A Study on the Evaluation of the Effects of Technical Cooperation

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Japan International Cooperation Agency

INTRODUCTION

The purposes of this study, entitled "A Study on the Evaluation of the Data concerning the Effects of Technical Cooperation", are (i) to analyze the fundamental problematical areas in the evaluation of the data pertaining to efficacy of technical cooperation, and, thereupon, (ii) to set up an evaluation methodology which is capable of withstanding practical tests.

The significance of taking a measurement of the effectiveness of technical cooperation does not expire when the efficacy of a cooperative project undertaken in the past has been evaluated; such measurement is an indispensable element in the planning and implementation of future cooperation projects. Any measurement of such a nature entails great many problems -- in theory as well as in practice -- making it difficult to set up a standard formula for evaluation. The difficulty applies not only to intra-nation technical cooperation but also to similar cooperation between nations. This formula, accordingly, has not been firmly established.

There has been a number of attempts to measure the effectiveness of projects involving, in the main, capital assistance (measurement of economic effects) and some of these attempts have come up with the results which are deemed meaningful. Efforts to measure the effectiveness of technical cooperation, however, have been confined to certain rare cases where effect-quantification is attainable. One cannot calibrate the efficacy of technical

cooperation per se in a project if the project contained other ingredients of cooperation, either capital or labor. The effectiveness of technical cooperation obviously varies from one technical sector to another in terms of time, quantity, etc. Further, the objective of one evaluation may be quite different from the purpose of another.

In view of the aforementioned problems associated with any attempt to ascertain the effectiveness of technical cooperation, this study seeks to systematize evaluation procedure by means of constructing individual project evaluation tables. A typical evaluation table shall (i) show the flow of the pertinent technical cooperation project, (ii) clearly point out the position (or moment) for evaluation, (iii) incorporate the concept of purpose management, and (iv) indicate the co-relationship among inputs, outputs, and purpose. This proposed table is linked to the organization and function of the International Cooperation Agency (Chapter I: General Discussion).

Chapter II contains an overview study of the current status of technical cooperation provided by our country. In Chapter III, we shall perform a theoretical, broad-angle investigation of (i) technical cooperation, and (ii) evaluation of the effects of technical cooperation. In Chapter IV, this study, from an effectiveness-measuring viewpoint, analyzes the special qualities of technical cooperation and capital cooperation as well as the correlation between the two types of cooperation. The various

effectiveness-measuring approaches and methods employed by the United Nations, OECD, and other organizations are described in detail in Chapter V.

Chapter VI makes a tangible proposal in the form of a system for measuring effectiveness and presents a comprehensive rendition of the flow of a sample technical cooperation project. The chapter also examines a systematized method of evaluation, and proposes a manner of employing the method in actual practice to measure the effectiveness of technical cooperation. Also, a project evaluation prototype table is proposed.

In Chapter VII, the preceding system of evaluation is applied to real projects in order to conduct case studies of medical, agricultural and mining-manufacturing sectors.

Chapter VIII summarizes this report. In Appendix, we have introduced, and incisively analyzed, the contents of the USAID project evaluation manual. Elsewhere in Appendix, and in the last pages of this report, we have introduced the scheme employed by the OECD to measure the effectiveness of its technical cooperation projects.

Over the past several decades the world economy has undergone major shifts and the shrill of developing countries in support of a new international economic order and in search of technology transfers in their directions has become increasingly high-pitched. The advanced nations are being pressured to respond, through tangible actions, to the call of developing nations. Our country,

with limited resources of her own, is today increasingly called upon to provide effective technical cooperation to less developed regions of the world. The need for a firmly-established means of measuring the effectiveness of such cooperation,therefore, is felt keenly by all concerned parties.

The definitions of some of the terms used in this report shall be as follows:

Goal. This means the purpose assigned to the key program in a given project. It also means, where appropriate, sector goal or program goal.

Purpose. This means an objective, or a set of objectives, attainable by a project when it is completed successfully by a predetermined date. A purpose may be expressed in either quantitative or qualitative terms.

Target. This means any compnnent of a purpose which may be expressed by an objective index.

Output. Certain specifically intended result which is expected to accrue when certain input has been managed in an appropriate manner for a period of time. In short, something obtainable through an input.

Input. The term means capital and/or service (personnel, equipment, material, training, etc.) introduced into the various activities of a project for the purpose of acquiring certain output.

Evaluation. There are two kinds of evaluation. Ex-ante evaluation, or appraisal, is the analytical process undertaken during the planning and implementation phases of a project to verify the

possibility of attaining the expected output through the existing means of input designed to achieve the goal and purpose assigned to the project. Ex-post evaluation refers to the analytical process undertaken after a project is finished to verify whether or not the intended purpose is attained.

Effectiveness measurement. The term refers to the process of ex-post evaluation plus measuring of all effects of a given project. The evaluation system is widely thought to represent the analytical process which is undertaken when a given project has been implemented to verify whether or not the specifically intended purpose of the project has been attained; but such a project, in fact,often can bring about certain influences and effects other than the specifically intended purpose.

CHAPTER VI. PLANNING AND EVALUATION OF TECHNICAL COOPERATION PROJECTS; PROPOSAL FOR SYSTEMATIZED MEASUREMENT OF EFFECTS

Clause 1. Flow of technical Cooperation Project

In this chapter, we shall (i) investigate the question of how a principal management body of technical cooperation may, or ought to, ascertain the effectiveness of projects it manages, and (ii) propose a trial plan designed to firmly establish an effectiveness measurement method which is capable of withstanding practical usage within the domestic department of the International Cooperation Agency. During the development stages of the trial plan, we had carefully studied the various opinions advanced by persons associated with economic and technical cooperation, incorporated many of them in the plan, and paid particular attention to the importance of unimpeded "meshing" between the plan and the organizational mechanism which is to implement it. We must emphasize, however, that this plan is nothing more than a trial proposal. The objective of developing the trial plan will have been attained if, in the future, the International Cooperation Agency comes up with an internally-developed plan of its own based on this trial plan and when the new plan is put to actual application.

In Chapter II we surveyed the current status of, and pointed out the problematical areas which have manifested themselves in, Japan's technical cooperation activities. The trial plan seeks to resolve such problematical areas in an appropriate manner within

the management mechanism. The trial plan proposes to set up a number of junctions (or check points) throughout the entire flow (from the very beginning to the very end) of a given project; and to check at a given junction all problematical areas which are discovered at, or prior to, that junction. The trial plan also proposes to set up a chain of evaluation points in parallel with the aforementioned flow of project implementation. Under this proposal, evaluation of a given implementation stage of the project is to be handled automatically when the pertinent evaluation point is triggered by the flow.

On the basis of the aforementioned project flow and evaluation mechanism, we shall now discuss in detail the trial plan for effectiveness measurement of technical cooperation projects.

Flow of Technical Cooperation Project

In order to devise a system of planning a technical cooperation project, it is necessary, above all, to determine the flow of the project from the very beginning to the very end. The reason for this necessity is obvious: If the flow is not firmly set up, it will not be possible to clearly attribute identifiable problematical areas to their respective, proper places in the entire flow. We must point out here that the flow plan suggested by us shall remain a trial scheme until and unless a uniform flow formula is, in fact, constructed within the organization of the International Cooperation Agency.

In Clause 2,"Problematical Areas in Real Technical Cooperation Flow", we shall, through a comparison of the real flow scheme with

the trial plan proposed by us,come back to look into the management of real projects.

At this point, however, we merely wish to say that we are looking forward to the day when the internal staff of the International Cooperation Agency successfully complete the construction of a practical project flow formula, one which can be used efficiently in real circumstances, on the basis of our study and investigation.

Proposed Project Flow Formula

(The foldout insert between pages 64 and 65 of the original text)

Principal action bodies (top to bottom)

(1) Office, agency, etc., in charge of planning and supervision; aid receiving nation.

(2) Department in charge of project management; aid receiving nation.

(3) Department in charge of decision making; aid giving institution.

(4) Department in charge of planning, study, and data control; aid giving institution.

(5) Department in charge of project management; aid giving institution.

(6) Outside consultant; evaluation team.

(7) Internal, full-time evaluation staff; evaluation team.

(8) On-the-scene experts sent by aid giving nation.

Background analysis stage, preparation phase (left to right, in blue)

1. Expression of the need for a project.
2. Organizational preparation for the management of the project.
3. Review of the management system.
4. Request for assistance.
5. Investigation of the assistance.
6. Expression of the purpose of the assistance.
7. Study and investigation.
8. Determination of the scope of assistance.
9. Study and investigation.
10. Determination of the form of assistance.

11. First-stage deliberation to decide approval or disapproval of the project. (Triangles indicate major decision-making junctions.)

Project appraisal stage, preparation phase

12. Beginning of ex-ante study.
13. Preparation for the startup of ex-ante study.
14. Beginning of the management of ex-ante study.
15. Receipt of request for joint study.
16. Selection of consultant.
17. Compilation of study report.
18. Acceptance of study report. (Broken line between 13 and 18: Study.)
19. Compilation of evaluation report.
20. Receipt of evaluation report.
21. Data file.
22. Receipt of the result of ex-ante study.
23. Receipt of the result of ex-ante study.
24. Examination of the result of ex-ante study.
25. Examination of the result of ex-ante study.
26. Second-stage deliberation to decide approval or disapproval of the project.

Implementation phase

27. Beginning of project management.
28. Beginning of management.
29. Receipt of order to begin management.

30. Selection of experts.

31. Receipt of order to begin management.

32. Compilation of personal statements and declarations.

33. Formulation of management plan.

34. Correction of reports and declarations.

(Broken line between 34 and 32: Disapproval.)

35. Examination of management plan formulated by aid receiving country. (Line between 33 and 35: Correction, or disapproval, of management plan. The transition between 34 - 35, and 35 - 36, is subject to approval.)

36. Completion of preparation for management.

37. Beginning of actual management.

38. Beginning of actual management.

39. Receipt of report on actual management.

40. Actual management instruction and guidance.

41. Management of secondary programs.

42. Management of secondary programs.

43. Management of secondary programs.

44. Management of final program, receipt of report.

45. Final program instruction and guidance.

a. The stage assigned to startup and implementation of primary program of the project.

b. The stage assigned to startup and implementation of secondary (and, without interruption, subsequent) program(s) of the project.

Ex-post assessment phase

46. Beginning of ex-post assessment.

47. Preparation for ex-post assessment.

48. Receipt of request for joint study.

49. Selection of consultant.

50. Compilation of study report.

51. Receipt of study report. (Broken line between 47 and 51:Study.)

52. Compilation of ex-post assessment report.

53. Receipt of report.

54. Data file.

55. Receipt of the result of ex-post assessment.

56. Receipt of the result of ex-post assessment.

57. Examination of study result.

58. Examination of study result.

59. Evaluation of ex-post study.

60. Decision on the necessity of followup project.

61. (Where followup project is deemed unnecessary) excavation of entirely new project. (Broken line emanating from 61: revert to the starting point of background analysis stage of preparation phase.)

62. (Where followup project is deemed unnecessary) study of plan for entirely new project. (Broken line emanating from 62: revert to the starting point of background analysis stage of preparation phase.)

63. (Where followup project is deemed necessary) formulation of plan for followup project. (Broken line emanating from 63: repeat the processes of project appraisal and subsequent stages.)

64. (Where followup project is deemed necessary) formulation of plan for followup project. (Broken line emanating from 64: repeat the processes of project appraisal and subsequent stages.)

(end of foldout insert)

(1) Every project is a dramatic undertaking.

Our fundamental concept of project flow can be succinctly described as a drama which is played out in an interwining manner in three phases by several principal bodies of action. Not unlike a drama composed of three acts, a project of ours opens with the preparation phase, proceeds through act two, which is the implementation phase, and in the ex-post assessment phase reaches the climax -- which may turn out to be a happy end or a great tragedy. This flexible, controlled climax makes each play of ours a far more demanding undertaking than ordinary dramas based on pre-written scenarios. The classification of the final scene of our plays in fact depends on the performance and zeal furnished by all participants. Our stage performers, therefore, must exert maximum efforts to make the climax a happy finale rather than a weeping and grieving event.

As shown on the left hand side of the foldout insert, we have divided the principal action bodies into eight functional categories. In the case of aid receiving side, one can consider a principal action body in charge of evaluating economic plans and international cooperation from a pan-national macro point of view, the institution which may be designated as the office, agency, etc., in charge of planning and supervision (1); and another principal action body assigned to manage, directly, international cooperation projects, the organization which may be designated as the department in charge of project management (2).

Within an aid giving institution, it is possible to identify

a department empowered to make highest decisions on (i) positioning of international technical cooperation within the framework of international economic cooperation furnished by that aid giving nation, (ii) establishment of basic guidelines for technical cooperation activities, and (iii) approval and authorization pertaining to the management of individual projects, the entity which may be designated as the department in charge of decision-making (3); another principal body assigned to perform such studies as are required by this highest decision-making department and to maintain individual projects properly positioned within the overall economic cooperation mechanism at all times, the structure which may be designated as the department in charge of planning, study and data control (4); and yet another principal body having the mission of managing cooperation projects, the agency which may be classified as the department of project management (5).

As clearly shown by the accompanying flow chart, the advent of each flow phase and stage is heralded by an action taken by the department in charge of planning, study and data control. As such this department behaves like the central revolving shaft stretching throughout the full course of project flow, triggering the motions of other departments as it turns. In our flow model, this department is given the function of data control, with powers to comprehensively compile, organize and process all pertinent data, from start to finish.

A team assigned to perform evaluation constitutes the third group within the ranks of principal action bodies. Professionally,

the evaluation team is made up of persons having abundant knowledge and experience in the management and evaluation of the projects similar to the one in question. In terms of organization, team members may include outside consultants in addition to regular, full-time evaluators who are affiliated with the appropriate technical cooperation institution.

Outside consultants are comissioned to perform, or participate in, evaluation when it is necessary to expedite the task, or to augment the technical expertise of the regular internal staff on hand. The regular, internal evaluators are people capable of analyzing all aspects of technical cooperation projects. They are, therefore, not confined to technicians; among them are professionals who have been trained in economic and financial analysis.

The group designated as on-the-scene experts sent by aid giving nation refers to those professionals who are dispatched by the aid giving institution to the aid receiving side with the mission to manage the project directly at the place where it is implemented.

The abovementioned parties form the functional deployment of the principal action bodies related to project management. Needless to say, this classification scheme is no more than a conceptual model based on the functions which are deemed to be performed by the respective principal action bodies; and the system is not necessarily a mirror image of the organizations presently in place.

On the other hand, such a scheme -- wherein all principal action bodies are classified by function -- should be a useful tool for the correct understanding of the interrelated and meshing

operations of the various action bodies throughout a given project flow.

(2) Preparation phase.

So far, we have clearly identified the roles to be played by the principal action bodies on a project. We shall now examine the proposal for project flow. As noted earlier, the flow is divided into three broad segments: the preparation phase, the implementation phase, and the ex-post assessment phase. As we undertake a phase-by-phase examination of the flow, we shall be paying particular attentions to the interrelationships among the principal bodies.

