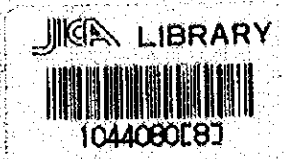


IRAN
REPORT ON SECOND PRELIMINARY SURVEY
FOR
AGRICULTURAL DEVELOPMENT OF SISAN PLAIN

DECEMBER 1973

OVERSEAS TECHNICAL COOPERATION AGENCY

304
81
AF



國際協力事業團	
受入 56.1.28	304
川 84.5.18	4871
登録No. 83630	AF

CONTENTS

FOREWORD	1
ACKNOWLEDGMENT	2
LIST OF MISSION MEMBERS	4
SURVEY SCHEDULE	5
CHAPTER I GENERAL	7
1-1 Brief Historical Background	7
1-2 Objective of Survey and Policy	7
1-3 Outline of Survey	8
1-3-1 Inspection of Agricultural Laboratories at Zabol and Adimi	8
1-3-2 Fact Findings in Farming Villages	8
1-3-3 Local On-the-Spot Natural Conditions	10
1-4 Problem Involved in the Agricultural Development	11
1-5 Recommendations on Pilot Farms	13
CHAPTER II DETAILS	17
2-1 Raising Crops	17
2-1-1 Present Agricultural Conditions	17
(1) The Organization of the Cooperative Society	17
(2) Extension Organizations and Agricultural Experiment Stations	18
(3) General Conditions of the Farming Communities	19
(4) Farming Management	22
2-1-2 Report on the Cultivation of Crops	25
(1) Wheat	25
(2) Summer Crops	26
2-1-3 Considerations on the Current State of Agriculture and its Future Trend	29
2-1-4 Some Suggestions as to the Establishment of the Pilot Farm	34

2-2	Livestock Farming	36
2-2-1	Pilot Farm and Livestock Farming	36
	(1) General	36
	(2) Pilot Farm	37
2-2-2	Livestock Farming in the Sistan District	39
	(1) Livestock Farmers	39
	(2) Feed Crops	42
	(3) Slaughter House	43
	(4) Livestock Disease Prevention Center of Zabol	43
	(5) Livestock Quarantine Station of Zabol	44
2-3	Dispatching Japanese Experts	45
	(1) Housing	45
	(2) Vacation Scheme	45
	(3) Going Home on Furlough	46
	(4) Isolated Location Allowance	46
	(5) Procurement of Japanese Food	46
	(6) Other Allowances	46
2-4	Outline of a Talk with Dr. Seino, Leader of the Mission and Mr. Mirheydar, Iranian Vice-minister of Agriculture	47

FOREWORD

The Imperial Government of Iran situated in the Middle East has a long close connection with Japan historically and economically. Iran is one of the big nations that share leadership and responsibilities showing a direction for tomorrow for other countries in the world as we Japanese do.

In spite of the shortage of natural resources facing all over the world, Iran, as a representative of nations having resources, has a strong voice abroad and is carrying out various development programmes at the head of the great Persians.

Particularly, the agricultural development programme has been the most significant of all among the Fifth five-year plans, which started in March 1972. The Imperial Government of Iran planned the development of the Sistan Plains along the boundary with Afganistan. The water resources programme that started in 1969 as a part of the Fourth five-year plans will be achieved during the Fifth five-year plans. Consequently, the Imperial Government of Iran requested to the Government of Japan the technical assistance as to what types of agriculture should be introduced into the Sistan Plains.

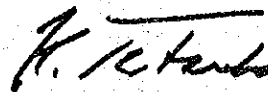
In compliance with this request, the Government of Japan sent the First Preliminary Survey Mission to Iran in December 1972 and the Second Survey Mission in August 1973, when actual farming situation in the dry season was surveyed and the basic conditions and possibility of the Japanese cooperation were also studied.

This report is to help interested parties better understand the whole situation when they study agricultural cooperation to be rendered by the Government of Japan regarding the Sistan Plains and it will be really carried out.

In conclusion, I wish to express my deep gratitude to Dr. Tamotsu Seino, Chief of Survey Mission, his members, staff members of the Ministry of Foreign Affairs, and of the Ministry of Agriculture and Forestry for their kind and great assistance.

Furthermore, I would like to express my personal thanks to the officials concerned of the Imperial Government of Iran, the staff members of Japanese Embassy to Iran, and men in Sanyu Consultants Inc. for the assistance they extended to the Missions on the spot.

Tokyo, November, 1973



Keiichi Tatsuke, Director General
Overseas Technical Cooperation Agency

ACKNOWLEDGMENT

Participating in both the First and Second Preliminary Survey Missions for the Sistan Agricultural Development Programmes, I could investigate the agricultural situation in the Sistan District. This time a delay in departure was caused by problem unexpectedly came up concerning the international agreement in the Hermand River between the Imperial Government of Iran and the Afganistan Government. We started our survey research immediately after the arrival at Teheran. The reason why the journey from Zahedan to Zabul seemed to us longer and further, though we carried on our journey even at night as compared with real distance, was probably because we experienced for the first time high temperature in summer. The sand storm lasted for six hours and the heat we had to bear were really hard and difficult for us, who flew to the place immediately from Japan.

The Second Preliminary Survey Mission gave top priority to the investigation of actual agricultural situation in summer which could not be conducted by the First Preliminary Survey Mission. We were quite fortunate to be able to rely on Mr. Kakizaki of the Sanyu Consultants Inc. who has a good command of the Persian language. We could visit only four villages to inspect the state of general affairs, organization and operation of the agricultural cooperatives, and local farming, and living conditions including interviews. This is due to the atmospheric conditions which restricted our freedom of action. Though it would be unfair to measure the whole of agriculture in the Sistan District by this smattering knowledge and experience, we are extremely pleased that we could talk with the farmers directly. Information obtained through such interviews was far much fresher and more vivid than the printed materials supplied by the Imperial Government of Iran. They often surprised the Japanese interviewers with utterly unexpected answers. We also noted the substantial difference existing between the farmers there and the Japanese in the monsoon zone with regard to the concept of water. It may be said, however, the farmers do not appreciate the significance of the programmes so much as the Japanese farmers. In Japan a land reform programme is effected only against petitions being filed by the farmers concerned. It is of prime importance the efforts be made hereafter to get the farmers to deepen their understanding of the Sistan Agricultural Development Programmes.

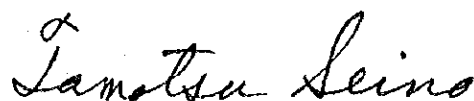
The team members chiefly surveyed crop cultivation or livestock according to their technical subjects. Thanks to their extensive knowledge and experience, regardless of specialties, the team could successfully fulfill the mission. During the first half of the period, many members including myself impaired health on account of sudden change of climates and drinking local water, but finished the task as scheduled since we became better towards the end of the stay.

After completing survey of the Sistan District, we visited Esfahan Agricultural Training Center to see youngmen being trained as leaders of the Iranian agriculture of tomorrow, and Qazvin Agricultural Laboratory from where we received significant suggestions with respect to the Pilot Farm Programme under the Sistan Agricultural Development Programme. Judging from the climate of the Sistan District which was far beyond our imagination as to the degree of severity, low intellectual standard in addition to adverse social and economic conditions, we are very afraid that it be immensely difficult to introduce into this district new agricultural techniques suitable for such local conditions and to upbringing self-supporting farmers getting rid of traditional pattern of agriculture. In fact the Second Preliminary Survey Mission shared the apprehensions in this regard with the First Preliminary Survey Mission.

We pay high tribute to the Imperial Government of Iran for having decided to set up the Pilot Farms as an integral part of the Sistan Agricultural Development Programmes. We sincerely hope the Imperial Government of Iran will do its best agricultural to develop agriculture in Iran.

I wish to express my deep thanks to all of the persons belonging to the Ministry of Foreign Affairs, the Ministry of Agriculture and Forestry, Overseas Technical Cooperation Agency, the Japanese Embassy to Iran, and Sanyu Consultants, Inc., as well as the officials of the Iranian Ministry of Agriculture and other concerned for their cooperation. Best wishes for the success of the Sistan Agricultural Development Programmes.

Tokyo, September, 1973



Tamotsu Seino, Leader of the Mission
The Second Preliminary Survey Mission
for
The Sistan Agricultural Development

List of Members of Mission

Assignment	Name	Present Position
Leader	Tamotsu Seino	Dr. of Agriculture Pre-Vice Director General Aichi Irrigation Public Cooperation
Planning	Shigekatsu Watanabe	Director of Agricultural Cooperation Department Overseas Technical Cooperation Agency (O. T. C. A.)
Livestock	Akira Tsurushima	Livestock Bureau Ministry of Agriculture and Forestry
Crop. Cultivation	Hiroshi Ikeda	Central Agricultural Experiment Station, Ministry of Agriculture and Forestry
Co-ordinator	Katsuhiko Biyajima	Agricultural Cooperation Department (O. T. C. A.)

Yukitoshi Nagasawa Director of OTCA Office
in IRAN, O. T. C. A.

نقشه مناطق خاک‌شناسی شده ایران

با همکاری و تحت نظر سازمان خاک‌شناسی و زمین‌شناسی ایران و سازمان خاک‌شناسی و زمین‌شناسی ایران

LOCATION MAP OF AREAS SOIL SURVEYED IN IRAN
SOIL INSTITUTE, MINISTRY OF AGRICULTURE AND FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

