

10.5.8 Rural Road Improvement

(1) Basic Concept

The rural road improvement plan is established based on the purpose described below:

- To improve, rehabilitate and construct rural roads for easy access to other villages and market,
- To keep stability of access especially in winter by provision of pavement, drainage facilities, river crossing and others,
- To strengthen participate group by providing knowledge and skill about maintenance of road and appurtenance facilities.

(2) Proposed Plan

The main road which is paved with asphalt passes through the area and connects 5 villages on the left bank of Boshar River. On the other hand, on the right bank of Boshar River, there is the rural road which reaches to Tang Sorkh. This road is unpaved and bumpy nevertheless it is main access way to other villages and especially to Yasuj. Then it is planned to improve this rural road as asphalt pavement road. Widths of road and pavement are designed to be 4 m and 3 m respectively.

After improvement, asphalt and gravel paved road should be maintained by government. As for unpaved road including farm road, villagers should have responsibility for construction and maintenance. In addition, it is necessary to transfer technology of road maintenance of road and side drain. Then, PIC should prepare training program. Project components are summarized as follows. By these projects, accessibility to the market will be improved.

- Improvement of road from Tangsork to the bridge constructed over Boshar River 5 km
- Transfer of technology for maintenance of road and side ditch 5 years
- Construction and maintenance of farm road by farmers 97 km

10.5.9 Establishment of Cooperatives

It is necessary to apply the participatory approach and proper training and education by the government for promoting these development plans. Procedure and method for establishment of cooperatives and its difficulties are as follows:

(1) Procedure and method for establishment of cooperatives

- a. Establishment of Project Coordination Committee (PCC) composed by central and provincial government: watershed management office, agricultural office, rural industry office and

- related agencies should participate PCC for coordination of project promotion,
- b. Selection of originator: To select the Shora as originator through the help and suggestion of Project Coordination Committee. To raise members for cooperatives. Provincial members of PCC periodically promote the villagers with the help of central members of PCC. Especially at the first stage, PCC frequently should conduct the workshop for the originator and villagers,
 - c. Cooperative will be established in each village. The cooperative will be for multi-purpose cooperative having services of all kind activities for produces and sales of agriculture, livestock, fish culture, forestry, etc. All villagers will be expected to participate,
 - d. Group will be established within the cooperative. Group will be formed based on the produce, members of which would grow same products or have intension to grow same products,
 - e. Review of project plan: Group members will receive the explanation and suggestion for project from the originator and PCC. To review and confirm the project components after discussing among the each group members for each project components.
 - f. Project implementation: Project will basically be conducted by the fund from the members. In case that the project is suitable to the governmental development plan, its scope are larger and its implementation is required high technology, government should consider the financial and technology supports.
 - g. Monitoring and evaluation: Monitoring and evaluation should be conducted from beginning stage to finishing stage including interim stage by project executioner. To feed back immediately the evaluation. Stakeholders should be prepared for that it is necessary to conduct the minor change of the plan.
 - h. Operation and maintenance: Group should conduct the operation and maintenance by himself. In case of technical problems occur, group can be receive the help and suggestion from government and related agencies. Monitoring and evaluation should be conducted periodically and more profitable operation and maintenance should be carried out.

(2) Difficulties:

There are some difficulties for project implementation as follows: It is necessary that explanation workshop should be conducted for long time suitable to the project scale and government should properly sincerely suggest and support to the villagers.

- a. As villagers have different status on the social or economical levels, it is difficult to unify opinions: It is necessary to abandon own interest and selfish desire.
- b. Number of villagers to participate eagerly is limited: It is important the government will conduct the promotion. Workshop and proper suggestion and support will be essential.
- c. It is necessary that profits will be distributed fairly and impartially: As it is difficult to distribute profits fairly, members should be decided the method of profit distribution beforehand. Also method of trouble resolution should be decided beforehand.

(3) Examples for establishment of groups or cooperatives:

There is no example for establishment of groups or cooperatives in the Study Area except agricultural cooperatives in Vastegan area. However, there is a carpet cooperatives in Chaharmahal and Esfahan Provinces; three agricultural activity clubs, One women clubs for supply seed, fertilizer and chemicals (helped by FAO) and three daughters' clubs in Kohgiluyeh-va-Boyerahmad Province. In other provinces, pistachio collecting and grading centers are established and operated. Therefore, before the establishment of groups or cooperatives, these precedents should be referred and based, and plan should be implemented by using the participatory method, workshop and PCM evaluation method.