The preparation phase consists of two stages: the background analysis stage and the project appraisal stage. As such, the preparation phase spans the distance from the excavation of a project to the moment when it's implementation is initiated. The background analysis stage represents the period during which technical aspects are not explored; the aid giving institution and the aid receiving nation meet face to face in accordance with their respective guidelines for cooperation; each side makes its views on cooperation known to the other, and the two sides reach (or fail to reach) a mutually acceptable understanding.

The aid receiving nation is expected to express its needs for development, set up a plan for distribution of resources in order to respond to the needs, identify the projects which may not be implemented with its own resources alone, pick up a project -- from among the projects for which external cooperation

is deemed indispensable -- considered to have the highest priority, and submit formal request for cooperation on that priority project. If a developing nation happens to lack a firmly-established infrastructure capable of proceeding on its own over the planning processes (from identification of developmental needs to project planning), an assistance in the planning methodology sector may very well become the first project of cooperation.

On the other hand, the aid giving institution, having reviewed the results of economic and/or technical cooperation studies performed by the planning department (the functional category 4 in the lineup of principal action bodies) is, first of all, supposed to clarify the objective, scope and form of the cooperation it is prepared to provide. The aid receiving side is not the only party carrying the burden of developmental needs; the aid giving side, obviously, has its own mix of developmental needs to consider. A potential aid providing institution, therefore, must possess the planning mechanism in which the process of cooperation project selection is accomplished in harmony with the requirements for satisfying its own needs for development.

When the aid receiving nation and the aid giving institution have taken these respective first steps, the next scene becomes the first confrontation between them. To be decided here is whether or not the proposed project brought out by the aid receiving side is eligible for cooperative consideration.

If it is agreed that the proposal indeed merits cooperation, then it will be passed on to the project appraisal stage. If the proposal is deemed not qualified to be chosen, then the two parties return to square one. In this sense, the first face-to-face encounter between the two parties may be described as the occasion where their basic policies concerning aid are confirmed.

The project proposal which has passed this first selection test is then allowed to flow into the project appraisal stage. The project appraisal is undertaken jointly by project analysts of the aid giving institution and project management staff of the aid receiving country. Upon receipt of a report submitted by the analysts and management staff, full-time, internal evaluators of the aid giving institution then write an evaluation report.

When the internal evaluators are assigned to undertake the project appraisal, the appraisal shall be performed during the alloted time-period which begins at the ex-ante appraisal point (circle 13 in the flow chart) and ends at the receipt of report point (circle 18 in the flow chart).

When the evaluation report of the internal evaluators is duly submitted, the decision-making department of the aid giving institution examines the project proposal in a comprehensive manner. This examination looks into such issues as the possibility of implementing the project, effects which are expected to accrue from that implementation, and, for the first time in the flow, technical-level aspects. If we see the aforementioned

first test as the occasion for confirmation of basic, aid-related policies, this second examination process can be described as the scene of allout evaluation and judgment centered around the key question of project feasibility.

(3) Implementation phase

If the project proposal has survived the second hurdle, and the project is duly recognized to be sound in terms of cooperation policies and management feasibility, it is pushed forward into the implementation phase. If one looks at this phase carefully, he can recognize two distinctive segments therein. The first segment, covering the span from the initiation of project management (by Department 4) until the completion of management preparation (by Department 5), represents the period of preparation for actual implementation. The second stage, which starts at the moment the first segment ends, takes up the remaining distance until the completion of the final program. The latter, therefore, is the period of actual implementation.

In this preparation period, the experts sent by the aid giving institution to the project site will be sending reports on their first-hand observation and judgment, and the project management department of the aid receiving nation will be submitting the plan for management. The two groups, meantime, will be coordinated by the regular evaluators of the aid giving institution.

Throughout the actual implementation period, the experts sent by the aid giving institution to the project site and the project management staff of the aid receiving nation shall jointly carry

out the project, subject to appropriate guidance given by other experts stationed within the aid giving institution as various programs are initiated and pushed forward. The project's progress will be checked at a number of key junctions to make sure it is not subjected to deviation (influenced by, for example, preferences or judgments of the on-the-scene experts) from the track prescribed in the plan originally approved.

(4) Ex-post assessment phase

The ex-post assessment phase begins at the point where the final program of the project is completed. This phase refers to a period during which the assessment is made on whether or not (i) the project has been carried out in accordance, on the whole, with the ex-ante appraisal report and the plan determined during the period of preparation for actual implementation, and (ii) the expected results have been attained. The roles performed by the respective principal action bodies during the ex-post assessment phase are nearly identical with the roles they played in the ex-ante project appraisal stage. (Please compare the ex-ante project appraisal stage of the preparation phase with the ex-post assessment phase as shown in the flow chart.)

By way of this assessment, it is determined, finally, whether or not any followup plan is necessary. If it is determined that certain additional programs are needed to attain the results originally anticipated, the principal action bodies then will retrace the steps from, and including, the ex-ante project appraisal stage.

On the other hand, when it is determined that the original objectives have been achieved, the principal action bodies may return to the point where the background analysis stage begins; re-examine the cooperation policies of the aid giving institution and aid receiving country on the basis of the experience gained through the implementation of the preceding project, and select a new project proposal.

This is the project flow which we have worked out. By delineating the flow from the background analysis stage to the point where the decision on followup programs is made, we have attempted to position the numerous problematical areas -- those great numbers of problematical areas which have been pointed out by the concerned parties -- at their appropriate places within the whole structure of project management.

From this point of view, we shall now return to an examination of actual project case histories. Our purpose is not to simply point out the problematical areas in those past undertakings, but to find their pertinent locations and other relevant links within the whole course of a given project.

Clause 2. Problematical areas in the existing flow of technical cooperation

(1) Absence of background analysis

When we place the existing flow scheme and the flow model we have developed side by side for comparison, the first thing we notice is the absence in the existing scheme of a stage which is designated as the background analysis stage in the flow model.

What this comparison shows is that the flow of a typical external cooperation project begins on a given day when some sort of arrangement is concluded;and an analysis centered around technical aspects is initiated; and then experts are sent to the place where the project is to be implemented.

What are the objectives of the International Cooperation Agency, the sole technical cooperation institution of our nation? What is the most appropriate volume of assistance? What is the optimum form of cooperation? We regret to say that the institution, in its performance of studies and analyses, has not always been particular about the significance of clarifying these points.

Obviously, no two advanced nations -- or, for that matter, international agencies -- can be expected to share an identical set of objective , scope and form of cooperation. However, it behooves our country to correctly comprehend the aid policies of other nations. And as we ponder the course and shape of our future cooperation, it would be most useful to study the latest approaches adopted by the World Bank.[1)]

The necessity of background analysis is felt strongly even in our own country; the interim recommendation (August,1975) by the Economic Cooperation (Deliberation) Council may be cited as a case in point.

The recommendation contains the following statements: "The development cooperation to be carried out by our nation in the years ahead shall necessarily be in harmony with the internal

administrative requirements, based on wholesome support and understanding by the Japanese people, and capable of attaining the optimum effects from the limited capital and manpower resources available for that purpose.

"Accordingly, we hereby strongly recommend that the following steps be taken in the future. First, our nation ought to select the most effective means and fields of international cooperation based on our accurate ascertainment of not only the developmental needs propounded by the peoples of the aid receiving nations but also the aid receiving capacities of such nations. Second,those developmental plans which are adopted ought to be implemented at all times in an effective manner and in accordance with a clearly defined formula of priorities.

"Consequently, the Cabinet Consultation Conference on External Economic Cooperation and other relevant organizations should attempt to further clarify the thrust, direction and procedure (i.e., the fundamental perspectives on quantity, quality and political relevancy of developmental cooperation; priorities and region-by-region, group-by-group or sector-by-sector propriety for cooperation, and participatory share ratios and relationships between government-financed programs and private-sector activities) of our nation's development cooperation policy."

Japan may congratulate itself upon such evidence of self-taught maturity in terms of basic planning and background analysis. We are all hopeful of an early operational application of such conceptual maturity embodied by the background

analysis procedures and basic guidelines for cooperation firmly established within the internal departments of the technical cooperation institution.

(2) Lack of qualified internal evaluation teams and absence of joint research

The flow model we have proposed entails the presence of regular, qualified evaluators at the main office of a given technical cooperation institution; and they are given the responsibility of evaluating all projects undertaken by the institution, making sure the projects are carried forward as previously planned, and causing course corrections where necessary in order to maintain the projects on their previously assigned tracks.

We have also considered that the composition of such regular evaluation staff must, besides technical professionals, include experts capable of analyzing the projects' economic effects as well as highly experienced sociologists who are qualified to investigate broad impacts in the respective target regions.[2)]

The existing manpower structure for evaluation of technical cooperation projects, however, is made up, in the main, of outside technical experts and, as a result, the thrust of attention so far has tended to lean toward the analysis of local effects within the projects' target regions. In the absence of a firmly established discipline dealing with evaluation, those evaluation activities which have been performed thus far have also been prone to lack uniformity. We believe

it is time to set up a staff of qualified professionals representing all essential fields of expertise and to firmly establish the standard method of project evaluation at the technical cooperation institution in order to improve operational and managerial efficiencies of our technical cooperation projects.

Another problematical area in the present state of project evaluation is the absence, or a serious lack, of research undertaken jointly with management specialists on the aid receiving side. We ought not consider our role in technical cooperation fulfilled when we have taught aid receiving nations how to manufacture certain products; we ought to also take the trouble of transferring pertinent technologies -- such intangible but relevant know-how as planning and evaluation skills -- as part of our aid package. The transfer of intangible techonology acquires an added importance if one considers the possibility of handing over a project, upon its completion, to the pertinent aid receiving nation to be managed by itself. This point was fully taken into account when we developed the flow model presented here, and we cordially invite your attention to that potential incorporated therein.

(3) Incorporation of a system requiring dispatched experts on the scene to file reports and declarations

Our flow model incorporates this system in order, among other purposes, to eliminate one of the major causes of anguish experienced by those experts who have had overseas assignments.

We are referring here to the oft-mentioned sense of disorientation and helplessness (i.e., inability to distinguish the first priority job to tackle) felt by many of the experts who were shipped out without being briefed in full and in depth on the projects to which they were assigned. Under such circumstances, the main office, too, suffers from a problem of command and control -- being without any reliable means to ascertain the operational contents of individual on-the-scene experts, or their respective roles within the whole framework of a given project.

Needless to say such predicaments ought to be avoided, if at all possible, by the main office, which does the dispatching, as well as by the experts who are posted overseas. In order to preclude such situations, we strongly emphasize the importance of incorporating in the flow a system which compels all on-the-scene experts to submit reports and declarations. Since it is somewhat unreasonable to expect on-the-scene experts to file perfectly objective and impartial assessments of their own performances at all times, we now need a principal body which is assigned to make objective assessments of the contents described in these reports and declarations. We recommend that the aforementioned regular, internal evaluators be designated as this principal body. Under this arrangement, the full-time, internal evaluators can perform this additional function in behalf of improving the efficiency of project management.

(4) Enlarged functional jurisdiction of planning department

Our flow model calls for each and every project phase to begin and end at the planning department (Department 4). The reason for this arrangement is that this department, as the control center of project management, is given the task of project evaluation as well as the power to ensure unimpeded progress of the whole plan. Also, this department is given the duty to perform such investigations and appraisals as required by the decision-making department. In addition, this department is assigned the functions of (i) collecting, organizing and storing all pertinent project-related data, and (ii) conveying the empirical data on finished projects to the parties engaged in the planning of new projects.

This arrangement enables the planning department, from its position which is comparable to the rivet of a fan, to keep its sharp eye on all phases of project flow. Some people, presumably, may question the propriety of emplacing such department within the existing internal structure of the technical cooperation institution. Others may expound the complexity and difficulty of realigning the functional links between this department and other units within the structure. Be that as it may, one thing is certain: We can no longer afford to engage in overseas projects without a department of this nature having the power of overall project control.

Clause 3. Method of evaluating projects

(1) Project evaluation

What do we in fact seek to clarify in an analytical exercise which is called project evaluation? Regarding this point, people often contend that one cannot hope to evaluate a project until and unless the benefits it generates are quantified. This contention, however, fails to answer the question "What do we seek to clarify?" and serves no purpose other than to cut off debate. It only echoes the old theory that what one cannot quantify, one cannot clarify.

At this point, let us go back to the beginning and focus our attention precisely on the objective of project evaluation. We propose to compare (a) the situation which exists where a given project is not implemented with (b) the situation which prevails where the project is completed; and to identify the changes between (a) and (b), and to determine the facts which tend to verify such changes.

We then intend to extract the facts (which tend to verify the changes) from among the societal phenomena related to the project; and to describe the facts in the language which can be understood by all. These may be deemed the ingredients of the purpose of project evaluation.

If we construct our thought in this manner, the question of whether or not project benefits can be quantified becomes a problem of secondary significance. Perhaps we have had too much useless arguments on this issue of benefit quantifiability.

One word of caution is appropriate here: The term "changes" as used in the preceding paragraph refers to the changes "with or without", rather than "before and after", a given project.

Let us take an actual example of project evaluation: The evaluation of the construction of a high speed highway. It is not possible to clarify the changes generated by this project if one applies the "before and after" comparison methodology. Under this methodology, one merely compares the "before" situation (at moment 1) of the old road prior to the construction of the new highway with the "after" situation (at moment 2) when the new highway is finished. What is overlooked in this exercise is the estimated situation at moment 2 of the old road (without the new highway).

Had the new highway not been built, and the old road put to use continuously, the conditions (pavement, congtestion, stress on drivers, etc.) of the old road at moment 2 would have been incomparably worse than they were at moment 1. In other words, the "before and after" comparison methodology unfairly neglects to take into account the meaningful "without" situation, i.e., "what would have been without the new highway".

The benefits of the new highway evaluated through this methodology, therefore, tends to be lower than their fair values. The sharp voices of criticism that are directed at the Tokyo-Nagoya high speed highway and other high speed roads of our nation ought to be treated with respect; but, unfortunately, the critics, in many cases, appear to have formed their views

from the "before and after" standpoint. For the sake of fairness, we propose strongly that the "with or without" comparison methodology be employed uniformly in project evaluations from now on.

(2) Three elements of project evaluation

As we proceed to apply the project evaluation methodology we advocate to actual projects we must first consider the following three indispensable elements of project evaluation.

1) Structure of the activity contents of a given project.
   (a) Linkage between input, output and purpose.
   (Definitions of these terms shall be given later.)
   (b) Linkage between the various operational functions which are designed to tie up input, output and purpose with the reality.
2) Project time schedule
   (a) Duration of time from start until finish.
   (b) Allocation of necessary time to individual operations.
3) Analyses of the economic and societal effects of the project.
   (a) Application of cost-benefit analysis.
   (b) Analysis of the effects extended to the various societal tiers in the project region.

Our objectives are: By means of using the three elements, (i) to ascertain whether or not the various predesignated activities of the project have been performed in accordance with the project schedule, (ii) to examine whether or not the anticipated levels of output and purpose have been attained, and (iii) to

clarify the project's effects through the cost-benefit analytical approach plus the sociological approach of analyzing societal changes. The basic objective of project evaluation which we discussed at the beginning of this clause, in section (1), shall be achieved through the processes of: (i) analyzing the mutual linkage between input, output and purpose; and (ii) analyzing economic and societal effects.

