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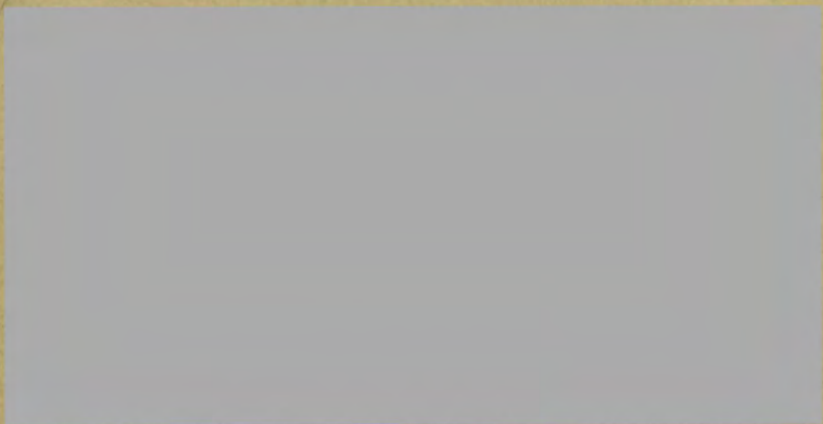
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RIPMAN, Hugh B - ARTICLES and speeches (1955-1967)



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RIPMAN

*Doris*  
Speech - May 10, 1955  
Ripman, Hugh B

Mr. Ripman

May 9, 1955

Jentry Holmes

Suggested Outline: World Touring Organization

*Annual meeting, Washington, D C*

- I. One of the most powerful forces influencing the course of our civilization today is the awakened desire of hundreds of millions of people in the less-developed countries for a better life and the belief that a better life can be had.
- II. Roads relate very distinctly to the efforts of these people. Roads have a meaning for us all; in the developed countries roads are the means to a wide variety of things - business and pleasure. We tend to take them for granted and think in terms of their improvement primarily from a personal viewpoint.

In the less-developed countries of the world, roads are just as meaningful and in some ways more vital because in a country where there are few roads the relation of these roads to the economic life of the individual and of the country is closely tied.

III. The Bank

- A. History and Purposes of Bank
- B. Lending of Bank: Related to basic needs of country

Electric power	\$ 559,000,000
Transportation	543,000,000
Communications	26,000,000
Agriculture and Forestry	203,000,000
Industry	201,000,000
General Development	135,000,000
	<hr/>
	\$2,164,000,000

- C. Roads:
  1. Financing roads
  2. Effects
    - a.) Colombia
    - b.) Nicaragua
    - c.) Ecuador





## APPRAISAL AND SUPERVISION OF PROJECTS

By Hugh B. Ripman  
International Development Association

(Speech given in Taipei in March, 1961)

### Introduction

When Mr. K.T. Li first suggested that I should give a talk on this subject, I had thought that he was going to gather perhaps a dozen or twenty people to listen to me, and so I was rather surprised, and a little taken aback, when I discovered that I would have to speak to an audience much larger than this.

As I look at this large and distinguished group gathered here today, I feel very much aware of my inadequacies. I am sure that there are among you persons who are more familiar than I with every single subject upon which I shall touch in the course of my talk. Perhaps my only distinction may be that I can bring all these different subjects into relation.

In the course of the time available, we cannot review the whole of the experience in the appraisal and supervision of projects gained during the last fifteen years in the work of the World Bank. We were lucky in the Bank, because at the beginning of our operations we had time to sit back and talk about the problems we expected to meet, and to think out the principles we should apply in meeting those problems. At that time we laid down certain principles which have governed our work ever since. We have refined and extended the application of those principles to new circumstances and new types of problems, but the principles themselves are the guiding-lines we use today both in the World Bank, and in its new affiliate, the International Development Association, which has only just commenced operations.

We have, of course, during these fifteen years of work, made many mistakes; but we have tried to learn from our mistakes and not to repeat them. I have no doubt we shall make more mistakes, and have plenty of scope for learning from them, in the future also. We do not pretend to have the last word to say about this work of appraisal and supervision of projects. We can only present to you the fruits of fifteen years' experience in work upon projects of many kinds in a large number of countries.

### Cynicism Necessary

One thing which this experience has taught us is never to take anything for granted. It is prudent to be very cynical in appraising projects. I have known, for instance, countries where the local economists applied the most modern techniques of mathematical analysis to their statistical data, even used computing machines to arrive at their results.



These results appeared to be very precise - until one had questioned the accuracy of the statistical data which the economists had started from, and found that they contained a margin of error of the order of magnitude of twenty percent. It is not much use applying refined statistical techniques to data as unreliable as this. But if one is not sufficiently cynical in his approach, one may be taken in by the apparent precision of the results.

#### Qualifications and Experience Needed

In our work in the World Bank and in the International Development Association we have found it necessary to use the coordinated efforts of men with three different types of professional skill and experience.

In the first place, we use men trained in economics. We use both the long-haired or general type of economist, and the short-haired, or applied type-man who is specialized, for instance, in the economics of electric power, or of transportation or of industry.

The second type of man we use has engineering qualifications. We do not of course carry out the actual engineering of the projects which we finance. Our task is to scrutinize the engineering work that has been done by others and to see that it has been done in a proper way. Since we cannot staff ourselves with specialists in every kind of project which we may be called upon to investigate, we sometimes hire consultants to supplement our permanent staff.

The third kind of specialist we use for appraisal and supervision work we call financial analysts, men who have a general training in accounting and banking and particularly in investment banking.

All these three types of men-economists, engineers and financial men - work in very close contact together. And in the end, after they have been working together for a certain number of years, a new type is produced. I think you know in Taiwan the advantages of cross-fertilization between different types - you have hybrid corn and hybrid hogs. Well, we produce a kind of hybrid investigator in the World Bank and in the International Development Association.

#### A Warning

I am going to speak to you about many aspects of appraisal and supervision. Now my difficulty is this - that if I took any one of these aspects I could talk to you about it for the whole two hours. So I have to compress what I have to say very severely, and of course I can only do this at the expense of precision. I shall have, of necessity, to make many broad generalizations which are not true in every case. So you must understand that I do not wish to lay down the law about anything. The particular circumstances of a given case may justify departure from the general rule.



I shall not be dealing with the peculiar problems characteristic of certain important types of project - for instance, regulated industries like the electric power industry. These regulated industries have their own particular problems, which have exercised us in our work and still continue to exercise us. Nor do I intend to cover the specific problems involved in weighing up the costs and benefits of non-revenue producing projects, such as highway and flood prevention projects. Much of what I shall have to say applies to these types of project, but I have to leave their peculiar and characteristic problems aside for today.

### General Approach to Appraisal

In appraising a project we do not in the World Bank simply take the relatively narrow point of view of a potential creditor. We put ourselves in the situation of management, and therefore do not confine our scrutiny to the project itself, but are interested in all the circumstances surrounding it, the whole economic complex of which the project will form a part. In practice, this means that we investigate six different aspects of the project, namely:

- 1) The economic aspect;
- 2) The technical aspect;
- 3) The managerial aspect;
- 4) The organizational aspect;
- 5) The commercial aspect; and
- 6) The financial aspect.

I am now going to speak to you about each of these aspects in turn.

### The Economic Aspect of Project Appraisal

#### Relative Priorities of Different Types of Project

Let us take first the economic aspect. Before we look at a project at all, some of our economists have already studied the whole economy of the country involved, and formed a conclusion about the relative priorities for development of the different sectors or types of economic activity. In many of the countries in which we work, it is evident that the highest priority should be given to what is called the infrastructure of the economy, the development of the basic services such as transportation and power. Agricultural activities of course rank high in almost every country. Once these sectors have been developed to a certain extent, light industry becomes important. And when light industry has reached a certain level of development, it provides the basis for heavy industry.

Once it has been established that a project is of a type that has a high priority, the question which the economist asks is this: what is the need for the goods and services this particular project is designed to produce? This question must be answered from a broad point of view. One has to investigate not only the potential demand for the goods and services in question, its direct contribution to economic development, but also the indirect benefits that may be expected from it.



### Market Studies

This normally involves a market study, the amplitude of which may vary very much. If one is looking into the economics of a brick factory, for instance, it is obvious that the cost of transportation limits the market area, and so no extensive market survey is needed. But take the case of cameras or transistor radios, where transportation costs are low in relation to the value of the product; one may have to make a much wider market study. Or if, for instance, the project is for the exploitation of a source of iron ore, it may be necessary to look at the whole world market, to form a judgment about the present and prospective future relation of demand to supply, and so to come to a conclusion about the probable future price trends.

The market study may not be confined to one commodity. For instance, in considering the demand for copper, one has to take into account the prospect of competition with other materials like aluminum and plastics, which may be substituted for copper for certain uses.

### Subsidy and Protection

Another aspect of the economic appraisal of projects is the question of subsidy or protection. In principle, it is a mis-direction of investments and a waste of scarce capital resources to create an industry which can only be profitable if it is protected by a large import duty or a quantitative restriction of imports. A very good example of this sort of mis-direction of investment took place in Australia, where a number of industries were created which were not at the time justified on an economic basis.

This is not to say, of course, that a certain amount of protection may not be justified in particular cases. Many of you are no doubt familiar with the classical "infant industry" argument, which makes the case for the protection of an industry in its earlier stages, if there is a true prospect of its being able to stand on its own feet without protection when it is well established.

But in principle, the moment you find that an existing or proposed industry needs a high degree of protection to operate profitably, you have a prima facie case that this industry may not be the right direction, from an economic point, for the investment of scarce capital.

### Relative Scarcity of Factors of Production

Now I come to another factor that the economist has to take into account - the relative scarcity of the factors of production. It may be, for instance, that in certain countries the population has grown or is growing at a faster rate than the opportunities for productive work. Labor in consequence is cheap. Very often in the same countries capital is scarce and its price high. In these circumstances, the creation of an industry which is labor-intensive, which will provide many new jobs, has an economic advantage over the investment of the same amount of money in an industry which is capital-intensive, and which provides far fewer opportunities for new jobs. I have seen in Taiwan, for instance, a plywood factory which is very labor-intensive. For every thousand dollars invested it creates many more new jobs than the same amount of money put for instance into an iron and steel industry or a big chemical plant.



But it is not only labor that can be unemployed. Natural resources may also be lying idle, and in this case it is generally economically advantageous to create an industry that puts these idle resources to use rather than one which depends on imported raw materials, with all the uncertainties that are involved in such dependence.

#### Indirect Benefits

I come to another point. As I said earlier, the investigator has to look at the project in all its relations to other economic activities. This means that indirect benefits to be expected from the project also have to be taken into account. For instance, the establishment of a particular project may give opportunities which did not before exist for the creation of related enterprises, maybe supplying components or raw materials, maybe for further processing its products. For instance, a bicycle industry may be set up, and may give opportunities to make bicycle tires. Or a plastic materials factory may form the basis for many small plastic fabricators.

#### Prestige or Fashionable Projects

One thing the economic investigator has to keep his eye open for is the appeal of certain projects which are regarded as carrying with them a certain prestige, or are simply fashionable.

For instance, a few years ago many countries became interested in nuclear power plants. We even financed one ourselves, which is now under construction in Italy. But today it is turning out that the operating cost of these plants is not likely to have the advantage which was expected over the costs of power plants based on oil, since the discoveries of oil made in recent years, and especially those in the Sahara Desert, have postponed for a long time a rise in the price of oil which was previously thought to be inevitable.

There is a feeling in many of the less developed countries that they are not, so to speak, grown up unless they have their own integrated iron and steel industry. But to establish such an industry without the necessary market for its products is one of the most wasteful possible investments that a developing country could make. We are at the moment dealing with a case like this at the World Bank, where such an iron and steel industry was set up a number of years ago, and set up in circumstances in which it could not have been successful. When we first heard of this steel mill, it could only be kept in operation by continuous government subsidies to cover its financial losses. We are now attempting to find a way to turn this white elephant, which is unusual and expensive but not profitable, into a useful water buffalo, and we hope that we may be successful, but it is a very difficult task.

Now I have two more things to say about the economists' work in appraising projects.



### Effects on Balance of Payments

The first is that we should take into account the effect which the project is expected to have on the balance of payments - either by way of generating exports or by way of substituting for imports. In forming his judgment from this point of view, the investigator must take all factors into account - for instance, the necessity to import on a continuing basis raw materials or fuel, and the repayment of foreign debt.

### The Timing of Projects

And the last point I have to make concerns the question of timing. It may, for instance, be quite true that looking into the future one may see that a certain scale of project will be justified by the demand in 15 or 20 years' time. But it will seldom be justified to invest scarce capital in a project when some of that capital will not be productive for many years to come. It would not matter if capital were so plentiful that it would earn practically nothing if put to other uses - but I need not remind you how far this is from the fact in a country where you can get paid 20% per annum on a two years' bank deposit. In such circumstances to lock capital up unproductively in an investment that will not yield benefits for several years to come is foolish.

Now that finishes all that I have to say this afternoon about the economic aspect of project appraisal, and I now turn to the second aspect, the technical aspect.

### The Technical Aspect of Project Appraisal

This aspect is the responsibility of engineers, or other specialists experienced in the techniques of the proposed projects.

### Scale of Operations

The first thing is to decide whether the proposed scale of operations is justified. There are certain industries which can only work economically on a certain minimum scale, and to establish such an industry on any more restricted scale is a mis-direction of scarce capital. The minimum scale varies very much, of course, as between different industries. Usually it is in the most capital-intensive industries that the minimum economic scale is very large. But of course the proposed scale of a project must be looked at not only from the point of view of technical efficiency and of reducing costs of production; it must also be related to the prospective demand for its product. And here again the question comes up: How far ahead should we plan, how far ahead can we afford to plan?

It may be very tempting to create a project which is designed to satisfy the demand for the next 10 or 15 years, and were capital so plentiful that its cost was negligible, it might be wise to do so. But in circumstances where capital is scarce and its price is high, it may be much better to divide the project into two or more stages, so that the capital invested in each stage can get to work and produce benefit as soon as possible.



### Operational Techniques

The investigator also has to think whether the proposed methods and processes are appropriate. In a type of activity in which rapid technological progress is being made, and new and improved processes and equipment are being developed, one has to be careful to take account of technological obsolescence. Otherwise one may find one has put money into equipment which may be completely out of date in four or five years' time. In America and Europe today, for instance, no company will invest in a plant for certain types of chemical manufacture unless there is a prospect that profits will be high enough to pay back the cost of the plant within five years. This, of course, is an extreme case, in which technological improvement is occurring very rapidly. But in appraising any kind of project, this factor has to be taken into account.

### Plant Lay-out and Location

After the investigator has satisfied himself with the proposed scale of operation and the methods and processes to be employed, he has to consider the planned lay-out of the plant. In this connection we have found many cases in which the possible requirements of future expansion had not properly been taken into account. This is something which must not be forgotten. Otherwise, when the time comes for expansion, efficiency may be reduced by bottlenecks in the flow of production from one process to another, and the whole problem of internal transportation may throttle expansion beyond a certain point. Here is a case where it may be very profitable to spend more money now in order to save money at a later stage. If in the future you will need more land to expand a factory, it may be better to buy it now, and leave enough room in planning the lay-out of your buildings to put in extra units later on. Of course, in some countries I have found it to be the case that the promoters of projects wish to borrow money to buy more land than they are ever likely to need, purely as a means of speculating in land values. This is a thing that one should be careful to prevent.

Now we come to the question of location. Here the investigator must take into account the relation of the proposed location to the sources of raw materials and other factors of production, and to the markets for what the project will produce. The sources of power, of fuel, of skilled and unskilled labor all have to be considered in this connection. There may be advantages in locating near a large city, where public utilities are available, and housing for workers presents no problem. But in some cases the economics of the case demand that the project be set up close to the sources of raw material, and then it may be necessary to include in the project the whole cost of building a town, with all the housing, schools and utilities involved. The Tata Steel Company in India, for instance, owns a town with 250,000 inhabitants.

There is one other thing that one has to take account of in this connection. Sometimes some outside authority will have to build the road or railway branch leading to the project, or a transmission line bringing



power to the site, and the investigator has to make sure that arrangements have been made for this, and that the progress of this kind of work is coordinated with the needs of the project.

#### Need for Consultants

The investigator also has to look into the proposed arrangements for doing the engineering work on the project. The first thing he must ask himself is whether the people responsible for the project are themselves capable of doing their own engineering work, or whether they will need help, for instance, from an engineering consultant. You may often find that a factory, for instance, maintains a very competent engineering department which is fully capable of understanding and solving the problems of production and maintenance, but is not qualified to carry out all the engineering tasks required for the design and construction of the proposed expansion of the factory. Of course, the amount of work consultants may be needed for varies very much from project to project. It runs from the design of the plant, the preparation of specifications and invitations to bid, the analysis of bids received and the recommendation of which bidder the contract should be awarded to, the inspection of equipment purchased, arrangements for shipping and insuring imported equipment, the supervision of construction and installation, and even the initial control of operations of the completed project. Consultants cost money; but their services frequently save much more than they cost.

#### Construction Schedule

The investigator now has to satisfy himself that the timing of construction has been realistically planned. This involves a careful scrutiny, for all the different main physical elements of the project, of a construction schedule which takes all the necessary steps into account, from the engineering design work to the installation and testing of equipment.

#### Cost Estimates for Construction and Operation

Parallel with the construction schedule there must be a budget, in which the estimated cost is calculated for all the different phases of construction and for all the main physical elements of the project. It is part of the engineering investigator's task to scrutinize this budget very carefully. We have often found that in estimating costs the optimism of promoters frequently leads them to forget that everything will not always go according to plan. Any project that starts out without taking any account of the unforeseen is almost certainly headed for trouble. So in making cost estimates one always has to be on the pessimistic side, and to provide something to take care of delays and accidents and changes in design and unfavorable movements of prices. The investigator has to satisfy himself that enough money has been provided for spare parts, for escalation, for interest during construction and - I emphasize this particularly - for working capital. Very frequently we find that the amount of working capital that will be needed has been under-estimated. I shall come back to this subject of working capital when I deal with the financial aspect of appraisal.



After having satisfied himself that the cost estimates for the construction period are reasonable, and have taken everything necessary into account, the investigator then turns to the estimates of the costs of production or operation. It is useful at this stage, of course, as also with the construction cost estimates, to compare the estimated costs with the actual costs of other similar projects, and if there is any major discrepancy, to find out its cause. The costs of operation need to be investigated for different levels of production. Many promoters expect that they will be able to produce and sell at capacity the moment the last brick is laid. This is seldom if ever true. So in estimating costs of production one has to take this into account.

Well, that is about all I have to say on the technical side.

Question:

You spoke about processes and methods. In your opinion, is it better, in relatively under-developed countries, to use an old-established process with a lower royalty or a new process with a high royalty?

Answer:

This is the kind of question which is impossible to answer in general. But I am quite sure that the most modern processes may not always be the best processes to adopt in underdeveloped countries, and in particular the type of processes which are in general known as automation. Frequently the incentive to develop new processes is the high cost of labor in America and Europe. Where labor is cheap, one always has to make a judgment how far it is economical to replace a man by a machine - particularly by an expensive and complicated machine. Even in America I read in the newspaper recently that some of the big industrial companies who followed the fashionable practice of employing mechanical brains, or computers, a few years ago are now coming to the conclusion that their costs have risen, instead of fallen, as a result, and are now going back to their former methods.

In general I would say that in a less developed country, the simpler the process the better. More complicated processes can get you into very serious trouble and expense when they go wrong. For instance, I remember visiting a plant in a country not too far from here, which was fitted out with all kinds of very modern recording instruments, designed to give the operators all kinds of information they needed in running the plant efficiently and keeping the cost of production down. This plant had been running five years when I visited it, and three-quarters of these complicated instruments were not working at all. Nobody knew how to repair them. Well, that is not a sensible way to work. You have to weigh up the benefits of this sort of progress with the costs of those benefits. If one does not have qualified men to run and maintain complicated machines, then it often is better to adopt a simpler, though less up to date, process.



Question:

In estimating cost, we have in the past been faced by difficulties on account of our multiple exchange rate system in Taiwan. Now, fortunately, we only have one foreign exchange rate. But we still have a large number of different interest rates. What rate of interest should we use in evaluating projects?

Answer:

This is not at all an easy question to answer. I and my colleagues, in the weeks that we have been here, have been scratching our heads a good deal about this sort of question. But we are quite clear about one thing. The scarcity of capital is one of the outstanding features of Taiwan's economy at the moment, and in looking at projects in this country this scarcity of capital must never be lost sight of. Any project which can produce a reasonable benefit only if it obtains money at say 3% or 4% per annum should certainly not be undertaken at all. Of course this is a complicated question. Take agricultural projects, for instance. There is no country in the world which does not subsidize agriculture in one way or another, for one reason or another, because the interests of government are not purely economic. Apart from anything else, no country wishes to depend too much on imports for its essential food requirements.

In general, it is necessary always to measure the benefits of the use of capital in a project with the scarcity of capital, and I would say in general that any project in this country that does not promise to return at least 12% per annum should be looked into with a very critical eye.

The Managerial Aspect of Project Appraisal

It is in evaluating the quality of management that the investigator has one of his hardest tasks. Whereas in other aspects of appraisal you have yardsticks of various kinds to judge by, in appraising management there is no rule of thumb that you can apply - or at least, if there is, we in the World Bank have not yet met it.

One may get, of course, quite a lot of evidence of the quality of management by examining the past record and present position of a business. One may also get important clues from the way in which the project is presented, and the way in which questions about the project are answered. But in general, the appraisal of management is an art and not a science, and the investigator has to rely on his personal judgment, based upon his own experience of men and affairs.

One word of caution is in place here. Any project which depends for its success on a one-man management is a risky affair, and one should try to find a way to cure that risk.



In cases where there has been no satisfactory arrangement made for management, one has to see what can be done. This case arises, for instance, where it is proposed to set up a new industry of a kind in which no local experience exists. Then it may be necessary, at least for the initial years, to import management from abroad. This generally costs a good deal, but to do without it may be much more costly. In many cases, the ideal arrangement is a joint venture, between local investors and an established company abroad who may provide know-how and management skills. Or one may hire a manager, and sometimes key staff to aid him. In this case, it is most important that the foreign manager and staff should train local men as soon as possible to take their place.

### The Organizational Aspect of Project Appraisal

Well, now let us turn to the organizational aspect. This can be divided into two different stages - one dealing with the organization that is required for the construction of the project, and the other dealing with the organization required for the operating stage.

#### The Construction Stage

In some industries, for instance in the electric power industry, the process of construction is more or less continuous. Before one project is finished, it is already necessary to have started on the next project. In such a case it is usually best for the electric power company to have its own construction department, which will normally perform all the necessary functions, though sometimes needing the aid of consultants to tackle a very large project, or one with unusual engineering features.

But of course a factory working on a relatively small scale, although it may need an engineering department which can handle the problems of operations and maintenance, has to make special arrangements if it is faced with organizing a major expansion of its plant, and in this case the necessary talent has to be hired from outside.

#### The Operating Stage

##### Organization and Scale of Operations

One of the most typical problems facing the investigator in evaluating the proposed organization for the operating stage is the question of scale, and the need to modify organization as the scale of operations grows. The classical example is the case of the businessman who has built up a successful one-man business. He is the president, the manager, the treasurer, the secretary, the chief engineer and the salesman all rolled into one. He has been very successful and he wants to expand his business - perhaps to double its scale of operations. And he believes that the expanded business can still be run the same way. This is frequently an illusion. Once a business grows beyond a certain scale, if one man attempts to run all aspects of it, and to make every decision himself, either he will make mistakes, or else he will drive himself to illness or death. But it is often very difficult to persuade such a man that it is



impossible for him to run a big business in the same way he has run a small business.

As the scale of operations grows, the organization must grow more and more specialized. At each scale, a judgment has to be made how far centralization of functions and decisions is practicable, and how far delegation of authority and decentralization of functions would be more efficient. Several functions which could before be handled by one organizational unit have to be split between several units. As this division of functions progressively gets more specialized, organizational units multiply, and the possibility of conflicts of interest and friction between them becomes more and more of a problem. It is this difficulty of coordinating the functions of many different units which is the heart of the problem of organization, whether it be of a factory or an army or a government, and it is this difficulty that effectively sets the limit to the efficient size of an organization.

#### Providing the Tools of Management

One test of the efficiency of an organization is the way in which it can provide the information which management needs in order to formulate policies and take decisions intelligently. This information is the most important tool of management, and it should flow to management from every part of the organization. It is not only necessary to know the results of past operations; it is equally necessary to have forecasts which show what the future will probably bring. In order to produce this information, an organization must include an efficient system of internal controls.

In our work at the World Bank, we often ask borrowers for this kind of information. Sometimes they throw their hands up in the air and reply: "We are busy creating a project, we have no time for all this paper work." But this is time well spent. Many times we have worked patiently with borrowers for a long time to get the right kind of reports, and when we are finally satisfied, we say: "Well, now you no longer need to send us this report every month; from now on quarterly reports will be enough for us." And at this point the borrowers often say to us: "But we wouldn't think of doing without this monthly report now. We cannot think how in the old days we managed without it. We have even applied the same sort of reporting technique to all our other operations."

Management needs information promptly and regularly. But management's task may be made impossible if it is swamped with undigested or unessential information. I remember before the war I had something to do with a U.S. company working in England. They sent me every month a portfolio of charts prepared for the managing director. Well, there were so many charts, and charts with so much on them, that one couldn't possibly see the essential information. I think about 80 of these charts were prepared with great care every month. I made a study of them, and in the end cut them down to six; and these six really contained all the essential information which the managing director needed. So it is just as necessary to keep unessential information away from management as it is to supply management with the essential information.



