# REPORT OF SURVEY ON AGRICULTURAL SITUATION IN LIBYA ARAB REPUBLIC

July, 1974

OVERSEAS TECHNICAL COOPERATION AGENCY
TOKYO, JAPAN

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# 1. INTRODUCTION

## 1-1 CONSTITUTION OF THE SURVEY TEAM

| | |
|---|---|
| Tadokoro, Kizashi | Leader<br>Director general, Japan Regional Crop Seed Association (The ex-director of Regional Bureau, Ministry of Agriculture and Forestry) |
| Sakaue, Seiei | Expert on Irrigation<br>Deputy Director, Irrigation Division, Ministry of Agriculture and Forestry |
| Sakayanagi, Michio | Expert on Soil and Fertilizer<br>Deputy Director, Agricultural Division, Ministry of Agriculture and Forestry |
| Itano, Tohru | Expert on Cultivation<br>Deputy Director, Resources Division, Chugoku-Shikoku Regional Bureau, Ministry of Agriculture and Forestry |
| Watanabe, Masao | Coordinator<br>Staff, Second Experts Assignment Division, Overseas Technical Cooperation Agency |

Report to Libyan Government

## 1-2 GRATITUDE

The Agricultural Survey Team of Japan stayed in Libya for 17 days during March 23 ∿ April 7, 1974. It made an on-site inspection of the agricultural conditions under the guidance of the Ministry of Agriculture and Agricultural reform of Libya. The team inspected the agricultural experiment stations, agricultural high schools, agricultural mechanization training centers, Extension Stations, government-run agricultural facilities, agricultural co-operative societies, irrigation facilities and development projects and had chances to exchange opinions with the agriculture interest and the staff of the Ministry of Agriculture and Agricultural reform.

The Team was enthusiastically welcomed by the Libyan Government during this period. The Team was able to accomplish its purpose owing to the Libyan Government's sincere efforts.

We particularly thank Mr. Soghmary of the Ministry of Agriculture and Agricultural reform, who accompanied the Team throughout this period, explained the country's agricultural conditions with energetic actions and humorous speaking and interpreted the conversation with the country's

leaders. Owing to his efforts, the Team was able to inspect numerous facilities and to talk with various Libyan leaders and people during the stay.

In presenting this report, the Team expresses sincere gratitude to them. It hopes that the report will contribute cooperation and exchange of agricultural technology and experiences between Libya and Japan. The Team hopes that it will promote the friendship between the two countries.

## 2. JAPANESE EXPERIENCES WITH SOME CURRENT AGRICULTURAL PROBLEMS IN LIBYA

### 2-1 PREFACE

The Team was able to study the agricultural conditions in Libya during its brief survey period owing to the cooperation of the Ministry of Agriculture and Agricultural reform in Libya. Both the Libyan Government and people have strong desire for agricultural development. We were deeply impressed by actually observing their enthusiastic efforts. We learned that some problems must be solved for agricultural development in Libya. These problems will surely be overcome if the enthusiastic efforts of the Government and the people for national construction are continued.

Agricultural mechanization, training and spreading of fertilizing and cultivating techniques, water resource development and damages by salt are among the current problems which were taken up and discussed by the Team and members of the Ministry of Agriculture and Agricultural reform of the Libyan Government. Except damages by salt, all of these problems are important problems in Japan, also. Various measures have been taken and still being studied to solve them. Although the agricultural conditions differ sharply between Libya and Japan, a part of the experiences in Japan are introduces here. We hope that the exchange of experiences between Libya and Japan will contribute to the future agricultural development in Libya.

Japan has little experience in damages of crops by salt since this problem has hardly occurred in Japan. This is explained by drastic difference between Libya and Japan in natural conditions.

### 2-2 ON MECHANIZATION OF AGRICULTURE

The scale of agricultural management, types of crops, cultivation conditions, field conditions, organizations etc. must be considered for efficiently introducing machines to agriculture. Their proper introduction and promotion are an important theme.

Large machines are currently being introduced to Libya and various measures for their introduction are being taken.

The history of agricultural mechanization in Japan reveals that rice planting has been the center of machanization. Machines have been improved to obtain higher performances and more compactness because of generally small agricultural management and frequent uses on slopes. Their employment has also been of small scale.