(4) Development plans

Analyzing the areas' conditions based on the above development potentials and policies, development plans would be designed for crop diversification during the short-(5 years) and medium-term (10 years) and for fruit marketing during the medium-(10 years) and long-term (20 years) as follows. The promotion of these development plans should be required the further feasibility study and detailed design study.

- | | |
|--|---------------------|
| ① Establishment of various groups and cooperatives: | short-term |
| ② Establishment of multi-purpose training center: | short-term |
| ③ Training and education plan by government: | short-, medium-term |
| ④ Others (for formerly mentioned plans; establishment of horticultural crops collecting and grading center and establishment of apple collecting and grading center) | |

a) Establishment of groups and cooperatives (short-term)

i) Purpose:

To emphasize villagers and promote the sale of produces and processed products made of and from raw materials grown in this area.

ii) Participants:

A group should be established, whose members should grow the raw materials and have intention for development. Group should be set in a cooperative. The cooperative should be formed within each village, whose size should be as same level as that of Iran's administration.

iii) Remarks for establishment of groups and cooperatives:

- (a) To make up the regulations and general rules, members should be well known,
- (b) To conduct election for board of directors. To decide the term of directors, and
- (c) To conduct the evaluation of productions and sales activities by using the multi-purpose training facilities.

b) Establishment of multi-purpose training center (short-term)

i) Purpose:

To promote villagers, groups members for production and sales by area's processing and handicraft activities as well as to train and educate them for area's development.

ii) Size of facilities:

Participants would be group members, cooperative members and villagers. If all villagers will happen to attend the meetings, a school or other larger place would be selected as venue. The standard size of multi-purpose training facilities should be for 50 persons. Facilities include building and play-yard.

iii) Remarks for establishment of multi-purpose training facilities:

To be established by villagers' participatory scheme,

- (a) To use the raw materials which is produced in this area and/or usually used in this area,
- (b) Size of facilities should be taken suitable for size of group and cooperative,
- (c) After constructed the facilities, regulation for usage should be made up and users should be well known, and
- (d) A housekeeper would conduct the activities of operation and maintenance. The housekeeper should be selected by election.

iv) Structural measures:

- (a) Size of facilities: Based on one village 100 households, required multi-purpose facilities to be constructed will be as large for 50 persons. Approx. 100m².
- (b) Form of building: It should be constructed using the suitable materials for this area and environment and taking into consideration the participatory scheme. Basically, main building material is brick.
- (c) Proposed villages: Tang Sorkh; 1 place
- (d) Required equipment, materials and facilities:
 - Building: made of brick, 100m²; 1 building
 - Tables: made of wood, 1,800x1,200x800mm; 10 units
 - Chair: made of wood 30 pieces
 - Incidentals: water supply, electricity, latrine 1 set
 - Land: relatively flat land with good access, 200m²

c) Training and education plan by government (short-, medium-term)

i) Purpose:

To instruct, train, educate and transfer the technology to group and cooperative members and villagers for development of areas.

ii) Extension service organization:

To improve the organization so as to be able to instruct, train, educate and transfer the technology to group and cooperative members and villagers.

iii) Remarks for organization of extension service:

To take the participatory scheme. To act with villagers from the beginning of plan formulation,

- (a) To improve the township level organization taking into consideration the area's conditions,
- (b) To establish each crop group for training and education and to conduct together with section in charge,
- (c) To train and educate the members of groups and cooperatives, villagers or villagers in several villages, and
- (d) To promote the trained group members so that they will train and educate the other members within the groups.

iv) Structural measures: None.

Each plan is basically independent. However, there would be rooms for reciprocal affection or common usage. Development plan should be implemented step by step. Suitable development could be led by conducting the monitoring, evaluation and feed back step by step taking into consideration the levels and situations of around development.

