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Management of Crop Production Programs:

An Evaluation

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## Synopsis

Some extremely significant lessons emerge from the reported country experiences in accelerating food production. The countries examined in depth--Turkey, Vietnam, Costa Rica--all employed a system output strategy which concentrates on a national effort to achieve a production goal for a single crop. All the inputs (seeds, credit, fertilizer, etc.) and institutions are means, not ends which must function within a specific time sequence set by the farming process and in a specific balance to each other in order to achieve a given goal. This is distinguished from the more common component approach which focuses upon improving some aspect of the total system, such as research, extension, agricultural education, credit, etc. A systems perspective also helps to distinguish a crop production approach, which takes the harvest as the final output, from a more complete food system which includes the storage and marketing phases with the final output a quantity and quality of food for consumers.

Actually, one strategy is supportive of the other, but the system output approach seems to be more effective, faster and efficient than the component approach. Other important benefits are noted: farm income rises, farm technology improves, government and private institutions are strengthened, agri-businesses grow, and there are benefits to political leaders as they demonstrate that government is concerned about food for the people and welfare for the farmers. Another significant finding is that a Crop Production Program is successful with

or without a high-yielding variety of seed. Costa Rica used the technique for local varieties of corn and kicked up production 15% in one year. The Ministries of Agriculture noted the potential benefit to their countries from application of the strategy to other domestic crops.

The Crop Production model has limitations as well as benefits. Some of these are already apparent, others are potential. Over-production is forecasted in Turkey and Vietnam. The technique can overconcentrate national efforts on one crop to the retirement of others, favor one physical region to the detriment of others, benefit certain classes of farmers (richer, larger, more progressive) to the detriment of others. Unless precautions are taken, it tends to be a "top-down" approach to the farmer with government bureaucracy playing a leading role, foregoing possible stimulation of agribusinesses, cooperatives and farmer organizations.

Is it possible to duplicate this experience in other countries? The paper identifies some 15 categories of success factors present in the cases analyzed. Some of the most important of these variables include national commitment, incentives, coordination of the multiple institutions involved, to-level decision mechanisms with power, synchronized inputs at field levels, detailed programming and control management methods, adequate financing, personnel, materiel and transportation.

Several implications for USAID management emerge from this experience. In each case, the Missions sparked the interest of the host country in a Crop Production program, and made significant contributions in resources, technical assistance and management methodology (planning, scheduling, follow-up). The principles that emerge for internal management are these: organize technical units by crop and major program outputs rather than specialties of personnel; emphasize administrative and negotiating qualities in the project chief; vary the number and duration of the manpower effort according to the job, since there was a considerable range in the amount of technical manpower utilized.

It is recommended that the Crop Production System be utilized to secure faster and more efficient increases in food supply. It is not limited to high-yielding varieties nor to new imported seeds; in fact the combination of a powerful management technique and a high-yielding variety can unbalance supply and demand. However, several precautions are suggested to help minimize the limitations of a production model: consider marketing and consumption as integral parts of the system; consciously stimulate nongovernmental involvement in the program; involve the farmers more directly and complete the information loop by presenting data on farmers' needs, realities, desires and problems to the institutions assisting them. To minimize the unavoidable socio-political stresses of rapid and uneven change,

it is recommended that an early-warning stress analysis be developed for decision-makers. It is possible to forecast these consequences much better with a systems interdisciplinary approach. Finally, it is suggested that AID further test the crop system technique and document it for wider use, along with orientation for top officials and training for specialists in its application.

## I INTRODUCTION

1. Purpose This paper seeks to accomplish the following objectives:

- Evaluate the management aspects of programs reported in selected Country Crop Papers
- View such programs in a systems perspective
- Identify the "success" factors of a Crop Production Program based on the country experiences
- Identify the benefits and limitations of such an approach
- Derive implications for AID policy and strategy

2. Content Focus In view of the audience, the focus will be on general management lessons learned and implications for Agency policy, strategy and technique in assisting with the development of food systems. It is not intended for management specialists, since the treatment would have to be more technical and focused on the "how" rather than the "what." Other papers can be developed later to cover the specialized management aspects in greater depth.

3. Country Selections Only a few of the Country Crop Papers deal with the management aspects in sufficient detail to permit an analysis and evaluation. This is understandable since there were no detailed guidelines to the Missions on what to include under such a topic. Moreover, the state of the art is such that there is no consensus on the elements of a management system nor on the management principles and techniques that are effective for introducing high yield varieties in LDCs. There were some data in some reports--

Thailand, India, Philippines, Pakistan--but not in sufficient detail to permit an analysis. It is fortunate that there are enough data in the following reports for an evaluation of the management aspects:

Vietnam - Rice

Turkey - Mexican Wheat

Costa Rica - Corn

4. The Turkey and Vietnam Crop Papers were submitted for the Spring Evaluation. They represent different approaches, in different cultures, for different crops and different relationships between AID and the host country. The Corn Report on Costa Rica is not a Crop Paper; it was prepared in May 1968 by the Advisor to the National Corn Commission as part of a University contract with AID. It is a valuable experience because in a sense it presents a check on the other reports:

- it deals with a native variety, not a recently imported seed;
- the corn seed does not offer spectacular productivity yields;
- there is no unusual price incentive to the grower;
- the campaign occurs in a Latin country;
- the critical path method and line of balance techniques were not used.

