

CHAPTER 14

CONCLUSION AND RECOMMENDATION

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14.1 Conclusion

14.1.1 Vicious Cycle

The study area has been degraded by decrease of the vegetation and the forest area due to overgrazing and cutting trees for fuels and reclamation for increase of the new cultivation area and subsequent soil erosion. In case of heavy rainfall or rapid snow melting, many types of disasters such as flood, debris flow and landslide are anticipated. The area is suffering from a vicious cycle of natural-social environment: "Decrease of farm income (Poverty) - Further exploitation of land - Degradation of natural environment - Natural disasters and damage to farmland - decrease of productivity of land -Decrease of farm income (Poverty)". The regional society is facing the danger of collapse.

14.1.2 Selection of Master Plan Study Area

Based on the Phase I Inventory Study, five master plan study areas were selected in taking into consideration of the scale and damage of the past natural disasters and development potentials. The number of master plan study areas were also taken into consideration and two (2) study areas were selected in Chaharmahal va Bakhtiyari and each one (1) in Kohgiluyeh va Boyerahamad, Esfahan and Khuzestan respectively. The selected master plan study areas are as follows;

Table 14-1-1 The Selected Master Plan Areas

Name	No.	Area (km ²)	Province
1. Vastegan	K4-1-9	67.0	Chaharmahal
2. Chaman Goli-Bazoft	K5-19-a	113.1	Chaharmahal
3. Sarbaz	K7-0-19-1	154.5	Esfahan
4. Tang Sorkh	K7-48	65.4	Kohkilouyeh
5. Zeras	K8-28	63.7	Khuzestan

14.1.3 Overall Goal and Project Purpose

The overall goal of the master plan is to break through the above vicious cycle at two nodes of the "Degradation of natural environment" and "Decrease of farm income. In order to realize the overall goal, following five project purposes are proposed.

- (1) Mitigation of flood, debris flow and landslide damages
- (2) Control of soil erosion and conservation of water
- (3) Restoration and improvement of rangeland vegetation
- (4) Improvement of living standard
- (5) Improvement of agriculture product/input marketing and agriculture extension

Above project purposes could be categorized into three (3) major project components.

- (1) Disaster prevention work (mitigation of flood, debris flow and landslide)
- (2) Natural environment recovery (soil erosion control and vegetation restoration)
- (3) Rural and economic development (improvement of living condition and increase of agricultural product)

14.1.4 Project Evaluation

Economic evaluation has been carried out for each project. Overall benefit cost ratios (B/C) at the interest of 12 % and economic internal rate of return (EIRR) are as follows;

Table 14-1-2 Results of Project Evaluation

Area	B/C	EIRR
1. Vastegan	1.22	23.5
2. Chaman Goli-Bazoft	1.19	24.1
3. Sarbaz	1.56	49.7
4. Tang Sorkh	1.51	31.0
5. Zeras	1.30	18.4

The projects are sound in engineering aspect and recommendable from economic point of view.

14.1.5 People's Participation

To achieve community development under people's initiative, an intensive approach to the village with technical information for plan formulation will be needed, and organizing and strengthening user's committees will trigger community development activities and reduction of vulnerability, then finally achieve a successful disaster prevention and community development project.

It is vitally important to select the farmers group and/or organization, who have strong willingness for development and are positive to pay for their share of project cost. Emphasis should be placed on the "Participatory" planning and implementation for the success of sustainable and positive development. The promotion of the better farmer's participatory organization is also important to get the official subsidies to the project and to receive the governmental training and education.

14.2 Recommendation

14.2.1 Government Function

Project planning in each province is the responsibility of the corresponding Provincial Jihad

Organization and the Study and Evaluation Department (SED) of WMD only check and evaluate the plan. Major work of the SED is to collect and analyze those data of floods and landslides and etc. and it seems that the staffing and capability of SED for project planning are insufficient. SED should have the initiative and responsibility of project planning of the large scale projects and the projects extending to large area of more than one province. Staffing and capacity of SED inclined to engineering aspect and ordinary economic and financial evaluation of the project such as Net Present Value (NPV), Benefit Cost Ratio (B/C) Economic Internal Rate of Return (EIRR) have not conducted until now. SED should master these tools and apply them for project planning and evaluation.