10.5.10 Community Enhancement

(1) Purpose

Community enhancement plays a key role to realize sustainable development in the Master Plan Areas. To maintain expected effect of the development project, villager's participation in the development process is quite important. Purposes of the community enhancement are as follows;

- a) To promote villager's participation in the projects implementation,
- b) To build up villager's mind for mutual aid, and capability against natural disasters,
- c) To strengthen villager's living environment.

(2) Organizing Villagers

To realize above purposes, village organization is planned to establish. Relevant government organizations, both in central and local levels, have to facilitate the establishment of the village organization, in cooperation with Village Islamic Councils. Village Islamic Council is positioned in the lowest level of administrative hierarchy in Iran, and is helpful to promote villager's participation. All villagers are naturally member of the village organization. But, the member of the organization should

be formed case by case, based on the purpose of the project. Such type of project as profitable and, therefore, villager have to bear a part of project cost, should be organized by those villagers who have a willingness to the development. Followings are procedure for establishment of village organization.

- a) Relevant government organization, both in central and local government, establish committee for M/P project which promote implementation of proposed projects and facilitate the establishment of village organization.
- b) The government committee holds meeting with representatives of Village Islamic Councils to explain the project purpose, project components, implementation method, etc.
- c) Representatives of Village Islamic Council hold small meeting at each villages to explain outline of the project.
- d) The government committee facilitates to establish villager's organization based on the villager's willingness to participation in the project.
- e) The village organization discusses and establishes organizational structure, rules and regulations of operation, detail plan for participation in the project, etc., under the support by the government committee and Village Islamic Councils.

(3) Remarks of Establishment of Village Organization

- a) All villagers are naturally member of the village organization. Number of household in each villages are as follows.

Table 10-5-10-1 Number of village and household in Tang Sorkh

No.	Village Name	Household	No.	Village Name	Household
1	Allah Abad	10	5	Mehrab Abad	9
2	Cheshmeh Chenar	8	6	Sar Tang Sorkh	28
3	Hassan Abad	15	7	Tang Sorkh	200
4	Islam Abad	11	—	—	—

Source: Village Survey, August 2001.

- b) The member of organization should be formed in accordance with component of the project. It is quite important that those villagers who have a will to participate into the development project organize the village organization.
- c) Project Coordination Committee should facilitate establishment of the village organization in cooperation with Village Islamic Council. The council is helpful to promote villager's participation, and to establish rules and regulations of the organization, and to arbitrate villager's conflict if it happens,
- d) Participatory approach should be taken into consideration at the beginning of the establishment. It is recommended to hold workshop to pull out villager's frank opinion when plan of operation and monitoring are formulated by villagers themselves,
- e) Selected leader will manage and coordinate communal activities, and to communicate with relevant officers from local and/or central government,

- f) At the time of establishment of rules and regulation, including account system, general meeting should be held with all members' participation. It is quite important that all villagers participate in the decision making of important issue. Such issue as member's rights, duties, and penal regulation are also the matter of general meeting,
- g) All villagers in the organization, including member of Village Islamic Council, should have a vote as an individual right of members. It is important that all members have equal right to participate in their decision-making.
- h) Leadership training, organized by rural government officers, should be provided to the leaders of organization, so that they could train and educate the other members within the organization, and
- i) Meeting with other near village organizations should be regularly scheduled under the leadership of the rural government officers. Important issue among village organization should be discussed in an open forum.

(4) Facility

Multi-purpose training center, which is proposed in the project for establishment of cooperative, will be available to used for the activities of village organization. The center will be established in those villages where more than 50 households live in, and 1 village in the project area, Tang Sorkh, meet the condition. Other 6 village organizations should use the multi-purpose training center in the neighboring villages or other communal facilities. Notice board should be established in these 6 villages to provide such information as date and kinds of disaster drills, extension services, etc. to all villagers. In case all villagers will happen to attend the meetings, a school or other larger place located inside or outside of village should be selected as venue.

(5) Activities

Activities of village organization should be planned and implemented through discussion among members in the organization. Followings are basic activities to attain the purpose of community enhancement.

- Participation in implementation, operation and maintenance of the projects in cooperation with local and/or central government.
- Participation in monitoring and evaluation of the projects in corporation with relevant government officers,
- c) Participation in enlightenment activities against disasters such as flood, debris flow, and soil erosion. Enlightenment activities will be carried out at least once after flood season.
- d) Promotion of health services and nutritional education, environmental education such as fuel consumption.
- e) Meeting with other village organizations and relevant government organization to exchange information and experience which obtain through the projects.