### Other Organizational Questions

Another aspect of organization with which I can only deal briefly is, for instance, the importance of good budgeting control. Here again, when an organization has been living without proper budgetary control, they are often reluctant to take the trouble to introduce it; but once the control is introduced, they very soon are surprised at how they ever got on without it.

An important aspect of good organization is the system of controlling inventories, and this in turn is closely connected with the system of controlling and scheduling production, which in its turn must be dovetailed into a regular schedule of routine and preventive maintenance. I cannot stress too much the necessity for preventive maintenance, particularly because in my experience its importance is not properly appreciated in many of the less developed countries.

One final point on the organizational side - the question of training. The investigator should always satisfy himself that arrangements for training - at all levels in the organization, from apprentices to management candidates - are taken into account in making plans for a project. Sometimes of course this training aspect is of first importance. For instance, it is not very sensible to establish projects to provide farmers with irrigation water and fertilizers if the farmers are not educated to make the best use of the water and fertilizer.

### The Commercial Aspect of Project Appraisal

We have already dealt with four of the aspects of project appraisal - economic, technical, managerial and organizational. I now turn to the fifth, namely the commercial aspect. By the commercial aspect, I simply mean all that has to do with buying and selling. This aspect can be considered, like the other aspects, in two stages: the problems of the construction period and those of the operating period.

#### The Construction Period

In the construction stage, the investigator has to satisfy himself that the arrangements made for procuring the goods and services needed are such as to provide the buyer with the best value for his money. We have frequently found that the method of procurement best calculated to produce this result is open competitive bidding. There are certain circumstances in which another procedure may be justified, but as a general rule open competitive bidding is the best method. One word of warning may be in place here. The lowest bid does not always represent the best value. It is necessary to take account of quality, of the experience of the supplier, of the terms of delivery and payment, of the advantages of standardizing equipment, and so on before coming to a decision which is the right offer to accept.



A word about buying transportation and insurance services. In any large project, much money can sometimes be saved by centralizing control over the shipment of equipment and arrangements for insurance. I have known cases where by centralizing arrangements for insurance, and getting a number of offers from different insurance companies, many tens of thousands of (U.S.) dollars were saved in insurance premiums.

I want to mention one other thing here. Increasing competition among the industrialized countries has encouraged manufacturers in those countries to offer longer and longer deferred payment terms on the equipment they wish to sell in less developed countries. These suppliers' credits are very expensive, and although their term is very gradually getting longer, it is almost never above seven years, and this puts a heavy repayment burden on the project in its initial operating years, when it can least afford to bear this burden. I do not say that one should never buy on the basis of a supplier's credit; I just give a warning that it is generally an expensive way to obtain financial help, especially since the supplier generally quotes a higher price to protect him against the risk of giving credit.

#### The Operating Stage

The investigator has to make sure that thought has been given to the problems associated with buying raw materials, fuel and so forth, and with selling the products of the project in the operating stage. The terms of purchase and sale are very important. How soon one has to pay for what one buys, how long one has to wait to receive the price of what one sells - the answers to these questions have an important bearing on the amount of working capital that is necessary to carry on operations.

The arrangements made for marketing the product, and for market research, are also something into which the investigator has to inquire. Sometimes one finds that not enough thought has been given to problems in this sphere. It may be necessary to spend a considerable amount of money on advertising, to bring the product to the notice of potential buyers. It may be necessary to discuss with the users of the products possible ways of improving it. And of course the investigator has to inquire into the arrangements for solving possible conflicts of interest between those responsible for marketing and those responsible for production and for finance. The marketing people want always to be in position to deliver what they can sell without delay; but the finance people do not want to lock too much money up in inventories of finished products; and the production men want to keep costs down by avoiding frequent changes in production. It is in finding the right balance between all these different legitimate interests that the quality of management shows itself.



## The Financial Aspect of Project Appraisal

Now I come to the sixth and last aspect of project appraisal - the financial aspect. Here I am most aware that what I shall say to you is inadequate, but all I can do is to indicate what sort of subjects the investigation should cover, and emphasize certain problems to which our experience has taught us to pay particular attention. Just as everything that we have mentioned so far has its material and human side, so also it has its financial side - it either costs money or brings in money. Here again it is useful to speak separately about the financial problems relating to the construction phase and those concerned with the operating stage.

But before we consider the construction stage it is necessary to say a few words about the pre-construction stage. By this I mean that when one is dealing with an existing organization with a past history of operations, one has first to analyze the financial results of past operations and the present financial situation. In this stage of the investigation what I said at the beginning of my talk applies with particular force - that is that it is not prudent to take anything for granted. One is faced with tables of figures - balance sheets, profit and loss accounts, and other kinds of financial statement. Every figure must be examined with a critical eye. Is the figure at which fixed assets are valued in the books a realistic one? Are the receivables over-due? Do the inventory figures include a lot of finished goods that cannot be sold? What are the terms of existing debt? Has a sound depreciation policy been followed? How much of the profits have been paid out as dividends, and how much retained in the business and reinvested? Has the business suffered from a shortage of working capital? Have the profits which have been earned included some "windfall" profits from the appreciation in value of inventories? Are the inventories conservatively valued? Are there any contingent liabilities that do not appear in the financial statements?

You will see by these questions what I meant when I said the investigator must be a cynic - if he takes anything at its face value, then he ought to be in another profession.

### The Construction Period

#### How Much Money is Needed, and When?

The first thing one has to do here is to satisfy himself how much money is needed to construct the project and get it operating. This is not quite as easy as it sounds. One starts, of course, with the estimates of cost which one's engineering colleague has already scrutinized; but this is only the start. Often that is not the only money that will be needed by an organization during the construction period. During this period it may be necessary to repay existing debts. It may be necessary to stockpile raw materials before the construction is completed. It may be necessary to make provision for interest during construction. It will be necessary to earmark a sufficient fund to take care of contingencies. Taking all



these into account, one arrives at a certain amount of money which will be needed during the construction period. It is not enough, though, only to know how much will be needed; one also needs to know when it will be needed. And so the final result of this phase of the investigation is a budget for the whole of the construction period, showing for each main element of the project, and also for other purposes, how much money is needed and when it is needed.

#### Estimating Working Capital Needs

I must at this point return to the question of working capital, which is one of the things about which our experience has taught us to be particularly careful. The amount of working capital which is needed for the successful operation of a project depends on various factors, each of which can be estimated with some degree of accuracy. It depends, for instance, on the volume of production; on the length of the productive process; the length of the pipeline of production. It depends on where you are getting your raw materials from. If you get them from a source thousands of miles away, from which they are shipped in large quantities at relatively long intervals, it will be always prudent and at certain times unavoidable, to keep more money locked up in stores of raw materials than if you get them from a source the other side of the road.

The amount of working capital needed depends on the terms on which you buy, the amounts of credit you can count on receiving from your suppliers. It also depends on the terms on which you sell, the amount of receivables which you have to finance.

All these things have to be taken into account in calculating the amount of working capital that is likely to be needed by an organization.

There is a further problem that has to be taken into account. Working capital is a fluid, dynamic concept, and every business has to keep a certain amount in cash or in the bank, just to meet the swings in its cash position which arise from the fact that the flow of receipts does not match the flow of payments in timing.

Finally, in some kinds of industry the requirements of working capital vary, and sometimes vary very considerably, from season to season during the year. Some factories, for instance concerned with processing agricultural products, may have a short production season and a long selling season; others, for instance a fertilizer factory, may continue production at a steady rate throughout the year, but their sales may be concentrated within a few months.

The financial investigator has also to make sure that satisfactory arrangements have been made to meet these fluctuations in working capital requirements.



### The Sources of Finance

After the requirements for finance have been estimated, the next thing is to see from what sources it is proposed that these requirements be met. It is not enough to ascertain that the total amount provided fully covers the needs; it must be available when it is wanted. So the investigator has to make sure that money will be made available either before or at the time when it is needed.

The next step is to find out the terms on which the money is planned to be provided, and to judge whether they are suitable. I believe there are instances in Taiwan where people have borrowed at short term to cover the costs of fixed assets, and very shortly found that they were in financial difficulties when they were faced with the obligation to repay the loan. That is, of course, unsound financing. One must be careful to make sure that the revenues which may be expected from the project will be more than adequate to pay interest on debt and to meet the repayment instalments when they fall due. To estimate the repayment capacity of the project one has of course to make a forecast of the probable revenues and expenses. Now in making this kind of forecast one has not only to estimate what would be the financial results of a normal year of operations; one has also to estimate the result of a bad year, because every kind of project meets a bad year now and then, and one must be able to meet a bad year without getting into financial difficulties.

There is one other thing one has to consider in making forecasts of earnings. One must make allowance for the difficulties and expenses which may be encountered in the process of preparing to go into operation, and in the initial stages of operation. Often the promoters of projects are much too optimistic about these difficulties and expenses.

### The Assumptions for Forecasts

I would add here that no forecast can ever, except by an extraordinary accident, be more reliable than the assumptions on which it is based. So in making forecasts, and in evaluating forecasts made by others, it is always a very useful practice to list all the assumptions which are at the basis of the calculations, and always to bear in mind the degree of margin of error contained by these assumptions.

### The Operating Period

I have already mentioned the need to forecast the financial results which may be expected during the operating period. Among other things it is often necessary to calculate what is called the break-even point. This term - the break-even point - is understood in at least two different ways. Sometimes it is interpreted to mean the point to which production and sales could be reduced without actually incurring a loss; and sometimes the point at which they must be maintained if all fixed financial obligations are to be met punctually. Finally, it is necessary to make a forecast of what is called the cash flow, in order to make sure that the working capital may not be run down to a dangerously low point.



### Conditions for Lending

It is only after all these calculations have been made and studied that the investigator is finally in a position to make a judgement about the soundness of the proposed financing plan, and to conclude on what conditions loan money should be made available for the project. It may be necessary, for instance, to limit the freedom to incur further debt, or the freedom to embark on further projects except in accordance with an approved financial plan. It may be necessary to restrict the power to pay dividends, in order to conserve an adequate amount of working capital.

Well, I am becoming more and more aware of how inadequately I have treated many of these complex questions, but I must now come to the end of what I have to say about project appraisal.

Let me sum up this part of my talk. In appraising projects, one has to look at them from six different points of view (economic, technical, managerial, organizational, commercial and financial). It needs different kinds of knowledge and experience to examine each of these aspects, which can generally be obtained by combining the work of economists, engineers and financial analysts. But in the last analysis, all these different points of view have to be brought together into a single judgement about the merits of the project. That is why in the beginning I said that this work of appraisal has to be approached from the broad point of view of management, which uses specialists in various fields as its servants and not as its masters.

### The Supervision of Projects

I now come to the second subject of my talk this afternoon - the supervision of projects. It is in exercising this function that one discovers what mistakes one has made, what things one has left out of account, in the process of appraisal.

### The Task in General

In the process of appraising the project, the investigator in effect sets up a number of targets, both physical and financial. He estimates that the project will take a certain amount of time to complete, and that a certain amount of money will be necessary to complete it; he estimates that the cost of production or operation will be so much that the project will be able to produce a particular amount of goods or services, and (if appropriate) that it will be able to sell these goods and services at a price which will result in a sound financial condition and a certain level of return on the capital invested. All these forecasts are the result of judgement; time will show whether that judgement was good or faulty. The task of supervision consists in learning whether actual progress of the project corresponds to the various targets which have been set up, and in discovering and if possible curing - or even better, in foreseeing and if possible avoiding - possible difficulties which may stand in the way of the punctual achievement of the targets.



### General Procedures

One can exercise the function of supervision in different ways. The first is to station a man at the site of the project who will himself act as your eyes and ears and report to you what he learns. This is an expensive way, and has certain drawbacks, because there is a real danger that this man will be drawn into the actual management of the project. Supervision does not mean management; it means "watching from above."

Another way is to require the submission of reports on progress from those who are responsible for carrying the project out, and relying simply on these reports for information. This also has its risks. People may not wish to report bad news, and they may be too optimistic about their ability to overcome difficulties.

As the result of our experience in the World Bank, we have come to the conclusion, on which our practice is based, that the best way of carrying out the function of supervision is to require the submission of regular progress reports, and to supplement our knowledge of the progress of the projects by sending our own men out to visit them from time to time. In this way there is a continuity of working relationships, which were established during the appraisal, and carried forward during the construction and operating stage of the project.

### The Construction Period

In this period the reports are designed to show how the actual progress made (both physical and financial) compares with the targets set up in the construction schedule and the budget, to draw attention to any delays and difficulties and to the measures taken or proposed to cure the delays and solve the difficulties. It is our experience that in this stage it is not so useful to be told that the project as a whole is 47% or 53% completed; a project may be 99% completed, but if the remaining 1% is vital, then the whole project is held up. To our way of thinking, it is much more significant to know if progress is three weeks ahead of schedule or five weeks behind schedule, and to know whether any delays can be made good without postponing the final completion date. Delay costs money in two ways; it increases the cost of completing the project, and it postpones the day when the project begins to generate a return on the investment made in it.

### Control of Expenditures

It is necessary to exercise some control, during the construction period, over expenditures. Unless this is done, the kind of unfortunate development may occur which caused many problems to one of the local development banks I know of in another country. Some of their borrowers, during the construction period, used the money which was originally earmarked as working capital to buy extra machinery. As a result, when their projects were completed, they found themselves without working capital and in a very difficult financial position.



### Revision of Estimates

One of the things that has to be watched in this period is the revision of estimates. As time goes on, it may be necessary to make amendments in the construction schedule and in the budget. If these are not made, or if the revision is left too long, unpleasant surprises may be in store for all concerned. In most big projects, both the construction schedule and the budget for the remainder of the construction period should be completely reviewed and revised at least once a year. The interval should of course be shorter, if the construction is not so long.

### Reports Should be Prompt, and Look Forward

In general, it is better to receive an incomplete report promptly, than to wait a long while for a report which is most beautiful and complete, but quite useless because it is out of date. Also, in general, reports should not be made indigestible by containing a lot of unnecessary detail; they should be as short as is consistent with their giving all the essential information. It is of course no use insisting on the prompt submission of reports unless they are reviewed, and any necessary action taken, without any delay at the receiving end.

### The Operating Period

This is of course when the real test of the project comes, and the reports will be of a quite different character during this period. They will be concerned with production, cost of production, sales and proceeds of sales, with the general financial or economic results of the project and with difficulties encountered in the operation of the project.

This is really as much as I have to say to you, and I would close my speech by reminding you that we in the World Bank and the International Development Association make no claim to know the last word about appraisal and supervision. We are ourselves learning all the time, and I may say that from this point of view our stay in Taiwan has been exceedingly profitable. We have all learned a number of things in the last three weeks that we did not properly appreciate before.

I thank you for the close attention with which you have listened to what I had to say, and apologize if I have disappointed you by not dealing fully with the particular aspects of appraisal and supervision in which some of you are particularly interested.



This is an excerpt from U.N. Economic and Social Council Documents "Report of the Ad Hoc Group of Experts on Housing and Development", E/CN.5/367, 16 March 1962:

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ANNEX IV

STATEMENT ON FINANCING OF HOUSING BY MR. H. B. RIPMAN, REPRESENTING  
THE INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT AND THE  
INTERNATIONAL DEVELOPMENT ASSOCIATION

The International Bank for Reconstruction and Development fully recognizes the important role that housing can play in the sound economic development of its member countries. The Bank welcomes this opportunity of expressing its interest in the subject of housing and of presenting the following views of its technical staff.

The lending policy of the Bank is governed by certain basic principles derived from its articles of agreement. Under these principles loans must be for productive purposes; the projects selected for financing must be those which are generally most useful and urgent for increasing the productive resources of its members; the Bank financing, except in special circumstances, must be designed to meet foreign exchange rather than local currency needs. Any assistance which the Bank could give to financing of housing would be governed by these and other factors affecting Bank loan policy.

These principles have more than legal significance. They are a recognition of the economic principle that countries with inadequate local resources for development should use their foreign credit in the manner most conducive to sound over-all development.



Coming more specifically to Bank participation in housing development, the first test of any project to be financed by the Bank is its productivity. The relation of housing development to increased productivity is most apparent in cases where housing development is an integral part of a directly productive project, for example, workers housing for an industrial plant. In other cases, such as those where housing is designed to prepare an environment for possible later investment in other more productive activities, the relation to productivity is more remote. In still other cases, the most effective and economic way of stimulating housing may be by way of investment in basic industries, such as steel, power, transport, and the like, which can support an active building industry. Since the available resources of most countries, including their capacity to borrow externally, are inadequate to meet all development needs, the question whether a country will sponsor a particular housing project for foreign financing should normally depend, in large part, on whether it regards the project as one which will contribute decisively to productivity. Participation by the Bank will be guided by the same test.

Another factor of special significance in the financing of housing construction is the requirement that Bank loans must ordinarily be designed to meet foreign exchange, rather than local currency, needs. Housing construction involves primarily local currency expenditures and relatively small direct foreign exchange costs. Thus, the assistance that the Bank might be able to give to a housing project would normally be relatively small in relation to the total cost of the project. The additional costs would have to be met from other sources.

The Bank has found that there is no single test by which the merits of projects can be judged. The situation in each country must be considered on its own merits and the determination to make a particular loan depends on many complex



factors. This is also the case in considering the advisability of financing housing construction. The Bank remains ready to examine any housing project which a sponsoring member thinks has sufficient priority to warrant consideration. However, the staff of the Bank is inclined to believe that in most cases the Bank's aid to housing will take the form, as it has done in the past, of investment in basic utilities and industries, thus helping to build economies in which housing industries can become progressively more active.

In the Act of Agreement IDA provides for the possibility of considering projects of high priority which heretofore had not been regarded within the scope of Bank objectives. This provision makes it possible for IDA to consider such projects as education, water supply and pilot housing, provided such projects come within the framework of priorities as set up in the development plans of a given country.

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THE CHALLENGE OF CIVIL AND SANITARY  
ENGINEERING WORK IN UNDERDEVELOPED COUNTRIES

by Hugh B. Ripman, Chief, Industry Division,  
International Bank for Reconstruction and  
Development (World Bank) and  
Peter Callejas, M, BSCE, Sanitary Engineer  
with the World Bank

Boston Society of Civil Engineers - May 23, 1962



First let me say how much we in the World Bank and the International Development Association, which have both been in existence a relatively few years, appreciate the invitation to address the members of such an old and distinguished society as your own. We particularly welcome the opportunity to speak to you about a subject in which the engineering profession and the Bank have an equal interest.

None of us can today fail to be aware of the very large sums of money - much of which comes from our own pockets by way of taxes - which are being made available to aid the economic progress of the under-developed countries. We have some grounds for suspecting that in the past some of this money has not been as well spent as it might have been. The efficiency and economy with which foreign development projects are carried out depend in large measure on the professional engineers associated with the projects, and the World Bank concerns itself very much with the same problem. You and we alike are interested to see that aid is not waste. We are concerned not only in the quantity of aid which is made available to the underdeveloped countries; we are also vitally concerned with the quality of that aid.

It is true, of course, that the responsibility for the success of development projects in underdeveloped countries lies in the first place with those countries themselves, but unfortunately exactly because they are underdeveloped, they are frequently not able by themselves efficiently to plan and execute economic development projects. So, much



of the responsibility for the soundness of projects has in fact to be borne by national and international financing agencies, such as the World Bank, and also by the professional engineers who are concerned with the planning and implementation of the projects.

During the last fifteen years we have been constantly impressed by the importance of the part played by the engineering professional in this field. We are very much aware of the way in which the costs of a project depend on the quality of the engineering work. The time required to get a project under way, how smoothly and how promptly it can be brought to the operating stage, how efficiently its operations can contribute to the economy - all these depend on the engineer. His work on feasibility studies bears closely on the possibility of obtaining finance for the project.

We have therefore thought it worth while to review our experience, and to set out some of the conclusions we have reached; conclusions which show that this responsibility which we share is a real challenge to our professional ingenuity and skill. As far as the engineering profession is concerned, we hope to show that this challenge requires the engineer to widen his horizon beyond the areas with which he is normally most intimately concerned; to be prepared to go beyond the study, planning and advisory efforts he might normally perform and even beyond those which he has contracted to perform; and to advance his profession by research and development. Finally, to meet successfully this challenge of work in underdeveloped countries, the engineer will need to muster all the patience, tact, diplomacy and understanding at his disposal.



The World Bank and its Activities

Before I comment on the challenge to the professional engineer, I want to speak briefly about the World Bank, in order to explain our activities and objectives in our work with underdeveloped countries, and to show how we are brought into contact with the engineering profession.

The World Bank, or to give it its full name, the International Bank for Reconstruction and Development, was established as an affiliate of the United Nations as the result of the Bretton Woods Conference. It is set up like a corporation, in which the member countries hold shares in proportion to their economic importance. Its membership (including some countries which have applied but are not yet members) includes most of the countries of the free world.

After making some initial loans for the post-war reconstruction of European countries - a task which was then handled under the Marshall Plan - the Bank has since 1948 devoted its energies and resources to the economic development of its member countries by financing specific projects. We do our best not to lend to any one country more than that country can afford to borrow, and not to finance any project unless we are satisfied that it has a high development priority and that it is soundly conceived.

Much of our lending is for what the economists call the economic infra-structure of our member countries - for transportation and power - but we also lend for agriculture and industry. The total amount of our loans is now about \$6.5 billion, but since our borrowers usually contribute more towards the costs of the projects than we do, the aggregate investment in which we are interested is probably of the order of \$20 billion. At present, the annual lending rate of the Bank and its



affiliates is approaching \$1 billion a year. I am glad to say that not all of the \$6.5 billion that we have lent comes out of the pockets of the taxpayer. As a matter of fact, only about \$1.7 billion represents subscriptions of our member countries. The rest has been raised by the sale of the Bank's bonds in the financial markets of the world, by the sale of portions of our loans to private investors, by repayments of loans, and from our earnings, which by now approach \$700 million. Our loans carry interest (at present at the rate of 5-3/4%), which is a little higher than the rate we pay on our borrowings. The term of our loans corresponds in general to the economic life of the projects they finance, varying for different types of project from 10 to 25 years. Our borrowers must repay their loans in foreign exchange.

You will understand from what I have said that the Bank is far from being a give-away organization. We are a bank, and we are proud of the fact that we have built up a reputation for doing sound business which is reflected by the fact that our bonds are rated AAA. But we are not an ordinary bank, and in fact we are much more than a bank. While we take pains to ensure that the projects which we finance will yield a good return, we are not only interested in the prospects of the repayment of our loans. The center of our interest is in finding projects to finance that will make the best contribution to the development of our member countries.

I have said enough to show you that we are indeed concerned with the quality of the help which we give to our member countries, and not just with the quantity. If we had a motto, it might well be: "Sound projects, soundly planned, implemented and operated". You will notice



that this includes the words "implemented and operated", and this refers to the fact that we keep in close touch with the projects we finance during the entire life of our loans. Our relation with our borrowers is not simply that of creditor with debtor, but much more that of partners bound together by a common interest in the success of the project.

#### The International Development Association

So much for the World Bank. Now I want to refer briefly to the International Development Association. This institution - commonly known as IDA - is an affiliate of the Bank which has been operating a little more than a year. It was brought into being to meet a need which the Bank could not fill. There are some countries which through no fault of their own cannot afford to repay foreign currency loans on conventional terms; these countries need capital for their development; they have sound projects to be financed; but the Bank is unable to help them.

IDA was therefore established in order to fill this gap. It lends to governments on long term (all its credits so far have been for fifty years), and charges no interest on its credits. All the borrower has to pay is a small service charge of  $3/4\%$  per annum. These are "soft" terms; but there is nothing soft about the projects which are financed. They are subjected to the same searching scrutiny as Bank projects; they have to measure up to the same criteria; they are expected to pay their way in the same way; and they are appraised by the same hard-headed investigators - since IDA has no separate staff.

Whether we are working for the Bank or for IDA, we have to satisfy ourselves that the project has high priority for the borrowing country, that its feasibility has been completely demonstrated, that it



is complete in itself and that its proposed financing is sound. So in fact we investigate each project from six different aspects, economic, technical, managerial, organizational, commercial and financial. I will not say more about the Bank's methods of appraisal tonight, but would refer you to the paper which will be presented on this subject to the Inter-American Sanitary Engineering Association (AIDIS) at its Washington meeting early in June, which no doubt some of those present will be attending.

Now how does our work in financing projects bring us into contact with professional engineers? In the first place, our staff includes a number of engineers, of various nationalities, experienced in the specialized fields of engineering. Secondly, we engage consultants from time to time to assist our staff in appraising projects, either to meet a peak in our work-load or to provide specialized qualifications not available among the staff. But our most frequent contact is with the engineers who are employed by our borrowers to perform services connected with their projects - from feasibility studies right through to initial operating advice. I might add that in any case where we are in doubt about the ability of our borrowers to do his own engineering work, we insist as a condition of our financing on his employing engineering consultants. We also come into contact with the engineering staffs of construction companies and suppliers.

As far as our experience in sanitary engineering projects is concerned, since we began work in this field with IDA money, little more than a year ago, only a few projects have reached the point where a credit agreement could be signed. But we are engaged in the study



of a number of projects in about ten countries, and it looks as though this would be a substantial activity in the future.

So it is with some trepidation that I speak to you about the engineering problems that arise in this field. While we have learned a lot in the past year, a good deal of what I have to say is in fact the application to sanitary engineering projects of what we have learned in our work with all kinds of projects in many lands over the last fifteen years.