5. As a result, the Costa Rica Corn Study permits us to examine the results of a Crop Campaign as a management approach when it is not assisted by the advantages of a high-yielding variety.

6. Management Criteria In order to analyze and evaluate the reports within a consistent and thorough framework, the following

set of criteria have been developed. The factors are applicable primarily to the government agencies in the program and could be applied to the participating private organizations. Obviously, the Reports do not contain data responsive to all of these criteria, but the list of factors serves as a basis for designing future evaluations. The criteria are also significant because they contain all of the management factors which the Country Reports suggest are correlated with success in their countries. Thus, they could be a first attempt at spelling out the elements necessary for managing a Crop Production Program.

7. The detailed criteria are contained in the Appendix; but for ease of reference, the major categories are shown below:

Major Factors in Managing a Crop Production Program

- Commitment of the Government: reflected in the amount and quality of resources assigned, the sustained push to accomplish the tasks, the legislative and official decrees supporting the program, and the acceptance by those affected.
- Incentive which the Program offers to political leaders, farmers, agri-businesses, farmer organizations, consumers, and the action agencies.
- Planning: the selection of crops, specificity of goals, scope of the system, coordination, choice of physical areas for concentration, etc.
- Programming: specification of action steps, resources, timing and responsibility assigned to the various action units.

- Control: the feed-back reporting, analysis and corrective action capability to keep program on target.
- Organization: the split-up of functions, coordinating mechanism, decentralization and synchronization of action in the field.
- Financing: the budgeting, flow and control of funds.
- Personnel: motivation, managerial quality, number and qualifications.
- Materiel and Transportation: the adequacy, timeliness and control.

8. Using the above factors, the Country Reports were analyzed and data organized in these terms. On some points there is a clear consistent pattern in the countries; on other variables there are little or no data. A follow-up analysis will be required for a complete evaluation. Lacking any rigorous and proven standards for determining what is "good" or "bad" for the various factors the author has used professional judgment as to what constitutes low or high effectiveness on the variables based on the reported evidence and the Mission evaluations. At this stage of our experience, the judgments should be considered hypotheses rather than conclusions. The summary results of this analysis and evaluation are contained in Section III, "Success Factors."

## II DISTINCTIONS AMONG SYSTEMS AND STRATEGIES

9. Before proceeding to the evaluation of the specific country experiences, it would be helpful to clear up some of the confusion--

both semantic and conceptual--that surrounds the use of the word "systems." It may also be helpful to provide a larger perspective through which we can relate a "Management Technique" to a "Management System" to a "Production System" to a "Food System"--and thus be able to distinguish and delimit the topic of this paper.

10. "Pure Systems". There is no complete consensus on the meaning of this term, but some authorities<sup>1/</sup> have suggested the following criteria for any system analysis and design:

- State the objectives (system outputs) that may be sought by a complex of activities
- State the general interrelations between the activity variables considered to be necessary and sufficient to produce the outputs
- Quantify the relationship between these variables and system outputs
- Quantify the relationship between these variables and system inputs
- Determine an overall input-output relationship
- Determine what level of inputs and what relationships among the component variables will give optimum operation of the system (the criteria for "Optimum" are set by decision-makers, not by the analysts.)

11. We are not yet at a stage where we can refer to a "Food System" in the rigorous terms required above, because the conceptual and analytical model and quantification are not yet present. But,

it is possible to make a beginning in identifying outputs and relevant component activities and inputs and the general relationships among these, even though it be non-rigorous in terms of full data and quantification. This first approximation is what has been called "Systems Perspective," and this is what most of us are doing when we begin to look for input-output relationships in agricultural development or crop production.

12. Crop Production System Although the term is not used, most of the Country Crop Papers are implicitly examining a Crop Production System, i.e., what inputs and activities are necessary to produce crop output. If the concept were expanded to include the marketing system and consumption it would be possible to view a complete flow from input to consumption which might be called a "Food System," applicable to one crop or several. The distinction is very important. If the output objective is consumer nutritional balance rather than production, it is possible to conclude that there should be less rice and more protein. The Thailand report, for example, suggests that 15 grams of rice per day per capita exceeds a nutritional requirement of 14 grams. Hence, the goal might be to reduce rice consumption and increase some other food supply. Most Country Reports deal with a Crop Production System for rice, wheat or corn--hence, some of the problems that do or may emerge in marketing, consumption and aggregate supply-demand balance are not discussed because of the cut-off of the system at the production point.

