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(As Revised)

PROPOSAL  
to the  
AGENCY FOR INTERNATIONAL DEVELOPMENT

from the  
CENTER FOR INTERNATIONAL AFFAIRS  
HARVARD UNIVERSITY  
Cambridge, Massachusetts, 02138,

for research support on

"Comparative Studies of Resource Allocation and Development Policy"

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## I. SUMMARY

The present proposal calls for a coordinated set of analyses in three areas of the economics of development. The first series deals with the economic aspects of several major sectors of the economy -- agriculture, transportation and education; the second provides for intersectoral comparisons of India, Pakistan, Korea, Greece, Turkey, and Latin America; and the third is concerned with economic development policy as it relates to trade and aid. Although each study will deal with a specific country or countries, the analytical method developed and many of the substantive conclusions will be transferable to countries other than those studied. In general, these analyses reflect the increasing concern of economists with sectoral and policy problems, as opposed to the more general macro analyses that characterized much of the work in the late 1950's and early 1960's. (Pages 11-29).

The suggested arrangement is for a "standard" research proposal which retains about 15 percent of the funds as a service component. This latter sum would be used for mutually agreeable studies of particular interest to A.I.D., and for rendering advice to A.I.D. within the general scope of the contract. (Pages 3-7)

One of the important, and perhaps unique, features of this proposal is that it draws systematically on two existing development groups within Harvard's Center for International Affairs - The Project for Quantitative Research in Economic Development and the Development Advisory Service. This

collaboration of "academic" and "field" economists should assure that the studies are sophisticated, yet practical. (Pages 8-10)

The proposal calls for approximately 25 senior man years of research over a 2½ year period, with the manpower divided about equally among the three substantive areas. The estimated total cost of this research, including all direct and indirect expenses, is approximately \$1 million. (Pages 30-32).

II. BACKGROUND TO THE PRESENT PROPOSAL

Many of the specific studies indicated in the current proposal have grown out of past research at Harvard's Center for International Affairs, including the work sponsored by a previous A.I.D. service contract (AID CSD 1073, Office of Program Coordination) that was initiated in November 1965. That contract called for the Center:

- (a) "To conduct a study using various country programming and planning models designed to suggest the most efficient use of U.S. and/or other foreign assistance;
- (b) To undertake studies of particular countries, including Pakistan, for the purpose of further developing experimental methodology;
- (c) To determine how the patterns of resource mobilization and allocation relates to the stage of a developing country's economic development; and
- (d) To provide computational and related assistance to A.I.D. consultants engaged in similar work for A.I.D."

The above contract ended in October 1966. Although the new proposal is not linked to this former arrangement, a brief summary of the work completed under it will give some indication of the broad types of studies in which the Center has been engaged.

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Work under the old contract was carried out by a group organized in 1965 as the Project for Quantitative Research in Economic Development, which is under the general supervision of Professor Hollis Chenery\*. Within this group, the Principal Investigator responsible for the A.I.D. contract was Stephen Lewis until August 1966, when he was replaced by Walter Falcon. Other senior staff members of the Project during 1965-66 have been Samuel Bowles, Alfred Conrad, Michael Bruno, and Carl Gotsch, all of whom have been members of the Economics Department as well as the Center for International Affairs.

The A.I.D. contract has made it possible to undertake several studies specifically on behalf of A.I.D. and to extend others so as to bring out policy conclusions and recommendations of interest to A.I.D. A.I.D. support under this contract has produced a number of publications, presentations and consultations with A.I.D. staff, notably the following.

(1) Aid Allocation and Effectiveness

The foreign-aid model developed by Hollis Chenery and Arthur MacEwan for Pakistan ("Optimal Patterns of Growth and Aid: The Case of Pakistan") was given as an A.J.C. presentation at the Paris D.A.C. meeting in December, 1965. Another publication stemming from Chenery's analysis ("The Effectiveness of Foreign Assistance") was presented at the September 1966

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\* As indicated in section (d) above, Chenery was a consultant to A.I.D. and received no compensation under this contract.

Cambridge (England) Conference on Foreign Aid. Both studies dealt with the relations between the policies of recipient countries and the form and amount of aid allocated to them by donors.

(2) Agriculture in Pakistan's Development

A second area in which substantial work was completed during the past year was the agricultural sector. A.I.D. funds helped to support a study by Walter Falcon and Carl Gotsch describing the radical improvement in Pakistan's agricultural performance ("Agricultural Development in Pakistan: Lessons from the Second Plan"). Highlights of this analysis were presented to the A.I.D. Administrator's Advisory Committee on Economic Development in April, 1966. Portions were also used by the Pakistan mission in developing the US A.I.D. program for agriculture in Pakistan.

(3) Resource Allocation and Structural Change.

A third area of concentration involved work on industrial structure and import substitution. The major findings of Stephen Lewis on Pakistan were presented to the Advisory Committee and provided the basis for several articles and a forthcoming book. ("Relative Price Changes and Industrialization", "Measuring Protection in a Developing Country: The Case of Pakistan", and Economic Policy and Industrial Growth in Pakistan.) The contract provided partial support

for similar research by Jaleel Ahmad on India ("Import Substitution and Structural Change in India, 1950-66") and another study on Pakistan by Wouter Tims and Alfred Conrad ("Setting Investment Priorities for Pakistan"). All these analyses were aimed at answering the crucial question of how a country chooses the particular scale and type of industries that are concomitant with its economic development. In a related study, Hollis Chenery and Lance Taylor have carried out a comparative analysis of the relationship between industrialization and economic growth ("Intercountry and Intertemporal Patterns of Industrial Growth").

(4) Aid Requirements and Self-Help in Latin America

At the request of the Latin American Bureau of A.I.D., the Center has made a large number of alternative projections of Latin America's requirements for external resources under various assumptions as to absorptive capacity, growth rates, and self-help measures. (The original contract was modified to cover this and related research activities on Latin America.) These projections, which were made by Peter Eckstein and several other assistants under the supervision of Hollis Chenery, are summarized in an Annex to his report ("Toward a More Effective Alliance for Progress"). A.I.D. plans to issue Chenery's report and the Annex as a discussion paper.

In addition to the above research, which has been largely completed, various other studies are still in progress. Hollis Chenery and Peter Eckstein are continuing their analysis of Latin American growth prospects; Carl Gotsch and Walter Falcon are doing further analyses of the water development program of West Pakistan; Walter Falcon and Stephen Lewis are completing a summary paper on economic policy and the success of Pakistan's Second Plan; and Hollis Chenery and Lance Taylor are continuing their econometric studies of the relations of a country's income level and patterns of development to its industrial and agricultural structure.

In total, the work carried out under the A.I.D. service contract comprised about 40% of the total research activity of the Project for Quantitative Research in Economic Development over the past year. It has been closely related to research on development programming and other studies of the Project, which are outlined in Annex A.

III. ORIENTATION OF FUTURE RESEARCH

In our judgment, the work outlined above meets the objectives that were set out in the previous contract. We now propose a new arrangement which: (a) is primarily a research contract, but which still retains a small "service" component,\* (b) is broader in scope, and (c) draws more systematically on the practical experience of the Development Advisory Service (DAS), which is also a part of Harvard's Center for International Affairs. (See Annex B.)

Compared to the previous contract, the new proposal calls for:

- (1) Greater comparative analyses among countries;
- (2) Increased attention to the transport and education sectors, along with continuing research on agriculture, industry and trade; and
- (3) Expanded efforts to improve the utility of policy models by developing greater understanding of the economic characteristics, constraints and experience of different underdeveloped countries.

To carry out this expanded program, a close collaboration is being established between the Quantitative Research Project and the Development Advisory Service. The research funds requested will make it possible for a number of the field advisors of the DAS (currently 30 in the field) who have worked actively

\* It is expected that Harvard personnel would be available to work on mutually agreed upon service studies and to render advice within the general scope of the contract. These services would not be expected to exceed 15 percent of the total budget shown in Section VI. It is, of course, understood that insofar as DAS personnel were involved, this service assistance would not conflict with the contractual relationship of the DAS with the governments of the countries in which it is engaged.

with the governments of underdeveloped countries, to return to Cambridge after completing their field assignments for work on research projects related to their practical experience.

The proposed collaboration of "academic" and "field" economists is rare -- perhaps unique. It would assure that the academic economists are fed data, ideas, and insights which could make their work more relevant to actual policy making in underdeveloped countries. In turn, the field economists would be enriched in their analysis and advisory capabilities through advice on the more advanced economic techniques and through insights derived from countries other than the ones where they have served.

For a small marginal cost, relative to the \$1.5-2.0 million that will be spent annually in field operations, we would thus be able to tap the existing capacity of the DAS and to provide a large body of experience merely waiting to be recorded. Since the funds available to the DAS are currently limited to uses directly related to its advisory operations, additional financing is needed to undertake systematic research of the type outlined below.

