

THAILAND

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MICRO IRRIGATION DEVELOPMENT WORK
IN TFY 2003

prepared by

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Agricultural Land Reform Office (ALRO)

The Agricultural Land Reform Office (ALRO) was established in 1975 to undertake the land reform programme in accordance with the Agricultural Land Reform Act B.E. 2518 (1975). The ALRO is a political agency under the Ministry of Agriculture and Cooperatives (MOAC) equivalent to a Department headed by a Secretary – General.

Implementation of the land reform programme entails two major sets of activities :

1. Improvement of land tenure and land rights in public and private lands.
2. Agricultural and rural development in the land reform areas.

The first set of activities involves land distribution to the landless , marginal farmers , and tenants. The second set involves development of rural infrastructures , provision of production , agricultural land reform cooperatives , marketing , and other supporting services, etc.

The ALRO has been divided into the central and the regional administration. At present , there are 8 divisions and 69 provincial land reform offices. The organization chart is attached herewith.

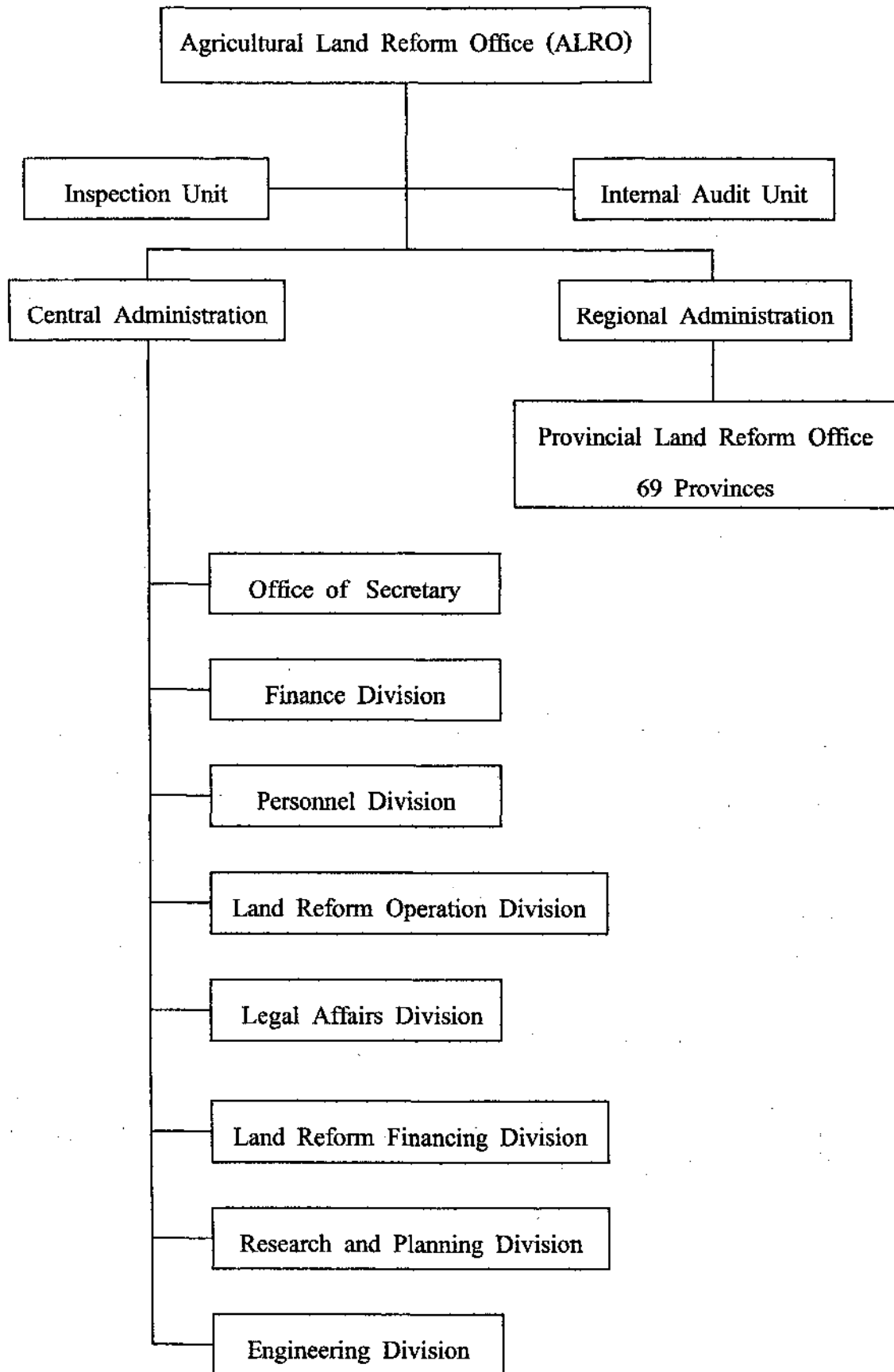
The nominee , Mr. Jirachai SUTHASSANAJINDA , is presently an agricultural engineer at Engineering Division , ALRO. His duties are concerned with planning and design of the rural infrastructure development in land reform areas. Because of more experience in planing and management of the rural infrastructure development, during the pass a few years, he has been responsible for the micro – irrigation development project. The project is implemented for farmers' quality of life.

