an organization that does not have it in its repertoire, the organization will likely reject it or may not respond to it appropriately. Organizations therefore need time to experience the new element and learn it. One adaptive device employed by organizations is to create a built-in learning sub-system. Such a learning sub-system acts as the organization's intermediate device to identify learning obstacles attendant to the new behavior, generate useful knowledge to increase understanding of the new behavior, identify key behavioral elements to be learned, develop the prototype for wider dissemination, and design a teaching-learning plan for the organization with respect to the new behavior.

In this study, the RURP represents the learning sub-system for the three organizations. It was expected to: (1) identify factors that limit rice production in rainfed and upland areas; (2) identify the technological elements that can offset these limiting factors; and (3) train future specialists for the BAE, NFAC, and IRRI.

## Organizational Cooperation

The case provides an empirical base for analyzing the reasons why organizations adopt cooperative strategies with other organizations. Cooperative behavior of organizations is adaptive. Adaptation is a response behavior to demands of and opportunities in the environment. As open systems, organizations engage in transactions with their environments, which include other organizations, if they want to continue to be an integral part of it.

Adaptive behavior in the case is represented by the common response of the three organizations to the challenge of developing a knowledge base in rainfed and upland rice production, including the identification of a set of technology that will increase productivity in this sector. The overall lack of rice supply in the Philippines, in other parts of Asia, in Latin America and in Africa, demands that the neglected areas of rainfed and upland rice production be developed in order for these sectors to contribute substantially to the total production of this critically important foodstuff. As organizations oriented to development, all the three are largely responsible to their public, the rice eating people and more directly to all the rice producers. This project then can be viewed as an attempt by all three organizations to respond to the needs of their public, to make a worthwhile contribution to the body of knowledge in rice production and thus to merit continuing public support.

Cooperative behavior between organizations can also be explained in terms of an exchange of resources relationship. At times, certain organizational goals and functions can only be attained through access to an element which an organization may find limiting. It is probable that the most convenient, expeditious, and beneficial way to acquire this scarce resource would be to enter into a transaction with another organization or other organizations which may have in its (their) possession the needed resource and which in turn is (are) in need of elements that only the other organization can supply.

In the case studied, the reason for cooperative venture between IRRI, BAE, and NFAC may be explained in terms of exchange relationship. The items exchanged were: (a) rice production and field experiment expertise, financial resources, and high prestige provided by IRRI, and (b) personnel and legitimation provided by BAE and NFAC respectively. As an international organization with a small and highly specialized staff, IRRI needed a large number of local professionally trained manpower to undertake the project. Using professionals from national agencies fit the IRRI's doctrine of increasing local self-reliance and building viable local agricultural institutions. Hiring of new employees would not only have been more expensive it also would have violated its own institutional norm. Moreover, it would have intruded into the prerogatives and domain of local agencies.

As reported earlier three of the most critical organizational constraints of the Philippine extension system are: (a) lack of financial resources for usual operations and innovative programs, (b) lack of continuing effective linkage with knowledge-generating institutions, and (c) lack of highly trained subject matter specialists. By entering into a cooperative relationship with IRRI, the Philippine agencies were able to acquire these scarce resources.

# CHAPTER VI

# SUMMARY, CONCLUSIONS AND IMPLICATIONS

## Introduction

Daniel E. Griffiths declares that the aim of science is to accomplish three things concerning its subject matter: description, explanation, and prediction arranged chronologically and in importance in that order.[1] One purpose of the present study has been to describe and analyze the subject using a normative framework of temporary system, organizational cooperation, and open systems view of organization. Another purpose has been to suggest both conceptually and empirically, explanations for the observed adaptive organizational behavior of formation of temporary system and employment of cooperative strategy.

In Chapter V, there was a comparison between observed behavior and what would have been expected on the basis of a prior conceptualization of the subject. This chapter is an attempt to go further than that. It provides interpretation.

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[1] Daniel E. Griffiths, Administrative Theory (New York: Appleton-Century-Crofts, Inc., 1959), p. 22.

Abraham Kaplan views research interpretation as the act of assigning meaning to observation according to the theoretical perspective initially developed by the investigator.[1] Interpretation is the giving of significance to observations by assigning them a place in the framework and then inferring conclusions from them or by pointing out existing deviations between the theoretical framework set and the reality observed.

## Summary

This has been a case study designed to collect, analyze, and interpret information about a subject, a cooperative pilot project in rice production in the Philippines. The project is officially called the "Rainfed and Upland Rice Project" (RURP). It was jointly created in the later part of 1970 by an international research center. The International Rice Research Institute (IRRI), and two national organizations engaged in agricultural planning, coordination, implementation and extension work, namely - the National Food and Agriculture Council (NFAC) and the Bureau of Agricultural Extension (BAE). The project was partly funded through a $90,000 grant from the Rockefeller Foundation and was administered through IRRI. It was intended to last no more than five years but not less than three years.

[1]Abraham Kaplan, The Conduct of Inquiry (San Francisco: Chandler Publishing Co., 1964), p. 359.

The need for the project stems from a number of events and situations that characterized the period: (1) a recognition within the scientific circle that it was time to shift research towards the heretofore neglected rainfed and upland areas, as research payoffs in the irrigated areas started to plateau; (2) a world-wide rice crisis prompted exploration of the high potential rainfed and upland areas as additional producing sectors to satisfy the increasing rice requirements; and (3) need to discover and test innovative institutional arrangements between a variety of institutions in view of need to increasing institutional adaptiveness to pressing and changing needs of the time.

The objectives of the project were threefold: (1) to test the emerging rice technology, basically developed for irrigated farms, under rainfed and upland conditions; (2) to try out other crops that could be used for a crop diversification scheme with rice as the main crop and to determine their economics; and (3) to train local technicians in applied research work.

The Memorandum of Understanding specified what each agency was to contribute. The IRRI was expected to: (a) acquire and administer the funds; (b) provide the technical leadership-preparation of experimental and work plans, training of technicians, setting up and management of the field experiment, and data processing. The Philippine agencies, on the other hand, agreed to provide: (a) all the field technicians required for the project, (b) an administrative coordinator or a liaison officer between the project and the two Philippine agencies, (c) field office and work space, and (d) all field support from the provincial extension office that might be needed for the project.