Community enhancement will be promoted step by step in the process of project implementation. Relevant government organization, especially in the provincial levers, should assist and facilitate the enhancement of the village organization. There are three steps in the process of the project implementation to enhance function of the village organization.

First step is at the beginning of the project implementation, and the village organization will be established based on the villager's willingness to participation in the projects. All members belong to the village organization will participate in the decision making process of their organization, and participate in the activities of the organization. Through these activities, a sense of participation will be formulated.

At the time of commencement of the project, plan of operations and detail activities of the villager are already designed by the government. The village organization, therefore, just receive the planned project. It should be noted that some of the members of village organization is dubious about for the result and effect of the project. The government officers have to make close communication with the village organization and build up intimate relations with them.

Second step is at the time of monitoring of the project. In the monitoring activities, villagers grasp the problem faced in the project implementation, and discuss how overcome the problems. The results of the monitoring are put into next activities. The village organization reviews their activities and improves their original plan by themselves. Through these activities, villagers can formulate and enhance a sense of ownership for the development projects.

Third step is at the time of completion of the project. At this time, government organization will hold the workshop for project evaluation under participation by village organization. The result of the project evaluation will be put into the next project activities. The village organization will choice next activity among the master plan projects, or will make new project plan based on their willingness to development. The government organization for project implementation have to support and facilitate villager' selection of next activities.

10.5.11 Increment of Household Income and Job Creation

Increasing household income and job opportunity is one of the most important matters in the villages in the Study Areas. Development plan will include the contents of increasing household income and job creation. These, in case of being fully developed, are shown as income generating activities below:

Table 10-5-11-1 Job Creation and Yearly Income Increment (with plan, fully developed)

Items	Job Creation (number)	Income Increment (Rials)	Increased income per household or person (Rials/H.H or person)
Horticultural crops collecting and grading center (one place)	100 households	3,750,000	37,570 per h.h.
	22 workers	55,000,000	2,500,000 per p.
Apple collecting and grading center (one place)	100 households	204,130,000	2,041,300 per p.
	32 workers	80,000,000	2,500,000 per p.

Note: Details are referred to ANNEX L Economic and Financial Evaluation, Annual O/M Cost and Value of Output.

10.6 K8-28 Zeras

10.6.1 Construction of Check Dam

(1) Specific Sediment Discharge

Based on the topography, geological condition and riverbed condition, the specific sediment discharge is applied $250 \text{ m}^3/\text{km}^2/\text{year}$.

(2) T1 Basin

The basin is located in the deepest valley of the right tributary of the Karoon River. Although the terrain is very steep and hazardous, four villages of Bardkal, Lir Siya Shapouri, Lir Siya Mozrom and Sartuf are located in the basin and receive frequent flood and debris flow damage.

Eight main check dams and one check dam to be implemented by people's participation are planned in order to prevent the movement of unstable sediment, and stabilize the riverbed and foot of slope. The villages of Bardkal and Lir Siya Shapouri, located in the most downstream, the place of which is the most hazardous area, are to be relocated to the safe area.

(3) T2 Basin

This basin has several villages, such as Gard Lidan, Dareh Zangi, Dareh Sohrab and Badelon, on the mild plateaus located in the middle reaches. Erosion is very severe in the upper reaches and flood and debris flow causes problems on houses and farmland, especially Dareh Sohrab and Dareh Zangi. Erosion is also severe in the upper reaches of Badelon village.

Four main check dams and five check dams to be implemented by people's participation are planned in order to prevent the movement of unstable sediment, stabilize the riverbed and foot of slope, and protect farmland. Two check dams out of five are allocated on the small tributaries, which flow into the eastern plateau.

(4) T5 Basin

T5 basin, which borders T1 Basin, had two villages in the lower reaches, however, they were

destroyed by flood and debris flow, deserted and fell into ruin. The two villages had relocated to the top of hill and only a few houses and limited farmland left in the basin. Erosion is also very severe here and gully is well developed on the steep slope.

Thus, only two main check dams are planned in order to prevent the movement of unstable sediment, and stabilize the riverbed and foot of slope.