The question of quantification turns up at this point in the form of the possibility of applying the cost-benefit analysis approach. This approach may not be used meaningfully in the cases where either the means of measuring the benefits are not clearly established or the benefits which have been measured are deemed to contain substantial doses/ of value judgment. Even in these cases, it is still not exactly hopeless to enlarge the effective purview of application for the cost-benefit analysis approach if it were not for the absence of an appropriate standard for such measurement.

In the present circumstances where the standard for cost-benefit analysis is not solidly set up, it appears that we have no prudent option but to honestly accept the limited applicability of such analysis. At any rate, the evaluation we expound here will not be accompanied by cost-benefit analysis if the benefit cannot be quantified.

(3) Formats of project evaluation by means of the three elements

Having explained the three elements of project evaluation, we shall now consider the formats of project evaluation which may be used to evaluate real projects.

First, we shall define input, output and purpose in order to contemplate the evaluation format for the structure of the activity contents of a given project.

* Input refers to the resources and services invested in a given activity of the project.

* Output refers to the result generated by this activity of the project.

* Purpose refers to the final result emanating from all outputs of all activities of the project.

Next, as our first step into the evaluation of the project's structure of activity contents, we shall check the following aspects: (i) Whether or not the inputs and outputs, as we have defined them, are assembled in a manner conducive to realizing the purpose, as we have defined it; (ii) Whether or not appropriate indexes and facts (which may not necessarily be quantitative expressions) are selected to formulate the standard for ascertaining the achievements of the outputs and purpose, and (iii) Whether or not these indexes and facts verify the achievements of the outputs and purpose.

In order to perform these checks, we shall make use of a table of links and relations among project contents. [3] The table is self-explanatory. The vertical axis is made up of three sections: input, output and purpose. The input section comprises n line items (1 through n); and the output section is made up of m line items (1 through m). In certain cases, the purpose section

may require more than one line item. We are, however, in favor of expressing the purpose in a single item for the sake of clarifying its thrust and because it represents,in fact, the overall result of the various outputs which have been accumulated. Still, if one prefers, the purpose section may be divided, with corresponding divisions effected in the input and output sections too. (We are inclined, at this time, to define the term "purpose" as a singular item, but if multiple expressions are unavoidable -- because of certain extraordinary qualities of a given project -- there is really no reason why that should not be done.)

Evaluation table 1 (page 72 of the original text)

Table of links and relations among project contents;(in blue)

a. Prosaic expressions.

b. Indexes and facts which tend to clarify results and accomplishments.

c. Mutual links and relationships between input and output, and between output and purpose.

d. Quantitative expressions. (end of table)

The horizontal axis of the table is constructed as follows. Project contents are shown by a "prosaic expression"column applicable to purpose and output, and a "quantitative expression" column applicable to input. Next, a column for "indexes and facts which tend to clarify results and accomplishments" is provided. The indexes and facts which can verify the status of

accomplishments within the purviews of purpose and outputs shall be entered in this column. Finally, a column for "mutual links and relationships between input and output, and between output and purpose" is set up. To be entered in this column are those project activities which are deemed absolutely essential to propel input toward output, and output toward purpose.

By making use of the evaluation table 1, we are able to ascertain whether or not a given project is based on an effective plan (an assembly of input and output) which is capable of accomplishing its intended purpose.

We have, so far, explained the evaluation and format concerning the activity contents of project. Next, we shall consider the format which can clarify the time-scheduling of project. In order to observe the time-schedule for a whole project, as well as the separate schedules for individual operations therein, we shall adopt a gantry chart (evaluation table 2). In this chart, the vertical axis is made up of line items representing various individual operations (from A1 through Az) ,the horizontal axis represents time flow, and each operation is shown by a stripe indicating its operational time-schedule. By means of this table, we are able to comprehend the time-oriented progression of the project.

Evaluation table 2. (page 73 of the original text)

Project time-schedule and investment; (in blue)

a. Operational contents. b. Time. c. Project beginning.

d. Project completion. e. Investment (cost). f. Total cost.

(end of table)

This table also gives us a by-product. One can discern at a glance exactly how much each operation is costing. When we have arranged the cost categories to match the line items in the input section of the evaluation table 1, and then all relevant figures are entered and added up, the cost data obtained from this table shall be identical with the quantitative data for the input section shown in the former table.

Having constructed the evaluation tables 1 and 2, we now must set about dealing with the challenge of devising a format applicable to the evaluation of the third and final element of project evaluation ("analysis of economic and societal effects"). However, we shall not grapple with (i) cost-benefit analysis and (ii) analysis of societal changes at this time because each of these exercises constitutes a major theme by itself justifying broad and in-depth studies, and, in particular, we do not think there is a firmly established analytical approach which may be employed to analyze societal changes.

A good many studies on the application of cost-benefit analysis to developing countries have been undertaken, and there have been certain breakthroughs in the exploration of its operational techniques. (Readers who are interested in the computer models of overview and analysis in this field are invited to consult "Handbook for Economic Evaluation of Projects, Vol. III, Theories", edited by Noboru Tabe and Eiji Tajika,Asian Economy Research Institute,1975; and "Economic Evaluation of Development Projects in Indonesia", by Asian Economy Research Institute,1975.)

(4) Network flow under the program evaluation and review technique (PERT)

We have learned so far that we are able to clarify the links and relationships between the input, output and purpose of a given project by means of the evaluation table 1, and to elucidate the time-schedules of the project's various operations (A1 through Az) by putting the evaluation table 2 to a good use. These two tables, however, are not capable of relating one integral operation to another in a given project in substantive terms. In other words, one can understand -- when he studies the evaluation table 1 -- that the outputs (O1 through Om) emerge from the inputs (I1 through In), and the purpose reveals itself out of the outputs (O1 through Om; but he cannot know what particular operations are involved in each of these processes.

By the same token, when one looks at the evaluation table 2, he can immediately comprehend the overall time-schedules (and their mutual time-oriented bearings) for all essential operations (A1 through Az) involved in a given project; but he also discovers that the table is totally incapable of relating one operation to another in any substantive sense.

Accordingly, it becomes necessary to devise a new table which can show the operational links and relationships between input and output, and between output and purpose, without losing the clear manifestation of the time-schedules of such operations as illuminated by the evaluation table 2. An analytical tool which is invented in response to this necessity is the so-called PERT

(program evaluation and review technique). What this technique does is to rewrite the information contained in the gantry chart of the evaluation table 2 by paying attention to the substantive links and relationships between the operations (which is called "activities" under the PERT concept).

When the necessary standard durations and costs (additional costs are needed if the necessary standard durations are to be shortened) for the various activities are given under this approach, it is possible on the basis of the network flow of the activities to trace the critical path (a route formed by linking the essential activities which may not be delayed even for a day if the project is to be finished by the target date) and the costs which are required to shorten the time-schedule of the project.[4)]

When the network flow incorporating these characteristics is drawn up under the PERT, that drawing is capable of superseding many of the roles performed by the evaluation tables 1 and 2. However, most technical cooperation projects undertaken in developing countries are prone to embrace a variety of uncertainties and it is not always possible to construct the textbook network flows in the initial days of project planning. For one thing, it is not easy to estimate the aforementioned necessary time periods. In certain extremely underdeveloped regions, it may be totally impossible to relate one activity to another.

Having duly taken such potential or real obstacles into consideration, the mode of approach we propose, therefore, shall take the forms of (i) at the moment when the experts (from the home office) on the scene of a project have completed their appraisals and investigations, (ii) to express the evaluation tables 1 and 2 (which, by then, have been drafted) in a relatively flexible network flow chart without nailing down every minute detail of the various activities, and (iii) to try to attain the objective of unimpeded project control and management.

As evinced by this proposal, we are positively in favor of introducing the system of project evaluation embodied by the PERT network flow. At the same time, we believe it is advisable to consolidate the ranks of the evaluation tables 1 and 2, and to broaden our commitment to the objective of ensuring systematic project control and management -- the actions which, in effect, will expedite the said introduction.

Our proposal, in other words, seeks to have the evaluation tables 1 and 2 firmly established within our evaluation community, and then to have the PERT network flow system introduced. This is the basic idea of ours pertaining to the introduction of project evaluation devices.

(5) Personal reports and declarations by experts sent by the home office

The subjects to be covered in the reports and declarations are: time periods of overseas assignments, contents of the activities

on the scene, results of the activities, costs of the inputs which are required by the activities, etc. Except for "results of the activities", all subjects referred to in the reporting requirements are describable by means of the evaluation formats we've discussed earlier. In complying with the reporting requirement for the remaining subject, that of "results of the activities", the experts on the scene may write the results of individual activities separately, or if necessary, describe the combined outcome of several activities.

There shall have to be a set of definite guidelines governing the style of reporting. When the style is finalized, the experts shall be asked to submit reports on (i) anticipated results of their activities and (ii) indexes and facts which verify such results.

The contents of activities thus reported by the experts on the scene shall be subjected to adjustment,modification or, if necessary, correction by the regular internal evaluation staff at the technical cooperation institution -- this process was discussed earlier when we explained the project flow chart we proposed -- and the experts, based on the feedback data, shall submit their final statements.

Clause 4. Practical application of evaluation technique

The technical projects undertaken by our country thus far have revealed a number of problematical areas. The problematical areas have been pointed out by not only outside observers but also by internal staff of the technical cooperation institution. The

staff criticisms, in fact, have been no less censorious than those voiced by outside critics. Unfortunately,however, these voices of concern have tended to be scattered snipings and failed to make major impacts on actual project management.

We believe this state of affairs calls for a major constructive step forward by the concerned parties. Accordingly, we have undertaken to (i) construct a project flow prototype incorporating "evaluation", (ii) compare the prototype with the existing project flows, and (iii) finalize a project flow chart by emplacing those empirical problematical areas at their appropriate positions inside the whole project flow.

Further, we have grappled with various project evaluation schemes, introduced the evaluation approach of our own composed of three elements, and put forward concrete evaluation formats. (However, we have decided not to explore, in this study, the development of appropriate formats for cost-benefit analysis and analysis of societal changes, but to take it up in our later studies.)

We are confident that all those problems in technical cooperation which have been pointed out can be resolved systematically once the project flow and the evaluation method (and its evaluation tables) which we have introduced in this charter are put to use.

We do strongly believe the project flow scheme and evaluation method (and evaluation tables) expounded herein deserve careful consideration and study within the technical cooperation

institution. Our efforts will have been rewarded in full when the institution, through that consideration and study, comes to acquire its own project flow system and evaluation method (and evaluation tables) in the near future. Our outlook is that if these actions are taken accompanied by a growing awareness, in and out of the institution,in project planning, our country will soon have a firmly established system of project planning.

Footnotes (for Chapter VI) :

1. Among the papers which tend to endorse the basic policies of the World Bank are (i) The Assault on World Poverty, Problems of Rural Development, Education and Health, with a Preface by Robert S. McNamara; the Johns Hopkins Press,1975, and (ii) H. Chenery et. al., Redistribution with Growth, Oxford University Press,1974.

2. In West Germany, sociologists are utilized extensively in the evaluation of project effectiveness. One cannot hope to analyze the effects of sociological changes without relying on sociologists. Among the analytical works performed by sociologists, an excellent example is: K.H. Junghaus, "Rourkelás Hinterland: A Socio-Economic Study", India and Germany, ed. V. Dagli, Vora & Co., 1970.

3. In constructing this table, we acquired useful hints from the Evaluation Handbook (second edition), U.S. Agency for International Development (AID),1972, and the Project Guidelines (third edition), 1974, USAID. However, we also subjected the AID schemes to certain adjustments in order to make them more

compatible with the three-element approach we adopted.

4. Readers who are interested in exploring the PERT concept in depth are invited to consult: "PERT and CPM", revised edition, by Tomoaki Sekine, the Association of Japanese Scientists and Technicians, 1973; "Economic Model of Decision Making" (Chapter IV), by J. Riguels (phonetic), translated by Tokan Abe,Kogaku-sha, 1971; and "Science of Planning" (PERT and CPM which may be used anywhere), by Shokichi Kato, Kodansha Bluebook,1965, and others.

Reference data (for Chapter VI)

1. On project flow.

a. W.R. Leonard, B.A. Jenny and O.Nwali, U.N. Development and Aid, Criteria and Methods of Evaluation, Arno Press, New York, 1971.

b. Sekine, Tomoaki, "PERT CPM", (revised edition), the Association of Japanese Scientists and Technicians, Tokyo,1973.

2. On cost-benefit analysis.

a. I.M.D. Little and J.A. Mirrlees, Project Appraisal and Planning for Developing Countries, Heinemann, London,1974.

b. P.S. Dasgupta, S.A. Marglin and A.K. Sen, Guidelines for Project Evaluation, UNIDO, New York, 1972.

c. E.J. Mishan, Elements of Cost-Benefit Analysis, George Allen & Unwin, London, 1972.

d. P.R.G. Layard (ed.), Cost-Benefit Analysis, (a collection of research papers), Penguin Books,London, 1972.

e. Tabe, Noboru, and Tajika, Eiji (editors),"Handbook for Economic Evaluation of Projects", Vol. III, Theories, the Asian Economy Research Institute, 1975.

3. On methods of technical cooperation project evaluation.

a. USAID, Evaluation Handbook,AID, Washington,D.C., 1972.

b. USAID, Project Evaluation Guidelines (third edition), AID, Washington,D.C., 1972

c. OECD, Evaluating Development Assistance, Problems of Method and Organization, OECD, Paris, 1972.

4. International Cooperation Agency evaluation reports.

a. Report on Circulating Guidance and Study concerning Dissemination of Agricultural Technology; Dhandakarania (phonetic), India, Agricultural Development Cooperation, and Nepal Agricultural Development Cooperation, 1975.

b. Western Java,Indonesia, Food Output Promotion Plan Evaluation Study Report, 1975.

Chapter VII. Examples of Effectiveness Measurement Application; Study of Some Operational Cases

In this chapter, we shall show three (medical,agricultural, and ming-manufacturing sectors) sample case studies of the technical cooperation project evaluation approach, as proposed in Chapter VI, being applied to real projects in a concrete manner.

The technical project evaluation tables used in the sample case studies are based on the ones referred to in Chapter I (General Discussion) and Chapter VI. In this respect, the project to investigate and control onchocerciasis in the Republic of Guatemala, as discussed in Clause 1 of this chapter, is a case where these basic formats are applied to. However, technology has many sectors, and certain technology cooperation cases may not -- or, in some circumstances, should not -- be dealt with by a uniform format. The AID's evaluation format, for example, makes room for some modifications (See Appendix 1). Accordingly, the basic format applicable to agriculture is somewhat different from the one for mining and manufccturing. These are the prototype formats which have emerged from this study, and they should be further developed and refined.

Clause 1. Onchocerciasis research and control project in the Republic of Guatemala

(1) Project contents.[1)]

In Chapter VI, we contended that construction of the evaluation tables 1 and 2 is indispensable because the tables are essential

tools for planning and evaluation of technical cooperation projects. The objective of this clause is to formulate a case study of project evaluation by means of this evaluation approach in order to further clarify what we were discussing in Chapter VI.

An outline of the project which is picked for the sake of the aforementioned case study formulation is presented in the Record of Discussion (hereinafter referred to as "RD") published hereunder. We invite each and every reader of this report to study the RD with care, and formulare his own scheme for evaluation of this project. Readers are further invited to feel free to formulate their own approaches, without being bound or influenced by the evaluation approach referred to in Chapter VI. Thus, we hope you will develop your own "answer" to this challenge.