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Organization Chart



**THE INCREASE OF WATER USE EFFICIENCY FOR AGRICULTURE
BY MICRO IRRIGATION SYSTEM PROJECT
THAI FISCAL YEAR 2003**

1 Executing Agency

Agricultural Land Reform Office (ALRO)

2 Principle and Rationale

Agricultural Land Reform Office (ALRO) has promulgated a total of 51.20 million rai* of the land reform area, both the state and private lands, in 69 provinces. A total of 21.43 million rai were allocated to 1.331 farm households. More than 95% of the allocated land was deteriorated forest, public land, and idle land. The encountered development constraints are the fact that these lands are rainfed area with poor soil, lack of water resources, and poverty of the local farmers.

In addition to the land allocation to farmers, ALRO takes responsibility in infrastructure development, especially water resource, which is the most important natural resource and input for farming. The ambitious goal of the land reform is *" security and sustainability of farmers in the land reform area to farm their own land and to have better income and quality of life."*

ALRO realizes that with constraints relating to the land reform area, it is very important to promote and support poor farmers in the land reform area to learn water-efficient farming method so as to achieve such goal. As a result, ALRO has initiated a project focusing on the increase of water use efficiency for agriculture by micro irrigation system or water-efficient farming method or frequent localized watering to plant base. This is another significant alternative of development process. ALRO envisions that in spite of many constraints, the efficient use of land and water-efficient farming method can adequately generate farm income, thus eventually leading to a close-knit family, love of land, no abandonment of land, and decline in social problems, especially labour migration to urban communities.

3 Compliance with Plan and Policy

The Increase of Water Use Efficiency for Agriculture by Micro Irrigation System Project is in line with the 9th National Economic and Social Development Plan (2002-2006), and the current and urgent government policies.

* 6.25 rai = 1 hectar

4 Project Objective

- 4.1 To promote understanding of water-efficient farming method among farmers in the land reform areas;
- 4.2 To promote efficient utilization of land and family labour among farmers in the land reform areas, as well as increase of farm income; and
- 4.3 To promote and build grass-roots economic strength by aiming at sustainable agricultural development.

5 Project Target

- 5.1 **Micro Irrigation System Installation:** To install necessary equipment on the lands of 7,500 participating farm households. All installed equipment will be transferred to the farmers.
- 5.2 **Increase of the Participating Farmers' Income:** An incremental income of about 28,000-40,000 baht/household/year is expected for the equipped farms.

6 Project Period

The project period is one year, in Thai fiscal year 2003 (October 2002-September 2003). Figure 1 presents the project action plan.