The proposed reorientation of our research efforts will result in a considerable expansion in the total support needed as well as greater emphasis on policy applications. Whereas the previous contract called for the support of about three man-years at the senior level, the new one suggests approximately ten man-years per year as the appropriate size.

Because of the increased role of economists previously working in the field, there will be a relative shift towards the sectoral and policy problems with which the field advisors have been mainly concerned.

One other point should be stressed before turning to substantive priorities. The flexible character of the previous contract has already proved its utility. It has been possible (1) to engage in considerable research whose usefulness and practicality was not foreseen when the contract was initiated, (2) to respond constructively and promptly to A.I.D.'s requests for assistance on particular problems related to the broad substance of the contract and (3) to exploit the emerging interests and capacities of particular staff members at the Center for International Affairs on A.I.D.'s behalf. We recommend that this general flexibility also be retained in the proposed contract.

IV. RESEARCH PRIORITIES

In drawing up a research program for the next several years, we have tried to strike a balance between the need for a specific and integrated set of initial studies and the desirability of maintaining flexibility so as to exploit the most productive opportunities in succeeding years. To meet both needs, we have identified areas in which we intend to work and have described in outline form the initial studies to be undertaken in each area.

Three principal criteria have been used in drawing up the research program submitted to A.I.D.:

- (1) Relevance of the results for aid and development policies;
- (2) Experience and comparative advantage of the Harvard research group involved;
- (3) Cumulative effects of the several studies and relationship to other work in the Center for International Affairs and the Department of Economics.

These criteria have been used to develop a program which is largely concentrated on a few countries and topics, but which also allows for exploitation of particular experience or techniques available in the Harvard research group.

The program is outlined below under three main headings:

- A. Sectoral Studies
- B. Studies of Resource Allocation and Structural Change
- C. Comparative Analyses of Development Policy

Since the main elements of the program are designed to be increasingly interrelated as the work progresses, the initial identification of a topic with a sector or a particular country is often arbitrary.

A. SECTORAL STUDIES

The primary interest in sectoral studies is in the technological and institutional characteristics of the sector, its role in development and relation to other sectors, and the planning techniques appropriate to it. Since empirical work on a sector must be done in particular countries, such studies also contribute to broader country analyses and economy-wide models.

(1) Agriculture

The general functions of agriculture in the development process have received considerable attention in recent years, but detailed empirical tests of the various competing hypotheses are scarce. The five studies outlined below are designed to formulate hypotheses and test methodology in a particular country -- primarily Pakistan -- and then explore their validity and usefulness in other countries.

(a) Agricultural Development in India and Pakistan

Of most immediate interest is a study comparing the magnitude and sources of recent agricultural growth in India and Pakistan. The study would focus on two regions common to both countries -- East and West Bengal and East and West Punjab. It would try to determine whether there is a significant difference in Indian and Pakistan agricultural

performance under comparable conditions, and if so, to what policies or inputs it might be attributed. Senior staff would include Walter Falcon and Carl Gotsch, both of whom have considerable field experience in Pakistan, and Morton Grossman, who is spending two years with the DAS in Cambridge (under a Ford Foundation grant) after six years of field experience as a senior economic advisor in India. In addition negotiations are under way (pending financing) to bring another senior agricultural advisor from India to participate in the above project and to do an independent evaluation of the Indian Intensive District Program.

(b) Evaluation of the Pakistan Rural Works Program

Also of high priority is a comprehensive examination and evaluation of the much discussed Rural Works Programs of East and West Pakistan. This study will examine the impact of the program on political and economic development of the country. Efforts will be made to determine its effects on underemployment in agriculture as well as on agricultural output. Factors influencing the differing degrees of success of the program will be examined, and the conclusions drawn from the study will serve as a point of departure for assessing its applicability to other countries -- especially under Title II of P.L. 480 (or its equivalent). John Thomas, formerly CARE representative in East Pakistan and now with the DAS, will be in charge of this study.

(c) Financing Development from Agricultural Savings

Few problems are more pressing in the transformation of an agrarian-based society into an urban, industrialized nation than the right mix of methods by which an agricultural "surplus" is generated and appropriated for general development purposes. Much has been written about appropriate investment strategies, but very little empirical work has been done on the appropriate types of fiscal and monetary policy to carry out the net transfer of resources from agriculture to industry. We propose several longer-run case studies designed to examine the various elements of transferring resources to agriculture (investments, subsidies, etc.) and taking resources from it (taxation, price policy, altering the terms of trade, etc.). One such study will be conducted on Argentina by Richard Mallon, former DAS Project Supervisor who will soon return to Cambridge. In particular, this analysis will examine the pricing policies toward agriculture, and how Argentine agriculture and industry were affected by altering the sectoral terms of trade. Richard Bird, a fiscal specialist and former advisor in Colombia, is also expected to analyze the tax aspects of sectoral resource transfers in several other Latin American countries.

(d) Water Resource Development in West Pakistan

West Pakistan's irrigation program has generated some of the most sophisticated large-scale planning techniques involving water development in the world. To date, the Pakistan studies have concentrated largely on "optimizing" techniques, although a beginning has been made using the simulation approach. However, no attempt has yet been made to use the

Pakistan experience for comparing the usefulness of these two types of planning models in answering basin-wide planning problems, nor have many attempts been made to apply either the optimizing or simulation techniques used in West Pakistan to other regions of the world. Given the magnitude of investments in irrigation projects in many less developed countries, we believe that further work in this field is warranted. This is an especially attractive alternative given the fact that six members of the A.I.D.-supported "Revelle" team on West Pakistan are in the Cambridge area. There is also a high probability that Marinus Maasland, one of Pakistan's leading water development advisors, could be brought to Cambridge for the last portion of the contract period.

(e) Technological Change in Agriculture

As a longer-run study, we plan a cross-country survey of situations and conditions under which a rapid spread of new technology has taken place in agriculture. This proposal was prompted by the spectacular expansion and contribution to growth of private tubewells in West Pakistan, which have already been analyzed by Walter Falcon and Carl Gotsch. Since new technology plays such a key role in the transformation of traditional agricultures, a wider search and documentation of the common characteristics in terms of the knowledge requirements, the necessary changes in cultural practices, the required rates of return, the role of government policy and agencies, etc., could have profound implications for agricultural planning.

(2) Transportation

The proposed work on the transportation sector is another example of the field-Cambridge, theory-policy potential stressed earlier. Two leading quantitative economists who are also scheduled to be field advisors for the DAS, John Meyer and Paul Roberts, have been working for three years under a Brookings (A.I.D.) grant on transportation and economic development. However, for small additional costs, a substantial number of policy and investment-project conclusions can be obtained for specific countries. In no sense, therefore, does this work duplicate earlier efforts, since the proposed studies will apply the general models to two case countries (Pakistan and Colombia) that are of importance to both A.I.D. and the DAS.

In the previous work, macro-economic and transport models were developed to explore the interrelationships between the economy of an underdeveloped nation and its transportation system. In this formulation, the macro-economic portion represents the yearly operation of the over-all economy by means of a national input-output table. Production and consumption are then regionalized considering population, capital investment and regional profitability. The transport sector model determines market areas and the distribution and routing of these commodity flows. It then assigns them to the links of a network representing the transport system which exists, or which is proposed, for the region under study. The consequences to the economy are then fed back to the macro-economic portion so that the interaction can be

accounted for in subsequent time periods. This approach attempts to combine macro-economic planning with fairly detailed simulation of the transport system over multiple time periods so investment plans may be compared and evaluated.

Work to date has focused on model testing and development, with only a minimum of application to Pakistan and Colombia. But even these preliminary tests have highlighted several important relationships. We now propose to evaluate these models for actual policy-making purposes in less developed countries. In particular, the intention is to:

- (a) Further calibrate the transport models for Colombian and Pakistan conditions,
- (b) Use the models to investigate long-term regional effects of following alternative transport investment policies in the two countries, and perhaps a third country to be selected later.

Given the theoretical and computer work already completed and the DAS entree into the planning and transportation agencies of these countries, real possibilities exist for making a significant advance in the science and practice of transportation planning.

### (3) Education and Manpower

Three series of studies are planned initially for the educational sector under the general supervision of Samuel Bowles, a member of the Quantitative Research Project who has had field experience in Nigeria and with the DAS project in Greece.

(a) The focus of work in the early part of the contract period will be on the modification and further development of planning tools for the educational sector. An optimizing model for resource allocation in education has been constructed and successfully applied to a number of concrete policy issues in Nigerian education. This model is being further developed through continued experimentation with the Nigerian case and with a new application to the educational system of Greece. On the basis of this and other work, Bowles is preparing a book on the economics of educational planning. In addition, opportunities exist for extending further this approach, and depending on additional staff availability, this work may continue on Liberia and one or two other African countries.

