REPORT ON THE PRELIMINARY INVESTIGATION FOR THE DEVELOPMENT OF RICE PRODUCTION

—WITH PRIORITY ON IRRIGATION—

REPUBLIC OF THE PHILIPPINES

OCTOBER 1966

OVERSEAS TECHNICAL COOPERATION AGENCY
GOVERNMENT OF JAPAN

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Preface

The Government of Japan, which undertook, at the request of the Government of the Republic of the Philippines, to perform an investigation into the question of the agricultural development and particularly that of an increased yield of rice of the Republic, entrusted, on the basis of its budget for fiscal 1966, the execution of this task to the Overseas Technical Cooperation Agency.

The Agency, in view of the Republic's urgent need for the production increase of food along with the general development of agriculture to cope with the rapidly increasing population, delegated to the Philippines its first preliminary survey team composed of four experts and led by Mr. Shiro Sasaki, Counsellor, Agricultural Land Bureau, Ministry of Agriculture and Forestry, Government of Japan.

The survey team stayed in the country from the 6th of September 1966 to the end of the month to perform, with the cooperation of the managing authorities, discussions and studies on the items of the development programme, reconnoitering, at the same time, the rice belt in the Central Luzon, the Cagayan Valley in the Northern Luzon, the Cotabato rice belt and Cotabato Marsh in Mindanao, etc. to gather data and documents. Thus the team is now ready to submit its report on its preliminary survey mission.

Nothing would be more gratifying to the Agency, if this report could be of any use to the promotion of the agricultural development programme of, and Japan's agricultural cooperation with the Republic and, at the same time, to the furtherance of the friendly relations and economic interchange between the two countries.

The Agency takes this opportunity to express its deep sense of gratitude for the support and cooperation extended by Vice-President Lopez and other authorities concerned of the Republic.

October, 1966

Shinichi Shibusawa
Director General
Overseas Technical Cooperation Agency
Government of Japan

Personnel List of the Preliminary Survey Team

Name	Title
Shiro Sasaki	Counsellor, Agricultural Land Bureau, Ministry of Agriculture and Forestry, Government of Japan.
Kazuma Nojima	Doctor, Chief, Crops Division, Central Agricultural Experiment Station, Ministry of Agriculture and Forestry.
Takeshi Nishiguchi	Chief of Irrigation Department Office, Agriculture Administration Bureau, Tokyo area, Ministry of Agriculture and Forestry.
Akihiro Mitarai	Staff Officer, Overseas Technical Cooperation Agency.

Itinerary of the Survey Team

Sept. 6, Tues.	12:00	departure Tokyo
	15:40	arrival Manila
	19:00	interview of Mr. Takeuchi, Japanese Ambassador to the Philippines, at his official residence.
Sept. 7, Wed.	8:30-9·15	visit to Presidential Economic Staff to learn about situation of the Philippine economic and agricultural development.
	9:45	visit to Department of Agriculture and Natural Resouces to see Mr. Lopez, Vice-President, Undersecretary Umali, Undersecretary Pascual, and other officials to learn about Philippine views and express our views on agricultural development programme. (in company with Ambassador Takeuchi, Counsellor Maeda, Secretaries Yamano and Miyazaki of Japanese Embassy)
Sept. 8, Thurs.	9:00	visit to PES to learn from persons in authority to learn about situations of irrigation, forest, fishing, etc.
	13:00	visit to RCPCC to learn about situation from Chairman Mondeñedo and other officials.
	16:00	visit to Agricultural Economic Bureau, DANR (Quezon City) to learn about situation.
Sept. 9, Fri	8:30	visit to ISU office to learn about irrigation situation from persons in authority.
	11:20	departure ISU
	12:00	arrival Rizal Provincial Capitol. learnt about agricultural development programme from Agricultural Development Committee of Rizal Province. surveyed rice field.
	19:00	dinner-party given by Minister Kanazawa of Japanese Embassy.