7 Project Cost

A budget of 270.375 million baht of Thai fiscal year 2003 is allocated for the project implementation (Baht: Two hundred and seventy million three hundred and seventy-five thousand only). The allocated budget is divided as follows:

	<u>Million Baht</u>
(1) Project Management Cost (<i>3% of the construction cost</i>)	7.875
▪ Temporary wages	1.834
▪ Remuneration, services, and supplies	3.416
▪ Construction supervision	2.625
(2) Construction Cost	262.500
▪ System installation and equipment of micro irrigation system	262.500

Figure 2 shows the disbursement plan of the project.

8 Project Area

The project will be implemented in 39 provinces scattering in all regions as follows:

- (1) **Northern Region:** 13 provinces, i.e. Chiang Rai, Chiang Mai, Tak, Nakhon Sawan, Nan, Phichit, Phitsanulok, Phrae, Mae Hong Son, Lampang, Lamphun, Sukhothai, and Uttaradit;
- (2) **Central Region:** 6 provinces, i.e. Chanthaburi, Trat, Prachuap Khiri Khan, Phetchaburi, Ratchaburi, and Lop Buri;
- (3) **Northeastern Region:** 11 provinces, i.e. Kalasin, Chaiyaphum, Nakhon Phanom, Nakhon Ratchasima, Loei, Si Sa Ket, Sakon Nakhon, Surin, Nong Khai, Udon Thani, and Ubon Ratchathani;
- (4) **Southern Region:** 9 provinces, i.e. Krabi, Chumphon, Nakhon Si Thammarat, Phatthalung, Yala, Ranong, Songkhla, Satun, and Surat Thani.

9 Project Approach

9.1 Criteria for consideration of participating areas are as follows:

- (1) A land use certificate (Sor Por Kor 4-01) was issued to the farm plot to be equipped with micro irrigation system or the participating farmer has already passed a land right investigation and been selected or the relevant farm plot was purchased by ALRO for the purpose of land reform.
- (2) The land capability and soils should be suitable for crop cultivation.
- (3) There should be no inundation problem.
- (4) There is sufficient water availability for all year round.
- (5) The farm plot should be not more than 20 metres far from the available water source. Priority will be given to the farm plot close to farmer's house or community.

9.2 Criteria for consideration of participating farmers are as follows:

- (1) The farmer has to own the farm plot where the equipment will be installed.
- (2) The farmer must be well disciplined, diligent, and patient.
- (3) The participating farmer should have an adequate number of family members in working age to work on the equipped farm plot.
- (4) The farmer is well prepared and accepts the project conditions and must voluntarily join the project.

9.3 Guidelines for selection of participating farmers and areas are as follows:

- (1) Each Provincial Land Reform Office (PLRO) will consider and select the participating farmers and areas. This project aims to select 7,500 farmers from land reform areas in 39 provinces.
- (2) For the above selection, first priority will be given to the criteria for consideration of potential areas, followed by the criteria for consideration of farmers to select farmers who own the selected farm plots.

- (3) Quantity will not be emphasized. Each PLRO will focus on potential of the relevant area and the preparedness of farmers who voluntarily participate in the project and accept the conditions set forth.
- (4) In the project area selection, emphasis will be given to nearness or grouping of the participating lands for the convenience of installation works and setting up of production group.
- (5) Project details and conditions should be clearly explained to farmers for making their own decision to join the project.
- (6) Prior to the project implementation, the land and farmers' preparedness will be rechecked.

9.4 Farmers' participation is the key condition of the project, i.e. *think, do and pay together*.

- (1) **Think Together:** Farmers will decide on the crop pattern between vegetables and fruit trees. This will help identify the required model of equipment installation. Additionally, farmers will select the location where equipment will be installed under ALRO's advice.
- (2) **Do Together:** Farmers will join in the installation works to build up their skills and experience. They will be provided with training so as to learn how to operate and maintain the equipment properly, Farming technique suitable for the equipped farm plots is also introduced for the purpose of income generation.
- (3) **Pay Together:** Farmers will partially pay for the pump, which is the indispensable equipment of the system. The payment will 50% of the pump cost, but not more than 4,000 baht.