(b) One of the major problems in educational planning arises from the primitive state of the conceptual tools and empirical understanding of the educational production process. A study has been initiated to explore the problems of estimating and using educational production functions. We expect that the application of economic concepts to determine the efficiency of educational production processes will help to clarify a number of conceptual issues of general interest to educators and economists interested in the economic problems of the less developed countries.

(c) Subsequent studies will include empirical and theoretical analyses of the contribution of education to economic growth, and studies on the effects of the obsolescence of educational skills on the rate and timing of development.

B. STUDIES OF RESOURCE ALLOCATION AND STRUCTURAL CHANGE

One of the central problems of development policy is the allocation of investment and other resources among sectors and projects. A comprehensive analysis of the effectiveness of resource allocation must cover the whole economy and distinguish the interrelations among sectors in some detail. For planning purposes, various forms of interindustry analysis are most appropriate for this type of study. Various types of comparative study are also useful in understanding the effectiveness of resource allocation -- including the use of foreign assistance -- in the past.

Considerable work has been done at Harvard in developing techniques of interindustry analysis and in applying them to developing countries. In the past year or two, members of the Quantitative Research Project and the DAS have worked on the application of such methods in Pakistan, Israel, Nigeria, Argentina and Korea. In addition, we have been engaged in several comparative studies of structural change using a variety of other quantitative techniques.

For the future, we <sup>plan</sup> ~~plan~~ to conduct economy-wide analyses of several countries in order to evaluate the effectiveness of resource allocation and aid utilization in the past, and to develop better planning methods for the future. The central feature of this program is a series of comparative studies of countries which have received substantial amounts of aid and in which the results of development programs can be evaluated

Studies are under way or planned for Pakistan, India, Korea and Greece. Over the next several years we expect to carry out several comparisons of countries having sufficient similarities in their points of departure: India-Pakistan, Turkey-Greece, and later two or three Latin American countries. These country studies have the added advantage of providing a broader framework for the sector studies outlined above.

In addition to the country-wide studies of resource allocation, we plan to carry out several narrower statistical comparisons of the structure of production and trade in a large number of developing countries. These help to determine the extent to which our findings for individual countries are representative and to suggest hypotheses for more detailed analysis in a country framework.

(1) Intersectoral Analyses and Comparisons

(a) Pakistan

Pakistan will continue to be a major country for study, thereby taking advantage of previous research work and the longstanding involvement of the DAS in that country. In addition to the sectoral studies previously described, further extensions of intersectoral analyses begun by Tims and Conrad are very promising. As suggested in a recent A.I.D. review, one of the most pressing needs is to incorporate a regional dimension into the Pakistan planning model. Wouter Tims and Willem Bussinck will soon return to Cambridge where they expect to complete additional studies using newly developed regional input-output tables. Joseph Stern will also be engaged in the regional analysis, with a particular emphasis on the policies

that will be required to meet long-term growth objectives and yet reduce the income disparity between East Pakistan and West Pakistan. Further work will also be done to develop more refined procedures for estimating consistent import targets for Pakistan under varying aid levels.

(b) India

While we do not plan such extensive work on India as on Pakistan, several hypotheses derived from Pakistan experience can be tested in India in collaboration with specialists on that country. One comparative assessment of the development performance of the two countries has already been completed by Professor Edward Mason ("Economic Development in India and Pakistan"). Another proposed comparison of agricultural performance in the two countries has been discussed above. We also plan to carry out further comparisons of industrialization, import and export performance and other structural features of the two economies and their recent development. These studies will be under the general supervision of Edward Mason, who has been a long-time consultant in both countries.

(c) Korea

Korea is a striking example of a country in which AID has played an important role during the last 15 years. Since Korea also has several parallels with the Pakistan experience previously described, it should provide an interesting comparison to the conclusions for that country. David Cole is now describing the process of formulating and implementing a 40-sector planning model for Korea. He will then be working on applications of the model to current planning problems in Korea. Cole will

collaborate with others in transforming the existing projection model into an optimizing model. This formulation will then be used to test alternative patterns of import substitution, especially in decreasing cost industries such as steel and petrochemicals.

A second facet of the work on Korea will be an analysis of the key role of exports, especially manufactures, in stimulating the growth of the economy and in aiding the process of financial stabilization. Finally, new Korean data on industrial structure and investment costs offer an opportunity for additional work on both inter-sectoral analyses for Korea and comparative analyses with other countries. Continuing efforts are being made to improve and expand such information under an AID contract with the Bureau of Standards. These in turn will permit further analytical work in Cambridge, which should be of use both to the Korean Planners and to the AID Mission in Korea.

(d) Greece and Turkey

As two of the earliest and largest recipients of U.S. economic assistance, Greece and Turkey present a favorable opportunity for a comparative study of a development process relying heavily on external assistance. The Adelman-Chenery study ("Foreign Assistance and Economic Development: The Case of Greece") and the work of the Center of Planning and Economic Research in Athens suggest a number of hypotheses which also could be explored for Turkey. The Development Advisory Service has recently accepted a commitment to provide advisors to the Athens Center and will be in a position to do continuing research

in both Cambridge and Athens. A recent study by Samuel Bowles ("Sources of Growth in the Greek Economy, 1951-1961") growing out of the DAS-Athens contract is indicative of the type of work that should be possible in the future.

Our future plans envision comparative quantitative analysis of the relations between development policies and aid utilization in the two countries, with particular attention to balance of payments policies and investment allocation. Once financing for this work is available, we will seek an economist with field experience in Turkey to design and carry out the Turkish part of this analysis. The end results should be to identify key similarities and differences in the experiences of the two countries which will both be helpful to AID planning in Turkey and in broader comparisons of development strategy.

The studies will be under the general supervision of Hollis Chenery, who has had considerable contact with both countries over the past fifteen years.

(e) Latin America

The growing experiment of the Development Advisory Service in Latin America and the interests of several other members of the Center in this region suggest the possibility of further comparative studies of resource allocation in this region at some time in the future. A number of structural problems, such as the relation of trade policy to development, are common to this area and the Asian countries which we plan to study. A comparative analysis of Colombia, Brazil and Chile would be particularly attractive as improved data become available; however, we suggest that the specific selection of countries be

deferred and be placed on a "mutually agreeable" basis.

(2) Industrialization and Structural Change

Since the projection of sectoral output and investment forms the core of a development program, generalizations as to the uniformity of the productive structure in relation to income level and other general characteristics are of considerable value for planning. We plan to continue our work on the "Patterns" approach to the analysis of resource allocation and structural change described in Section II. Parallel studies are planned to analyze structural changes in agriculture and industry, both over time and by comparisons among countries. Preliminary analyses by Chenery and Taylor show considerable similarities in the time-series and cross-country relationships in both agriculture and industry. Deviations from the average patterns of change suggest differences in development policy which may be worth more intensive study.

Further work in this field will utilize disaggregated data on both agriculture and industry for the post-war period which will shortly become available from the United Nations. The analyses will be directed by Chenery and Falcon.

C. COMPARATIVE ANALYSES OF DEVELOPMENT POLICY

One of the principal aims of policy-oriented research is to produce empirical generalizations or analytical techniques that will be applicable to a large number of countries. Many of the results of sector and country studies should be tested in a larger sample of countries before being recommended for

policy application. In addition, there are other problems that can best be studied initially in a comparative framework in order to determine the similarities and differences among underdeveloped economies.

(1) Foreign Assistance Policies

Several members of the Center for International Affairs have been involved in the administration of bilateral and multi-lateral aid programs as well as doing research on aid effectiveness. Our past work in this field is indicated in Section 1 and Annexes A and B. For the future, we plan three investigations of the design and effectiveness of aid policies.

(a) Functions and Effectiveness of Aid in Accelerating Growth

Previous work has suggested several hypotheses as to the role of aid in bringing about a transition to sustained growth. Some assessment of this role has been made by estimating alternative patterns of development, both past and future, for Greece, Israel, Pakistan and several other countries. We wish to broaden our understanding of this process by undertaking additional studies in a comparative framework of countries where significant amounts of foreign assistance have been provided. This will be an important aspect of the Korean study outlined above. Current work by Chenery and Eckstein on development alternatives in Latin America is providing additional suggestions for a more general treatment of the role of aid in development models. Future analyses will be under the general supervision of Hollis Chenery.