13. Management Methods and Systems Some other distinctions should be made between a "management method" and a "management system." Some Reports refer to Program and Evaluation Review Technique (PERT) and "line of balance" techniques as "management systems." These methods are used to schedule and control activities. As such they are very useful techniques, especially well adapted to a systems approach because they facilitate identifying an output and the necessary actions to reach that objective. But these are methods, not systems.

14. There may be a "management system" for crop production, but there is no consensus on what it should be. We have the beginnings of a model that helps us to determine how to plan, program, control, how to secure incentive, coordination, personnel, financing, material, etc. We hope eventually to develop a "management subsystem," since a management process is not apart from but a part of all the other elements in a Crop Production System.

15. Strategies. Using the distinctions made above helps to clarify some of the approaches or strategies that are being utilized for increasing food supply or developing agriculture or developing rural areas. There are two broad categories of strategies: the component approach and the output approach.

- Input or Component Approach. Much of agricultural development falls into this category. The focus is upon improving research, extension, credit, fertilizer distribution, cultural practices, marketing, etc. Although these are often presented as increasing

food supply, or productivity or national development, the direct objective is increasing the effectiveness or efficiency of that particular component. It does not necessarily deal with just one crop; it does not necessarily result in a production or consumption increase; it does not necessarily require a balance with other components.

- The Crop Production Approach focuses on an output of one crop and then looks to all the component parts--fertilizer, seed, soil, water, equipment, credit, group support, price incentive, research, extension, etc.--to concentrate on delivering this output. All the inputs and institutions and sub-activities are not ends--but means to an end--on a specific crop in a specific time and in a specific balance with all the other components. This is an extremely powerful strategy, with advantages and disadvantages, but as evidenced in Turkey, Vietnam, Costa Rica and the Philippines, it does produce surprising results. The Country experiences in the above countries are classified as Crop Production Output strategies, thus their evaluation is important for the lessons they offer.

### III SUCCESS FACTORS

16. What are the factors associated with successful management of a Food Production Program? The Country reports have been analyzed carefully and the findings are summarized below in terms of the key variables that appear to influence the objectives that were set out

for the Production Program in each Country.

17. Crop Selection. In each Country case, there was the selection of a single crop for concentration of the government and USAID priorities and resources. In Costa Rica, the President declared 1967 as "The Year of Corn." In Turkey, the Government's main energies were directed to Mexican Wheat. Vietnam assigned top priority to the IR-8 and IR-5 variety of rice. In each country, the particular crop is a major commodity for domestic consumption rather than export, and the food was selected because of a deficit in domestic supply to meet national demand. The rice and wheat crops are high-yielding varieties which carried their own glamour and incentive, quite apart from national campaigns. As Bart Harvey says (Deputy Director, USAID/Turkey),

"Mexican Wheat was a promoter's dream.

"a) It had a romantic name.

"b) It was simple . . .

"c) It promised a high, immediate payoff: more and better wheat, bigger income

"d) It was dramatic . . . controversial . . . risk for the farmers . . . involvement of VIPs . . . intense tea house discussion."?

18. The Costa Rican corn varieties are a contrast:

- There was no emphasis on any particular variety. The campaign was to increase corn, most of which are the flint type varieties.
- The seeds were not imported for the campaign. The corn was already in use and known.
- There are no spectacular yield increases offered as incentives. Any increase in productivity had to come

from inputs, organization, cultural practices, technical, etc. .. not from the seed itself. Corn production increased 15% in 1967 (it was 3% the year before), and it cannot be accounted for by "miracle varieties."

19. Area Concentration. In each country, there was a further focus on specific physical areas for increased production. In Turkey, it was the Coastal Plain and Anatolian Plain. In Vietnam, the Delta was looked to for most of the production, though effort was made to get more production in the other regions mainly for social and psychological reasons. Costa Rica concentrated on the Nicoya Peninsula and the Meseta Central. This area concentration permitted the husbanding of resources and greater saturation of assistance to a smaller number of farm producers.

20. National Self-Confidence. It is easy to forget that confidence was extended not just to the wheat and rice seeds and the production technology but to national resource, organizational and human capabilities themselves. This is strongly etched in the Philippines report:

"While the Government was convinced of the need, it still lacked the confidence that the Philippines possessed the resources in technology, technicians, and finances to solve its food problem. Officials were thinking of grandiose land and water development schemes requiring large outlays of capital and trained management. There was some skepticism at all levels that the job could be achieved through improved management of existing Government institutions working with small farmers, despite advanced technology in rice varieties taking place at IRRI. Convincing the Government of this possibility was probably U.S. A.I.D.'s greatest achievement in the entire program."3/

Both the Turkey and Vietnam reports emphasize this. The Turkish Minister of Agriculture "bet his political future on it--and persuaded the rest of the JP leadership to support him."