9.5 Emphasis will be put on the system installation and equipment of farm plots or individual farmers. The participating farmers will determine their own crop pattern and choose an appropriate model of equipment installation. One of the following two standard models will be chosen by the participating farmers.

- (1) V3 model for vegetable or flower growing, one rai of installation area;
- (2) F2 model for fruit tree growing, two rai of installation area.

10 Expected Project Benefit

- 10.1 In terms of agricultural development process, this project is another alternative for rainfed area which often face water shortage. By this way, learning process is created for farmers to learn the principle and method of optimizing the limited water resources.
- 10.2 The above learning process will help increase farm income for farmers who are the grass-roots people of the country, specifically the poor, and upgrade their quality of life in consistence with the concept of sufficiency economy.

- 10.3 The construction works under this project will directly create rural employment of about 60,000 man-days, which will generate 7.80 million baht of income, and 39 million baht of cash flow. It is estimated that jobs will be created for about 7,500 people.
- 10.4 After project completion, the farmers will be able to use the facilities for farm production. It is expected that the participating farmers will achieve an incremental income of 28,000-40,000 baht/year or gross domestic product of 210-300 million baht/year.

11 Project Monitoring and Evaluation

- 11.1 To ensure the effective project implementation, monitoring and evaluation will be carried out in 2 phases as follows:
 - (1) During the construction, to report work progress and problems encountered;
 - (2) After the construction or completion of project implementation, to monitor the construction works to meet the target, and to monitor the use of the completed facilities.
- 11.2 The evaluation is to measure the project success and will be conducted after the project completion and use of the facilities for a certain period. The following key indicators will be determined.
 - (1) Use of the installed equipment
 - (2) Income of the participating farmers
 - (3) Understanding and learning of operations and maintenance of the equipment
 - (4) Improvement of farm practice
 - (5) Farmers' capability in payment of their debt
 - (6) Increase of farmers' investment in expanding the equipped area.

Figure 1 : Action Plan for the Increase of Water Use Efficiency for Agriculture by Micro Irrigation System Project
in Thai Fiscal Year 2003

Agricultural Land Reform Office (ALRO)
Ministry of Agriculture and Cooperatives (MOAC)

Activity	Quantity	Thai Fiscal Year 2003												
		Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	
1. Project Management	1 Project													
2. Installation of Equipment and Micro Irrigation System														
(1) Preparatory Work	39 Provinces													
(2) Contracting Work	7,500 Farmers													
(3) Construction Work	7,500 Farmers													
(4) Construction Supervision Work	39 Provinces													
(5) Monitoring of Construction and Use of Project Facilities	1 Project													

Figure 2 : Disbursement Plan for the Increase of Water Use Efficient for Agriculture by Micro Irrigation System Project

in Thai Fiscal Year 2003

Agricultural Land Reform Office (ALRO)

Ministry of Agriculture and Cooperatives (MOAC)

Unit : mil. Baht

Items	Quantity	Thai Fiscal Year 2003												Total		
		Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.			
1. Project Management Cost	1 Project	0.438	0.438	0.438	0.438	0.875	0.875	0.875	0.875	0.875	0.875	0.875	0.438	0.438	0.438	7.875
1.1 Temporary Wages	1 Project	0.153	0.153	0.153	0.153	0.153	0.153	0.153	0.153	0.153	0.153	0.153	0.153	0.153	0.153	1.834
1.2 Remuneration, Services and Supplies	1 Project	0.285	0.285	0.285	0.285	0.285	0.285	0.285	0.285	0.285	0.285	0.285	0.285	0.285	0.285	3.416
1.3 Construction Supervision	39 Provinces	0.000	0.000	0.000	0.000	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.000	0.000	0.000	2.625
2. Construction Cost	7,500 Farmers	0.000	0.000	0.000	0.000	0.000	0.000	65.625	65.625	65.625	65.625	65.625	0.000	0.000	0.000	262.500
Total		0.438	0.438	0.438	0.438	0.875	0.875	66.500	66.500	66.500	66.500	66.500	0.438	0.438	0.438	270.375