(b) Aid as a Means of Inducing Change

Increasing attention is being paid to the indirect effects of aid and its use as an instrument for bringing about changes in economic and social structure and institutions. Lester Gordon is engaged in analyzing foreign assistance as a device for inducing such change. His work consists of analyzing the various elements of the aid transaction which affect the possibilities and limits of inducing change. These elements include, not only the substance of the changes sought and the political and economic context within which they operate, but also the timing, form and manners of the negotiating process. A distinction is made between direct and indirect influence, and aid is viewed as a bargaining process which is analyzed in terms of the typical elements of that mechanism.

(c) Utilization of Food Aid

The present conditions of limited food and feedgrain stocks require new and different programming criteria for both the giving and receiving of P.L. 480 commodities. Questions such as how much the U.S. should increase domestic production to handle food aid requirements, the substitutability of food aid for other types of assistance (or vice versa), and the effect of P.L. 480 on recipient countries are critically important. It is expected that work on this project would be undertaken by several Center staff members in Cambridge (e.g., Walter Falcon, Carl Gotsch, Lester Gordon), in collaboration with several members of the Program Coordination staff of AID.

(2) Trade Policies

The study of trade policies is closely related to the comparative study of the role of external assistance, since the effectiveness of the latter depends in large part on the adjustments in the external sector of the economy.

(a) Trade Liberalization

One response which has been advocated by aid agencies and attempted in a few countries is import liberalization combined with the institution of more uniform tariffs. We propose to study various aspects of this problem in Pakistan, India, Korea, Colombia and Argentina.

Pakistan's internal and external trade liberalization program during the first half of this decade will be examined by Richard Gilbert, Wouter Tims, Joseph Stern and Gustav Papanek, all of whom have advised the Government of Pakistan for substantial periods of time. In a similar and comparative study at the Center, Morton Grossman will appraise India's recent trade and exchange liberalization programs. Korea's import liberalization and export efforts from 1963 to date will be analyzed by David Cole in connection with the country study outlined above. Richard Mallon will also analyze the numerous exchange liberalization efforts of Argentina as a part of his larger analysis of that country. Colombia's devaluation efforts of the early 1960's have already been partially analyzed by Harold Dunkerley ("Exchange Rate Systems and Development in Conditions of Continuing Inflation"), although an opportunity

exists for further fruitful work given the continuing DAS relationship with that country.

(b) Tariff Structure

An important analytical step in formulating a liberalization program consists of determining the existing effective tariff structure. For policy purposes, any generalized estimate of effective tariffs is often of little use. A detailed estimate covering particular commodities or groups of commodities to which action can and should be directed is much more useful. The problem has been discussed by Lewis, Stern and others in the case of Pakistan. Daniel Schydrowsky, a DAS advisor in Argentina, has devised an input-output model which imputes effective tariff rates on a highly disaggregated product basis. Schydrowsky is now experimenting with Argentine data. On his return, he plans to analyze the utility of the method in the Argentine case as a means of gaining greater understanding of the competitive strengths and weaknesses of the country's economy. If the method proves useful for the Argentine case, it will be applied to one or more other countries.

(3) Development Programs and Programming Techniques

Virtually all of the Center personnel involved in this Project have been concerned with either the theory or the practice of formulating development programs. In addition to the study of particular sectors and countries, we propose to make an overall assessment of the use of development programs as a basis for development policy. This will involve a systematic comparison of the development plans of a number of countries

and of their analytical foundations. We then plan to investigate the utility of alternative techniques for program formulation and the relations among economy-wide, sectoral and project analysis.

This study is planned as a synthesis of a number of the sectoral and country studies and will therefore be undertaken during the latter part of the research program. It will involve considerable collaboration among the theoretical and applied economists concerned.

V. PERSONNEL

Many of the key persons involved in the proposed contract have been mentioned briefly in the previous sections. Additional information about the Principal Investigator and other senior staff members is given in Table 1 and Annex C. All of the individuals listed have (or will have) an affiliation with the Center for International Affairs. In addition, eleven have appointments in the Department of Economics.

Several additional aspects of the proposed staffing have a direct bearing on the duration and quality of the proposed research. First, the list includes a number of economists whose return to, or extended stay in, Cambridge is dependent on supplemental financing. Conversations have also been held with a few other senior individuals, but additional commitments are being withheld pending assurances of further financial assistance

Second, if the research project is to attract outstanding individuals who are both scholars and field advisors, it is highly preferable that the research-supporting funding be at least for the 2½ year period requested. Since the field assignments (which are to be separately financed) are usually of 18 months duration, a long-run program is needed if attractive field-Cambridge packages are to be developed. The latter arrangement we regard as one of the main strengths of our proposal.

Table 1.

SENIOR RESEARCH PERSONNEL  
(January 1, 1967 to June 30, 1968 only)

<u>NAME</u>	<u>POSITION</u>	<u>APPROXIMATE PORTION OF SALARY FINANCED BY AID</u>
Walter Falcon (Project Director)	Lecturer in Economics and Director of Research, Development Advisory Service.	50%
Hollis B. Chenery	Professor of Economics and Director, Project for Quantitative Research in Economic Development.	0%
Gustav Papanek	Lecturer in Economics and Acting Director, Development Advisory Service.	25%
Edward Mason	University Professor, and Chairman, Advisory Committee, Development Advisory Service.	0%
John Meyer	Professor of Economics and Research Associate, Center for International Affairs.	25%
Richard Bird	Lecturer in Economics and Research Associate, Center for International Affairs.	25%
Samuel Bowles	Assistant Professor of Economics, and Research Associate, Center for International Affairs.	50%
Willem Bussinck*	Research Associate, Center for International Affairs.#	75%

#Tentative

\*September, 1967 to June, 1968.

## (Table 1 Continued)

David Cole	Research Associate, Center for International Affairs.	75%
Richard Gilbert	Development Advisor, Development Advisory Service.	25%
Lester Gordon	Deputy Director, Development Advisory Service.	25%
Carl Gotsch	Instructor in Economics and Research Associate, Center for International Affairs.	50%
Morton Grossman	Ford Fellow and Research Associate, Center for International Affairs.	0%
David Kendrick	Assistant Professor of Economics and Research Associate, Center for International Affairs.	25%
Marinus Maasland*	Research Associate, Center for International Affairs.#	50%
Richard Mallon*	Development Advisor, Development Advisory Service	50%
Paul Roberts	Lecturer in Economics and Research Associate, Center for International Affairs.	50%
Joseph Stern	Research Fellow, Center for International Affairs.	50%
Daniel Schydrowsky	Instructor in Economics and Research Associate, Center for International Affairs.	50%
John Thomas	Public Service Advisor, and Research Fellow, Center for International Affairs.	25%
Wouter Tims*	Development Advisor, Development Advisory Service.	75%

#Tentative

\*September 1967, to June 1968.

Third, even though the listing in Appendix C is long (in part because most of the individuals are also on the faculty and spend only a portion of their time on research), it does not do complete justice to the resources and personnel that would be available, formally or informally, at Harvard. A number of development specialists at the Center for International Affairs have separate financing, as do a number of other economists in Harvard's Department of Economics (e.g., Raymond Vernon, Albert Hirschman, Henry Rosovsky, Richard Musgrave, Simon Kuznets, J. Kenneth Galbraith, and Wassily Leontief). Moreover, the graduate school has a strong program in economic development and it can be relied upon to supply much of the middle-level manpower required on the various research topics. (For example, in the fall of 1966, more than 60 first-year graduate students were admitted to the Department; over one-third of these expressed an interest in the field of economic development.)

Finally, there are the other research groups at Harvard (such as the International Program in Taxation and the Center on Education and Economic Development) and at other leading Universities in the greater Boston area which make Cambridge an ideal setting in which to complete the proposed research.

VI. BUDGET

The division of senior research personnel among the various projects is shown in Table 2. The distribution is approximately equal for the three main research headings, though it should be emphasized again that the present allocation is tentative and that the eventual division may vary slightly due to unforeseen changes in staff or to the changing scope and nature of the analysis as research proceeds.

The financial budget, shown for each fiscal period in Table 3, has been derived in detail from the individual research studies described previously. The salary expenditures are roughly proportional to the time allocations shown in Table 2. Of the non-salary expenses, "Computation Expenditure" is the largest item. The estimate of computation expenses is based on actual experience over the past 18 months in doing empirical research on sectoral and intersectoral studies -- to which the bulk of the computation expense has been allocated.

Thus for the "average" faculty member who works 50 percent of his time on research, the budget provides annually for about \$8000 in direct salary costs.\* It also provides annually for the associated services of approximately 1/2 research assistant (\$3600), 1/4 secretary (\$1350), and for computational supplies and other expenses of about \$3500. In total, the budget request for the 2 1/2 years is slightly more than \$1 million, inclusive of the Harvard overhead charges.

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\* All salary figures are inclusive of Harvard's mandatory retirement contributions.

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Table 2.