Although irrigation, drainage, adjusting works and plowing works were mechanized quite early, the mechanization of harvesting works was delayed sharply. Thus, mechanization has progressed in a zigzag line.

Only recently, dry field forming has been mechanized and large machines have come to be shared among farmers.

With regard to the maintenance of agricultural machines, large and complicated machines must be maintained well to ensure safe operation, efficient uses and large durability etc. According to our information, efforts for effective maintenance of agricultural machines are being made also in Libya. It is important to introduce machines of good performances and to establish a system for supplying parts or repairing machines at any time according to farmers' request. It is also important to establish on after-service organization.

Users must be taught the importance of sufficient maintenance for agricultural machines. The following items are important.

(1) Farmers must have sufficient knowledge on operational instructions and cautions of machines.

(2) Machines must be inspected periodically. Inspection standards for machines must be prepared and users must be encouraged to follow them. Daily maintenance inspection standards, periodic inspection standards and housing inspection standards are among such inspection standards.

(3) Operations' technical standard must be improved.

Approximately sixth years have passed since the mechanization of agriculture began in Japan. Efforts have been made in the following respects.

(1) Fabrication and improvement of adequate machines for Japanese agriculture

Numerous types of agricultural machines have been imported from European and American agricultural countries. Since these machines were for large-scale dry field farming, they had to be improved for Japanese agriculture. The machine makers throughout the country have constantly improved machines by asking the opinion of their users, namely, farmers.

(2) Establishment of after-service net

Japanese agricultural machines makers have branch stores for sales and repair services throughout the country. They readily supply parts and repair machines at farmers' requests.

(3) Improvement of ground foundation

The Government has provided large assistance for road and field improvements to facilitate mechanization. Ground foundation has been improved mainly in the following respects.

(i) Roads must be wide enough for operating machines and convenient for maintaining them.

(ii) Fields must be blocked into good shape and sufficiently large for efficient operation of machines.

(iii) Fields have nothing to hinder machines' travelling and their slope should be adequate for various operations.

(iv) At least one side of a field should be a road to allow the entry of machines.

(v) Roads and fields must be organically connected to farmhouses, and sheds for agricultural tools and various other facilities. The layout of these facilities must of efficient.

(4) Spreading of suitable cultivation techniques for mechanization

To increase the efficiency of mechanized works, efforts are made to raise rice and wheat varieties with strong stems and large resistance to laying force and to promote group cultivation. For fruit trees, efforts are made for orderly planting and suitable tree shape for mechanization. For pasture, grass varieties are combined to extend grass cutting period.

(5) Establishment of Agricultural Mechanization Promotion Law

Since the Government had to promote labor-saving efforts in agriculture to cope with heavy loss of labor power in this field, it established the Agricultural Mechanization Promotion Law in 1962. It clarifies the duties of the administrative organs (country, prefecture etc.) in the field of tests and experiments, mechanical training, mechanical inspection etc.

(6) Tests and experiments

Effective promotion of mechanization requires not only the improvement of machines, but also integrated studies covering

efficient combination of machines, adequate scale of machines, desirable land factors, users' organizations etc. These studies are being conducted with close communication among local Agricultural Experiment Stations, Agricultural Civil Engineering Experiment Stations and the Institute for Agricultural Machinery.

(7) Training in agricultural machines

In compliance with the Agricultural Mechanization Promotion Law, the Government established the Agricultural Technical Training Center for training farmers. Individual prefectures also offer local training. The number of the trainees at the Agriculture Technical Training Center was 610 in 1972. They were given training in agricultural mechanization techniques, mechanization of production, efficient operation and maintenance of machines etc. The prefectures trained 327 Farm Advisors at Prefectural Agricultural Experiment Stations in 1972.

For fruit tree agriculture, there are two National Fruit Agriculture Mechanization Training Centers, where about 130 farmers are trained each year. Since the Japanese farmers obtain basic knowledge on machines through these trainings, they can not only operate machines, but also repair simple troubles by themselves.

(8) An example of technological system for mechanization

Since the introduction of large plowing and seeding machines requires large investments, systematic techniques for efficient utilization of machines must be used.

For this reason, the Government organizes study groups consisting of research staff at governmental or prefectural agricultural experiment stations. They prepare a standard technical system for large and medium-sized machines by crops and regions. Technological systems for numerous crops and numerous regions have been made to provide guidance for the introduction of large machines. The technical system for wheats applicable to certain region is briefly shown below, as an example.