SCALE: 1:2,500,000

DATE: DEC. 1966

دریای مازندران

اتحاد جماهیر شوروی

CASPIAN SEA

TURKEY

عراق

IRAQ

افغانستان

AFGHANISTAN

پاکستان

PAKISTAN

خلیج فارس

دریای عمان

OMAN SEA

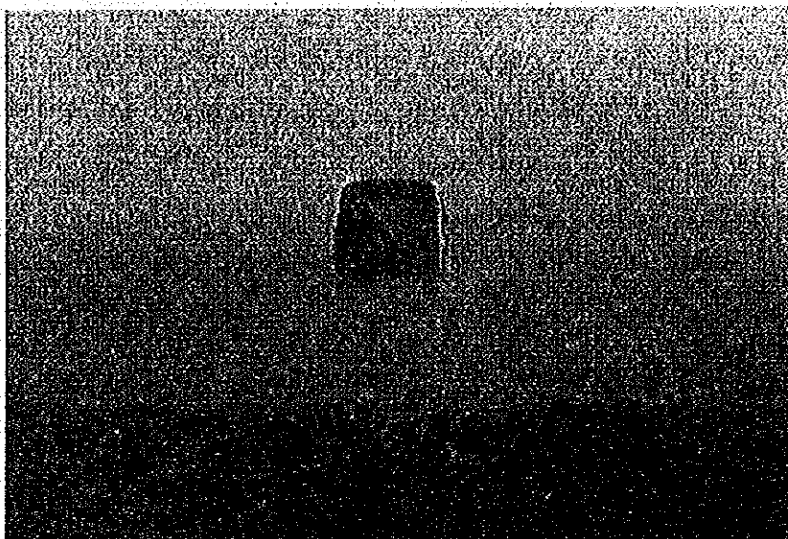
LEGEND

- | | | |
|-----------------------------------------|-----------|--------------------------------------|
| CAPITAL | ● | تهران |
| OSAN CENTERS | ○ | کازرون |
| GOVERNORSHIP CENTERS | ⊙ | کابل |
| STATISTICAL CENTERS | • | کابل |
| INTERNATIONAL BOUNDARIES | ++ | مرزهای بین‌المللی |
| ASPHALTED ROADS | — | جاده‌های آسفالت |
| SECONDARY ROADS | - - - | جاده‌های فرعی |
| THIRD CLASS ROADS | - · - · - | جاده‌های درجه سوم |
| OSTAN BOUNDARIES | · · · · · | مرزهای استان |
| LAKE | ☪ | دریاچه |
| RIVER | — | نهر |
| MINERAL | ⊕ | معدن |
| RAILROADS | —+—+— | راه‌آهن |
| ONE DAM UNDER CONSTRUCTION | —+—+— | سد در حال ساخت |
| AREAS SOIL SURVEYED | | مناطق خاک‌شناسی شده |
| DETAILED | ▨ | مناطق خاک‌شناسی شده دقیق |
| SKETCHED | ▨ | مناطق خاک‌شناسی شده طراحی شده |
| DETAILED | ▨ | مناطق خاک‌شناسی شده دقیق |
| ANOTHER TYPE OF SURVEY IN THE SAME AREA | ⊙ | نوع دیگری از خاک‌شناسی در همان منطقه |

MAP BY: [unreadable]



Adimi Experiment Farm



Sandstorm in Sistan area

Survey Schedule

August

- 1 Mr. Selno, team leader and Mr. Biyajima, team member, arrived at Tehran.
- 2 The survey schedule was confirmed at the Japanese Embassy.
A visit was paid to the Ministry of Agriculture.
A courtesy call was paid to Mr. Jalali, Director General of Centralization and Coordination of Agricultural Research, and the survey schedule was discussed and coordinated.
The survey schedule was also discussed and coordinated with Mr. Arita, Ambassador; Mr. Ohsima, Counselor; and Mr. Nagasawa, OTCA Representative.
- 3 (Vacation) Information and data were obtained from Kage-Sanyu consultant.
- 4 Courtesy call was paid to Mr. Mirheydar, Vice-minister of Agriculture, (at the Ministry) and questions and answers were exchanged. Messrs. Watanabe, Tsurushima and Ikeda, team members, arrived at Tehran.
- 5 Review meeting took place by the team members, with participation by Mr. Nagasawa, OTCA Representative.
- 6 Traveled from Tehran to Zahdan (Air) and to Zabol (Jeep).
At Zahdan, a courtesy call was paid to Mr. Kamali, Director of the Sistan & Baluchistan Agricultural Department.
- 7 General information was obtained from Kage-Sanyu at the Sistan Office.
- 8 Visited Zabol Agriculture Experimental Station.
- 9 Visited co-op offices in the villages of Heidas, Keiha, Lutak, etc., in the Sistan District.
Survey of progress in Sistan (Zahak water intake, shall canal, Chainime dam, Hermand river, etc.)
- 10 (Vacation) Survey of Hamun Swamp and surrounding area.
- 11 Surveyed sand prevention materials and methods of sand prevention at Miankangi National Laboratory of Sand Prevention.
Surveyed farm labor in Miankangi district.

August

- 12 Traveled from Zabol to Zahedan (Jeep) and to Teheran (Air).
At Zahedan, opinions were exchanged on development of the Sistan District with the Mayor of Sistan-Baluchistan States.
- 13 Outline of the survey was reported to Mr. Kamali, Director of the Agricultural Department.
- 14 Traveled from Teheran to Qhazvin and Talegan (Car).
Surveyed irrigation and development in progress in Talegan.
Information and data were obtained from the Director of the Agricultural Department of Qhazvin.
- 15 Inspected the project district in Talegan. Traveled from Talegan to Teheran (Car).
- 16 Information and data were obtained on Agribusiness in the Khuzistan district from the representative of Mitsui & Co., Ltd.
Luncheon party at the Ambassador's official residence, and an outline of the survey in the Sistan District was reported.
- 17 (Vacation) Traveled from Teheran to Eofhan (Air).
- 18 Inspected Toloii Agricultural Training Center.
Traveled from Eofhan to Teheran (Air).
- 19 General reports of survey were consolidated.
- 20 At the Ministry of Agriculture, general progress of the survey was reported to Mr. Mirheydar, Vice-minister of Agriculture, and Mr. Jalali, Director General of Centralization and Coordination of Agricultural Research, and opinions were exchanged.
- 21 Prepared for return travel.
- 22 Traveled from Teheran to Japan.

CHAPTER I GENERAL

1-1 Brief Historical Background

In 1972, the Imperial government of the Iran approached the government of Japan in application for technical assistance with respect to the Pilot Farm Programmes as a part of the Sistan Agricultural Development Programmes. In compliance with its request, the Japanese Government dispatched the First Preliminary Survey Mission to Iran for three weeks in December 1972. The First Preliminary Survey Mission acknowledged that it could not achieve satisfactory results because it was in winter and a consequent mission would have to visit the country in summer to conduct a complementary survey and analysis of the premises for technical assistance and co-operation by the Japanese Government. Thus the Second Preliminary Survey Mission was sent to Iran from August 22, 1973.

1-2 Objectives of Survey and Policy

The following three points were surveyed:

- (1) Field study of farmers and farming;
- (2) Premises on which technical assistance to be formulated;
- (3) Fundamental concept of the Pilot Farm Programmes.

The objectives of the First Preliminary Survey Mission were (1) Investigation of agricultural conditions in the Sistan District, (2) Discussion of the Water Resources Development Programme and Agricultural Development Programme, including the Pilot Farm Programmes under the overall Sistan Projects, and (3) Feasibility Study of Japanese Technical Cooperation and Assistance. The time of the Mission in Iran was devoted to review and discuss the overall Sistan Projects and field study.

Due to the shortage of time, Mission could not interview the farmers. Speaking of investigation of farming situation, the Mission could only visit agricultural laboratories of Zabol and Adimi in addition to inspection of winter cultivation of wheat. Taking these points into account, the Second Preliminary Mission surveyed carefully;

- (a) General situation of specific farm villages
- (b) Organization and Activities of Agricultural cooperatives
- (c) Individual farmers' conditions of farming and consciousness of the Sistan Project.

The premises were analysed on the basis of the members' own experience in the course of surveying under the scorching sun and the labor conditions of the Iranian Government employees. With respect to the fundamental policy of the Pilot Farm, a more positive recommendation will be made subsequently based on the results from survey conducted during the last summer combining with those obtained in winter by the First Preliminary Survey Mission.

1-3 Outline of Survey

1-3-1 Inspection of Agricultural Laboratories at Zabol and Adimi

The Second Mission, too, visited the agricultural laboratories at Zabol and Adimi in order to compare the present situation with that reported by the First Preliminary Survey Mission. Test products included wheat, grass, oil-seeds, melons and vegetables such as tomato, egg-plant and carrot. The Mission could see only egg-plants and tomato because sun-flower, typical oil-seeds of summer crops, had been harvested, while grass had not been planted since it completed a series of experiments a few years ago. There were no particular results to be noted except for the fact that crops were growing in the face of strong wind. All the results obtained by and at these local laboratories are transferred to the Seed and Seedling Organizations of the Ministry of Agriculture for selecting the excellent species after analysis, and the local establishments seem to have no direct concern. Consequently, the Mission could make no satisfactory research there.

1-3-2 Fact Findings in Farming Villages

In the offices of agricultural cooperatives, the Mission studied the state of general affairs, organization and operation of agricultural cooperatives as well as individual farmers, with respect to one village in the Miankangi district and three villages in the Sistan District, all involved in the Agricultural Development Projects. Both villages and individuals were selected at random without any kind of intention, so that the survey enabled the team members to get a glimpse, if not an overall idea, of agricultural situation in the Sistan District. The First Preliminary Survey Mission pointed out that a pattern of farming should be established according to the conditions of location in the Sistan District. This was fully reaffirmed through sampling survey conducted by the Mission. Though the details will be dealt with in Chapter II, conclusion of the survey research is only mentioned below.

- (1) Both the size and population of the villages surveyed varied from 3,500 to 250 in population or 573 to 50 in number of households. Per household farming area, too, differs from 2 - 6 hectares. Winter wheat acreage occupies 40 - 60% of farm land according to villages. To be common to all the villages, a large number of sheep was ruined in the long spell of drought in 1969 - 1970, and the farmers are now keeping only 5 to 10% of the number previously raised.
- (2) Cattle raising farmers are about 10 to 20% of the number of households.
- (3) An exceptional case was found during the interviewing that a Royal family who still owns a large lot of land covering four villages in the Miankangi district, divides the estate into sections of four hectares each per household to tenant even after the Land Reform.
- (4) The farmers who cultivate winter wheat harvest only 3 or 4 times of the seeds planted (150 Kg per hectare), told that 10 times as much would yield if water could be available in sufficient amount in right time. The previous Mission's Report that rush and bulrush are the principal feedstuff for livestock according to the information obtained from the Iranian Government sources was not verified by farmers when interviewed, probably due to the drastic decrease in number of livestock. Generally speaking, livestock is put to grass on fallow land or wheat field after harvesting, and subsequently are fed with wheat straw, barley and grass. Therefore, livestock promotion largely depends on the production of barley, wheat and the species.
- (5) Irrigation: The farm land will undergo pre-irrigation once after plowing, and subsequently in February and April once, respectively, with 3,000 cubic meters of water per hectare for each time. According to the farmers, three or four times of irrigation will be sufficient. However, the Government-issued feasibility report calculates 8,366 cubic meters as categorically required amount of water per hectare for each irrigation of wheat and barley during October to April. It is said that wheat undergoes irrigation 3 to 7 times, though greatly depending on rainfall, in Iran (Irrigated Wheat, A World-Wide Survey, 1972). It may well be said that Iran is greatly under-irrigated.
- (6) Every farmer supports the irrigation programme under the Sistan Agricultural Development Projects, and is greatly looking forward to securing water for irrigation.