(5) Other Basin

Several tributaries flow into the Karoon River at the western tip of the master plan area. Two villages, Ali Bandeh and Behoz, are located in this area. Ali Bandeh has one or two families, while Behoz has more than eighty. Behoz, located on the right bank of the Karoon River, will be submerged after the completion of the Karoon No.3 Dam and they will probably move to the higher riverbank adjacent to the existing village.

Two main check dams and three check dams to be implemented by people's participation are planned in order to prevent the movement of unstable sediment, stabilize the riverbed and foot of slope, and protect farmland.

(6) Outline of Check Dams

The dimension of main check dams are listed in Table 10-6-1-1 and their location is also shown in Fig. 10.6.1-1 The total number of check dams by type is summarized as follows;

Main check dam (Type C).....	10 No.
Main check dam (Type D)	6 Nos.
Check dam (Type D)	9 Nos.

(7) Estimation of Sediment Discharge and Sediment Capacity of Check Dams

Sediment discharge and sediment capacity of main check dams are worked out and summarized in Table 10-6-1-1.

(8) Effect of Check Dams

The check dams planned here are mainly considering securing farmland and villages on the lower reaches, and preventing devastation of the basin. Because of the steep gradient of the tributaries, storing capacity for debris is very limited.

Based on Table 10-6-1-1, the total vacant volume (storing capacity for debris) of main check dams is around $15,800\text{m}^3$, and that of 9-check dams by people's participation $9,000\text{m}^3$ ($1,000\text{m}^3$ per each) and totally become $24,800\text{m}^3$. On the other hand, annual sediment discharge is estimated around $7,600\text{ m}^3$. Thus, the total vacant volume is equivalent to about 3-years of sediment discharge.