The project had three phases. The first was the applied research phase where field experiments were set up in four municipalities in Bulacan province and one in Nueva Ecija. The field experiments were set up in four municipalities in Bulacan province and one in Nueva Ecija. The field experiments were conducted on farmers' fields, managed by the technicians in cooperation with the farm operators. The results of the first year of operation so impressed the project management that the initiation of the second phase of the project - the pilot extension phase, was advanced by a year.

The goal of the second phase, pilot extension was to try to put 20,000 hectares under the project's assistance in one year. The program aimed to provide the farmers with a 16-step rice production system that was developed from the applied research findings and experience. Additional technicians were recruited and trained for this operation.

The goal of 20,000 hectares was not reached. Only 864 farmers in the first crop and 796 farmers in the second crop with aggregate areas of 1843 and 1476 hectares respectively participated in the program during the first year of the second phase. The poor achievement was explained by the half-hearted cooperation of the rural banks whose credit facilities are vital for buying production inputs. The rural banks generally considered lending money for rainfed and upland rice farming as a risky proposition because of the unreliable supply of water.

The project however demonstrated the value of the "Masagana 99" (the name given to the Bulacan pilot extension project) package of technology. The farmers who participated had yields of as much as four to five times their usual yield even under unusually bad growing conditions of excessive floodings, then drought, and an attack of a virus disease (tungro).

Realizing that the country needed a program that would bring the country again into self-sufficiency in rice production, the project management, with the help of private industry (a pesticide company), proposed the Bulacan experience as the basis of a national rice program. They argued that the scheme which gave four to five times more yield than usual even with flood, drought, and tungro disease, could restore the country to self-sufficiency in rice production.

This became the third phase of the project - the communication of the pilot project's findings, lessons and experiences to the policy makers in the agricultural sector. After three months of persuasion, discussions, debate, and power struggle, the government decided on a national program. This national rice program for 1973/74 adopted several of the suggestions from the Bulacan project in addition to adopting the name of "Masagana 99" itself.

The RURP, is conceptualized as a case of a cooperative, temporary system. Temporary systems have been defined as social organizations in which: (a) the members know from the outset that the organizations are not permanent; (b) their existence is based around a specific problem or issue; (c) they are usually isolated socially and physically from the usual operations of parent organizations, and (d) staff recruitment is based on specialization and expertise. Cooperative organizational relation is defined as a form of joint organization behavior in which the parties concerned agree to exchange or contribute elements or do things jointly.

Further, the RURP organization has been assumed to be an open system because it carried on transactions with its environment. The transactions were in the form of taking inputs from other systems as well as producing products that were used by other systems.

The nature of the study has been basically descriptive and exploratory and its purpose has been to gather and employ empirical data to test the goodness of fit between the posited normative conception of the subject and observed reality. The particular problem explored in this study could be summarized as follows: what is the fit between the case (RURP) and prior conceptions about temporary systems, organizational cooperation, and open systems? In addition, what is the fit between theory and practice on the questions: why was a temporary system used, and why was a cooperative strategy employed in the case?

The data for the study were collected in a field study in the Philippines from July to September 1973. The approach used in the data collection was largely historical and processual in the sense that the investigator attempted to reconstruct the historical roots and the developmental stages that the project went through. Multiple sources were employed, - people, newspapers, magazines, scholarly reports and other documents. The methods were varied, - personal interview, panel interview, questionnaire, personal observation during field trips, meetings, seminars and participation in some field activities. The data generated were of many types - testimonies, records, statistical, personal observation, responses to questionnaire, verbal comments, behavioral reactions, and published expert's opinions. The summary of findings from this study are presented in Chapter V, "Discussion and Analysis", answering the following questions:

1. What were the characteristics of RURP as a temporary system?

2. What were the characteristics of the RURP as an organizational cooperative arrangement? What were its stimuli or inducements?

3. What were the characteristics of the RURP as an open system?

4. What were the consequences of the RURP as a cooperative temporary system?

5. Why was a temporary system used in the case?

6. Why was a cooperative arrangement employed in the case?

## The RURP as a Temporary System

The RURP was referred to by its various participants, not as a temporary system, but as a pilot project. It had however the basic defining characteristics of a temporary system. It had a definite tenure of at least three years and no more than five years. Its initial seed funding was set at $90,000 without promise of continuity beyond that period. The personnel who were recruited for the experimental project were aware of this arrangement. In terms of scope and size of operation, the RURP was limited to a designated area in Bulacan and Nueva Ecija. Its total expenditure and number of personnel involved, however, though not small in comparison with similar pilot projects in the Philippines, were modest. The problem that it was charged to pursue was specific and narrow. It had several specific tasks: to help develop a knowledge base in rainfed and upland rice production through testing of emerging rice technology; and to help develop institutional capability for mass dissemination of the findings through training of local personnel and discovery of institutional and organizational arrangements and practices for a successful campaign.

As an exploratory project, it was not following traditional or routine work patterns of the parent organizations. There was, therefore, some degree of social and physical isolation from the parent organizations. The recruitment process was elaborate and based on high standards, i.e., the personnel were required to be recommended by a supervisor, to have previous rice production training, to have leadership qualities, and to pass the interview.

Communication within the project was informal, mostly face-to-face, and frequent. The workers as a group were cohesive, had high group pride and identity, and, in general, high job satisfaction.

### The RURP as a Cooperative Arrangement and Its Inducements

From the start, the RURP was a cooperative or joint undertaking between the IRRI, BAE, and NFAC. It was called a cooperative project. The provision for resources and management of the project was shared, although the quantity and quality of inputs from the three parent organizations were unequal. The IRRI provided technical and financial requirements of the project and received and administered the grant. The BAE and NFAC provided personnel, legitimation, and field support.

Two types of inducements or stimuli for this cooperative arrangement were identified: the environmental, and the organizational. Considered as environmental inducements were elements in the task environment: (1) the three parent organizations themselves who had frequently and positively interacted in past rice production matters; (2) the perceived rice crisis brought about by natural calamities, institution malfunctioning, and people problems; and (3) the felt need to develop the relatively neglected area of rainfed and upland rice production.

Considered as organizational stimuli or inducements for this cooperative arrangement were: (1) the respective missions of the parent organizations which helped give organizational direction and shape program activities; (2) resource complementaries between the IRRI and the two Philippine agencies which made an exchange relationship possible; (3) perception of mutual benefits which were considered contributory to goal attainment; and (4) the presence of a promoter or change agent which provided leadership in the creation and organization processes.