- (7) Ninety-three agricultural cooperatives have been organized in 410 towns and villages involved in the Sistan Agricultural Development Projects, representing 52% of the number of towns and villages, each having more than 50 households; this can be said a pretty high percentage. These agricultural cooperatives deal with long- and short-term loans, collecting and distributing wheat, as well as distributing daily necessities such as oil, sugar, tobaccos, etc. The average number of cooperative membership is 175 and average capital about 190,000 rials (Economic Statistics of Sistan and Baluchistan, theoretically suggesting that the agricultural cooperatives are short funded for efficient operations.)
- (8) In two villages among those surveyed, private-owned tractors are considerably popular being rented for 750 rials per hectare for ploughing, and for 350 to 550 rials per hectare for crushing. According to "Farm Villages in Asia" by Morio Ohno, Professor of University of Tokyo, "farmers used to depend on cattle labor provided by the landowner for ploughing. Since the Land Reform, drastically decreasing cattle has given away to renting tractor supplied by village leaders instead of landlords. Anyway, these renting tractors indicate a new trend towards group work system; it may be suggesting the possibility of the Sistan farming pattern to shift to group management and operation in the future.

1-3-3 Local On-the-Spot Natural Conditions

Field survey from August 7, 1973, was carried out mostly from 7 a.m. to noon every day, due to the intense heat. It recorded 40° to 44°C every day consecutively, even to 46° or 47°C at times during daytime. No one of the team could stand this degree of heat.

We were told that it would be tough and windy every three days, but the wind seemed to blow violently at some places such as Niatak region in the Miankangi district. As far as the Mission is concerned, strong wind was experienced when we visited Zabol and Adimi laboratories and a farm village in Miankangi. In the former case, the winds were blowing at more than 10 meters a second, and we could see the winds sweep over the treetops of shelter-belts consisting of pines and tamarisks, more than 10 meters high, swinging strongly to and fro.

They told us that low plants, 30 to 40 cm high, will not be too badly damaged in summer in the laboratory area, but farming is very hard labor in the face of stormy winds and high temperature in June through August.

Sand dune forests are rather effective to arrest sandshifting of dunes in Niatak region in the Miankangi district, but the road from east to west is often blocked with sands. We saw many sand-removers were hard at work, just like snow-removing workers who clear the way of snow in Japan.

Blockade of canal, as apprehended by the First Preliminary Survey Mission will remain unsolved even after shelter-belts and sand-dune forests being set up.

1-4 Problem Involved in the Agricultural Development

The following summarizes the results of the first and second preliminary surveys and raises points to be studied for agricultural development in the Sistan District. It should be noted however, that certain areas are only speculative and will be left open for further survey and clarification.

- (1) The purpose of agricultural development is to achieve a high level of productivity with the aim of encouraging independent farmers to be self subsisting and consequently, successful. The Iranian Government recently formed the "Agro-Business" Agency in Khuzistan Province to expand productivity and has now been established in the Sistan District with plans to produce and assist independent farmers. It was pointed out in our previous report, that it was necessary to know the actual state of the farming communities in Sistan District and to obtain data on the present use and management of land, in order to establish a successful farming pattern for such an independent farmer. This was the purpose of the last "Agricultural On-the-spot Survey", through which it was quickly realized that a more scientific and inclusive survey of farming communities in the entire region was necessary. Without the pertaining data, it would be difficult to develop the Sistan District as a whole.
- (2) The last survey revealed that the average farming area of a Sistan farmer is as small as 2 - 6 ha., that there is only one wheat harvest in two years and dependence is basically on the winter crop which is only 450 - 900 Kgs per ha. or three to six times the amount of seeds sown. This, combined with the area planted, can not add up to capital accumulation for the poor farmers.
- (3) The data indicated the planted area for summer crops to be about 15% the agricultural land. However, our limited survey which included very little vegetables, alfalfa, water-melon and melon, did not reveal a significant planted area of Summer crops.

Accordingly, there isn't a supply and demand plan for live-stock feed in any mentionable quantity.

It is no exaggeration to state that the livestock is largely dependent on "natural grazing" for food.

- (4) The Iranian Government intends to realize a farm which owns livestock, as a pattern of farming in Sistan. However, it is considered difficult to realize it for many farmers with limited resources, to shift toward farming with livestock, due to financial and farming acreage problems. The immediate task would be to ensure the production of barley and wheat effectively, by utilizing the irrigation water, consequently contributing to better management. Today, about 700,000,000 m³ of water is annually channelled from the Sistan River via the Shahr and Taheri canal. Insufficient canal facilities, however, cause the soil to alkalify, resulting in ineffectiveness. Therefore, immediate attention should be given to areas where favorable results can be expected and small scale land improvements, such as dredging and/or adjusting the grade of the canal should be carried out so that production be increased.
- (5) It is advisable that infra-structure work, such as land preparation and the fundamental construction work of main and branch canals, go side by side. For example, in the case of the Toyokawa Irrigation Project, a system was adopted through the cooperation between local farmers and Aichi Prefecture authorities, to allow irrigation during the construction work for the partial effects to be gained, and when construction was completed, all shared in the benefit of irrigation. With the above in mind, it would be recommendable to construct and operate a "pilot farm" along with a parallel working schedule for the infra-structure work and the canal construction previously mentioned work. In addition, it would be also necessary to provide another drain-net work to control and maintain the underground water level at about the depth of 1 - 1.2 m under the soil (a drain pipe may be necessary depending on the properties of the soil and its salinity).
- (6) The strong summer winds of the Sistan Plain along with the alkaline soil, is a restrictive factor for crop growing throughout the plain. Although a "shelter belt" may serve some purpose, it would be safer to restrict summer crops to those that are tolerant to strong wind. In the light of the concept, it would be conceivable

to adopt Sugar beet, Alfalfa, Persian clover and vegetables into a "crop-rotation" system. Care should be taken to avoid growing crops which compete with the winter wheat harvest. After communication is improved between the villages and cities, another farming pattern worth consideration, would be to introduce vegetable which would make the most of the spring climate and avoid the summer heat. This would bring much needed cash income to the small scale farmers on the Sistan Plain.

- (7) Although existing Agricultural Cooperatives appear to be functionable, they lack working capital and have no capacity as a producing organization as far as can be seen. However, it can be predicted that there will be a shift from an individual farming pattern toward a joint or collective farming pattern in competition with "Agro-Business" which has already started production. For this reason, it is considered necessary to open the way for financial assistance from the Government and to inject more technical aid in the field of production activities in order to consolidate and expand the Agricultural Cooperative Organization.
- (8) For the cooperatives to take an active part in production, means a change from an individual, to a collective farming pattern and moreover, from manual labor to mechanized farming. Mechanized, collective and efficient operation requires planned production (Governmental designation of producing areas for main agricultural products), joint shipment, joint purchase of farming equipment etc., broadening the scope of the Cooperatives' operation. However, contrary to this, farming labor will become excessive according to normal patterns. Therefore, it would be necessary, first, to expand the working area as much as possible by various means, including soil improvement techniques and, second, to induce farm industries such as those that process agricultural products thus absorbing excessive labor and contributing to the development of the local economy.

1-5 Recommendations on Pilot Farms

- (1) The Sistan Plain, once called the Iranian Granary, has brought about salinity damage due to wrong use of irrigation water and consequently, productivity of wheat and so is very low. Merits of the natural conditions over the Sistan District would be: (a) numerous sunshine hours (b) low humidity (c) high temperature. Demerits would be: (a) insufficient irrigation water due to limited precipitation

(b) highly alkaline soil (c) strong summer wind. To establish a pattern of farming suitable to these natural conditions is the objective of the pilot farm. Another important subject of study is the problem of how to treat small-scale farmers which is a restrictive social factor dominant in Sistan farming communities. Among those demerits listed, insufficient irrigation water and the alkaline soil are the two fundamental and urgent problems the pilot farm has to undertake in search of improvement. After examining the latest results of experiments and studies performed at the Soil Institute, Safiabad and other places in Iran, it would be advisable to make plans for the required surveys and tests on irrigation and the removal of salt. Also such a consideration should be paid by the Japanese Government in the case of the dispatch of the technical experts.

(2) While experiments and studies as well as the extension of the findings in the agricultural field usually takes time, it may be effective to divide the operation into four steps, as indicated below. These points are for convenience only and some of them can proceed simultaneously, while others could be postponed.

- | | | | | |
|---|---|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|-------------------------------------------------------------------------------------------------------------------------------------------------|
| I | { | Experiments and studies | { | (1) Removal of salt; effective use of irrigation water; Selection of crops tolerant to salinity; Breeding experiments; study of growth methods. |
| | | (2) Analysis of actual conditions of feed crops; How to raise livestock; Feeding techniques; Growth experiments of feed crops; Inauguration of a crop rotation system of feed crops and cultivation crops. | | |
| | | Surveys on land use and farming | | |

II Extension of growth techniques { Establishing "Test Farms";
Training farm instructors

III Planning the farming pattern and establishing the Model Farm

IV Complete the Regional Development Plan

(3) In Japan, there have been many instances where it takes months and even years after the planning of "pilot farms", for completion and even after the completion it was difficult to start immediately on crop growth experiments. Therefore, it may be necessary to reorganize the existing experimental farms (Zabol, and Adimi) and start basic experiments as a tentative measure to expedite Step I.

As it was possible to view the experiment records in Zabol and Adimi it was concluded that it was necessary to start from the basic studies for crop growth experiments.

- (4) It was stated in our previous report that it would be necessary to construct modern farming villages on the basis of data which included the actual situations in the use of farming land and the management of farms in Sistan. We wish to take up this problem again.

Generally speaking, agricultural development is a constant battle with nature and, therefore, development is not simple as is industrial production. In the Sistan District, the existing farming villages face severe natural and unsatisfactory economical conditions which present many problems which have to be overcome. One of them is a technical problem on how to improve productivity. This may prove to be difficult but not impossible in the light of the facts that Iranian agricultural development in Khuzistan and Ghazvin regions have already indicated. When attention is drawn to the present condition of land usage in the region, the following problems from the agricultural and economical point of view, must be expected. The future pattern of farming, for instance, will have numerous economical and social barriers to break in order for it to be established. Then, there is the policy of farm management. The collective farming method may offer some difficulties in the sector of organization and management, as shown by raising questions as to whether or not this pattern should be adopted among a community depending on the present situation.

In Miankang area which was surveyed, a casual opinion was expressed about the lack of mutual confidence between the locals and the Government, which could either be a local inclination or a credibility gap which may linger along the border of Afghanistan.