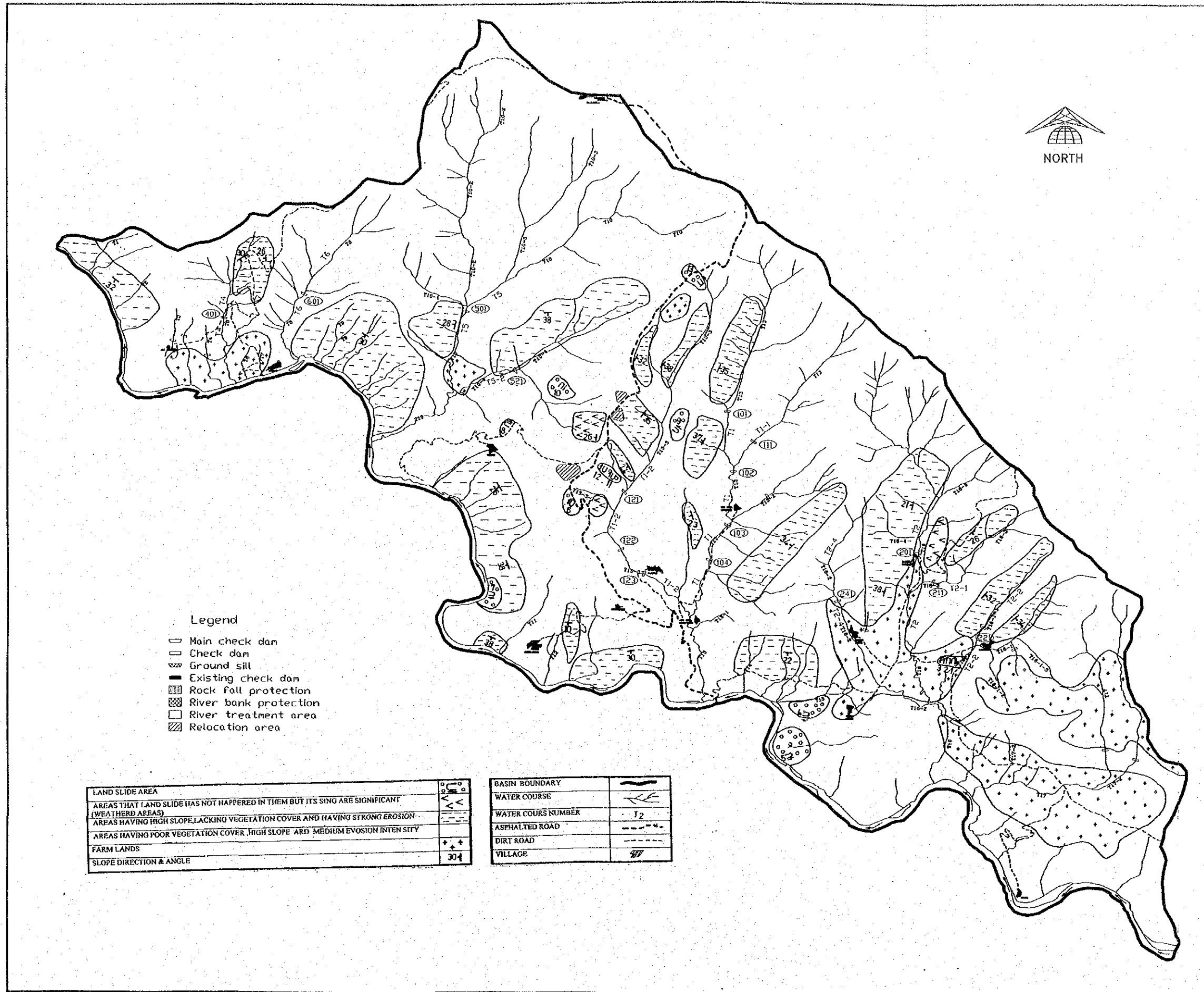


Figure 10-6-1-1 Location Map of Disaster Prevention Facility : Zeras

10.6.2 Relocation of Houses

(1) Critical Situation

Lir Siya Shapouri, located in the lower reaches of the deepest valley, T1 basin in Zeras, is surrounded with severely eroded steep slope and in hazard of debris flow from the tributary behind the village. On the narrow riverbank, the village is crowded with houses and many people, and consequently becomes in very poor living condition. In addition, there is high possibility of being hit by debris flow like the adjacent basin, T5, which occurred around 24 years ago. The village has 56 households with the population of around 280, which is the third from the top among Zeras Area.

While, Zeras village is located on the steep slope of the Karoon Valley and gully erosion is well developed around the village. There is a danger of flush floods on these gullies, which sometimes block up these gullies with big boulders and cause more damage to the village. The countermeasures are rather difficult and/or costly in view of its steep slope. The village is rather small and has 15 households with the population of around 80.

(2) Study on Non-structure Measures

A warning system with rainfall gauge is considered here, however, the problems arise on the evacuation routes.

a) Lir Siya Sapouri

- On the left bank of T1, where the village is located, it is difficult to locate evacuation route and a shelter because the slope behind the village is very steep.
- On the right bank, there are some flat areas on the gentle slope, however, it is necessary to cross the river. The village road branching from the main road is in poor condition and has to cross the riverbed because of no bridge. A footpath bridge, located in the lower part of the village, has no road access on the right bank, and flood sometimes overflows the bridge. A new bridge is required, there are no suitable sites on the same level of the village.

b) Zeras

The existing dirt road will be used as an evacuation route, however, the slope is rather steep and a few gullies cross the road. During evacuation, this route also becomes hazardous.

The warning system won't function safely, so that the system is abandoned, and instead relocation within the same area is planned.

(3) Relocation Plan

In both villages, majority people are mainly engaged in grazing and the farmland is limited, therefore, relocation is planned so as to shift safe areas within the same basin. The place to be relocated is

selected on the ridge where the main road from Dawodiha is aligned. Reclamation of land on this ridge is planned in order to reserve the same space of the both village. The relocation areas are shown in Figure 10-6-2-1.

(4) Effect

Altogether, 71 households, 360 people and the livestock such as 3,700 sheep and goat, and 160 cows, will be released from flood and debris flow hazards.

10.6.3 Landslide Protection

Landslide occurs around the ridge, where the main road is aligned from Dawodiha to the other side of the Karoon River, the right riverbank of the Karoon River, and the plateaus in the southeast. There are no landslides near the villages. Therefore, the countermeasures are taken only along the main road and the plan of which are the same as that of Bazoft. The road distance to be protected is around 1.3 km.

