

TEN YEARS OF TECHNICAL CO-OPERATION WITH THE UNDERDEVELOPED COUNTRIES

by DENRŌ YASAKA

Japanese technical co-operation with the underdeveloped countries is at present being carried on in a great variety of forms and by a great variety of methods. In this paper it is proposed to give an outline of Japan's government-level technical co-operation being conducted by the Overseas Technical Co-operation Agency.

It is now ten years since Japan began technical co-operation with government backing. The results achieved have been highly evaluated, even among the advanced countries of the world, and of late moves have been made in the direction of participation in OECD. Japan has thus acquired a mission to play a part in world economic co-operation.

Japan is at present carrying on technical co-operation over an area comprising all the underdeveloped areas, including Asia, the Near and Middle East, Africa, and Latin America. In Asia Japan has been participating in the Colombo Plan since 1954, and has also drawn up plans for technical co-operation in two overseas areas—the Near and Middle East and Africa, and Latin America. These plans have been in operation since 1958. Since 1960 Japan has been carrying out the North-East Asia Technical Co-operation Plan in association with China (Taiwan), a country which is not one of the participants in the Colombo Plan. Again, since 1959 Japan has been carrying out an Atomic Energy Utilization Plan (the I.A.E.A. [Type II] Programme) as a part of Japanese co-operation with the International Atomic Energy Agency. The forms in which this technical co-operation has been carried out include the form of co-operation between two countries which is being implemented under the Plans mentioned above, as well as the form of co-operation which involves a large number of countries, as in co-operation with the agencies of the United Nations, a form of co-operation which is particularly worthy of note is joint action with America in communal co-operation. In spite of the differences in the areas involved and the forms of co-operation employed, however, there is no basic difference in the actual technical co-operation carried out. The following is a detailed account of the co-operation carried out in these various forms.

I. Acceptance of Technical Trainees from Overseas Countries

1. Acceptance Procedure

One of the forms of acceptance procedure employed in the acceptance of trainees from countries overseas is that carried out under the Colombo

Plan and the other four plans mentioned above. In order to qualify for acceptance under these plans at the request of one of the co-operating countries, it is the general rule that trainees should be drawn from the middle stratum of their profession and should have had four or five years' practical experience since graduating from a university. The period of study in Japan is usually between three months and one year, and has the object of enabling the student to acquire skill in higher levels of technology. It need hardly be said that, in addition to study of this kind there is also a considerable number of trainees who are in Japan only for short periods and whose studies are centred on tours of inspection. All the expenses of the trainees are met by the Japanese Government, payments being made in respect to return air passages, outfit allowance, living expenses allowance, medical expenses (if any), and travel expenses in Japan.

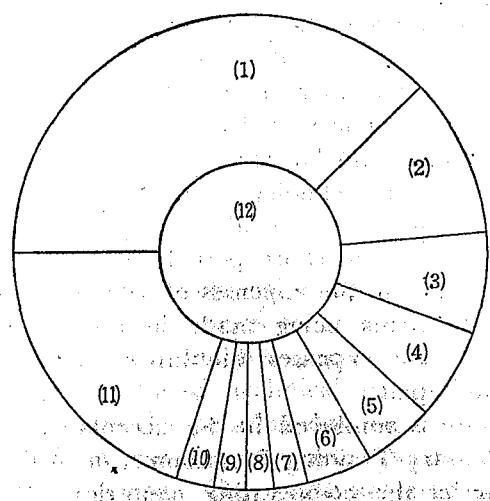
Another form of acceptance procedure is employed in the acceptance of trainees under the Japan-U.S. Third Country Training Programme, or at the request of the United Nations or of one of the co-operating countries. No special qualifications are laid down in respect to these trainees, but in general the trainees are qualified up to the same standard as those mentioned above. The greater part of these trainees are high officials and others who come to Japan for short tours of inspection. Their average length of stay is between two and five months. The air passages and other expenses incurred by these trainees are met by payment from American Aid funds, United Nations funds, or from the funds of the governments of co-operating countries. Only the expenses incurred in the course of their studies are met by Japan.