There is little need to underline the tremendous work being done in this connection. I have already said that the United States is leading the way in the world with about \$1 billion a year. But the United States is not by any means the only or the largest provider of finance for the underdeveloped countries. The American Government and Export-Import Bank, the Inter-American Development Bank, and many other public and private agencies all play a part in this field. And to judge from the amount of money being spent, it is likely to be of the order of \$2 billion in the next five years, and to increase very much more in the next ten years. On the other hand, the need for such projects is so great that the amount of finance available is very small. It is only about \$1 billion a year, for example, a recent study made by the World Bank could be spent on water projects alone in the next five years. In the general field of water resources, there are of course

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A report on "Water Supply Program Costs in Developing Countries, 1950-1970," by John H. Ridd, Senior Engineering Consultant, International Cooperation Administration, Washington 25, D.C., June 1961.



The Challenge to the Engineering Profession

The challenge of civil and sanitary engineering work to which reference is made in the title of this paper really refers to two different things. The first is the challenge presented by the tremendous volume of work which faces the profession in the coming years. The second is the unusually severe responsibilities that must be faced by professional engineering firms working in underdeveloped countries.

There is little need to underline the tremendous volume of work coming up in this connection. I have already said that the Bank's current lending is at the rate of about \$1 billion a year. But the Bank is not by any means the only or the largest provider of finance for the underdeveloped countries. The American Government and European Governments, the Inter American Development Bank, and many other public and private agencies all play a part in this field. Aid to India alone is likely to be of the order of \$2 billion in the next five years. Aid to Pakistan may reach almost \$1 billion in the next two years. On the other hand, the need for such projects may be even greater than the amount of finance available. If we take urban water supply projects alone, for example, a recent study shows that by 1975 \$4 1/4 billion could be spent on water projects alone in Asia, Africa and Latin America.\* In the general field of water resources, there are of course

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\* "Report on Global Urban Water Supply Program Costs in Developing Nations, 1961-1975", by John M. Henderson, Sanitary Engineering Consultant, International Cooperation Administration, Washington 25, D.C. June 1961.



in addition rural water supplies, water supplies for industry, irrigation projects and multi-purpose projects. The expansion of urban and industrial water supplies will create need for sewage and waste disposal works.

The value of engineering services connected with Bank projects alone has been estimated to approach \$50 million a year. The total amount spent on engineering services for all projects in the underdeveloped countries must be several times this amount.

The need is not only for a very great volume of engineering services, but also for the very highest quality of services, and it is here that the challenge and the responsibility can most clearly be seen.

Those of you who have had experience only in this country have, I am sure, sometimes been faced with great difficulty in discovering the basic data necessary for your work. Municipal records are sometimes disorganized and out of date. It is difficult to be sure what facilities actually exist, how what has been constructed differs from what was planned, on which side of the street distribution pipes are laid, how many service connections there are and so forth.

All these difficulties fade into insignificance compared with the difficulties you may meet in underdeveloped countries.

In a city in one of these countries you may find that nobody knows how many of the meters are working properly. Perhaps there may be IBM machines for preparing the bills - but the figures fed into the machines may be no more than figments of the meter-readers' imagination. So you have no reliable record of past consumption, and no



reliable information about water losses in the system. You may not be able to find out how many houses there are, let alone how many people or how many connections.

And if, for instance, you wish to make a reasonable estimate of future water consumption, you cannot take as a guide the kind of consumption levels which are common in the U.S. or other highly developed countries. This may sound obvious, but we have seen this sort of thing done, by engineers who have a good reputation, as a basis for design in cities where less than half the population is served by the existing system, and in which most of the people could not afford to have modern plumbing for their dwellings much less to purchase water-using appliances at least during the design period.

Another difficulty in designing the expansion of the water supply and distribution systems in a city in one of the underdeveloped countries is to decide for how many years in the future, the additional facilities should be adequate. In this country, you may design without hesitation for 30 or 40 years to come. You can count on the project being financed at a low rate of interest, and on the city being able to afford the corresponding debt burden. The situation in the underdeveloped countries is quite different. The uncertainty about future demand, the poverty of the people, the fact that local interest rates may be as high as 12% or even 18%, must all be taken into account. The people cannot afford to pay now for facilities that may not be fully used for 25 years.

Additional uncertainties enter the calculation. It is difficult to tell how demand may develop if water rates are raised to the



level of the real cost of supply. If people have been used to using very small quantities of water, how much will they use when plenty is available? In a city where the pressure is irregular, and people have been filling tanks and oil drums to tide them over periods of low pressure, will they use more water or less if the pressure is maintained?

Another difficult problem in design is to decide how far to include up-to-date practices and control mechanisms. The client will always want the latest and best; but can he use it, and does it make any sense for him to have it? Many of the latest advances in mechanization make sense where labor costs are high, but are an extravagance where labor is cheap. A man on a bicycle may cost a great deal less than a telemetering system, but may serve the same purpose sufficiently well. Moreover, if the telemetering system gets out of order, no one may be able to repair it. Spare parts may have to be imported from a supplier thousands of miles away. Since capital is limited, decisions have to be made as to the relative merit of expenditures for modern treatment works which would provide water of the best quality and of expenditures to improve and expand seriously inadequate distribution systems.

In addition to facing all these problems in design, the engineer may have to cope with complications in estimating the cost of a project and developing construction schedules. He must decide what are the most economic methods and materials of construction. How far should earthmoving machinery be used? Would it be cheaper to move all the earth by hand? Steel, cement, even timber may have to be imported. Climatic conditions must be taken into account. The investment in spare parts may need to be much greater than in a city where



suppliers are within easy reach. Finally, local prices may not be stable, since many underdeveloped countries suffer from some degree of inflation.

The client may not speak English. He may be importing his equipment from several different countries. Business ethics and practices may be unfamiliar. Problems of culture and custom, even religious habits must be taken into account. All these difficulties accentuate the demand made on the engineer during the design and construction of a project, and face him with many judgements between alternatives of an unfamiliar kind. I do not need to stress that in these circumstances one cannot rely on the routine use of rules of thumb which may have become almost second nature in design work in a developed country. But in fact this is sometimes forgotten. We have seen many cases in which some or many of the factors I have described were not properly taken into account.

Another thing which must be recognized is that in working with underdeveloped countries, consulting engineers cannot usually confine themselves to "pure engineering". Often the contracts defining their scope of work may be drawn up by inexperienced clients. Not infrequently, the client wants to build a bigger or better project than one of his neighbors, simply to gain prestige. I recognize of course the tendency to build monuments is not confined to underdeveloped countries; but in these countries capital is so short and the demand upon it so large that economy is of overriding importance. Many of the elements of planning necessary in order to prepare a project satisfactory to a financing agency, and these include a number which are beyond the normal scope of engineering, may never have been considered at all by



the client. Another thing which you may well meet with in these countries is a lack of understanding of the principles of efficient operation and management.

Of course I do not wish to scare you away from this kind of work by listing all the difficulties that you may meet, and it is not common to find all these different difficulties combined in any given project. Some of you may have had experience in foreign cities where there was a surprisingly high level of statistical information and professional ability. But it seems worthwhile to draw your attention to all the difficulties that you may be faced with in order to illustrate what we mean by the challenge of this sort of work in underdeveloped countries.

If there is one thing that we have learned from our experience, it is that every situation, every project, has its own peculiar characteristics and requires a fresh and open-minded approach. From this point of view, the work provides the maximum of stimulus to our ingenuity and ability as professional people.

In the face of these challenges, there is an urgent need for really competent and ethical consultants such as yourselves to become actively involved in this kind of foreign business. Otherwise, there is a risk of a great deal of business falling into the hands of the inexperienced and incompetent. Now we know that it is not easy to break into this field. The business will not come to you. You have to go and get it; get it by making yourselves known in the face of competition from other firms in the U.S. and Europe. You may ask, how do we find out about what business is in prospect in the foreign field? Well, I am afraid that we cannot help you directly here, since our own negotiations are confidential until we announce the signature to a loan or credit, and by



that time, the consulting engineering arrangements have often been made. But you may hear of the opportunity for this type of business through contact with the embassies of the underdeveloped countries in Washington, through the appropriate services of the U.S. Government, and in the case of sanitary engineering projects through the World Health Organization, the Pan American Health Organization and other such bodies. This requires some international, nose-to-the-ground techniques, and you would be surprised how grateful many potential borrowers are to know the names of good consulting firms. They often really have no idea how to find reliable consultants, and making yourselves known to them can be a surprisingly valuable service.

The Bank itself does not keep any list of approved consultants, and does not suggest the names of consultants to its borrowers. However, we do keep particulars of the qualifications and experience of consulting firms from a number of countries in our files, and we frequently have to advise our borrowers whether a particular firm or list of firms would be satisfactory from our point of view.

At this point, I would like to say something about professional ethics. International engineering competition is becoming more severe, but this can be no reason for lowering standards, which could do great harm both to the engineering profession and to the underdeveloped countries. In our experience we have from time to time gained the impression that when some firms go abroad they seem to think that the normal ethical standards no longer apply. Many foreign clients, for lack of experience, or simply because they are used to bargaining for everything they purchase, will ask for proposals in which the price of engineering services will be an important element in their decision.



We take every possible step to discourage this practice, because we know that there are always some firms who cannot rely on their merits in competition, and so try to get the business by quoting a low price. If you are placed in the position of being asked to compete for business on the basis of price, it is not enough just to send a polite refusal to submit a proposal. You should be careful to explain exactly why. If this happens in connection with any project which the Bank or IDA is financing, we would always wish to be advised at once of any such unethical proposal. We are your allies in this respect. I should add, however, that we have in some cases seen unjustifiably high fees charged, and we are also anxious to avoid this possibility.

While I am talking about professional ethics, I should mention that in this work with underdeveloped countries, it is very necessary for the engineer to concern himself most scrupulously for his client's best interest. From the very outset, in negotiating a contract, you should be sure that its terms permit you to do all the things necessary for the project. To accept a contract where a client, without adequate preliminary engineering studies, instructs you to design a 300 mgd treatment plant, assuming an adequate water supply from a certain source, may be very far from serving a client's best interest. You must be prepared to give a client unwelcome advice; to recommend rejection of a project which has no merit.

Now I come to another point of particular interest to us in the Bank in connection with water supply projects. I refer to research, and the publication of its results concerning problems common to the underdeveloped countries. We have found that there are many areas of study about which little published research is available. For example: the



relative effectiveness of different water treatment processes in the removal of certain disease organisms common, for instance, to tropical countries; the relative importance of contaminated water and hand-to-mouth contact in disseminating water and filth-borne disease; and in general the question of practical water quality standards suitable to underdeveloped countries. More carefully documented and analyzed statistics of water use and waste disposal requirements and practices, and research on standards of design, construction and costs would be most valuable; better information concerning the relation between improved water supply and decreased incidence of disease would also be useful.

Publication of the results of such research in national and international professional publications would be well worth the effort involved. We ourselves hope from our own experience in due course to make some contribution in this way.

One additional thing that you should bear in mind is that in order to meet the challenge of work in underdeveloped countries it may be necessary to broaden the qualifications of your staff. To prepare adequate feasibility studies, and to provide the client with all the advice that he needs, it will be sometimes necessary to bring economic and financial abilities to bear. In addition, you may well have to employ in some cases people with experience in administration, management and operation. A well-rounded study, covering the proposed project from these different points, may speed considerably the obtaining of the necessary finance. It is certainly valuable to the client for the engineer to become acquainted with the requirements and procedures of the agency or agencies who will be asked to assist in financing the project. In this



connection, we have ourselves worked out a questionnaire covering the different aspects of water supply projects about which we need to have information in considering whether to finance them.

I want to end by extending to all of you a most hearty invitation to visit the Bank when you are in Washington, and to keep us informed of your experience and the particular interests of your firms on a current basis so that we may be in a position as expeditiously as possible to answer questions from our borrowers about the suitability of particular firms for employment by them.



INTERNATIONAL DEVELOPMENT ASSOCIATION

September 11, 1962

Statement on Educational Projects and Problems  
by Hugh B. Ripman, Assistant Director  
Department of Technical Operations

It was felt that on this occasion, when the first project in the education field was being submitted to the Executive Directors, it would be interesting to explain how the staff have approached the investigation of this new type of project, and to give some idea of the general criteria adopted in appraising such projects.

Since IDA was established, the staff has been studying the problems of education. An inter-departmental committee was set up for this purpose. Close contacts were established with UNESCO and with a number of other agencies of the United Nations active in the field of education and training, such as ILO, FAO, and ECLA. Early this year, staff members attended an international conference in Santiago which dealt with the relation between the development of education and economic and social development in general. In July a report was sent to a conference held in London on school construction.

During the past 18 months contact was established and maintained with leading educational authorities in this country, in Europe and in Latin America, and with several U.S. private foundations (Ford, Rockefeller and Carnegie) which are particularly active in this field.

One of the main conclusions reached has been that there is no general agreement about the solution of educational problems,



and that even the developed countries confront many problems in this field.

It is particularly striking to realize that in the last few years there has been a change of emphasis in many countries in considering the nature and objectives of education. Whereas previously great stress had been laid on the basic human right of people to receive the benefits of education, and consequently there had been a wide-spread impetus in the less developed countries to broaden primary education, more recently the emphasis has changed, and it has become fashionable to pay attention to the aspect of education which is called the development of human resources, and to regard education as an organic part of the whole social and economic development of a country. It is only within the last two or three years that educationalists have begun to think in terms of economics, and that economists have begun to pay special attention to education.

A few universities have done pioneer research work in the field: Princeton, Chicago and Stanford in the United States, and London, Paris and Frankfurt in Europe. This research has been concentrated on two subjects: first, the techniques of manpower surveys, designed to forecast the future needs for high-level and skilled manpower; and second, the relation between the cost of investment in education and the benefits to be derived from it.

The forecasting of manpower needs is at present an art and not a science. There are so many variables, so many uncertainties, that to pretend to make an accurate forecast for 15 or 20 years ahead is quite impossible. However, much work is being done to develop the necessary techniques, both by way of studies at the universities and by way of sample operations in various countries.

The study of the relation between the costs and the benefits of investment in education is also in its infancy. It is the beginning of an art, and certainly does not approach being a science. But much work is being done, and the general conclusion (which cannot be supported by a lot of precise equations) is that properly planned investments in education pay great economic dividends, especially in the less developed countries.

As is often the case when new approaches are being thought out, there is today the danger that the pendulum may swing too far, with the result that people may tend to concentrate too much on the economic benefits of education, and to lose sight of the fact that



the whole process of development is ultimately to raise standards of living, and that a broad liberal education plays an important part in this process.

From our studies and from the contacts we have made, we see that there are certain common problems that face the less developed countries. It is clear that there is no easy or quick solution to these problems. It will be a very long-term operation, to develop along efficient lines the educational systems of such countries to the point where all these problems have been solved.

These common problems, which are also present to a smaller extent in other countries, refer to the following five aspects of education:

- (a) the administration of education;
- (b) the structure of educational systems;
- (c) teachers and teaching policy;
- (d) the financing of education; and
- (e) the planning of education.

#### THE ADMINISTRATION OF EDUCATION

Looking first at the administration of education, one is struck by the lack of continuity, both in the formulation of policy and in its implementation. For instance, the average life of a Minister of Education in office in Latin America is not much more than six months. Moreover, in a number of countries where there is no well-developed civil service, when the Minister goes many of the top officials go with him. Obviously, no large corporation could ever work efficiently under these conditions--indeed, no large organization of any kind.

The degree of centralization of control poses a problem in any large organization, particularly an organization consisting of many units widely spread over a large area. This problem is particularly acute in the case of education, where it is compounded by the fact that the Ministry of Education is seldom responsible for the whole system. The Finance Ministry, for instance, plays an important part in decisions. The Ministry of Public Works is frequently responsible for school construction and maintenance. The Ministry of Agriculture, the Ministry of Health, and the defense authorities may be concerned



with certain kinds of training. In addition, outside the public education system, there may be an apprenticeship system, and private industry may give in-service training.

In some countries there is a problem of coordinating the activities of private schools with the government system. In some African countries the large majority of the schools are church or missionary schools.

The problems of administration are not complicated only by the multiplication of agencies responsible in the country itself. There are today many different kinds of agency which offer assistance in the development of educational facilities. Besides UNESCO, ILO and FAO, there are regional organizations, individual governments and private foundations which are engaged in providing such help. Obviously, the coordination of all these efforts is very important; yet in fact it is often very deficient.

Another problem has to do with the construction of educational buildings, in which a great deal of money is invested. In many countries, because of the fragmentation of control, the design and construction of schools is the responsibility of local groups, and there is no central organization for research and design. Moreover, the results of the excellent research work in this field that has been carried out in the United Kingdom and in some other countries are not widely known in the less developed countries.

Some steps are being taken to disseminate the results of such research, and to initiate research specifically designed to meet the problems of the less developed countries. The O.A.S. Education Task Force has recommended the creation of a Latin American research centre, and this suggestion was endorsed at the recent conference in London. Two such regional centres have already been established under UNESCO auspices, one for Africa, in Khartoum, and one in Bandoeng for Asia. A further recommendation of the London conference proposed that certain types of research, and the exchange of information on the design and construction of school buildings, should be centralized at the international level.

A final problem of administration is that there are very few people in the world, and particularly few in the less developed countries, who are qualified and experienced in the techniques of planning educational development. This point, though mentioned later, arises here as evidence of the need for training educational officials of most countries in modern administrative principles.



## THE STRUCTURE OF EDUCATIONAL SYSTEMS

The second group of general problems is concerned with the structure of educational systems. Here the first thing that strikes one is the compelling political pressure to expand primary education as fast as possible until it becomes universal.

In many countries, the target rate of expansion can only be achieved at the cost of increasing difficulties with regard to the quality of instruction, and at the cost of distorting the whole structure of the educational system. There are not enough qualified teachers to make it possible, without grave loss of efficiency, to expand primary education as fast as many countries have tried or would like. The result of such well-meaning efforts is to increase the number of drop-outs and repeaters, and to sacrifice quality to quantity. UNESCO has recognized this danger, and in recent conferences in Latin America, in Africa and in Asia, has stressed the importance of maintaining a balance between the three levels of education--primary, secondary and higher--and countries are now beginning to think in this way. But the popular pressure for the expansion of primary education is such that it will be politically impossible in most countries to slow down the pace at all sharply.

At the other end of the scale, many countries regard the establishment of a university as a sign of their independence and a symbol of great prestige value. There are many agencies ready to help countries to found universities, and progress has sometimes been too fast, with the result that some faculties do not have enough students to fill the classes, while others are producing graduates for whom there are no jobs.

In general secondary education has been the "Cinderella" in many countries, and this has had unfortunate results, since the secondary schools have to perform three essential tasks; first, to provide teachers for the primary schools; second, to prepare candidates for higher education who can man top level positions; and thirdly, to produce recruits for middle level posts in administration, industry, commerce and agriculture. Experts who have studied the problem state that mid-level manpower should increase from six to nine times as fast as the general labor force. It is these considerations that have led the staff to conclude that much of the aid to be provided by IDA should properly go to the secondary level.



## TEACHERS AND TEACHING POLICY

Turning now to the problems connected with teachers and teaching policy, the most striking factor is of course the serious shortage in every country, accentuated in many cases by the departure of expatriates. Apart from this general shortage, there is a particularly acute shortage of teachers in scientific and technological subjects. It is not always fully appreciated that the rate at which teachers can be trained sets an absolute limit to the pace at which an educational system may be expanded without loss of efficiency.

Apart from the shortage of teachers, many of those who are today employed as teachers lack the necessary qualifications; for example, it was reported recently that in a large South American country, 54% of the primary school teachers had received no specific teacher training. In some countries, the shortage is so great that people are being recruited to teach in primary schools who have themselves less than six years of elementary education.

The poor quality of teaching, and the low ratio of teachers to pupils, contribute to the swelling of the school population by what are called repeaters (pupils who have to take a course twice).

From all this it is clear that the provision of facilities for training new teachers, and for up-grading existing teachers, ranks high among the education needs of most countries.

When teaching policies are considered, no country has a clean slate. In most countries there is a bad heritage from the past. Teaching policies are followed that have not been designed with a view to the particular needs of the children or the countries. Sometimes this arises because a system has been copied from that of another country, and sometimes because it corresponds to the needs of a social system that is out of date.

For example, this is evident in the case of some university curricula, in countries where the concept of education as a means of developing the human resources needed for economic development has not yet taken root. In such countries universities still concentrate mainly on turning out the lawyers, the doctors, and the general arts graduates who are their traditional product.

Next there is the problem of language. Some difficulties arise from the fact that many languages are spoken within the borders of a single country, and these difficulties may be accentuated by



political factors. In most of the less developed countries, higher education, and to some extent secondary education, may have to be conducted in a foreign language, partly because there are no textbooks in the local language (which may even lack the necessary vocabulary) and partly because access to the current technical literature demands knowledge of a foreign language.

A difficulty of another sort arises in rural districts. In many countries the curricula of the primary schools in such districts is deficient in agricultural training. As a consequence, the parents do not see any practical use in the schooling their children are getting. This contributes to a very high rate of drop-outs in the first two years of school, most of whom revert to illiteracy almost at once, and thus the money spent on what is called their education is completely wasted.

#### THE FINANCING OF EDUCATION

This leads to the problems connected with the financing of education.

Recently the head of the O.A.S. Task Force on Education, estimated that 50-60% of the money being spent in Latin American countries on education is actually wasted. This is appalling to contemplate, especially because education is bound to be more expensive in the less developed countries than it is in other countries.

About three-quarters of the current cost of education is represented by teachers' salaries. A teacher's salary in a developed country may be between one and a half and three times the average per capita income. In the less developed countries it is proportionately much higher; in Nigeria, for instance, it is as much as seven times the average, and in Tunisia as much as ten times. There are good reasons for this. Apart from the general shortage of teachers, and indeed of educated men in general, there is the fact that in many countries native teachers have inherited salaries and conditions of service which had been established to attract teachers from abroad. Although one hopes that this very high cost will come down as more teachers are trained, it is clear that the present shortage will persist for a long time.

Apart from this, costs are swollen in the less developed countries by the high rates of drop-outs and of repeaters; by the construction of over-elaborate and sub-standard buildings; and by the loss of investment incurred in sending students abroad who do not return home when their studies are finished.



The amount of money made available for education clearly sets a limit on the pace at which education can be expanded, and this leads to the conclusion that it is essential to obtain the maximum possible contribution at the provincial or local level, including the enlistment of village dwellers to give labor and perhaps materials on a voluntary basis for the construction of schools and teachers' houses.

#### THE PLANNING OF EDUCATION

The planning of educational development faces a critical shortage of qualified and experienced personnel. Something is being done to fill this gap; and plans are in hand to do more. There are already regional training centres in New Delhi and Beyrout, and two more are proposed for Africa and Latin America, as well as the international Education Planning Institute proposed to be established under UNESCO auspices in Paris. However, IDA is faced with the problem that for some years to come we shall have to consider requests from countries which are not yet in a position to have good educational plans. An additional difficulty in this connection is that attempts at planning may be handicapped by the absence of the necessary basic statistical material.

However, in practice, the shortage of finance and the shortage of adequately trained teachers set limits to the rate at which any educational system can be expanded without serious deficiencies in the quality of instruction. What can be done, by way of well-balanced growth, within these limits, can be shown without any difficulty to be economically justified. In practice, therefore, for some years to come the absence of well worked out plans should not prevent investments in education from being justified.

#### CRITERIA IN APPRAISING PROJECTS

The foregoing description of problems that are faced suggest the kind of criteria that are appropriate in appraising the merits of educational projects, though few projects will meet all criteria perfectly. The following criteria have been tentatively adopted:

- (a) The government of a country wishing to borrow must decide for itself that education has a high priority in its general plans for development, and must support this decision with arguments convincing to IDA. Of course, the importance which the government attaches to the development of education will be evidenced by the amount of its own resources which it is prepared to devote to this purpose.



- (b) IDA would not normally consider financing an educational project unless it were an integral part of a plan for the development of the whole educational system on practical and well-balanced lines which in turn were related to a plan for economic development. Investigations would not normally be confined to the project as submitted, but would cover the whole educational system and all aspects of the plan for its development.
- (c) The project to be financed should have a high priority within the educational development plan.
- (d) IDA would not wish to finance the normal year-to-year growth in an educational system but would rather wish to concentrate on filling the most crucial gaps in the system.
- (e) IDA would not normally expect to finance any part of the current costs of an educational system. However, it might well consider financing, for instance, the cost of expatriate staff employed for a limited period to train future instructors of local teachers.
- (f) If faced with a choice between several different projects of equal priority in the educational field, IDA would have a bias towards those projects which could be shown to have a relatively speedy effect for increasing national productivity.
- (g) IDA would not be able to consider any project which had not been properly planned, in its human, material, and financial aspects. Well documented cost estimates will be needed and some analysis of the relation between costs and benefits (while recognizing, of course, that many of the benefits cannot be quantified).
- (h) Finally, IDA would need to be satisfied that the administration and organization of the educational system were going to be efficient. This means, for instance, that we should expect to find arrangements made for exercising a continuing planning function, efficient coordination of aid received from various sources, a proper coordination between all the national agencies responsible for various kinds of education, and some assurance of continuity in policy.



This does not mean that IDA should not be able to consider any project which did not fully qualify under each of these criteria. But it does mean, for instance, that IDA should not consider financing education in a country where no arrangements were made for a continuing planning function, or there was no assurance that the government appreciated the necessity for continuity in policy and were prepared to take steps to make corresponding administrative arrangements.