The participatory workshop generally helped the local residents actively participate in the planning process. However, number of the governmental officers was sometimes more than that of the residents people's and active participation was interfered by the governmental officers' attitude. Even though the officers of all levels of administration (local, provincial and central) are essential components of the workshop participants, some officers were too active (aggressive) to insist their ideas. They acted as if they knew all the problems of the residents and they could make most appropriate decisions on the master plan even without listening to the local residents. Such attitude completely opposes to the participatory approach. The attitude of government officials should be moderate not so as to interfere the participation of the resident people.

14.2.2 Legislation Measures for Over-grazing

Wide-spread and chronic over-grazing situation is prevailing in the study area, which is the main cause of degradation of natural vegetation. This is a country-wide problem and the Department of Livestock recognized the problems seriously. The Study Team proposed the project of vegetation recovery of rangeland and the project of production increase of alfalfa for livestock feed. However, the projects would not solve the over-grazing situation totally. For the fundamental solution of this problem, control of the livestock head is inevitable. National level legislation measures would be required for provincial level regulation of control of livestock head. Substantial allocation of head of livestock to individual farmers would be entrusted to Shola based on the regulation of the province.

14.2.3 Experimental Pilot Project

The Study Team recommends prompt implementation of the projects. Disaster prevention work including mitigation of flood, debris flow and landslide and natural environmental recovery including soil erosion control and vegetation restoration are very urgent. However, projects proposed in the master plan are integrated and have many components and some project such as soil erosion control and vegetation recovery have less implementation experience. Experimental pilot project would be recommended in a selected area among the five (5) master plan study areas. The Study Team would

like to recommend Vastegan as a pilot project area because of many components of project and accessibility and expected propagation effect, which will enable easy project monitoring, extension and propagation.

(1) Purpose of the Pilot Project

The purpose of this pilot project is to give a sample of participatory implementation of watershed management projects which would be a kindling and propagate to other projects in the Master Plan area with target of poverty alleviation and improvement of natural environment. Realization of poverty alleviation means that "people can live without debts" and "people need not go to cities or abroad for getting job". The selection criteria of pilot project are as follows;

- to give direct effect on improving natural environment
- to have project scale of easy implementation in short term
- to give the chance of many villager participation
- to give profit to participants
- to be certain in success with the similar natured past sample
- to have a probability of propagation

In due consideration of the above condition, the project of orchard terrace for soil erosion protection is recommended. To assure success of the pilot project, it is also recommended that scale of the project and number of participants should be decided by considering villager's close communication.

(2) Selection of the Project Site

Vastegan area is located in about 80 km south of the province capital Sharekord and it can be approached from Sharekord within one hour drive. Access to the site and communication with local people would be easy for the provincial officials concerned. It would also help other local people visit the site, which contribute to exhibition effect and propagation effect. It is very favourable that the some local people in Vastegan area already have experience of construction of orchard terrace and they are now in an initial stage of getting fruits of apples.

(3) The Project

The orchard terrace for soil erosion protection is selected for the pilot project because of the following reasons;

- The project can be initiated in a small scale with rather small amount of budget.
- Farmers can get direct profit through their ownership of orchard terrace.
- The project will give quick yield of soil erosion control and apple fruit production.

The project will contribute both to natural environment improvement and to poverty alleviation of local people. The operation and maintenance and farming would be easy because the project site is located near by the Vastegan village. Many provincial officials and local people can visit the site easily, exhibition effect of which will help to promote similar nature scheme.

(4) Contents of the Project

a) Purpose of the Project

The project aims at reduction of poverty and improvement of natural environment. With reference to the PCM Workshop held at Vastegan, the two major issues; low buying motivation (living standard) and youth's migration to cities are raised. Therefore, reduction of poverty implies to stimulate people's buying motivation and to improve living standard. In addition, youth's migration to cities will be reduced and then the local community will be revived. On the other hand, improvement of natural environment implies to reduce the damage on farmland and to secure income by decreasing natural disaster, and finally to provide people safe and peace life.

b) Effects of the Project

- To reduce soil loss of about 8t/ha/year (5 mm/year) to almost negligible and to stabilize and maintain the productivity in the hilly rangeland, where the land suffers from severe soil erosion due to deterioration of vegetation by over grazing

- To create annual income of about 6,000,000 Rial for each family, which is equivalent to 60% of present income, by converting lower productive rangeland to apple orchard with productivity of 40t/ha.