Next, please compare your answer with the answer which is based on the approach described in Chapter VI and examine, in detail, merits and shortcomings of our approach. We are strongly inclined to believe that a method of technical cooperation project evaluation which is superior to our own will emerge from these examination exercises undertaken by our readers.

Onchocerciasis is not a widely known word. It is better known as the "blindness sickness" of Outer Volta.

Onchocerciasis is a disease of man caused by a worm (Onchocerciasis volvulus) that is native of Africa but now present in parts of tropical America. Throughout the world today, about 30 million persons are believed to be afflicted with this

sickness. It is more common in the African continent south of Sahara; and the sickness is said to have caused several villages in Outer Volta to become extinct. In the Western Hemisphere, the sickness is a serious health problem in Mexico, Guatemala, Venezuela and Colombia. At this time, there are conflicting theories about the origin of onchocerciasis in America as some seem to believe that the American onchocerciasis is different from that in Africa. No conclusive answer to this conflict has been provided.

This disease is transmitted by biting flies. The transmission takes the following stages: a fly bites a mammal (cow, horse or man) which is already carrying onchocerciasis volvulus; the fly sucks in larval onchocerciasis volvulus from that mammal; when the fly bites another mammal the larvae are injected by the fly into the latter mammal. Onchocerciasis larvae thus transmitted live in parasitism on tendons and other tissue bands, grow up to become imagoes which in turn breed more larvae.

People infected with onchocerciasis is more apt to show symptoms caused by onchocerciasis larvae / than abscess or tumor which are attributable to onchocerciasis imagoes. Skin shrinkage and eye problems, including total blindness, are the most common sumptoms caused by onchocerciasis lavae.

To combat this sickness, one must, first of all, firmly establish an effective method of treating the sickness and then help out as many patients as possible. On the chemotherapy front, many experts are trying to discover an anti-onchocerciasis agent with little or no side effects. In terms of prevention, the

highest priority is assigned to the discovery of a methodology to annihilate biting flies. The annihilation is easier said than done. If we subject the target rivers and streams to systematic spraying of DDT, the measure may solve one problem but also will create a new problem: that of water contamination. The chemical will also adversely affect the ecological system in and near the water channels. In the prevention sector, therefore, the first step ought to be the development of certain spray chemical which is effective against the flies but is safe to other living matters. The most immediate and unavoidable challenge confronting the people responsible for the control of onchocerciasis is: to discover an effective means of curing the sickness and to destroy the biting flies completely for the sake of preventing the disease.

This concludes a short introduction to onchocerciasis. Next, we shall reprint the project's RD in its entirety. One of the objectives of the project is to select a 300 square km region in San Vincenta as a pilot region and then to turn the region into an anti-onchocerciasis model region. As we emphasized earlier, we invite you to read the RD carefully and to formulate your own means of evaluating the project.

(2) Evaluation of the onchocerciasis research and control project

The evaluation table 1 ("table of links and relationships between project contents") and evaluation table 2 ("project time-schedule and cost") on a following page (page 86 of the original

text) for this project represent, jointly, a real-case application example of the evaluation methodology referred to in Chapter VI.

Regretfully, we were unable to analyze this project pursuant to the project flow chart referred to in Clause 1,Chapter VI, because the available data were insufficient. When the analysis was undertaken, the project had just about moved through the preparation phase but has not entered the implementation phase. The analysis of the roles played by (i) the background analysis during the initial period until the project proposal is established, and (ii) the ex-ante appraisal since the project proposal is established is an absolutely essential component of the evaluation of this project.

In particular, the analysis of the various background developments culminating in the formulation of this project plan must be considered to have an extraordinarily important meaning from the standpoint of ascertaining the real needs and intentions of the Republic of Guatemala and Japan pertaining to this particular project. In other words, the essence of this background analysis is -- as we discussed in Clause 1, Chapter VI -- to position this project correctly in the two government's full-length portraits of "cooperation" receiving and giving.

At this juncture of evaluating this project, we shall briefly explain our own "answer" (the evaluation tables 1 and 2 attached hereunder). The objective, composition, and entries of the evaluation tables faithfully reflect the prototype scheme

discussed in Clauses 2 and 3, Chapter VI, and their contents have not been subjected to any modification.

We have constructed the two evaluation tables on the basis of the RD and the data submitted by experts. A problematical area of these evaluation tables which makes itself self-evident -- or which is probably felt by many readrrs of this report trying to formulate their own means of evaluation -- is that the objec. ives of this project (to which many words are devoted in Section 2 of the RD) are in fact quite vague. Listed in the space (in the evaluation table 1) for outputs are: 01 "basic research work for onchocerciasis control", 02 "implementation of onchocerciasis control measures in a 300 square km pilot region", and 03 "firm establishment of an effective vector control methodology". These expressions for outputs are, therefore, the exactly same words used in the RD to describe the project's objectives.

In other words, the objectives are excessively flowery and one cannot but wonder how a project of this kind exploring an unknown field could hope to attain such broad aims in a limited period (five years). Further, the objectives as they are written tend to cause speculations that the plan for onchocerciasis annihilation in the pilot region might have been formulated before there / was a definitive system for basic research work and before the work's constructive outcome could be predicted with a degree of certainty. Outwardly the plan implies the perils of too much zeal as expressed in many bloomy words heaped one upon

another, and inwardly it exposes a lack of rational planning as shown by its complexity and cumbersomeness. To express in another way, the planners who have proposed to undertake this wholly new project are portrayed to be somewhat reluctant to specify just what they hoped to achieve, by hook or by crook, in such a short time as five years.

There is no one who does not hope to see the outcome of this basic research translated into a concrete sanitation measure for the direct benefit of the people in the region. On the other hand, wouldn't it be somewhat unreasonable if one draws up a definitive objective of implementing that public sanitation measure (one which depends on a successful outcome hopefully emerging from that basic research) before he can predict the outcome with a degree of certainty -- especially when the research is to explore an unknown field in a faraway land?

Evaluation table 1 (page 86, of the original text)

Table of links and relationships between project contents: onchocerciasis research and control project (in blue)

a. Prosaic expressions.

b. Indexes and facts which tend to clarify results and accomplishments.

c. Mutual links and relationships between input and output, and between output and purpose.

d. Quantitative expressions.

(in red)

A. Purpose (prosaic expressions).

Annihilation of onchocerciasis.

B. Outputs (prosaic expressions).

O1. Basic research work for onchocerciasis control (including vector control and chemotherapy).

O2. Implementation of onchocerciasis control measures in a 300 square km pilot region.

O3. Establishment of an effective vector control methodology (cf. Section 2 of the RD).

C. Inputs (quantitative expressions).

Dispatch of experts (I1 through I4)

I1. Epidemiologist and parasitologist	120 man/month
I2. Medical staff and ophthalmologist	60 man/month
I3. Entomologist	120 man/month
I4. Topographic map experts	24 man/month

Supply of equipment and apparatus (I5 through I9)

I5. Laboratory instruments.

I6. Instruments for entomological research.

I7. Chemicals. I8. Office supplies.

I9. Motor vehicles.

Training in Japan (I10 and I11)

I10. Senior staff	2 persons
I11. Junior staff	3 persons

D. Purpose (indexes and facts which tend to clarify results and accomplishments).

Rates of decline in the numbers of (i) persons with onchocerciasis symptoms, and (ii) biting flies in the pilot region through the outputs 01, 02 and 03.

Whether or not an effective theory for vector control as expressed by 03 is in fact performing in behalf of annihilating onchocerciasis.

E. Outputs (indexes and facts which tend to clarify results and accomplishments).

Hydrobiological map (sheet; degree of precision).

Collection of existing data (examination of reliability).

Classification of biting fly species, and documentation of the result of analysis (density distribution map; sheet).

Result of ecological analysis of biting fly species.

Result of biting fly larvae control (chemotherapy) tests.

Result of chemical spray tests.

Collection and organization of data pertaining to health care within the pilot region.

F & G. Mutual links and relations between input and output, and between output and purpose.

F. Whether or not 01, 02 and 03 are effectively inter-linked and inter-related for the sake of attaining the purpose.

Whether or not collection and organization of pre-project and post-project data have been undertaken for the sake of determining the project's impact.

Whether or not Japanese experts on the scene have been guaranteed complete freedom of action within

the administrative structure of the aid receiving nation.

Whether or not the target population of the project has reacted to the project in a positive manner.

Whether or not the project's activities and the existing health care and sanitation structures of the aid receiving nation are mutually complementary.

G. Whether or not Japanese experts on the scene are completely fulfilling their reporting obligations.

Whether or not equipment and apparatus supplied by Japan are truly withstanding local usage.

Whether or not dispatch of experts and supply of equipment and apparatus are being carried out according to their time-schedules.

Whether or not activities of local counterparts to Japanese experts on the scene are mutually linked and related for the sake of generating the three outputs.

Whether or not the aid receiving nation has, in a timely manner, supplied qualified local counterparts (three specialists in epidemiology; three specialists in vector control and three vector control field workers; one medical staff, and an adequate number of public education specialists).

Whether or not laboratory and other facilities have been provided by the aid receiving nation in full compliance with the pertinent provision of the agreement.

Evaluation table 2. (page 86, bottom, of the original text)

Project time-schedule and cost (onchocerciasis research and control project) (in blue)

a. Activities. b. Time. c. Project initiation.

d. Project completion. e. Costs (investments).

f. Total cost. g. Grand total.

(Activities)

A1. Compilation of hydrobiological map.

A2. Analysis of existing data.

A3. Confirmation of biting fly species.

A4. Investigation of biting fly densities.

A5. Study of biting fly ecology.

A6. Investigation of biting fly larvae control approach.

A7. Study of effectiveness determination methodology.

A8. Spray of chemicals.

Footnote: This table is based on the "Operational Time-Schedule for an Onchocerciasis Research and Control Project in the Republic of Guatemala" (a summary), prepared by the First Health Care Section, Japan International Cooperation Agency.

(end of table)

Because the project's objective is described in these excessively bloomy sentences (O-1, O-2 and O-3), it is not possible to enter specific expressions in the space assigned to output. As a result, the mutual links and relationships between project contents have become murky. We have constructed the evaluation table 1 by faithfully observing every letter of the

RD but it appears the table is not complete. In order to make sure that this project is managed in an effective manner, it behooves the persons responsible for planning and evaluation of this project to consider the actual needs and intentions of the governments of the Republic of Guatemala and Japan and then to narrow down and extract the real objective of this project.(In this regard, the aforementioned analysis of the background of this project is indispensable.)

A technical footnote appears to be in order here. In our original scheme (Chapter VI), the space for inputs was supposed to include the entries of expenses for I1 through I11. In the preceding table, the section does not contain such entries because we did not have access to the necessary data. Likewise, the investment cost section of the evaluation table 2 is shown without any entries.

In the evaluation table 1, the spaces assigned to "the mutual links and relationships between input and output, and between output and purpose" contain our own discretionary statements. The statements show our views on what we believe to be important to make sure this project is managed effectively; and they are based on the empirical data -- albeit limited -- on the technical cooperation projects undertaken by our country up to this point.

We hope each of the check items in the aforementioned spaces will be subjected to meticulous handling and this project will be implemented in an effective manner. However, even if this project fails to attain these outputs and purpose, our

experience in undertaking the project ought to be carefully examined for the sake of accumulating valuable empirical data for the evaluation of future projects and such data should be made available to the appropriate project planners and evaluators.

The evaluation tables we have presented here are intended to be no more than a tool for understanding the evaluation methodology referred to in Chapter VI. As we had stated in Sub-clause (1), we sincerely hope that readers will examine this clause and Chapter VI with care, devise their own methods of project planning and evaluation and, by so doing, give a constructive impetus to enhancing our nation's technical cooperation projects making them capable of contributing more effectively to the economic growth of developing nations.

Clause 2. Technical cooperation project in agricultural sector

A point which is shared by many agricultural sector projects is that the target population is made up of indigent farmers of low educational levels. Exterior forms of the activities in this sector are diverse but the activities can be classified into the following two groups from the evaluation point of view.

(1) Activities whose principal objectives are to provide intellectual services in the fields of experimental research, extension, training, etc.

(2) Activities made up of a number of project programs, including the above-mentioned services, which seek to accelerate areawide development.

We have selected for our consideration (i) the Indo-Japanese

Agricultural Demonstration/Extension Center Project, Shahabad District, Bihar State, India, from among the projects of the category (1), and (ii) the Indo-German Nilgiris Development Project, Nilgiris, India,from among the projects falling under the category (2). For each project, we shall attempt to describe necessary check points.

(Case History 1) Indo-Japanese Agricultural Demonstation/ Extension Center Project, Bihar State, India. (Data: Case Studies of Agricultural Technical Assistance Projects, OECD CD/R70.23, by Noboru Tabe, 1970.)

1. Project summary.

The governments of Japan and India entered into an agricultural cooperation agreement on April 23, 1962, on the establishment of agricultural demonstration/extension centers in India. The agreement, which was signed at New Delhi (becoming effective on the day of signing), set forth the objectives, etc.,of the project as follows.

Article 1. (1) The two governments, through mutual cooperation, shall set up agricultural demonstration/extension centers (hereinafter referred to as "the center(s)").

The objectives of the centers shall be to demonstrate agricultural technology by technicians representing the Japanese side and to make their facilities and services available to farming population of the Indian side as field training establishments.

(2) The centers shall conduct field operations of various improved agricultural implements, propelled by human power,

animal power, or motive power, to evaluate their respective compatibility with the existing conditions of India and to determine their individual adaptability potentials.

(3) The centers shall be made up of four independent units which are located at Nadhya in West Bengal State, at Sambalpur in Orissa State, at Shahabad in Bihar State, and at Surat in Gujarat State, and which are institutions of the respective State governments.

Article 2. (1) In accordance with laws and regulations in force in Japan, the Government of Japan shall take necessary measures to provide, at its own expense, the requisite services of a dir ctor and other agricultural staff (hereinafter collectively referred to as "the Japanese personnel") at each of the centers.

(2) The Japanese personnel in India shall be granted privileges, exemptions and benefits no less favorable than those granted to experts being assigned to India persuant to the Colombo Plan.

Article 3. (1) In accordance with laws and regulations in force in Japan, the Government of Japan shall take necessary measures to provide, at its own expense, such machinery, equipment, implements, spare parts and other materials, as listed in Annex I, which are required for the establishment and operation of the centers. (2) and (3) Deleted. Article 4. Deleted.

Article 5. (1) The Government of India hereby agrees to provide, at its own expense, the following personnel and facilities.

a. Indian center chief (hereinafter referred to as the "center

chief") at each center.

b. Necessary buildings, farm land, and other incidental facilities and land as lited in Annex II.

c. Appropriate furnished living quarters for the Japanese personnel.

(2) The Government of India hereby promises to meet:

a. Customs duties, internal taxes and other similar charges, if any, imposed in India on the goods referred to in Article 3.

b. Expenses necessary for the domestic transportation and installation of the goods referred to in Article 3.

Article 6. (1) Expenses necessary to operate the centers shall be borne by the Government of India.

(2) The Government of India shall make available to the centers such financial assistance as deemed required to operate the centers.