During the next two or three years projects may be recommended to the Executive Directors which on their own merits are of unquestioned justification, though not part of a well worked out plan for the general development of education if help from UNESCO and/or another competent institution is being given to the government in developing such a plan.

Finally, the question arises: What can IDA contribute, apart from finance, to the development of education? It may seem at first sight that there were so many different agencies and institutions already at work in the field that there is nothing left for IDA to do which would not duplicate or overlap the spheres of activity of these agencies and institutions, but this is not so. IDA can make real contributions without danger of intruding on aspects of education which are properly the responsibility of other agencies.

In the first place, IDA can help countries to understand better the need to plan their educational investments along well balanced lines. Secondly, IDA can help them to improve their educational statistics, which are the basis for good planning. Thirdly, IDA can help them by underlining the importance of sound administration and coordination, and finally IDA can help them to get the best value out of the large amounts of money spent on school construction.



Speech - Sept 6, 1963

Menton - St. Bernard, France

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INTERNATIONAL ECONOMIC ASSOCIATION

Conference on the Economics of Education  
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INTERNATIONAL FINANCING OF EDUCATIONAL INVESTMENT

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I am particularly pleased to have this opportunity to present to such a distinguished group a paper on the international financing of educational investment. Not because I believe that I will be able to shed new light on the theoretical aspect of the problem, but simply because since last year's meeting my institution, the International Bank for Reconstruction and Development, and its affiliate, the International Development Association, have initiated the practical task of financing educational investment in newly developing countries. Some aspects of our experience to date may be of interest to this gathering.

During the last five years or so, there has been a substantial change of attitude toward the role of education and training in economic and social development, and a growing appreciation of the importance of investment in this sector as one means of accelerating the processes of modernization and development in newly developing countries. You are well aware that the professional economist has made an important contribution to this change in attitude. At the same time, the change cannot be attributed exclusively to the findings of theoretical economists. Educators and other social scientists have for many years tried to attract the attention of statesmen and others committed to the task of economic development to the importance of this sector. Moreover, institutions like the World Bank, involved in the day-to-day task of investing in economic development projects in newly developing countries, have been aware for a long time that only people can make these investments effective. In fact, from the beginning, one of our greatest concerns has been to ensure that qualified and experienced management and staff would be available to manage and operate the projects that are financed by Bank loans.



Sometimes we have found that such management and staff were not available, and then we have had to make special arrangements to have them trained or even to import them from abroad in the initial stages of a project. From our experience with many kinds of projects all over the world, we have come to understand that economic development is hampered in almost every country by the lack of what may be called the non-commissioned officer, in administration, in agriculture, in industry and commerce.

This gap we filled in the case of the projects which we financed by making arrangements for the training of staff, arrangements which had to be initiated in some cases several years before the projects entered the operational phase.

But this was of course tackling only a small part of a much larger problem, that of developing within our borrowing countries adequate systems of education and training which could supply the needs of the economic development process. It was not until the establishment of the International Development Association, generally called IDA, which lends at long term to countries which cannot afford the foreign exchange required to repay a loan from the Bank on conventional terms, and only charges  $3/4\%$  per annum for the use of its money, that we considered making a contribution to the solution of this problem directly, and not simply on the basis of project needs.

Although the bulk of the projects financed by IDA are the same kind of projects which the Bank finances, in the fields of agriculture, transportation, power and industry, it was decided from the beginning that IDA should be prepared to pioneer in other significant development sectors which for various reasons the Bank had not entered. At that time we immediately began to study whether IDA might finance projects in the field of education and training. We created an internal committee, we hired consultants, we attended many international conferences and we relied on the advice and guidance of our sister institutions also concerned with this problem--UNESCO, ILO and FAO.

As you can imagine, we soon became impressed by the complexity of the problems in this field. There was no simple panacea on which we could concentrate our efforts. For example, we could have decided that IDA would finance only business school education or vocational education and training, on the basis that either of these specialized forms of education and training has a high priority in all newly developing countries. But we decided this type of limitation would not have been a sound policy since we could see that in many countries other problems have a higher priority. After long consideration we decided that our concern should not be limited to any one aspect of education and training, but had to be selective and flexible enough to meet whatever priorities and urgent needs existed in the educational and training systems of countries seeking financial assistance. We also concluded that it would be unsound to have an exclusively "economic" viewpoint when selecting priorities and agreed that we should be concerned with gaps that were significant also from a social and educational point of view.



Naturally we had to provide a framework and a reasonable limitation to the scope of our activities. We accordingly laid down the following ground rules for our financing in this field.

Criteria for Bank/IDA Financing of Education and Training Projects

- (a) The government of a country wishing financing must decide for itself that education and training have a high priority in its general plans for development, and it must support this decision with arguments convincing to the Bank and IDA. Of course, the importance which the government attaches to the development of education and training will be evidenced by the percentage of its GNP and of public funds which it is now devoting or plans to devote for both development and recurrent expenditures in education and training.
- (b) The Bank and IDA are interested primarily in projects involving substantial capital investment in the construction and equipment of facilities to be devoted to educational or training purposes. They would not normally expect to finance the current costs of an educational or training program; however, they may be prepared to finance under a Bank loan or IDA credit, or in some cases as technical assistance, special external expenditures which may be required for a limited period of time to pay for personnel or teaching materials needed for purposes of a project which introduces significant revisions or innovations in the educational program.
- (c) The Bank and IDA would not normally consider financing a project for education or training unless:
  - (i) it had a high priority and contributed to or was part of a comprehensive, well balanced and practical plan for the development of education and training, and
  - (ii) the education and training plan was carefully designed to meet the needs implied by the economic and social development of the country.
- (d) The Bank and IDA would not wish to finance the normal year-to-year growth in an educational and training system but would rather wish to concentrate on filling the crucial gaps in the system.
- (e) If faced with a choice between several different projects of equal priority in the educational field, the Bank and IDA would have a bias towards those projects which could be shown to have a relatively speedy effect in increasing economic growth or national productivity.



- (f) The Bank and IDA would not be able to consider any project which had not been properly planned, in its human, material, and financial aspects. Well documented cost estimates will be needed together with an analysis of the relation between costs and benefits (while recognizing, of course, that many of the benefits cannot be quantified). In some cases, however, technical assistance may be provided for the preparation of a project to be subsequently financed.
- (g) Finally, the Bank and IDA would need to be satisfied that steps were being taken to make the educational or training system both effective and efficient. This means, for instance, that they would expect to find arrangements made for exercising a continuing planning function, efficient coordination of aid received from various sources, a proper coordination between all the national agencies responsible for various kinds of education and training, and some assurance of continuity in policy. It also means that the Bank and IDA would want to be satisfied that adequate steps are being taken to modernize educational practices and educational content, that modern school buildings are being planned and that enough educational research is undertaken to introduce a spirit of innovation and efficiency in education and training.

You may now want to know what we have been able to do in practice in finding projects to finance within these ground rules. First of all I must point out that we have purposely proceeded slowly. Whatever our awareness of the importance of investing in education and training in the newly developing countries, we were also aware that we were treading on new ground; in practical terms, there were few available guidelines to help us select priority projects.

In our task we have been helped substantially by UNESCO, which has sent missions, at the request of governments, to help identify projects which appear to have priority for external financing.

When a government, or an institution backed by its government, has either with the help of a UNESCO mission or on its own, prepared a project and approaches us for financing, we first study the information submitted in support of the request. If our criteria for financing show that the project merits a careful appraisal, we send a team to the requesting country to examine the merits of the project. We study how the project has been planned in all its aspects, including administration, construction, management, operation and financing. We particularly review the estimated cost, the proposed means of financing and the means available to implement it. In this appraisal of the merits of a project we have found many problems.



First and foremost, we have become painfully aware how difficult it is to select priorities for educational and training projects. In most countries there are so many gaps that it is very difficult to know where to start. Furthermore, we are all aware of our limited knowledge regarding the role of education and training in economic and social development. In some countries we find that vocational education seems deficient or inadequate to meet needs, but is this really the most urgent problem? What about adult education and training? What about mass communication techniques for training purposes? Would it be preferable to try to help a government reform the teaching of science in secondary schools, or to invest in better technical institutes? In fact, of course, it is not a simple question of choosing between alternatives; it is always a question of the relative emphasis to be put in developing the different aspects of the whole system of education and training.

We have found that governments are also aware of these problems and also find it difficult to find a right balance in their educational development. In some instances, it appears that a priority need is for UNESCO, ILO or even ourselves to provide additional technical assistance to help governments do a better job of educational planning. In such cases we hope to help governments find out for themselves what the priorities really are, how these priorities can realistically be met and so to develop a balanced plan for investment. This, I am convinced, is one sector where help is likely to be effective, since the selection of project priorities must take place internally; and until there is adequate educational planning and implementation, the framework against which prudent international financing of educational development can take place is missing. UNESCO and ILO have responsibilities in this field, and we are pleased that they are intensifying their efforts. We on our part will supplement their efforts when this is appropriate.

In this connection we have taken an important step in agreeing to sponsor with UNESCO an independent International Institute for Educational Planning which will concentrate on advancing practical knowledge of the role of education and training in economic and social development. This institute, which began operations in Paris in July this year, is also to train people who will carry down to the national level the techniques developed at the institute. We are particularly pleased that we were able to join our resources with those of UNESCO in this endeavor and intend to keep in close touch with the institute's activities, which will be of great interest to us.

Another very real problem is that in most of the countries we have visited, few people know how to prepare educational and training projects for external financing. Even when priorities have been selected, we often find that no agency has the experience or the time to work out the project in sufficient detail for our consideration. This is partly due to the lack of experience of ministries of education in seeking international financing for education. They do not realize that all the details of the project have to be worked out before we can consider it for financing. We are often



approached to finance schools only to find that no one has yet selected sites for these schools; no one knows where the teachers will come from; cost estimates, if they exist at all, are either incomplete or based on inadequate data, and no provisions have been made to take care of the recurrent cost of the projects. The inadequate preparation of projects naturally slows down the process of their appraisal. But we hope that with the help of UNESCO, ILO and of regional institutions such as the OAS we will be able to help governments better understand how projects should be thought through, so that the time lag between request and financing can be decreased.

Even when we have been able to select project priorities and have obtained adequate information about the project we must still decide to what extent we are satisfied with conditions within the educational and training system in which we have been asked to invest. As you know, there are bound to be many problems in any educational or training system. Maybe teachers are too scarce because they are not well paid, or they are poorly trained. Or the curriculum is old fashioned and is not adequate, or the administrative practices of the Ministry of Education are obsolete, or school construction is not standardized and is expensive, inefficient and wasteful. I need not make this list any longer, but in all countries, including the developed countries, there are inefficiencies in the educational system that need repairing. The question which we have to ask ourselves is whether such inefficiencies are likely to jeopardize the successful operation of the project which we have been asked to finance, or to prevent it from making its optimum contribution to the general social and economic development of the country. It is not sensible, for instance, to finance a technical college unless one can be sure that the secondary schools are able to produce graduates properly prepared to take advantage of the training it is designed to provide.

It is therefore part of the task of our appraisal missions to identify gaps and inefficiencies in the system of which the proposed project is a part. It may or may not be appropriate for the Bank or IDA to assist countries to make good these gaps or to eliminate these inefficiencies, but we may draw the attention of the government concerned to their existence, and may often act as a catalyst in putting the government into touch with other agencies who can provide technical assistance to this end. If no other source of such assistance proves to be available, we may be able to provide such technical assistance ourselves.

In the light of all these difficulties, it is not surprising that up to now we have made only one development credit, that is for an educational project in Tunisia--the construction of six secondary schools which are a representative sampling of the secondary school system.



In addition the Bank approved a project of technical assistance to the Tunisian Government whose long run importance may well be far greater than the schools whose financing we are assisting. We have employed a team of consultants made up of architects, engineers, quantity surveyors, and school administrators to develop improved standards and procedures for the design and construction of secondary schools to be used by the Tunisian Government and by the Bank in such countries as it may find appropriate. The study will cover not only such matters as space standards, the possibility of multi-purpose use, materials, construction procedures, standardization of components, various aspects of cost and the relation of these to climatic and social conditions, but will also be concerned with the relation of school design to present schooling methods and to their possible change in the future.

Thus while the project obviously aims at making possible better buildings at lower cost, it is hoped also that through the interchange of viewpoints which will take place the Tunisian Government may be stimulated in its efforts to develop modern, functional, and efficient educational practices.

Since making this first development credit to Tunisia, which was financed by IDA, we have sent appraisal missions to Afghanistan, Pakistan, Tanganyika, and the Philippines and have received requests and inquiries from a number of other countries. Projects in these countries are in various stages of preparation. I should like to say a few words about one of the projects about which we have been approached, because it entails a new and significant departure. One of our member countries has asked us to consider a project involving an agricultural college which would train agronomists and other experts needed particularly to expand the extension service. It also appears that the country's credit standing is good. This means that under World Bank practice this country is not eligible for an IDA development credit but is eligible for a Bank loan. We looked into this matter thoroughly and concluded that such a specialized education project was a legitimate investment by the Bank. It was our conclusion that if an education project is likely to make a significant contribution to the development of the economy; if this contribution can in part be quantified; if it is found that this economic return is adequate; if the government is willing to guarantee a loan; and if there is not too much time lag between beginning the project and the resulting economic return, there is no reason not to finance such a project with a conventional Bank loan. Bearing in mind, however, the long lead-time in educational investments, we consider that such loans should have long periods of amortization and long periods of grace.



In the past, our experience in financing all kinds of projects has convinced us of the importance of education and training in the process of economic development. During the last year, we have begun to tackle the problems involved in ourselves financing development in this field. We have found that the principles we have applied to the appraisal of other types of projects can also be applied to educational and training projects. We have found that our hard-boiled insistence on sound project priorities and on adequate project planning and implementation can benefit those countries where we have been invited to provide financing. We have found that other institutions concerned with education and training welcome the opportunity to cooperate with us. In some cases we have been able to bring together international and bilateral sources of aid and private foundations to work together on specific projects. We have been able to do this because we were fortunate enough to assemble in a relatively short time a small but dedicated group of educators, economists and architects who in the last year have worked out the practical details of how an institution like the World Bank can finance educational projects. We believe that we have successfully gone through this initial or pilot period, and we are convinced that the financing of educational investment is not only an important task from the point of view of economic and social development, but that it forms a sound basis for the utilization of Bank and IDA funds.





Notes prepared by Mr. Kalim for Hugh Ripman in connection with a Communications Workshop at Westinghouse Electric International, New York, July 12, 1966

POINTS FOR MR. RIPMAN'S TALK BEFORE  
WESTINGHOUSE EXECUTIVES

I. The Steps Involved in Granting the Project Credit

The decision to extend a loan or credit as well as preceded by a thorough analysis and appraisal of the project by the Bank staff. The first step is to ascertain the creditworthiness (the capacity to service a debt) of the proposed borrower. After this has been established, the project is examined in detail along the lines outlined below.

1. The Economic Aspect

- A. Is the sector of the economy in which the project is located one which deserves priority?
- B. Is the project justified by demand for the product or the service it is to produce by the project on a regional, national or international scale?
- C. Is the project justified by the economic rate of return on the measurable costs and benefits?
- D. Is the project one which fits the factor-endowment pattern of the country?
- E. The timing of the project. Is it prudent to execute it at a particular moment?

2. The Technical Aspect

The following queries have to be answered in assessing the project.

- A. How much use should be made of consultants' services?
- B. What should be the scale of operations?
- C. What should be the location and layout of the project?
- D. A rigorous scrutiny of cost estimates should be carried out.



3. The Management and Organizational Aspect

- A. How much foreign staff should be employed and for how long and for what purpose?
- B. Organization. In the construction phase and the operational phase the question to be asked is, "is responsibility and authority to be delegated or centralized and in what proportion?"

4. The Commercial Aspect

This hinges upon determining how to obtain the goods and services required to implement the project at the lowest cost.

- 5. An estimate of the likely financial result of the operation should also be made. It is only after favorable answers to the queries listed above are obtained that the loan which has been requested is approved.

II. The Procedure Followed in Procurement Under Project Credits

The World Bank and IDA do not take any part in issuing bid invitations for supplies and services required by their borrowers. The borrower engages in this activity himself and the contracts are awarded subject to Bank/IDA approval. The World Bank and IDA, however, require their borrowers to use the proceeds of their loans and credits to obtain goods and services on an international competitive basis. The following principles are usually followed with regard to contracting procedures.

- 1. Prequalification of Bidders. Where contracts are sought for large bids a list of prequalified bidders is usually established in order to save the cost of bid preparation to those who would fail to qualify in any case. Prequalification is based by taking the following factors into account:



- i. Experience of the firm on similar work.
- ii. The firm's capabilities with respect to personnel, equipment and plant.
- iii. The firm's financial position.

#### Currency Regulations

IBRD/IDA require that the borrowers make reasonable efforts to assure that payments for goods and services procured under loans and credits be made in the currency of the country of origin.

#### Exchange Risk

The contractor supplier of goods and services is not required to bear the exchange risk in cases where a payment is to be made to him based on a conversion of local into foreign currency.

#### Insurance

The specifications should state precisely all types of insurance to be provided by the successful bidder.

#### Evaluation of Bids

In analyzing bids the determining factors are efficiency and reliability of the equipment offered by various bidders. The availability of service, spare parts and the time of completion of construction are also taken into consideration.

#### Award of Contract

The lowest evaluated bid which meets the appropriate standards of capability and financial responsibility is awarded the contract.



III. The Bank's Leadership in Participation Studies and Surveys Directed Toward an Over-all Country Program

1. Concern with general development of member countries grew out of the necessity of assessing the relative priority of various projects which member governments submitted to the Bank. The first Bank mission was in 1949 to Colombia. These general survey missions are intended to survey development potentialities and problems of the countries to which they are sent and to make recommendations that will assist governments in formulating long-term development programs. The emphasis is on three points. The first is to estimate in a rough order of magnitude, the amount of investment which the country can appropriately undertake with resources at its command. The second is to recommend priorities with public investments, among the important sectors of the economy and among types of undertakings within each sector after taking private investment requirements into account. The third is to suggest economic and financial policies and administrative measures necessary to assure the success of development programs. The size of these missions usually averages about 16 members. The Bank has received assistance from other organizations in this aspect of its work. FAO has nominated agricultural experts for most of our missions. IMF has provided the service of staff members and public health experts have been recruited in cooperation with WHO and educational experts in cooperation with Unesco. The analysis and recommendations of the mission are published in a report prepared in such a form that it can be utilized not only by technicians but by all interested elements of the community. These reports are usually published in English by The Johns Hopkins Press of Baltimore, Maryland.

July 6, 1966



yo con la Argentina.  
La firma de los documentos citados por parte de todos los integrantes de cada una de las delegaciones demandó cerca de una hora. Concluida esta labor la presidencia solicitó un voto de aplauso para la República Dominicana con motivo de celebrar este país ayer su fecha patria. El jefe de la delegación dominicana agradeció el homenaje.

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(Cont. en la 5ª pág., 1ª col.)

no; Aires.  
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unidad de alma y tradición, muchos y diversos pueblos que podrían regirse por las mismas reglas en la paz y en la guerra, pero que sabían, a la vez, guardar y celar sus particularidades y costumbres propias, tanto para la esencia de sus existencias individuales como para vivero de la universalidad creada por esas individualidades.  
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La Nación, March 6, 1967, front page

# Bases para la integración en la Cuenca del Plata

## LAS ESTIPULARON CANCELLERES DE CINCO NACIONES

Con tal fin creóse un Comité Intergubernamental Coordinador

(Martes 28)

Poco menos de una hora y media de duración tuvo la Primera Reunión de los Cancilleres de los Países de la Cuenca del Plata, efectuada ayer por la tarde en el Teatro Municipal General San Martín, con asistencia de los ministros de Relaciones Exteriores de la Argentina, Bolivia, Brasil, Paraguay y el Uruguay. Como resultado de las deliberaciones, emitióse una declaración en la que señala la decisión de los gobiernos de efectuar un estudio conjunto e integral del área con miras a la realización de obras multinacionales, bilaterales y nacionales en pos del progreso de la región.

También se integró un Comité Intergubernamental Coordinador que tendrá por fin centralizar las informaciones y girarlas a los gobiernos interesados. El estudio antes citado versará acerca de las posibilidades para la construcción de obras de infraestructura, y la estructuración de programas de educación, de conservación de la vida animal y forestal, de radicación de industrias y de lucha contra las epidemias.

Los cancilleres resolvieron efectuar una nueva reunión para proseguir con el análisis de los problemas que se han

carado en la ciudad de San-

(Cont. en la 4ª pág., 6ª col.)

## La declaración conjunta

La declaración conjunta de los cancilleres de los países de la Cuenca del Plata —dada después de la conferencia que celebraron ayer—, dice:

"Los ministros de Relaciones Exteriores de la Argentina, señor Nicanor Costa Méndez; de Bolivia, señor Alberto Crespo Gutiérrez; del Brasil, señor Juracy Magalhães; del Paraguay, señor Raúl Sapena Pastor, y del Uruguay, señor Luis Vidal Zaglio, reunidos en la ciudad de Buenos Aires, a los veintisiete días del mes de febrero del año mil novecientos sesenta y siete, animados de un firme espíritu de cooperación y convencidos de la necesidad de aunar esfuerzos para el desarrollo armónico y equilibrado de la región de la Cuenca del Plata en beneficio de los intereses comunes de sus países y sus pueblos, como un paso de gran alcance en el proceso de integración latinoamericana y procurando concretar mejor los objetivos nacionales de cada uno de los Estados participantes, declaran:

"I. Que es decisión de sus gobiernos llevar a cabo el estudio conjunto e integral de la Cuenca del Plata con miras a la realización de un programa de obras multinacionales, bilaterales y nacionales útiles al progreso de la región.

"II. Los embajadores extraordinarios y plenipotenciarios acreditados ante el gobierno argentino y el funcionario de igual rango que designe la Cancillería argentina se constituirán en Comité Intergubernamental Coordinador. Cada país podrá acreditar los asesores técnicos que crea conveniente. Este Comité adoptará decisiones por el voto unánime de sus integrantes y tendrá la misión de centralizar las informaciones y encaminarlas a los gobiernos interesados, así como la coordinación de la acción conjunta que se considere necesaria.

"Es de su competencia elaborar un proyecto de estatuto para su definitiva constitución, que será presentado en la próxima reunión de cancilleres de los países de la Cuenca.

"III. Que se proponen adoptar las medidas necesarias para que en cada uno de los países organismos nacionales especializados centralicen los estudios y la apreciación de los problemas nacionales de cada uno de ellos, relativos a la Cuenca.

"Por intermedio del Comité Intergubernamental Coordinador estos organismos intercambiarán las informaciones vinculadas con el estudio previsto en el numeral I de esta declaración.

"IV. Que para alcanzar el objetivo del desarrollo integral de la Cuenca el estudio deberá tomar en consideración, principalmente, los siguientes temas:

"A. Las facilidades y asistencia a la navegación; el establecimiento de nuevos puertos fluviales y el mejoramiento de los ya exist-

tentes, con el propósito de que puedan ser utilizados en forma más eficiente por los países de la Cuenca, y en especial por aquellos que tienen una situación mediterránea; los estudios hidroeléctricos, con miras a la integración energética de la Cuenca; la instalación de servicios de agua para usos domésticos, sanitarios e industriales y para regadíos; el control de crecidas e inundaciones y de la erosión, y la conservación de la vida animal y vegetal.

"B. La interconexión vial, fluvial, ferroviaria y aérea, la construcción de polductos y el establecimiento de un eficiente sistema de telecomunicaciones.

"C. La complementación regional mediante la promoción y radicación de industrias de interés para el desarrollo de la Cuenca.

"D. La complementación económica de áreas limítrofes.

"E. La cooperación mutua en programas de educación, sanidad y lucha contra las epidemias.

"V. La cooperación técnica y financiera de los organismos internacionales será indispensable para que estos estudios puedan alcanzar los fines que persiguen resultando necesario mantener un estrecho contacto con dichas organizaciones de asistencia y crédito.

"Que han tomado nota de la declaración de los ministros de Relaciones Exteriores de la Argentina, Bolivia y Paraguay, en el sentido de que cada uno de sus gobiernos ya han solicitado la colaboración del Banco Interamericano de Desarrollo que se prestará a través del Instituto para la Integración de América latina y con la participación del Programa de Naciones Unidas para el Desarrollo, la secretaría de la Organización de los Estados Americanos y el Comité Interamericano de la Alianza para el Progreso y otros organismos internacionales, para la realización del estudio mencionado en el numeral I.

"VI. Los cancilleres de la Argentina, Bolivia, Brasil, Paraguay y Uruguay, realizarán una nueva reunión para seguir considerando este programa en la ciudad de Santa Cruz de la Sierra (Bolivia) en la fecha que recomienda el Comité Intergubernamental Coordinador y, en lo posible, en el curso del año 1967.

"Esta declaración es la prueba del firme propósito de cooperación que anima a los pueblos de América latina y de la decidida resolución de los gobiernos de los cinco países de colaborar activamente en la realización de los estudios y de las obras indispensables para acelerar el progreso de la Cuenca del Plata".

Footnote 3, Water for Economic Development (p.9): "Only three months ago the Ministers of Foreign Affairs of Argentina, Bolivia, Brasil, Paraguay and Uruguay adopted a joint declaration which lays the groundwork for development of the Rio de la Plata Basin."





*Knapp Report*

## International Conference on **WATER for PEACE**

May 23-31, 1967

Washington, D.C.