10.6.4 Soil Erosion Protection

Present erosion and proposed erosion protection in Zeras are summarized in Table 10-6-4-3 and its proposed plan is illustrated in Figure 8-5 in Database Map. As shown in Table 10-6-4-3, present annual erosion rate is 48 t/ha (3.4 mm) in the sub-basin basis, that is the highest among five Master Plan areas. The annual erosion rates of dry farmland and rangeland are 41 t/ha and 63 t/ha respectively. Although both rates are high, the erosion of rangeland is dominant in this sub-basin. The erosion rate will be improved to 30 t/ha (2.2 mm) in the sub-basin basis in future. Improved erosion rate is still high due to high erosion rate of rangeland even after improvement.

(1) Plan of Surface Soil Erosion Protection for Farmland

In Zeras, dry farming is carried out extensively even in the very steep land over 50% inclination as shown in Table 10-6-4-3. Annual soil erosion rate is kept within the allowable level of 15 t/ha/yr in the farmland below 20 % inclination. However, erosion rate exceeds allowable level in the farmlands with a slope over 20% inclination. Erosion rate reaches 61 t/ha (4.3 mm) in the farmland over 50% inclination. Therefore, according to the agricultural plan of Scenario-1, that is based on the present cultivation pattern, contour bunds of 30 and 20 m interval have been proposed for 20-30% and 30-40% inclination respectively, and vetiver grass contour bund of 12.5 m interval has been proposed for over 40% inclination. However, erosion rate can not be reduced to the allowable level in the lands over 30% inclination. Major reasons of high erosion rate are due to high ratio of fallow land of about 30% as well as erosive soil. Therefore, reduction of fallow land and introduction of dry type alfalfa have been proposed in Scenario-2. In the steepest farmland over 50% inclination, it is proposed to cultivate the land with alfalfa not only in the fallow land but also in the wheat cultivation land without contour bund. As the results of Scenario-2, 287 ha of dry type alfalfa is introduced and

the fallow land is reduced from 664 ha to 434 ha. Annual erosion rate of the farmland of 1,724ha is reduced from 44.7 t/ha (3.19 mm) to 15.1 t/ha (1.08 mm) as shown in Table 10-6-4-1.

Table 10-6-4-1 Surface Erosion Protection for Dry Farmland in Zeras

Area (ha)	Type of Farmland	Slope	Facility	Alfalfa Introduction	Soil Loss	
					Present	Senario-2
1,724	Dry farmland	20%-50%	Contour Bund (20 m interval in average)	287ha	44.7 t/ha/yr 3.19 mm/yr	15.1 t/ha/yr 1.08 mm/yr

(2) Erosion improvement in Rangeland

In Zeras, vegetation improvement is proposed by means of protection in the whole rangeland of 3,361/ha due to steepness over 40% as shown in Table 10-6-4-2.

Table 10-6-4-2 Proposed Rangeland Improvement in Zeras

Rangeland Veg. Zone	Slope (%)	Area		Bare Soil Ratio		Soil Loss			
		Present (ha)	Sc.-2 (ha)	Present (%)	Sc.-2 (%)	Present		Scenarion-2	
						(t/ha)	(mm)	(t/ha)	(mm)
Protection									
AB	49%	529	529	33%	18%	50.4	3.60	35.1	2.51
AE	38%	216	216	37%	22%	25.1	1.79	17.4	1.24
AP	53%	148	148	29%	14%	43.7	3.12	27.0	1.93
SH	52%	474	474	29%	14%	54.5	3.89	37.2	2.66
EA	43%	431	431	40%	25%	50.3	3.59	37.7	2.69
OE	41%	155	155	39%	24%	38.0	2.71	28.2	2.01
QC	54%	811	811	59%	44%	99.4	7.10	78.5	5.61
QH	48%	440	440	30%	15%	57.8	4.13	38.5	2.75
QB	53%	157	157	51%	36%	86.6	6.19	66.2	4.73
Total	48%	3,361	3,361	39%	24%	63.0	4.50	46.3	3.31

Improvement of annual erosion rate is very limited only from 63.0 t/ha (4.5 mm) to 46.3 t/ha (3.31 mm) due to high bare soil ration even after protection. Due to severe deterioration of rangeland, bare land ratio is too high for protection, that is about 40% in average, and it remains at 24% even after protection. Bare land ratio is especially high in the vegetation zones, QC and QB, of which bare land ratios are 59% and 51% as shown in Table 10-6-4-2. It is strongly recommended to study and experiment on possibility of seeding in the steep rangeland from the technical and economic viewpoints.