It is very important to strengthen and maintain contact and understanding between the farmers and the Government in order to expedite the development.

With these points in mind, it is emphasized that the expertise of the Management and Land Use Department should be incorporated with the "Pilot Farm Project". This department coordinating with Research, Popularization, Livestock Breeding Department is to patternize farms suitable to the actual situation as well as make

a regional development plan based on integrated land use and farming type by hearing the opinions of specialists.

- (5) The survey group is confident that the construction of a pilot farm is essential and indispensable to the Sistan Project and at the same time, appreciates the request of the Government of Iran for the technical aid judging from her present situation. We sincerely hope that appropriate measures should be taken by all the organizations of Iranian Government for ensuring comfortable working conditions for the dispatched specialists especially by considering severe climate so that the dispatched specialists may exert all their technical ability. It gives the bases on which this technical aid is reflected in the policies of Iranian Government.

CHAPTER II DETAILS

2-1 Raising Crops

The object of the second Study-Mission was; to survey the conditions of agricultural communities supplementary to the first Mission; to study the present situation in raising crops in a severe summer climate, to investigate the basic policy and administration of the pilot farm; and to clarify the various conditions as a pre-requisite to providing technical assistance.

This report will give the present agricultural situation in view of raising crops and it will also consider the pilot farm and the technical assistance to be provided for it.

2-1-1 Present Agricultural Conditions

Points not mentioned in the preparatory study reports about the use of land, general problems of producing crops, local environment, and social and economic conditions in the Sistan district are as follows:

(1) The Organization of the Cooperative Society

The cooperative society in the area was organized around 1966, and it consists of one or more villages as a unit. The society has a chief director, one managing director, a third director and two secretaries. The directors are elected every two years and the secretaries annually, from among its members. Each member is qualified by his investment. Shares are 50 rials each, but it appears that acquisition of more than ten stocks is necessary to become a full member. Moreover, it is not a household membership but based on individual admission. At present, administrators for the societies are trained while engaged in military service, in cooperation with the military authorities.

The present number of societies in the Sistan district is 93 (16,338 members with a total capital of 17,744,200 rial) and recently, the Central Association of Cooperative Societies was established with the investment of these local societies. The association is located in Zabol, and provides and sells a steady supply of materials in cooperation with similar associations in other districts.

The aim of the cooperative societies is; to sell daily commodities and manufacturing materials; to finance farming and; to assemble and sell wheat and barley.

At present business activities are primarily centered on the selling of daily commodities and financing farms. As this is relative to the production of crops, a further description follows. Daily commodities such as oil, matches, sugar, cigarettes, rice, beans, batteries, soap, sickles, plows, lamps, aspirin, etc., are sold at a discount of 4-5% and some items are sold at 20% off. Sugar, oil and cigarettes are the best sellers. Wheat seed is provided to the small scale farmer (who comprises 30% of the total of farmers) on a credit basis. Best quality wheat seed in the Sistan District is decided by the National Seed and Seedling Organization. This seed is produced by entrusted local farmers. However, there are farmers who can produce or secure seeds through their own efforts.

Urea is the best selling fertilizer, followed by phosphate of ammonium both of which are only sold on a small scale. Urea is sold in Baghak Village (mentioned later) at the rate of only 60 bags annually (one bag is 50 kg.), as only a few farmers use one bag per 1 ha.

Two forms of financing are available; long-term and short-term (the latter being the most popular). The long-term loan of up to 130,000 rial, is to be repaid within three years, the short-term loan of up to 30,000 rial, within a year. Interest for the two systems is 4% in addition to 2% commission. Loan conditions are: more than 50% of the loan to be used specifically for farming; 20% as reserve; 30% for private use. The farmers make use of the loan to pay for seed and for hiring plowmen. In principle, the loan is to be repaid in cash, however, it is also possible to repay the debt out of the wheat which is delivered to the Central Association.

Wheat repaid to the Association this year as debt totalled a small amount of about 1,000 tons.

A part from this loan system, there is another loan made available by the Machine Promoting Public Corporation, for the acquisition of agricultural machines such as tractor, to be repaid under a 5-year-installment system on the security of land.

(2) Extension Organizations and Agricultural Experiment Stations

The Agricultural Office of the Zabol District is situated on 16-ha. of land in Zabol and farmland and also has 80-ha. of farmland in Adimi, and its organization

consists of sections responsible for extension seeds and seedlings, the fight against disease and pest control, agricultural economics (including statistics of agriculture and forestry), livestock farming and veterinary medicine. Promotion is mostly executed by twenty military servicemen assigned for short-term (One or two years). The Seeds and Seedlings Section performs experiments with the seeds sent by the Seeds and Seedlings Organization (hereinafter referred to as "SSO") which are tested as designated and then sends back the results to the SSO, which in turn arranges the data from each district and decides the most suitable seeds for them and eventually reports to the Extension Bureau of the Ministry of Agriculture. Finally the bureau contacts the Agricultural Office in Zabol. The office itself does not involve itself directly in the activities of each section. All sections cooperate in their efforts to fight disease and pests in the area concerned.

Farmers are not required to pay for this service as the Sistan, Baluchistan Province is designated as a "Special protection district". All these sections except livestock farming and veterinary medicine, are under the direction of a director, three technicians (graduates of training school after completing junior or senior high school) and twenty workmen.

The sections on livestock farming and veterinary medicine are omitted, as they have already been reported.

(3) General Conditions of the Farming Communities

The general conditions of four farming communities included in the survey, are shown in the Table I. The number of houses vary greatly from 50 to 600, but the people are one hundred percent farmers, 10-20% being livestock farmers. The average farmer's land comprises 2-6 ha., and wheat is the staple crop with summer crops being very scarce. The low rate of livestock farming and the rarity of summer crops are due to the lack of water during the past ten years and particularly because the farmers have not recovered from the damage caused by the severe and almost fatal drought in 1970 and 1971.

Table 1 General Conditions of the Farming Communities
 Values in parenthesis () are those of 1969

Name of Communities Items	Baghak	Lust Mahamdhan	Gaimabad	Bondjar
Number of Houses	50	92	110	573
Number of Farmers	150	430	750	3500
Farmers' Rate (%)	100	100	100	
Livestock Farmers' Rate (%)	10 (100)	28 (28)	10-15	
Number of Cattle		100 (1000)	70 (2000-2500)	
Sheep		20 (200)	10 (250-300)	
Cows				
Farmland (ha)		160	600	1200
Contents of Crops and Cattle	Wheat and alfalfa No summer crops	ha. Wheat 70 Barley 10 Grapes 2 Pomegra- rate 1 Other fruits 2	Wheat 400 ha. No summer crops	
		Number of cattle Cows 20 Sheep 100 Goats Chickens 200		
		Summer crops are small in types and areas.		

Table 1 General Conditions of the Farming Communities (Cont'd)
 Values in parenthesis () are these of 1969

Number of Communities Items	Bagbak	Lust Mahamdhan	Gaimabad	Bondjar
Agricultural Situations	Before the drought in 1970 and 1971, all the farmers had sheep. Due to the lack of water, only wheat became available.	Before 1969, the number of cattle was tenfold. Due to the severe lack of water during the past 10 years, no summer crops are available. Even winter crops are unstable.	During the great drought, the whole community moved to Gurgan 10-20% have not returned. Due to the geographical remoteness, they could not get unemployment aid to repair water-ways made useless the silt buildup. Nothing has been done for them yet.	
Cooperative Societies	Established by four communities (253 inhabitants). 75% membership. Capital 375, 000 rial.		Joined by 196 farmers. Established in 1966. Capital 104, 000 rial.	
Rented Tractor Rate	Almost all farmers		100 %	

The farmers used to cultivate good summer harvests of vegetables, beans, melons and fruits. The number of cattle used to be ten times as many as at present and livestock farmers have dropped to only 10% of the total. In Lust Mahamdhan, the number of cattle has dropped to only 10% of those preceding the drought and in Gaimabad the number is as low as 3%. The situation is serious as can be seen. Speedy measures to repair canals and improve the credit system are urgently required.

A further impression gained in the general survey, is that the use of rented tractors (which belong to individuals) is very common.

Public relations by the Ministry of Agriculture's Cooperative Society for the extension of rented tractors, collective labor, exchange or rearrangement of land and collective pooling of agricultural products is penetrating considerably into the farming communities. The extension of rented tractors would provide a good opportunity for future cooperative work which will need to be encouraged in the production area after completion of the Sistan Project.

(4) Farming Management

The surveys of Farmer A and Farmer B are shown respectively in Table 2 and Table 3. Farmer A's land area is 4 ha., while Farmer B has 310 ha. As already mentioned in the preparatory survey report, 60% of the farmers in the Sistan District have less than 8 ha. of farmland, and only 5% have more than 120 ha. After the third land reform plan is completed, most farmers will have 5-6 ha. Therefore, it can be said that Farmer A belongs to an average class and Farmer B is an exceptionally large land owner.

The income statement of Farmer A (as shown in Table 2) reveals that he makes 18,000 rial from wheat, 14,000 rial from cattle, and has a combined yearly income of 36,000 rial (¥146,000) which includes his own consumption of wheat. His expenses are 30,850 rial, and consequently his short-term loan of about 20,000 rial is carried over every year. All of this, is basically due to the fact that he has not recovered from the great loss of sheep caused by the '70-'71 drought.

Table 2 Farmer A's Income Statement

Items		Contents	Income Statement			
1. Income (Rough figures)			Items	Quantity	Unit cost	Price
Family	Engaged in farming	5 members 2 (husband & wife) up to 55 years of age	Wheat	2.4 tons	7,500 rial	18,000 rial
Others (children)		Male 2 (not at home) Female 1 (married)	Cattle sales	3	2,000	6,000
Employed labor		None	Carpets	1(2.5m ²)	8,000	8,000
Owned land		4 ha.	Miscellaneous income	-	-	-
Number of cattle		Sheep 5, Giving birth once a year. Keeping the female, and selling the male. Shearing twice a year. 1 kg. per one time. Chickens 4-5.	Home consumed products (wheat)	0.6 tons	7,500	4,500
Use of land		Winter crops, wheat 2 ha. alfalfa 0.5 ha. Fallow 1.5 ha.	Total	-	-	36,500
Harvesting situation		Wheat harvest decreases every year. No sales last year due to a bad harvest. Present harvest is three times more than the seeds sown without fertilizer, ten times more with 50 kg of fertilizer per ha.	2. Borrowing Payable (Cooperative society) 20,000 rial			
Natural disaster		Most cattle lost in the drought of 1970 and 1971.	3. Expenses			
			Items	Quantity	Unit cost	Price
			Household expenses	12 months	2,000 rial	24,000 rial
			Rented tractor	2 ha.	1,300	2,600
			Wheat seed	300 kg.	8	2,400
			Fertilizer (Urea)	2 bags	450	900
			Water	4 ha.	150	150
			Debt interest (4%)	-	-	800
			Total	-	-	-

Table 3 Farmer B's (Landowner) Income Statement (310 ha.)