TENTATIVE ALLOCATION OF SENIOR RESEARCH  
PERSONNEL BY PROJECT

	(man years per year)	
	<u>Financed by AID</u>	<u>Total*</u>
A. Sectoral Studies.	(2 7/8)	(3 1/8)
(1) Agriculture.	1 3/8	1 5/8
(2) Transportation.	1	1
(3) Education.	4/8	4/8
B. Resource Allocation and Structural Change.	(3 2/8)	(3 6/8)
(1) Intersectoral Studies.	3	3 3/8
(2) Industrialization and Economic Structure.	2/8	3/8
C. Comparative Analyses of Development Policy.	(1 5/8)	(2 1/8)
(1) Aid Policy.	4/8	5/8
(2) Trade Policy.	5/8	7/8
(3) Development Programs and Programming Techniques.	4/8	5/8

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\*Includes the research time of Hollis Chenery, Edward Mason and Merton Grossman who are separately financed.

Table 3.

PROPOSED BUDGET

	Jan. 1, 1967 to June 30, 1967 (6 months only)		July 1, 1967 to June 30, 1968		July 1, 1968 to June 30, 1969		TOTAL	
	Man Yrs.	\$	Man Yrs.	\$	Man Yrs.	\$	Man Yrs.	\$
<b>SALARIES (Incl. Retirement)*</b>								
Research Staff	3.0#	44,500	10.5	167,500	11.5	187,000	25.0	399,000
Research Assistants	4.3	34,000	9.0	62,000	9.0	62,000	22.3	158,000
Secretaries	2.6	14,000	4.7	25,500	5.5	29,500	12.8	69,000
<b>NON-EXPENSE EQUIPMENT **</b>		3,125		--		--		3,125
<b>COMPUTATION EXPENSES</b>		30,000		50,000		50,000		130,000
<b>TRAVEL AND SUBSISTENCE</b>		2,000		5,000		5,000		12,000
<b>OTHER DIRECT COSTS</b>		6,100		11,300		11,300		28,700
Materials, Supplies, Stationery		1,500		3,000		3,000		7,500
Telephone and Telegraph		1,200		2,000		2,000		5,200
Postage and Freight		1,000		1,500		1,500		4,000
Research Material Acquisitions		400		800		800		2,000
Service Purchased		1,000		2,000		2,000		5,000
Rental Equipment		1,000		2,000		2,000		5,000
<b>SUBTOTAL</b>		\$133,725		\$321,300		\$344,800		\$799,825
<b>HARVARD OVERHEAD @ 27%</b>		36,106		86,751		93,096		215,953
<b>TOTAL</b>		\$169,831		\$408,051		\$437,896		\$1,015,778

# Implies Annual Rate of 6.0 man years/year.

\* Average Salary per man year (incl. Retirement)

Research Staff	\$16,000
Research Assistants	7,200
Secretaries	5,400

\*\* 2 Calculators \$800  
2 Typewriters 700  
5 Desks 750

5 Bookcases \$250  
5 File Cabinets 375  
5 Desk Chairs 250  
\$3,125

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ANNEX A

CENTER FOR INTERNATIONAL AFFAIRS  
PROJECT FOR QUANTITATIVE RESEARCH IN ECONOMIC DEVELOPMENT

The Project for Quantitative Research in Economic Development was organized in the Fall of 1965 by five members of the Department of Economics under the leadership of Hollis Chenery. Its primary objective is to provide a better empirical basis for development policy in underdeveloped countries. To this end, the group conducts several kinds of research:

- (1) Econometric studies of the structure and growth of individual countries (Examples are given in items 5, 6, 8, 11, 17, 18, 20, 22 of the attached list of project memoranda).
- (2) Comparative studies of production, trade, savings behavior, and other structural features relevant to development planning (items 9, 13, 15).
- (3) Construction and testing of planning models for individual countries (items 1, 2, 3, 14, 21, 23).
- (4) Explorations of the applicability of new techniques for use in development programming (items 4, 10, 16).

The work completed to date is representative of the type of study which is intended to be carried out for the next several years.

Although the focus of the project is on the application of the quantitative approach of modern economics to problems of underdeveloped countries, close contact is maintained with economists working with more traditional methods and in particular with the policy-oriented group in the Development Advisory Service.

The Quantitative Project's major aim is to develop a research facility largely oriented toward the practical problems of the policy maker rather than toward the more traditional concerns of academic research.

The total staff of the Quantitative Project is currently about 25 persons, including seven members of the Department of Economics and Center for International Affairs and eight doctoral candidates and post-doctoral fellows doing independent research. Close contacts are maintained with other research groups in the United States and abroad having similar interests. Financial support for the Project has been provided primarily by the Ford Foundation (through a grant to the Center for International Affairs) and the Agency for International Development.

In addition to their own research, several members of the Project conduct a Workshop in Quantitative Analysis of Underdeveloped Countries which trains graduate students for work in this field. Members of the Project also act as consultants on development problems to a number of international organizations and governmental bodies.

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ANNEX A.

CENTER FOR INTERNATIONAL AFFAIRS -  
PROJECT FOR QUANTITATIVE RESEARCH.

Publications and Research Memoranda.

- # 1. Hollis B. Chenery, "The Process of Industrialization", Paper presented to the Econometric Society, Rome, September 1965.
- # 2. Samuel Bowles, "A Planning Model for the Efficient Allocation of Resources in Education", Paper presented to the American Economics Association Meeting, December 1965. Revised version, April 1966.
- # 3. Michael Bruno, "A Programming Model for Israel", Presented at the Conference on The Theory and Design of Economic Development sponsored by the Center for Agricultural and Economic Development, Iowa State University, Ames, Iowa. November 1965. Published in I. Adelman and E. Thorbecke (eds.) The Theory and Practice of Economic Development, Johns Hopkins Press, September 1966.
- #\* 4. Hollis B. Chenery and Arthur MacEwan, "Optimal Patterns of Growth and Aid: The Case of Pakistan". Presented at the Conference on The Theory and Design of Economic Development sponsored by the Center for Agricultural and Economic Development, Iowa State University, Ames, Iowa. November 1965. Published in Pakistan Development Review, Summer 1966. Published in I. Adelman and E. Thorbecke (eds.) The Theory and Practice of Economic Development, Johns Hopkins Press, September 1966.
- \* 5. Stephen R. Lewis, Jr. and R. Mushtaq Hussain, "Relative Price Changes and Industrialization in Pakistan, 1951-1964", Published in the Pakistan Development Review, Summer 1966.
- \*+ 6. Walter P. Falcon and Carl H. Gotsch, "Agricultural Development in Pakistan: Lessons from the Second-Plan Period", To be published in the Bellagio Conference Proceedings, Spring 1967.

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- \*+ 7. Alfred H. Conrad and Wouter Tims, "Setting Investment Priorities for Pakistan". Presented at the Bellagio Conference, Development Advisory Service, June 1966.
- # 8. I. Adelman and Hollis B. Chenery, "Foreign Aid and Economic Development: The Case of Greece". Published in the Review of Economics and Statistics, February 1966.
- #\* 9. Hollis B. Chenery and Alan Strout, "Foreign Assistance and Economic Development", American Economic Review, September 1966.
- # 10. Michael Bruno, "The Optimal Selection of Export-Promoting and Import-Substituting Projects", United Nations. To be published in volume on the Planning of the External Sector, Fall 1966.
- \*+ 11. Walter P. Falcon and Carl H. Gotsch, "Economic Rationality: A Case Study of Farmer Decision Making in West Pakistan". To be published in Pakistan Volume being edited by Gustav Papanek, Spring 1967.
- #\* 12. Hollis B. Chenery, "The Effectiveness of Foreign Assistance" Presented at the University of Cambridge Conference on "How to Make Aid More Effective through Co-operation". September 1966.
- \* 13. Luis Landau, "Determinants of Savings in Latin America", July 1966.
- # 14. Michael Bruno, "Optimal Patterns of Trade and Development" To be published in Review of Economics and Statistics, Fall 1966.
- # 15. Hollis B. Chenery and Lance Taylor, "Intercountry and Intertemporal Patterns of Industrial Growth", Presented to U.N. Conference, Copenhagen, Denmark, August 1966.
- # 16. Hollis B. Chenery and Larry Westphal, "Economies of Scale and Investment Over Time", Presented at International Economics Association Conference, Biarritz, France. September 1966.