2. Forms of Study in Operation

The number of students accepted between 1954 and the end of March, 1964, amounted to 5,276 (excluding trainees maintained by the Indonesia and Philippines Indemnity Funds), and their studies covered all fields "from bamboo-work to atomic energy." The chief subject of study is Agriculture and Fisheries, and 37% of the students come under this head. The Medium and Smaller Enterprises appear in second place, followed by a wide range of subjects—education, telecommunications, government administration, building and construction, etc. The list of subjects gives some idea of the usual requirements of the countries of the underdeveloped areas.

At the beginning it was the practice for a suitable place of study to be selected for each student in respect to whom application for acceptance had been made, and to draw up a programme of study, but as a result of the increase in the numbers of students over the years these programmes were concentrated, and study courses were drawn up in advance in order that students might make a more thorough study of their subjects. In this way "mass courses" were prepared, and at present this form of study is in operation among approximately half of the total number of trainees. In many cases the trainees' studies will be inadequate unless they are pursued within the framework of the course, and this is especially so in the case of the

Figure. 1



- (1) Agriculture and Fisheries (37%)
- (2) Light Industry (11%)
- (3) Education (8%)
- (4) Government Administration (7%)
- (5) Building and Construction (6%)
- (6) Telecommunications (6%)
- (7) Heavy Industry (3%)
- (8) Chemical Industries (3%)
- (9) Atomic Energy (2%)
- (10) Welfare (4%)
- (11) Others (13%)
- (12) Total Number of Students (5,276)

agriculture and fishery industries, since these are subject to seasonal changes throughout the year. These "mass courses" have been well received.

In the fiscal year 1963 the following "mass courses" were run:—

Agriculture	5
Fisheries	2
Animal Husbandry	1
Telecommunications	7
Forestry	2
Occupational Training and Work Supervision	4
Building and Construction	3
Transport and Vehicles	2

In addition to these, there were also courses in town planning, seismic engineering, printing, electrical power generation, etc. The total number of courses was 39. The greater part of these courses are also scheduled to be run in 1964. In contrast to the students taking part in these courses, the majority of the trainees studying on an individual basis are in Japan on short tours of inspection. This is especially so in the case of the trainees accepted under the Japan-U.S. Third Country Training Programme and other arrangements of a like nature. Many of those who come to Japan on short tours of inspection are high government officials or university professors. It would appear that these visits enable them to understand the progress which has been made in all fields in Japan, and that unexpectedly good results of a kind which cannot be ignored have eventuated from their introduction into their own countries of the knowledge which they have acquired. Further, it is of course usual for students studying on an individual basis to engage in practical technical training in a particular subject, but a considerable number of these students are also engaged in research, and their period of stay in Japan is between three months and one year. In general, practical

technical training and research carried out by these students is undertaken with the object of matching the knowledge acquired with the climate, geography, social institutions, manners and customs of the student's native country, and for this reason it is necessary for there to be some differences in detail among the studies undertaken by individual trainees. The system of individual study has great importance from this point of view. Neither the system of individual study nor the "mass courses" mentioned above can be neglected. Perhaps it is possible to conceive of future study courses which will be designed to combine these two.

The following descriptions of "mass courses" are given as a representative sample of studies in Japan.

(1) The Practical Agricultural Course

As has already been noted, a very large number of the trainees who come to Japan in each year opt for courses in practical agriculture, the main content of which is the technology of rice cultivation. Since the established agricultural research institutions were unable to meet the demands of all the students requiring these courses, it became necessary to set up a place of study for overseas students, and in 1961 the Ibaraki International Agricultural Training Centre was set up in Japan under the direct control of the Overseas Technical Co-operation Agency. By 1963, 58 students had taken these courses. The participants in the 1963 course comprised 6 students from Indonesia, 8 from Thailand, 5 from the Philippines, 3 from Iran, 1 from Nigeria, and 1 from Panama—a total of 24 students from 6 countries. The course was run over 11 months, beginning in April, 1963.