Items	Contents
Family	10 members
Engaged in farming	None
Others	Husband and wife Children: Male 1 (student), Female 7 (5 married, 2 unmarried)
Employed labor	Permanently employed 2 (tractor operator and his assistant). One superintendent for every 4-ha. area to hire any necessary laborers for that area.
Owned land	310 ha. (40 ha. in A village, 80 ha. in B village, 80 ha. in C village, 110 ha. in D village)
Number of cattle	Sheep: 100-150, goats: 100, cows: 1, camels: 5, donkeys: 1.
Main machinery	60 Hp. tractor (350,000 rial): 1, plow, disk-harrow.
Use of land	Wheat (92 ha.), vine yard (4 ha.), some mulberries, pistachio and pomegranate If water is available, beans, kamin melons and water-melons are possible, but this year only wheat was cultivated.
Harvesting situation	Due to the lack of water during the past ten years, wheat is unstable. No harvest in 16 ha. this year. Generally poor harvest: About three times more than the seed sown in 24 ha. If enough water, 10-20 times more can be expected.
Natural disaster	1,000 sheep decreased to one-tenth in the drought of 1970 and 1971.
Concerning income statement	Sharing the price for river-irrigation for wheat; Landowner 1/3 (for seeds), Landowner 1/3, Tenant-farmer 1/3. In the case of irrigation by the pump: Pump 2/5, Landowner 2/5, tenant-farmer 1/5.

Farmer B is the typical landowner (in the land reform, ownership of different land in various communities appears to belong to each family), and the system of profit sharing still continues.

Each and every farmer is concerned about the unstable wheat production due to the lack of water, and so the Sistan Project is a welcomed undertaking, and its early completion is hoped for by all.

2-1-2 Report on the Cultivation of Crops

(1) Wheat

The following is supplementary to what has already been mentioned in the preparatory report.

At present, a two-cycle-farming system is taken in terms of wheat and fallowing period. The quantity of the seed sown is 150 kg. per ha. and the kind of seed used is traditional. It is common to use irrigation three times a year; before plowing, in February and in April. However, in some areas, a single irrigation is adequate. The most common fertilizer is sheep dung (the sheep being grazed after the harvest). Many farmers use urea and others use phosphate of ammonium (20-30% the farmer in Gaimabad village use this fertilizer). One 50 kg. bag of urea is used per ha. in February just before irrigation. 20-30 kg. of phosphate of ammonium is used per ha. The effect of these chemical fertilizers is quite dramatic.

In order to make use of cattle dung, the grazing of the sheep and goats was often around lake Hamun, thus avoiding the wild grass area. This is due to the fact that the sheep flocks decreased after the drought which enabled the remainder to be fed within the farmer's own land. Consequently, this maintained a natural fertilization of the wheat fields.

The method of seeding is as follows: weeding the fallow fields, plowing, irrigation, seeding by hand and disk-harrowing. Another method is similar to the above except that plowing is not done in the seeding process. The use of tractors is very common, the rental fee being 750 rial per ha. for plowing and 350-550 rial per ha. for disk-harrowing. Plowing is preferred for wheat cultivation. The time for seeding varies between the end of September and the beginning of April depending on the amount of irrigation. The best harvest is expected

between the end of September and the end of November. In this case, the harvest was done between the end of May and the end of June. The period that requires the shortest time for wheat growth is at the beginning of April, which is harvested in July. A considerable harvest can be expected if the temperature is low during this period.

The following shows the quantity of the harvest has been multiplied by the amount of seeds sown: In the case of only dung being used without chemical fertilizer, 3-5 times more can be expected; with a good natural soil, 10 times more; by using urea (50 kg. per 1 ha.), 10-20 times more. Naturally, this is based on the assumption that there is enough irrigation water available. Damage caused by disease and pests is rare, but if damage does occur, the Government will spray the crops free of charge. For example, last year, there was an outbreak of plant rice and other pests such as pentatomidae, grass hoppers and mice, whereby the Government understock the task of spraying.

(2) Summer Crops

Due to the lack of water during the past ten years, the only summer crops seen occasionally are sunflower, bean, corn and melon.

Feed crops are also scarce with alfalfa being in the majority.

Limitation for summer crops are: 1 Lack of water due to the incomplete irrigation system. 2 High salt level in the soil owing to the lack of correct irrigation and drainage. 3 Alkaline soil; 4 Severe summer heat and dust storms. 5 Lack of adequate social and economic conditions. These obstacles have been referred to previously in the preparatory report. Limitations 1 and 5 will now depend on a 5 year plan. Table 4 shows a summary of experiments and results of the farmers and experiment stations, on the cultivation of crops under the natural conditions which are listed in limitations 2 to 4.

Table 4 Report concerning the findings on Summer Crops of the Sistan District

Kind of Crops	Name of Crops	Growth Harvest	Remarks	Source of Information
Oil crops	Sunflower	250-2,000 kg/ha.	Various kinds are under experiment for comparison.	Experimental stations.
	Sunflower	Good	Sown at the end of March. Harvested at the beginning of August. Height: 2m, No damage from dust-storms.	Farmers' experiment.
Sugar crops	Sugar beet	Good 80 tons/ha.	Sown at the end of May. Harvested at the beginning of December.	Farmers' experiment.
Miscellaneous crops	Corn	Poor	Poor harvest at the beginning of August.	Farmers.
		Good	Sown in March and harvested at the end of May, thus avoiding storm damage.	Farmers.
Vegetables	Tomato	Good	Sown in April, transplanted in May and harvested in July and August.	Experimental stations and farmers.
	Egg-plant	Good	Various kinds are under experiment for comparison.	Experimental stations and farmers.
	Carrot	{ Poor Good	Easy to get pores.	Experimental stations. Farmers.
	Cabbage	Poor	The leaves not rounded enough.	Experimental stations.
	Potato	Poor	Too many leaves to produce potatoes.	Experimental stations and farmers.
	Onion	Good		Experimental stations and farmers.
	Turnip	Good		Experimental stations.

Table 4 Report concerning the findings on Summer Crops (Cont'd)

Kind of Crops	Name of Crops	Growth Harvest	Remarks	Source of Information
Melons	Melon	Good		Experimental stations and farmers.
	Cucumber	Good		Experimental stations and farmers.
	Water-melon	Good		Experimental stations and farmers.
Feed crops	Alfalfa	Good	Traditional variety is good.	Experimental stations and farmers.
	Pessian clober	Good	Traditional variety is good. 16 tons of hay/ha.	Experimental stations and farmers.
Fruits	Grapes	Good		Farmers.
	Mulberries	Good		Farmers.
	Pestachio	Good		Farmers.
	Pomegranate	Good		Farmers.

Foot notes

1. The growth and harvest column is based on the assumption that irrigation is good.
2. On the Admi Experimental Farm, irrigation water is channelled every other day through small waterways for egg-plants and tomatoes. The standard irrigation plan, states that the water should be given every other day for sandy soil, and every fourth day for clay soil. However, there is no data giving the quantity of water to be used.

As shown in this table, it is found that, generally speaking, both growth and harvest is good except potato, which are unsuitable in alkaline soil, cabbage, the kind of which apparently was not an ideal choice and corn which was affected by storm damage. Consequently, it would seem possible to stabilize the summer crops by selecting the most suitable kinds and also choosing the right time for sowing and harvesting, on the assumption that the amount of salt in the soil be lowered by correct irrigation and drainage. This has already been endorsed by the results concluded in the pilot farms, experimental station and agricultural training centers of the Ahwaz, Qhazvin and Isfahan districts.

The problem in the Sistan District, is the strong wind in the three months of summer. It is not known whether sunflowers and corn would withstand the wind or be physiologically damaged.

It would appear necessary for the pilot farm to study further, the methods of successful crop cultivation.

2-1-3 Considerations on the Current State of Agriculture and its Future Trend

One of the chief objectives of the recent research was to practically feel high temperature and strong wind in summer and to observe the actual state of the summer crop farming in Iran.

The road from the Zahedan Airport to Zabol in the desert was 211 kilometers, which was terribly rough at many places due to sand storms. As a result, we encountered unexpected many hardships to drive our car all the way. After sunset, we had to bear the heat ranging from 40° to 50°C. Sand storms enabled us to see only 20 meters ahead. We had loose bowels because we ate foods and drank water which did not agree with us. We could not sleep well due to the heat as if it were coming out from the mats of our beds. Judging from the above condition, we have to say that farmer cannot do the farming work outside during the period from June through August. Consequently, we presumed that even when water service is available in this area, seeding work, preparation, processing, and transportation of farm products after harvests would be difficult to perform. Such being the case, we assumed that they could only control water at most as a field work in summer.

However, we came to recognize that this way of our thinking was not correct in a sense as we advanced contact with Iranians later on. What they agreed

with our thought was reflected in our conversations at the agricultural extension office in Zabol to the effect that even when water service would be available in this area, summer crops will be limited to pasture grass or gourd family (like melon, cucumber, etc.) but other crops may be difficult to cultivate in such a hot weather and a strong wind. It seemed to us that those who live here do not feel pain at all about high temperature, in summer. We found there exists some difference between what they think and live and what we felt when plunged into hot air all of a sudden and had to bear new food living to us. Particularly, the farmers there are longing for water in summer and also are eagerly thinking of growing whatever crops they may grow if only water becomes available in this area.

This is probably because they might have made various kinds of crops when water service was available many years ago. This is often the case with in Qhazvin and Esfhan. When we come to think of the future farm management, however, we believe that our thinking referred to earlier should be put to practical use and it is still correct in that sense.

The actual state of farming in Sistan District was discussed earlier but we can say in a word that the present situation is in a critical condition owing to the shortage of water supply. In fact, every leading agency, say, agricultural extension service and agricultural cooperative activities are now in a considerably lower level as compared with those of ours. However, it is clear that the main reason can be sought in the fact that their passive activities in the farm management due to the shortage of water supply are on low side to a great extent. At this moment, we cannot help saying that the situation in this sector is helpless.

According to the Sistan Project, the 4th canal (channels up to 500 ha unit in Miankangi District and 100 - 150 ha unit in Sistan District and its land preparation are expected to be completed in 1980. However, would it be possible to start the practice of economic farming at a single stroke on the basis of a new rotation cropping system? Viewed from the present condition of the farmers there, we cannot help saying we have some doubt about it. The farmers themselves should make preparations for entering from the conventional farming to modernized economic farm management during the next 7 - 10 year period until the canal will be completed. We believe this will be a key point to lead the Sistan Project to a success.