Topic - - of the Agenda **V.B.**  
Author's Name: **World Bank Staff**  
Co-Author's Name:

Original Language: **English**  
Author's Country:  
Author's Affiliation: **International Bank for Reconstruction and Development**

### **WATER AND ECONOMIC DEVELOPMENT**

The efficient use of fresh water is a major concern of the International Bank for Reconstruction and Development (World Bank) and its affiliates, the International Development Association (IDA) and the International Finance Corporation (IFC), for it is crucial to the orderly economic growth of the developing countries. Fresh water is the most basic and abundant natural resource. It is essential to life, to the production of food and fibers, and to the growth of industry. In its flow to the sea, it is also a primary source of power and, in many countries, an important medium of transport.

Although water occurs everywhere, even in the rocks and desert sands, it is seldom found where it is most needed in sufficient quantity, of suitable quality, or under adequate control. The need for these added values -- control, transportation, treatment -- which represent most of the cost of water, accounts for much of the demand for development finance. Yet the easy availability of water is still taken largely for granted, and neither the cost nor the complexities involved in its best employment are fully appreciated. We welcome the initiative of the United States Government in convening this International Conference on Water for Peace, which highlights the central role that water must play in the growth of nations.

The orderly exploitation of fresh water in developing countries presents problems of extraordinary difficulty. This paper will deal with only a few of the more critical questions involved in financing development projects. It will focus especially on those in the fields of irrigation and urban water supply, but much of the discussion will apply to other types of projects as well.

It should be borne in mind throughout that economic problems in development are linked inseparably with others of a scientific and technological nature, which play an unusually important role in the financing of water-related projects. Unfortunately, there are serious gaps in our knowledge of water. Hydrological data for most areas are seriously inadequate. Systematic studies of water resources and their development potential have been made in only a few countries such as West Pakistan, where a comprehensive survey was completed recently under the supervision of the Bank as administrator of the Indus Basin Development Fund. The lack of information for most countries imposes limitations on our ability to make clear economic choices between alternative uses of available supplies, to assure ourselves that some types of upstream projects will not have adverse effects downstream, to estimate the reliability of future supply, and sometimes to anticipate and forestall destruction of the land's productivity by salinity, waterlogging, drought or floods.

As the pressure on readily usable water supply builds up with expanding population and industrialization, the need to fill this information gap becomes increasingly urgent. The need is universal, but it is especially acute for countries now in the early stages of economic development, for they can hardly afford the profligate use of resources which characterized earlier eras. It is to be hoped that the most acute shortcomings will be rectified eventually as a result of the cooperative program of the International Hydrological Decade, organized under the auspices of the United Nations Educational, Scientific and Cultural Organization (Unesco). Meanwhile, we must do the best we can with the knowledge and resources available, for economic growth and a higher standard of living for two-thirds of mankind are imperative demands.

To help meet these demands by providing finance for high priority purposes is the function of the World Bank Group, the largest multilateral source of funds for development. As used in this paper, the term World Bank Group will refer only to the Bank and IDA, since they provide the



vast bulk of the Group's development finance and their operations are more directly relevant to the subject of this conference. The more specialized role of IFC, which is to promote the expansion of industrial and commercial activity in the less developed countries, will have an increasingly important bearing upon problems of water use as the process of industrialization accelerates.

The Bank and IDA have the same general purposes. They are administered by the same officers and staff, and they apply the same standards in appraising and supervising projects. Their funds are separate, however, and the terms of their lending are radically different. The Bank itself raises the largest part of its funds through the sale of bonds in the private capital markets, and therefore makes loans on conventional terms to reflect the cost of the money it borrows. The Bank is the oldest of the development finance institutions, having been in operation since 1946. Its shareholders are 105 member governments. IDA was organized by the Bank's members in 1960 to provide a channel for multilateral lending on easy terms to countries that are capable of faster development than they can safely finance through additional borrowing on conventional terms. Its funds are in the form of contributions, chiefly from the 18 wealthier nations among its membership of 97, and its loans have been for 50 years without interest except for a service charge of 3/4 of 1%. Since its resources have been limited, they have been reserved for lending to countries with relatively good economic policies but very low per capita income. Although the governments of these countries receive the benefit of IDA terms, when the project being financed is a revenue-earning enterprise it is required to repay the government on conventional terms.

Together, the Bank and IDA provide about a quarter of all official external finance for capital development projects in the less developed countries, as distinguished from such aid as food shipments and program loans. Through 1966, the Bank had lent about \$10.2 billion net for 485 projects in 79 countries, while IDA had advanced about \$1.6 billion in 100 credits to 36 countries. The pace of their lending has increased rapidly in recent years and is now at an annual rate of well over \$1 billion. The vast bulk of this financing has been for infrastructure projects which provide the base for self-sustaining economic growth. A very high proportion -- perhaps as much as half -- of the total of about \$12 billion has been for projects which depend on adequate supplies and efficient management of fresh water. Chiefly, they include irrigation and flood control works, urban water supply systems, inland waterways, hydroelectric installations and multi-purpose projects.

Successful lending for development, as distinguished from normal banking practice in countries with an ample supply of necessary skills, often requires the provision of technical aid to the borrower, as well as external finance. With hindsight, it is easy to see that the need for such help is a fundamental factor in the problem of development. It varies in scope from country to country, and ranges from aid in the formulation and administration of economic policy to the identification and preparation of specific projects. Neither the nature nor the extent of this need was fully perceived 20 years ago when the World Bank received its first request for a loan from a non-industrialized member country. Today technical assistance is a household phrase in almost every language, but everything we know about it had to be learned the hard way, step by step. We now consider the provision of such services, including the conduct of basic research and broad studies in the field of development economics, to be at least as important as the money we lend. It offers the borrowing country in need of such aid the best assurance that both its own resources and those of the Bank will obtain the desired results; and it puts the Bank in a position to judge realistically whether a project is sound and the money it lends will be repaid.

#### Priorities for Development

Technical assistance is often required in the determination of priorities for development financing, a problem so basic that it calls for discussion on general grounds, without special reference to water-related projects. It is especially relevant to those involving the use of fresh water, however, since they command such a high proportion of available finance and require particular care in the allocation of both financial and natural resources.

To the maximum feasible extent, every project to be financed should justify itself in terms of its relative urgency and importance to the particular sector and the entire economy, in competition with all other projects which contest for scarce financial resources. In addition, any project involving the use of limited natural resources, including fresh water, should justify its priority in relation to alternative uses.

In practice, of course, it is exceedingly difficult for less developed countries to adhere to such a rule. There is often a strong temptation to postpone the provision of safe drinking water, for example, and to channel investment into more dramatic or popular projects. Practical considerations occasionally make it necessary to proceed with projects which happen to be ready for financing, without waiting to know whether others might be more productive. Sometimes the inadequacy of data makes it impossible to assess relative priorities with assurance. The guideline is no less important, however, because it cannot always be rigidly applied. Increasingly



strict adherence must be the constant goal, for the avoidance of waste and the ability to achieve self-sustaining growth within a reasonable time depend upon it.

Even the approximate adherence to such a standard implies relatively sophisticated planning, whether in the formal presentation of a four or five-year plan or through a more pragmatic and flexible mechanism for investment programming. This presents immediate problems, however, and confronts both the provider and the recipient of external aid with an uncomfortable dilemma. Virtually by definition, most less developed countries suffer from an extreme shortage of some or all of the skills required to draw up or administer realistic investment programs. Their need for external technical advice and assistance is often acute. At the same time, they tend not to welcome foreign intervention in their investment decisions, especially when they suspect the presence of political, military or commercial motives. While this is understandable, the lending agency must either appraise the country's entire economic program and performance in arriving at a judgment on financing an individual project, or abandon its insistence that first things must come first. If the agency accepts its full responsibility and adopts the first alternative, it should also be prepared to offer assistance in overcoming the borrower's difficulties. But the offer is likely to be suspect, especially if only one project is under consideration and the lender's objectivity is open to doubt. The problem often is resolved by financing the project without regard to priorities, sometimes with unfortunate results.

The pressures to follow such a course are very strong. It side-steps the political dilemma for both sides, while permitting construction of projects which may be useful in any case. Intense competition among suppliers and contractors in the aid-giving countries to provide goods and services for a particular project also tends to subordinate questions of economic priority. This is particularly true when the project is politically attractive to leaders in the host country. Large dams, steel mills, overly ambitious irrigation works, television networks, automated water supply systems -- all these and other symbols of progress have played their role. All, of course, have their place in development; the point is that when they are financed before their turn in a rational scheme of priorities, the investment pattern is distorted, both domestic and external resources are misused, the recipient country's prospects for growth and a higher standard of living are diminished, and a disservice is done to the whole cause of development.

This would not be an easy problem to overcome even if ideally cooperative relations existed between givers and recipients of aid, with no motivation on either side but the most efficient use of resources. Severe limitations on the rationality of development would still be imposed by the world-wide shortage of skills in economic analysis, administration, science and technology, by historical, political and social realities which inhibit orderly growth, by the inadequacy of the statistical base in less developed countries, and by the shortcomings of economics, engineering, hydrology and other relevant sciences. It can be hoped, however, that ways will be found to permit objective analysis, whatever its technical limitations, to gain increasing ascendancy in the process of allocating development resources.

The World Bank attempts to advance this process, and it has done so with increasing success in view of the enormous difficulties inherent in the problem. Its methods are pragmatic. In its own operations, the key factor has been the evolution of relationships with its less developed members which are characterized by mutual trust and rooted in rigid standards of professional competence and objectivity on the part of the Bank itself. By now it is well known and generally accepted, if not always eagerly, that finance will be available from the World Bank Group only if the Bank is satisfied that the proposed project is technically feasible and economically justifiable, that it merits high priority in relation to competing needs and alternative uses of scarce financial and natural resources, and that the borrowing country is prepared to adhere to reasonably sound development policies. It is equally well known that, while the Bank can be very tough in this regard, its judgments will be impartial and motivated by the purpose laid down in its charter: to help increase production and improve living standards in the country concerned.

In applying such policies, it is obviously necessary to require that the borrowing country lay bare its development plans and permit the examination of its finances, administrative structure, policies and practices in considerable detail. While response has not been universally favorable, it has been encouraging. At one extreme, a few countries have found the Bank's requirements inadmissible, and assistance has been withheld. In many cases, however, confidence in the Bank's motivation has led to relationships which can best be described as open, frank and productive partnerships in development. Between these extremes, the degree of cooperation varies widely, but its general level has been rising as experience demonstrates that this is the most promising road to genuine economic growth.

The establishment and maintenance of such relationships, while difficult at best, is easier for a multilateral institution than for a national agency. Since about 85% of all official aid to the less developed countries is bilateral, however, a major problem is how to achieve the maximum benefits of close collaboration between providers and recipients of aid without diminishing the



independence and importance of bilateral action. The Bank hopes to move a long way in this direction through its sponsorship and servicing of what we call consultative groups.<sup>1/</sup> These are formally organized groups of aid-giving members of the Bank that are interested in providing assistance to particular less developed members. Their discussions are based chiefly on Bank studies of the economic position, policies and prospects of the countries concerned, and its recommendations on sector and project priorities and terms of financing.

The evolution of consultative groups stems from experience in the consortia on aid to India and Pakistan, organized by the Bank in 1958 and 1960 respectively, and four groups to coordinate assistance to Colombia, Nigeria, Sudan and Tunisia. Renewed emphasis on this approach has resulted in the formation of five additional groups, and within the next few years it is hoped that a large part of all external development assistance can be coordinated through such mechanisms. To the extent that this can be achieved and the groups succeed in their purpose, it may be expected that an increasing proportion of both technical and financial aid will be allocated in accordance with objectively determined priorities.

#### Financing Public Utilities

Beyond the question of priorities, responsible lending for development requires careful attention to all financial and technical aspects of the specific project, in order to assure maximum benefit to the borrowing country and the soundness of the loan. On the side of finance, the lending agency must be sure that adequate funds will be available from other sources as required, and that sound financial policies will guide both the execution and management of the project.

About half of all Bank Group financing has been for hydroelectric power, railways, ports and waterways, telecommunications and urban water supply -- for projects which can clearly be classified as revenue-producing public utilities. The financial policies of such enterprises have an important impact on the whole process of development. The most crucial question concerns their rate structures: do their revenues cover costs and provide enough surplus to finance improvements and future extensions to meet growing demand?

In fact, rates charged by long-established utilities in some less developed countries bear no close relation to real costs, but are held low for socio-political reasons. The utilities are subsidized. While the subsidies may be too small and uncertain to assure satisfactory service, they place a heavy burden on the government's scarce revenues and often lead to inflationary borrowing. In some cases, utility revenues themselves are diverted to other purposes to relieve pressure on the budget. Service inevitably deteriorates, falling progressively farther behind demand. Public indignation over poor service and resistance to higher rates grow simultaneously, feeding upon each other, while development is inhibited by the shortage of services that are basic to the health, mobility and productivity of people. It would be unrealistic to expect any other result from such policies, given the shortage of financial resources available to the government of a less developed country, the many pressing demands that are made upon them, and the relative political impotence of a financially dependent utility system.

The Bank Group's experience in less developed countries has indicated clearly that revenue-producing public utility projects almost invariably will fail to meet the needs of economic development unless they are made to pay their own way. Consequently, the Bank and IDA make the adoption of sound financial policies a precondition of their lending for such projects. They require especially that rates be established which will cover all operating and maintenance costs, including debt requirements, and produce a surplus which will help finance future extensions. These conditions apply whether the utility is publicly or privately owned.

An excellent example of the efficacy of such policies is a small project in Managua, Nicaragua, where the water supply system has been reorganized, modernized and extended with the aid of a \$3 million IDA credit. When the credit was approved in late 1962, only about 40% of the city's built-up area and 53% of its population of 221,000 were served by the Empresa Aquadora de Managua, the water utility. Door-to-door vendors supplied most of the remaining population, chiefly in the low-income groups, while some had access to private wells and a few were served by small, independent systems. Water from these sources was often contaminated, and the limited statistics available indicated a high incidence of typical water-borne diseases.

In some important respects, the situation was far better than in many developing areas. The Empresa had some competent staff on which to build its organization. It was not subsidized, nor were its revenues diverted to other government purposes, so that it was able to cover operating costs and pay for modest replacements and extensions. During the preceding four years it had been able to borrow enough local funds to expand its system by more than a third. Nevertheless, more than 100,000 residents still had no direct public water service and population was growing faster

1/ Hoffman, Michael L. Aid Coordination. World Bank, Washington, 1966.



than the number served. There had been no change in the Empresa's rates since 1945, while water purchased from private vendors cost from two and a half to nearly 14 times as much and other items in the cost of living had nearly doubled.

In borrowing from IDA, the Nicaraguan Government agreed to adopt policies permitting the Empresa to establish and maintain a schedule of rates covering operation and maintenance, depreciation, interest and amortization payments, normal year-to-year extensions of service, and a reasonable proportion of major expansion programs as they became necessary. Arrangements were made for a management study, assisted by the Pan American Health Organization. The Empresa moved immediately to adopt recommendations growing out of this study, including the modernization of its accounting system.

Free service was eliminated, average rates were increased by more than 50%, and a program was initiated to meter all water connections. As in all such cases, these decisions required political courage, but they have been amply vindicated by results. Even before the IDA-assisted project was completed last year, extending service to 65% of a population which had grown by a third, the Empresa was earning 8% on net fixed assets, including new facilities constructed with the IDA credit but not yet in service. Although the credit to the Nicaraguan Government was for a 50-year term without interest except for a service charge of 3/4 of 1%, the Empresa is required to repay the loan to the government by 1986, with interest at 6%; this is in line with IDA's policy of giving the benefit of its easy terms to governments, but requiring that revenue-producing sub-borrowers repay on conventional terms.

The Empresa is now in a position to continue its growth on a sound basis, providing safe water at reasonable rates to an ever-increasing proportion of Managua's rapidly-growing population. It has also proved that its customers will pay a fair price for good water if they can get it; at least, its most recent report indicated that it had accomplished the remarkable feat of collecting 99% of its bills within two months of billing date!

Unfortunately, the Managua case is not typical. Resistance to realistic utility rates is prevalent. It is often difficult to gain acceptance of the concept even for railway and electric power service, and it is even more difficult when the product is safe drinking water, the most basic commodity of all. The idea that water for drinking and hygiene should be free, or heavily subsidized, tends to inhibit financing for water supply and is a major cause of the shortage in less developed countries which already is critical and is growing worse.

For technical advice and information on water supply problems, the World Bank relies heavily upon the World Health Organization (WHO). Four years ago, WHO published a study<sup>1/</sup> which indicated that at least 70% of the urban population in 75 less developed countries, or more than 200 million people, had inadequate piped water service, were supplied with unsafe water, or both. The greatest urban water need, according to this study, is in Asia and Africa south of the Sahara. The worst conditions are in South and South Central Asia, where about two-thirds of the urban and at least 70% of the total population has no piped water. The situation is particularly acute in such urban centers as Calcutta, which is said to be the endemic center of cholera for all of Southeast Asia.<sup>2/</sup>

The cost of such inadequacies in illness, death and wasted manpower is staggering. The loss of industrial and farm production is beyond estimating. And the situation becomes more serious year by year with increasing urbanization. The authors of the WHO study calculated that, in the 15 years from 1962 to 1977, some 450 million urban dwellers in the 75 countries studied would need new, extended or improved piped water supplies, requiring an annual investment of between \$400 million and \$500 million. Against this need, they found that only five or six of the 75 countries had construction programs which promised even to keep pace with the rise in population, but with no improvement in current low standards of service.

It is doubtful that financing required to overcome the existing backlog, even on the most modest scale, and to keep abreast of population growth will be forthcoming where sound financial policies are not adopted. On the other hand, there is ample reason to believe that realistic rate structures will go far toward attracting the necessary funds from domestic and foreign sources and that urban consumers will pay reasonable rates for a reliable supply of good water if service is available.

Unfortunately, there is little evidence to support the same conclusion about rural users of water, whether for irrigation or for drinking and hygiene. We can only speculate about the financing of rural drinking water projects, since the Bank has had no experience in this field.

1/ Dieterich, Bernd H. and John M. Henderson. Urban Water Supply Conditions and Needs in Seventy-Five Developing Countries. WHO, Geneva, 1963.

2/ Bose, Nirmal Kumar. "Calcutta: A Premature Metropolis." Scientific American. Vol. 213. 1965. pp. 90-102.



The question is becoming important, however, especially in areas newly irrigated with slightly brackish or otherwise contaminated water and where the irrigation canals are the only source of village supply. In some parts of India, for example, the problem is rather acute, and sooner or later fresh water may have to be piped and pumped over long distances at considerable expense if farmers are to be held on the irrigated land.

#### Financing Irrigation

As a development institution, the World Bank Group must look far beyond the engineering and financial aspects of an irrigation project it considers for financing. Its interest is not only in the immediate expansion of output, but in giving impetus to the modernization of agriculture. The potential benefits to the nation of a well-conceived irrigation project are often very great. Their full realization, however, would usually entail a virtual revolution in farming practice and fundamental improvements in government services, all of which take time. Meanwhile, the Bank seeks to assure that the maximum feasible benefits will be achieved immediately, and that conditions will favor their continuing growth.

In pursuit of these objectives, the Bank examines every relevant aspect of the borrowing government's agricultural policy and administration, as well as all economic and technical factors affecting the success of a proposed irrigation project. Some of the most pertinent questions are the accessibility of profitable markets, the availability of sufficient fertilizer, pesticides, improved seeds and essential equipment at prices the farmer can afford, the adequacy and cost of credit, the quality of research and extension services, and the equitability of the tax and land tenure systems. All of these affect the farmer's attitude toward participation in an irrigation project, and they largely determine his ability to take advantage of it.

Double-cropping and increased yields per acre are often possible, but only with the farmer's full cooperation. His attitudes are often formed in a more or less rigid mold of local values and customs, which is sometimes slow to accommodate the extra work required by a double-cropping system of farming. Agriculture, including irrigation farming, is one of the oldest modes of civilization. It is rich with a deep accretion of accustomed ways -- and of skepticism, usually grounded in hard experience. In many areas, farmers are virtual strangers to money. Traditionally, they are offered few incentives to additional effort, and new assurances are suspect. Patterns of economic attitudes, relationships and behaviour, which are rooted in history and reinforced by custom, are relatively difficult to modify. Usually change is possible and often deeply desired, but the farmer must be convinced by his own experience that the promised benefits are real.

Potential direct benefits to the farmer can be calculated on the basis of the most likely realizable cropping patterns, farming methods, prices and other variables. When they are projected over a substantial number of years, they are often quite modest in relation to the total cost of the project, and their realization may take as long as 10 years or more. Even then, many real economic uncertainties are likely to remain.<sup>1/</sup>

Indirect benefits of an irrigation project to the immediate community, the region and the country as a whole may be much greater than those derived by the farmers who use its water.<sup>2/</sup> The surrounding farming community benefits in many ways. The project provides jobs during the construction stage and creates need for seasonal labor in the fields after it is completed. It establishes a new basis for the growth of processing industries, which further add to the community's expansion and to the demand for equipment, construction materials and consumer goods. Often such industries provide the only alternatives to idleness or unproductive effort for a traditionally immobile rural population.

The benefit is often greatest, however, from the point of view of the country as a whole, when a successful project adds to the food supply, improves the balance of payments by increasing exports or reducing the need for imports, relieves upward pressure on prices, and contributes to expansion of the tax base. A good example is found in Mexico, whose farms today produce 95% of the country's food requirements and more than half its total exports, despite the fact that only 16% of its land area is suitable for farming and much of that lacks an adequate natural water supply. The key has been an intensive investment program which doubled the irrigated area between 1950 and 1962 and embraced a total of 10 million acres by 1966. The more productive early projects, which were executed without the World Bank's assistance, were producing as much as \$400 million per year by 1960, against capital expenditures of about \$500 million. More recent projects, chiefly for the rehabilitation, expansion and improvement of existing irrigation schemes, will bring somewhat smaller, but still impressive, returns in relation to cost. The Bank is

1/ van der Tak, Herman G. The Evaluation of Agricultural Projects: A Study of Some Economic and Financial Aspects. World Bank, Washington, 1964.

2/ Zimmerman, Josef D. Irrigation. John Wiley & Sons, Inc., New York, 1966. p. 17.



involved in three of these, with loans totaling \$46.5 million out of a total cost of \$170 million; on completion, they are expected to increase the value of Mexican farm production by about \$41 million per year.

Since the social, political, economic and technical factors which determine the success or failure of irrigation projects are never confronted twice in the same combination, no ready formula for the allocation of costs is likely to be satisfactory in all circumstances. The Bank requires, as a condition of its lending for irrigation projects, that water charges be at least sufficient to meet the expense of operation and maintenance. Beyond that, it seeks to assure that the project will be as self-sustaining as circumstances will permit, but when necessary it agrees that capital costs should be borne by the government.

This rough division is a pragmatic and flexible one, based on experience. Partial subsidization may be unavoidable. In a developing country, however, there are stringent limits to the ability of government to provide subsidies from budgetary resources. As a practical matter, therefore, an individual enterprise should generate at least enough funds of its own to cover current expenses. The capacity of an irrigation project to do so, however, is limited by the credibility to the farmer of the promised benefits. In an area where irrigation is already fairly common, the charges it is possible to impose may be further limited by local usage. Often in such areas, the capital costs of existing irrigation projects have long since been amortized by the government, operating and maintenance costs are largely subsidized, and purely nominal water charges are a part of the web of life. Over time, it might be possible to readjust water rates upward through a program which eliminates inequalities and is aimed at embracing agriculture in the money economy. Eventually, it should be possible to levy ordinary taxes on the farmer's increased income. But in many cases, these developments must be postponed to later stages in a long process. The immediate problem is to obtain the farmer's commitment to the most productive use of land and water. A charge for water tends to assure more efficient use, but too high a charge will be self-defeating.

Sometimes, a large portion of the costs of irrigation projects can be recovered in the form of indirect taxes on processing, consumer sales or exports. In practice, for example, one of the Bank's borrowers employs specific levies on exports to recover all costs beyond those met by minimal water charges; in this case, much of the added production resulting from Bank-financed projects is clearly for sale abroad. When local circumstances make other solutions impracticable, the Bank will agree to the adoption of such policies.

Most of the available possibilities for the construction of low-cost gravity irrigation systems in developing countries have already been exploited. Further expansion of the output of low-value staple crops, therefore, will have to be achieved primarily by increasing yields from land already irrigated. There is ample latitude for such expansion, which is now being emphasized in India, Mexico and elsewhere.

The largest remaining sources of fresh water for irrigation are below the ground and in rivers, where it can be pumped directly to the land. There are some areas, as in the Indus plain of West Pakistan and perhaps in India, where vast aquifers exist in circumstances which make their use for low-cost irrigation feasible. In many areas, however, the possibilities for large-scale irrigation of low-value crops with groundwater are limited, since the cost may be greater than the yield;<sup>1/</sup> while the capital costs of such systems are likely to be relatively low, their operating costs are high. The same considerations often apply to the use of water taken from rivers through various types of pumping arrangements. Consequently, such resources can be used economically in many cases only for crops which usually require a higher investment than staples and a more sophisticated system of culture and marketing, but which promise commensurate returns. This type of agriculture, including vegetable growing, horticulture and plantation farming, is practiced on a significant scale in only a few of the less developed countries. In West Pakistan, where such crops are becoming more common, a study in 1964 showed that the highest yields in money value were obtained from such fruits as mangoes, dates, citrus and bananas. Sugar cane yielded about half the value of those crops per acre, while rice and wheat gave only a little more than a tenth as much.<sup>2/</sup>

#### Technical Services and Financing

Engineering, management and other technical services are infinitely more important as a complement to finance in less developed countries than in areas where the borrower normally has ready access to such skills and ample experience in using them.