- By the increase of the income, the peoples can attain better living condition and moreover, the surplus, a part of the increase income can be spent for further investment of development, which would create upward spiral in the regional society. In addition, the reduction of youth's migration to cities and the revival of the local community will be attained by showing the way to earn stable income through the Project when they participate actively.

c) Components of the Project

Area: 15ha

Facilities:

Diversion Weir: 1 masonry weir

Irrigation Canal: L = 2,800m (Conveyance Canal = 1,300m, Main Canal = 1,500m)
Concrete Canal (B 0.20m x H 0.20m)

Orchard Terrace: 15ha

Project Cost: 488,486,000 Rial

Facility	Breakdown of the Project Cost (rial)			
	Total Cost	Adm. Cost	Labor Cost	Material Cost
Water Source (Diversion Weir, Canal)	264,507,000	35,496,000	31,352,000	197,659,000
Orchard Terrace (including apple nursery)	223,979,000	10,666,000	171,628,000	41,685,000
Total	488,486,000	46,162,000	202,980,000	239,344,000
Composition	100%	9%	42%	49%

O/M Cost: 27,202,000 Rial/year

Facility and Farming	Breakdown of O/M Cost (rial/year)			
	O/M Cost	Adm. Cost	Labor Cost	Material Cost
Water Source (Diversion Weir, Canal)	2,849,000	191,000	1,011,000	1,647,000
Orchard Terrace	1,778,000	0	1,430,000	348,000
Farming Cost	22,575,000	0	9,375,000	13,200,000
Total	27,202,000	191,000	11,816,000	15,195,000
Composition	100%	1%	43%	56%

Participants: 75 families (0.2ha/family) participating among 600 families in 4 villages.

Trees per family: 80 trees (1tree/25m²x2,000m²=80 trees)

Benefit of the Project: 32,800,000 Rial/ha x 15ha = 492,000,000 Rial

492,000,000 Rial/75 families = 6,560,000 Rial/family/year

=60% of Present Income (Present Income: 10,300,000 Rial/family/year)

Economic Evaluation: B/C= 4.59 IRR= 43.4%

Carrying Capacity: In view of 50 % increase of the average income, 30 new dependent families are to be introduced.

(5) Share of the Cost

a) Share of the Project Cost

Since this Pilot Project aims to preservation of natural environment and increase of income for farmers, it contributes to improvement of natural environment as well as to increase of income directly to farmers. Therefore, the project will be proceeded with a cost share of beneficial farmers. It will make farmers to have ownership of the project. Project cost is composed of administrative cost, labor cost and material cost, of which labor cost shares 40%. Beneficial farmers are, therefore, requested to share 40% of the project cost by means of labor work or cash payment. Remaining 60% is requested to the Government or NGO or the International Aid Agencies.

i Share of the Farmers

In case labor cost of 202,980,000 Rial is shared by 75 farmers, one farmer shares about 2,706,000Rial, equivalent to 27% of annual income of a family in Vastegan. It will be over burden for farmers. Since construction work of the project is composed of simple easy works such as manual earthwork, it is recommended to request farmers to contribute by labor work. In the case of labor work, share cost is equivalent to 3.6 months. (unskilled labor :750,000 Rial/month) In Vastegan, farmers are diversifying their farming with alfalfa, sugar beat, potatoes and legume other than wheat and barley. Since wheat and barley shares 50% of cropped area, farmers are busy during sowing and harvesting of wheat and barley. However, they are able to work for the project from March to April before harvesting and from August to October before sowing except farm works for other crops. It is, therefore, recommended to make options for farmers to choose ①payment, ②labor work or ③combination, in order to increase participatory selections for farmers.

ii Remaining Share other than Farmers

Remaining share is requested to the Government or NGO or the International Aid Agencies. Since it is composed of administrative cost and material cost, it should be in the form of fund. It is, therefore, very important to make deep understanding of donors on effects of the project.