21. Commitment to the Program. This is flagged as a key factor both by the Mission reporters and the evidence itself. In the three countries, the Presidents and the Ministers of Agriculture personally approved the program. There was involvement and follow-through during the execution stage. The Under Secretary of Agriculture in Turkey is reported visiting workers in the field to buttress local leadership; the top policy council of Ministers directed vehicles from other programs to meet needs. High priority was given for financial, managerial and physical resources. Acceptance of village leaders was solicited in Turkey; Costa Rica involved more of the private sector organizations than the other countries. The relative commitment to these programs by the governments was excellent. Private sector commitment varied by country as did the relative roles it fulfilled.

22. Incentive. The motivational pull to harness large numbers of farmers, businessmen, politicians, bureaucrats and institutions into a coordinated effort must be substantial. The reports are not explicit on the incentives to the political executives, but the implication is that there was a desire to reduce imports, meet domestic demand and raise productivity. Little mention is made regarding incentives to the bureaucracy--except for increased attention and importance for the role they played in raising production. Little mention is made of incentives for Provincial Governors and local

community leaders. In Turkey, the inference is that village leaders were motivated by appeals to local welfare.

23. Farmer incentives in Turkey and Vietnam were clearly provided by the increased yield and profit from the HYV, as well as the price supports, free technical assistance and availability of inputs.

24. Costa Rican incentives to farmers did not include spectacular yield or income except that an increase was offered by better fertilizer and cultural practices. Prizes and certificates were awarded to participating farmers.

25. The incentives to the private sector are not stated explicitly. Presumably, there was more demand and more profit-- it explicit incentives are not mentioned. Costa Rica generated motivation by including all the key organizations in the sponsoring, planning and execution of the campaign.

26. The consumer incentive to buy the product is not clearly stated. The price, taste and availability are potential incentives for increasing consumer demands but the role they played is not clear. In Turkey, the Mexican wheat is preferred for bread and was so advertised. There appeared to be no disincentive resulting from the taste and gummy nature of the rice in Vietnam. No special consumer incentives appeared to be offered in Costa Rica.

27. Public Sector-Private Sector Institutions. The three countries present a diverse picture on this score. The Turkey program seemed to be mainly a government program. For example, the top policy

and coordinating committee included only central government officials. Most of the execution occurred through government agencies. In Costa Rica, the National Corn Committee included representatives of private industry, 4-S Clubs, the FAO, OAS, the Nicoya Development Association, the University of Costa Rica, Fertilizer and Chemical Companies, etc. Each agency was assigned specific action steps, at certain times and in coordination other agencies. In Vietnam, the government turned over fertilizer distribution to private businesses, but most of the planning and execution was done by the government. The Mission report is quite explicit about what the objective should be:

"AID/Washington should give considerable attention to the policies which LDC governments follow with respect to the development of private business institutions; also to the capability of LDC universities to conduct research in agriculture. One very important point is that farm management contracts and the private sector sale of pesticides and fertilizers, farm implements, etc. can provide extension services to farmers in addition to those provided by the government. The most important thing is that this kind of extension service by sales representatives of agri-business companies is free to the farmer and does not cost the government for its administrative support. It is for this reason that AID/Washington should support a vigorous program to develop independent and private agri-businesses in LDCs with whom AID has cooperative programs. This should be a primary policy of AID/Washington."4/

28. Scope of Program. A crucial issue emerges from the country experience: should the Crop Program extend beyond production into storage, drying, processing, transportation, market facilities and consumption? This is obviously the same issue raised concerning the system outputs: is the objective one of providing a certain nutrition level and quality (need); or one of meeting consumer demand; or

providing a certain production level? If the objectives are to meet nutritional needs, it could mean decreasing rice and increasing other foods. If the objectives are to meet consumer demand, it can be accomplished by decreasing losses in the storage and handling systems. All the countries examined set their sights on <sup>the</sup> Production scope of the program and cut off the marketing system. With possible surpluses looming in Turkey and Vietnam, the Missions are turning to a broader scope. Vietnam puts the case clearly:

"USAID advisors are concerned that there could be an over production of rice in Vietnam unless a good marketing system provides some balance. The balance between requirements for domestic use and an exportable surplus requires an enlightened policy and an action program by the government. In the Philippines, there is a Rice and Corn Administration which attempts to stabilize prices and assist in the marketing of rice and corn. No such system exists in Vietnam. It is believed that unless some measures are taken to provide the Vietnamese rice market with balance and coordination, that serious problems will arise as production increases particularly if past export markets cannot be regained or are no longer available."5/

29. The conclusion is that the planning and system scope of the programs when limited just to production could lead to imbalances between marketing and production, between supply and demand and between consumer needs and consumer demands. The remedy is to be prepared to extend the program scope to consider both marketing and consumption.