## The RURP as an Open System

An open system paradigm was constructed (Fig. 1) to serve as a device for data collection, ordering, and interpretation, and to aid in description and analysis. In the paradigm six data points were identified. They are: (1) statement of end-state; (2) specification of domain; (3) supra-system; (4) inputs; (5) transformation component; and (6) outputs.

The statement of end-state of the RURP consisted of the charge given and the objectives set out. The charge was to help develop a body of scientific knowledge and technology that would result in greater productivity and income of rice farmers in rainfed and upland areas. The goals were: (1) to test emerging technology in rainfed and upland conditions; and (2) to train local extension agents in applied research and effective extension.

Its domain, which specified the system's boundaries, was expressed in terms of: (1) its experimental function of applied research and pilot extension and the communication of its findings; and (2) its rendered services to various systems (parent organizations, other institutions, participating farmers, including its own personnel) i.e., generation of information about rainfed and upland rice production, providing educative opportunities to various people, and helping farmers prepare farm plans and budgets and diagnosing and solving field problems.

Its supra-systems were the IRRI, BAE, and NFAC. These organizations created RURP, and provided its resources. It was institutionally responsible to all three organizations.

Its inputs consisted of: (1) technical and agricultural information relevant to its operation; (2) demands, expectations, and suggestions from the parent organizations as well as some agribusiness firms which later became interested and joined the project as supporters; and (3) resources in the form of operating funds, experimental materials, personnel, facilities, and equipment.

The transformation components of RURP consisted of five sub-systems: (1) production sub-system - the applied research, extension work and rice culture activities; (2) maintenance sub-system - the activities and procedures that maintained human relationships such as informal and frequent communication and group activities; (3) adaptive sub-system - the modifications done by the project in response to opportunities and demands in the environment; (4) supportive sub-system - the acquisition of additional material resources from two pesticide companies; and (5) managerial sub-system - the functions of budgeting, programmed releases of funds, monitoring and coordination of field activities, and establishment of needed linkages with parent organizations and other systems.

The outputs of the RURP consisted of generated rice production knowledge and technology; functional services rendered to the parent organizations and other systems; and behavioral changes in technicians (increased rice production and research competence) and in farmer participants (adoption of recommended practices) increased understanding of modern rice culture and increased production and income).

## Consequences of RURP as a Cooperative Temporary System

It had been posited that there were inherent structural characteristics of a cooperative temporary system that shape the outcomes from RURP. These inherent features of temporary systems and cooperative relationship have been identified and discussed as they are manifested in the RURP, in the preceding chapter. A system perspective has been used as the framework for analyzing performance of programs. This viewpoint suggested that programs are capable of concurrently performing functional (perceived as desirable to the system) and dysfunctional (perceived as undesirable to the system) consequences to other systems with which they have direct and indirect links, as well as to itself. This is so because social systems are integral parts in each other's environments.

A device (Table 4) for delineating the relationships between the two types of consequences (functional and dysfunctional) and subject systems (parent organizations, RURP system, and other systems) was constructed. The findings when verified against the charge and goals of RURP show that, with few exceptions, the functional consequences were either explicitly or implicitly intended. That is, the functional consequences were related to production of knowledge and technology in rainfed and upland rice production, training of personnel, and discovery of organizational and institutional arrangements and practices for a successful commodity campaign. All these were implicitly, if not explicitly, stated in the purpose and objective of RURP.

The dysfunctional consequences, as would be expected, appeared to be unintended outcomes of the project. That is, although they could have been anticipated, the project did not willfully and deliberately cause them nor consider them as desirable ends to be achieved. Most of the dysfunctional consequences were people and organization relationship problems.

Great caution is called for in attributing these consequences to the cooperative and temporary nature of RURP. Due to the nature of the study, no definite claims can be made regarding the relationship between these consequences and the cooperative and temporary character of RURP. It is, however, suggested that there are logical connections between these two elements.

## Why the Temporary System

Four arguments were proposed in answer to the question why a temporary system was used to carry out the given tasks. These arguments were: first, it was an organizational strategy for innovation. The internal apparatus of formal organizations are geared to maintenance of existing programs and relationships, therefore it is inhibited to innovate. The creation of a separate temporary unit (temporary system) was, for BAE, a strategy to discover innovation and open up new possibilities for itself without heavy organizational commitments.

Second, because the funding for the project was expected to be temporary, the most appropriate organizational format would also have to be temporary in nature. With this arrangement, the personnel involved could return to their parent agencies when the project funds ran out and the project terminated.

Third, because rice production technology is highly dynamic and subject to environmental variation, adopting organizations consider it risky to immediately integrate innovations into her systems. In the case, a specific program to test emerging technology was considered the right thing to do before the organizations totally committed themselves to work in rainfed and upland rice production.

Fourth, for new problems, organizations need time to study, to train people, and prepare plans of action. The rainfed and upland rice production was a novel problem to all three parent organizations. Therefore a temporary and learning sub-system like the RURP was adopted to deal with it.

## Why the Cooperative Arrangement

The use of cooperative arrangement between the three organizations to set up the project is explained in terms of two concepts. First, the concept of adaptive behavior of organizations. In the case, cooperative strategy was assumed to be a response behavior to the challenge of developing a knowledge base for rainfed and upland rice production. Furthermore, it was a response to the demands of the situation, a perceived rice crisis not only in the Philippines, but in all the rice consumer countries.

The other concept is exchange relationship. The IRRI needed a large number of local, professionally-trained technicians to carry out the project. The BAE and NFAC also needed financial and technical resources for them to do exploratory projects. It was logical that both separate needs can be met by forming a coalition relationship where resources from three organizations are pooled for a joint project. Such interdependencies and cooperation between organizations bring about mutual goal attainment.

## Conclusions

Based on the fit between the normative framework and the findings from the study, the following are concluded:

1. The RURP can justifiably be referred to as an instance of temporary systems based on the criteria of: (a) a specified tenure which is based on the nature of the problem that it is assigned to work on; (b) a specified and sharply focused charge; (c) a limited territoriality and size of operation; (d) an internal influence that is based on competence rather than authority of position in the hierarchy; (e) a recruitment procedure that values entry expertise and competence; and (f) a more informal, free and open internal communication. As in most temporary systems, the RURP also has some degree of physical and social isolation from its parent organizations.

2. The RURP can justifiably be classified as a form of cooperative arrangement between organizations because it was jointly formed, resources were shared among the parent organizations, and the benefits were also shared. Due to the variation in the quantity and quality of inputs from the participating parties and the differential importance in the roles of the assigned personnel in the project, this cooperative relationships may be precisely considered a complementary type.