The course was programmed to offer practical on-the-farm instruction covering the whole process of Japanese-style rice cultivation from sowing to harvest, and in the intervals of this instruction the students attended lectures on Plant Breeding, Physiology, Cultivation, Disease and Insect Pest Control, and Soils and Fertilizers, and also carried out practical work. In this way efforts were made to ensure maximum efficiency in the students' studies. The students also carried out practical work which was principally concerned with the use, repair, and assembling of small-scale agricultural implements and machinery, and instruction was given in the practice of modern agriculture with the aid of these implements and machinery. Instruction was also given in the practical aspects of agricultural extension work among the peasantry. A form of instruction which was particularly effective was that of billeting out the trainees among the peasantry for a period of about a week, thus allowing them to share in the daily lives of the peasants and experience the reality of rural life at first hand. This form of instruction was also very well received by the students, who felt that they had been able to carry out their studies of Japanese agriculture through the medium of direct personal experience.

(2) The Automobile Engineering Course

Since the war, it has not been exceptional for motor vehicles to come into more widespread use in the underdeveloped countries, but there has been a severe shortage of persons possessing the mechanical skills required in

the maintenance and repair of motor vehicles, and the training of the necessary personnel is a question which is being seriously considered in each country. This course was started in 1963 in order to meet this demand, and was run over 11 months, beginning in May, 1963. The participants comprised 3 students from Indonesia, 2 from North Borneo, 2 from Pakistan, 1 from Sarawak, 2 from the Philippines, and 2 from Thailand—a total of 12 students. The students stayed at the Overseas Technical Co-operation Agency's International Training Centre at Nagoya. Instruction consisted principally of lectures together with practical work at the Toyota Mechanics College, and a full curriculum of study was taught, comprising Repair of Engines and Chassis, Wiring Work and Inspection of Electrical Systems, Draughtsmanship, Shop Management, etc.

The course also included some practical work and other forms of study carried out in related industries, and throughout the whole course the students worked alongside Japanese workers in Japanese factories, thus learning much about work management in the factories and productivity in the factories as well as acquiring skill in technology. This was welcomed by the students as experience which they would be able to apply at once in factory management when they returned to their own countries.

(3) The Coastal Fisheries Practical Course

There has been a continual demand from year to year for practical courses in fishing, and the same situation arose in regard to the establishment of facilities for carrying on practical work as arose in the case of agriculture. In 1961 the Misaki International Fisheries Training Centre was set up at Misaki in Kanagawa Prefecture, and the course was started with the co-operation of the adjacent Kanagawa Prefecture Fisheries Research Station. Since then 48 trainees have taken the course, and in 1963 a total of 18 trainees participated, the nationalities represented being Indonesia, Malaysia, Thailand, Ceylon, Iran, and Nigeria. The course was run for 11 months, beginning in May, 1963. The content of the instruction comprised lectures and practical work on the subjects of Methods of Inshore Fishing, Navigation and Seamanship, Fishing Vessels, Fishing Gear, Ships' Engines, Fish-Detection Equipment, etc., and the students were well satisfied with the practical work done aboard the small vessels owned by the Centre and aboard privately-owned fishing vessels. It appears that the foreign students were very eager to learn about such modern methods in fishing as the use of nylon fishing-nets and fish-detection equipment. This course is also scheduled to be given every year in the future.

II. The Dispatch of Specialists to Countries Overseas

1. Procedures in Dispatching Specialists to Countries Overseas

The dispatch of specialists to countries overseas began under the Colombo Plan in 1955 at the same time as the acceptance of overseas students as described above, and in the course of time the area to which they were sent was extended to the areas coming under the Technical Co-operation Schemes

for the Near and Middle East and Africa, for Latin America, and for North-East Asia.