30. Specific Output Goals. The program goals were specified quantitatively: 500,000 tons of Mexican Wheat to meet Turkish self-sufficiency; 69,400 metric tons of corn for Costa Rica and an 8% productivity increase on 5,500 manzanas. The significance of this is two-fold:

- There was a precise, understandable target that could arouse incentive and serve to measure actual progress. Contrast this goal with "raise the value of the gross national product," or "improve the efficiency of the agricultural sector," etc.
- The focus on a specific crop output instead of component activities and institutions focuses, narrows and propels all contributing actions in public and private sectors, for seed, fertilizer, pesticide, equipment, credit, extension services, research, training, education, etc. toward that output. It serves as a laser beam in directing all light waves in one direction. These countries all employed the output strategy for these varieites.

31. Planning. There was wide participation in the planning by the government action agencies but little is said as to participation by lower echelons and provincial governments. The real action center, of course, is the farmer--and yet in none of the countries was the farm-producer asked to prepare a farm production plan. It was contemplated in Vietnam but had to be abandoned for lack of trained technicians. When linked with credit and technical assistance, the farm production plan is the vital link in the production process.

32. The time frame seems to be one year, and no provisions made for continuing the push a second year. Preparations are made for succeeding years, but the Program effort itself does not seem to be planned beyond that.

33. Decision-Making Organizations. In each country, the diversity of organizations involved in and out of the government forced the creation of several new mechanisms to decide and coordinate.

- Policy-level committees were created in each instance: an Inter-ministerial Wheat Council in Turkey, a Rice Committee in Vietnam and a National Corn Committee in Costa Rica.
- A National Coordinator was designated by Costa Rica to implement the campaign. There is no clear top-assignment in Turkey, but reference is made to a Project Coordinator in the Ministry of Agriculture. The Vietnam report does not mention a single manager but the Director General of Agriculture was the principal policy level counterpart of the Mission, and reporting to him was the Chief of the Rice Service.
- Field Coordination was achieved in Vietnam by Regional Meetings of all agencies concerned, including the Director General of Agriculture and Central government personnel. An Agricultural Service Chief was appointed for each Province responsible for extension, information and rice production. Turkey relied mainly on its extension service, and there is no clear coordination mechanism for all the action agencies-- public and private--at local level. This may be one of the aspects requiring better integration at local levels.

34. Decentralization is a vital aspect for implementation of a program that is spatially dispersed and must deal with thousands of farm units, each of which requires its own blend of inputs. The Reports give the impression that the programs were managed at central levels and it is not clear how much operating flexibility was given to the provincial and subordinate teams. This is an important point worthy of follow-up.

35. Programming of the resources and actions in a time-sequence is vital for a farm production process. Vietnam used critical path method (PERT) and line-of-balance techniques in the Mission to program, predict, coordinate and control. Turkey used activity scheduling. Costa Rica used a less sophisticated technique, but exactly the same principles: it identified what action was to be taken by whom and when. These principles can be applied in a simple, non-rigorous way, without massive data or machines--as they were in Costa Rica--and still be very effective. See Ken Smith's paper for a more detailed treatment of this, and the control procedures discussed below.

36. Control was accomplished by daily contact and weekly reports from field teams in Turkey; by PERT and by Regional Meetings of all the action agencies in Vietnam; and by reports and meetings to take corrective actions through the National Corn Committee in Costa Rica. Evidently, the control was not perfect, but relatively effective for the environments.

37. Financing was accomplished with no major problems. The USAID input varied from a \$3.5 million loan in Turkey and 50% for

local costs, to USAID Costa Rica's input of technical advice and some printing. The significant point is that sufficient funds were planned and supplied in a timely fashion to meet program needs.

38. Personnel. Problems existed but were resolved to the point of accomplishing goals. Turkey assigned 250 extension workers to the wheat program and added 30 workers to the State farms.

39. Training was needed for these workers, and the USAID assisted by bringing in 12 Oregon State extension agents. This team was crucial to the success of the efforts.

40. Vietnam's problem was also one of training: they established a National Rice Production Training Center and instructed hundreds of extension agents.

41. Costa Rica operated with the personnel and facilities they had and made no mention of special problems.

42. The Reports reflect that the leadership from the Ministers, the training and the responsible role given to the employees noticeably raised morale and accomplishment. Managerial and leadership qualities of the field teams varied, but pressure from the Director General or Minister improved performance.

43. Material and Transportation. Turkey and the USAID did an excellent job of selecting, procuring and distributing the Mexican Wheat seed. The major problem turned out to be vehicles for transportation to the fields. This was resolved by AID procurement of excess and vehicles in England/by diversion of vehicles from other government agencies.

44. In Vietnam, the U.S. made a vital input: AID America moved people, USAID helped transport seed, and CORDS helped with telegraph and reports from the field.

45. Costa Rica was short on shelling machines, corn cribs, harvesting equipment and chemicals.

#### IV USAID MANAGEMENT

46. The USAID's were intimately involved in these programs and some of this is reflected in the success factors mentioned above. It may be possible to derive some lessons, however, by focusing explicitly on what was done inside the Missions to support these efforts.