b) Share of the O/M Cost

O/M cost is composed of O/M and repair cost of the water source facility, repair cost of the orchard terrace and farming cost of apples. Other costs than water source facility, which is a common facility, has to be born by individual farmers. From an aspect of general case of this scale, O/M and repair of water source facility are conducted by farmers themselves. Therefore, all O/M and repair costs are should be born by farmers. Share of annual O/M cost of 27,202,000 Rial is 363,000 Rial for one farmer, which is equivalent to 6% of 6,109,660 Rial, income from orchard. Out of 363,000 Rial, 90% or 325,000 Rial is for O/M and farming cost of orchard which is responsible to individual farmer. Remaining 10% or 38,000 Rial is share for common facility. It is only 0.6% of income from orchard, and a part of it can be compensated by cleaning work of canal. It is, therefore, easy for farmers to bear all costs for O/M of the project.

(6) Implementation of the Project

a) Establishment of Project Coordination Committee

In order to implementing the Pilot Project, Project Coordination Committee (PCC) should be established, which composes of members from central Watershed Management Office, Ministry of Jihad-Agriculture as a central force and funding agencies, NGOs, Forestry Office as well as provincial Watershed Management Office who will be a executing agencies. PCC will conduct a budget acquisition for the project and coordinate the central level competence. PCC will carry out, at the beginning stage of the project, the explanation of the background, purpose, implementation schedule for the Pilot Project, holding the originators' meeting at the project site and supporting the establishment of beneficiaries' group. Roles of PCC is as follows in order:

- i To explain the Project outline to provincial offices (Provincial offices of Jihad-agriculture, Forestry, Water Resources, etc.),
- ii To explain the Project outline and to request cooperation to the supporting organizations (Government, NGO or International organizations),
- iii To submit the application for changing from range land to agricultural field (Forestry Office),
- iv To hold the originator's meeting for the Project in coordination with provincial Jihad-agriculture,

- v To explain the Project outline to the inhabitants and to request their participation,
- vi To establish a beneficiaries' group of the inhabitants which are willing to participate, and to support and educate the group,
- vii To establish and support the Project Implementation Committee (PIC),
- viii To acquire a budget for the Project (to confirm the budget from supporting agencies and an allotment of beneficiaries),
- ix To coordinate roles and competent of related administrative organizations,
- x To supervise and control the project implementation organization, and
- xi To support for the project implementation administratively at the central level.

The Pilot Project will basically be implemented under the participation of the inhabitants. PCC will have a role as facilitator up to the completion of the Project. PCC should support the beneficiaries in establishment of group's organization, technical transfer of participatory operation method so that beneficiaries would be able to operate and maintain the project by themselves.

b) Opening of originator's meeting

The Project Coordination Committee (PCC) will hold the originator's meeting with provincial related organizations, whose participants should be inhabitants in the related villages who have rights to enter the project site. Address of the Project participation should be carried out to all related village inhabitants through the Village Islamic Councils or Shora.

It is found that the Sefid Rood Watershed Management Project, which was implemented by the method of the participatory system, was well conducted for the obtaining the inhabitants' participation with the useful help of Shora. The Shora is organized in each village (villages), consists of three councils who are elected by votes from the inhabitants every four years. The chairman of the Shora has a role of village headman, has a strong leadership for information transfer, coordination of opinions, arbitration of confrontation, decision making of the trouble, etc.

On the Sefid Rood Watershed Management Project, when promoting the participation of inhabitants to the project and educating the project implementation, the Seminar was held firstly to Shora members. Next, Shora members held the meeting in their villages to transfer and explain the knowledge and information to villagers. It is found that the key is a practical use of the traditional systems in villages.

The purpose of the originator's meeting is to concretely explain the Project purpose, contents, effects, project cost, their allotment, method of allotment, etc. and to receive applications. The Pilot Project should be conducted with the participation of the inhabitants who acknowledge their allotment. Based on the Village Survey carried out by the Study Team in Vastegan Area, all four

villagers have willingness to development, for agricultural sector in three villages such as Vastegan, Konark Olya and Knark Sofla, for income generating activities in Nasir Abad. So it is expected that the inhabitants will participate the Project.

c) Establishment of beneficiaries' group

In order to sustaining the Project, it is important that the inhabitants would participate the project and they would have ownership. Beneficiaries' group, which consist of the inhabitants who show the willingness in the originator' meeting, should be established. At the time of establishment, it is efficient that PCC will act as a facilitator and Shora members will participate as coordinator for supporting and advising on the establishment of group's organization and operation rules. Participation of Shora members is important for requesting arbitration when the confrontation occurs between or among the beneficiaries after the project completion. Group organization will consist of a chairman, who will be a controller cum representative of the group in order to discuss with related government agencies, one or two sub-chairman (chairmen), who support the chairman and treasurer and sub treasurer, who collect and manage members' allotment.