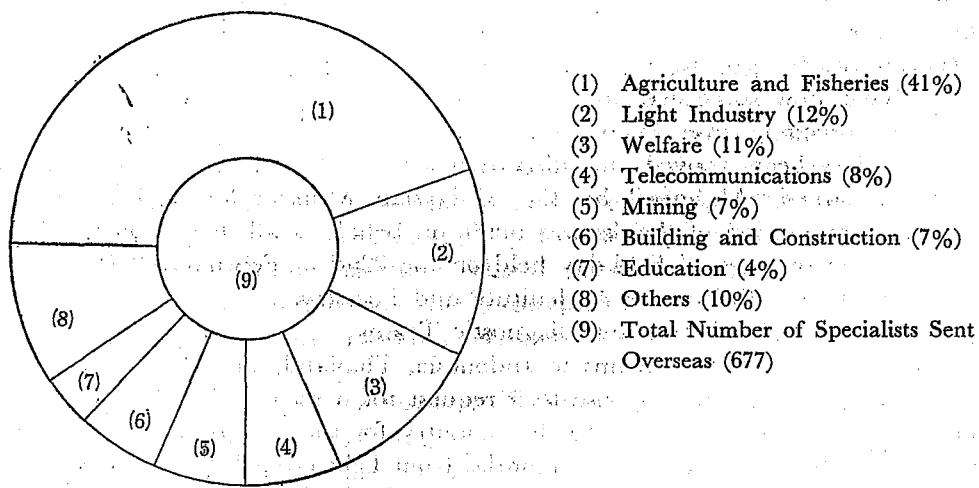
Up to March, 1964, a total of 677 specialists had been sent overseas. The expenses involved in the dispatch of these specialists are met by the Japanese Government, but as a general rule the receiving country pays for housing expenses, medical expenses, travel expenses in the course of employment, etc. The expenses met by the Japanese Government comprise a return air passage, an outfit allowance, and a monthly payment in respect of living expenses.

In addition, the specialists are provided by the Japanese Government with such materials, equipment and instruments as may be required in the course of the instruction which they are to give, and these are handed over to the receiving country when the specialists have completed their duties.

2. The Operation of the System of Dispatching Specialists to Overseas Countries

Figure 2 shows the types of specialists sent overseas in the period up to March, 1964. First place is occupied by agriculture and fisheries (41%), followed by light industry (12%), medical services and hygiene (11%), telecommunications (8%), mining (7%), and building and construction (7%). These

Figure 2.



proportions indicate the extent of the demand for specialists in the primary industries, agriculture and fisheries, and the types of specialist requested clearly reflect a desire to encourage medium and smaller enterprises, to provide health and hygiene facilities, and to develop natural resources. At the same time they indicate that Japan has a latent capacity for co-operation in these fields, and in particular it would appear that the requests for specialists in the fields of agriculture and fisheries and of the medium and smaller enterprises indicate some degree of confidence in Japan in these fields.

The dispatch of specialists usually takes place in response to individual requests, but in certain types of work a number of specialists may be sent out as a group. Again, in certain cases survey teams may be sent out for short periods. There is thus no fixed form which regulates the dispatch of specialists to countries overseas. There is also much variety in the length of period of service overseas. At the most the period of service extends to a year or two years, and when the services of a specialist are required for a longer period another specialist is sent out in exchange. In this way the services of specialists may sometimes be made available for periods of four or five years.

The following is an account of the principal projects to which specialists have been sent overseas up to the present.

(1) *The Improvement of Rice Varieties in Malaysia*

Since 1958 Japan has sent 18 specialists to Malaysia to co-operate in the fields of plant-breeding, cultivation, soils, fertilizers, and disease and pest control. One of the main pillars of agricultural policy in Malaysia is that of attaining self-sufficiency in rice—the staple food of the country, and the aim is to replace imports of rice (which at present amount to 40% of the total consumed) by home-produced rice. As a means of accomplishing this, efforts are being made to extend the practice of cultivating two crops of rice each year. In this connection, specialists were required in breeding "off-season" varieties of rice. In response to this requirement, Messrs. Yamakawa, Fujii, Kawakami, and Samoto have been engaged since 1958 in breeding new rice varieties by crossing Japanese varieties with the native Malayan varieties. They have now succeeded in selecting new superior varieties of rice, the result of breeding over 14 to 16 generations, and the superiority of these varieties has been proved in cultivation trials. These varieties have been specially named "Malinja" by the Malaysian Minister for Agriculture, for which an expression of thanks was made on behalf of all those concerned on the occasion of a grand field-day held on the 22nd of February, 1964, in the presence of the Minister for Agriculture and Forestry.