- <sup>1/</sup> Barnea, Joseph. Water Costs in Developing Countries. Paper presented at the First International Symposium on Water Desalination. Department of the Interior, Washington, 1965.
- <sup>2/</sup> White House - Department of the Interior Panel on Waterlogging and Salinity in Pakistan. Report on Land and Water Development in the Indus Plain. Superintendent of Documents, U.S. Government Printing Office, Washington, 1964, p. 40.



Like any prudent banker, the World Bank Group insists upon high technical standards in the preparation, execution and management of the projects it finances. Such a policy could be applied, and the Bank's reputation for sound lending could be safeguarded, simply by denying loans for poorly prepared projects. A far more positive approach is necessary when the object is to advance the economic growth of less developed countries. Banking must become dynamic, on an unprecedented scale.

The World Bank learned this through experience, beginning with the first development loans requested by its less developed members. Gradually, it became clear that the Bank itself would have to add an entirely new dimension to the business of financing -- not merely insisting upon high technical standards, but doing everything in its power to see that borrowers would be able to meet them. This required the development of new methods to assure that competent technical personnel would be available to members and effectively used by them, to strengthen the Bank's ability to give active advice and assistance, and to maintain the objectivity and technical excellence of its own appraisal and supervisory services.

The result is a system which has evolved from a pragmatic search for solutions to problems for which there had been no precedent. It is still evolving, as the scope of the Bank's operations expands, as knowledge about development increases, and as the developing countries themselves gain experience and their needs shift and change. No one in the Bank would claim perfection for it, but the record suggests that it has been reasonably successful. Certainly there has been no major engineering failure in connection with Bank-financed projects. The Bank has been able to avoid most of the waste which results from over-sophisticated design of projects in less developed countries. There have been a few, but only a few, instances in which a project's anticipated economic return has been seriously diluted because engineering failed to be guided by competent advice in related fields, a failing which accounts for many of the "horror stories" one hears about waste in development.

Zimmerman,<sup>1/</sup> reporting on "scores of irrigation analyses made in the last decade," says that "costly and supposedly efficient installations were often operating at an alarmingly low water efficiency, sometimes below 20%." He found that the difficulty in many cases was that "planning had been done with the mistaken belief that soil, agriculture, and irrigation science need not be considered as basic engineering design data." Many installations "were utterly unsuitable for local conditions" and had to be abandoned.

The Bank itself has encountered irrigation projects in which the major works were built without thought to the distribution of water in the fields or its use on crops; design responsibility was presumed to end with delivery of water to the village or local area, leaving it to each farmer to carry on from there. In other cases, the engineers had provided for flushing the irrigation canals during the growing season, when they should be carrying water to the fields. In urban water supply, not a few cities in less developed countries have been saddled with heavy investments in fully automated equipment which is not required, and in excess capacity which will not be used for years.

The World Bank Group attempts to avoid such inefficiencies in the use of funds, which neither the recipients nor the providers of aid can afford. It insists that unnecessary immobilization of capital be prevented by planning for construction in stages, whenever feasible. It will not approve complicated engineering and expensive equipment which is difficult to service. It insists upon international competitive bidding to ensure procurement at the lowest possible cost. It also requires that every project it finances be based upon feasibility studies which take full account of all factors affecting its success, and that it be engineered and supervised throughout by qualified personnel approved by the Bank and familiar with its standards and objectives.

Feasibility studies may be carried out by the borrower if it has a sufficiently experienced staff, or by acceptable consultants employed by the borrower. They may be organized by the Bank itself, either on its own account or acting as the executing agency for studies financed by the United Nations Development Programme. In these cases, independent consultants are always retained. A satisfactory feasibility study includes the most realistic possible estimates of both costs and benefits, as the basis for a financing plan, as well as thorough consideration of all technical aspects of the project. Consultants are expected to anticipate possible difficulties and propose feasible solutions.

If assistance is required in preparing a project for the Bank's consideration, the borrower will often be urged to employ consultants. In eastern and western Africa, the Bank itself has established special missions to help governments in both the identification and preparation of projects. Borrowers are also required to employ outside consultants to supervise the construction,

<sup>1/</sup> op. cit. p. 103.



and often the initial operation, of projects if the Bank considers their own technical services to be inadequate for the purpose. The consultants are chosen by the borrower, subject to the Bank's approval.

#### Institutional Vehicles for Financing

Although World Bank loans and IDA credits are either made to governments or guaranteed by them, the Bank insists on assurance that each project will be efficiently executed and operated. The strength and ability of the administering agency is one of the first and most important questions examined by the Bank when it appraises a project.

While it is obvious that no project is either self-executing or self-operating, the Bank has often been asked to finance a waterworks, power plant or irrigation system when no responsible authority existed, public or private, to construct or manage it. On other occasions, existing institutions which were intended to administer proposed projects have been found to lack sufficient authority, responsibility or both, or to be improperly organized, inadequately staffed or insecurely financed.

In such cases, the Bank suggests appropriate reorganization of the existing institution or the establishment of a new one. It often provides the technical assistance required to carry out such recommendations, and sometimes helps the borrowing government in finding new management or other key personnel. In no case does it lend without assuring itself that the organization charged with administering the project is capable of doing so efficiently.

Thus, the Bank has found that aid in institution-building is often a fundamental prerequisite to successful development financing. Today, the Bank's clients in Latin America alone include 33 autonomous or semi-autonomous institutions which have received more than \$1 billion in Bank loans and IDA credits, and 28 of them have been organized or brought into operation with the help of the Bank. Many of these are agencies responsible for the administration of ports or power systems.

Ordinarily, the principal needs for institutional improvements in connection with urban water supply systems involve assistance in problems of organization and in business, technical and financial management. Such enterprises are often subordinate units of political entities, with excessively limited authority to hire and fire, fix rates, borrow funds or manage their own affairs. When extensive changes appear to be necessary, the Bank recommends -- and sometimes insists as a condition of its financing -- that outside consultants be employed.

The needs are usually more complex where irrigation projects are concerned. Several government departments and agencies are normally involved in both the determination of policy and its implementation. Construction of the major works may be the responsibility of one department, while the water distribution system is the concern of another. Farm-to-market roads may be solely in the province of a Ministry of Transport. Questions of adequate market outlets, organization and pricing may well be considered beyond the interest of government. The Ministry of Agriculture is most likely to be responsible for research and extension services and the provision of improved seeds, while a Ministry of Industry and Commerce may be concerned with the supply of fertilizer, pesticides and farm equipment. The Finance Ministry, and perhaps a Ministry of National Economy, will be influential in determining investment, export and fiscal policies which affect the project.

A major problem, therefore, is to assure adequate coordination of all branches of government whose decisions and programs have a bearing on the success of the project. This is sometimes extremely difficult to accomplish. In some cases, the problem has been approached through the establishment of an Irrigation Department, as in Thailand and Turkey. In others, different types of formal or semi-formal coordinating mechanisms have been set up, with varying degrees of success. To assist in this effort, the Bank often urges the employment of qualified consultants and insists upon specific action to improve coordination, as a condition of its lending.



and often the initial operation of projects if the Bank considers their own technical services to be inadequate for the purpose. The consultants are chosen by the borrower, subject to the Bank's approval.

Institutional Vehicles for Financing

Although World Bank loans and IDA credits are either made to governments or guaranteed by them, the Bank insists on assurance that each project will be efficiently executed and operated. The strength and ability of the administering agency is one of the first and most important questions examined by the Bank when it appraises a project.

While it is obvious that no project is either self-executing or self-operating, the Bank has often been asked to finance a waterworks, power plant or irrigation system when no responsible authority existed, public or private, to construct or manage it. On other occasions, existing institutions which were intended to administer proposed projects have been found to lack sufficient authority, responsibility or both, or to be improperly organized, inadequately staffed or financially financed.

In such cases, the Bank suggests appropriate reorganization of the existing institution or the establishment of a new one. It often provides the technical assistance required to carry out such recommendations, and sometimes helps the borrowing government in finding new management or other key personnel. In no case does it lend without assuring itself that the organization charged with administering the project is capable of doing so efficiently.

Thus, the Bank has found that aid in institution-building is often a fundamental prerequisite to successful development financing. Today, the Bank's clients in Latin America alone include 33 autonomous or semi-autonomous institutions which have received more than \$1 billion in Bank loans and IDA credits, and 28 of them have been organized or brought into operation with the help of the Bank. Many of these are agencies responsible for the administration of ports or power systems.

Ordinarily, the principal needs for institutional improvements in connection with urban water supply systems involve assistance in problems of organization and in business, technical and financial management. Such enterprises are often subordinate units of political entities, with excessively limited authority to hire and fire, fix rates, borrow funds or manage their own affairs. When extensive changes appear to be necessary, the Bank recommends -- and sometimes insists as a condition of its financing -- that outside consultants be employed.

The needs are usually more complex where irrigation projects are concerned. Several government departments and agencies are normally involved in both the determination of policy and its implementation. Construction of the major works may be the responsibility of one department, while the water distribution system is the concern of another. Farm-to-market roads may be solely in the province of a Ministry of Transport. Questions of adequate market outlets, organization and pricing may well be considered beyond the interest of government. The Ministry of Agriculture is most likely to be responsible for research and extension services and the provision of improved seeds, while a Ministry of Industry and Commerce may be concerned with the supply of fertilizer, pesticides and farm equipment. The Finance Ministry, and perhaps a Ministry of National Economy, will be influential in determining investment, export and fiscal policies which affect the project.

A major problem, therefore, is to assure adequate coordination of all branches of government whose decisions and programs have a bearing on the success of the project. This is sometimes extremely difficult to accomplish. In some cases, the problem has been approached through the establishment of an irrigation department, as in Thailand and Turkey. In others, different types of formal or semi-formal coordinating mechanisms have been set up, with varying degrees of success. To assist in this effort, the Bank often urges the employment of qualified consultants and insists upon specific action to improve coordination, as a condition of its lending.



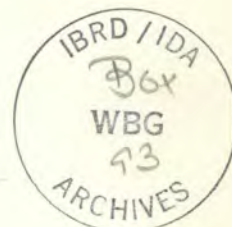


INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT  
INTERNATIONAL DEVELOPMENT ASSOCIATION

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EDUCATIONAL PROJECTS AND PROBLEMS  
Statement to the Executive Directors' Board  
by Hugh B. Ripman, Assistant Director  
Department of Technical Operations



It was felt that on this occasion, when the first project in the education field was being submitted to the Executive Directors, it would be interesting to explain how the staff have approached the investigation of this new type of project, and to give some idea of the general criteria adopted in appraising such projects.

Since IDA was established, the staff has been studying the problems of education. An inter-departmental committee was set up for this purpose. Close contacts were established with UNESCO and with a number of other agencies of the United Nations active in the field of education and training, such as ILO, FAO, and ECLA. Early this year, staff members attended an international conference in Santiago which dealt with the relation between the development of education and economic and social development in general. In July a report was sent to a conference held in London on school construction.

During the past 18 months contact was established and maintained with leading educational authorities in this country, in Europe and in Latin America, and with several United States private foundations (Ford, Rockefeller and Carnegie) which are particularly active in this field.

One of the main conclusions reached has been that there is no general agreement about the solution of educational problems, and that even the developed countries confront many problems in this field.



It is particularly striking to realize that in the last few years there has been a change of emphasis in many countries in considering the nature and objectives of education. Whereas previously great stress had been laid on the basic human right of people to receive the benefits of education, and consequently there had been a wide-spread impetus in the less developed countries to broaden primary education, more recently the emphasis has changed, and it has become fashionable to pay attention to the aspect of education which is called the development of human resources, and to regard education as an organic part of the whole social and economic development of a country. It is only within the last two or three years that educationalists have begun to think in terms of economics, and that economists have begun to pay special attention to education.

A few universities have done pioneer research work in the field: Princeton, Chicago and Stanford in the United States, and London, Paris and Frankfurt in Europe. This research has been concentrated on two subjects: first, the techniques of manpower surveys, designed to forecast the future needs for high-level and skilled manpower; and second, the relation between the cost of investment in education and the benefits to be derived from it.

The forecasting of manpower needs is at present an art and not a science. There are so many variables, so many uncertainties, that to pretend to make an accurate forecast for 15 or 20 years ahead is quite impossible. However, much work is being done to develop the necessary techniques, both by way of studies at the universities and by way of sample operations in various countries.

The study of the relation between the costs and the benefits of investment in education is also in its infancy. It is the beginning of an art, and certainly does not approach being a science. But much work is being done, and the general conclusion (which cannot be supported by a lot of precise equations) is that properly planned investments in education pay great economic dividends, especially in the less-developed countries.

As is often the case when new approaches are being thought out, there is today the danger that the pendulum may swing too far, with the result that people may tend to concentrate too much on the economic benefits of education and to lose sight of the fact that the whole process of development is ultimately to raise standards of living, and that a broad liberal education plays an important part in this process.

From our studies and from the contacts we have made, we see that there are certain common problems that face the less-



developed countries. It is clear that there is no easy or quick solution to these problems. It will be a very long-term operation, to develop along efficient lines the educational systems of such countries to the point where all these problems have been solved.

These common problems, which are also present to a smaller extent in other countries, refer to the following five aspects of education:

- (a) the administration of education;
- (b) the structure of educational systems;
- (c) teachers and teaching policy;
- (d) the financing of education; and
- (e) the planning of education.

#### THE ADMINISTRATION OF EDUCATION

Looking first at the administration of education, one is struck by the lack of continuity, both in the formulation of policy and in its implementation. For instance, the average life of a Minister of Education in office in Latin America is not much more than six months. Moreover, in a number of countries where there is no well-developed civil service, when the Minister goes many of the top officials go with him. Obviously, no large corporation could ever work efficiently under these conditions -- indeed, no large organization of any kind.

The degree of centralization of control poses a problem in any large organization, particularly an organization consisting of many units widely spread over a large area. This problem is particularly acute in the case of education, where it is compounded by the fact that the Ministry of Education is seldom responsible for the whole system. The Finance Ministry, for instance, plays an important part in decisions. The Ministry of Public Works is frequently responsible for school construction and maintenance. The Ministry of Agriculture, the Ministry of Health, and the defense authorities may be concerned with certain kinds of training. In addition, outside the public education system, there may be an apprenticeship system, and private industry may give in-service training.



In some countries there is a problem of coordinating the activities of private schools with the government system. In some African countries the large majority of the schools are church or missionary schools.

The problems of administration are not complicated only by the multiplication of agencies responsible in the country itself. There are today many different kinds of agency which offer assistance in the development of educational facilities. Besides UNESCO, ILO and FAO, there are regional organizations, individual governments and private foundations which are engaged in providing such help. Obviously, the coordination of all these efforts is very important; yet in fact it is often very deficient.

Another problem has to do with the construction of educational buildings, in which a great deal of money is invested. In many countries, because of the fragmentation of control, the design and construction of schools is the responsibility of local groups, and there is no central organization for research and design. Moreover, the results of the excellent research work in this field that has been carried out in the United Kingdom and in some other countries are not widely known in the less developed countries.

Some steps are being taken to disseminate the results of such research, and to initiate research specifically designed to meet the problems of the less-developed countries. The O.A.S. Education Task Force has recommended the creation of a Latin-American research centre, and this suggestion was endorsed at the recent conference in London. Two such regional centres have already been established under UNESCO auspices, one for Africa, in Khartoum, and one in Bandoeng for Asia. A further recommendation of the London conference proposed that certain types of research, and the exchange of information on the design and construction of school buildings, should be centralized at the international level.

A final problem of administration is that there are very few people in the world, and particularly few in the less-developed countries, who are qualified and experienced in the techniques of planning educational development. This point, though mentioned later, arises here as evidence of the need for training educational officials of most countries in modern administrative principles.



## THE STRUCTURE OF EDUCATIONAL SYSTEMS

The second group of general problems is concerned with the structure of educational systems. Here the first thing that strikes one is the compelling political pressure to expand primary education as fast as possible until it becomes universal.

In many countries, the target rate of expansion can only be achieved at the cost of increasing difficulties with regard to the quality of instruction, and at the cost of distorting the whole structure of the educational system. There are not enough qualified teachers to make it possible, without grave loss of efficiency, to expand primary education as fast as many countries have tried or would like. The result of such well-meaning efforts is to increase the number of drop-outs and repeaters, and to sacrifice quality to quantity. UNESCO has recognized this danger, and in recent conferences in Latin America, in Africa and in Asia, has stressed the importance of maintaining a balance between the three levels of education -- primary, secondary and higher -- and countries are now beginning to think in this way. But the popular pressure for the expansion of primary education is such that it will be politically impossible in most countries to slow down the pace at all sharply.

At the other end of the scale, many countries regard the establishment of a university as a sign of their independence and a symbol of great prestige value. There are many agencies ready to help countries to found universities, and progress has sometimes been too fast, with the result that some faculties do not have enough students to fill the classes, while others are producing graduates for whom there are no jobs.

In general, secondary education has been the "Cinderella" in many countries, and this has had unfortunate results, since the secondary schools have to perform three essential tasks; first, to provide teachers for the primary schools; second, to prepare candidates for higher education who can man top level positions; and thirdly, to produce recruits for middle level posts in administration, industry, commerce and agriculture. Experts who have studied the problem state that mid-level manpower should increase from six to nine times as fast as the general labor force. It is these considerations that have led the staff to conclude that much of the aid to be provided by IDA should properly go to the secondary level.



### TEACHERS AND TEACHING POLICY

Turning now to the problems connected with teachers and teaching policy, the most striking factor is of course the serious shortage in every country, accentuated in many cases by the departure of expatriates. Apart from this general shortage, there is a particularly acute shortage of teachers in scientific and technological subjects. It is not always fully appreciated that the rate at which teachers can be trained sets an absolute limit to the pace at which an educational system may be expanded without loss of efficiency.

Apart from the shortage of teachers, many of those who are today employed as teachers lack the necessary qualifications; for example, it was reported recently that in a large South American country, 54% of the primary school teachers had received no specific teacher training. In some countries, the shortage is so great that people are being recruited to teach in primary schools who have themselves less than six years of elementary education.

The poor quality of teaching, and the low ratio of teachers to pupils, contribute to the swelling of the school population by what are called repeaters (pupils who have to take a course twice).

From all this it is clear that the provision of facilities for training new teachers, and for up-grading existing teachers, ranks high among the education needs of most countries.

When teaching policies are considered, no country has a clean slate. In most countries there is a bad heritage from the past. Teaching policies are followed that have not been designed with a view to the particular needs of the children or the countries. Sometimes this arises because a system has been copied from that of another country, and sometimes because it corresponds to the needs of a social system that is out of date.

For example, this is evident in the case of some university curricula, in countries where the concept of education as a means of developing the human resources needed for economic development has not yet taken root. In such countries universities still concentrate mainly on turning out the lawyers, the doctors, and the general arts graduates who are their traditional product.



Next there is the problem of language. Some difficulties arise from the fact that many languages are spoken within the borders of a single country, and these difficulties may be accentuated by political factors. In most of the less-developed countries, higher education, and to some extent secondary education, may have to be conducted in a foreign language, partly because there are no textbooks in the local language (which may even lack the necessary vocabulary) and partly because access to the current technical literature demands knowledge of a foreign language.

A difficulty of another sort arises in rural districts. In many countries the curricula of the primary schools in such districts is deficient in agricultural training. As a consequence, the parents do not see any practical use in the schooling their children are getting. This contributes to a very high rate of drop-outs in the first two years of school, most of whom revert to illiteracy almost at once, and thus the money spent on what is called their education is completely wasted.

#### THE FINANCING OF EDUCATION

This leads to the problems connected with the financing of education.

Recently the head of the O.A.S. Task Force on Education estimated that 50-60% of the money being spent in Latin-American countries on education is actually wasted. This is appalling to contemplate, especially because education is bound to be more expensive in the less-developed countries than it is in other countries.

About three-quarters of the current cost of education is represented by teachers' salaries. A teacher's salary in a developed country may be between one and a half and three times the average per capita income. In the less developed countries it is proportionately much higher; in Nigeria, for instance, it is as much as seven times the average, and in Tunisia as much as ten times. There are good reasons for this. Apart from the general shortage of teachers, and indeed of educated men in general, there is the fact that in many countries native teachers have inherited salaries and conditions of service which had been established to attract teachers from abroad. Although one hopes that this very high cost will come down as more teachers are trained, it is clear that the present shortage will persist for a long time.



Apart from this, costs are swollen in the less-developed countries by the high rates of drop-outs and of repeaters; by the construction of over-elaborate and sub-standard buildings; and by the loss of investment incurred in sending students abroad who do not return home when their studies are finished.

The amount of money made available for education clearly sets a limit on the pace at which education can be expanded, and this leads to the conclusion that it is essential to obtain the maximum possible contribution at the provincial or local level, including the enlistment of village dwellers to give labor and perhaps materials on a voluntary basis for the construction of schools and teachers' houses.

#### THE PLANNING OF EDUCATION

The planning of educational development faces a critical shortage of qualified and experienced personnel. Something is being done to fill this gap; and plans are in hand to do more. There are already regional training centres in New Delhi and Beirut, and two more are proposed for Africa and Latin America, as well as the International Education Planning Institute proposed to be established under UNESCO auspices in Paris. However, IDA is faced with the problem that for some years to come we shall have to consider requests from countries which are not yet in a position to have good educational plans. An additional difficulty in this connection is that attempts at planning may be handicapped by the absence of the necessary basic statistical material.

However, in practice, the shortage of finance and the shortage of adequately trained teachers set limits to the rate at which any educational system can be expanded without serious deficiencies in the quality of instruction. What can be done, by way of well-balanced growth, within these limits, can be shown without any difficulty to be economically justified. In practice, therefore, for some years to come the absence of well-worked-out plans should not prevent investments in education from being justified.



CRITERIA IN APPRAISING PROJECTS

The foregoing description of problems that are faced suggest the kind of criteria that are appropriate in appraising the merits of educational projects, though few projects will meet all criteria perfectly. The following criteria have been tentatively adopted:

- (a) The government of a country wishing to borrow must decide for itself that education has a high priority in its general plans for development, and must support this decision with arguments convincing to IDA. Of course, the importance which the government attaches to the development of education will be evidenced by the amount of its own resources which it is prepared to devote to this purpose.
- (b) IDA would not normally consider financing an educational project unless it were an integral part of a plan for the development of the whole educational system on practical and well-balanced lines which in turn were related to a plan for economic development. Investigations would not normally be confined to the project as submitted, but would cover the whole educational system and all aspects of the plan for its development.
- (c) The project to be financed should have a high priority within the educational development plan.
- (d) IDA would not wish to finance the normal year-to-year growth in an educational system but would rather wish to concentrate on filling the most crucial gaps in the system.
- (e) IDA would not normally expect to finance any part of the current costs of an educational system. However, it might well consider financing, for instance, the cost of expatriate staff employed for a limited period to train future instructors of local teachers.



- (f) If faced with a choice between several different projects of equal priority in the educational field, IDA would have a bias towards those projects which could be shown to have a relatively speedy effect for increasing national productivity.
- (g) IDA would not be able to consider any project which had not been properly planned, in its human, material, and financial aspects. Well documented cost estimates will be needed and some analysis of the relation between costs and benefits (while recognizing, of course, that many of the benefits cannot be quantified).
- (h) Finally, IDA would need to be satisfied that the administration and organization of the educational system were going to be efficient. This means, for instance, that we should expect to find arrangements made for exercising a continuing planning function, efficient coordination of aid received from various sources, a proper coordination between all the national agencies responsible for various kinds of education, and some assurance of continuity in policy.

This does not mean that IDA should not be able to consider any project which did not fully qualify under each of these criteria. But it does mean, for instance, that IDA should not consider financing education in a country where no arrangements were made for a continuing planning function, or there was no assurance that the government appreciated the necessity for continuity in policy and were prepared to take steps to make corresponding administrative arrangements.

During the next two or three years projects may be recommended to the Executive Directors which on their own merits are of unquestioned justification, though not part of a well-worked-out plan for the general development of education if help from UNESCO and/or another competent institution is being given to the government in developing such a plan.

Finally, the question arises: What can IDA contribute, apart from finance, to the development of education? It may seem at first sight that there were so many different agencies



and institutions already at work in the field that there is nothing left for IDA to do which would not duplicate or overlap the spheres of activity of these agencies and institutions, but this is not so. IDA can make real contributions without danger of intruding on aspects of education which are properly the responsibility of other agencies.

In the first place, IDA can help countries to understand better the need to plan their educational investments along well-balanced lines. Secondly, IDA can help them to improve their educational statistics, which are the basis for good planning. Thirdly, IDA can help them by underlining the importance of sound administration and coordination, and finally, IDA can help them to get the best value out of the large amounts of money spent on school construction.



INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT



# WATER for economic development

*Two Papers*

*presented by the World Bank to the  
International Conference on Water for Peace*

Washington, D.C.

May 23-31, 1967

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1. Water for Industrial and Economic Development  
by MOHAMED SHOAI B, Vice President
2. Water Use and Economic Growth  
by HUGH RIPMAN, Deputy Director,  
Projects Department



# 1. WATER FOR INDUSTRIAL AND ECONOMIC DEVELOPMENT

By MOHAMED SHOAIB, Vice President

I am very grateful for the opportunity to address this conference on Water for Peace. This is a subject of continuing and deep interest to all humanity and, as such, to us in the World Bank.