- \* 17. Jaleel Ahmad, "Import Substitution and Structural Change in Indian Manufacturing Industry, 1950-1966", September 1966.
- \* 18. Stephen R. Lewis, Jr., and William Steele, "Procedures for Processing Tariff Data", September 1966.
- \* 19. Hollis B. Chenery, "Structural Imbalance and Future Development in Latin America", October 1966.
- \* 20. Stephen R. Lewis, Jr., and Stephen Guisinger, "Measuring Protection in a Developing Country: A Case Study of Pakistan" October 1966.
- +\* 21. Alfred H. Conrad, "Ecometric Models in Development Planning", To be published in the Bellagio Conference Proceedings, Spring 1967.
- \* 22. Stephen R. Lewis, Jr., Economic Policy and Industrial Growth in Pakistan, to be published in 1967, by Allen and Unwin, Inc.
- \* 23. Hollis B. Chenery, "Toward a More Effective Alliance for Progress", October 1966, with Annex "Alternative Projections of Latin American Growth and Capital Requirements 1966-1976", by Peter Eckstein.
- \* 24. Benjamin I. Cohen, "The Less Developed Countries' Exports of Primary Products", May 1966.
- \* 25. Benjamin I. Cohen, "The Sensitivity of Input-Output Results to Errors in the Coefficients", June 1966.
- \* 26. Stephen R. Lewis, Jr., "On a Measurable Model of "Successful" Import Substitution, May 1966.

\* Research supported completely or in part, by the Project for Quantitative Research in Economic Development: A.I.D. financing.

# Research supported by the Project for Quantitative Research in Economic Development: Center for International Affairs financing.

+ Research supported by the Development Advisory Service.

ANNEX B.

CENTER FOR INTERNATIONAL AFFAIRS  
DEVELOPMENT ADVISORY SERVICE

In May 1962, Harvard University placed the advisory work initiated by Professor Edward S. Mason on a continuing basis and gave it an institutional home by creating a Development Advisory Service within its Center for International Affairs.

Acting on the invitation of foreign governments and other foreign institutions, the Service provides advice and assistance in training and research, and on problems of economic development. It is designed to fulfill three purposes:

- (1) It responds to the needs of foreign governments and institutions concerned with economic development;
- (2) It expands the supply of interested and trained professionals in economic development from the advanced countries by providing firsthand experience in the developing nations; and
- (3) It draws from such firsthand experience insights and materials needed to enrich teaching and research at Harvard and elsewhere on problems of economic development.

The bulk of the economic advisers attached to the Service's overseas groups are recruited from a number of advanced countries for specific periods of service, usually eighteen months to two years. They normally work as fully integrated members of the government or institutions to which they are attached. A small

number of the overseas advisors also serve as members of a permanent corps who are rotated between field assignments and Harvard University

At the present time, the Advisory Service is engaged in six projects and is contemplating one or two more. A group of advisers remains actively associated with the Planning Commission at the Center, and in each of the Wings in Pakistan; another group is in its second year of assistance to the National Planning Agency in Liberia; still another is engaged with the National Development Council in Argentina; a fourth is completing four years of similar work with the National Planning Department and Finance Ministry in Colombia; and the fifth and sixth are beginning multi-year programs of assistance in economic and administrative planning with the Government of Malaysia, and in economic planning with the Government of Greece.

The director of the Development Advisory Service is Gustav F. Papanek, who joined the Harvard Faculty in 1958 after four years of service with the Pakistan advisory group, and who served as deputy director of the Advisory Service until February, 1965. The deputy director is Lester E. Gordon, who served for some years as deputy assistant administrator for program at A.I.D. before joining the Center for International Affairs.

BIBLIOGRAPHY OF PUBLICATIONS WRITTEN AS A RESULT OF DAS EXPERIENCE

Published by June 30, 1966.

- Baldwin, George. "The Foreign-Educated Iranian: A Profile". The Middle East Journal, Summer 1963.
- "Iran's Experience with Manpower Planning: Concepts, Techniques and Lesson". In Harbison, Frederick, and Myers, Charles A., Manpower and Education. New York: McGraw Hill Book Company, 1965.
- "What Price Domestic Industry?" Finance and Development (The Fund and Bank Review), March 1966.
- Bell, David. "Allocating Development Resources: Some Observations Based on Pakistan Experience". In Public Policy, A Yearbook of the Graduate School of Public Administration, Harvard University, 1959.
- Bergan, Asbjørn. "Measurement of Structural Change in the Pakistan Economy: A Review of the National Income Estimates 1949-50 to 1963/64". Pakistan Development Review, Summer 1966. (with T.M.Khan)
- Chantler, P.V. Planning in Pakistan. London: Political and Economic Planning, April 1959.
- Curle, C.T.W. Planning for Education in Pakistan. Cambridge: Harvard University Press, 1966.
- Eddison, John C. "Industrial Growth and Urban Land Requirements in East Pakistan". Pakistan Development Review, Winter 1963.
- Falcon, Walter P. "Some Comments on the Real Effects of Foreign Surplus Disposal in Underdeveloped Economies". Quarterly Journal of Economics, May 1963.
- "Farmer Response to Price in a Subsistence Economy: The Case of West Pakistan". American Economic Review, May 1964.
- "The Role of Agricultural Diversification in the Development of West Pakistan", and "Prospects in Sind", contributions to the White House--Interior Panel Report (the "Revelle Report") on Land and Water Development in the Indus Plain, January 1964.
- 44

Gilbert, Richard V. "The ~~Works~~ Programme in East Pakistan", International Labour Review, March 1964.

Gittinger, J. Price. Planning for Agricultural Development: The Iranian Experience. Washington: Center for Development Planning, National Planning Association, 1965.

The End of an Affair: The Impact of Planning on Subsequent Agricultural Policy Formulation in Iran, Washington: Center for Development Planning, National Planning Association, 1965.

Kristjanson, B.H. "The ~~Ag~~rarian-Based Development of Iran". Land Economics, February 1960.

Mallon, Richard D. "Export Policy in Pakistan". Pakistan Development Review, Spring 1966.

Olsen, R. Bjørn and Rasmussen, P. Nørregaard. "An Attempt at Planning in a Traditional State: Iran". In Hagen, Everett, Planning Economic Development. Homewood, Richard D. Irwin, Inc.

Papanek, Gustav F. "Industrial Production and Investment in Pakistan". Pakistan Development Review, Autumn 1964.

"The Use of Accounting Prices in Planning" in Organization, Planning and Programming for Economic Development: Vol. VII of U.S. Papers prepared for the U.N. Conference on the Application of Science and Technology for the Benefit of the Less Developed Areas (Government Printing Office), 1963.

"The Development of Entrepreneurship", American Economic Review, Proceedings Issue, May 1962.

A Plan for Planning, Occasional Paper No. 1, Center for International Affairs, Harvard University, July 1961.

"Framing a Development Program", International Conciliation, Carnegie Endowment for International Peace, March 1960.

Estructuración de un Programa Económico Para Países en Desarrollo, Mexico, 1963 (Spanish translation) in Bird and Oldman's Readings on Taxation in Developing Countries, Johns Hopkins Press, 1964. (Excerpt)

"The Location of Economic Policy Decisions in Pakistan". Public Policy, Yearbook of the Graduate School of Public Administration, Harvard University, 1959.

Comment on Stephen Lewis and Ronald Soligo, "Growth and Structural Change in Pakistan's Manufacturing Industry", Pakistan Development Review, Winter 1965.

Comment on Ronald Soligo and Joseph Stern, "Tariff Protection, Import Substitution and Investment Efficiency," Pakistan Development Review, Spring 1966.

Pakistan: The Development Miracle. A speech delivered in New York on May 4, 1965 under the joint auspices of the Pakistani-American Chamber of Commerce, Inc., and the Asia Society. Published by the Embassy of Pakistan, Washington

Pakistan: Miracle du Developpement. (French translation)

Pakistan: Growth in the Mixed Economy. Paper read at the Conference of Planning and Growth Under a Mixed Economy, held in Istanbul, Turkey, August 22 to September 4, 1965. Published by the Embassy of Pakistan, Washington.

Sheahan, John B. "El Desarrollo de la Produccion de Bienes de Capital en Colombia" Revista del Banco de la Republica, June 1965.

Shorter, F.C. "Foodgrain Policy in East Pakistan". Public Policy, IX. Yearbook of the Graduate School of Public Administration, Harvard University, 1959.

"Planning Procedures in Pakistan", Pakistan Development Review, Autumn 1961.

Snyder, J. Herbert. "Problems and Possibilities in Planning for Agricultural Development" Economic Development and Cultural Change, January 1964.

Stern, Joseph J. "Tariff Protection, Import Substitution and Investment Efficiency". Pakistan Development Review, Summer 1965. (with Ronald Soligo)

Reply to a comment by G.F.Papanek, on "Tariff Protection, Import Substitution and Investment Efficiency," Pakistan Development Review, Spring 1966. (with Ronald Soligo)

"Some Comments on the Export Bonus, Export Promotion and Investment Criteria". Pakistan Development Review, Spring 1966. (with Ronald Soligo)

-B6-

Tims, Wouter. "Input-Output Relationships in Pakistan",  
Pakistan Development Review, Autumn 1965.