47. Commitment. Some of the same success factors were present in the Missions. There was strong support by Mission management, even though there was considerable debate and prudent caution about the scope and management and pace. The commitment was then evident in terms of the resources and the follow-through supplied by the USAIDs. In the cases of Turkey and Vietnam, there was a significant amount of resource input. In Costa Rica, it involved only one full-time advisor and some short-term consultants, a film and some printing. Commitment is not necessarily expensive nor financial--but important.

48. Management Input. One of the strong points that emerges is the contribution of the Missions in methodology of planning, organizing and conducting crop production programs. According to Bart Harvey:

"USAID made a number of invaluable methodological inputs: Activity planning and scheduling. A long series of meetings with the Ministry of Agriculture directors results in a new appreciation of lead times and preparatory steps reduced to PERT chart form."6/

49. In Vietnam, the use of critical path method and line of balancing intrigued the Vietnamese who wondered how the Mission knew that a problem was going to occur in Region II in two weeks. They now want to see what's in the "black box." In Costa Rica, it was an explicit objective of the Program to "Demonstrate use of the team approach in which all pertinent agencies contribute resources to an agreed-upon objective and follow-up in actually implementing programs. The organizational framework and know-how developed through the corn campaign can then be easily adapted to other crops deficit to a specific area."7/

50. Management by Output and by Commodity. The Missions were willing to focus on one crop--a key one for that particular country--and to set the goal in terms of an output, rather than the component activities and institutions. This had significance not only for the program, but also for Mission organization and personnel.

51. Organization. In Turkey and Vietnam, a Chief and a unit were created to manage the program: A Rice and Crop Production Division in Vietnam, and a Cereals Production Branch in Turkey. The Costa Rica Mission is presumably too small to do this, but it assigned a contract advisor full time from the University of Florida.

52. In Vietnam, the functions and specialties were subordinated to the Crop Program: the Rice Division had one branch dealing with the physical inputs, another dealing with extension and information, and an agronomy and research unit. The various specialties were lined up with these program output categories (specialists included: agronomists, entomologists, soils and seed specialists, youth and

home economics advisors and irrigation engineers). The principle that emerges: organize by crop and output rather than by specialty.

53. Personnel. The chief qualifications of the program manager are ability to persuade and administer. If he has technical knowledge about some aspect of the crop, this is beneficial. If not, he can be assisted by an appropriate specialist. Vietnam appointed an officer with a background in city management, not an agricultural specialist. Turkey and Costa Rica had agricultural specialists.

54. Vietnam started with a headquarters staff of 30 technicians and cut to 12. Turkey had 12 short-term extension agents--but no report on how many direct-hire. Costa Rica contracted one full-time advisor and short-term consultants, all under contract with the University of Florida. Turkey believed its U.S. team of 12 was just right and that 4 months was about the right length of time. The principles that emerge:

- emphasize administrative and persuasive talent in the program manager,
- group specialists by major program output emphasis, not by specialty,
- vary the number and duration of the manpower effort according to the job.

55. Emerging Profile. It is possible to think about Mission management in terms of Commodity Teams which can shift from one crop to another with a minimum of change in personnel and specialties. Such teams can be supported by ad hoc specialists in economics, public

administration, rural sociology and political science as the need arises to deal with these aspects of rural development. Such Commodity Teams can be assembled from existing Mission technical divisions or brought in. They can serve to provide one-shot impetus to rural development or to a food crisis in the country--thus they serve both short-term and long-term development goals for both a specific food and a larger system of national development. But to get this permanent benefit for the institutions and practices in agriculture requires specific attention during the planning, implementation and follow-up phases.

#### V BENEFITS

56. What are the advantages that result from the use of a Crop Production Program? Based upon Mission views, analysis of the evidence and this evaluator's judgment, the benefits appear to be as follows:

57. Food Increase. The programs were surprisingly effective in terms of production output. In Turkey and Vietnam, the outlook is for a surplus. In Costa Rica, corn production rose 15% in 1967 (only 3% in the year before) and retained that volume in 1968.

58. Farm Income Rises. In each country, the farmer's net return increased considerably: an average profit of 115% was reported in Turkey (more than double the profit on native wheat) and 43% in Costa Rica. The Vietnam Ministry of Agriculture calculates that a family of five can feed themselves, meet production costs and still market 11 times as much IR-8 rice than traditional varieties (1100 kilos of IR-8 versus 100 kilos of native rice). This is most significant for

it means that the technique can be used both for raising farm income and rural welfare objectives as well as food production objectives. This is especially meaningful for Latin America where income distribution for the agricultural sector is a high priority.

59. Faster. The technique can achieve in one year what a dozen years effort in building components does not achieve--though one approach supports the other.