The crucial role of water management has been a major theme of ours at the World Bank for 20 years. About one half of the \$12 billion we have lent to 96 countries has been for projects for the efficient use of water resources. So our financial stake alone is large. Our interest, however, and sometimes, I am encouraged to believe, our influence, is much larger. We are the instrument of 106 member governments, our stockholders. Our whole purpose is to help increase the output and living standards of our less developed members, 88 countries with half the population of the world. We are therefore deeply concerned about the efficiency of all forms of investment for development, domestic and foreign, public and private. For in the perspective of this task, any misdirection of resources is more than regrettable, whatever the cause.

In any large enterprise, of course, a certain misallocation of resources is unavoidable. But the excuse of ignorance and lack of understanding is no longer quite as valid as it might have been in earlier times, when waste was a camp follower of progress. The structure of industrial society in Europe and North America has taken seven generations to build. For the better part of 200 years, the principal guide was trial and error. The process involved much dissipation of human life and of irreplaceable resources. In the wake of phenomenal gains, it threw up unhappy consequences which



are all too familiar. A few of these, such as water shortages and pollution in some of the more generously endowed areas of the world, are germane to the subject of this conference. Such problems might have been avoided if what we know today had been known 50 or 100 years ago.

Instead, much of our current knowledge has accumulated in the last few decades. This is true, I believe, in the fields of economics, government and business administration, industrial production and technology, marketing, the natural and behavioral sciences, medicine, and perhaps even agriculture. Today, we have a vast and strikingly new store of knowledge and experience which gives us the capability of greatly reducing the time and easing the task of development. This places an unprecedentedly heavy burden on our generation, and most especially on the leaders of the developing countries and those of us who have been given the privilege of helping them.

When we consider the question of water as a resource for development, for industrialization, and hopefully for building a more congenial environment for peace, what is most notable is the lack of readily available basic information. This is a problem which has preoccupied World Bank engineers and consultants in scores of countries for many years, as they have searched for the hydrographic and hydrological data required in connection with projects for irrigation, hydroelectric power, flood control, inland navigation and urban water supply. Adequate and reliable data on rainfall, runoff, flood levels, and the composition and movements of groundwater simply do not exist in many areas, even for some of the most important rivers and watersheds in the world. In this field, as in a number of others, our theory and technology have far outstripped the supply of information required to translate knowledge into well prepared development projects.

I have noted with satisfaction that the need for more and better data has been given full recognition in planning for

this conference. And of course it is the chief motivation behind the International Hydrological Decade (IHD), in which many national programs will be coordinated through the United Nations Educational, Scientific and Cultural Organization (Unesco). While there is a universal paucity of information on water, it is undoubtedly most acute in many developing countries. It is to be hoped that means will be found for most of them, if not all, to participate in the IHD program. It will be a major advance if the foundation can be laid for the systematic accumulation of reliable data which are both adequate and comparable from country to country and region to region. It is especially important that this be achieved with respect to watersheds involving the interests of more than one country.

This brings me to another important aspect of my subject. Just as we lag in such seemingly humdrum matters as the collection of facts and figures required for responsible decisions at the national level, we have been slow to devise a satisfactory politico-legal approach to the beneficial development of international water systems.

The manifold advantages of developing watersheds or river basins as single units are well known. When more than one state is involved, however, political sovereignty and the efficient use of water resources are not always compatible, though the need to bring them into harmony may be perfectly clear. The construction of projects upstream for navigation, flood control, power, irrigation or urban water supply often have important economic and social implications for a neighbor down the river; and such improvements downstream usually have consequences in the upper reaches. In some circumstances it may be most efficient to inundate land in a neighboring country in order to irrigate farms or meet rising power needs in one's own, though the neighbor may naturally be reluctant to agree to such a concept of efficiency. A flood control system in one part of a watershed is likely to affect the whole, for better or worse and without



regard to nationality. The use of rivers for the disposal of industrial and urban waste can have serious international repercussions. Especially in areas such as Africa, where a single river may be shared by half a dozen countries, these problems are likely to be particularly relevant for their future growth.

Such interactions raise exceedingly difficult issues in administration, law and international relations. At the same time, the benefits of integrated river basin development are so great in contrast to competitive or piecemeal exploitation, and they are becoming so widely known, that they tend to reinforce all other reasons for practical international cooperation. Conferences such as this contribute to the process.

Movement towards the truly rational use of international water systems seems painfully slow in the light of immediate needs and potential benefits. Nevertheless, if one takes a fairly detached view, it is surprising how much has been accomplished in a relatively short time. Until a few decades ago, international law had virtually nothing to say about the flow and control of water except for questions of navigation and boundaries. A profound change has come about since the introduction of hydroelectric power. Growing needs and technological advance, especially in the fields of irrigation and conservation, and lately the stifling new problems of pollution, have given added force and dimension to the change. There are now well over 50 international treaties concerning the use of water for purposes other than navigation, and there are several multilateral conventions. In addition, there is a large body of legislative enactments and judicial opinions dealing with analogous questions among states in federal systems.

Growing out of all this, it is possible to see the outlines of what perhaps may be regarded as an accepted set of principles. Thus, there has developed a widely accepted principle to the effect that no state has a right to use the waters of an international river within its own borders without

taking account of the effects on its neighbors.<sup>1</sup> A corollary principle has evolved in the settlement of water disputes, with the result that increasing weight seems to be given internationally to the "equitable apportionment" of benefits, a doctrine applied by federal courts in the United States, Germany and Switzerland.<sup>2</sup> While these are negative principles, they are nevertheless important.

International law can acquire positive strength only as principle and practice go hand in hand. The principles already enunciated will gather weight and force to the degree that the successful execution of international agreements on the use of water resources results in mutual benefits of real and recognizable value. This is a long and difficult process, and we will be wise not to expect too much too soon. So far there have been many failures and partial failures, but there have also been a few extremely important demonstrations of at least limited success. If one makes ample allowance for inevitable disappointments, it is possible to say that the general trend is promising.

Undoubtedly the most dramatic example of success in the less developed areas has been the carrying out of the Indus Waters Treaty of 1960. The Treaty took over eight years to negotiate, with the active aid of the World Bank. It helped resolve the dangerous disputes which arose as the line of Partition separating India and West Pakistan slashed right across the Indus water system, one of the most extensive in the world. The Treaty provided for division of the waters of the Indus and its five major tributaries. A separate agreement provided for a fund, administered by the Bank, to finance a very large complex of projects in West Pakistan. Foreign exchange contributions to the fund, totaling about \$1,200 million, were committed by the two riparian states

<sup>1</sup> Eagleton, Clyde. *The Use of the Waters of International Rivers*. The Canadian Bar Review. Vol. XXXIII, November 1955, p. 1021.

<sup>2</sup> *Legal Aspects of Hydro-Electric Development on Rivers and Lakes of Common Interest*. U.N. Document General E/ECE/136 E/ECE/EP/98 Rev. 1. Geneva. January 1952. pp. 69-79.



and six of the Bank's industrialized members—Australia, Canada, Germany, New Zealand, the United Kingdom and the United States. In addition, the United States and the Bank lent Pakistan funds to meet a part of its contribution, and agreed to provide foreign exchange to India for hydroelectric and irrigation projects which are now under construction.

The Indus Basin projects include five barrages to back-stop the rivers and divert their discharges through eight link canals, which pass over and under other waterways and are crossed by hundreds of road and railway bridges. The show-piece of the entire complex is the Mangla Dam on the Jhelum River. Water is already running over the spillway, and in just a few days—a full year ahead of schedule—the dam will be topped out with the last of 120 million cubic yards of earth and rock, which I believe makes it the second largest structure of its kind. Although irrigation is the major purpose of the entire Indus Basin program, the Mangla Dam will also produce a fair amount of power. The first generators have just begun to turn, I am told, and by the time the project is officially inaugurated next October, it may be producing 400,000 kilowatts. With additional units, capacity can be more than doubled.

In addition to such projects already completed and under construction, the Indus Basin Development Fund has financed a comprehensive study of the water and power resources of West Pakistan. The study includes an inventory of both surface and groundwater resources. It will provide a plan for meeting water needs beyond 1975 and achieving relief from problems of water-logging and salinity. In its initial stage, the study also established the technical and economic feasibility of a proposed dam at Tarbela on the Indus River, which will be even larger than Mangla. A substantial balance remaining in the Development Fund will be available to meet a large part of the foreign exchange cost of the Tarbela project.

I might also mention two other efforts in which the Bank is involved in quite different ways, and from which we hope to gain more insight into the best techniques for regional development of water resources. One is the Nam Ngum hydroelectric project in Laos; the second is a joint approach by Mali, Mauritania, Guinea and Senegal to the comprehensive development of the Senegal River and its tributary, the Bafing.

The Nam Ngum project has many interesting features, not the least of which is the fact that the World Bank is serving solely as the administrator; we have no financial participation. General explorations leading to the project were carried out by the Committee for Coordination of Investigations of the Lower Mekong Basin (the Mekong Committee), representing Cambodia, Laos, Thailand and the Republic of Vietnam and operating under the aegis of the United Nations Economic Commission for Asia and the Far East. The feasibility study was financed by the United Nations Development Programme (UNDP) and the Government of Japan, which is also financing the detailed design under its own program of aid to Laos. Thailand has agreed to provide cement worth \$1 million in exchange for power to be generated by the project. The basic financing is to be in the form of grants of various amounts by Australia, Canada, Denmark, France, Japan, the Netherlands, New Zealand and the United States, totaling about \$24 million. The organizing work is just getting started.

In the case of the Senegal River program, the role of the Bank at this stage is a purely advisory one. In that capacity, however, we have a part in a new and interesting arrangement, under the leadership of the UNDP. The original initiative came from the Interstate Committee on the Senegal River Basin, an intergovernmental organization established by the riparian countries and made responsible for joint planning. At the Committee's request, the United Nations organized a mission which made a general survey of prob-



lems and possibilities. On the basis of its report, the four countries adopted a general development policy for the basin and, through the Committee, requested financing from the UNDP for a series of pre-investment studies. As a means of coordinating such studies and other external advice and technical assistance, the UNDP established a Senegal River Basin Advisory Group, of which the Bank is a member along with the United Nations, the Food and Agriculture Organization of the United Nations (FAO) and Unesco.

The three examples I have chosen, the Indus and Senegal Basin programs and the Nam Ngum project, should help to illustrate the point that there is a great diversity of situations in which regional development of water resources might come about. We are still exploring and experimenting to find whatever combinations of political, administrative and legal techniques for multilateral operations might be most useful and productive in different sets of circumstances. As far as we know now, there is no single solution, no ready formula.

We can say that a few key factors were of great importance to the success of the Indus program, as long as we are careful to reserve judgment about their relevance for other situations. First, despite the magnitude of the works involved, they were perfectly feasible within the limits of administrative and financial resources available. Second, the underlying agreements were both clear and limited. Third, the agreements did not provide for joint administration. This responsibility was delegated to an impartial and professional organization on whose Board of Directors and Board of Governors both signatories are most ably represented, but which neither one nor both together can control.

I do not mean to suggest that joint administration by riparian states is undesirable *per se*, or always impracticable. On the contrary, I think the effort should be made whenever it seems clearly feasible. There is now consider-

able experience, especially in Europe and North America, to illustrate what might be accomplished.

So far, experience in the developing areas is relatively scant and inconclusive. Interest, however, is very much alive. Only three months ago, the Ministers of Foreign Affairs of Argentina, Bolivia, Brazil, Paraguay and Uruguay adopted a joint declaration which lays the groundwork for development of the Rio de la Plata Basin.<sup>3</sup> Presumably, the decision taken last month at Punta del Este to proceed with the formation of a Latin American Common Market will give added impetus to the search for closer international collaboration in resource development as well as trade.

Appropriately enough, the sense of urgency may be strongest in Africa, a continent divided into 48 separate countries and territories, of which 39 are independent nations. Paradoxically, the same historical forces which cut Africa into small segments and left it beset by political tensions also generated stronger tendencies toward collaboration than one generally finds in other areas. Partly as a consequence of this, our own experience in joint lending to organizations representing more than one state is virtually confined to the African continent. Examples are loans to the East African Common Services Authority, providing transport and communications services for Kenya, Tanzania and Uganda, and to the East African Power Corporation, which operates the Kariba Dam on the Zambezi River and feeds power to both Rhodesia and Zambia. In close collaboration with the African Development Bank and other interested agencies, we intend to encourage and support such common projects wherever we find them if we are convinced that they are well conceived.

We suffer no illusions, however, about quick success. The opportunities for fruitful collaboration are virtually unlimited. But our enthusiasm should be tempered with caution.

<sup>3</sup>Text in *La Nación*, Edición Aerea Internacional. March 6, 1967.



In all undertakings for the international use of water or any other economic resource, much effort can be saved and many mistakes avoided by applying the relevant lessons we have already learned in the more familiar realm of development within national boundaries.

If careful attention to priorities, the maintenance of high technical standards in the preparation, appraisal and supervision of projects, and regard for sound economic policies are important to national development, as I have no doubt they are, they could hardly be ignored in the even more intricate sphere of multinational operations. For the remainder of my time I should like first to comment on these questions, and then to conclude with a few remarks on a related subject, the international coordination of development assistance.

When the Bank entered the field of development finance, we set up a few policy guidelines in accordance with the terms of our charter. We decided that any project we helped to finance would have to measure up to certain essential criteria. It would have to be proved feasible by qualified experts. It would have to be well engineered. It would have to be executed and administered by a competent organization. Finally, we would have to be convinced that it warranted high priority in terms of the country's development needs.

Looking back after two decades, it is easy to see that any country in a position to meet such apparently routine requirements without help could hardly be classified as underdeveloped.

Some of those who came with requests for loans made little effort to provide facts, figures, plans or blueprints; furthermore, many did not know how to go about it, and saw no reason why they should. We could have turned down such requests or merely signed checks, taking guarantees from the borrowing governments, and I suspect that either course would have done wonders for our popularity rating.

But our charter said that we were to help increase production and living standards in the less developed countries. So one of the earliest lessons we learned was the necessity for technical assistance related to financing for specific projects.

This meant the creation of a new kind of banking, based on a premise that was rather unorthodox at the time: the idea that our responsibility was not merely to insist on proper technical standards for projects we agreed to finance, but to do everything in our power to help the client see to it that our standards would be met. Sometimes, we merely had to convince the borrower to employ competent consultants, but often the situation called for much more direct involvement on our part. In this way education in development began, for us and for many others. I suspect that most of us are grateful that a kind providence let us learn only gradually how monumental and involved the process would turn out to be.

Over the years, the most difficult aspect of the job has been associated with the question of priorities. This is the point where the great dilemmas of development converge. First, there are the awkward choices confronting the leaders of developing countries, which are especially difficult for those who have only recently gained their independence. One of these is the choice between the aid they need for faster economic growth, with some limitation on their freedom of action, and unrestricted freedom without aid. In this light, even simple and prudent conditions such as we laid down in the beginning, and to which we firmly adhere, are sometimes seen as "strings" attached to aid. It is all the more difficult to understand the necessity for such conditions if there is any cause to suspect that they might merely be a cover to gain some political, military or commercial advantage. The choice between what is popular and what is sound is another extremely serious dilemma in many developing countries, especially for leaders who are trying



earnestly to build democratic systems from scratch and who badly need public support.

Those who provide aid also have choices to make, and they are no easier. The money for public assistance to less developed countries has to be produced willingly by taxpayers. They may favor foreign aid but be curious, perhaps even skeptical, about what it achieves. Therefore, those who administer aid must attempt to ensure that the money will actually result in development. To do this, they have to insist that first things come first. If they go this far, they must be able to determine to their own satisfaction what is first, second, and third. In other words, they have to get involved in the question of priorities, which leads right to the central dilemma confronting both the giver and the receiver of aid: how can the most genuine problems and interests of both sides be accommodated without in some way diminishing the sovereignty of those who receive or jeopardizing the goodwill of those who give?

No one has the final answer to these questions, or for that matter to any of a number of others which, though less basic, are troublesome enough. These fundamental difficulties have led us to take a highly pragmatic approach. Gradually, the standards we established in the first place, and especially our insistence on priorities, led us far beyond the consideration of specific projects which we were asked to finance. They involved us increasingly in questions of country economic policy, investment programming, and the administration of development. These in turn have impelled us into the conduct of a wide variety of studies, ranging from comprehensive surveys of entire economies to the detailed examination of sectors and parts of sectors. Little by little, as our member countries at both ends of the economic scale have let themselves be persuaded that our only motive is the one we say we have, our relations with both have evolved in ways that open more and more paths to effective collaboration. The fact that ours are multilateral institutions in

which everyone involved has a voice has helped, of course, to overcome any doubt about our motivations; and I am immodest enough to say that our performance has contributed, too.

With this foundation to build on, we began a few years ago to tackle what seems to us to be the other most important aspect of the same problem. This is the question of international coordination of financial and technical assistance. Our approach to this is through the organization of what we call consultative groups, based on experience we have gained in the consortia on aid to India and Pakistan. They are groups of interested aid-providing governments and international institutions, brought together specifically to discuss the needs of individual developing countries. The Bank serves as organizer and chairman and provides the secretariat. We also provide the basic information required for productive discussions, including an objective analysis of the developing country's economic position, policies and prospects. When circumstances warrant it, we make specific comments on the country's investment program and offer recommendations on project priorities and the most suitable terms of financing. We are hopeful, I would even say confident, that this mechanism will gradually improve the climate of international development assistance. Already, 14 such groups have been organized, including three under the leadership of other international institutions. The 14 aid-receiving countries account for something over 40% of all development finance from official sources.

It is with all of this background in mind that I urge caution and careful attention to the lessons of experience when we look forward to the possibilities inherent in the integrated use of watersheds and river basins. It is possible, I think, that some entirely new and more effective kind of mechanism for the development of common water resources may evolve out of the opportunities and difficulties of the present situation. It should be possible to avoid the exces-



sive cost, complexity and inefficiency which often attend the administration of international enterprise. It is important to search for more acceptable and workable means of shielding the administrative structure from the abrasive and often stultifying effects of political control, once basic agreements have been reached on the content and financing of programs, on the "equitable apportionment" of benefits, and on means of settling disputes.

These objectives, however, are as difficult to attain as they are desirable. The only guides we have are experience and ingenuity, and in this sphere we need a great deal more of both.

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## 2. WATER USE AND ECONOMIC GROWTH

by HUGH RIPMAN, Deputy Director, Projects Department

The efficient use of fresh water is a major concern of the International Bank for Reconstruction and Development (World Bank) and its affiliates, the International Development Association (IDA) and the International Finance Corporation (IFC), for it is crucial to the orderly economic growth of the developing countries. Fresh water is the most basic and abundant natural resource. It is essential to life, to the production of food and fibers, and to the growth of industry. In its flow to the sea, it is also a primary source of power and, in many countries, an important medium of transport.

Although water occurs everywhere, even in the rocks and desert sands, it is seldom found where it is most needed in sufficient quantity, of suitable quality, or under adequate control. The need for these added values—control, transportation, treatment—which represent most of the cost of water, accounts for much of the demand for development finance. Yet the easy availability of water is still taken largely for granted, and neither the cost nor the complexities involved in its best employment are fully appreciated. We welcome the initiative of the United States Government in convening this International Conference on Water for Peace, which highlights the central role that water must play in the growth of nations.

The orderly exploitation of fresh water in developing countries presents problems of extraordinary difficulty. This paper will deal with only a few of the more critical questions involved in financing development projects. It will focus especially on those in the fields of irrigation and urban water supply, but much of the discussion will apply to other types of projects as well.



It should be borne in mind throughout that economic problems in development are linked inseparably with others of a scientific and technological nature, which play an unusually important role in the financing of water-related projects. Unfortunately, there are serious gaps in our knowledge of water. Hydrological data for most areas are seriously inadequate. Systematic studies of water resources and their development potential have been made in only a few countries such as West Pakistan, where a comprehensive survey was completed recently under the supervision of the Bank as administrator of the Indus Basin Development Fund. The lack of information for most countries imposes limitations on our ability to make clear economic choices between alternative uses of available supplies, to assure ourselves that some types of upstream projects will not have adverse effects downstream, to estimate the reliability of future supply, and sometimes to anticipate and forestall destruction of the land's productivity by salinity, waterlogging, drought or floods.

As the pressure on readily usable water supply builds up with expanding population and industrialization, the need to fill this information gap becomes increasingly urgent. The need is universal, but it is especially acute for countries now in the early stages of economic development, for they can hardly afford the profligate use of resources which characterized earlier eras. It is to be hoped that the most acute shortcomings will be rectified eventually as a result of the cooperative program of the International Hydrological Decade, organized under the auspices of the United Nations Educational, Scientific and Cultural Organization (Unesco). Meanwhile, we must do the best we can with the knowledge and resources available, for economic growth and a higher standard of living for two-thirds of mankind are imperative demands.

To help meet these demands by providing finance for high priority purposes is the function of the World Bank Group,

the largest multilateral source of funds for development. As used in this paper, the term World Bank Group will refer only to the Bank and IDA, since they provide the vast bulk of the Group's development finance and their operations are more directly relevant to the subject of this conference. The more specialized role of IFC, which is to promote the expansion of private industrial and commercial activity in the less developed countries, will have an increasingly important bearing upon problems of water use as the process of industrialization accelerates.

The Bank and IDA have the same general purposes. They are administered by the same officers and staff, and they apply the same standards in appraising and supervising projects. Their funds are separate, however, and the terms of their lending are radically different. The Bank itself raises the largest part of its funds through the sale of bonds in the private capital markets, and therefore makes loans on conventional terms to reflect the cost of the money it borrows. The Bank is the oldest of the development finance institutions, having been in operation since 1946. Its shareholders are 106 member governments. IDA was organized by the Bank's members in 1960 to provide a channel for multilateral lending on easy terms to countries that are capable of faster development than they can safely finance through additional borrowing on conventional terms. Its funds are in the form of contributions, chiefly from the 18 wealthier nations among its membership of 97, and its loans have been for 50 years without interest except for a service charge of  $\frac{3}{4}$  of 1%. Since its resources have been limited, they have been reserved for lending to countries with relatively good economic policies but very low per capita income. Although the governments of these countries receive the benefit of IDA terms, when the project being financed is a revenue-earning enterprise it is required to repay the government on conventional terms.



Together, the Bank and IDA provide about a quarter of all official external finance for capital development projects in the less developed countries, as distinguished from such aid as food shipments and program loans. Through 1966, the Bank had lent about \$10.2 billion net for 485 projects in 79 countries, while IDA had granted about \$1.6 billion in 100 credits to 36 countries. The pace of their lending has increased rapidly in recent years and is now at an annual rate of well over \$1 billion. The vast bulk of this financing has been for infrastructure projects which provide the base for self-sustaining economic growth. A very high proportion—perhaps as much as half—of the total of about \$12 billion has been for projects which depend on adequate supplies and efficient management of fresh water. Chiefly, they include irrigation and flood control works, urban water supply systems, inland waterways, hydroelectric installations and multi-purpose projects.

Successful lending for development, as distinguished from normal banking practice in countries with an ample supply of necessary skills, often requires the provision of technical aid to the borrower, as well as external finance. With hindsight, it is easy to see that the need for such help is a fundamental factor in the problem of development. It varies in scope from country to country, and ranges from aid in the formulation and administration of economic policy to the identification and preparation of specific projects. Neither the nature nor the extent of this need was fully perceived 20 years ago when the World Bank received its first request for a loan from a non-industrialized member country. Today technical assistance is a household phrase in almost every language, but everything we know about it had to be learned the hard way, step by step. We now consider the provision of such services, including the conduct of basic research and broad studies in the field of development economics, to be at least as important as the money we lend. It offers the borrowing country in need of such aid the best

assurance that both its own resources and those of the Bank will obtain the desired results; and it puts the Bank in a position to judge realistically whether a project is sound and the money it lends will be repaid.

## PRIORITIES FOR DEVELOPMENT

Technical assistance is often required in the determination of priorities for development financing, a problem so basic that it calls for discussion on general grounds, without special reference to water-related projects. It is especially relevant to those involving the use of fresh water, however, since they command such a high proportion of available finance and require particular care in the allocation of both financial and natural resources.

To the maximum feasible extent, every project to be financed should justify itself in terms of its relative urgency and importance to the particular sector and the entire economy, in competition with all other projects which contest for scarce financial resources. In addition, any project involving the use of limited natural resources, including fresh water, should justify its priority in relation to alternative uses.

In practice, of course, it is exceedingly difficult for less developed countries to adhere to such a rule. There is often a strong temptation to postpone the provision of safe drinking water, for example, and to channel investment into more dramatic or popular projects. Practical considerations occasionally make it necessary to proceed with projects which happen to be ready for financing, without waiting to know whether others might be more productive. Sometimes the inadequacy of data makes it impossible to assess relative priorities with assurance. The guideline is no less important, however, because it cannot always be rigidly applied. Increasingly strict adherence must be the constant goal, for



the avoidance of waste and the ability to achieve self-sustaining growth within a reasonable time depend upon it.