Sept. 10, Sat.	6:30	departure Manila
	8:30	visit to the University of the Philippines College of Agriculture at Los Baños to learn about situation from Dr. Saguiguit, Dr. Escuro, Dr. Ongkingco, etc.
	12:00	visit to International Rice Research Institute to listen to briefing by Director Chandler Jr.
	14:00	visit to IRRI Experimental Farm shown round by Director Chandler Jr.
Sept. 11, Sun.	9:30	visit to IRRI Experimental Farm to learn about situation.
	14:00	meeting for arrangements.
Sept. 12, Mon.	7:00	departure Los Baños for St. Cruz, capital of Laguna Province. on the way visit to Laguna branch offices of APC and BPI to learn about situation.
	9:00	visit to Governor of Laguna Province at his office to learn about agricultural situation and especially that of rice cultivation.
	10:30	under Governor's conduct visit to rice field of Laguna Province laying stress on irrigation facilities.
	15:30	departure St. Cruz for Manila
Sept. 13, Tues.	9:00	meeting at Bureau of Plant Industry.
	13:00	learnt about situation at Bureau of Soils. took advice of experts in agriculture delegated from United Nations.
Sept. 14, Wed.	6:30	departure Manila
	8:30	arrival Baliuag, Bulacan Province to investigate representative rice belt in Central Luzon. investigation at branch office of BPI. learnt about situation from expert team in rice cultivation delegated from Republic of China.
	9:30	survey of rice field.

	11:30	inspection of irrigation facilities of River Angat (Bustos dam).
	13:00	luncheon with persons concerned and members of Chinese mission.
	15:00	departure Baliuag for Manila.
Sept. 15, Thurs.		examination of gathered data. arrangements and preparations for reconnaissance of Cagayan Valley.
Sept. 16, Fri.	6:30	departure hotel for airport.
	8:00	departure by Philippine air force plane for Tuguegarao. aerial surveying over Cagayan Valley.
	11:00	arrival Tuguegarao. visit to Governor of Cagayan Province at her office. immediate inspection of Cagayan River. learnt about situation at Mayor's residence and branch office of BPI.
	14:00	reconnoitered Cagayan Valley by jeep.
	20:00	arrival lodgings.
Sept. 17, Sat.	8:00	departure by jeep for inspection of rice field and irrigation facilities. investigation of Barrio.
	19:00	dinner-party given by provincial Governor.
Sept. 18, Sun.	8:00	departure for Tuguegarao airport. on flight back to Manila inspection of rice terraces from high up over Mountain Province.
Sept. 19, Mon.	13:00	team leader's visit to Ambassador Takeuchi to exchange views on principles of recommendation, etc. examination of data by team members and arrangements for trip to Cotabato.
	16:00	meeting for arrangements with Philippine counterparts.

Sept. 20, Tues.	6:40	departure hotel for air force aerodrome.
	8:40	departure aerodrome.
	11:30	arrival Cotabato in Mindanao. after lunch learnt about situation from Provincial Director of BPI and other persons concerned.
	14:00-17:00	aerial surveying of Libungan and Liguasan Marshes.
Sept. 21, Wed.	8:30-12-00	investigation by jeep of Cotabato rice belt. learnt about situation at RIS (Irrigation Office) and FACOMA.
	13:30	departure Cotabato airport.
	15:00	arrival Zamboanga. after briefing by Provincial Director of BPI, inspection of rice field.
	18:30	discussion with persons concerned.
Sept. 22, Thurs.	8:30	departure Zamboanga airport.
	10:30	arrival Iloilo City, Panay. inspection of experimental rice field of Visaya Agricultural Experiment Station, Iloilo City, learnt about situation.
	16:00	departure Iloilo airport.
	18:00	arrival Manila
Sept. 23, Fri.		collection of supplementary data and arrangement of data.
Sept. 24, Sat.		- ditto -
Sept. 25, Sun.		arrangement with Philippine persons concerned.
Sept. 26, Mon.	9:00	meeting with Philippine persons concerned at Japanese Embassy. Japanese team's briefing of results of investigation, questions and answers. dining together.
	14:00	visit to Mr. Mandeñedo, Chairman of RCPCC, to report on survey work (in company with Secretary Miyazaki of Japanese Embassy).

Sept. 27, Tues.	9:00	arrangements with Philippine persons on maps concerned and other matters.
	11:00	courtesy call on Vice-President Lopez (in company with Minister Kanazawa and Secretary Miyazaki of Japanese Embassy).
	14:00	visit to Undersecretary Pascual of DANR (Quezon City).
	19:00	thank-you party for persons in authority.
Sept. 28, Wed.	8:00	inspected two rice mills in suburbs of Manila to investigate rice-cleaning situation. arrangement of gathered data and preparation for returning home.
Sept. 29, Thurs.	9:00	farewell call on Japanese Embassy.
	12:00	lunchen given by Philippine authorities concerned.
	15:00	departure for airport.
	18:00	departure Manila.
	22:40	arrival Tokyo

Conclusions and Recommendations

When taking a general view of its geographical and meteorological features, the land of the Philippines is doubtlessly favourable for the development of agriculture. And yet, how to make efficient use of these favourable natural conditions is a question. The reason is that the realities of the Philippine agriculture indicate that they have not yet satisfactorily put such blessed conditions to practical use, although the trend of their farming is neither going in a wrong direction nor running counter to the natural conditions.