(3) For the purpose of promoting the unimpeded management and operation of the centers, the Government of India shall, at its earliest convenience, take necessary measures to set up an adequate fund to be managed by the center chief of the respective centers.

Article 7. The Japanese directors of the respective centers shall be responsible for all technical aspects concerning the activities of such centers referred to in Article 1. The Indian center chiefs of the respective centers shall assume the full responsibility for office duties and finance of the respective centers.

Article 8. Deleted.

Article 9. (1) Deleted. (2) This agreement shall remain in force for three (3) years commencing from the day it becomes effective, but the term of effectiveness may be extended over specific period(s) through mutual consent.

2. Environmental data.

(The original text, pages 89-90, is in English.)

Table (page 91 of the original text)

Case Study 1. Project name: Rice Cultivation Experimental Research, Extension and Training

(left to right, in blue)

a. Links to attainment of goals. b. Indexes.

c. Necessary variables for evaluation. d. Premises.

Goals - Links to attainment of goals.

Establishment of goals.

By means of introducing "the Japanese rice cultivation technology", to increase average yield per acre from 400 kg to 1,368 kg.

G-1. The purpose applicable to the interval necessary for the attainment of the goals.

G-2. Project area(designation of demonstration farms, subdivision of the farms, etc.).

Goals - Indexes.

"Confirmation of the significant relevancy / between the project purpose and the establishment of goals (G)."

G-1. Comparison of unit yield, by crop category, in each plan

plan year with that of the base year.

G-2. Annual comparison of the target area with the control area.

Goals - Necessary variables for evaluation.

"Standard period and time lag."

G-1. "Standard period" and time lag for the attainment of the purpose as seen from technical standpoint.

G-2. Necessary time lag for the attainment of the farmer-level extension.

Goals - Premises

G-1 and G-2. The presuppositions that the innovativeness, economics, and compatibility of the transferred technology will be proven.

Outputs - Links to attainment of goals.

Outputs

O-1. Field application of the "Indica" strain rice cultivation technology.

O-2. Investigation and experimentation of extension methodologies.

O-3. Demonstration of modern farm management.

Outputs - Indexes.

O-1 through O-3.

a. Yield increase effects shown by the target population of training and extension.

b. Unit yield of irrigated and fertilized land.

c. Lecture attendance status and know-how application

capability on the part of the target population of training and extension.

Outputs - Necessary variables for evaluation.

O-1 through O-3. Criteria and velocity of technology extension.

O-4. Negative effects of technology extension (enlargement of inter-class and inter-region income disparities).

Outputs - Premises.

O-1 through O-3. The presuppositions that these outputs will not be alien, in terms of cultural and economic characters, to the society where the pertinent technologies are introduced.

O-4. The presupposition that the spillover effects of such technological evolution will, in the long run, be adjusted by other policy means.

Inputs - Links to attainment of goals.

Inputs

I-1. Necessary technical know-how.

I-2. Necessary implements and materials.

I-3. Capital.

I-4. Administrative and managerial systems.

Inputs - Indexes.

I-1. Suitability of sector-by-sector experts.

I-2. Suitability of experts to target area.

I-3. Total expenses; and the expenses met by the local government.

I-4. "Supportive relations" -- the attitude of the local

government, public institutions and other entities toward the Japanese personnel.

Input - Necessary variables for evaluation.

I-1 through I-4. Definitive establishment of (i) suitability of the project's purpose management, and (ii) "supportive relations".

Inputs - Premises.

I-1 through I-3. The presupposition that the technical expertise of the Japanese personnel and the extension system will be environmentally appropriate.

I-4. The presupposition that the project's internal structure (organization) will not be hostile to changes.

3. Establishment of Goals

Pursuant to the general purposes as given in the agreement, the Japanese experts had, immediately upon their arrival in India, set up a concrete operational plan. (Please consult the "G" section of the table on page 91 of the original text. The section is based on an operational report submitted by the pertinent center director to the Overseas Technical Cooperation Agency.)

G-1. Duration: The first period (1962-64) of the agreement shall be the interval for attaining the objectives set up from the technical standpoint.

Subsequently, the duration of agreement shall be extended until 1968, and the centers shall continue to function thereafter until 1975 as extension centers.

Objectives: Upon consultation with the local government, the Japanese experts decided to undertake the following activities. (i) To study the cultivation technology for the Indica strain which is most suitable to the agricultural environment of Shahabad District. (ii) For the purpose of disseminating "the Japanese style rice growing technology", to undertake demonstration activities within the center, to set up demonstration test paddies at selected individual farms, and to train agricultural extension workers. (iii) For the purpose of enhancing the efficiency of farm management, to make local farmers comprehend the various merits of the modern farming methods of high scientific and technical standards.

G-2. Area purview: To undertake experimentation and research at the paddies within the center, and to conduct demonstration and experiments at the paddies set up in selected model farms at nearby villages.

4. Inputs

I-1 and I-2. The implements and materials to be provided by the Japanese side during the initial period of the agreement are listed in Annex I. They are:

(1) Agricultural implements and spare parts.

(2) Pesticides, fertilizers and other materials which are necessary during the early stages of farming.

(3) Necessary equipment and apparatus for laboratory operations.

(4) Necessary materials (including chemicals and fertilizers) for laboratory operations.

(5) Implements and apparatus for meteorological observation.

(6) Motor vehicles.

(7) Other necessary small-scale equipment.

I-3. The overall cost of the material support (excluding the cost of dispatching the experts) in 1962-67 is estimated to be about $25,000 U.S. dollars (current price).

5. Outputs

Principal outputs may be described as:

(1) Local application of the Indica strain rice cultivation technology.[1)]

(2) Investigation and experimentation of extension methodology.

(3) Educational function on modern farm management.

O-1 through O-3.

Beneficiaries of "the Japanese style rice growing technology" are presumed to increase their unit yields as the result, among others, of: (i) Improved skills in paddy planting, weed control, fertilizer mixing (nitrogen,posphorus and potash elements), fertilizer use timing selection, tiller operations, etc., (ii) Introduction of chemical fertilizers, and preservation or enhancement of soil strength, and (iii) Demonstration of modern farm methods.

O-4. By utilizing the demonstration paddies set up in selected model farms, "the Japanese style rice growing technology" is to be extended step by step over a broad region. This program is to be preceded, or accompanied, by intensive investigation and study of extension technologies.

These outputs will tend to highlight the powerful inter-relation which presently exists between the extension of modern technologies and the current mix of societal, religious and economic environments in the target region.

6. Impact indexes

G-1 and G-2. Outcome of the project in terms of yield per unit area is extremely noteworthy.

In 1962 when the demonstration farms were set up, the average yield per acre in Shahabad District was 320 kg. Subsequent yields are shown in the following table. (Original data: OECD Working Paper CD/70/23 by Noboru Tabe.)

Table (page 93 of the original text)

Changes in Unit Yields between 1961/62 and 1968/69 Crop Years

(The text is in English, pages 93-94)

O-1 through O-4. When new agricultural technologies are introduced in a given farm community, the community tends to gradually develop an aspiration for higher production goals. The aspiration, however, is prone to fluctuate depending on rice market futures projections and the magnitude of outstanding debts owed by the farmers concerned. Here, the following indexes, on page 94 (of the original text),have a special significance. The table compares yield levels with aspiration levels.

Table (page 94 of the original text)

Farmers' Aspiration Levels and Changes thereof.

(The text is in English)

7. Necessary variables for evaluation

G-1. "Standard period".

From a technical point of view, the systematization of the rice growing technology compatible with the agricultural environments of Shahabad District appears to have been accomplished to a significant extent during the first agreement period. On the strength of this success, an IR-8 field experimentation program was added to the list of preset goals for crop year 1966-67 (according to a center report) and this additional goal induced a shift in the purpose-goal relationship over the entire project period.

G-2. "Time lag of extension".

O-1 through O-3. By means of sampling, farmers were interviewed. The following tables, on page 95 (of the original text), show the data obtained from the interviews, etc.

Table (on page 95, top, of the original text)

Distribution of Farmers Growing IR-8, by Land Size

(Entries are in English)

Table (on page 95, middle, of the original text)

Motivations for IR-8 Introduction, by Land Size

(Entries are in English) (end of table)

The foregoing data were developed by Mr. (first name not given) Chiba, an extension specialist, who interviewed farmers in the target region of a 50-acre demonstration program, and conducted visual checks. The survey encompassed 37% of the region's entire population. The data, therefore, is the most reliable

information on the trend of the first seed revolution in Bihar State. (Please consult the center's operational reports to the Overseas Technical Cooperation Agency.)

G-1 and G-2. "Profitability" of new technology.

It is difficult to acquire profitability data on a given new technology by means of interviews with the farmers who have adopted the technology. And, if such an interview survey is physically possible, reliability of the data thus collected may not be deemed very high. For the sake of expediency, maximum profit levels of the farmers who have adopted the new technology were estimated pursuant to the net profits computed on the basis of the varieties grown, and their unit yields attained, at the center itself.

8. Premises - Socioeconomic

First, the influences of newly introduced agricultural machinery are examined. The influences are devided into (a) labor substitution effects, (b) time saving effects, and (c) qualitative improvement effects on farming operations. Next, the profitability of the traditional methods (employing draft cattle, etc.) is compared with that of mechanized farming (using power tillers, etc.). The results, as presented in the OECD Working Paper CD/70/23 by Noboru Tabe, are as follows:

Table A. (page 96, top, of the original text)

Labor Substitution Effects

Table B. (page 96, bottom, of the original text)

Time Saving Effects

Source: Based on experiments performed at the Agricultural Extension Center, Khopoli, Koloba District, Maharashtra State.

Let us now examine the next table.

Table C. (on page 97 of the original text)

Economic Effects of Mechanized Farming: Overall Evaluation

(end of table)

(Case History 2) Indo-German Development Project, Nilgiris District, Tamil Nadu State, India. (Data: Case Studies of Agricultural Technical Assistance Projects, OECD CD/R/70.23, by Noboru Tabe, 1970.)

1. Project summary

Geographical description: A mountainous region surrounded by Mallabar District, Keraela State to the west; by Mysore State to the north, and by Coimbatore District (County), Tamil Nadu State, to the east.

Economy: About six out of every 10 residents in the region depend on plantation economy. Main crops are potatoes, tea and coffee but as many as 75 out of every 100 farmers are engaged in potato growing. As such, the region constitutes a typical, backward monocultural economy.

Pursuant to an inter-governmental agreement (signed in March 1966), West Germany put a comprehensive plan into effect throughout the whole administrative district (county) of Nilgiris.

Special features of the plan are as follows.

a) It is not monolithic agricultural project. It is a comprehensive areawide agricultural community development project.

b) Target sectors of development are: agriculture, forestry, fishery, health and welfare, tourism, etc.

c) It does not attempt to make all flowers bloom at the same time. Instead, unitary projects are to be combined step by step in a manner most conducive to the attainment of their companionship effects.

d) A package approach shall be employed to deal with each of these sectors. For example: i) Introduction and test cultivation of high-yield varieties of potatoes, vegetables, etc., which may be grown in high altitude and low temperature fields, ii) Establishment of crop rotation system designed to reduce fallow periods, among other purposes, iii) Establishment of supply structure encompassing seeds, chemical fertilizers, machinery, implements, etc., iv) Realignment of marketing, and v) Establishment of extension service infrastructure.

Table (on page 99 of the original text)

Case Study 2. Project name: Areawide Comprehensive Agricultural Community Development

(left to right, in blue)

a. Links to attainment of goals. b. Indexes.

c. Necessary variables for evaluation. d. Premises.

Goals - Links to attainment of goals.

Establishment of goals.

"To double the levels of farmer income and agricultural production throughout the whole district of Nilgiris."

G-1. Approach for goal attainment: to take the form of package program.

G-2. Activity sectors: to implement experiments, research, extension and demonstration over a wide region.

Goals - Indexes.

"Levels of, and changes in, regional incomes."

Output, employment and consumption levels.

G-1. Confirmation of respective time-scheduling for component activities of package programs.

G-2. Status of new technology acceptance by key farm households, and velocity of extension therefrom into nearby farm households.

Goals - Necessary variables for evaluation.

"Divisions of implementation stages for various activities of package programs; and continuity and consistency of the activities in respect to time and space."

G-1 and G-2. a. Regional exponential effects.

b. Regional welfare (equalization of regional per capita income levels and income distribution). c. Emergence of externality (emergence of the region's non-marketability).

Goals - Premises.

G-1. The presuppositions that the innovativeness, economics, and compatibility of the transferred technologies will be proven.

G-2. Public institutions will invest in areas related to the above-mentioned activities; and public investment will then induce private sector industrial activities.

Outputs - Links to attainment of goals.

Outputs

O-1. Improvement of potato cultivation technology.

O-2. Introduction of technology in respect of high-altitude, low-temperature rice cultivation.

O-3. Result of soil and geological survey.

O-4. Development and employment of light-weight machinery designed for high-altitude application.

O-5. Introduction of new crop varieties.

O-6. Establishment of pesticide/application methodologies.

O-7. Establishment of extension and demonstration methodologies.

Outputs - Indexes.

O-1 through O-6. Effects on unit yield increase and income.

O-7. Number of beneficiaries.

1) Comparison of crop-by-crop, variety-by-variety unit yields between the base year data and those of the years covered by the plan.

2) Comparative and chronological changes at key points and control area.

Outputs - Necessary variables for evaluation.

O-1 through O-6. Extents and velocities of technology extension.

Outputs - Premises.

O-1 through O-6. The presuppositions that these outputs will not be alien, in terms of societal and cultural characters, to the region where the pertinent technologies are introduced.

Inputs - Links to attainment of goals.

I-1. Establishment of a comprehensive test and research center.

I-2. Establishment of extension demonstration farms.

I-3. Institution-building deemed necessary for the comprehensive

developments of agriculture, horticulture, animal husbandry, tourism industry, cooperatives, fishery, family planning, etc.

Inputs - Indexes.

I-1 and I-2. Amounts of assistance to meet start-up, management and operation expenses; and the expenses borne by the local government.

I-3. "Supportive relations" between the project managers and the administrative machineries of local and State governments.

Inputs - Necessary variables for evaluation.

I-1 through I-3. Management of unit project goals.

a) Compatibility with the overall project objective.

b) Effectiveness of the performance of experts in the respective activities.

I-3. Whether or not effective institution-building for "supportive relations" has been accomplished.

Inputs - Premises.

I-1 through I-3. The presupposition that these inputs will be capable of maintaining "supportive relations" with the pertinent local society.

a) Beneficiary farmers and extension workers will develop motivation for "participation".

b) These inputs are capable of establishing themselves as permanent institutions.

2. Environmental data

(First part, page 98 of the original text, is in English.)

The data on the environments surrounding the project --

-- geography, temperature, rainfall, population trends, industrial activities, technical levels, etc. -- shall be collected and organized. The target district of Nilgiris was administered by Britain for several centuries and Ootacamund, a city in the district, was once the administrative center for Southern India. Accordingly, data collection encountered few problems.

3. Establishment of goals

The project objective is defined as: "To double the levels of farmer income and agricultural production throughout the whole district of Nilgiris". Quantative goals are set up.

G-1 and G-2. Approach scheme: The initial two-year period shall be devoted to research and specialized development activities, and confirmation of their results. Subsequently, activity sectors shall be gradually expanded in the direction of enhancing the mutual link effects among the constituent projects.