Wilcox, Clair. "Pakistan". In Hagen, Everett, Planning Economic  
Development. Homewood: Richard D. Irwin, Inc., 1963.

Research Papers Presented by Current and Former  
DAS Advisors at the Bellagio Conference, June 1966.

1. Falcon, Walter P., and Gotsch, Carl H., "Agricultural Development in Pakistan: Lessons from the Second-Plan Period".
2. Conrad, Alfred H., and Tims, Wouter, "Setting Investment Priorities for Pakistan".
3. Felix, David, "Beyond Import Substitution: A Latin American Dilemma (Argentina)".
4. Schydrowsky, Daniel, Comment on "Beyond Import Substitution: A Latin American Dilemma by David Felix".
5. Freire, Remy, "Price Incentives for Argentina Agriculture".
6. Mallon, Richard, "Exchange Policy: Argentina".
7. Maynard, Geoffrey, and Van Rijckeghem, Willy, "Stabilization Policy in an Inflationary Economy: Argentina".
8. Van Rijckeghem, Willy, and Aldabe, Hernan, "The Use of Simulation for Forecasting Changes in the Argentine Cattle Stock".
9. Bird, Richard M., "Sales Taxation in Colombia: Tax Reform and Development Planning".
10. Dunkerly, Harold, "Exchange Rate Systems and Development in Conditions of Continuing Inflation".
11. Sheahan, John, "Imports, Investment and Growth: Colombian Experience since 1950".
12. Delaplaine, John, "The Structure of Growth in Colombia and Argentina".

13. Berg, Elliot, and Pogson, Robert, "Defining a Strategy for Planning -- The Liberian Experience".
14. Weckstein, Richard, "Wages and Labor Scarcity: Liberia".
15. Hollinger, William C., "The Planners and the Projects".
16. Tims, Wluter, "A Growth Model for Pakistan and Its Application".
17. Wellisz, Stanislaw, "Physical Planning and Economic Development in Pakistan".
18. Conrad, Alfred H., "Econometric Models in Development Planning".
19. Vernon, Raymond, "The Meaning of D.A.S. Experience for Development Theory".

ANNEX C.

BIBLIOGRAPHIC DATA OF SENIOR RESEARCH PERSONNEL

HOLLIS CHENERY

Present position: Director, Project for Quantitative Research  
in Economic Development, and Professor of Economics  
Harvard University.

Previous position: Assistant Administrator for Program Coordination,  
Agency for International Development.

Education: Ph.D. Economics, Harvard.

Major Publications:

Arabian Oil, America's Stake in the Middle East, with R. Mikesell,  
University of North Carolina Press, 1949.

"Engineering Production Functions", Quarterly Journal of Economics,  
November, 1949.

"Overcapacity and the Acceleration Principle", Econometrica,  
January, 1952.

"The Application of Investment Criteria", Quarterly Journal of  
Economics, February 1953.

"Process and Production Functions from Engineering Data", in  
Leontief and others, Studies in the Structure of the American  
Economy, Oxford University Press, New York, 1953.

The Structure and Growth of the Italian Economy, with P. Clark and  
V. Cao Pinna, U.S. Mutual Security Agency, Rome, 1953.

Turkish Investment and Economic Development, with G. Brandow and  
E. Cohn, U.S. Foreign Operations Administration, Ankara, 1953.  
(Reissued by the International Cooperation Administration, 1961.)

"The Role of Industrialization in Development Programs", American  
Economic Review, May, 1955.

"Interregional and International Input-Output Analysis", in T. Barna  
(ed.), The Structural Interdependence of the Economy, John Wiley,  
New York, 1956.

- "Application of Interindustry Analysis to Problems of Economic Development," in T. Barna (ed.), The Structural Interdependence of the Economy, John Wiley, New York, 1956.
- "Resource Allocation for Economic Development", with K. Kretschmer, Econometrica, October, 1956.
- "Development Policies and Programmes", Economic Bulletin for Latin America, March, 1958.
- "International Comparisons of the Structure of Production", with T. Watanabe, Econometrica, October, 1958.
- "Non-Linear Programming in Economic Development", with H. Uzawa, in Arrow, L. Hurwicz, and H. Uzawa, Studies in Linear and Non-Linear Programming, Stanford University Press, 1958.
- "The Interdependence of Investment Decisions", in Abramovitz, et al., The Allocation of Economic Resources, Stanford University Press, 1959.
- Interindustry Economics, with Paul Clark, John Wiley, New York, 1959. (Spanish edition, 1962; Russian edition, 1964; Turkish edition, 1966)
- "Interindustry Research in Economic Development", American Economic Review, May, 1960.
- "Patterns of Industrial Growth", American Economic Review, September, 1960.
- "Capital-Labor Substitution and Economic Efficiency," with K. Arrow, B. Minhas, and R. Solow, Review of Economics and Statistics, August, 1961.
- "Comparative Advantage and Development Policy", American Economic Review, March, 1961.
- "The Pattern of Japanese Growth, 1914-1954", with S. Shishido and T. Watanabe, Econometrica, January, 1962.

-C 3 -

- "Development Alternatives in an Open Economy: The Case of Israel", with M. Bruno, Economic Journal, March, 1962.
- "Development Policies for Southern Italy", Quarterly Journal of Economics, November, 1962.
- "Foreign Assistance and Development Planning", in Capital Formation and Investment in Industry, Economic and Social Studies Conference Board, Istanbul, Turkey, 1963.
- "The Use of Interindustry Analysis in Development Programming", in T. Barna (ed.), Structural Interdependence and Economic Development, MacMillan and Company, Ltd., London, 1963.
- "The Role of Foreign Aid in Middle Eastern Development", with C. T. Morris, in W. R. Polk (ed.), The Development Revolution, Middle East Institute, Washington, D.C., 1963.
- "Objectives and Criteria for Foreign Assistance", in R. A. Goodwin (ed.), Why Foreign Aid?, Rand McNally, Chicago, 1963.
- "Land: The Effects of Resources on Economic Growth", in K. Berrill (ed.), Economic Development with Special Reference to East Asia, St. Martin's, New York, 1964.
- "Approaches to Development Planning", in E.A.G. Robinson (ed.), Problems in Economic Development, Proceedings of a Conference held by the International Economic Association, St. Martin's Press 1965.
- "The Process of Industrialization", World Congress of the Econometric Society, Rome, Italy, 1965.
- "Foreign Assistance and Economic Development", with A.M. Strout, American Economic Review, September, 1966.
- "Foreign Aid and Economic Development: The Case of Greece", with I. Adelman, Review of Economics and Statistics, February, 1966.

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-C 4 -

"The Effectiveness of Foreign Assistance", Round Table Conference on Capital Movements and Economic Development, 1965, Washington, D.C. (Published in Mexico in El Trimestre Economico, April-June, 1966).

"Optimal Patterns of Growth and Aid: The Case of Pakistan", with A. MacEwan, Pakistan Development Review, Summer, 1966.

GUSTAV PAPANEK

Present position: Acting Director, Development Advisory Service, and Lecturer, Department of Economics, Harvard.

Previous position: Deputy Director, Development Advisory Service.

Education: A.M. and Ph.D., Economics, Harvard.

Major Publications:

Social Goals and Private Incentives in Pakistan's Development, Harvard University Press, Spring, 1967 (forthcoming).

"Industrial Production and Investment in Pakistan", The Pakistan Development Review, Autumn, 1964.

Framing A Development Program, International Conciliation, Carnegie Endowment for International Peace, March, 1960. Reprinted by the Center for International Affairs, June, 1963.

"The Use of Accounting Prices in Planning", in Organization, Planning and Programming for Economic Development: Vol. VII of U.S. papers prepared for the U.N. Conference on the Application of Science and Technology for the Benefit of the Less-Developed Area, (Government Printing Office), 1963.

"The Development of Entrepreneurship" The American Economic Review, Proceedings Issue, May 1962.

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Major Publications:

"Farmer Response to Price in a Subsistence Economy: The Case of West Pakistan", American Economic Review, May, 1964.

"The Role of Agricultural Diversification in the Development of West Pakistan", and "Prospects in Sind", contributions to the White House - Interior Panel Report (the "Revelle Report") on Land and Water Development in the Indus Plain, January, 1964.

"A Strategy for Increased Agricultural Growth During the Third Plan Period", Pakistan Planning Commission, October, 1964, (with Carl Gotsch).

"Consistency of U.S. Policy Towards P.L. 480, with Special Reference to Pakistan", Pakistan Planning Commission, March, 1965.

"Price Response, Economic Rationality and the Allocation of Water: A Case Study of Farmer Decision Making in West Pakistan", (forthcoming essay with Carl Gotsch for Pakistan volume being edited by G. F. Papanek).