For this purpose, firstly, it is essential to break a series of bottlenecks for making improvements on the present farm management by carrying out the new program, say, repairs of the existing canal, increased production of staple food, and growing of salt-resistant crops. In order to encourage farmers, every possible means should be taken at this moment, for instance, planning countermeasures for increasing wheat production which is so far experienced by farmers, encouragement of sheep farming which has been experienced by farmers since early days with their own skills taking the top seat in their cash income, government subsidy for recovery of sheep herds lost by the long drought in 1970 and 1971, pavement of roads, improvement of marketing facilities of farm products, expansion and intensification of agricultural cooperatives' services in the fields of technical farm production.

Secondly, during the process of organizing all functions well, it is important for the authorities concerned to complete the accumulation of capital among the growers as soon as possible. In the agricultural management systems in the transitional process from the extensive farming to the intensive farming, there will be none except the diversified livestock farming which has been prevalent so far in this area. We think that in this region such farm management as in combination with wheat, feed crops (barley, alfalfa, etc.), vegetables, and livestock are practicable.

As pointed out by Mr. Terazawa in his preliminary report, considering that input of organic matters is indispensable to the soil conservation in the Sistan District, livestock farming is indispensable in that sense to the farm management in this region. Furthermore, this sounds quite natural because livestock farming has already been established in this region as a rational type of farm management adapted itself to the natural environment. Assuming an example of diversified farming with the center of sheep raising by four ha land raising farmer which is an average farmholding and when the gross income from the current management is compared with the anticipated income from the future intensive farming, the results are as shown in the following trial balance sheet (Table 5).

Table 5 Gross Income from 4 ha Farm Holding (Trial Balance)

Farm Products	Items	Present			
		Yield	Number	Unit Price	Sum
Wheat		1.5 tons/ha	2 ha	7,500 Rials	22,500 Rials
Lamb sold		3 heads/year	3 heads/year	2,000 Rials	6,000 Rials
Carpet		2.5 m ² /yr	1 sheet	8,000 Rials	8,000 Rials
Vegetables		-	-		
Total					36,500 Rials
Farm Products	Items	Near Future (after several years)			
		Yield	Number	Unit Price	Sum
Wheat		3.0 tons/ha	2 ha	7,500 Rials	45,000 Rials
Lamb sold		10 heads/yr	10 heads/yr	2,000 Rials	20,000 Rials
Carpet		2.5 m ² /yr	1 sheet	8,000 Rials	8,000 Rials
Vegetables		20 tons/yr	0.2 ha	10,000 Rials	40,000 Rials
Total					113,000 Rials

At present, since the farm gross income is approximately 37,000 rials, we can estimate that their earnings will be about 25,000 rials. On the other hand, if the farm management is enlarged to such a size as herd of 10 sheep and feed crop field of 0.5 ha, wheat farm of 2 ha two times as much as present acreage, and vegetable farm of 20 a, the gross income per farm becomes about 113,000 rials.

Assuming that the income ratio is 70 per cent from wheat, 70 per cent from lamb, 70 per cent from carpet and 50 per cent from vegetables, the total will be 70,000 rials. Since the target for farmers' income which is aimed at the 5-year Development Program planned by the Government of Iran is 75,000 rials, the final goal can be achieved even in this size of farm management.

Thirdly, the farmers are requested to prepare for future management before the canal is completed in 1980. From 1980 onward, irrigation and drainage facilities and land preparation shall be so arranged as to facilitate water supply all the year round. As a result, the rotation cropping system will be organized well so that the intensive farming in the desalted fields will be performed on the basis of scientific water control and improved techniques of fertilization. Thus, the pilot farms will play an important part in the preparation of technical aspects, and then the 5-year Development Program will carry out its duty in the arrangement of socio-economical conditions. About technical matters, however, this is not merely a question of the pilot farms. When we think of the pilot farms as an objective of arrangements, we find some difference between in the case of Agrobusiness of Khuzistan and in the case of existing farms in the Sistan District. It goes without saying that a new type of farm management in the former differs from the latter in the nature of farm management. In the case of the Sistan District, the farmers are requested to have time for preparations and transitional processes in changing their farm management in their own way.

For example, an anticipated 5-year rotation cropping in Ghasvin is as follows:

Winter sheat ----- Sugar Beet ----- (Sorghum) ----- Fallow
 (Chickpea)

or 4-5 year-rotation cropping is as follows:

Winter wheat ----- Sugar Beet ----- (Annual feed-crops) ----- Oil crops
 (Winter crops) (Pulse) Vegetables

Such rotation systems can be anticipated to introduce in each region respectively. Nevertheless, when wheat production is left in such a lower level of production as it is now, it cannot be expected that the present farming can be switched over to the rotation cropping system.

To maintain the present level of production, farmers are requested to obtain techniques to produce at least two times as much as the present production per 10 are.

Moreover, when such rotation system is adopted in this area, the fallow-area will be remarkably reduced especially in summer and farmers will be in trouble due to the shortage of grazing pasture in area.

Also, viewed this in the light of fertility, it can be expected that wheat straw and crop residue should be given back to the soil together with animal manure as much as possible. In such a case, the prevailing pattern of livestock feeding which is mainly fed on wheat straw and grazing enables the farmers to switch over to a new pattern of feeding based on the cultivated land for animal feeds. Then, annual and evanescent feed crops will be incorporated in the rotation cropping system. As a result, however, feed preparation, feed and animal care/management will be brought out as a question after harvesting. In any case, it is important to consider in connection with animal keeping. However, farmers are not in a position to change their prevailing practice to a new system at one time. It is necessary to think how to lead the farmers to new pattern gradually during the next decade, so that the farmers can shift their farming to a new management.

If the pilot farm is set up at the Sistan District based on our thinking mentioned above, experimental work at the pilot farms should not be carried out only for the anticipated agricultural patterns 10 years ahead, but the work should be practiced under the yearly program being adjusted to each transition stage leading to a new farm management pattern during the next 10-year period from now on, and the program must be developed into extension service. In that respect, this should not be a kind of experiment to perform tests as those simply directed by the Seeds and Seedings Organization at Teheran or not be a kind of tests being presently conducted only for selection breeding as mentioned before, but in the manner of its own free will, say, like the Sistan Project in which Ministry of Agriculture, Ministry of Hydroelectric Power, and Ministry of Agricultural Cooperatives have been united, test must be carried out by farmers and the authorities together. Namely, the government and the people should be in coordination with one other in performing the socio-economic policy which is worked out by their joint efforts. Otherwise the pilot farm shall have to follow the same fate as the present Adimi Farm for which the pilot farm is not being operated in the form of an organic combination with it.

2-1-4 Some Suggestions as to the Establishment of the Pilot Farm

Based on the researches and the studies mentioned above, we wish to make the following proposals.

- (1) To take part in working in combination with the General Development Program of the Sistan Project which is going to be carried out at the Sistan District by the Government of Iran, it is to be desired that the Pilot Farms should be operated aiming at the establishment of agricultural techniques covering every transitional process leading to a new intensive farming ranging from the present stage to the completion of irrigation works.
- (2) It is necessary for the Pilot Farm in which the yearly program should be worked out in close connection with the long-term programs on the socio-economic policy to be set up for the Sistan Regional Development Program by the Ministry of Agriculture, the Ministry of Hydroelectric Power, the Ministry of Agricultural Cooperatives, etc.
- (3) This does not only aim at establishing agricultural techniques to cope with new agricultural economy in anticipation of the completion of irrigation works 10 years hence, but also it implies that the Pilot Farm have to fully perform its functions, even in the mid-course of the transitional processes to the new agricultural management, to materialize farm capital accumulation, mastery of techniques and farm improvement. In that point, the Pilot Farm differs from other places in its nature, say, the Agricultural Center which is being set up for Agro-Business in Safiabad.
- (4) Therefore, the Pilot Farm will be divided into three stages based on its functions. In the first stage, the function of the Pilot Farm must start with fundamental problems such as research works on land preparation, desalting methods, irrigation, effective use of water and windbreaks. Then, while in training staff members of the Pilot Farm in cultivation techniques, it is necessary for them to obtain techniques of the basic research works such as primary element-finding tests, measurement method, statistical analysis, and system engineering, which may enable them to obtain skills and an approach to establish techniques for research works on comparison of species and varieties of grass, cultivation methods and mechanized farm operation. Also, in this stage, the Pilot Farm have to aim to find the basis on which they establish a new management system by means of re-examination of the conventional diversified farming with prevailing wheat, feed crops, vegetables, and livestock. In the second stage, the cultivation

method of new varieties of crops, say, sugar beet, oil crops, annual or evanescent feed crops, fruit-trees, vegetables, etc. should be carefully studied and the rotation cropping system based on scientific water control, and fertilizing techniques must be clarified. Thus, the farm management patterns in the Sistan District should be established. In addition, during this period, a new livestock feeding system planned according to demand and supply program of feeds shall be established with the center of pasture grass or feed crops in the fields under cultivation and in turn the established patterns must be developed into farmers' practice through the farm extension service.

The third stage, namely, the period after the completion of the canal, is in the period during which the Pilot Farm will literally become an agricultural center for the technical development of agriculture and its extension service. It is believed necessary for the Pilot Farm to be carried out so that such step-by-step functions can get along.

2-2 Livestock Farming

2-2-1 Pilot Farm and Livestock Farming

(1) General

The Iranian Government's intention to develop agriculture in the Sistan District which will depend upon the expansion of livestock farming is well understood. As far as it is known, however, there are many difficult problems ahead in view of the severe natural, social and economic conditions underlining the district. Opinions on general conditions for agriculture and its development are reported in detail later.

The relationships between agriculture and livestock farming will be reviewed first, rather than discussing only livestock farming. At present, livestock such as sheep, goats, cows, asses, camels and garden fowls are raised. Among these, asses and camels, which have been used for transportation, are now being replaced by automobiles; cows which were important to farm labor, are being replaced by tractors. Consequently, the major livestock in future, will be sheep and goats, and only some cows for beef and milk.

Considering the poor technical standards and economic potential of the local farmer together with the severe climatic and social conditions, direct introduction

of a successful farm management system could never be realized. A basic survey, which takes time, is needed in order to implement such a system. The problems of agricultural development and of achieving a self supply of produce for livestock cannot be solved by technology alone. The economic factor also needs to be studied in order to help farmers raise livestock.

This assistance should be promoted step by step.