3. There are two kinds of inducements or stimuli for organizational cooperation that led to the formation of RURP. They are environmental and organizational. The environmental consists of: (a) joint undertaking and positive and frequent communication and interaction between the IRRI, BAE, and NFAC. in the past; (b) a perception of a rice crisis situation; and (c) a common felt need to develop the heretofore neglected rainfed and upland rice sectors. The organizational inducements consist of: (a) the respective missions of the participating organizations; (b) perception of mutual benefits; (c) organizational resources; and (d) presence of a promoter or change agent.

4. Using a constructed paradigm, the RURP manifests characteristics of open systems in terms of: the statement of end-state; the specification of domain; the specification of supra-system; the inputs from its task environments; the transformation or processing component; and production of outputs that are consumed by other systems in the environment. The key defining characteristic of RURP which qualifies it as an open system is its transactions with other systems in its task environment by acquiring and sensing inputs from them and in turn converting these inputs into products that other systems use.

5. The following consequences of the RURP appears to be related to its cooperative and temporary characteristics: (1) its functional consequences on its parent organizations as expressed in its change-generating, testing, feedback, educating, and resource acquisition functions; and (2) its dysfunctional consequences on its parent organizations and on other systems such as the resulting conflicts between personalities, its negative effects on existing pattern of institutional relationships, the anxieties it brought on its personnel; and the perception that its transferability to normal situations is questionable due to the abnormal nature of its financial resources, personnel qualifications, a unique agro-climatic setting, and its limited territoriality and size of operation.

6. On the question of why a temporary system was resorted to in the case, four explanations are inferred to have some influence on the decision by the parent organization: (1) it is an organizational strategy employed to generate and open up new program possibilities; (2) the source of funding is temporary; (3) the technology involved is changing and location specific; and (4) the problem faced is novel to the organizations. It is further inferred that these explanations are not independent and isolated in their impact but have combined and synergetic effect.

As essentially after-the-fact statements and based on just one case, the above conclusions should be considered exploratory rather than definitive. Further comparative study and using a hypothesis testing design could provide a more definitive statements of relevant relationships.

7. On the question of why a cooperative arrangement was employed as the mechanism for setting up the project, two explanations are inferred to have some effect. The first, is based on the concept of adaptive behavior of organizations. That is, the case is a response behavior by the organizations involved to common opportunities in and demands of the task environment. The second, is based on the concept of exchanged resource relationship. Orgatizations, for goal attainment, have needs for certain types of resources that might be scarce to them and can only be provided by other organizations. The logical thing to do for the organizations in this situation would be to pool their resources and attain their respective goals.

Again, as in the preceding conclusion, this one on cooperative arrangement should be regarded as exploratory rather than definitive.

While there is some degree of correspondence between the previous conceptualization of the RURP and the actual subject, variations between the two also exist. These variations may have been caused by the features unique to the subject case which previous studies did not consider or incorporate. Consequently, these dimensions were not integrated into the theoretical system of the study.

Before citing the theory - observation deviation, a summary of the unique features of the case is in order. First, unlike most of the cooperative arrangements studied, the parent organizations of the present temporary cooperative system (IRRI, NFAC and BAE) are distinctly different in their organizational structure, governance, functions and "nationality." The reviewed works on organizational cooperation did not include international organizations and their interrelationships with indigenous organizations. These studies of cooperative alliances dealt with formal organizations performing similar functions (welfare agencies, institutions of higher education, or medical services) and having similar governance and organizational pattern.

The second unique feature is related to the first, it is that the present cooperative arrangement includes the sensitive dimension of the interrelationship between an international institution and the national economic-political system.

Its third unique feature is, the basic production system involved in the process is of type distinct from the industrial, medical, social work, or educational production systems dealt with in previous studies. In the present case, the production system (agri-cultural) is largely dependent on natural elements for its functioning. The basic unit of production, contrary to those in previous studies, are performed by a widely diffused, autonomous, disorganized, and largely anonymous growers. Furthermore, the organizations charged with improving the performance and functioning of the total production system have little control or authority over the unit producers. These present a serious constraint to the organizations.

And its fourth unique feature is, the cultural setting in which the temporary cooperative system was constructed is different from the Western organizational setting where previous studies were done. In the Philippine culture, there are certain nuances that are more pronounced and pervasive than in the Western world (familism, interpersonal relationship, debt of gratifude, hospitality, deference to foreign national, particularly the whites, etc.) that may have some influence on the problem of formation, behavior and consequences of cooperative temporary systems.

At this point, the deviations between theory and field observation which also constitute additional conclusions of the study will be cited:

(1) The formation of the RURP was enhanced by such cultural factors as the existence of personal links between personalities across parent organizations; and in another instance, family ties influenced operational decisions, such as the one concerning where to locate the project.

(2) The international organization involved in the study, because of its being non-indigenous, had to sensitively come to grips with constraints that are related to the local economic-political system. Even if it wanted to, it could not just launch a project of this nature and magnitude without involving local agencies, to be effective. Non-indigenous systems operating within a given country are bound by international rules of propriety such as to respect national sovereignty and to recognize local institutional prerogatives.

(3) The basic system's production unit (rice producers) did not have considerable direct input into the creation process of RURP since they were disorganized, lacking in sophistication, and were not perceived as integral parts of any of the parent organizations.

(4) The attainment of individual needs within the organizational system such as need for self-renewal and personal gratification of scientists in scientific institutions is an inducing force for adaptive organizational behavior. In the case, the scientists' need for new challenges, new stimulations, and new concerns, was for one parent organization a contributory factor favoring its interest in the RURP.

(5) Foreign nationals at times could be more effective change agents or promoters than local personalities. In the case, an American and a British served as effective change agents to promote RURP findings and lessons to national leaders in agriculture. However their effectiveness could not simply be due to their foreign nationality. There were other compelling factors that were inextricably woven to the nationality factor such as: access to resources aggressive personality, dedication, personal access to influential networks, and communication and change agentry skills.

(6) Finally, the total cost of the project certainly must have been over $90,000 if all institutional expenditures such as overheads, incidental, additional personnel travel, services (of personnel) and payoffs (of resources) foregone, etc. are costed. Unfortunately, these cost items were not part of the study.