Photos of the previous project



1. Farm pond, provided by ALRO, is used for water resource of micro - irrigation work.



2. A set of high pressure pump installed for micro - irrigation development work.



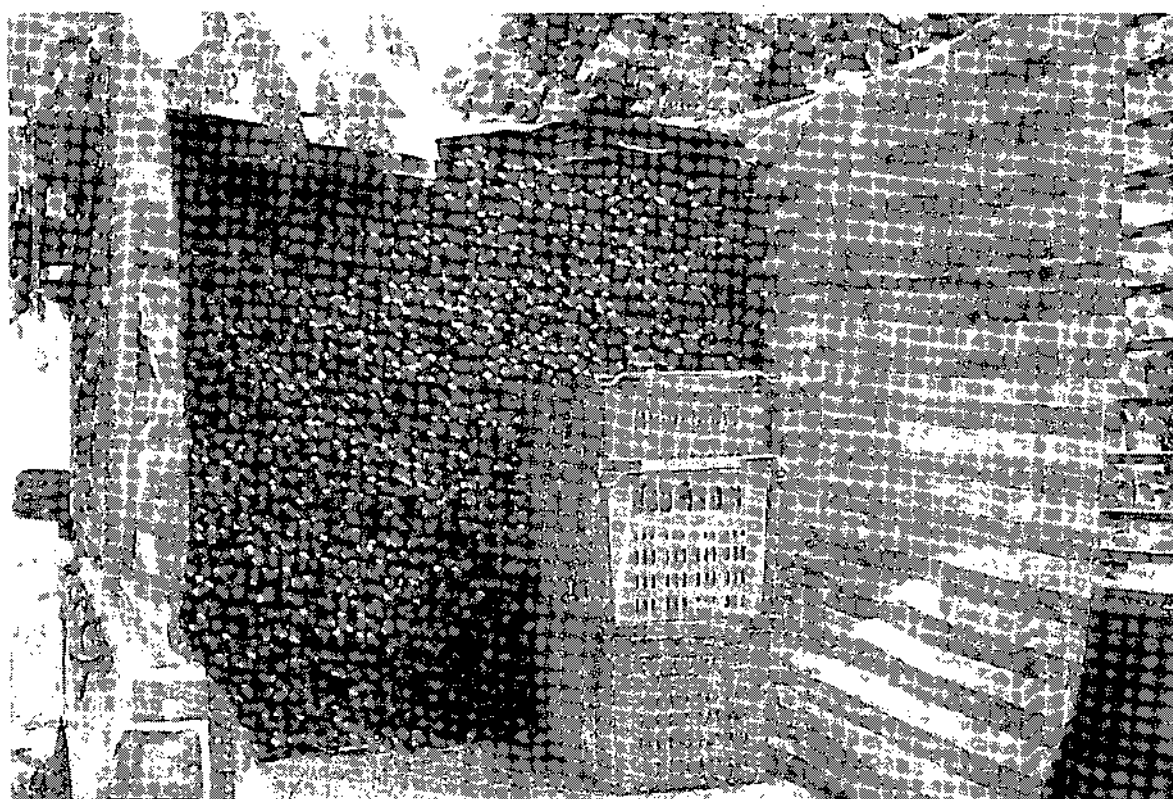
3. A set of micro sprinkler installed in the vegetable plot.



4. A set of micro sprinkler installed in the orchard plot.



5. Vegetable product, Chinese kale, prepared to market delivery.



6. Orchard product, Longan, prepared to market delivery.

**MICRO IRRIGATION WORK....
AN ALTERNATIVE OF
AGRICULTURAL
DEVELOPMENT IN LAND
REFORM AREA**

**BACKGROUND OF
LAND REFORM PROGRAM**

- **Agricultural Land Reform Office (ALRO) has been established to implement the land reform program since 1975.**
- **The promulgated land reform area cover a total of 8.2 million hectares in 69 provinces.**
- **At present, ALRO has allocated land in a total of 3.43 million hectares to 1.33 million farmers.**

GOAL OF LAND REFORM

“ security and sustainability of farmers in the land reform areas to farm their own land and to have better income and quality of life ”

THREE OBLIGATIONS SET FORTH TO SUCH GOAL

- Allocation of land to farmers;
- Infrastructure development; and
- Farmers' income and quality of life.