4. Inputs

I-1. Establishment of a comprehensive test and research institution. The institution shall be made up of nine (sic) divisions, namely: agronomy, economic planning, soil science and plant nutrituion, water development and soil conservation, district agricultural office and extension branches, mechanical engineering, horticultural, and plant protection.

I-2. Establishment of extension demonstration farms.

I-3. Demonstration activities. Necessary equipment, machinery and materials shall be supplied by West Germany.

5. Outputs

O-1 through O-6. The technologies in respect of high-altitude, low-temperature cultivation of potatoes,rice and vegetables are firmly established; the superior qualities and profitabilities of such technologies are acknowledged by local population, and such acknowledgement in turn accelerates the extension of these technologies among the lowest-echelon farmers.

The tables on page 101 (of the original text) propose to compare the yields and incomes of the project farms with those of ordinary farms.

Tables 1 and II show that the net income per hectare increased to 2,500 rupees as a result of new technologies; and Table III indicates that incomes doubled by merely using the seeds furnished through the project.

When a given new t chnology is acknowledged -- and its profitability is demonstrated -- it is then spread among the farmers.

6. Premises

A multi-sector project, because of its special characteristics, does not necessarily require its component projects to generate identical results.

For the purpose of evaluation, it only needs to show that the acceptors of new agricultural technologies have increased in numbers and to demonstrate verifiable signs of production growth and income improvement throughout the target region. The main

question is how are these identifiable changes influencing the sectors -- income distribution, employment, etc. -- which have important weights in the society. If one hopes to interprete the structures of these changes, he must acquire a new tool: the relevant political and societal data which can link the changes to the conditions of income distribution and employment. In this sense, the on-the-scene experts are required to be superior field workers as well.

Clause 3. Mining and Manufacturing Industry Technical Cooperation Projects

(1) Special characteristics of technical cooperation in the mining and manufacturing industry sector.

1) Distinctive features of mining and manufacturing industry technical cooperation.

The mining and manufacturing sector occupies a special place in the technical cooperation furnished by the Japan International Cooperation Agency pursuant to foreign government requests. If one assumes the ultimate goal of technical cooperation in the mining and manufacturing industry sector to be that of assisting the progress of developing countries toward the development of industries and, hopefully, the achievement of industrial self-reliance, the purview of government-to-government cooperation is not exactly boundless. One cannot hope to set up an industry in a developing country by merely transferring the pertinent narrow-sense "know-how" and certain cooperation in related sectors.

The task necessarily entails the development of circulation

sector, monetary sector and related industries, and the orderly alignment of many hardware infrastructures such as roads, railways, electric power, ports, etc., plus a variety of software sectors such as educational levels,management know-how, and establishment of appropriate policy guidelines. In this respect, one may say that if a developing country wants to set up any viable industry it must first satisfy all these preconditions.

The so-called modern industries depend on the aforementioned foundations more heavily than others do and they cannot be hoped to exist independent of such outside conditions. Accordingly,it would be incorrect to assume that a successful industrial transfer could be accomplished through a transfer of one limited sector which,in this case, is one upper building block named "the mining and manufacturing industry know-how."

In common usage, the term "mining and manufacturing industry sector" refers to a vertically classified category. In the conceptual model of international cooperation, however, there are certain horizontal sectors which are propping up industrial sectors; namely, the agricultural, and mining and manufacturing sectors. Education always represents the largest horizontal sector. In certain cases electric power, roads and railways may also fall under the purview of horizontal layers. None of the vertical sectors can stand by itself without one or more of the horizontal sectors beneath it; and the performance of any vertical sector depends, as a matter of course, on the combined capabilities of all horizontal sectors underneath. What we are saying here is that success and non-success of a given mining and manufacturing

industry sector project cannot be evaluated in full by analyzing the project's technical side alone. This means one must take many other factors into account.

The development of the mining and manufacturing industry sector is influenced to a great extent by the aforementioned foundation layers within the country; and, at the same time, it is also affected, to a significant degree, by the country's external relations. This is because many of the goods manufactured by the mining and manufacturing technologies are circulated as international commodities often in competition with the goods turned out by the advanced nations. The on-going development in the area of export shipping technologies is apt to make this competition more fierce.

Since the great majority of production know-how consists of the technologies developed by the advanced nations, the task of setting up relatively superior industries in developing countries tends to become more and more difficult. This is one more factor to be taken into account as one seeks to start up the mining and manufacturing industry in developing countries.

Next, the technological know-how of the mining and manufacturing sector, especially those skills directly affiliated with production, are in the hands of the civilian enterprises of the advanced nations. What this implies is that if technology of the mining and manufacturing industry sector -- as apart from such sectors as agriculture, health care or infrastructures -- is to be transferred, its source in most cases must be found within the civilian business community.

Further, as far as modern industrial technologies are concerned, to successfully accomplish one project (which in fact is no less than to start up one industry) is to mobilize a vast quantity of professional know-how flowing from one country to another in a structural or systematic manner, a task which no longer can be accomplished by any single indivisual but which calls for a team of professionals. A collection of experts raked together will not do. Such a team normally is -- or ought to be -- made up of the experts belonging to one and the same enterprise.

A case in point is the composition of the experts sent by Yawata Iron and Steel to the Malayawata Iron and Steel project. This example clearly reveals just how many experts have to be mobilized according to organic time-schedules to transfer a single production system called iron-making (one which in this case is built around very small furnaces fired by charcoal at that). The processes involved in the transfer go beyond the purview of one technology.

Whereas the composition and size of any incoming project team depends as a matter of course on the industrial or technical level of the host country concerned, such a large-scale project team is required as a rule to undertake just one industrial project.

Chart (page 103 of the original text)

Numerical Shifts of Japanese Workers at the Malayawata Project (in blue)

a. Construction-related workers.

b. Workers affiliated with operation, etc.

1. August, 1965; the company is formed.

2. April 1966; first-phase construction is started.

3. August 1967; blast furnace I and an integrated iron and steel mill is completed.

4. September 1967; plant dedication ceremony.

5. August 1969; construction of blast furnace II is started.

6. 1971; blast furnace II is completed. (end of chart)

2) Technology transfers by enterprises; and complementary roles of governments.

It should be noted that the technology of the mining and manufacturing industry sector as incorporated in the structure of "enterprise" (if this is an overly narrow expression, then we say the whole structure of production) is something which, because of the special characteristics of private enterprises, is not easily made available to outsiders. Essentially, a private enterprise is an entity which strives to win over its competitors and make profits by means of its highly accumulated and organized production system and, therefore, it is not inclined to help out its business rivals, real or potential, for a song. In other words, private enterprises are not easily

motivated to participate in international cooperation -- unless, of course, there are adequate profit incentives.

Although private enterprises are not prone to get into cooperative activities, they can be expected to accept principal roles in international technical transfers without being called upon by their governments (a governmental request often implies little or no profit motivation) whenever sufficient incentives to profit exist. The roles played by private enterprises may take the form of direct investment, export of technology for a fee, or technical service to customers.[2)]

One can cite a variety of reasons why there are so few projects of assistance in the mining and manufacturing sector: the necessity for cooperation as perceived by the governments concerned is often inadequate to motivate the private sector; any mining and manufacturing sector cooperation must necessarily rely on the private sector; a project which is deemed infeasible by the private sector cannot be turned into a successful undertaking by the government since the standard for evaluating success or non-success as used by the private sector is not significantly different from that applicable by the government; and if a project is feasible in the eyes of the private sector, the project does not really need any push from official sources.

In fact, private Japanese enterprises in the mining and manufacturing sector have already invited more than 1,000 foreign trainees through their own arrangements apart from the channels provided by the JICA.

Accordingly, the private sector must inevitably play the leading role in the transfer of mining and manufacturing technology, especially if the technology in question is directly related to production. At this point, it becomes necessary to map out the area in the mining and manufacturing sector cooperation which must necessarily be assigned to the government. If we may state bluntly, the state's role in the mining and manufacturing industry sector is that of complementing the projects undertaken by private enterprises. (This statement is applicable not only to technical cooperation but also to capital cooperation because the main bodies of almost all mining and manufacturing projects are well-organized private business entities.)

The aforementioned complementary role may take any of the following forms: (1) to prepare the groundwork for civilian-based activities, and (2) to undertake certain activities which are difficult to be performed by the private sector.

The first form may include the activities of: (a) Collecting the base data for the industrial development of the target developing country, drawing up industrial development proposals, and planning and managing the country's industrial development strategy. As a rule, it is desirable to position all direct investments and tecnnical tie-ups undertaken by individual enterprises plus realignment, etc., of infrastructures at their appropriate places within such a systematic structure of planning. (Some of the most typical activities in this form are that of compiling geological maps to be used for resource development

and of project-finding pursuant to the economic development master plan formulated by, or in behalf of, the host country.)

b) Realigning and improving the hardware sectors such as electric power, industrial water supply, roads, ports,etc.

c) Realigning and improving the most important software sectors, such as technical infrastructure (industrial standards, patent system,etc.), policy-making infrastructure, and laboratory infrastructure (designed to render principal services in terms of domestic technical service, technical extension, technical improvement, etc.). The government-based cooperation often discovers that its overtures are more cordially received when they are directed to the infrastructures for technical standards and patent system because these are the areas requiring experts not affiliated with private enterprises (i.e., public officials who are under the government's exclusive domain) and also because they must necessarily be managed as units of the local administrative system.

As for the form (2), one can immediately cite the cooperation in the small enterprise sector. More often than not this sector is hospitable to the government-based cooperation because most of the advanced nations do not have the comparable enterprises ready and willing to respond to foreign requests for cooperation and because most individual projects are too small to trigger profit motivation on the part of the private business community. Further, one may speculate that there is room for the government-based cooperation in this sector because its relatively simple

production systems are not incompatible with the so-called "individual-level" cooperative approaches, and also the party rendering such cooperation is not required to sense the constraints imposed on the men of business enterprises. Again, the government-based cooperation may be deemed unavoidable in certain cases where the target developing country has extremely limited private sector activities, or where a project which is unattractive to the private sector of Japan needs to be brought to surface because of its special importance in the eyes of local political factors. Likely examples: requests for assistance (i) in the area of basic industrial sector surveys, and (ii) pertaining to investment plans where Japanese enterprises are not allowed to exercise stock options. The former is no longer a major problem because we now have firms specializing in such surveys, but as far as the latter is concerned, it is often difficult to find cooperators in Japan.

Bearing in mind the aforementioned special characteristics of technical cooperation in the mining and manufacturing sector, we shall now proceed with a substantive, form-by-form analysis of the technical cooperation in this sector currently performed by the Japan International Cooperation Agency.

(2) Forms, and their characteristics, of the JICA technical cooperation in the mining and manufacturing industry sector.

Accordingly to the technical cooperation yearbook for 1974, the technical cooperation activities performed by the JICA in the mining and manufacturing industry sector may be divided into the

following 4 forms:

i) Acceptance of foreign trainees.

ii) Dispatch of Japanese experts.

iii) Overseas technical cooperation centers.

iv) Planning and studies concerning overseas development, and basic surveys for resource development.

1) To receive foreign trainees, Japan has set up two training courses, one for groups and the other for individuals. In 1973, the group course accepted 1,390 and the individual course accepted 688 (for a total of 2,078 persons). The trainees from the mining and manufacturing sector represented about 12% (20% if public service business and management technology are included) of the entire influx. In 1973 Japan set up 131 group course units, and their schedules and lessons, based on its study of the needs of developing countries, and then invited trainees from developing countries. Twenty-six (26) -- or about 20% -- of the course units are considered more or less to fall within the purview of the mining and manufacturing industry sector. The number, to be sure, includes five software course units on trade, management of small and medium enterprises, standardization, etc. Four other course units relate to geological survey and other resource related curricula.

Major objectives of the group course are: (1) training of technicians, (2) training of research scientists or engineers, and (3) training of administrative officials. As most of the trainees are affiliated with their respective governments or public institutions, the group course is built around (2) and

(3) rather than (1).

Furthermore, more than a half of incoming trainees are received by national and public laboratories or research institutions, and practically none by purely private enterprises. The fact that private enterprises -- the ones having production systems built in them -- are not participating in this foreign trainee program implies that what the trainees are learning here is not directly related to production know-how. In other words, the training furnished by national and public laboratories, etc., relates in the main to basic technologies; and its focus is to give foreign research scientists an opportunity to study general technologies applicable to the business community as a whole.

Although we have not been given data on the trainees' occupational backgrounds in their respective home countries, we are inclined to speculate that the visitors are made up in the main by government officials with a relatively small minority comprised of engineers affilicated with local private enterprises, and that the acquisition of production know-how is not necessarily the main purpose of their visits. One may, therefore, surmise that the on-going group training system does not have the characters of training key personnel directly linked to the implementation of specific projects in specific countries but does have an appearance of making general basic education available to foreign trainees of various levels from various countries.

One the other hand, as shown by the Malayawata example, to start a given production activity requires an organization capable of

bringing to reality a whole range of production systems; and modern production systems may not be transferred from one individual to another individual, but only from one organization to another organization. If the JICA purpose to relate its foreign trainee program directly to individual production activities, the present modality for trainee invitation will have to be modified. Reversely, if the JICA intends to give up such approaches to individual projects, it is then necessary to re-define the trainee program as one which seeks to complement individual projects from a long-range point of view. The foreign trainee program of the Overseas Engineer Training Association (a financial entity) referred to earlier in this report is one which emphasizes the importance of training foreign engineers at the plants operated by member enterprises. As such this program is not only geared to project-oriented assistance but also conducive to organization-to-organization transfer of production know-how.

The group course program in 1973 included 131 course units including the following activities related to the mining and manufacturing industry sector.

Table 1. (pages 106-7 of the original text)

JICA Group Training Course Units (the Mining and Manufacturing Industry Sector); Course Unit Titles, Receiving Institutions, and Training Periods

1. Metal surface treatment technology; Nagoya Industrial Test Center; 6 months.

2. Automobile maintenance; Nissan and Toyota; 7 months.

3. Coastal mineral resources; Geological Survey Center; 8 months.

4. Printing technology; Japan Typographical Academy; 4 months.

5. Mining course; Japan Mining Association; 6 months.

6. Casting; Nagoya Industrial Test Center; 9 months.

7. Thermo-electric generation; Overseas Electric Power Study Council; 3 months.

8. Hydro-electric generation; Overseas Electric Power Study Council; 3 months.

9. Electric power distribution technology; Overseas Electric Power Study Council; 3 months.

10. Leather tanning; Hyogo Prefecture Leather Industry Guidance Center; 7 months.

11. Subterranean water development; Geological Survey Center; 4 months.

12. Trade enhancement (A and B course units); World Trade Center; 2 months.

13. Manufacture of fire-proof materials; Nagoya Industrial Test Center; 7 months.

14. Computer technology; Japan UNESCO Committee; 3 months.

15. Pottery and porcelain industry; Nagoya Industrial Test Center; 11 months.

16. Geothermal energy; Japan UNESCO Committee; $2\frac{1}{2}$ months.

17. Electronic engineering; Osaka Prefecture Industrial Promotion Center; 4 months.

18. Glass technology; Osaka Industrial Technology Test Center; 6 months.

19. Small and medium industry development seminar; Nagoya International Training Center; 3 months.

20. Plastics; Osaka Municipal Industry Research Center; 5½ months.

21. Textiles (fabrics); Nagoya Municipal Industry Research Center; 7 months.

22. Lumber industry machinery; Aichi Prefecture Industrial Guidance Center; 3 months.

23. Industrial standardization; Japan Standards Association; 3 months.

24. Metal processing; Nagoya Industrial Test Center; 12 months.

25. Small and medium industry operation and management; Osaka Bureau of International Trade and Industry; Osaka Prefecture; 2½ months.