## Implications

In this time characterized by high information and technology turnover and a generally dynamic organizational environment, existing social institutions find themselves in continuous confrontation with this new reality. Formal organizations faced with this fact discover that maintenance and salience to existing goals and procedures is dysfunctional for growth and survival, and what is needed is innovation, adaptability and flexibility to internal and external demands and opportunities.

This situation of dynamism also exists within the context of the present study - the agricultural and the non-formal education sectors. It is therefore a necessity that a search for alternative organizational and institutional arrangements be a continual concern of scholars and practitioners to develop organizational instruments to help solve mankind's problem of providing food to the ever increasing population and in meeting their educational needs. The present study has a contribution in this theoretical and practical problem.

To a certain extent, this case study can be considered a "success story." It identified the necessary conditions or elements that contributed to "success." However, a question is in order at this point: "What sort of successes did the case produce?"

There were several types of successes produced. These are: (1) producing vital elements of scientific knowledge, technological package, organizational and administrative arrangements, and practices that are useful for formulating a set of policies and programs to develop a particular commodity; (2) producing the key personnel resources to carry out a similar program on a more expanded scope; and (3) demonstrating the feasibility of a set of ideas to policy makers and other important individuals and systems.

## Practical Implications

The next question is: "If this is a success story as claimed, how does one set up a similar system in order to attain similar results?" Re-stated, "What are the significant conditions or elements necessary for a cooperative temporary system to work?"

Based on this case study, a cooperative temporary system should have the following elements to be "successful."

1. Adequate resources must be provided to guarantee that programs and activities intended are actually carried out.

2. A dynamic, forceful, and dedicated leadership should be provided to be able to integrate the various internal sub-systems as well as to be able to effectively carry out resource acquisition, public relation, and communication in the task environment.

3. Participating organizations should be highly committed and involved in the cooperative undertaking.

4. The personnel should be given training, motivation, and incentive for higher work performance.

5. The environmental location should have a reasonable degree of representativeness with the larger setting that eventually absorbs it.

6. The technological sub-system that is involved in the process should be demonstrably more superior than its existing counterpart.

7. To effect a viable collaboration between organizations, the following conditions should be present: (a) mutual respect and acceptance (domain consensus) between the parties; (b) convergence of mission and interest between the parties; (c) mutual benefit between the parties; and (d) something exchangeable between the parties involved.

8. An effective linkage should be established between the project and the individuals and systems that have a voice in the way inputs from the project are received and processed. One effective method of creating a continuous linkage between the project and another organization would be to work through their leaders by

regularly feeding them relevant information, consulting with them, and taking them on trips to see what is going on.

The project would not have been received enthusiastically and receptively by the agricultural sector had there been no general anxiety of a crisis in the rice industry caused by flood, drought, tungro virus, and higher levels of consumption. A number of people have credited the leadership of President Marcos and the conditions brought about by Martial Law for the speed in the action, committing of agencies and institutions to the national rice program.

## Research Implication

One of the rewards of a case study research effort is its insightful and comprehensive description of a particular subject which usually provides leads into further researchable domains related to the original topic. The following are issues, topics, and hypotheses that the researcher suggests as viable investigative studies to increase the knowledge and understanding of temporary systems and institutional relations:

1. On a more general level, there is a need for more sensitive studies to detect the influence of cultural elements, either as facilitating or inhibiting forces, in the creation of a

cooperative, temporary system. As Clemente II speculated:

Is there an erosion of traditional role relationships, belief, and value systems within a given local formal organization as it becomes more secularized or as it takes on the efficiency and effectiveness values of the industrialized, modern, and dynamic world?

2. The development of a more precise system of assessing the performance of temporary systems or of a cooperative project that can be used as a comparative base for two or more programs.

3. A related research would be to determine more precisely the costs and returns of a cooperative venture on the organizations that are engaged in it as well as its products.

4. Based on the theoretical questions in the present case study, some general hypotheses are hereby posited. An empirical verification of them would further knowledge of temporary systems and organizational relations.

(a) Organizations set up a temporary system either internally or in cooperation with other mutually interested organizations to: (1) generate additional resources for exploratory or innovative activities as well as for its own traditional goal setting and maintenance; (2) reduce risk of an uncertain new product or idea

before adoption or acceptance by subjecting the new product or idea to a critical test and evaluation; and (3) to develop key personnel who will disseminate, train or manage the new element within the organization.

(b) Given a number of organizations in a social setting, those which are more prestigious or possess greater resource-acquiring ability will attract more cooperators.

(c) The organization that furnishes more critical and substantial inputs into the cooperative system will have more influence on decisions affecting the cooperative system, such as over programs and activities.

(d) Organizations which have mutually rewarding and positive interactions in the past are likely to form joint projects again if the opportunity exists, than (1) organizations whose previous interactions have been aversive to at least one of the parties; and (2) organizations that have no prior relationships with each other.

(e) The birth and viability of cooperative projects between two or more organizations are preconditioned through: (1) mutual respect and acceptance between parties; (2) convergence of interest between the parties on an issue or a problem; (3) assurance to the parties involved that all will get some form of benefits from the undertaking; (4) exchange of something identifiable through the project between the parties involved; and (5) dedicated leadership possessing organizational and managerial ability, and having the trust and acceptability of all the cooperating organizations.

(f) The effectiveness of non-indigenous assisting organizations (such as international research centers and technical assistance agencies) within a given country is contingent on their ability to: (1) establish cooperative working arrangements with local, functionally related systems; (2) sensitively recognize national sovereignty; (3) work within and through the economic-political system of the country; and (4) show success or results.

# APPENDICES

A QUESTIONNAIRE FOR FIELD PERSONNEL

B THE BUREAU OF AGRICULTURAL EXTENSION YEARLY APPROPRIATION, 1965 to 1973

C HISTORY, ORGANIZATIONAL AND OPERATIONS STRUCTURE OF THE RICE AND CORN PRODUCTION COORDINATING COUNCIL

D TYPES OF APPLIED RESEARCH TRIALS CONDUCTED BY RURP

E TEXT OF THE RURP "MASAGANA 99" SLIDE-TAPE PRESENTATION

F MASS MEDIA COVERAGE OF RURP

# APPENDIX A

## QUESTIONNAIRE FOR FIELD PERSONNEL

Note: Don't write your name. Please be assured that no one will see your responses except me, the researcher.

(1a) Year graduated from college? _____ (1b) School? __________
(1c) Major if any? ______________________________

(2) Your high school curriculum? Please check.