The group basically operates under the participation of inhabitants. At the time of reviewing of the activities' plan, monitoring plan and reviewing the project at the interim stage, workshop type meeting, which makes flank and free circumstance, is useful to obtain the various participant opinions. *On the other hand, important decisions for group's organization and operating rules, should be made by the opinions of the general meeting consisting of whole members.*

It is necessary that participants' allotment should be decided by the general meeting. Participants will have right to receive land suitable to the allotment, to obtain the profits from said land as well as bear the roles of operation and maintenance of infrastructure such as terrace and irrigation facilities based on the land size. Such rights and roles as well as penal regulations to the person who abandon the land should be decided by the general meeting.

Shora member may participate as a beneficiary and may be elected the chairman of the group. Such Shora member may behave overpower to decision-making. In order to preventing such trouble, unsigned vote should be considered for a decision-making, which can be obtained fairness because even Shora member has only own one vote as same as other members have for decision-making.

d) Establishment of Project Implementation Committee (PIC)

The Project Implementation Committee (PIC) should be established, consisted of Provincial Jihad-Agriculture as a central force and representatives (5 -6 persons) of beneficiaries' group. PIC will be entrusted with missions; the system construction that inhabitants can participate the Project

from the planning stage and implementing stage up to operating and maintaining stage as well as supporting the beneficiaries' group on the technical aspect. PIC also entrust the works such as site survey or composition of implementation drawing to the local survey companies and transfer the technology to them. This system can promote the survey and designing abilities of the local companies and extend the project to near areas.

- i To establish the project implementation organization with participatory system,
- ii To conduct survey, compose the implementation documents (drawings, cost estimation),
- iii To confirm the components of the Project (facilities, cost, effects),
- iv To decide the method of implementation, operation and maintenance
 - Decision of land allocation,
 - Decision of allotment of beneficiaries and ways of allotment,
 - Decision of method of water distribution (ordering system, etc.),
 - Decision of cooperate-management, cleaning and repairing for water supply facilities, and
 - Decision of cooperate-purchasing, etc.
- v To supervise the facilities, and
- vi To monitor and evaluate the Project.

PIC will support and advise as the facilitator to the group members in whole stages on the administrative and technical aspects. The group members will participate the Project by means of cash allotment and/or offering their services. At the beginning stage, the group members may doubt the Project, PIC should closely hold the meeting with the group members to submit the information of the Project in order to construct the good relationship and obtain the beneficiaries' understandings.

(7) Implementation of the Project

a) Construction Work

Main construction works of the project are for small canal and orchard terrace. These works are easy for construction. However, selection and decision of the canal route and definition of the beneficial project boundary are essential and important from an engineering viewpoint. Survey works of the canal route and the boundary will be entrusted to the local survey company by PIC. The route of canal and the boundary of the project will be confirmed by the beneficial group. Preparation of construction documents will be also entrusted to the local survey company.

Since almost construction works will be conducted by labor work of the beneficial group who are unskilled in construction work, it is difficult to supervise the works even for simple earth and concrete works. PIC should recruit jobless capable men by administrative fee and transfer technology to them on supervision of construction work in order to accelerate the implementation of the project.

b) Allocation of the Land

Developed land of 15 ha will be allocated to 75 farmers with a land of 0.2 ha for each farmer. As shown in Figure-2, developed land is irrigated by distribution ditches of 100 m length in average aligned at 30m interval through outlets of the main irrigation canal. One distribution ditch irrigates apples to both sides within 15m distance. Two slit shaped farmlands of 0.15 ha with a length of 100m and a width of 15m are reclaimed at both sides of a distribution ditch. One distribution ditch irrigates 0.3 ha. In case beneficiaries are allocated to one distribution ditch, problems occur frequently on water allocation between upstream and downstream. It is necessary to minimize number of beneficiaries to one ditch. Since a land of 0.2 ha is allocated to each farmer, 1.5 beneficiaries is allocated in average to each ditch as shown in Figure-2.