Research and experiments in the technical phase should have priority if a "new farm management system" is a prerequisite for the development of the Sistan District.

The above-mentioned reviews will then, outline how to develop the Pilot Farm, the details of which are as follows.

(2) Pilot Farm

- 1) It is a common prerequisite that, although good arable land is available, agricultural development cannot be realized without irrigation. This applies to the Sistan District. Therefore, a steady supply of water is the first priority for continued development of farmland which will include expanding the area of cultivated wheat, the basic farm product of this district.
- 2) Demonstration of a typical farm management system would not be accepted by farmers whose farm labor has no basis of stability or capital accumulation, and the Pilot Farm would probably be disregarded. Emphasis should be placed on research and experiments with long-term prospects.
- 3) It is said that farmers raising livestock account for approximately 10% of all the farmers. These farmers can use their farm products as food or convert it into money. If they have no livestock, feederops are cultivated depending upon their farmland and/or irrigation. It is therefore thought necessary for the Iranian Government to promote economic assistance by offering livestock to farmers who are capable of raising it, and in doing so it would increase the number of farmers raising livestock. (For example, livestock is loaned to farmers, and the young are purchased by the government.)
- 4) The following are suggested items for research and experiment on the Pilot Farm.

a. Selection of suitable farm products

As the scale of livestock farming is expanded, it is important to secure fodder for the winter season. At present, alfalfa and Persian clover are being cultivated in the Sistan District, but areas of cultivation are limited because of the seasons of these grasses and wheat overlap each other. For summer, correct selection of farm products should be made with consideration given to high temperature, low humidity, strong wind, heavy alkaline soil, etc., together with correct irrigation.

b. Utilization of arable land

On the basis of effective use of irrigation and selection of suitable farm products, consideration should also be given to adequate rotation of arable land.

c. Irrigation techniques

Important subjects for study are irrigation techniques in terms of time and water quantity for respective farm products, and especially the desalting technique.

d. Stock raising

Livestock is being raised carelessly. Fully grown sheep weigh only 40 - 45 Kg and therefore yield only 10 - 13 Kg of meat. Consequently, transactions of livestock in terms of meat are seemingly disadvantageous. It appears that the chronic shortage of fodder and poor quality wheatstraw which had long been used as fodder has caused livestock to become undersized. Notable differentials are found among growing livestock, and many losses occur among young livestock. (A survey shows that two out of five head livestock died.) Apart from the severe conditions in the past, it is necessary to introduce new kinds of fodder, and a more efficient distributing technique.

e. Livestock improvement and the economic factor

The rationality in the development of traditional fodder is not denied. However, losses caused by the fodder presently in use should not be overlooked. If fodder depends upon farm produce, the cost will become higher and will create problems for the farmer in raising his livestock.

Consideration should therefore be given to introduction and improvement of livestock and thorough reviews on economic function.

2-2-2 Livestock Farming in the Sistan District

(1) Livestock Farmers

Livestock farmers are generally favored, having comparatively wider areas of cultivation in this district. They comprise about 10% of all farmers which total 23,000. (Information obtained from the Zabol Agricultural Experiment Station.)

The table below was produced as a result of a fact-finding survey which was conducted in the districts of Miankangi and Sistan.

District	Village	Farmer			Livestock		Area of cultivation (ha)
		Total	Livestock farmer	Rate (%)	Sheep/Goats	Cattle	
Miankangi	Rusto-Maha-Madson	92	20	22	100	20	160
Sistan	Bonjar	573	-	-	4,000 - 5,000	-	1,200
	Gaim-Abatt	10	16 - 20	15 - 20	70	10	600
	Bagark	50	5	10	500	-	-

Area of cultivation per farmer is 2 ha on average. However, only 1 ha area is actually cultivated as half of the area is closed under the two shift cultivation system. Data on wheat which, as previously mentioned, is the key product of this district, show that by seeding 150 Kg in a 1 ha area, 450 - 600 Kg crop can result. Considering that a person requires 300 Kg of wheat a year, the farmers can not even secure their own food supply. Also, in Gaim-Abatt village, 20 - 25 of the 110 farmers have no farmland of their own. They are sustaining themselves by securing the loanee's share (each 1/3 shared by the seed supplier, the land owner and the loanee) and engaging in other labor.

The table below shows the situation of leading farmers in the same villages as the table listed above. From this table, we can observe that farmland ownership

is largely disproportional and that large livestock farmers enjoy wider areas of cultivation. It can be seen that livestock farmers are well-favored.

Except for the Miankangi farmer in this survey, female sheep and goats are raised exclusively for mating purposes and the male for livestock products.

As mentioned previously, it is inevitable that automobiles will replace asses and camels which have been used for transportation and tractors will replace cows that have been used for farm labor.

Livestock in future will primarily be sheep and goats and only a few cows for meat and milk. It was observed through the surveys on villages and individual farmers, that many farmers gave up or reduced the number of livestock raised due to the severe drought of 1970 - 1971. At present, livestock is priced at 2,500 - 3,000 rial (10,000 - 12,000 yen) in transaction, in comparison to only 100 rial (400 yen) at the time of the drought.

Table - Livestock Farming per Farmer.

District	Village	Vocation	Areas of Cultivation (ha)	Head of Livestock				
				Sheep	Goats	Cattle	Asses	Camels
Miankangi	Rusto-	President of summary court	310 Landowner in 4 villages	150-200	110	1	1	5
	Maha-Madson			(500-1000)	(30)	(30)		
Sistan	Bonjar	Farmer	8	6 (50)	2	2	1	
	Gaim-Abafi	Village headman	30	11 (200-300)	9			
	Bagark	Village headman & president of agricultural co-op.	4	5 (100)		(5)	(2)	

Note: Figures in parentheses show the head of livestock before dry weather.

As the table indicates, livestock farming was influenced by the lack of water. Consequently, the shortage of water also resulted in poor crops of wheat, a key food for the farmers, and they had to dispose of their livestock. The seriousness of the situation can be concluded from the fact that even landowners were forced to dispose of their livestock and that the selling price was ridiculously low at 100 rial a head.

(2) Feed Crops

In general, wheat is cropped close to the ear when harvested. In summer, livestock is raised in the harvested fields. While the successful cultivation of wheat is based on irrigation, such weeds as camel horn and kermack prosper, and the farmers feed their livestock on these weeds rather than wheat straw. Farms left to follow are clearly contrasted with farms that have been harvested. In present-day livestock farming, the wheat harvest is closely related to feed crops. Although the wheat harvest is not always stable, wheat is the cheapest fodder. Furthermore, livestock farming is carelessly maintained.

Major fodder in the winter season is wheat straw, barley and dried stalk of alfalfa. The quality of alfalfa is not satisfactory as it is cultivated in partitioned areas to prevent being damaged by wandering livestock.

Expansion of livestock farming to the 4,000-ha Hilmand pond, where reeds grow, is very difficult as the pond is fully water-sprinkled. Some farmers are at present working nearby and reaping reed for feeding their livestock. No concrete facts concerning the value of the reed was confirmed. If the farmers increase their head of livestock, cultivation of feed crops will be of primary importance as will be the following considerations.

- a. One of the feed crops already introduced to the district is alfalfa, which is very useful as a perennial grass. Areas of feed crops are comparatively limited, as in the case of alfalfa, as the season for these crops overlaps that of wheat.
- b. Introduction of feed crops for the summer season is necessary. Also, introduction of irrigation should be considered, and the selection of suitable crops is primary importance.

c. Upon introducing summer crops, a basic land utilization system should be established in relation with the restricted areas for livestock farming in the summer season. Furthermore, livestock farming should be reviewed in terms of the economic factor in view of the rising costs of fodder as compared with conventional feedstuff.

(3) Slaughter House

Two slaughterers are working in a small slaughter house in Zabol city. The table below indicates sheep slaughtered each season in the Sistan District. No remarkable difference is seen between each season.

Table - Livestock slaughtered each season

	Sheep	Goats	Cattle
Spring	6,069	3,606	467
Summer	6,329	3,280	490
Autumn	6,500	3,072	484
Winter	6,067	2,604	409
Total	24,965	12,562	1,850

From the above data, it is understood that in Zabol, about 30 sheep and 3 - 4 cows are slaughtered every day, not more than 40 in all. There are twelve cattle dealers and four hide-and-skin dealers in Zabol. Sheep are directly transacted between the dealers and the farmers, the carcasses of which are put through the quarantine station. In the case of cattle, several dealers jointly purchase cows and allot 3 Kg of meat per man. Hide-and-skin dealers purchase hides, skins and entrails. Purchasing price of sheep is 5,000 - 6,000 rial (20,000 - 24,000 yen) per two head, and a sheep's meat weighs 11 - 13 Kg. Retail price of mutton is 120 rial (480 yen) per 1 Kg, and that of beef is 90 rial (360 yen) per 1 Kg.

(4) Livestock Disease Prevention Center of Zabol

In Zabol, Livestock Disease Prevention Center and Livestock Quarantine Station have been established by the Iranian Government, from which the government's effort in livestock disease prevention can be seen.

Two veterinary surgeons and ten vaccinators are allocated to the Livestock Disease Prevention Center (vaccinators are all military personnel). This district is badly polluted by livestock epidemics partly because so many exchange of livestock are taking place between this district and Afganistan and Pakistan. Mouth and hoof disease, anthrax and pyroplasma among sheep and cows, and smallpox, blackleg, etc. among sheep, are great concerns of the Government. 80,000 head of sheep and cattle will be subjected to preventive vaccination against the mouth and hoof disease during this fiscal year.

At present, livestock farmers have no incentive to consult with veterinary surgeons on poor breeding, malnutrition and mouth and hoof disease, nor are there any such facilities to meet farmers' request, if any. Under these conditions, greatly varied growth rates are noted among livestock and especially among the young. Surveys on individual farmers indicated that 40% of young livestock died of malnutrition.

(5) Livestock Quarantine Station of Zabol

All livestock which is to be subjected to slaughter are gathered at this station. Those to be slaughtered at the Zabol slaughter house undergo quarantine examination. Those to be sent to other districts are retained at the station for 15 days, after which quarantine certificates are issued. Livestock without the certificate, cannot go through the checkpoints. (There are four checkpoints on the 240-Km route from Zabol to Sahedan.)

A veterinary surgeon and twenty technicians are allocated to this quarantine station. (Technicians are military personnel. University graduates of the natural science course, work here for one and half years, and high school graduates for two years, as substitute service for the army.)

Livestock is either sent to big livestock markets in Tehran, Mashad, etc., or to such districts where weed is available in the winter season (and then sold there).

Technicians from the station accompany livestock and confirm destination.