______________ (Vocational) ______________ (Agricultural ) ______________ (General )

(3) Please name the organization(s) that you have worked for up to the present

| Name of organization | What years | Designation and position held |
|---|---|---|
| ______________________ | ____________ | ____________________ |
| ______________________ | ____________ | ____________________ |

(4) Please write the previous training program(s) that you have attended specifying the kind, content, duration and location.

| Kind (specialist, technician, supervisory, enumerator, etc.) | Content (rice, poultry extension methods vegetables, etc.) | Duration (in days, weeks or months) | Location |
|---|---|---|---|
| ________________ | ____________ | ____________ | ____________ |
| ________________ | ____________ | ____________ | ____________ |
| ________________ | ____________ | ____________ | ____________ |

(5a) What was your basic salary before joining this project? ₱_____

(5b) Incentive pay? ₱______

(6a) When did you join this project? _______ month, _____ year.

(6b) What is your work assignment? ____________ ________
Masagana 99 RURP

(7) Why did you join it? ______________________________

<u>QUESTIONS 8a THROUGH 15 REFER TO YOUR PREVIOUS JOB BEFORE JOINING THE PROJECT</u>

(8a) <u>Before this project</u> what specific program were you following in the field? ______________________________

(8b) Did you prepare this (8a) program yourself? ______ _____
Yes No.

(8c) If no, where did it come from? ____________________

(8d) How was it communicated to you? ____________________

(9a) Did your immediate supervisor discuss this program with you? ______ _____
Yes No

(9b) If yes, ________ ____________
(in a group) (Just the two of us)

(10) What was the designation of and position held by your supervisor? ____________________

(11a) Did you have a provincial rice specialist? ______ _____
If No proceed to 13a. Yes No

(11b) How often did <u>he</u> come to see you? _____ (per week or per month)

(11c) How often did you go to see him? _____ (per week or per month)

(11d) What was the usual content or subject of your interaction with the rice specialist? ______________________________

(12) On a scale of 1-5 (1-lowest & 5-highest), how do you rate your provincial rice specialist on his subject matter competence? ________

(13a) Were you receiving technical information materials?
Yes _____ No _____

(13b) From where? ____________ (13c) What were they about?
______________________________________

(14a) In cases when you encountered technical problem in your work, who did you go for help? ____________________

(14b) Were you usually satisfied with his assistance? _____ _____
Yes No

Why? ______________________________

(15) What do you consider as the biggest difficulties or obstacles that you had been faced within your work in extension <u>before joining this project</u>? (Please rank them according to degree of seriousness.)

1st ____________________________________
2nd ____________________________________
3rd ____________________________________
4th ____________________________________
5th ____________________________________
6th ____________________________________

<u>QUESTIONS 16a THROUGH 37 REFER TO YOUR CURRENT WORK IN THIS PROJECT</u>

(16a) On a scale of 1-5 (1-lowest & 5-highest), how happy are you <u>in this project</u>? ______________________________

(16b) Why? ____________________________________________

(17) In terms of field work, <u>what are you doing now</u> that you were <u>not doing</u> before?

a) ____________________________________
b) ____________________________________
c) ____________________________________

Why are you doing these now? ____________________
______________________________________________

(18a) In this project what is your total take home pay? ₱________
Please break this down as follows:

Basic salary: ____________
Incentive pay: ____________
Bonus from bank: ____________

(18b) In addition to the above (18a), what other privileges/benefits do you get here? ______________________________________

(19a) (FOR BOTH RURP AND MASAGANA 99) How many farmers did you regularly assist/supervise in the 1972 wet season?

(19b) Total area? __________________

(19c) How many farmers are you regularly assisting/supervising up to this time in this wet season? _________________

(19d) Total area? _____________

(20a) (FOR RURP ONLY) How many applied research projects did you handle in the wet season of 1971? _____ (20b) In wet season of 1972? _______

(20c) and this year? ________

(21a) On the average how many farmers do you see in a day? ____

(21b) How long do you see a farmer each time? ____ (minutes/hours)

(21c) What usually do you see him for? ________________________

(22) What specific assistance do you give to these farmers?

(a) ______________________________________
(b) ______________________________________

(23) On the average how many miles/kilometers do you put on your motorcycle in a day? __________

(24) (FOR RURP ONLY) What are the criteria for selecting applied research cooperators?

a) ____________________
b) ____________________

(25a) Do you have team meetings? Yes ____ No ___ (25b) If Yes, is it regular? Yes ___ No ___

(25c) If regular, what is the schedule? ____________________

(25d) What do you take up in these team meetings? ______________

(25e) On the average, how often do you see the other members of the team? __________ (per day/per week)

(26) If you want to contact your other team members, what do you do? ____________________

(27a) (FOR RURP ONLY) What does the team leader do in this project? ____________________

(27b) (FOR MASAGANA 99 ONLY) What does the supervisor do in this project? ____________________

(27c) How much will your own work be affected if the team leader / supervisor is pulled out .

| ________ | ________ | ________ | ________ |
|---|---|---|---|
| Very much | much | not much | not at all |

(27d) Why? ____________________

(28) What do the project coordinators do in this project?

a) I.C. Bolo: ____________________
b) Greg Bautista: ____________________
c) L. Almasan: ____________________

(29) How is your weekly plan of work prepared? ______________

(30a) Do you have activities that you do together as a team? Yes ___ No ___

(30b) If yes, please specify. ____________________

(31a) Assuming you encounter a technical problem in the field who do you go to for assistance? ____________________ Why? ____________________

(31b) How about for personal problem, who do you go to for assistance? ____________ Why ? ____________

(32a) How often do you see your team leader/supervisor? ______ (per day/per week/per month).

(32b) What do you take up with him? ____________________

(32c) How often do you see the project coordinators? ________ (per day/per week/per month).