c) Apple Cultivation

Although cultivation technology of apples is popularized among farmers in the large growing districts, its technology is not yet extended to the slopes where the development is not yet extended. It is, therefore, required for farmers to acquire necessary technology for apple cultivation. Extension Department of General Provincial Agricultural Bureau should be responsible on its extension. PIC should support farmers to visit the large growing districts in order to make them able to learn by themselves. Since apples are sold generally through brokers to market, farmers should also learn negotiation technique with brokers.

On the other hand, since apple trees require 5 years to reach the productive stage, it is essential to grow fodder crops as alfalfa meanwhile in order to protect land from erosion as well as to ensure certain income.

(8) Monitoring and Evaluation

The objective of participatory monitoring and evaluation are to guide the beneficially group to grasp progress of the pilot project and problems raised in the project implementation, and then, to improve their original plan and activities by themselves based on result of the monitoring and evaluation. Through these activities, the beneficially group can formulate and enhance a sense of ownership for the pilot project. It is important to attain sustainable development through that the group recognizes their problems by themselves and improves their project activities through their discussions. Monitoring and evaluation is also important from a view of accountability to project sponsors including their families.

Monitoring will be conducted once per month during construction period, and once per year after completion of the construction. The main procedure of the monitoring is to grasp progress of the project and problems faced in the project implementation, and to revise and improve their further activities. PIC has a responsibility for making a report on the result of monitoring to PCC and, if any,

project sponsors. PIC also has responsibilities for taking measures against problems and for adjustment of next activities with the beneficiary group.

Evaluation will be carried out once after completion of the construction, and once after 5 years of completion when the products of apple tree can be cultivated. The member of evaluation team should be composed of third parties such as representatives of PCC and, if any, donor organizations, to ensure objectivity of the project evaluation. PIC will organize the evaluation team and hold a workshop under participation of the beneficiary group. Such aspects as achievement degree of the project purpose, efficiency of the project inputs, choice and adaptation of technology appropriate to the local condition, impact of the pilot project on local society and environment, organization and management system/abilities, should be discussed and analyzed in the evaluation workshop. Result of the evaluation will be put into future activities and another projects.