System of mechanized cultivation techniques for wheats

A. Assumptions

(i) Management

Wheat accounts for most of winter crops. Sweet potatoes

and forage crops etc. are cultivated as summer crops.

Harvesting machines are to be borrowed from a agricultural cooperative society. The other machines are to be shared by ten households.

(ii) Working area

The arable land is 25 ha (10 households, each with 2.5 ha). The cultivated acreage of wheat is 20 ha.

(iii) Major agricultural machines

The following machines are to be shared.

One large tractor (40 PS), lime pL, disk plow, disc harrow, culti-packer, drill seeder, roller, sprayer

The following machines are to be borrowed from agricultural association.

Combine, one small four-wheel vehicle

(iv) Yield

The yield of barley and wheat is to be 4 tons and 4.5 tons, respectively, per ton.

(v) Field

Each block is to be larger than 0.5 ha and the transport distance is to be 300 m.

B. Technical system for barley (cultivated acreage 5 ha)

| Cultivation type | | Cultivation type | | | Techniques | | | | Materials per ha | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Work condition, accuracy | Suitable period | Number of possible days | Size of machine | Number of machine operating hours | Number of workers | Number of hours of man-power | Fuel | Materials |
| Seed preparation | Seed sorting in salt water | Specific gravity of ammonium sulfate water 1.13 | Oct. 20 ∿ Oct. 27 | 7 days | (Manual) | hours | person 1 | hours 2.4 | ℓ | Seed 75 Kg<br>Ammonium sulfate 11 Kg |
| | Seed disinfection | Usplun diluted to 1,000 l hour | Oct. 20 ∿ Oct. 27 | 7 | (Manual) | | 2 | 2.4 | | Usplun 180 g |
| | | | | | | | | (4.8) | | |
| Lime spraying | | Total spraying | Oct. 10 ∿ Oct. 20 | 11 | Lime sower 2.4 m wide | 1.5 | 2 | 3.0 | 1.5 | Lime 1 ton |
| Plowing | | Two-way plowing | Oct. 20 ∿ Oct. 30 | 11 | Disk plow 26"x3 series | 3.4 | 1 | 3.4 | 10.2 | |
| Stamping | | One application | Oct. 20 ∿ Oct. 30 | 11 | Disk harrow 20"x24 | 1.2 | 1 | 1.2 | 6.0 | |
| Ground making | | Three application | Oct. 20 ∿ Oct. 30 | 11 | Tooth harrow 30 clawsx3 | 2.4 | 1 | 2.4 | 8.4 | |
| Tamping | | One application before seeding | Oct. 20 ∿ Oct. 30 | 11 | Culti-packer 2.4 m wide | 1.3 | 1 | 1.3 | 3.8 | |
| Fertilizing and seeding | Fertilizing and seeding | Total-drilling, drill spacing 20 cm | Oct. 27 ∿ Nov. 5 | 10 | 7"x13 Drill seader | 1.9 | 2 | 3.8 | 4.6 | Seed quantity 70 Kg |
| | Transportation | | | | | 1.0 | 2 | 2.0 | | Compound synthetic fertilizer (6-12-9) 1.2 ton |
| | | | | | | (2.9) | | (5.8) | (4.6) | |

| Cultivation type | | Cultivation type | | Techniques | | | | | Materials per ha | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Work condition, accuracy | Suitable period | Number of possible days | Size of machine | Number of machine operating hours | Number of workers | Number of hours of man-power | Fuel | Materials |
| | | | | days | | hours | person | hours | ℓ | |
| Herbicides spraying | | 1,000 ℓ/ha | Seeding ∿ 15 days | 15 | Sprayer 400 ℓ | 0.9 | 2 | 1.3 | 3.3 | CAT 0.5 Kg |
| Tamping | First | One application | Jan. 20 ∿ Jan. 31 | 12 | Roller 2.4 m wide | 1.3 | 1 | 1.3 | 3.8 | |
| | Second | One application | Feb. 10 ∿ Feb. 20 | 11 | " | 1.3 | 1 | 1.3 | 3.8 | |
| | | | | | | (2.6) | | (2.6) | (7.6) | |
| Harvesting | Combine harvesting | Two-way harvesting | May 26 ∿ June 5 | 1 | Combine 2.4 | 2.3 | 2 | 4.6 | 17.9 | |
| | Transportation | | | | Small 4 wheel vehicle | 3.0 | 2 | 6.0 | | |
| | | | | | | (5.3) | | (10.6) | (17.9) | |
| Total | | | | | | 21.5 | | 36.9 | | |