(2) *The Dispatch of Itinerant Diagnostic Teams*

Japan has sent these teams to Indonesia, Thailand, and Burma in each year since 1960, and in response to a request for a second visit by Indonesia in 1963 a team has been sent to that country for the second time, and is to operate in that country for four months from February, 1964, chiefly on the island of Bali. These teams have been enthusiastically welcomed by the receiving countries, and in particular the mobile diagnostic units (fitted with X-ray apparatus) which have been donated to the receiving countries are highly valued for the function which they perform, and they are still being actively used in each of the receiving countries. These yearly projects are being carried out with the backing of the Colombo Plan and in co-operation with the Japanese Red Cross. Doctors and nurses of the Japanese Red Cross are members of these teams, and their medical co-operation with the underdeveloped countries—especially their tours of areas away from the main

cities—serve to improve international relations with the help of the medical services which they provide. The team dispatched to Indonesia this year took with it mobile diagnostic units and medical supplies valued at approximately ¥14,000,000.

(3) Industrial Arts Instruction in Ceylon

In order to improve the quality and design of articles made in wood and bamboo, and of other articles produced by the industrial arts, and in order to promote the home production of toys, articles for daily use, etc., the Government of Ceylon requested the services of Japanese specialists in the industrial arts. Mr. Kyōzō Sōda was dispatched to Ceylon in response to this request. Noting the conspicuous results produced, the Government of Ceylon applied on more than one occasion for Mr. Sōda's stay to be prolonged, and he has now been giving instruction in the industrial arts for five years. The Government of Ceylon has newly established factories for the production of articles in wood and bamboo as well as for manufacture of toys, and the toys and other similar goods which are now being sold in the department stores in Ceylon have all been made in accordance with the instruction provided by Mr. Sōda. These articles have been found to be not inferior to those formerly imported from Europe and elsewhere.

(4) Dispatch of a Specialist on the Tuberculosis Bacillus to Thailand

Japan had already co-operated in sending several doctors to do medical work in Thailand, but since a department of bacteriology has recently been set up in the Thai Central Tuberculosis Hospital in addition to the existing medical, surgical, and radiological departments, and since the past technical achievements of Japanese specialists were much esteemed, a request was made for Japan to send a specialist to direct the new department. In response to this request, Mr. Sukeyoshi Kudō of the Anti-Tuberculosis Research Institute was sent out in January, 1964. Japan also donated microscopes, dry-heat sterilizers, centrifuges, and medical supplies to the value of ¥2,250,000 for use in research. The Minister for Public Health made an expression of thanks at the ceremony of handing over this research equipment. The gift has had a very good effect on Japanese-Thai relations.

III. Work Carried on by the Overseas Technical Co-operation Agency

1. The Establishment of Technical Co-operation Centres

In 1957, at the time of his two tours of South-East Asia, Prime Minister Kishi declared Japan's willingness to co-operate in the establishment of Technical Co-operation Centres as one of the ways of increasing Japan's technical co-operation with other countries. Great interest in this proposal was expressed by Prime Minister Nehru of India and by the governments of all the countries of South-East Asia. In 1958 a budget appropriation was passed providing for the establishment of a Medium and Smaller Enterprises Centre in West Bengal, India, and in 1959 funds were made available for the establishment of an Agricultural Centre in Pakistan, a Fisheries Centre in Ceylon, a Telecommunications Centre in Thailand, and Small-Scale In-

dustries Centre in Iran. Since these four Centres were set up the number of Centres has increased from year to year. There are at present eight Centres, and five more are planned.

These Centres are set up in mutual co-operation on the basis of an arrangement drawn up between Japan and the receiving country. The receiving country is responsible for the provision of land, buildings, and the staff required in the running of the Centre, while Japan supplies equipment and sends out directing personnel (the expenses of the directing personnel are borne entirely by Japan), and as a general rule it is arranged that the Centre shall be handed over to the receiving country in its entirety after three years' operation under Japanese direction.

2. The Operation of the Technical Co-operation Centres

(1) The Thailand Telecommunications Training Centre, Nondaburi, Thailand

The Centre was started under an agreement signed on the 24th of August, 1960. Training is given in telegraphs, telephones, wireless, lines, conveyance, micro-wave, etc., and instruction is given in two departments, an Ordinary Department and a Special Department. There are now 73 students in the Ordinary Department, and 250 in the Special Department. Great interest in the Centre has been shown on the Thai side, and the educational standard of the Ordinary Department is treated as equivalent to that of the Thailand training institutions (a 3-4 years' course). There have also been requests for an enlargement of facilities to provide training in radio and television. In co-operation with this, Japan has decided on an extension of two years.