60. More efficient. A country can do more with the same resources--"more bang for the buck". By employing the principle of concentration, it marshalls scarce funds, people, materials, authority, information and concentrates energy, incentives, organization, managerial talent and national will into a powerful surge. The same resources invested during the same time period in one or more of the components of food production does not appear to produce the same production per capita.

61. Socio-Political Benefit. It demonstrates that the government is concerned about food and the welfare of farmers. Increased farm income, increased agri-business, more jobs for the populace, and prevention of price increases for food are meaningful to the people. Political leaders find it attractive; note the number of Ministers that espoused the programs.

62. Private Sector Benefits. The agri-businesses supplying the inputs, the banks supplying credit, the traders, etc., all are strengthened in terms of their capacities to do more business. Equipment manufacturing is increasing in Turkey, fertilizer businesses

are growing in each country, storage and processing facilities are expanding, and so on. There is an economic structural benefit as well as a one-time surge in business.

63. Farm Technology Improves. Farm producers are helped not only for the immediate harvest but in terms of a production technique that can be useful in succeeding years. Thousands of wheat farmers in Turkey received training in scientific care of the new variety; a Costa Rican youth under the supervision of a local extension agent demonstrated to his father and neighbors a profit of \$300 on a \$30 production loan--a 1000% return; rice kits in the Philippines and Vietnam are effective carriers of new technology. The technological impact can be permanent.

64. Institution Building. For both the private sector organizations and the government agencies involved, there is an electric shock-wave effect when the leadership and the employees are required to perform as part of a team effort with visible results of success or failure. New policy units were created; Vietnam experienced regional coordination for the first time among Agriculture services and field personnel; hundreds of extension agents were trained, managers were tested and some replaced, the inexorable time-table of nature required fertilizer, seed, credit, chemicals at certain times and so managers had to schedule and control, etc. "The fire that consumes some, tempers others." Institutions are toughened. The Philippines grew in self-confidence. Turkish and Vietnamese government officials had higher morale.

65. Transfer Benefits. If it works on rice or wheat, it can work on barley, beans, yucca, sorghum, etc. This is the judgment of country reports and host governments. In each country, the Ministry of Agriculture began to think in terms of using the same techniques on other crops. The techniques and institutions and the farmers gain in experience which can be applied again and again.

#### VI PROBLEMS

66. Just as there are benefits, so also are there problems with a Crop Production Model. Some of these are already apparent, others are potential. The Mission reports and the preceding analysis indicate these include the following:

67. Overproduction. In Turkey and Vietnam, a surplus of wheat and rice, respectively, is forecasted. This can be quite serious if the corrective action capability is inadequate. Focusing only on production without considering the marketing and consumption aspects is dangerous. The remedies for this are known and are discussed in the recommendations.

68. Overconcentration. Focusing on one crop can deprive attention, resources, time and leadership from other crops required for food balance. It can cause farmers to shift an undue amount of their land and attention to the "crop of the year." Research and training and extension personnel that should be working on other matters may be absorbed in one crop. These are not insurmountable problems, but inherent tendencies.

69. Area Imbalances. A crop program tends to favor certain physical areas that already have favorable conditions for the growth of that product. In Mexico, this favored irrigated areas. In Turkey, it

avored the coastal plain. This may increase political and economic stresses in that society, and may unfairly deprive other growers in other areas of assistance. Some area concentration is unavoidable, but there are ways to minimize it.

70. Bureaucratization. There is a tendency for the government to play the leading role in such programs without stimulating agribusinesses, cooperatives and farmers. In the countries studied most of the effort was made by the central government. It is easier to plan and control a government effort--and it may lead to taking over more functions--but it weakens the private sector. Vietnam reports that the private sector did better than the government in delivering fertilizer, seed, pesticide--even technical assistance.

71. Top-down Approach. Farm production is essentially a dispersed, decentralized, multiple-unit enterprise--and every farmer is a decision-maker. Yet, the temptation in a Crop Program is to "tell" the farmer what to do, how and when. Do the farmers have a chance to talk back and say what they need, want and can do? A partnership with a two-way information loop is required. The farmer should be involved in the planning.

72. Economic-Political Imbalances. A surge in productivity and farm income that benefits only certain regions, and larger more prosperous farmers can cause more stresses than that society desires or can handle. The rate at which this change occurs and whether it coincides with other stresses--racial, religious, political parties,

rural-urban--can be crucial. Does the plan consider effects on employment, rural migration, tenancy arrangements, etc.?

#### VII RECOMMENDATIONS

73. With some refinement, a Crop Production System can be used to secure faster, more efficient increases in food supply for domestic demand. It is recommended that the technique be considered for wider use, with some of the precautions suggested in the last recommendation below.

74. The technique should be utilized not just for high yielding varieties--but for such other crops which the country believes important to its welfare. In fact, because the technique can so easily spurt supply ahead of demand, there are advantages in using it on more traditional and proven native varieties.