26. Course for standardization of weights and measures; Weight and Measures Research Center; 1 month. (end of table)

2) Dispatching of Japanese experts.

According to the aforementioned yearbook, the experts have been sent out in two distinctively different situations; one where subject matters of guidance are clear; and the other where subject matters of guidance are not clear (in other words,where the experts are sent to discover pertinent subject matters of guidance or to perform certain functions similar to advance surveys designed to dig up cooperative projects and to identify their problematical areas).

The experts being sent out in the latter situation are in fact assigned to perform the functions which lap over the activities assigned to the survey team dispatching program and the cooperation center program. (We shall look into these programs later.) (This so-called expert dispatching program is made up of short-term dispatching -- several weeks to two months -- and long-term dispatching -- one to two years; and the short-term activities are identical, in substance, with the functions normally performed by survey teams.)

The guidance functions performed by the experts take the forms of (1) technical training guidance, (2) research and educational guidance at research institutions, universities, etc., (3) planning of policies, and formulation of proposals, for developmental projects, and (4) consultation in the areas of management improvement and technical guidance at business enterprises and research institutions. As such the functions may be broadly divided into: (i) those activities focusing on personnel education and (ii) consultation, and policy planning and proposal formulation on their own accord.

An examination of the current status of expert dispatching reveals that there are ery few teams involved, the majority being one-man postings. According to the table of experts dispatched during 1974, the mining and manufacturing industry sector contains a 7-man team sent by the Nippon Kokan (steel pipes) to the Indonesian Shipbuilding Bureau. This happens to be the largest team dispatched in 1974. The list shows other teams

but they are no more than two or three smaller teams, each having three experts or less, which were sent to work on mineral resources development. The Malayawata project was, of course, a private sector undertaking but it is nevertheless a conspicuous example of massive professional manpower introduction abroad. One must not overlook the fact that this team, at its peak,was made up of as many as 160 persons (representing construction, operation, management and sales sectors) engaged in the training of local personnel.

This case history, moreoever, shows that the direct investment projects of this nature not only entail dispatching of experts to project sites but also facilitate transfers of integrated technical systems in close conjunction with trainee acceptance, and supply of capital, etc. According to the preceding JICA yearbook, the profile of experts dispatching has come to signal a strong shift toward "project-like" (i.e., team) dispatching in recent years, but the publication also refers to the following aspects: (i) as far as the mining and manufacturing industry sector is concerned, the largest projects are inevitably the ones linked to direct investment (i.e., development of production activities); (ii) in the area of expert dispatching, private enterprises are not inclined to make their best people available to undertakings which are not directly related to their business activities; (iii) private enterprises are not willing to reveal their individual production know-how; consequently, (iv) production-related experts constitute a very small proportion in the overall total of experts working abroad; and finally,(v) the production-related experts abroad are more often than not

consultants to the government and they are, again, likely to be found at test and research centers or at training facilities.

It stands to reason, therefore, that one cannot expect the main goal of expert dispatching to be that of transplanting individual production technologies in individual private enterprises abroad. What these aspects signify is that the main thrust of expert dispatching has to be that of extending universal business technologies (e.g., dispatch of fertilizer marketing experts to Indonesia) or that of supplying fundamental technologies not normally considered to be private properties (e.g., dispatch of experts to the Ethiopian geological research institute).

At any rate, the primary significance of expert dispatching by the JICA ought to be found outside the arena of extending direct production technologies -- the arena which, after all, is a domain of the private business.

3) Overseas cooperation centers.

Today there are 23 overseas technology cooperation centers in operation. Their purposes and forms very widely; some are vocational training centers, others are research centers, test centers, or technical centers affiliated with universities or engineering high schools.

Pursuant to the technical centers program, Japanese experts are assigned to these centers to oversee management and operation. The following centers are related to the mining and manufacturing industry sector:

1. Brazilian textile industry technology training center.

2. Korean industrial technology training center.

3. Filipino small-scale cottage industry technology center.

4. Singapore prototype production training center.

5. Iranian small-scale industrial technology training center.

6. Kenyan small-scale industrial technology training center.

In addition to these institutions, there are also several vocational training centers related to the mining and manufacturing industry sector. The purposes and implementing forms of the technical cooperation center program may be described as follows (table on page 109 of the original text).

Purpose 1: Manpower training.

a. Training of scientists and engineers.

Form of cooperation: Establishment of engineering college.

Remark: Basic and long-range manpower training institution.

b. Training of technicians.

Form of cooperation: Establishment of engineering high school.

Remark: Basic and long-range manpower training institution.

c. Training of skilled workers.

Form of cooperation: Vocational training center.

Remark: Near-term transfer of individual skills which are closely linked to production know-how.

Purpose 2: Technology development and research development. (Exploration, etc., of appropriate technologies.)

Form of cooperation: Establishment of industrial test center and research institution.

Purpose 3: Technical services pertaining to "digestion" of technology, and local application and extension.

Form of cooperation: Industrial test center.

Remark (for Purposes 2 and 3): The primary objective shall be to strengthen organizational and institutional functions rather than to train manpower.

Purpose 4. Conveyance and extension of systems related to production know-how.

Form of cooperation: Prototype production center, agricultural center, and highway construction center.

Remark: Reproduction of mini-scale models of actual work sites in order to faciliate conveyance of technological systems.

(end of table)

What the preceding table shows is that technical cooperation centers may be divided into the following three broad categories: (i) ones which are designed to train manpower through education provided by schools and training institutions; (ii) ones which are designed to strengthen technical development institutions, and (iii) others which are designed to convey technical systems by means of models. Among the three broad functions, some activities of the third and final category (iii), conveyance of technological systems, in fact lap over the functions of the first category (i), manpower training, but the third category may be deemd to occupy a singular place of its own because vocational training centers tend to concentrate on individual skills and they are closer to work places than colleges are. For example, a prototype production training center may be viewed as a kind of factory, capable of reproducing therein all serial

functions associated with production -- from raw material procurement to manufacture and sale of prototypes -- thus enabling trainees to experience the whole system of production. That approach is based on the so-called on-the-job training concept which is widely adopted (e.g., highway construction centers and model farms) outside the mining and manufacturing industry sector as well.

The approach, however, has some problems. For example, the two functions of training and manufacturing at prototype production training centers are sometimes not mutually compatible. A scheme which hopes to accomplish these functions concurrently is the concept of industrial test center. Industrial test centers are designed to perform technological development and improvement at one end and take in trainees at the other end. The scheme has been adopted by Japan as an integral segment of technical services and it is said to have some merits. But the training given under this scheme leans toward short-term teaching as opposed to long-term training; the situation which moves one to speculate that a key to coordination between the aforementioned functions may lie somewhere in the time-scheduling options available to training.

Many a function -- be it manpower training, consultation or assistance concerning test center establishment, or planning and proposal formulation -- performed by the cooperation centers is one which is not easily supplied by private enterprises. For this reason alone, the cooperation center projects designed to

strengthen the foundation for mining and manufacturing developments represent an area of international activity which is best left to governmental initiatives. Since the objectives of the cooperation center projects are, in the main, to seek long-term, indirect, or complementary effects, it must be admitted that their effectiveness is often difficult to measure.

4) Appraisal and investigative study activity.

In 1974, the JICA undertook 58 appraisal/investigative study activities. They included:

Pre-investment basic appraisal activities (related to the Ministry of Foreign Affairs):	41
Comprehensive economic development basic appraisal activities (related to the Ministry of Foreign Affairs):	3
Overseas development plan appraisal activities (related to the Ministry of International Trade and Industry):	8
Resources development cooperation basic appraisal activities (related to the Ministry of International Trade and Industry):	6
Total:	58

These are the activities which are performed by experts to determine the real conditions of target regions and they do not seek to train manpower directly. As such their objectives are focused on identification of problematical areas and presentation of problem-solving approaches. More often than not the experts undertaking such investigative projects are not the ones who subsequently put such problem-solving approaches into effect.

(The cases involving geological map making should be considered exceptional events with a more concrete objective.) If an undertaking happens to require one expert only, then it falls within the purview of expert dispatching. Most appraisal/investigative study teams are, however, made up of more than one person and they usually complete their assignements within relatively short periods.

In its 1974 report, the JICA divided these activities into eight project categories, namely: (1) master plan formulation, (2) compilation of land or sea map, (3) project-finding survey,(4) project feasibility study, (5) investigation directly related to capital assistance, (6) comprehensive economic development basic survey, (7) resource development cooperation basic survey, and (8) evaluation measurement survey. We believe, however, this classification mode may be consolidated by moving (5) into (4), (6) into (1), and (7) into (2). Subsequently, the activities then may be divided into the following phase-oriented categories (which are more commonly used): (i) compilation of master plan, (ii) project finding survey, (iii) objective foundation survey (including land and sea map, etc., compilation), (iv) project feasibility study, and (v) follow-up activity.

Most investigative projects pertaining to the mining and manufacturing industry sector come under the categories (i),(ii), (iii) and very few under (iv). Many an investigative project starts out as a feasibility study but ends up being nothing more than an undertaking for collecting basic data,the activity which

falls somewhere lower than the feasibility study category. What this reflects, of course, is the growing trend in which the feasibility (or, for that matter, non-feasibility) of a given mining and manufacturing industry project is no longer what the state thinks it is but is the function of whether or not the project can be implemented as a private sector direct investment activity. Here, again, the role of government-based cooperation comes off to be one of complementary nature. By way of exception, one can cite electric power generation which often is hospitable to government-based feasibility studies. Government-based feasibility studies are often performed for electric power development (provided, of course, necessary funds are forthcoming) because electric power cannot by itself (i) become an international commodity, and (ii) build up a rival relationship with the private sector.

(3) Problematical areas in the objective management of mining and manufacturing industry technology cooperation projects.

1) Establishment of program goal.

The ultimate goal of technical cooperation in the mining and manufacturing industry sector is to enable the target country to acquire a sense of self-reliance conducive to its internal industrial development. What the preceding sentence attempts to convey is that a country which starts up industrial production is not necessarily in possession of a sense of self-reliance.

Japan's successful import of technology has come through the processes of (i) production start-up with technologies borrowed

from overseas shortly after the Meiji Restoration (A.D.1868), (ii) learning about, and consolidating, the foundation for production through domestic production activities. Sensing the alarming international situation prevailing at that time,Japan chose to dash toward the concrete objective of domestic production start-up,almost completely skipping the process of acquiring basic technologies and performing basic research. This skipping has left a large void on the ground floor of Japan's industrial structure. Even today, when Japan's industrial capacity is one of the largest in the world, some segments of the structural contradiction are still obvious.

What then is the most practical process of industrial development to be followed by developing countries? There can be many conflicting views but we are inclined to believe that some of the steps taken by Japan in the past can be applicable to developing countries today. We believe the optimum development strategy should consist of (i) creation of production sites in developing countries, and (ii) foundation-building activities implemented in parallel with (i). Today, the transfer of production activities to developing countries necessarily entails cooperation (bluntly speaking, direct investment) furnished by private enterprises in the advanced nations because most of the target regions are without adequate capital, technology, trained manpower and business organization.

We are, of course, not unaware of certain voices of criticism thrown at the present mode of the private-sector direct investments originating from the advanced nations, but one should not

underestimate the efficacy of such private-sector cooperation in terms of making the whole structure of production system expeditiously understood by developing countries. When any government-based assistance is to be extended to the mining and manufacturing industry sector of a developing country, the first thing to bear in mind, therefore, is how to utilize private secter cooperation most effectively, and how to maximize the effects of such private sector involvement.

Today's modern technologies, or modern industries, are much more complex than those which were imported by Japan during her initial phase of industrial development. Many times we have seen technology transfers becoming entangled in the societal systems of recipient countries. Even when a developing country has set up production activities on the surface, the road beyond leading to self-reliance must be seen to be steep, rough and distant. This means all developing countries must exert strenuous efforts of their own, and it behooves us to extend our assistance to that efforts. In this sense, our government's external technical cooperation must seek to achieve: first, construction or realignment of basic education and manpower infrastructures; second, emplacement of production facilities in target regions; and finally, building of conditions conducive to extending as many aspects of production as possible to target population through local production activities. In behalf of attaining these objectives, one must deliberate with care about the selection, and weaving, of optimum technical cooperation forms.

2) Establishment of project purpose and assumption of input and output.

When the broad goal is defined in the manner described above, next process is to select the form of technical cooperation. As noted earlier in detail in part (2), technical cooperation may be provided in the forms of (i) education of trainees, (ii) dispatch of experts, (iii) dispatch of investigative teams, or (iv) establishment and operation of cooperation centers, with finely classified objectives assigned to each of these forms.In other words, the forms to be employed in a given project must be selected pursuant to the predetermined purpose assigned to the project and they must be assembled in an organic manner.

Clarification of purpose and selection of means are probably the key factors which ultimately determine success or non-success of a given project. Up to this point, however, we have practically never undertaken any large-scale projects of the mining and manufacturing sector, and, therefore, we have rarely been exposed to the need for combining these means.

When the purpose of a given project is set up, next logical process is to clarify the project's inputs and outputs. If a developing country intends, for example, to set up an industrial estate and to invite foreign enterprises to locate plants therein, and applies for our technical assistance in the area of training skilled workers, our response in this case may take the form of receiving trainees here and/or setting up a technical training center in that country, or other options. If we have chosen the form of setting up a local technical training center to be our response, then the items to be examined are: (i) size of the center, (ii) courses to be offered by the center,

(iii) criteria of trainees, (iv) method of education, (v) number and criteria of Japanese staff to be sent to the center,(vi) method of assembling the Japanese staff, (vii) whether the center will ultimately be turned over to local authorities, and (viii) if so, conditions and process of such transfer.

This process of item-by-item examination in order to select most appropriate items (i.e., determination of inputs) is an inseparable component of project purpose. Inputs have to be dealt with, always, within the purview of limitative factors existing in Japan and quality and extent of cooperation coming from the other side. On the other hand, outputs are concrete effects growing out of inputs. In the abovementioned example, they represent two pillars: (i) a technical training center which has been established and (ii) a technical training center which is effectively operated. These pillar effects may be broken down to: (i) trainees who have been given training in pertinent fields, (ii) trainees who are applying the knowledge they gained at the center to productive on-the-job activities at the new industrial estate. We can also identify certain secondary effects, such as: (i) trainees have had an opportunity to know Japanese people and to learn Japanese technology, and (ii) trainees have had an opportunity to reassess Japan. As such the outputs in this case are also inseparable components of project purpose and they collectively embody and clarify project purpose. In other words, a mutually complementary relationship exists between product purpose and outputs since project purpose determines inputs (means of cooperation) and outputs (the more

the better) which grow out of inputs tend to clarify project purpose. Likewise, such a relationship also exists between inputs and outputs.

3) Evaluation of outputs and project purpose.