## C. Technical system for wheat (cultivated acreage 10 ha)

| Cultivation type | | Cultivation type | | Techniques | | | | | Materials per ha | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Work condition, accuracy | Suitable period | Number of possible days | Size of machine | Number of machine operating hours | Number of workers | Number of hours of man-power | Fuel | Materials |
| | | | | days | | hours | persons | hours | ℓ | |
| Seed preparation | Seed sorting in salt water | Specific gravity of ammonium sulfate water 1.22 | Oct. 28 ∿ Nov. 2 | 7 | (Manual) | | 2 | 2.4 | | Seed 55 Kg<br>Ammonium sulfate 19 Kg |
| | Seed disinfection | Usplun diluted into 1,000<br>1 hour | Oct. 28 ∿ Nov. 2 | 7 | (Manual) | | 2 | 2.4 | | Usplun 180 g |
| | Total | | | | | | | (4.8) | | |
| Lime spraying | | Total spraying | Oct. 10 ∿ Oct. 20 | 11 | Lime sower 2.4 m wide | 1.5 | 2 | 3.0 | 1.5 | Lime 1 ton |
| Plowing | | Two-way plowing | Oct. 20 ∿ Oct. 30 | 11 | Disk plow | 3.4 | 1 | 3.4 | 10.2 | |
| Stamping | | One application | Oct. 20 ∿ Oct. 30 | 11 | Disk harrow 20"x24 | 1.2 | 1 | 1.2 | 6.0 | |
| Ground making | | Three application | Oct. 20 ∿ Oct. 30 | 11 | Tooth harrow 30 claws x 3 | 2.4 | 1 | 2.4 | 8.4 | |
| Tamping | | One application | Oct. 20 ∿ Oct. 30 | 11 | Culti-packer 2.4 m wide | 1.3 | 1 | 1.3 | 3.8 | |
| Fertilizing and seeding | Fertilizing and seeding | Total drill seeding, line interval 20 cm | Oct. 27 ∿ Nov. 5 | 10 | Drill seeder 7" x 13 | 1.9 | 2 | 3.8 | 4.6 | Seed 55 Kg<br>Synthetic compound fertilizer (6-12-9) 1 ton |
| | Transportation | | | | | 1.0 | 2 | 2.0 | | |
| | Total | | | | | (2.9) | | (5.8) | (4.6) | |

| Cultivation type | | Cultivation type | | Techniques | | | | | Materials per ha | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Work condition, accuracy | Suitable period | Number of possible days | Size of machine | Number of machine operating hours | Number of workers | Number of hours of man-power | Fuel | Materials |
| | | | | days | | hours | persons | hours | ℓ | |
| Herbicides spraying | | 1,000 ℓ/ha | Seeding ∿ 15 days | 15 | Sprayer 400 ℓ | 0.9 | 2 | 1.8 | 3.3 | CAT 0.5 Kg |
| Tamping | First | One application | Jan. 20 ∿ Jan. 31 | 12 | Roller 2.4 m wide | 1.3 | 1 | 1.3 | 3.8 | |
| | Second | One application | Feb. 10 ∿ Feb. 20 | 11 | " | 1.3 | 1 | 1.3 | 3.8 | |
| | | | | | | (2.6) | | (2.6) | (7.6) | |
| Harvesting | Combine harvesting | | Jun. 10 ∿ Jun. 20 | 11 | Combine 2.4 m wide | 2.3 | 2 | 4.6 | 17.9 | |
| | Transportation | | | | Small 4 wheel vehicle | 3.0 | 2 | 6.0 | | |
| | Total | | | | | (5.3) | | (10.6) | (17.9) | |
| Grand total | | | | | | 21.5 | | 36.9 | | |

## 2-3 EXPERIMENT AND RESEARCH ORGANS AND EXTENSION WORK

The Team was able to inspect experiment stations and experimental farms. Experimental farms and display farms are said to be planned and run under various projects. Centers for promoting extension works are also being constructed. To improve farmers' technical standard and to use the results of projects effectively, various problems must be solved to increase agricultural production and to spread the results among farmers quickly. This requires not only the promotion of tests and researches, but also the training of capable advisors for teaching various agricultural techniques to farmers.