75. In order to minimize undesirable consequences from its use, the following precautions would be prudent:

- Consider the marketing (storage, drying, processing, transportations, price information and market facilities) and the consumption (taste, nutritional value, quality, grading, demand and availability) aspects as part of the program. The important considerations are to define the objectives and the production target within this larger framework and to balance them.
- Limit the concentration of resources on a particular crop program to the point where it does not create undesirable consequences for other key crops.

- Build into the program a systematic effort to increase the participation of the private sector both in the planning and the execution. It is realized that this balance is highly variable according to specific conditions in specific countries, but the thrust toward more effective nongovernmental economic organizations can be stimulated.
- Because food production is ultimately a set of decisions made by thousands of farmers, motivate the farmer to use Farm Production Plans by such means as supervised credit, and gather this "micro" information to feedback to all the supporting institutions in such a way as to permit some aggregate "farmer profiles" of their needs, desires, realities and problems. This two-way communication is vital!
- Socio-Political Imbalances are almost unavoidable. The problem is threefold: to identify consequences in advance; determine which are undesirable; and attempt to minimize these consequences. To accomplish this requires a type of systems "stress analysis" which can serve as an early-warning system for decision-makers. It should be possible to develop this kind of tool and it is recommended that AID/W sponsor such a project, with the end result being a methodology, for use of USAID Missions and Host country officials.
- Just as seed needs adaptive research, so also does management technology. Before adoption in any country, it will be advisable to have some "adaptive management analysis" to

determine how to match local conditions and absorptive capacity with the new variety of program technique.

76. As a means of expanding the use of the Crop Program technique, it is suggested that AID:

- Further test, refine and document for Agency-wide use the principles and techniques of such an approach.
- Brief top AID managers (and selected country officials) on the potentialities, benefits and limitations of the technique for both food increases and general agricultural development.
- Provide more detailed orientation, training and documentation for AID specialists and counterparts in the methodology of systems and program management for food crops in developing countries.

## APPENDIX

### Factors in Managing a Crop Production Program

#### Commitment of the Government:

- Amount and timeliness of resources applied to the program--financial, manpower, physical, managerial.
- Progressive accomplishment of interim targets to final goal.
- Legitimation of program by legislation and/or official decrees.
- Acceptance of program by governmental and non-governmental leaders, as well as action organizations.
- Degree to which the government is willing to use political power to overcome resistance.

#### Incentives the program offers to:

- Political leaders. How attractive is it to the President, Ministers, legislators, governors?
- Farm producers--financial, technical, social.
- Agri-businesses.
- Farmer organizations.
- Consumers.
- Action agencies involved in the program.
- Effectiveness of promotional campaign to motivate and mobilize support.

#### Planning:

- Scope of the plan. Does it include all the necessary component activities? Does it extend to storage, transportation, processing, marketing, price information, consumer demand, price support, etc.?

- Crop selection. Single or multiple crop, relevance to demand.
- Physical area concentration.
- Specificity of goals. Quantification.
- Time-frame.
- Coordinating mechanism. Central government, field level, public and private sectors.
- Participation by action agencies. Include public, agri-businesses, and farm level.
- Consideration of political, social, and economic dimensions.
- Adequacy of data.

Programming:

- Operational steps identified.
- Resource requirements estimated.
- Time-phasing of above.
- Responsibilities assigned to organizations and individuals.

Control:

- Reporting from action levels.
- Progress appraisal.
- Executive action frame to take corrective action.
- Appropriate controls at various levels.

Organization:

- Functions assigned to organizations.
- Functional and area synchronization of organizations.
- Coordinating units at central and field levels.
- Delegation.

Financing:

- Adequacy of budget.
- Timely flow.
- Flexibility of reprogramming.
- Control.

Personnel:

- Adequacy of number.
- Qualifications and training.
- Motivation. Leadership quality and incentive.
- Managerial quality.
- Timeliness of arrival.

Materiel and Transportation:

- Quantity.
- Quality.
- Timeliness.
- Control.

NOTES

- 1/ See "Systems Analysis in Government Operations" by Guy Black in Management Science, Vol. 14, No. 2, Oct. 1967, p. 13-41-57.  
Also, "The Theory and Management of Systems" by Richard Johnson, Fremont F. Kast and James E. Rosenzweig, McGraw Hill Co., N. Y. 1967
- 2/ USAID, Turkey "The Introduction of Mexican Wheat into Turkish Agriculture," TOAID A-141, March 21, 1969. p. 79
- 3/ USAID Philippines, "Spring Review of New Grain Varieties," Section 12, p. 3
- 4/ USAID Saigon "Spring Review on New Grain Varieties," TOAID A-1357, March 12, 1969. p. 31
- 5/ Saigon Report, op. cit., p. 12
- 6/ Turkey Report, op. cit., p. 79
- 7/ "The 1967 Costa Rican Corn Campaign: A Successful Venture in Basic Food Crop Production in Central America." Victor E. Green, Jr. University of Florida Report, May 15, 1968. p. 7