"Agricultural Development in Pakistan: Lessons from the Second-Plan Period", To be published in the Bellagio Conference Proceedings, Spring, 1967.

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**Major Publications:**

(Senior Editor) Readings in Economics, Irwin, 1957. (Revised edition, 1961).

(Co-editor) Towards a Self-Reliant Economy, 1961, Government of India

"Balance of Payments Planning", ECAFE, Technical Paper, 1962.

Several technical studies for the Planning Commission and Government of India including:

"Taxation, Inflation and Sectoral Balance of Payments Problems", 1963.

"Agricultural Price Policy and Agricultural Development", 1964.

"Balance of Payments Adjustment, Prices and Exchange Rates, 1965.

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**Major Publications:**

Investment Decision: An Empirical Inquiry (with Edwin Kuh) Harvard University Press, 1957.

Economics of Competition in the Transportation Industry (with M.J. Peck, C. Zwick, and J. Stenason), Harvard University Press, 1959.

Investment Decisions, Economic Forecasting and Public Policy (with Robert Glauber) Division of Research, Harvard Graduate School of Business, 1964).

The Economics of Slavery and Other Essays on the Quantitative Study of Economic History (with A. Conrad), Aldine Press, 1965.

The Urban Transportation Problem (with M. Wohl and J. Kain) Harvard University Press, 1965.

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Major Publications:

"The Economic Setting", in Vietnam, the First Five Years, R.W. Lindholm (ed.), East Lansing, M.S.U. Press, 1959.

"Tax Exemption for New Investment in Vietnam", Saigon, M.S.U., Vietnam Advisory Group, 1960.

"Problems of Measuring the Incidence of the Tax System", Taxation and Socio-Economic Growth, (Papers and proceedings of the first seminar of the Joint Legislative-Executive Tax Commission) August 30 to September 1, 1960, Manila.

"The Tools of Monetary Policy in the Philippines", Central Bank News Digest. September 13, 1960.

"The Growth and Financing of Manufacturing in the Philippines", (University of the Philippines, Manila, P.I. 1962).

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Major Publications:

"World Import Trade, 1925-57", Manchester School of Economic and Social Studies.

"Input-Output Relationships in Pakistan", Pakistan Development Review, Autumn, 1965.

"Growth Model for the Pakistan Economy", Pakistan Planning Commission, Karachi. March 1965.

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Major Publications:

"Export Policy in Pakistan", Pakistan Development Review, Spring, 1966.

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Education: M.A. Michigan State. M.P.A.. Harvard.

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**Major Publications:**

- "The CARE Program in Ceylon, Help and Self Help", Department of Probation and Child Care Service, Government of Ceylon, June, 1959.
- "Problems of International Welfare Organizations", The Ceylon Journal of Social Work, 1959.

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**Major Publications:**

- "A Strategy for Increased Agricultural Growth During the Third Plan Period", Pakistan Planning Commission, October, 1964. (with W. P. Falcon).
- "Price Response, Economic Rationality and the Allocation of Water: A Case Study of Farmer Decision Making in West Pakistan", (forthcoming essay with W. P. Falcon in Pakistan volume being edited by G. F. Papanek).
- Agricultural Development in Pakistan: Lessons from the Second Plan Period, to be published in Bellagio Conference Proceedings, Spring, 1967, (with W. P. Falcon).

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Major Publications:

"Tariff Protection, Import Substitution and Investment Efficiency",  
Pakistan Development Review, Summer, 1965 (with R. Soligo).

"Some Comments on Export Bonus, Export Promotion and Investment  
Criteria", Pakistan Development Review, Spring, 1966 (with R. Soligo)

Inter-Industry Relations in East Pakistan, (forthcoming), Monograph  
to be published by the Pakistan Institute of Development Economics,  
Spring, 1967.

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portation Engineering, Northwestern.

Major Publications:

"Digital Terrain Model System, DTM 11 Manual," MDPW, BPR, Research  
Project Report, August, 1960.

"DTM Design System 40K Program Manual", M.I.T. Department of Civil  
Engineering Report R62-7, December, 1961.

"An Evaluation of Techniques for Highway User Cost Computation",  
National Academy of Sciences National Research Council Highway  
Research Board, 1962.

"Highway Location Analysis -- An Example Problem", M.I.T., Department  
of Civil Engineering Report P62-40, December, 1962.

"Toward Optimum Methods of Link Addition to Transportation Networks",  
Department of Civil Engineering, Northwestern University, September,  
1964.

"The Role of Transport in Developing Countries: A Development Planning Model", Harvard Transport Research Program, Discussion Paper No. 40, May, 1966.

"A Vehicle Performance Model for Highways in Developing Countries", Harvard Transport Research Program, Discussion Paper No. 46., October, 1966.

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Major Publications:

Programming Investment in the Process Industries: An Approach to Sectoral Planning, (forthcoming), M.I.T., Press.

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Major publications:

"A Planning Model for the Efficient Allocation of Resources in Education", December, 1965.

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Education: M.S., Soil Physics, Iowa State; M.S., Agricultural Engineering, Wageningen.

Major Publications:

"Theory and measurement of anisotropic air permeability in soil", (with D. Kirkham) Soil Sci. Soc. Am. Proc.

"Measurement of hydraulic conductivity by the auger hole method in anisotropic soil" Soil Sci.

"The Relationship Between Permeability and Discharge, Depth, and Spacing of Tile Drains, Groundwater and Drainage Series", Water Cons. Irr. Comm., N.S.W., Australia.

"Water Table Fluctuations Induced by Intermittent Recharge", Journal of Geophysical Research, 1959.

"Development of Ground Water in the Indus Plains", Proceedings of the West Pakistan Engineering Congress.

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Education: M.A., and Ph.D., Economics, Columbia.

Major Publications:

"A National Tax on the Unimproved Value of Land: The Australian Experience, 1910-52", National Tax Journal, December 1960.

Bibliography on Taxation in Underdeveloped Countries, Harvard Law School International Program in Taxation, 1962.

"The 1964 Budget: Closing the Gap", Quarterly Review of Economics and Business, Spring, 1963.

60

-C 13-

"Countercyclical Variation of Depreciation Allowance in the U.K."  
National Tax Journal, March, 1963.

"Depreciation Allowances and Countercyclical Policy in the U.K.,  
1945-1960", Canadian Tax Journal, May-June and July-August, 1963.

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Education: M.A. and Ph.D., Economics, Harvard.

Major publications:

Tomorrow Without Fear, (with Chester Bowles), 1946.

Economic Program for American Democracy, 1938.

"Inflation and Growth", Joint Economic Committee Report, 1959.

"Controls", Saving American Capitalism (edited by Seymour Harris).

"Inflation", Agricultural Outlook, December, 1942.

"The Works Program in East Pakistan", International Labour Review,  
March 1964.

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Publications: Yearly Reports of Short-term Macro Forecast,  
Central Planning Bureau, Netherlands.

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Major Publications:

"Proyecto de Ley Organica del Banco Central de Reserve del Peru de 1961 - Estudio Analitico-critico", Lima, 1961.

"Foreign Investment and Peruvian National Income, 1900-1960: A First Approximation", Cambridge, 1963.

"The Macroeconomics of Underdeveloped Countries - A Graphical Exploration", Cambridge, 1963.

"Exchange Risk and the Business Enterprise", Berkeley, 1964.

"A Payments Union for Underdeveloped Countries", Cambridge, 1965.

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Major Publications:

Foreign Aid and Foreign Policy, Harper and Row, 1964.

Economic Planning in Underdeveloped Areas, Fordham University Press, 1958.

On the Appropriate Size of a Development Program, Harvard University Center for International Affairs, August 1964.

Promoting Economic Development: The U.S. and Southern Asia,  
Claremont Press, 1955.

Controlling World Trade, Mc-Graw Hill, 1946.

Economic Concentration and the Monopoly Problem, Harvard  
University Press, 1957.

The Corporation in Modern Society, Harvard University Press,  
1961.

Economic Development in India and Pakistan, Harvard University  
Center for International Affairs, September 1966.

"The Role of Government in Economic Development", American  
Economic Review, May 1960.

"Interests, Ideologies and the Problem of Stability and Growth",  
American Economic Review, March 1963.

"Foreign Money We Can't Spend", Atlantic, May 1960.

"Market Power and Business Conduct", American Economic Review,  
May 1956.

"Raw Materials, Rearmament and Economic Development", Quarterly  
Journal of Economics, August, 1952.

"The Doctrine of Comparative Cost", Quarterly Journal of Economics,  
November, 1926.

"Price and Production Policies of Large-Scale Enterprise",  
American Economic Review, March 1939.

"Power Aspects of the Tennessee Valley Authority's Program",  
Quarterly Journal of Economics, May, 1936.