(1) In Japan, national and prefectural experiment stations have been established. The national experiment station is engaged in tests and researches in basic studies and fundamental technical problems of regional agriculture. Prefectural experiment stations are engaged in tests and researches in concrete technical problems in each prefecture. The results of their tests and researches have greatly contributed to the development of Japanese agriculture. A prefectural experiment station usually consists of a cultivation division, an environment division, a management division and general affairs division.

(2) Twenty-five years have already passed since Agricultural Improvement and Spreading Work started in Japan. More than ten thousand farm advisors are stationed at the 635 agricultural extension stations. However, a long history of guidance on agricultural techniques preceded this work. During the period when agricultural engineers hardly existed, new technical knowledge was given to old and capable farmers and they were expected to be agricultural advisors.

Subsequently, agricultural experiment stations were gradually established and they have made a large contribution to not only to tests and researches but also to technical guidance. At experiment stations, young farmers been trained to raise leading farmers and engineers have been trained by various courses. Many of technical advisors belonging to agricultural organizations had been trained in this course and have played an important role as agricultural advisor. The Spreading Works began subsequently and various activities have been made. Since it is extremely important to improve the quality of advisors, they are given various trainings, such as general training, study and training at Japanese or foreign universities, investigations of foreign agriculture etc.

## 2-4 IMPROVEMENT OF SOIL AND FERTILIZERS

Soil improvement and fertilizer improvement are among the most important problems for increasing agricultural production.

Fertilization standard has been improving in Lybya. However, there is an urgent need for establishing fertilization standards by individual regions and crops and for observing them.

Various measures for improving soil and fertilization have been taken in Japan for many years for increasing food production. The following works are currently in progress.

(1) Organizations in charge of soil improvement and fertilization improvement

The Government appointed (302) soil survey staff at prefectural agricultural experiment stations. In addition, 53 engineers in charge of soil and fertilizer are appointed for each prefecture.

(2) Soil survey

The Government has a project to survey 80% of the total agricultural land (approximately 5.7 million ha) during the fifteen years beginning in 1959. This project is to be almost completed in 1974. This soil survey project includes not only the investigation of soil properties, but also field tests on soil improvement and fertilization. The results of the soil surveys are completely recorded as soil map of 1/50,000. They are used as basic data for soil improvement and fertilization improvement.

(3) Diagnosis of soil and crops

The Government plans to establish a soil and crops diagonizing facility at the (635) Agricultural Extension Stations throughout the country between 1966 and 1976. This facility has been established at 310 Stations by 1972.

If Farm Advisors of Agricultural Extension Stations discover poor growth of crops within their block, they are so analyze the soil of the field to clarify the cause and advise soil improvement and fertilization improvement to farmers.

(4) Liquid fertilizer and solid fertilizer

Liquid fertilizers are used in Japan for sandy land, gravelly land and some fruit gardens. Solid fertilizers are used for forest land and crops requiring lasting fertilization effects. These fertilizers seem worth studying in Lybia.

(5) Example of fertilizer quantity

The standard quantity of fertilizers for each crop is established for each region. There is no uniform national standard. The following table shows the standard fertilizer quantity in certain region. Farmers improve fertilization according to the conditions of their field.

(Unit: Kg/10 a)

| Fertilizer / Crop | Nitrogen (N) | Phosphoric acid ($P_2O_5$) | Kalium ($K_2O$) |
|---|---|---|---|
| Rice | 10 | 9 | 9 |
| Wheat | 8 | 6 | 6 |
| Barley | 8 | 6 | 6 |
| Tomato | 36 | 30 | 36 |
| Eggplant | 34 | 30 | 34 |
| Potato | 11 | 7 | 11 |
| Peach | 20 | 12 | 21 |
| Mandarine orange | 30 | 20 | 24 |

## 2-5 ON WATER RESOURCE DEVELOPMENT

Water resources must be developed and maintained for developing agriculture. The Libyan Government gives priority to projects of water resource development. As a result, it is said that multi-purpose dams are being constructed, large-scale ground water development projects are being carried out in the inland region and various investigations and projects are in progress. The following items are based on Japanese experiences and are expected to contribute to the development of water resources, especially for agricultural water.