Livestock is carried by 12-ton double-deck van on which 120 head of livestock is loaded.

2-3 Dispatching Japanese Experts

The undermentioned are the reviews on dispatching Japanese experts in consideration of their usual living standard.

(1) Housing

Housing for experts and their families is provided in accordance with their usual living conditions (natural, social, economic and health) and the stages of their children's education. In the case of the Sistan District, there are no schools exclusively for Japanese or American children providing compulsory education. Therefore, family members will have to live in Tehran city while the experts work in Zabol. Assuming that the experts will look for a house to let in Zabol, it must be pointed out that almost all houses are made of earth and clay and consequently, will not be suitable. For Japanese experts under such conditions, it is thought to be appropriate to request the Iranian Government to provide billets for the experts. It is also deemed appropriate to request the Iranian Government to bear expenses, whole or in part, for the family housing in Tehran city.

Monthly rents for the houses to let currently available in Tehran city are as follows:

2 bedrooms and furnished (ground floor)	25,000 - 30,000 rial
3 bedrooms and furnished (ground floor)	30,000 - 40,000 rial
3 bedrooms and furnished (2nd and 3rd stories)	25,000 - 30,000 rial

Note: 1 rial is approximately 5 yen.

Such monthly rent reflects excessive inflation. In the case of the Karazi Vocational Training Center, as it is still in the RD stage for OTCA to launch co-operation in the development, success has been made in persuading the Government to provide billets in Karazi and to bear housing expenses of not more than 20,000 rial for the houses to let in Tehran city.

(2) Vacation Scheme

As was reported in the first preliminary survey report, natural conditions in the Sistan District are very severe. In the hottest season of July and August, even local farmers refrain from farm work. From the standpoint of long-term cooperation and for health reasons, it is considered imperative for the specialists dispatched to the Sistan district, to spend July and August in other districts of

Iran or in neighboring countries, to avoid such a severe summer climate. Consideration should be given not to affect the work schedule when re-allocating the specialists during the summer months.

(3) Going Home on Furlough

According to the OTCA's 'Going home on furlough' scheme, the specialists who are dispatched for more than 2 and a half years, are entitled to home leave for one month. However, those who are engaged on projects in the 'special' district are entitled to one month's home leave after completing one year's duties. Working conditions in the Sistan district are equally or more severe compared with the 'special' district, and annual home leave for one month will be appropriate.

(4) Isolated Location Allowance

According to the OTCA's 'Isolated location allowance' scheme, 15% and 5% allowances of the basic salary will be paid to those who work in A and B class places respectively. It is thought appropriate to apply the allowance of A class place considering the conditions in the Sistan District such as living conditions, isolation, transportation facilities, medical and other public establishments, etc.

(5) Procurement of Japanese Food

It is strongly desired that tax-free privileges when importing Japanese food will be ensured in the negotiation of the cooperation agreement. At present, the experts dispatched to Iran under the Colombo Plan are not enjoying these privileges. However, the Dentsu Center, managed by the Overseas Enterprise Department of OTCA, has tax-free privileges when importing Japanese food which is based upon the agreement. The limit of tax-free imports is not more than 10,000 rial (50,000 yen) for one person per annum. A much higher limit for tax-free imports than that of the Dentsu Center is considered necessary in view of the more inconvenient situation of the Sistan District.

(6) Other Allowances

It would be appropriate to request the Iranian Government to bear the following expenses. For example, travelling expenses to Tehran from Sistan for official business; expenses for inspection trips during execution of the project; traffic expenses for the specialists and their families to commute to Tehran regularly

(once in two months) in view of the isolation of Sistan. When an official trip to Tehran becomes necessary, the specialists and their families will undergo a medical examination, and they also will be permitted time for favorite diversions and shopping for daily necessities.

A thorough review will be needed on the above-mentioned items when negotiating the cooperation agreement. The success of the agricultural development project in the isolated district will depend on the selected experts, their attitude and the materials used. In order to recruit capable and talented experts for the project, preconditions should be set and all details coordinated and finalized as far as possible so that the requirements of the Kingdom of Iran in the development of the Sistan district can be met satisfactorily.

2-4 Outline of a Talk with Dr. Seino, Leader of the Mission and Mr. Mirhedar, Iranian Vice-minister of Agriculture (Aug. 20)

After the activities of the Mission, a visit was paid to Vice-minister Mirheydar, to thank him for his cooperation during the survey and to exchange views with him after the Director, Dr. Seino had presented the following outline on the study of agricultural development in the District of Sistan.

Outline of the Director's Report:

- (1) The recent Study-Mission was supplementary to the one made last winter and was aimed at examining a basic plan and its administration for the following items;
(a) Present situation of the summer crops; (b) Environmental conditions of the District of Sistan; (c) Building a pilot farm.
- (2) The Plain of Sistan appears to be a difficult area for agricultural development under existing natural and social conditions. However, the water problem, one of the obstacles of agricultural development, will probably be overcome so that wheat production may be increased in winter. The local farmers, therefore, could be assured of this vital crop. It is hoped that the pilot farm which is to be established will produce a new strain in order to raise the productivity of wheat.
- (3) During the time of the agricultural survey, farmers complained about the severe droughts in 1970 and 1971 in which they lost many cattle. With sufficient irrigation, an adequate winter wheat crop would be assured and the number of cattle would increase due to availability of summer feed-crops. The study recognizes

the feed supply plan as well as the cultivation experiment of feed-crops, as a major problem. However, at present, the most urgent problem is to make the best use of the existing irrigation system, by repairing canals temporarily, thereby stabilizing the wheat crops.

- (4) From the above viewpoints, due respects are given to Mr. Mirheydar and his ideas, promoting livestock farming as a promising pattern and as encouragement for self-supporting farmers.
- (5) Apart from livestock farming it would be advisable to study introduction of vegetable cultivation to the small scale farmers, which would make effective use of the mild spring climate, thus avoiding the intense summer heat. In order that this becomes an economical venture, it is recommended that the roads between Zabol, Zahedan and Mashad be improved.
- (6) It is suggested that wheat, sugar beet, sorghum, vegetable and fallow be used in a crop rotation pattern. Mechanized agriculture along with communal administration should be studied from the viewpoint of the farmers' for their protection in order to raise the productivity of Agro-Business. The surplus LABOR which may arise from the mechanization of agriculture should be used for agricultural manufacturing and industry.
- (7) As a result of the recent studies, the basic views on the pilot farm are as follows:
 - (a) The fundamental aim is to establish an agricultural pattern suitable for the natural and economic conditions of the Sistan Plain and to concentrate on technical studies of the above, as well as to put them to practical and managerial use.
 - (b) According to past experience concerning pilot farm establishment and its management, it would be advisable not to start experimental studies immediately after its completion, due to the many difficulties involved. Therefore it is advisable first, to take three steps: (1) Study the basics of existing facilities like those in Zabol and Adimi; (2) Design and propagate the agricultural pattern suitable to the social conditions of the district; (3) Produce a "development plan" of the district.
 - (c) The problems of the pilot farm at present are similar to those already experienced in Safiabad and Qhazvin those include salt-eliminating measures,

irrigation, effective use of water and selection of study crops for raising in the salty soil. These basic experimental studies must be done quite soon. Taking this into consideration, it is thought that members of the Japanese Government Study Mission which are to be sent on a long-term basis, should be irrigation and soil specialists.

(8) It will be reported to the Japanese Government that the construction of a pilot farm is urgently required for the development of the Sistan Plain. As the Overseas Technical Cooperation Agency (O.T.C.A.) is responsible for such matters, upon receiving this report, consult the Ministry of Foreign Affairs and the Ministry of Agriculture & Forestry on the matter of experts to be sent, as to their number, areas of speciality, terms and methods etc. At this time various conditions on the environment of Sistan District will be mentioned in conjunction with the despatch of the specialists. Therefore, if cooperation is decided, a study and clarification of these conditions by the Iranian Government, is desired. Finally, Mr. Mirheydar's opinion concerning the Study Missions' views and the Japanese Government's technical assistance would be appreciated. Vice-minister Merheydar expressed the following views on the subject:

- (1) The proposal of a crop rotation system including sugar beet, is worthy of consideration. Although this is based on the proposal by the Sanyu Consultant, the winter sugar beet requires further experimentation and in the summer it competes with the wheat harvest.
- (2) At least 100,000-ha., is needed for sugar beet fields to supply one sugar mill, and education is needed for the farmers, on sugar beet fields to supply one sugar mill. Education is also needed for the farmers, on sugar beet cultivation. At first, a sowing of at least 50,000-ha. is needed, and it is hoped that a harvest of more than 40 tons per ha. will eventuate. The sugar mill should have a capacity to refine 200,000 tons per day. However, perhaps only 20 tons per ha. can be expected in the District of Sistan. Areas as large as 100,000-ha. are eventually required, therefore, care should be taken in the placing of the mill and its capacity of gathering goods.
- (3) Sorghum should be classified as a "father crop" which thrives in the alkaline soil of Sistan District.

Throughout the report, wheat has been emphasized.

Why has barley failed to be mentioned?

Answer: In the report, it was meant both wheat and barley. Wheat is a staple food, and barley is feed. The misunderstanding arose because a Japanese word "Mugi-rui", which means wheat and barley together. This was translated into "wheat".

- (4) It would be desirable to set the crop rotation at approximately 50 - 60% of the livestock farming. The remainder would depend on experiments, whether sugar beet, barley or any other crop is preferable.
- (5) Correct emphasis has been placed on the importance of a wheat production increase. What is required in actual fact, is 130 - 140 kg per person (including children) every year. If there are 30,000 tons for a population of 200,000 in the Province for Zabol, a shortage of food will not be feared.
- (6) The repairing of canals is considered of no value since there is a plan to consolidate farms in this district.

Answer: What was stated, is aimed at improving the present farmers' living standard. It is not a permanent program. It is hoped that this will bring about a secure livelihood and consequently raise capital for the Sistan Project.

- (7) The LABOR problem caused by the agricultural mechanization should be solved by introducing industries such as livestock farming. Further discussion is required with regard to the pilot farm.

Answer: The reason why sugar beet was included in the crop rotation is to absorb surplus LABOR.

- (8) The Iranian Government is grateful to the Study Mission for the accord reached concerning the construction of the pilot farm. It is thought that the suggested inclusion of an economic department within the pilot farm would be most useful and it is hoped that it will actually be established.

Vice-minister further expressed his appreciation by saying that the suggestions on various points received from us, were noteworthy. He also expressed his great hope that the problem of technical assistance would be turned over to diplomatic negotiation. He added finally, that he was convinced that the severe natural conditions of the Sistan Plain is fully realized by the Study Mission.