Even the approximate adherence to such a standard implies relatively sophisticated planning, whether in the formal presentation of a four or five-year plan or through a more pragmatic and flexible mechanism for investment programming. This presents immediate problems, however, and confronts both the provider and the recipient of external aid with an uncomfortable dilemma. Virtually by definition, most less developed countries suffer from an extreme shortage of some or all of the skills required to draw up or administer realistic investment programs. Their need for external technical advice and assistance is often acute. At the same time, they tend not to welcome foreign intervention in their investment decisions, especially when they suspect the presence of political, military or commercial motives. While this is understandable, the lending agency must either appraise the country's entire economic program and performance in arriving at a judgment on financing an individual project, or abandon its insistence that first things must come first. If the agency accepts its full responsibility and adopts the first alternative, it should also be prepared to offer assistance in overcoming the borrower's difficulties. But the offer is likely to be suspect, especially if only one project is under consideration and the lender's objectivity is open to doubt. The problem often is resolved by financing the project without regard to priorities, sometimes with unfortunate results.

The pressures to follow such a course are very strong. It side-steps the political dilemma for both sides, while permitting construction of projects which may be useful in any case. Intense competition among suppliers and contractors in the aid-giving countries to provide goods and services for a particular project also tends to subordinate questions of economic priority. This is particularly true when the project is politically attractive to leaders in the host country. Large

dams, steel mills, overly ambitious irrigation works, television networks, automated water supply systems—all these and other symbols of progress have played their role. All, of course, have their place in development; the point is that when they are financed before their turn in a rational scheme of priorities, the investment pattern is distorted, both domestic and external resources are misused, the recipient country's prospects for growth and a higher standard of living are diminished, and a disservice is done to the whole cause of development.

This would not be an easy problem to overcome even if ideally cooperative relations existed between givers and recipients of aid, with no motivation on either side but the most efficient use of resources. Severe limitations on the rationality of development would still be imposed by the world-wide shortage of skills in economic analysis, administration, science and technology, by historical, political and social realities which inhibit orderly growth, by the inadequacy of the statistical base in less developed countries, and by the shortcomings of economics, engineering, hydrology and other relevant sciences. It can be hoped, however, that ways will be found to permit objective analysis, whatever its technical limitations, to gain increasing ascendancy in the process of allocating development resources.

The World Bank attempts to advance this process, and it has done so with increasing success in view of the enormous difficulties inherent in the problem. Its methods are pragmatic. In its own operations, the key factor has been the evolution of relationships with its less developed members which are characterized by mutual trust and rooted in rigid standards of professional competence and objectivity on the part of the Bank itself. By now it is well known and generally accepted, if not always eagerly, that finance will be available from the World Bank Group only if the Bank is satisfied that the proposed project is technically feasible and economically justifiable, that it merits high priority in rela-



tion to competing needs and alternative uses of scarce financial and natural resources, and that the borrowing country is prepared to adhere to reasonably sound development policies. It is equally well known that, while the Bank can be very tough in this regard, its judgments will be impartial and motivated by the purpose laid down in its charter: to help increase production and improve living standards in the country concerned.

In applying such policies, it is obviously necessary to require that the borrowing country lay bare its development plans and permit the examination of its finances, administrative structure, policies and practices in considerable detail. While response has not been universally favorable, it has been encouraging. At one extreme, a few countries have found the Bank's requirements inadmissible, and assistance has been withheld. In many cases, however, confidence in the Bank's motivation has led to relationships which can best be described as open, frank and productive partnerships in development. Between these extremes, the degree of cooperation varies widely, but its general level has been rising as experience demonstrates that this is the most promising road to genuine economic growth.

The establishment and maintenance of such relationships, while difficult at best, is easier for a multilateral institution than for a national agency. Since about 85% of all official aid to the less developed countries is bilateral, however, a major problem is how to achieve the maximum benefits of close collaboration between providers and recipients of aid without diminishing the independence and importance of bilateral action. The Bank hopes to move a long way in this direction through its sponsorship and servicing of what we call consultative groups.<sup>4</sup> These are formally organized groups of aid-giving members of the Bank that are interested in providing assistance to particular less developed

<sup>4</sup> Hoffman, Michael L. *Aid Coordination*. World Bank, Washington, 1966.

members. Their discussions are based chiefly on Bank studies of the economic position, policies and prospects of the countries concerned, and its recommendations on sector and project priorities and terms of financing.

The evolution of consultative groups stems from experience in the consortia on aid to India and Pakistan, organized by the Bank in 1958 and 1960 respectively, and four groups to coordinate assistance to Colombia, Nigeria, Sudan and Tunisia. Renewed emphasis on this approach has resulted in the formation by the Bank of five additional groups, and within the next few years it is hoped that a large part of all external development assistance can be coordinated through such mechanisms. To the extent that this can be achieved and the groups succeed in their purpose, it may be expected that an increasing proportion of both technical and financial aid will be allocated in accordance with objectively determined priorities.

## FINANCING PUBLIC UTILITIES

Beyond the question of priorities, responsible lending for development requires careful attention to all financial and technical aspects of the specific project, in order to assure maximum benefit to the borrowing country and the soundness of the loan. On the side of finance, the lending agency must be sure that adequate funds will be available from other sources as required, and that sound financial policies will guide both the execution and management of the project.

About half of all Bank Group financing has been for hydroelectric power, railways, ports and waterways, telecommunications and urban water supply—for projects which can clearly be classified as revenue-producing public utilities. The financial policies of such enterprises have an important impact on the whole process of development. The most crucial question concerns their rate structures: do



their revenues cover costs and provide enough surplus to finance improvements and future extensions to meet growing demand?

In fact, rates charged by long-established utilities in some less developed countries bear no close relation to real costs, but are held low for socio-political reasons. The utilities are subsidized. While the subsidies may be too small and uncertain to assure satisfactory service, they place a heavy burden on the government's scarce revenues and often lead to inflationary borrowing. In some cases, utility revenues themselves are diverted to other purposes to relieve pressure on the budget. Service inevitably deteriorates, falling progressively farther behind demand. Public indignation over poor service and resistance to higher rates grow simultaneously, feeding upon each other, while development is inhibited by the shortage of services that are basic to the health, mobility and productivity of people. It would be unrealistic to expect any other result from such policies, given the shortage of financial resources available to the government of a less developed country, the many pressing demands that are made upon them, and the relative political impotence of a financially dependent utility system.

The Bank Group's experience in less developed countries has indicated clearly that revenue-producing public utility projects almost invariably will fail to meet the needs of economic development unless they are made to pay their own way. Consequently, the Bank and IDA make the adoption of sound financial policies a precondition of their lending for such projects. They require especially that rates be established which will cover all operating and maintenance costs, including debt requirements, and produce a surplus which will help finance future extensions. These conditions apply whether the utility is publicly or privately owned.

An excellent example of the efficacy of such policies is a small project in Managua, Nicaragua, where the water supply system has been reorganized, modernized and

extended with the aid of a \$3 million IDA credit. When the credit was approved in late 1962, only about 40% of the city's built-up area and 53% of its population of 221,000 were served by the Empresa Aquadora de Managua, the water utility. Door-to-door vendors supplied most of the remaining population, chiefly in the low-income groups, while some had access to private wells and a few were served by small, independent systems. Water from these sources was often contaminated, and the limited statistics available indicated a high incidence of typical water-borne diseases.

In some important respects, the situation was far better than in many developing areas. The Empresa had some competent staff on which to build its organization. It was not subsidized, nor were its revenues diverted to other government purposes, so that it was able to cover operating costs and pay for modest replacements and extensions. During the preceding four years it had been able to borrow enough local funds to expand its system by more than a third. Nevertheless, more than 100,000 residents still had no direct public water service and population was growing faster than the number served. There had been no change in the Empresa's rates since 1945, while water purchased from private vendors cost from two and a half to nearly 14 times as much and other items in the cost of living had nearly doubled.

In borrowing from IDA, the Nicaraguan Government agreed to adopt policies permitting the Empresa to establish and maintain a schedule of rates covering operation and maintenance, depreciation, interest and amortization payments, normal year-to-year extensions of service, and a reasonable proportion of major expansion programs as they became necessary. Arrangements were made for a management study, assisted by the Pan American Health Organization. The Empresa moved immediately to adopt recommendations growing out of this study, including the modernization of its accounting system.



Free service was eliminated, average rates were increased by more than 50%, and a program was initiated to meter all water connections. As in all such cases, these decisions required political courage, but they have been amply vindicated by results. Even before the IDA-assisted project was completed last year, extending service to 65% of a population which had grown by a third, the Empresa was earning 8% on net fixed assets, including new facilities constructed with the IDA credit but not yet in service. Although the credit to the Nicaraguan Government was for a 50-year term without interest except for a service charge of  $\frac{3}{4}$  of 1%, the Empresa is required to repay the loan to the government by 1986, with interest at 6%; this is in line with IDA's policy of giving the benefit of its easy terms to governments, but requiring that revenue-producing sub-borrowers repay on conventional terms.

The Empresa is now in a position to continue its growth on a sound basis, providing safe water at reasonable rates to an ever-increasing proportion of Managua's rapidly-growing population. It has also proved that its customers will pay a fair price for good water if they can get it; at least, its most recent report indicated that it had accomplished the remarkable feat of collecting 99% of its bills within two months of billing date!

Unfortunately, the Managua case is not typical. Resistance to realistic utility rates is prevalent. It is often difficult to gain acceptance of the concept even for railway and electric power service, and it is even more difficult when the product is safe drinking water, the most basic commodity of all. The idea that water for drinking and hygiene should be free, or heavily subsidized, tends to inhibit financing for water supply and is a major cause of the shortage in less developed countries which already is critical and is growing worse.

For technical advice and information on water supply problems, the World Bank relies heavily upon the World

Health Organization (WHO). Four years ago, WHO published a study<sup>5</sup> which indicated that at least 70% of the urban population in 75 less developed countries, or more than 200 million people, had inadequate piped water service, were supplied with unsafe water, or both. The greatest urban water need, according to this study, is in Asia and Africa south of the Sahara. The worst conditions are in South and South Central Asia, where about two-thirds of the urban and at least 70% of the total population has no piped water. The situation is particularly acute in such urban centers as Calcutta, which is said to be the endemic center of cholera for all of Southeast Asia.<sup>6</sup>

The cost of such inadequacies in illness, death and wasted manpower is staggering. The loss of industrial and farm production is beyond estimating. And the situation becomes more serious year by year with increasing urbanization. The authors of the WHO study calculated that, in the 15 years from 1962 to 1977, some 450 million urban dwellers in the 75 countries studied would need new, extended or improved piped water supplies, requiring an annual investment of between \$400 million and \$500 million. Against this need, they found that only five or six of the 75 countries had construction programs which promised even to keep pace with the rise in population, but with no improvement in current low standards of service.

It is doubtful that financing required to overcome the existing backlog, even on the most modest scale, and to keep abreast of population growth will be forthcoming where sound financial policies are not adopted. On the other hand, there is ample reason to believe that realistic rate structures will go far toward attracting the necessary funds from domestic and foreign sources and that urban consumers will

<sup>5</sup> Dieterich, Bernd H. and John M. Henderson. *Urban Water Supply Conditions and Needs in Seventy-Five Developing Countries*. WHO, Geneva, 1963.

<sup>6</sup> Bose, Nirmal Kumar. "Calcutta: A Premature Metropolis." *Scientific American*. Vol. 213. 1965. pp. 90-102.



pay reasonable rates for a reliable supply of good water if service is available.

Unfortunately, there is little evidence to support the same conclusion about rural users of water, whether for irrigation or for drinking and hygiene. We can only speculate about the financing of rural drinking water projects, since the Bank has had no experience in this field. The question is becoming important, however, especially in areas newly irrigated with slightly brackish or otherwise contaminated water and where the irrigation canals are the only source of village supply. In some parts of India, for example, the problem is rather acute, and sooner or later fresh water may have to be piped and pumped over long distances at considerable expense if farmers are to be held on the irrigated land.

#### FINANCING IRRIGATION

As a development institution, the World Bank Group must look far beyond the engineering and financial aspects of an irrigation project it considers for financing. Its interest is not only in the immediate expansion of output, but in giving impetus to the modernization of agriculture. The potential benefits to the nation of a well-conceived irrigation project are often very great. Their full realization, however, would usually entail a virtual revolution in farming practice and fundamental improvements in government services, all of which take time. Meanwhile, the Bank seeks to assure that the maximum feasible benefits will be achieved immediately, and that conditions will favor their continuing growth.

In pursuit of these objectives, the Bank examines every relevant aspect of the borrowing government's agricultural policy and administration, as well as all economic and technical factors affecting the success of a proposed irrigation project. Some of the most pertinent questions are the accessibility of profitable markets, the availability of sufficient

fertilizer, pesticides, improved seeds and essential equipment at prices the farmer can afford, the adequacy and cost of credit, the quality of research and extension services, and the equitability of the tax and land tenure systems. All of these affect the farmer's attitude toward participation in an irrigation project, and they largely determine his ability to take advantage of it.

Double-cropping and increased yields per acre are often possible, but only with the farmer's full cooperation. His attitudes are often formed in a more or less rigid mold of local values and customs, which is sometimes slow to accommodate the extra work required by a double-cropping system of farming. Agriculture, including irrigation farming, is one of the oldest modes of civilization. It is rich with a deep accretion of accustomed ways—and of skepticism, usually grounded in hard experience. In many areas, farmers are virtual strangers to money. Traditionally, they are offered few incentives to additional effort, and new assurances are suspect. Patterns of economic attitudes, relationships and behaviour, which are rooted in history and reinforced by custom, are relatively difficult to modify. Usually change is possible and often deeply desired, but the farmer must be convinced by his own experience that the promised benefits are real.

Potential direct benefits to the farmer can be calculated on the basis of the most likely realizable cropping patterns, farming methods, prices and other variables. When they are projected over a substantial number of years, they are often quite modest in relation to the total cost of the project, and their realization may take as long as 10 years or more. Even then, many real economic uncertainties are likely to remain.<sup>7</sup>

Indirect benefits of an irrigation project to the immediate

<sup>7</sup> van der Tak, Herman G. *The Evaluation of Agricultural Projects: A Study of Some Economic and Financial Aspects*. World Bank, Washington, 1964.



community, the region and the country as a whole may be much greater than those derived by the farmers who use its water.<sup>8</sup> The surrounding farming community benefits in many ways. The project provides jobs during the construction stage and creates need for seasonal labor in the fields after it is completed. It establishes a new basis for the growth of processing industries, which further add to the community's expansion and to the demand for equipment, construction materials and consumer goods. Often such industries provide the only alternatives to idleness or unproductive effort for a traditionally immobile rural population.

The benefit is often greatest, however, from the point of view of the country as a whole, when a successful project adds to the food supply, improves the balance of payments by increasing exports or reducing the need for imports, relieves upward pressure on prices, and contributes to expansion of the tax base. A good example is found in Mexico, whose farms today produce 95% of the country's food requirements and more than half its total exports, despite the fact that only 16% of its land area is suitable for farming and much of that lacks an adequate natural water supply. The key has been an intensive investment program which doubled the irrigated area between 1950 and 1962 and embraced a total of 10 million acres by 1966. The more productive early projects, which were executed without the World Bank's assistance, were producing as much as \$400 million per year by 1960, against capital expenditures of about \$500 million. More recent projects, chiefly for the rehabilitation, expansion and improvement of existing irrigation schemes, will bring somewhat smaller, but still impressive, returns in relation to cost. The Bank is involved in three of these, with loans totaling \$46.5 million out of a total cost of \$170 million; on completion, they are expected

<sup>8</sup> Zimmerman, Josef D. *Irrigation*. John Wiley & Sons, Inc., New York, 1966. p. 17.

to increase the value of Mexican farm production by about \$41 million per year.

Since the social, political, economic and technical factors which determine the success or failure of irrigation projects are never confronted twice in the same combination, no ready formula for the allocation of costs is likely to be satisfactory in all circumstances. The Bank requires, as a condition of its lending for irrigation projects, that water charges be at least sufficient to meet the expense of operation and maintenance. Beyond that, it seeks to assure that the project will be as self-sustaining as circumstances will permit, but when necessary it agrees that capital costs should be borne by the government.

This rough division is a pragmatic and flexible one, based on experience. Partial subsidization may be unavoidable. In a developing country, however, there are stringent limits to the ability of government to provide subsidies from budgetary resources. As a practical matter, therefore, an individual enterprise should generate at least enough funds of its own to cover current expenses. The capacity of an irrigation project to do so, however, is limited by the credibility to the farmer of the promised benefits. In an area where irrigation is already fairly common, the charges it is possible to impose may be further limited by local usage. Often in such areas, the capital costs of existing irrigation projects have long since been amortized by the government, operating and maintenance costs are largely subsidized, and purely nominal water charges are a part of the web of life. Over time, it might be possible to readjust water rates upward through a program which eliminates inequalities and is aimed at embracing agriculture in the money economy. Eventually, it should be possible to levy ordinary taxes on the farmer's increased income. But in many cases, these developments must be postponed to later stages in a long process. The immediate problem is to obtain the farmer's commitment to the most productive use of land and water.



A charge for water tends to assure more efficient use, but too high a charge will be self-defeating.

Sometimes, a large portion of the costs of irrigation projects can be recovered in the form of indirect taxes on processing, consumer sales or exports. In practice, for example, one of the Bank's borrowers employs specific levies on exports to recover all costs beyond those met by minimal water charges; in this case, much of the added production resulting from Bank-financed projects is clearly for sale abroad. When local circumstances make other solutions impracticable, the Bank will agree to the adoption of such policies.

Most of the available possibilities for the construction of low-cost gravity irrigation systems in developing countries have already been exploited. Further expansion of the output of low-value staple crops, therefore, will have to be achieved primarily by increasing yields from land already irrigated. There is ample latitude for such expansion, which is now being emphasized in India, Mexico and elsewhere.

The largest remaining sources of fresh water for irrigation are below the ground and in rivers, where it can be pumped directly to the land. There are some areas, as in the Indus plain of West Pakistan and perhaps in India, where vast aquifers exist in circumstances which make their use for low-cost irrigation feasible. In many areas, however, the possibilities for large-scale irrigation of low-value crops with groundwater are limited, since the cost may be greater than the yield;<sup>9</sup> while the capital costs of such systems are likely to be relatively low, their operating costs are high. The same considerations often apply to the use of water taken from rivers through various types of pumping arrangements. Consequently, such resources can be used economically in many cases only for crops which usually require a higher

<sup>9</sup> Barnea, Joseph. *Water Costs in Developing Countries*. Paper presented at the First International Symposium on Water Desalination. Department of the Interior, Washington, 1965.

investment than staples and a more sophisticated system of culture and marketing, but which promise commensurate returns. This type of agriculture, including vegetable growing, horticulture and plantation farming, is practiced on a significant scale in only a few of the less developed countries. In West Pakistan, where such crops are becoming more common, a study in 1964 showed that the highest yields in money value were obtained from such fruits as mangoes, dates, citrus and bananas. Sugar cane yielded about half the value of those crops per acre, while rice and wheat gave only a little more than a tenth as much.<sup>10</sup>

#### TECHNICAL SERVICES AND FINANCING

Engineering, management and other technical services are infinitely more important as a complement to finance in less developed countries than in areas where the borrower normally has ready access to such skills and ample experience in using them.

Like any prudent banker, the World Bank Group insists upon high technical standards in the preparation, execution and management of the projects it finances. Such a policy could be applied, and the Bank's reputation for sound lending could be safeguarded, simply by denying loans for poorly prepared projects. A far more positive approach is necessary when the object is to advance the economic growth of less developed countries. Banking must become dynamic, on an unprecedented scale.

The World Bank learned this through experience, beginning with the first development loans requested by its less developed members. Gradually, it became clear that the Bank itself would have to add an entirely new dimension to the business of financing—not merely insisting upon high

<sup>10</sup> White House—Department of the Interior Panel on Waterlogging and Salinity in Pakistan. *Report on Land and Water Development in the Indus Plain*. Superintendent of Documents, U.S. Government Printing Office, Washington, 1964, p. 40.



technical standards, but doing everything in its power to see that borrowers would be able to meet them. This required the development of new methods to assure that competent technical personnel would be available to members and effectively used by them, to strengthen the Bank's ability to give active advice and assistance, and to maintain the objectivity and technical excellence of its own appraisal and supervisory services.

The result is a system which has evolved from a pragmatic search for solutions to problems for which there had been no precedent. It is still evolving, as the scope of the Bank's operations expands, as knowledge about development increases, and as the developing countries themselves gain experience and their needs shift and change. No one in the Bank would claim perfection for it, but the record suggests that it has been reasonably successful. Certainly there has been no major engineering failure in connection with Bank-financed projects. The Bank has been able to avoid most of the waste which results from over-sophisticated design of projects in less developed countries. There have been a few, but only a few, instances in which a project's anticipated economic return has been seriously diluted because engineering failed to be guided by competent advice in related fields, a failing which accounts for many of the "horror stories" one hears about waste in development.

Zimmerman,<sup>11</sup> reporting on "scores of irrigation analyses made in the last decade," says that "costly and supposedly efficient installations were often operating at an alarmingly low water efficiency, sometimes below 20%." He found that the difficulty in many cases was that "planning had been done with the mistaken belief that soil, agriculture, and irrigation science need not be considered as basic engineering design data." Many installations "were utterly unsuitable for local conditions" and had to be abandoned.

<sup>11</sup> *op. cit.* p. 103.

The Bank itself has encountered irrigation projects in which the major works were built without thought to the distribution of water in the fields or its use on crops; design responsibility was presumed to end with delivery of water to the village or local area, leaving it to each farmer to carry on from there. In other cases, the engineers had provided for flushing the irrigation canals during the growing season, when they should be carrying water to the fields. In urban water supply, not a few cities in less developed countries have been saddled with heavy investments in fully automated equipment which is not required, and in excess capacity which will not be used for years.

The World Bank Group attempts to avoid such inefficiencies in the use of funds, which neither the recipients nor the providers of aid can afford. It insists that unnecessary immobilization of capital be prevented by planning for construction in stages, whenever feasible. It will not approve complicated engineering and expensive equipment which is difficult to service. It insists upon international competitive bidding to ensure procurement at the lowest possible cost. It also requires that every project it finances be based upon a feasibility study which takes full account of all factors affecting its success, and that it be engineered and supervised throughout by qualified personnel approved by the Bank and familiar with its standards and objectives.

Feasibility studies may be carried out by the borrower if it has a sufficiently experienced staff, or by acceptable consultants employed by the borrower. They may be organized by the Bank itself, either on its own account or acting as the executing agency for studies financed by the United Nations Development Programme. In these cases, independent consultants are always retained. A satisfactory feasibility study includes the most realistic possible estimates of both costs and benefits, as the basis for a financing plan, as well as thorough consideration of all technical aspects of



the project. Consultants are expected to anticipate possible difficulties and propose feasible solutions.

If assistance is required in preparing a project for the Bank's consideration, the borrower will often be urged to employ consultants. In eastern and western Africa, the Bank itself has established special missions to help governments in both the identification and preparation of projects. Borrowers are also required to employ outside consultants to supervise the construction, and often the initial operation, of projects if the Bank considers their own technical services to be inadequate for the purpose. The consultants are chosen by the borrower, subject to the Bank's approval.

#### INSTITUTIONAL VEHICLES FOR FINANCING

Although World Bank loans and IDA credits are either made to governments or guaranteed by them, the Bank insists on assurance that each project will be efficiently executed and operated. The strength and ability of the administering agency is one of the first and most important questions examined by the Bank when it appraises a project.

While it is obvious that no project is either self-executing or self-operating, the Bank has often been asked to finance a waterworks, power plant or irrigation system when no responsible authority existed, public or private, to construct or manage it. On other occasions, existing institutions which were intended to administer proposed projects have been found to lack sufficient authority, responsibility or both, or to be improperly organized, inadequately staffed or insecurely financed.

In such cases, the Bank suggests appropriate reorganization of the existing institution or the establishment of a new one. It often provides the technical assistance required to carry out such recommendations, and sometimes helps the borrowing government in finding new management or other

key personnel. In no case does it lend without assuring itself that the organization charged with administering the project is capable of doing so efficiently.

Thus, the Bank has found that aid in institution-building is often a fundamental prerequisite to successful development financing. Today, the Bank's clients in Latin America alone include 33 autonomous or semi-autonomous institutions which have received more than \$1 billion in Bank loans and IDA credits, and 28 of them have been organized or brought into operation with the help of the Bank. Many of these are agencies responsible for the administration of ports or power systems.

Ordinarily, the principal needs for institutional improvements in connection with urban water supply systems involve assistance in problems of organization and in business, technical and financial management. Such enterprises are often subordinate units of political entities, with excessively limited authority to hire and fire, fix rates, borrow funds or manage their own affairs. When extensive changes appear to be necessary, the Bank recommends—and sometimes insists as a condition of its financing—that outside consultants be employed.

The needs are usually more complex where irrigation projects are concerned. Several government departments and agencies are normally involved in both the determination of policy and its implementation. Construction of the major works may be the responsibility of one department, while the water distribution system is the concern of another. Farm-to-market roads may be solely in the province of a Ministry of Transport. Questions of adequate market outlets, organization and pricing may well be considered beyond the interest of government. The Ministry of Agriculture is most likely to be responsible for research and extension services and the provision of improved seeds, while a Ministry of Industry and Commerce may be concerned with the supply of fertilizer, pesticides and farm equipment. The



Finance Ministry, and perhaps a Ministry of National Economy, will be influential in determining investment, export and fiscal policies which affect the project.

A major problem, therefore, is to assure adequate coordination of all branches of government whose decisions and programs have a bearing on the success of the project. This is sometimes extremely difficult to accomplish. In some cases, the problem has been approached through the establishment of an Irrigation Department, as in Thailand and Turkey. In others, different types of formal or semi-formal coordinating mechanisms have been set up, with varying degrees of success. To assist in this effort, the Bank often urges the employment of qualified consultants and insists upon specific action to improve coordination, as a condition of its lending.

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