EXISTING PROBLEMS OF LAND REFORM AREAS

- **Low Soil Fertility;**
- **Lack of water sources for farming;**
- **Farmers' poverty; and**
- **Farmers' debt.**

SOLUTIONS OF SUCH PROBLEMS

- **Low soil fertility : to adopting appropriate technology and local wisdom.**
- **Lack of water sources for farming : to promote farmers' awareness of the importance of water security by storing rainwater for dry-season use and to create learning process regarding water efficient agriculture for value-added production and high return.**

SOLUTIONS OF SUCH PROBLEMS

- **Farmers' poverty : to enable farmers to generate continuous farm income.**
- **Farmers' debt : to create learning process for farmers to be able to classify their debts, and then promote reduction and elimination of borrowing for family subsistence.**

CONCEPT OF DEVELOPMENT

**Micro Irrigation Work ...
an Alternative of Agricultural
Development in Land Reform Area**

WHAT IS MICRO IRRIGATION ?

- **An irrigation system where water efficiency is adopted;**
- **Water is limitedly and frequently brought of only root zone of plant;**
- **Emitters may be drip or micro sprinkler; and**
- **To efficiently use the limited water sources for maximum benefit.**

ESTIMATE OF INCOME

- **To generate a net income of 28,000-40,000 Baht per year per household while the investment cost is approximate 38,000 Baht per farm plot.**

IMPLEMENTATION GUIDELINE

- **Establishment of criteria for selection of land plots and participating farmers;**
- **Investigation and selection by Provincial Land Reform Office (PLRO);**

IMPLEMENTATION GUIDELINE

- **The first selection of land plot prior to consideration of participating farmers;**
- **Emphasis on area potential and preparedness of farmers;**
- **Equipment installation on individual land plot or for individual farmer;**

CRITERIA FOR SELECTION OF PARTICIPATING LAND PLOT

- Land right certificate;
- suitable soil for crop cultivation.
- No inundation problem;
- Availability of sufficient water for all year round; and
- Not more than 20 metres of distance between land plot and water source.

CRITERIA FOR SELECTION OF PARTICIPATING FARMER

- Owner of the land plot;
- To be well disciplined, diligent, and persevering;
- An adequate number of farm labor; and
- Acceptance of project conditions.

CONDITIONS OF PROJECT PARTICIPATION

- Think Together : to decide on cropping pattern;
- Do Together : to join in equipment installation works; and
- Pay Together : to partially pay for equipment cost.

STANDARD MODELS OF EQUIPMENT INSTALLATION

A total of 8 standard models of equipment installation are divided into 2 parts.

- Three standard models for vegetable or flower plot;
- Five standard models for fruit tree plot.

THREE STANDARD MODELS FOR VEGETABLE OR FLOWER PLOT.

- **Model V1** : dripping system
- **Model V2** : micro sprinkler with watering
radius of 4.00 X 4.00 m.
- **Model V3** : micro sprinkler with watering
radius of 6.00 X 6.00 m.

FIVE STANDARD MODELS FOR FRUIT TREE PLOT

- **Model F1** : micro sprinkler for planting
space of **3.00 x 3.00 m**
- **Model F2** : micro sprinkler for planting
space of **4.00 x 4.00 m**
- **Model F3** : micro sprinkler for planting
space of **6.00 x 6.00 m**
- **Model F4** : micro sprinkler for planting
space of **8.00 x 8.00 m**
- **Model F5** : micro sprinkler for planting
space of **10.00 x 10.00 m**

WATER SOURCES FOR MICRO IRRIGATION SYSTEM

- Canal / natural canal
- Natural pond / farm pond
- Shallow well
- others

THE PRINCIPLES OF MICRO IRRIGATION DEVELOPMENT WORK

- The key element of work is
“ water availability ”
- The target of work is “ farmers ”
- The successfulness of work is
“ Joining Hands of ALRO ”