(2) The East Pakistan Agricultural Training Centre, Dacca, East Pakistan

The Centre was set up under an agreement signed on the 30th of July, 1960. Training is centred on rice cultivation and horticulture. The students are agricultural extension workers from all parts of East Pakistan, and up to the present about 220 students have graduated from the Centre. These graduates are already actively propagating the Japanese system of rice cultivation throughout East Pakistan. In this Centre, too, Japan has decided on an extension of two years as a result of a request from Pakistan. Seven Japanese specialists are at the Centre as directing personnel.

(3) The Ceylon Fisheries Training Centre, Negambo, Ceylon

This Centre was established under an agreement signed on the 10th of March, 1961. It comprises two departments, a Fishing Department and a Mechanical Department, and training is given fishing gear, fishing methods, the operation and repair of mechanized fishing vessels, etc. Thirty students are under training in the Fishing Department, and 10 in the Mechanical Department. Eight Japanese specialists are at the Centre as directing personnel.

(4) The Iran Small-Scale Industries Technical Training Centre, Karadi, Iran

The Centre was started under an agreement signed on the 12th of

September, 1960. The subjects taught are the assembling of machines, sheet metals, welding, metal casting and forging, wooden moulds, plastic mouldings, plastic tubes, etc. The students have undergone six years of primary school education, and each course lasts for one year. The first course produced 64 graduates, and 90 students are at present under training on the second course. Eight Japanese specialists are at the Centre as directing personnel. The opening of the Centre was delayed, and in response to an Iranian request it has been decided in this case, too, that an extension of two years should be made.

(5) The Afghanistan Small-Scale Industries Technical Training Centre, Kabul, Afghanistan

The Centre was started under an agreement signed on the 15th of March, 1960. Training is given in three subjects—bicycles, glass, and plastic mouldings. The Afghanistan-Pakistan frontier dispute occurred while the Centre was being got ready, and it became impossible to transport equipment to the Centre because of the breaking off of diplomatic relations between the two countries. As a consequence, some delay was caused in bringing the Centre into operation. Instruction began in the spring of 1963, when 20 students began receiving training on the bicycle, 10 on glass, and 10 on plastics. In accordance with the wishes of the Afghanistan Government the carrying-out of productive activities in all fields is permitted, provided that it does not interfere with training. Eight Japanese specialists are at the Centre as directing personnel, and in this case, too, it has been decided that an extension of one year and a half shall be made.

(6) The Indian Marine Products Processing Training Centre, Mangalore, India

The Centre was started under an agreement signed on the 31st of March, 1962. Training is given in canning, frozen foods, the manufacture of fish pasting, etc. The students are university graduates and thirty of them commenced training in July, 1963. The course of training lasts for one year (or three terms), and as well as attending lectures and undertaking practical work in the three subjects mentioned above, the students also carry out practical work which extends to the operation of the machines installed in the Centre, and the assembling and dismantling of the same. Seven Japanese specialists are at the Centre as directing personnel.

(7) The Thailand Virus Research Centre, Bangkok, Thailand

The Centre was opened under an agreement signed on the 25th of November, 1960. This Centre differs from the other Centres in that it is a Research Centre and not a Training Centre, and it is principally concerned with epidemiological surveys, the diagnosis of virus infections, and the manufacture of antigens. Since Japanese specialists took up their posts at the Centre in September, 1962, the research carried on at the Centre has proceeded according to plan. The care of the experimental animals has already been handed over to the Thai staff, and at present experiments are being carried out in the preparation of feeding-stuffs. The Thai staff are also

being thoroughly trained in the techniques of serum diagnosis and tissue cultures. The Thai Government has allocated funds for the provision of a laboratory at the Centre for research into the production of fluorescent antibodies. This laboratory is to be set up at the end of 1964. Three Japanese specialists are at the Centre as directing personnel.