Evaluation of a given cooperation project shall be deemed to begin with the confirmation of whether or not the outputs assumed pursuant to its purpose have emerged sufficiently. In other words, it is necessary to (i) translate the project purpose into concrete items (outputs) and (ii) pick up as many of these items as possible and (iii) check the pre-project and post-project conditions of each and every item.

In this case, it is important to have outputs (the more the better) which may be evaluated qualitatively. In the aforementioned example of cooperation (involving a training center), evaluation of the project cannot be deemed complete when the number of trainees processed by the center has been counted. It goes without saying that one of the anticipated outputs must have been to turn out fully trained graduates. The evaluation, therefore, also calls for qualitative assessment of individual graduates.

In this qualitative assessment, evaluators must determine whether or not the graduates have (i) understood the center's teaching in full, and (ii) been able to use the knowledge they gained in a useful manner. To do this the evaluators must have appropriate ground rules for measuring these qualities.

At any rate, one evaluation formula may not be applicable to all projects. The listing of concrete outputs pursuant to project purpose and the method to be used to evaluate such concrete

outputs necessarily depend on the form and purpose of the project in question. We propose , therefore, that the JICA, for the time being, prepare an evaluation handbook on the basis of: (i) projects shall be divided into four functional categories (forms), namely;manpower training, investigation, consultation, and service; and (iii) each category (form) shall have its own check manual containing criteria for input selection, points to be taken into account, formula for listing of outputs, and method of output evaluation.

Further, it is important to make sure that the purpose management of each project is effected according to the appropriate check manual.

4) Coordination of project purpose and input/output.

Coordination of project purpose/program goal and input/output shall have to be attempted after output and project purpose are evaluated. Since project purpose is strongly influenced by the way input and output are selected, it is prone to shift its weight away from what it was at the beginning. In this sense, input and output should be evaluated or selected at all times on the basis of the project purpose as originally defined. For example, let us consider a manpower training project which requires Japan to receive group trainees from a developing country. The courses we offer must be exactly in accordance with the project's purpose as originally agreed upon. If we set up an X industry sector course while there is no need for X industry sector manpower in that country, our input -- large or small -- pertaining to that course will be irrelevant to the project's

purpose. What this implies is that there ought to be appropriate feedback mechanism.

(4) Resolution of problematical areas in project effectiveness measurement.

Thus far we have described methods of evaluating technical cooperation in the mining and manufacturing industry sector. One must concede that some of the technical cooperation projects undertaken by the JICA so far happen to be the ones incompatible with these methods of effectiveness measurement-- the methods which are oriented to purpose management. In other words, the JICA business department is essentially the one which ought to be selecting the most effective inputs and outputs to accomplish a given project but, in fact, such discretion is often not given to the JICA because of political considerations or the other country's circumstances.

In such a case, the JICA is given the authority to perform certain small individual activities; and the experts dispatched to the scene of a cooperation project often are unable to discover their rightful places in the project to which they have been assigned. The purpose management system we are referring to here will not only enable such experts to find their most useful places within the whole structure of individual projects but also stimulate the JICA's self-examination of its own functions as the principal agency performing the dispatching of experts. The JICA ought to establish itself as the principal body in international technical cooperation and acquire the discretionary power to

to select optimum inputs and outputs in the light of given project purposes.

Certain future projects, even in the mining and manufacturing industry sector, will undoubtedly call for decisions from the point of view of national policy. The Kilimanjaro development plan is a large regional development plan centered around industrial development and the JICA is expected to be called upon to supply all cooperation activities it requires, from planning and proposal formulation to actual implementation. The JICA's discretionary power on this project -- subject to, of course, limitations imposed by availability of capital and manpower -- is seen to be incomparably greater than the cases in the past. In order to boost the effectiveness of the technical cooperation in the future, it is proper for the JICA business department -- the entity in charge of technical cooperation project planning and proposal formulation -- to conduct appropriate purpose management by re-examining,and reflecting upon, the erstwhile technical cooperation projects it had performed.

We now present a check manual for evaluation of technical cooperation in the mining and manufacturing industry sector. The manual is prepared for the benefit of the JICA and other experts who are directly involved in technical cooperation. To begin with, we can attempt to prepare a fixed-style, general-purpose check manual applicable to a given sector or program only when real conditions of the sector or program are fully identified and understood.

This is because such a manual must indicate the ways to resolve the bulk of the problems which are likely to show up in the course of implementing technical cooperation projects. For the benefit of readers, our draft manual lists the commonest problematical areas in each of the forms usable in technical cooperation. In order to incorporate as much empirical data as possible in this draft manual, we interviewed many experts who have physically participated in cooperation projects. Readers are invited to note, however, that this draft manual is intended to be no more than a set of basic guidelines. As for individual projects,each will have to have a check manual of its own.

Footnotes for Chapter VII.

1) The high-yield IR-8 was introduced by the State government in 1966-67 as a component of the farm policy for that crop year. This project performed preliminary /trials of crop-raising technical systems for not only the originally proposed Indica strain but IR-8 and other high-yield varieties as well.

2) According to the "Survey of Trainee Acceptance Trends", released by the Overseas Technician Training Association (a financial entity), December 1970, composition of foreign trainees accepted by private enterprises in Japan from 1960 through 1969 was as follows:

Trainees affiliated with enterprises where such private enterprises have direct investment 21.3%

Trainees employed by enterprises with which such private enterprises have technical tie-up arrangements 10.3%

Trainees affiliated with dealers and retail outlets of

such enterprises	18.6%
Trainees affiliated with local users of goods exported by such private enterprises	26.5%
Other trainees	Balance

Check Manual for Mining and Manufacturing Industry Sector Technology Projects

1) Cooperation form 1. Manpower training.

Purpose: i) Training of skilled workers; ii) training of research scientists and engineers, and iii) training of administrative officials.

Ground rules for input selection.

i) Determination of the target country's manpower needs through prior survey. Why are they going to be trained? What skills are they going to learn?

ii) Clarification of the area of responsibility assigned to the other country.

Selection of inputs.

i) Determination of training method.

Group course or individual course. Classroom education or practical training. Compilation of appropriate curriculum. Determinatinn of teaching tools, text books and other substantive matters. Number of trainees to be accepted.

ii) Determination of trainee criteria.

Age limits, professional backgrounds, educational requirements, and linguistic capabilities.

iii) Selection of instructors.

iv) Selection of trainee receiving institutions (enterprises, research establishments, and others).

Outputs.

i) Trainees shall be adequately trained or educated.

ii) Trainees shall have acquired adequate skills and know-how to perform pertinent on-the-job activities in their home country.

iii) Trainees shall have deepened their understanding of Japan.

Output effectiveness measurement approaches.

i) To check whether or not the trainees have fully understood the teaching which has been provided; and to identify the areas which have not been fully understood.

ii) To ascertain the status of on-the-job activities performed by trainees upon their return; to determine whether or not the substance of training is occupationally relevant and useful; to clarify the relationship between the substance of training and trainees' home country employment status; and to evaluate trainees' contribution to productivity increase.

iii) To ascertain trainees' understanding of Japan and their post-return attitude toward Japan.

Reassessment of project purpose and cooperation form (to effect feedback measures).

i) To ascertain the degree and character of significance attached by the other country to the particular training program.

ii) To examine the propriety of the trainee acceptance methodology used, and, if necessary, to look for and locate superior options.

iii) To clarify the relationship between the trainee program and other technical cooperation programs -- in particular, the programs, if any, in the mining and manufacturing industry sector-- directed to the same country.

Remarks.

i) Although trainees may be accepted in groups or individually, there are more receiving facilities in Japan compatible with group trainees than those which are suited to individual trainees.

2) Cooperation form 2. Dispatching of experts.

#Purpose: To provide education and guidance at training centers, universities, research institutions, etc.

Ground rules for input selection.

i) To lay hold on organization and function of the institution to which experts are sent and to identify problematical areas therein.

ii) Clarification of the objective assigned to experts being sent. Is the objective confined to teaching? Are they going to have a hand in management?

iii) Sector and duration of cooperation..

iv) Clarification of authority granted to Japanese experts, status of local cooperation machinery, and division of responsibility.

Selection of inputs.

i) To choose experts on the basis of project appraisal.

Selection criteria: professional quality, personality, linguistic ability, zeal, etc.

ii) Appropriate positioning of Japanese experts at receiving institution and within host country, and confirmation of authority delegated to the Japanese.

iii) Dispatching of personnel and supplying of materials.

#Outputs.

i) Key personnel affiliated with host country's training centers, universities, research centers, etc., shall be adequately trained.

ii) Problematical areas at target enterprises in host country shall be identified, and problem-solving approaches shall be spelled out.

iii) Problem-solving measures shall be put into effect; or those measures already in force shall be accelerated.

iv) New policies, etc., shall be formulated, and the usefulness of such policies, etc., shall be examined in light of host country's developmental needs and directions.

Output effectiveness measurement approaches.

i) To check the effectiveness of key personnel training.

ii) To check whether or not problematical areas in research, planning, etc., are recognized by host country; and if adequate measures are being taken to resolve such problems.

iii) To check whether or not problem-solving measures are clearly spelled out; or if such measures are practical.

iv) To determine whether or not follow-up activities are necessary.

v) To check whether or not development projects are being excavated; to examine whether or not such projects are pushed forward pursuant to appropriate policy, from excavation to implementation, and to ascertain whether or not projects being considered are appropriate undertakings.

vi) To ascertain whether or not the perception of Japan by host country has been improved.

Reassessment of project purpose and cooperation form (to effect feedback measures).

i) To determine whether or not the institution which received Japanese experts has turned out to be an appropriate choice.

ii) To ascertain whether or not the dispatched Japanese experts have proven themselves to be capable and appropriate.

iii) To confirm whether or not the host country has extended adequate cooperation to the project in question.

Remarks.

i) As it is in the case of trainee program (cooperation form 1), the extent of freedom granted to the country sending out experts in this form of cooperation is somewhat confined. The effectiveness of this modality, therefore, is influenced to a significant degree by the quality of cooperation coming from the host country.

ii) Where Japanese experts are invited to give advice, or draw up plans, etc., the procedure to be followed shall be: to understand real conditions correctly; to identify problematical areas; to explore specific problem-solving measures, and to put such measures into effect.

3) Cooperation form 3. Investigation/survey team.

Purpose: i) Formulation of master plan, ii) basic investigation/ survey, iii) feasibility study, and iv) follow-up activities.

Ground rules for input selection.

i) To analyze substantive aspects of request submitted by the other country.

ii) Identification of feasibility study required, problems to be solved, and areas to be investigated.

iii) Examination of data presently available to identify the areas requiring on-the-scene data collection.

iv) Confirmation of cooperation structure in the other country.

Selection of inputs.

i) Dispatching of investigation/survey team.

Organization and deployment of expert team.

ii) Supply of equipment necessary for investigation and survey.

Outputs.

i) To determine whether or not sufficient data necessary for host country's development have been collected.

ii) Analysis and evaluation of such data; and formulation of systematic development proposals.

iii) Formulation of project-by-project implementation plans:

iv) Identification of potential problematical areas in respective projects; and presentation of practical suggestions to resolve such problems.

v) Clarification and determination of future cooperation ground rules.

vi) Accumulation of basic data in Japan and utilization of such data by the private sector.

Output effectiveness measurement approaches.

i) To examine the data collected through on-the-scene investigation and study; and to ascertain whether or not necessary data for host country's development have been sufficiently acquired.

ii) To review the areas analyzed and to ascertain whether or not the analysis has been adequate.

iii) To determine whether or not such analysis has contributed, in a tangible manner, to the construction of relevant implementation plans.

iv) If certain cooperation is recommended by the team in its report, to ascertain whether or not such cooperation is forthcoming.

v) To ascertain whether or not the collected data are made available to the general public.

Reassessment of project purpose and cooperation form.

i) It is important to decide whether or not the objective of the investigation/survey team in question has been achieved. Depending on this decision, it may become necessary to extend the time-period of investigation/study, or to send in a new team made up of experts in a different field.

ii) Experts engaged in feasibility study should focus their attention at all times on the areas directly relevant to the pertinent master plan for development.

Remarks.

i) Investigation/survey constitutes the foundation for all cooperation projects. As such, the extent of freedom enjoyed by Japan in this form of cooperation is considerable. Unfortunately, there are many cases where results of such Japanese investigation/survey projects have not been fully utilized.

ii) Team modality is not the only available approach to investigation/survey. It may be performed internally (within Japan) or by individuals. Needless to say, the most appropriate modality ought to be selected out of these options.

4) Cooperation form 4. Establishment and operation of cooperation center.

Purpose: To set up and/or operate i) educational or training center, ii) research or test center, or iii) model plant.

Ground rules for input selection.

i) To determine objective(s) -- education, training, technical guidance, research, etc.

ii) To correctly identify and comprehend host country's needs.

iii) Confirmation of cooperation structure (in particular, financial backing) in the other country.

Selection of inputs.

i) Determination of the modality of cooperation center in accordance with the designated objective.

ii) Ground rules for operation pertaining to:

Designation of the duration of cooperation; selection of the method of transfer to host country before the end of such

period; center's specific activities and functions; curriculum, training and research methodology, etc.

iii) Selection of experts to be sent. Professional make-up of such experts (instructors, management experts, research specialists, or technical guidance exerpts) depends on the project's objective.

Outputs.

i) Key personnel (trainees, researchers, engineers, instructors, etc.) who have been trained.

ii) Research or test center with reinforced organization.

iii) Extension of technology within host country; digestion of technology, accompanied by technical innovation; and, among others, utilization of technology in the development of local resources.

iv) Substantive improvement in technical (e.g., analytical) services.

v) Transfer of production systems.

vi) Preparation of foundation hospitable to private Japanese enterprises.

vii) Creation of opportunities for people-to-people contacts.

Output effectiveness measurement approaches.

i) To ascertain the numbers of people trained or educated; and to determine the degree of education or training received by such beneficiaries.

ii) To ascertain whether or not the technical center in question is properly managed and operated.

iii) To determine whether or not the center will be turned over to local authorities before the end of the term of cooperation originally agreed upon.

iv) To assess the status of technology extension among local enterprises; and to determine the number of contacts made with such enterprises or of cases where advices were given.

v) To ascertain tangible effects, if any, in terms of technical innovation.

vi) To assess the center's reputation within the host country and, especially, with its business community (as reflected in the quality of enrollees and instructors and the status of jobs available for graduates).

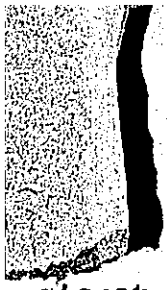
Reassessment of project purpose and cooperation form.

i) In terms of objective attainment, certain segment of this cooperation form is in competition with the form 1 (trainee acceptance) and the form 2 (expert dispatching). Accordingly, there is room for discretionary selection among these options.

ii) It is necessary to analyze the needs for this form of cooperation in the light of the host country's master plan for development and the growth trends of its private enterprises.

Remarks.

i) In terms of substance, this form of cooperation comprises dispatch of experts and supply of materials. Since such technical centers are set up at the discretion of Japan, their intents and objectives may be determined without difficulty, and, accordingly, purpose management can be effected with ease.



Persons evaluating such technical center projects not dwell on the assessment of individual experts dispatched or individual materials supplied. They ought, instead, to focus their attention on the overall functions of such centers.

END