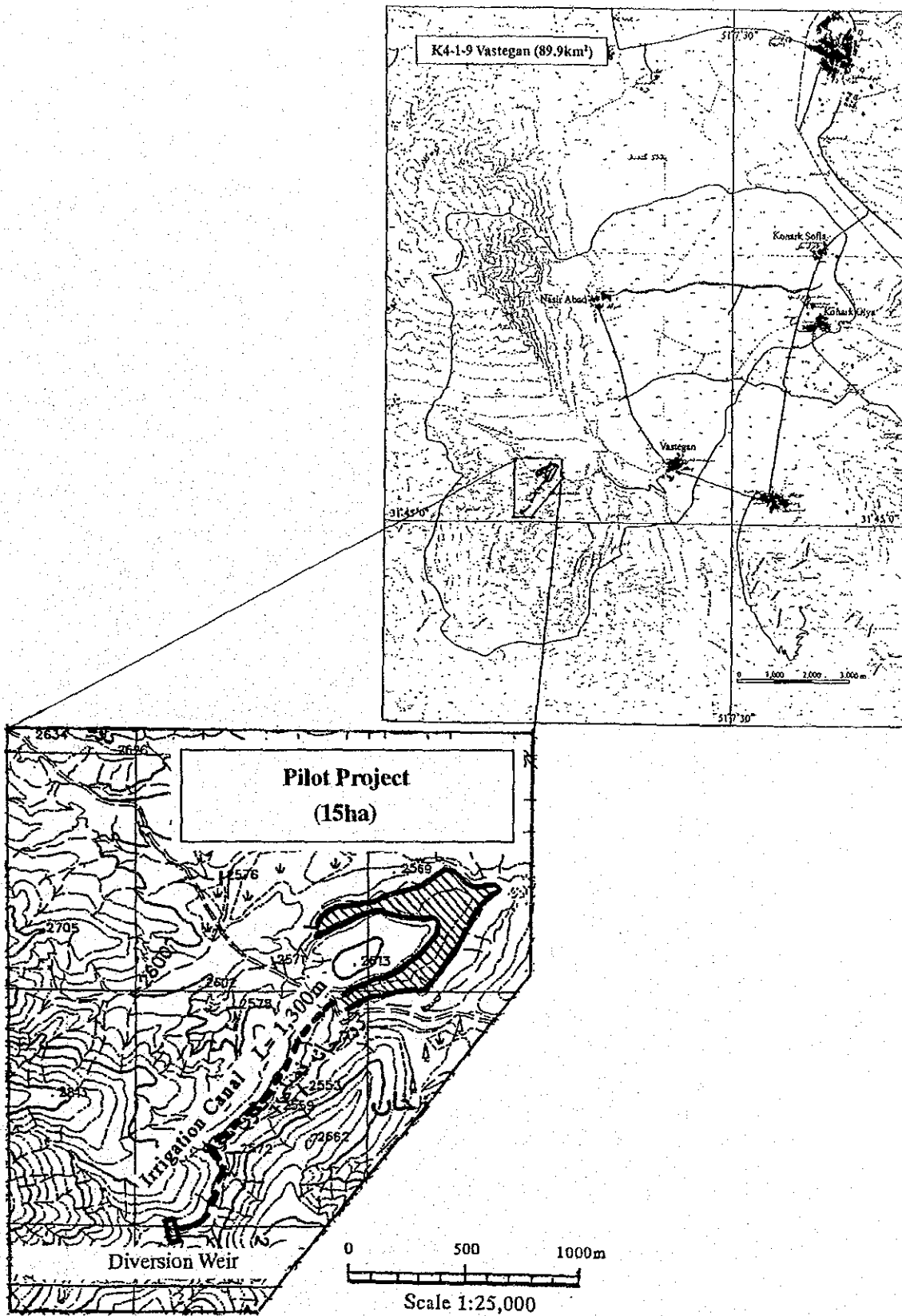


Figure 14-2-2-1 General Plan of Pilot Project

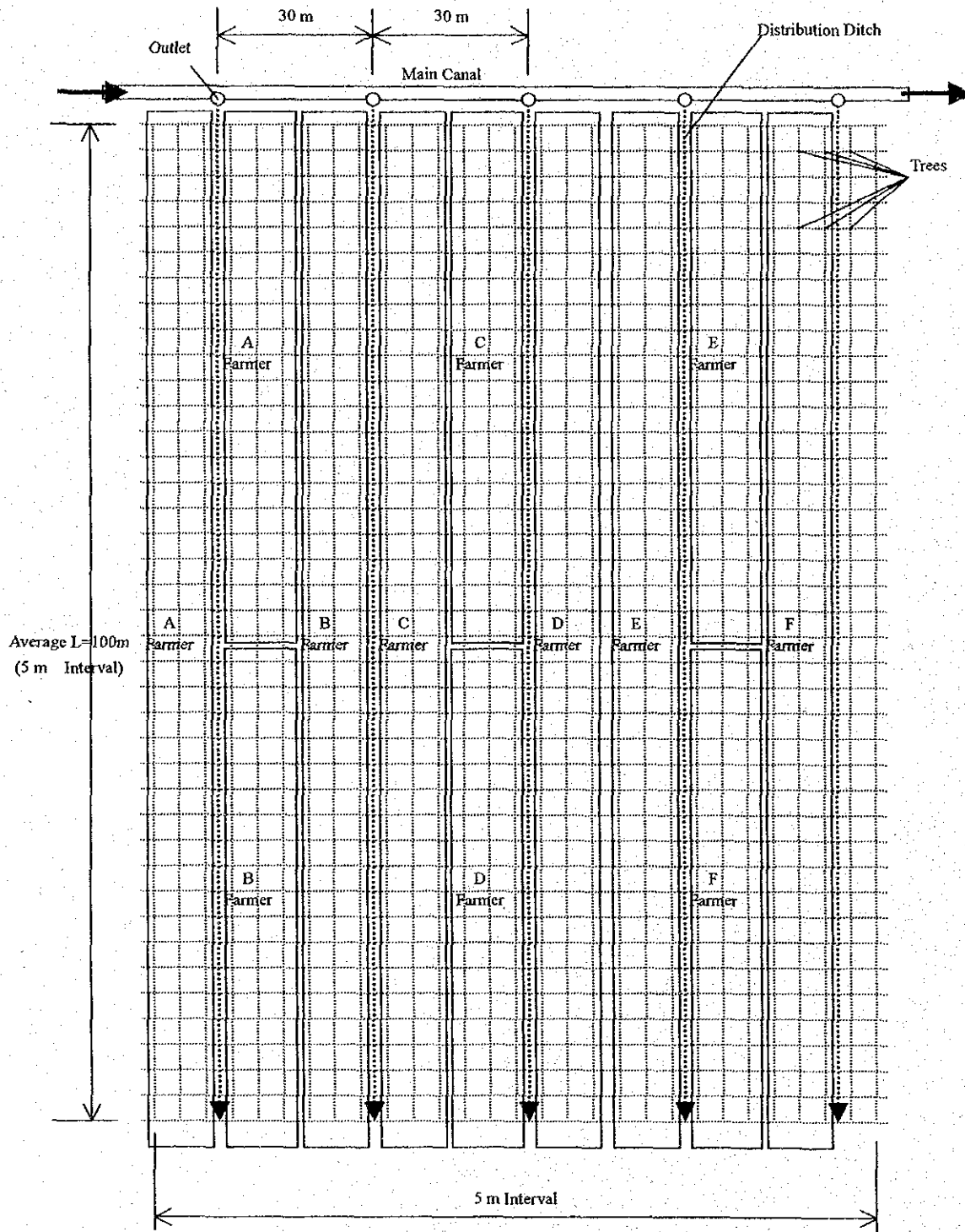
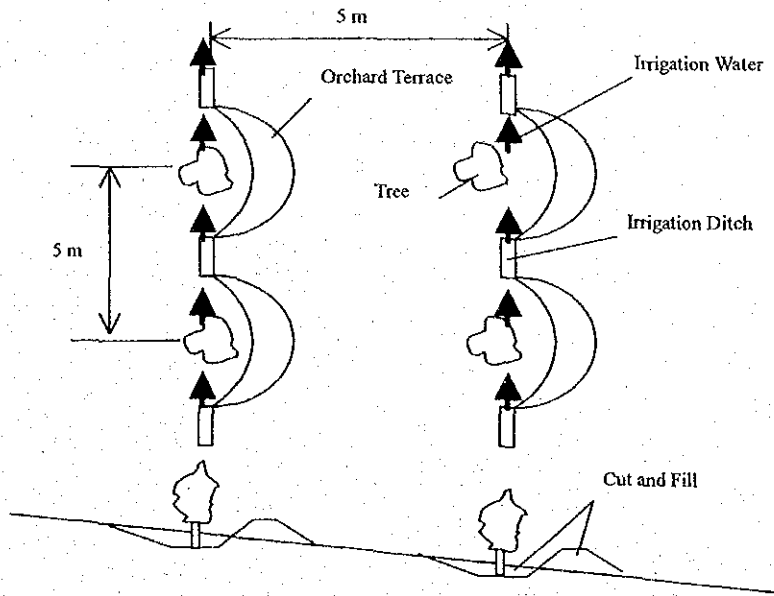


Figure 14-2-2-2 Plan of Orchard Terrace



Orchard Terracing

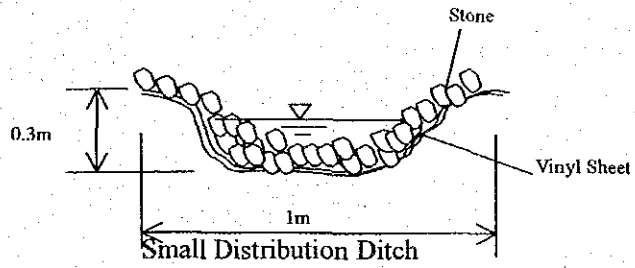


Figure 14-2-2-3 Layout of Facilities