(8) The Indian Agricultural Demonstration Farms

Under an agreement signed on the 23rd of April, 1962, the following model farms were set up for the purpose of demonstrating the technology of rice cultivation.

The Nadia Agricultural Demonstration Farm, West Bengal.

The Sambalpur Agricultural Demonstration Farm, Orissa.

The Shahabad Agricultural Demonstration Farm, Bihar.

The Surat Agricultural Demonstration Farm, Gujarat.

Four specialists were sent to each Demonstration Centre. In the first year in which these Demonstration Centres were in operation, 1962, high yields were obtained from the summer crop, and still better results were obtained in 1963. In addition to cultivating wheat and vegetables as winter crops in land used for irrigated rice cultivation, these Centres are using mechanical cultivators, pest-control sprays and other agricultural machinery and implements, and are spreading knowledge of agricultural machinery and implements as well as of the Japanese system of rice cultivation. On the Indian side the results obtained at these farms are highly appreciated, and requests have been made for the establishment of more of these farms in other parts of the country. Japan is to establish another four farms in 1964.

(9) The West Bengal Medium and Smaller Enterprises Centre, Houra, West Bengal, India

This Centre, which was opened under an agreement signed in January, 1960, is carrying on the training of skilled workers in order to encourage the medium and smaller enterprises in India, as well as carrying on the production of prototype machine-tools and accessories, and the production of, and acceptance of orders for, special machine parts. Training is given in six-month courses. About 100 students have attended each of the courses which have been given, and the fifth course is at present under instruction. There are 20 Japanese specialists at the Centre as directing personnel, and the period of co-operation has been extended to April, 1966.

(10) Others

In addition to the above, preparations are being made for the establishment of a Ghana Textile Training Centre, a Brazilian Textile Industry Technical Centre, a Pakistan Telecommunications Centre, and a Kenya Small-Scale Industries Training Centre.

IV. Development Surveys

1. Procedures in Carrying Out Development Surveys

The Overseas Technical Co-operation Agency co-operates with the under-developed countries in carrying out basic surveys in connection with public

development plans. In concrete terms, surveys can be undertaken at any of the following three stages:

- (1) In cases where the country intends to undertake development but has no specific plan, the Overseas Technical Co-operation Agency may make a survey of the existing situation and point out the direction for development.
- (2) In cases where the country has a plan, the Overseas Technical Co-operation Agency may make more detailed investigations in order to improve the plan or to bring the plan to realization. In some cases the Agency may make outline plans for work to be carried out.
- (3) In cases where the country has outline plans for the actual work to be carried out, the Overseas Technical Co-operation Agency may make further detailed on-the-spot surveys and may make preparatory plans and estimates of the costs of the work to be carried out. As a result of such survey work, decisions may be reached on the technical and economic possibilities of the project to be undertaken, as well as on its efficiency. In some cases a plan of operation may be drawn up with a view to obtaining a loan.

At such stages as these, or at stages intermediate between them, survey teams composed of specialists may be sent, at the request of the receiving country, to make on-the-spot surveys. The procedure adopted is for the receiving country to be advised through the form of a Survey Report.

Development Surveys of this kind have been in operation since 1957, the Japanese Government allocating funds yearly under the budget for this purpose. Up to March, 1964, 320 specialists had been sent out, and 60 surveys undertaken. As a part of such survey work, Japan has been carrying on positive co-operation with the United Nations' ECAFE Mekong River General Development Survey since 1958, and up to March, 1964, 170 specialists had been sent out on a total of 19 missions in connection with this project.

2. The Operation of Development Surveys

In 1963, 21 surveys were carried out (including two surveys made in connection with the Mekong River Development Project). Some of this survey work is described below.

(1) The Arab League Desert Development Plan Survey

Since 1959 the Arab League has had a design to "make the desert green," that is, to make land suitable for cultivation, and has set up the Egyptian General Desert Development Organization for this purpose. As a part of this project, there is, in addition to the Aswan Dam Plan, a plan for the development of the "new valleys," the depressions in the rock terraces in Western Egypt, and these have been surveyed by Japanese specialists. In response to a request for Japanese co-operation in this plan, seven specialists were sent out in October, 1963, for a period of approximately three months. These specialists made ground surveys of five of the principal oases areas, and presented advice to the Arab League Government on the question of ground-water, the construction of towers for solar batteries, wireless control

of well-pumping, the forms of agriculture suitable for the reclaimed land, etc.