(1) The waters that gather at Wadi must be used effectively. It will be effective to construct a large-scale multi-purpose dam. However, a plan of constructing many small-scale dams is also worth further study. Since paddy rice is the major crop in Japan, water resources have been developed from old times. The annual mean rainfall amounts to approximately 1,500 mm in the whole land of Japan.

However, it is not evenly distributed and it is as small as 800 mm in some regions. Rice planting is carried out even in those regions with small rainfall. Small dams have been constructed in such regions from old times to store rain water during the rainy season and to use it for irrigation. In some regions, more than 400 small dams (reservoirs) exist per 100 $Km^2$. In Japan, irrigation water is taken mostly from rivers. When river water is not sufficient, dams are constructed to secure irrigation water. Currently, Japan has 277 thousand irrigation dams, of which the number of so-called large dams (with height exceeding 15 m) is 13 thousands. (The total number of large dams, including dams for all the purposes, is approximately 18 thousands in Japan.) In other words, the irrigation dams in Japan account for approximately 10% of all the large dams (128 thousands, excluding dams in China) in the world. The technological standard of Japanese dam construction is high.

(2) It is said that the salt concentration of ground water has been increasing along the coast of the Mediterranean Sea because of the recent rapid subsidence of the ground water level. This is an extremely serious situation. Measures for quantitative and qualitative maintenance of ground water must be taken urgently. The Libya Government is said to be carrying out investigations for this purpose. In Japan, excessive pumping of ground water has caused ground subsidence and underground invasion of sea water in some regions. To prevent such a problem in the future, pumping of underground water has been restricted and surface water has been used instead of underground water. Some regions have a project of artificially making an underground reservoir by forming an impermeable wall by grouting impermeable materials on the basis of the result of thorough geological survey in attempts to increase usable ground water.

(3) New sources of ground water must be developed in Libya. For this reason, ground water has been probed at various locations in Libya. Since surface waters are more richly available in Japan than in Libya, Japan depends mostly on surface waters. However, new sources of ground water have also been actively developed since the demand for water has been increasing gradually. Currently, a ground water probing technique based on radiation is drawing attention in Japan. This technique was studied and developed at certain experiment station of the Ministry of Agriculture and Forestry. It uses radio-isotope for analyzing flow velocity and circulating system of ground water within large region as well as for analyzing hydrogeological structure. It also allows to measure natural radiation from the ground and to discover a water vein while running in a vehicle. This technique has been used for practical purposes.

(4) Along with the development of water resources, Libya will have to establish a system of agricultural techniques for using scarce water most effectively. For this reason, studies on irrigation are said to be in progress at universities and Govermental experiment stations in Libya.

In Japan, studies on irrigation for paddy fields have been carried out for a long period and it technological standard is high. Studies on irrigation of dry fields have also been carried out actively at universities, Governmental experiment stations and research institutes. In Japan, emphasis is laid not only on fundamental studies, but also on tests and studies for establishing the best system of agricultural techniques for each region. Successful agricultural development on sand dune is an example of the result of such studies. In other words, certain national iniversity studied irrigation and afforestation methods etc. for developing a coastal sand dune near the sea as an agricultural zone. As a result, the coastal sand dune which has been considered infertile is being changed into a highly productive agricultural zone.

(5) It will be extremely important to establish water-saving cultivation techniques in Libya. Intensive agriculture using a circulating irrigation system is among the possible measures. In Japan, highly productive intensive horticulture is very popular. Year-round culture using various facilities is widely spread for some vegetables. Production by sand culture and gravel culture are also found locally.

## 3. CONCLUSION

(1) Since Japan differs from Libya in natural conditions and agricultural conditions, Japanese experiences will not necessarily help the agricultural development in Libya. However, some the Japanese experiences will halp the development of Libyan agriculture, in the field of technical cooperation from Japan. Detailed investigations on pertinent subjects must be carried out by a specialized survey team for further technological exchange.

(2) Japan and Libya have hardly exchanged information in the field of agriculture. Since the two countries do not have sufficient knowledge on agriculture of each other, agricultural engineers, researches, government officials and other agricultural interest must be exchanged and experiments, studies and experiences related to agriculture must be actively exchanged for the development of the agriculture in the two countries. This is believed to contribute to freindly relation between Japan and Libya.