We know, as a matter of fact, that both the Government and farmers are making earnest efforts for the development of the country's agriculture.

How to produce more satisfactory results and how to expedite the solution of the problem they are facing by directing and concentrating such efforts properly? This is a matter on which opinion may be divided, but, as for us, we have, from a technical point of view, come to the following conclusions:-

(1) One of the most important problems now confronting the Philippine agriculture is, as already pointed out by the Government, the necessity of increasing the country's food production, and, especially, an increased production of rice obviously constitutes a pressing need, which involves the following two aspects:

One is a short-term outlook for the annual increase in the import of food in recent years. The other is a long-term outlook for the growing unbalance between the rapidly increasing population (at an annual increase rate of about 3.2 per cent) and the stagnation of food production (at an annual increase rate of about 1 per cent).

As for the former which is an immediate question, the Government, already in June this year, formulated and commenced its four-year plan of food self-supply, expecting to attain the object in three years, and, moreover, to produce some surplus food in the fourth year. We consider that this is a fairly definite and material measure to deal with the situation.

As for the long-term outlook, however, we were unable to learn about any substantial measures. According to the circles we came in contact with, the solution of this question seems to consist in the large-scale reclamation of such an undeveloped wilderness as found in Cotabato or Cagayan; and, furthermore, some people appear to be thinking of making the Philippines an exporter country of rice through the introduction of mechanized farming by means of agricultural machines of large size to bring such a

waste land as found in Cotabato under cultivation, building up its competitive ability in the international rice market.

Such a situation tends us to consider that at the bottom of the above-mentioned idea lie the deep-rooted farm-land problem of the country along with the trend of the agricultural labour population which is already showing a relative decrease.

(2) At the request of the authorities concerned we had to deal with the aforementioned two questions, long-term and short-term, concerning an increased yield of rice. The means and methods of production increase are as diversified as they are complicated, and, moreover, restricted by the country's domestic administration, that is, its agricultural policy. Therefore, a proposition of merely technical means of solution neglecting such circumstances may be of no practical use. However, such technical means may not be fruitless, if they are devised independently of the administrative restrictions as far as possible or considered feasible even under such restrictions.

As a means of increasing the yield of rice, the Government had already emphasized to us, firstly, the importance of irrigation, which was in this case a comprehensive term including land development; and, secondly, that of rice milling.

As for these two suggestions, we had been aware of their important correlation with the other problems involved in the country's agriculture, and, especially, that with the various questions of its domestic administration, but we tried, in spite of this, to find out a solution somehow or other.

(3) Irrigation is the most important factor of the country's rice cultivation. This is a fact not only verified by us but also iterated by the Government and farmers.

Rice may be grown at any time and place throughout the year. Since the entire country is subjected to two seasons, dry and wet, though there is some measure of difference depending on districts and the rainfall distribution during the wet season is sometimes capricious, the area under rice cultivation is unexpectedly large.

The rice acreage increased from about 2,250,000 hectares in 1951 to about 3,200,000 hectares in 1965, representing an increase of approximately 50 per cent in 25 years, while the average crop increased from 1.16 t/ha to 1.25 t/ha during the same period, accounting for an increase of little less than 8 per cent only; thus the productivity still remains at the lowest level of the rice growing countries of the world.

The Government, also taking note of this fact, attached importance to the improvement of the average crop per hectare rather than the development of new rice fields. This is reflected in the four-year plan of food self-supply recently formulated. Such an expansion of rice acreage as above-said seems to have been promoted by the voluntary

activity of the farmers and land owners rather than the administrative measures of the Government.

Since irrigation, as compared with non-irrigation, can increase the harvest per ha. by nearly 50 per cent on the average and also enables two crops a year it can obviously double the annual average crop.

In spite of this only 30 per cent of the total rice acreage is irrigated, and even in such area the degree of irrigation is not always satisfactory.

(4) It is hardly necessary to say that we should not lay two much stress on the importance of irrigation to neglect the other technical matters of rice production. In this connection certain results of other researches have been already obtained and, for instance, new varieties have been adopted and practised by some farmers. This may be the major reason they can attach importance to irrigation.