(32d) What do you take up with him? ____________________

(33) In this project, from what or whom do you usually first know of new information about rice production? ___________

(34a) In this project, do you get technical information materials about rice? Yes _____ No ____ (34b) If Yes, from where? __________

(34c) How do you get them? ____________________

(35) Please list the extension methods that you use in this project.

a) ____________________
b) ____________________

(36) Have you been a resource person outside your project? Yes _____ No ______ If yes, please specify:

| Place | Date | Occasion | Topic |
|---|---|---|---|
| ________ | ________ | ________ | ________ |
| ________ | ________ | ________ | ________ |

(37) Do you have any remark/comment/complaint regarding this project? Yes ____ No _____ If yes, please specify:

a) ____________________
b) ____________________

# APPENDIX B

## THE BUREAU OF AGRICULTURAL EXTENSION YEARLY APPROPRIATION, 1965 to 1973

BAE Appropriations From 1965 to 1973

| Year | Amount |
|---|---|
| 1965 | ₱ 17,896,035 |
| 1966 | 19,393,401 |
| 1967 | 18,486,300 |
| 1968 | 20,132,000 |
| 1969 | 13,694,000* |
| 1970 | 15,572,845 |
| 1971 | 17,199,500 |
| 1972 | 19,950,000 |
| 1973 | 19,850,000 |

*The drop in amount is due to the decentralization law (RA 5185) which partly shifted the burden of paying some provincial and municipal extension personnel from national to provincial government funds.

# APPENDIX C

## HISTORY, ORGANIZATIONAL AND OPERATIONS STRUCTURE, OF THE RICE AND CORN PRODUCTION COORDINATING COUNCIL*

On June 14, 1958, Congress enacted Republic Act 2084, otherwise known as the Rice and Corn Production Act. Section 2 of this act declares explicitly an overriding concern of government:

> "It is hereby declared to be the national policy to attain self-sufficiency in rice and corn at the earliest possible time and to provide adequate measures to insure permanent stability in the production of these cereals by marshalling all government agencies to increase rice and corn production at minimum cost."

To achieve this objective, a four-year rice and corn production program was planned and executed under the management and control of a Rice and Corn Coordinating Council (RCCC).

In 1964, when President Macapagal instituted a rice crash program he issued Executive Order No. 62 which created the Rice and Corn Authority and took over the functions of the RCCC. When the Marcos Administration took over, the Authority was in a moribund state. President Marcos immediately revoked Executive Order 62 and remobilized the RCCC, first by giving it its new name, RCPCC, and then, by designating it the sole authority and power to take charge of the rice and corn production program.

### Structure

At the apex of the Council sits the Secretary of Agriculture and Natural Resources as Chairman and Coordinator of the Council. He is assisted by the following Council members: Director, Bureau of Plant Industry; Director, Bureau of Soils; Commissioner, Agricultural Productivity Commission; Chairman-General Manager, RCA; Dean, U.P. College of Agriculture (UPCA); Administrator, Agricultural Credit Administration (ACA). In addition, a number of agencies give support to the Council.

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*Excerpt from Albina Manalo-Dans, "The Coordinating Councils: Rice Production Coordinating Council and the Infrastructure Operation Center," Philippine Journal of Public Administration, Vol. XIII, No. 2, April 1969.

... The International Rice Research Institute at Los Baños assists in rice research and training of farm technicians; USAID extends financial assistance to the program as do elements of agro-chemical suppliers and farm equipment dealers who cooperate with the program within their respective spheres.

Operations

The Chairman and Coordinator presides at all council meetings, guides the council in the promulgation of rules and regulations and appoints all RCPCC personnel. There is also an Executive Director who, while not a member of the Council, is directly responsible for the RCPCC program. With the assistance of a Deputy Executive Director, he controls and supervises the technical staff at the national and provincial levels and sees to it that all concerned in the program are doing their part well.

The technical staff has charged of the management, planning, programming, and evaluation of the rice and corn production program.

RCPCC field operations are carried out at the area and provincial levels. Each organization at these levels is organized like miniature RCPCC's.

... The provincial officials are directly responsible for the successful prosecution of the program at the provincial level. The production technicians, under the leadership of district production supervisors, are the liaison between the RCPCC and the farmers. It is they who actually make the farm visits problems, and who guide them in the proper use of modern farm equipment and techniques.

Planning

Planning in the RCPCC is undertaken by the Council sitting as a body, with the Chairman and Coordinator presiding. Subsidiary plans, however, are done by each cooperating/implementing agency. Plans, programs and policies and any subsequent changes in them are communicated to the employees at the area and provincial levels largely through field teams.

Community Participation

One dimension of RCPCC operations which is considered significant is the bridge of understanding that it has built between the organization and the people. By allowing the private sector to initiate moves to increase rice and corn production, it has put in proper perspective the appropriate role of government in development -- to generate a climate that will encourage people to free themselves from unnecessary dependence on a remote bureaucratic apparatus and liberate local communities from the notion that they cannot help themselves ... Under the RCPCC program, the production technicians have been working side by side with civic organizations and farmers' groups.

# APPENDIX D

## TYPES OF APPLIED RESEARCH TRIALS CONDUCTED BY RURP

| Types of applied research trial | No. of trials |
|---|---|
| 1. Variety trial upland | 8 |
| 2. Variety trial rainfed area | 28 |
| 3. Nitrogen x variety trial rainfed area | 31 |
| 4. Nitrogen x variety trial upland area | 9 |
| 5. Nitrogen x stand establishment trial | 8 |
| 6. Herbicide trial upland area | 9 |
| 7. Herbicide trial rainfed area | 15 |
| 8. Management levels trial rainfed area | 16 |
| 9. Insecticide trial upland area | 11 |
| 10. Insecticide trial rainfed | 8 |
| 11. Production plot trial | 7 |
| | 150 |

# APPENDIX E

## TEXT OF THE RURP "MASAGANA 99" SLIDE-TAPE PRESENTATION

General Manager of Company A

Central Bank Governor Licaros, Mr. Exec. Sec. Melchor, Secretary of Agriculture Tanco, Honored Guests, we are grateful to you for giving us your time to listen to a story - a success story. It is about rice growing in the Philippines, achieved with the co-operation of the Government Research and Industry. We started with a research project which has developed into an area extension program we call Masagana 99 . . . I would like to acknowledge with thanks the opportunity given to us by Governor Licaros to hold this meeting here. I would also like to say that without the help and guidance of Secretary Tanco and Chairman Paterno, we would not be making this presentation. Finally, I think it is fitting at this point to record that there are many people not here today who have given their support to Masagana 99 and without whose help the project would never have got off the ground. In particular, I would like to acknowledge the support of Governor Santiago of Bulacan and his staff, the officers of the Rural Bank Division of the Central Bank and those Rural Banks who participated. Much credit is due to these people and we are grateful to them.

Project Technical Coordinator

These are the results we have achieved with Rainfed Rice and the New Technology in the Philippines and its application for 1973.