(2) The Lebanon Tunnel Construction Survey

This survey was carried out by six specialists sent out in October, 1963, for a period of approximately one month at the request of the Lebanese Government. The plan is for the construction of a tunnel through the Lebanon Mountains on the stretch of the road from Beirut to Damascus in Syria which lies between Beirut and the Becca highlands. This road is beset with problems arising from the steepness of the gradients and sub-zero temperatures during the winter, and it is believed that its economic efficiency would be greatly increased by tunnelling, the levelling of gradients, the reduction of transportation time, and assured use all the year round.

(3) The Galle Fishing Port Shore Installations Plan Survey, Ceylon

As a part of its plans for the encouragement of the fishing industry, the Government of Ceylon has drawn up a plan for the construction at Galle of a base for the deep-sea fishery, principally the tunny fishery. Japan co-operated in making a survey for the construction of the shore facilities of the harbour installations and the fishery installations. Six specialists were sent out in February, 1964, for a period of approximately one month.

(4) The Mekong River Development Survey

The parts of this survey which were made at Sambor on the main stream of the Mekong were carried out by 25 specialists sent out in October, 1963 for a period of approximately two and a half months, and comprised topographical surveying, quantity surveys of forests, and catchment surveys. This survey work was continued from the previous year. The survey of the upper reaches of the Sre Pok, a tributary of the Mekong, was carried out by six specialists sent out in November, 1963, for a period of approximately two and a half months. This survey work was carried out in the Krong Buk area, an area upstream from the Dar Lac marshes which were surveyed in 1962, and comprised topographical surveying, a geological survey, an agricultural survey, and a catchment survey.

V. The Future Prospects for Technical Co-operation

As has been shown above, Japan's technical co-operation extends over a wide area of the world and is being pursued by a variety of methods. The following points must be considered in carrying forward this type of work in the future.

First, in connection with the acceptance of overseas trainees from the underdeveloped countries, unceasing attention will have to be given to the gap between Japan and the underdeveloped countries in levels of technology, and to differences in technological environments. That is to say, when technical co-operation is carried on in fields ranging "from bamboo-work to atomic energy" and in relation to an area comprising Asia, the Near and Middle East, Africa, and Central and South America, it will be found that specific forms of technology employed in these various countries will differ greatly from those employed elsewhere. When trainees are called upon to

study technology in Japan, it will be necessary to have a thorough acquaintance with the technological environments of the students' home countries if their studies are to be efficient in practice. For this reason, studies and surveys of these various areas will be found indispensable. In addition to this, there is need to train interpreters in order to surmount the barriers of language, and at the same time to train English-speaking instructors. There is also need to prepare lodging facilities for students visiting Japan in as many of the cities as possible.

Next, it will be necessary to give a thorough course of prior instruction to specialists sent overseas and directing personnel sent to overseas Centres, not only in the language of the country to which they are sent, but also in its history, society and customs, in order that when they are sent overseas they may fit into the way of life of the country to which they are sent, be able to mix with the people of the country, and employ their specialized knowledge to the best advantage.

Arrangements for co-operation in Development Survey work are at present in existence which make it possible for Japan to co-operate with other countries up to the stage of drawing up development plans, or presenting advice on the implementation of such plans. However, it is necessary to go beyond this, and to organize the internal institutions of the receiving countries in such a way that governments or private bodies may follow up such development projects with the aid of the Survey Reports. Unless something of this kind is done, the underdeveloped countries will find that co-operation will be very imperfect.

A number of problems requiring solution still remain in the various types of work outlined above, but in the course of the last ten years the importance of technical co-operation has come to be recognized both in government and non-government circles in Japan, and a result of this recognition has been the establishment by law in 1962 of the Overseas Technical Co-operation Agency. In the future we must look not only for the solution of the various problems mentioned above, but also for the steady advancement of such technical planning and implementation as will amply fulfil the true aspirations of the underdeveloped countries overseas.