Fertilizer, another important means of increasing rice production, is not applied so much, except part of the acreage, owing to the low income of farmers and scarcity of fertilizer itself. The effect of fertilization is raised all the more by the utilization of irrigation prior to the application of fertilizer.

(5) The irrigation of farm-land now managed by the Government is made up of two systems: one is a state-operated system (NIA) by means of natural irrigation and the other, a system applied for by farmers and by means of pump irrigation (ISU). The former is large-scale and the unit of irrigated acreage often ranges 1,000 - 10,000 ha., while the latter is small-scale and the average unit of benefited area is 40 - 50 ha.

In our opinion these systems seem to have the following questions:-

(a) Although the farm-land placed under the management of NIA amounts to 320,000 ha. only 70 per cent of its total area are actually irrigated during the wet season, and during the dry season this percentage diminishes to 30. This is caused by the shortage of water and insufficient facilities.

(b) The construction work of the proposed irrigation facilities (in 23 regions) is now temporarily suspended owing to shortage of funds.

(c) In view of the circumstances stated in (a) the NIA authorities have difficulty in collecting the water charges from farmers.

(d) The irrigation by means of pumps which is managed by ISU is on a small scale (the pump size is mostly 4 - 10"). This is inefficient, because the installation of a number of small-capacity pumps, which requires much labour, cannot produce results corresponding to the number in the case of an expanding

acreage to be irrigated.

(e) In addition to the technical matters stated above, there is another question, which is concerned with the administrative affairs, as to the measure for the farmers' response to the collection of water rates by NIA and also to the responsibility placed on them by ISU. That is to say, there does not seem to exist any definite measures either to ascertain the farmers' ability to bear the burden or to facilitate for them to bear it.

(f) Generally speaking, it is undeniable that there is in the country insufficiency in the number of experts and degree of technical training. As for the studies on irrigation, universities, laboratories, and government agencies have already produced achievements, but the farmers do not seem to duly recognize its significance.

(g) We may say, all things considered, that the shortage of funds is the greatest problem underlying all of the matters stated above.

(6) Looking at the situation in the light of the aforementioned restrictions, practical measures for increasing as rapidly as possible the yield of rice by laying stress on irrigation may be as follows:-

(a) While laying stress on the pump irrigation method, make modifications of the existing system as stated below:

i. Increase the acreage unit of pump irrigation. Increase the existing unit, which is 40-50 ha. on the average, to a minimum of 200 - 300 ha. and a maximum of 1, 000 ha.

ii While giving priority to the pump irrigation method, avoid all-out dependence on it, and make, at the same time, a plan of natural intake of river water.

iii. In working out such a plan exert scrupulous care to the installation of irrigation and drainage channel system, balance of the amount of water in the source and needed water and relevant demarcation of the irrigated area, and farmers' responsibility for the facilities (for example, water rates, maintenance and management of facilities, etc.).

iv. In view of the existing facilities of NIA, those to be newly constructed had better be made up of such pumps, engines, pipes, etc. as can spare earthworks as far as possible for the convenience of their maintenance and management; and especially, installation of pipe lines instead of water

channels would be more effective.

(b) Although the irrigation facilities based on NIA system have developed a numerous problems, their causes have been clarified. What is essential at the moment is how to eliminate these problems. Accordingly, pushing this irrigation system further forward without correcting its defects which have so far piled up would mean an additional accumulation of problems.

In this connection we consider that the unsatisfactory effects of NIA facilities would be, for the most part, improved by means of self-supporting efforts.

Some of the conceivable means of making up the difference between the irrigable acreage planned by NIA and actually irrigated acreage would be as follows:-

i. Re-examination of the existing system of water utilization (irrigation and drainage).

ii. Re-examination of the water amount in the water source and that needed for irrigation; by virtue of this result together with that of i take a new look at the irrigated acreage.

iii. As for the damaged or faulty sections of the facilities, resort not only to their restoration but also to their replacement by new equipments (for instance, partial adoption of pumping method of irrigation).

(c) An irrigation system, whatever it may be, should incorporate such plannings as the demarcation of farm-land, building of agricultural roads, etc. in its irrigated area. The adjustment of the irrigation and drainage channels and other organizations should go together with such plannings.

(7) As for the rice milling and warehousing, which is an important question next to irrigation and also a subject of our study requested by the Government, we consider that the problems involved in the conventional "kiskisan" milling method must be exphasized and also the "conos" method cannot be free from some problems. We were unable, however, to find out any material means of solving such problems since our survey team had no expert member for this subject. We are in the opinion that this question will be held over till the delegation of our next survey team.