In irrigated areas, using old varieties the previous average yield was only 40 cav/ha. In the 1971 wet season, a new technology of improved rice varieties, using fertilizers, insecticides and herbicides, improved the average production to a dramatic 114 cav/ha and an all-time high of 131 cav/ha in the dry season.

However, irrigated areas make up only 25% of Rice lands in the Philippines, a mere 0.6 million hectares, while Rainfed areas comprise 74% - over 1.8 million hectares.

Of this 74%, 27% is in upland areas without bunding, and 47% is in rainfed areas with bunding to hold the water in the paddies.

The average yield in upland areas is 20 cav/ha while in rainfed areas the average yield is 33 cav/ha making a total average yield in these areas of only 28 cav/ha as against a current national average of 40 cav/ha.

... The new technology comprising new rice varieties, and use of fertilizers, insecticides, and herbicides has worked to increase yields in irrigated areas. Can this combination improve the rainfed average yield of 28 cav/ha?

We say the answer is most definitely YES.

But this is not just an opinion.

In 1971, the Agricultural Productivity Commission and IRRI through the National Food and Agricultural Council and authorized by Sec. Tanco, embarked on a 3-5 year research program. The areas chosen for this research were Bulacan and Nueva Ecija.

... We were pleased with the results.

In fact, we were especially pleased because our selected areas were affected by two major disasters, severe drought and tungro epidemic, and still the New Technology triumphed. You will see on the rainfall graph the very low rainfall for 1971 compared with the average rainfall for the areas over the past 20 years. The Bulacan area is indicated in blue and Nueva Ecija in red.

... Here now are the net returns in rainfed areas under the present technology and the new technology.

Using the present technology, for a total cost of ₱618 pa/ha, the gross return is ₱700 on 28 cavans, making a net return per hectare of only 92 pa/ha. Using the new technology, the total cost per hectare is ₱1,236 for gross returns on 92 cavans pa/ha of ₱2,306 for a net return pa/ha of ₱1,064.

... To see, we shall look at the 1972 wet season, whole farm extension program in Bulacan involving 300 rice farmers.

... In this area, yields in the past have been between 30 and 65 cavans per hectare. Using the new technology under supervision, the yields have increased to between 80 to 130 cavans per hectare bringing in an income of up to ₱1,064 per hectare.

... What is the potential of the new technology in the Philippines? At present the Philippines sometimes has to import rice to meet its needs.

... Here are projected rice requirements for the next five years together with the potential gains from using the new technology in irrigated and rainfed areas. As you can see, the new technology extended to 30% of present rice growing areas would produce about 32 million more cavans of rice. This is far more than it is situated we will need.

So the Philippines could even become a rice exporter, and could hold in store supplies against natural disasters, like this years floods.

... If we are to attract technicians of high calibre willing to work long, hard, difficult hours with the farmer, we must put sufficient attraction his way in the form of above average pay, generous allowances and good bonuses for hard work and success. This must include the provision of transport to make him as mobile as possible, gasoline allowance, free insurance, etc. Everything in fact that will add up to helping him achieve total job satisfaction.

... Success is based on just three things.
The new technology itself.
Sufficient capital.
And well trained highly motivated technicians.

Therefore the best technicians must be selected for training. They must be trained thoroughly and given the proper incentive to encourage them to do their best, most productive work.

What would all this cost?

The cost to the Rural Banks and agricultural agencies would be only the cost of the technician's transportation, and lodging during the IRRI course.

IRRI will train the technicians absolutely FREE.

Rural Banker

As Chairman of the Rural Bank of Pandi where we have experienced the new technology project called Masagana 99 in action, I would like to stress again the importance of financing methods, the use of highly trained technicians to put across these methods, and the necessary incentives to encourage them to do a good job.

... In Pandi we had 4 technicians, 2 from the APC, one from the BPI and one of our own. The average salary for their type is 300 pesos. Instead, we gave them ₱400 per month, a vehicle plus gasoline allowance, a bonus of ₱1 per farmer per month over the 4 month season and a ₱3 bonus per farmer after collection. We felt this was the sort of incentive required to make sure of a job well done. And we were right.

President, Agricultural Pesticide-Institute

I would now like to discuss the role of industry in its New Technology and the main areas in which it can help.

1. Production and Research
2. Financing
3. Education
4. Supervision
5. Agricultural Research

As far as production is concerned, chemical companies have already made large investments in manufacturing plants to provide the inputs needed by the farmer at the lowest possible cost. Industry also invests heavily in research for new and better products both here and abroad. This, I must add, with the limited prospects of recovering these risk investments.

Two recent local developments are that the Agchem Corporation is at present constructing a plant to manufacture 24-D herbicides at a cost of ₱3 million and Shell Chemicals, a Filipino owned company, has already set up a formulation plant for pesticides with a total investment of over ₱8.9 million. These investments have been made because industry believes that the right products, properly tested and approved should be made available to the farmer at the lowest possible cost and without delay.

... Industry's involvement in agricultural research is at present tied to Masagana 99. It has provided ₱30,000 for IRRI's research projects and has also provided all the products needed for this research-free.

... These are the ways that industry (at the moment represented by the chemical companies alone) together with Research (represented by IRRI) and the Government can provide everything the farmer needs ... Research, Financing, Education, Supervision and Production ... to make a success of this project for the good of the Philippines and its people.

Our first joint goal should be to take Masagana 99 into the major rice growing areas of Central Luzon, Panay and Cotabato. The question is how?

# APPENDIX F

## MASS MEDIA COVERAGE OF RURP

Number of releases sent to the press -- 7

Number of pickups -- 15 (Jan.-Feb. 1973)

| Newspaper/Magazine | No. | Circulation |
|---|---|---|
| Business Day | 5 | 30,000 |
| Times Journal | 3 | 100,000 |
| Bulletin Today | 3 | 150,000 |
| Daily Express | 1 | 530,000 |
| Evening Express | 1 | 250,000 |
| Balita Ng Manila | 1 | 92,500 |
| Panorama | 1 | 150,000 |

Total lineage obtained -- 431 C.I.
Equivalent of 24/7 of standard newspaper

Total paid advertising value of the space -- ₱13,708.50

Readership count -- 1,414,000

Television coverage --
Jan. 24 -- Channel 9 (7 and 10 p.m. editions)
Channel 13 (6:30 and 11 p.m. editions)
Feb. 5 -- Channel 9 (7 p.m. edition)
Channel 13 (6:30 p.m. edition)