(8) In addition to the above, we consider that good market, agricultural finance, system of farm-land, the systems of food control, etc. have some problems. Although we are especially interested in them, we will refrain from directly discussing them, since we are not experts in these fields, and, moreover, they are concerned with the

domestic administration of the country.

(9) The most important aspect of the question of increasing the yield of rice lies in how to make the farmers thoroughly understand the technical side of this question. Assuming that they can make free use of the irrigation and drainage channels, how to popularize the techniques of breeding, cultivating, fertilizing, and controlling the blight of the rice plant? On the other hand, we believe that various achievements of tests and experiments on these matters have been already produced for their application. The Government, being fully aware of the importance of the matter, are making earnest efforts to spread the techniques far and wide, and we hope that such efforts will bear fruit as early as possible.

(10) As regards the regional development programme of the country, we are told that the two Provinces of Cagayan and Cotabato are the most promising and preferential of all proposed regions of development.

These two regions undoubtedly consist of a vast area which is suitable for agricultural development and yet remains uncultivated, and, while Cagayan contains a considerable area already under cultivation, Cotabato is entirely composed of a marshy land lying wild. The farm-land of the former has a very low productivity, since the rice growing there depends for the most part (90 per cent) on rainfall alone. The greater part of the farmers in both regions are owner farmers; this is a feature common to both the regions.

(11) The result of our field reconnaissance of the Province of Cagayan indicates the necessity of working out an over-all irrigation plan extending through the entire area; this plan will involve all sorts of irrigation systems such as pumping facilities, natural intake channels of water, reservoirs if necessary, etc., depending on the abundant water of the source of the Cagayan River and its tributaries. The priority order of the facilities to be constructed will be determined by the outcome of this planning.

(12) As for Cotabato which is a vast wild marshy land, its reclamation work involves more complicated technical and greater economic problems than that of Cagayan. The desirable order of undertaking the work is, to begin with, to select a location of the greatest elevation whose physical aspects are most favourable for development, instead of aiming at the all-out reclamation at a stretch of a vast area amounting to 85, 000 ha. Even such a selected location is estimated to range from thousands to ten thousand ha.

There may be diversified opinions on the type of farming after the completion of the reclamation work, but, prior to such discussions, suitable technical systems for the land development should be established.

(13) The purpose of the present preliminary survey team is to determine the

subject of investigation centering around the irrigation question relative to an increased yield of rice. On the basis of our preliminary conclusion a regular survey team is expected to visit the country to perform a full-scale investigation of the matter, and the schedule of this regular team is as stated below.

In this connection we sincerely hope that over-all cooperation of the Government and other persons of the country will be extended to the survey team.

(a) Items of coming investigation

i. It is desirable to perform the necessary investigation during the dry season for the purpose of working out a new irrigation plan based on pumping system by selecting an un-irrigated farm-land ranging from 500 to 1, 000 ha.

We hope that the Government of the Philippines will prearrange and make a list of a few lots of farm-land proposed for this investigation work and send the list to the Government of Japan.

ii. It requires, along with the above investigation, that the question of rice milling and warehousing be investigated.

(b) Items of future investigation

Since the investigation work for the development of the two Provinces of Cagayan and Cotabato is based on a long-range programme, it will require a considerable period and number of persons; and we expect that a continued investigation will be necessary in future.

i. Cagayan

First of all, it is desirable to make out an over-all development plan of the agriculture of the Cagayan Province. For this purpose the items of investigation will be as follows: irrigation, drainage, crops, soil, meteorology, fertilizer, economics of agriculture, etc.

ii. Cotabato

In order to ascertain the feasibility of reclaiming the Liguasan Marsh in Cotabato a detailed economic and technical investigation will have to be performed as to the following items: irrigation, drainage, reclamation, management of farming, soil, geology, meteorology, economics of agriculture.

(c) In parallel with the aforementioned investigations it would be advisable, if possible, for the Government of the Philippines to send to Japan such experts as in charge of all of the matters above mentioned and let them make a scientific investigation of the realities of the like matters in Japan.

The field to be specialized in by such experts may be any of the following: irrigation, drainage, land development, crops, cultivation, soil, control of blight, fertilizer, agricultural machinery, rice milling, market, financing, extension system, farm-land system, agricultural cooperative, food control, etc., but we believe that it will turn out to their advantage to make a special investigation into the irrigation, drainage, market, financing, rice milling, extension system, food control, and farm-land system of Japan.