(3) Gully Protection

In Zeras, gullies are severely developed not only in the steep slopes but also in the relatively flatter farmland. If no countermeasures are taken, they may become enlarged, cause landslides and fall into Karoon No.3 Reservoir, and eventually decrease the storage capacity of the Reservoir. It is difficult to protect gullies in the steep slopes by structural measures not only from the technical viewpoint but also from the economic viewpoint. However, erosion of those steep gullies seems to stop by the base rock or deposit of rocks and cobbles. Therefore, gully protection of this area is concentrated in the relatively flatter farmland below 20% inclination.

As shown in Table D-5-1-8, lengths of waterways in the farmland are measured at 2.80 km of 5 – 13% and 7.85 km of 13 – 20% inclination, totally 10.65 km. Loose-rock check dams are provided at 30 m interval in 5 – 13% and at 20 m interval in 13 – 20% inclination. It is proposed to provide 486 loose-rock check dams for protection of gullies in the farmland. By the provision of those check dams, the farmland of 293 ha with a slope less than 20 % will be protected from gully erosion. On the other hand, some large gullies are developed in the main outlet streams to the Karoon river and some of downstream villages are threatened. Such large gullies are to be protected by gabion type check dam by public works because the scale of gullies is too large for villagers to protect those.

Table 10-6-4-3 Summary of Soil Erosion Protection in Zeras

Development Stage Land Use	Present					Scenario-1					Area (ha) (+) (-)	Scenario-2								
	Slope	Crop	Conservation		Soil Loss		Area (ha)	Conservation		Soil Loss		Area (ha)	Conservation		Soil Loss					
			Facility	Slope L (m)	(t/ha)	(mm)		Facility	Slope L (m)	(t/ha)			(mm)	Facility	Slope L (m)	(t/ha)	(mm)			
Farmland																				
DFL (Dry Farmland)																				
1 5%-13%	123		Contour bund	225	6.7	0.48	123		Contour bund	225	6.7	0.48		123		Contour bund	225	6.7	0.48	
Wheat	85				4.6	0.33	85				4.6	0.33		85				4.6	0.33	
Fallow	38				11.4	0.81	38				11.4	0.81		38				11.4	0.81	
2 13%-20%	170				15.2	1.08	170				15.2	1.08		170				15.2	1.08	
Wheat	117		none	100	10.3	0.74	117		none	100	10.3	0.74		117		none	100	10.3	0.74	
D. Alfalfa	0				0.0	0.00	0				0.0	0.00		0				0.0	0.00	
Fallow	53				25.9	1.85	53				25.9	1.85		53				25.9	1.85	
3 20%-30%	464				28.2	2.01	464				15.4	1.10		464				15.4	1.10	
Wheat	320				19.2	1.37	320		Contour bund	30	10.5	0.75		320		Contour bund	30	10.5	0.75	
D. Alfalfa	0		none	100	0.0	0.00	0				0.0	0.00		0				0.0	0.00	
Fallow	144				48.1	3.44	144				26.4	1.89		144				26.4	1.89	
4 30%-40%	789				49.7	3.55	789				19.3	1.38		789				19.3	1.38	
Wheat	544		none	100	37.1	2.65	544		Contour bund	20	11.6	0.83		544		Contour bund	20	11.6	0.83	
D. Alfalfa	0				0.0	0.00	0				0.0	0.00	99	99				2.1	0.15	
Fallow	245				77.8	5.56	245				36.5	2.61	-99	146				36.5	2.61	
5 40%-50%	471				52.6	3.76	471				22.0	1.57		471				14.8	1.06	
Wheat	325		none	50	39.1	2.79	325		Vetiver c. bund	12.5	14.5	1.04		325		Vetiver c. bund	12.5	14.5	1.04	
D. Alfalfa	0				0.0	0.00	0				0.0	0.00	93	93				2.4	0.17	
Fallow	146				82.7	5.91	146				38.8	2.77	-93	53				38.8	2.77	
6 50%-	124				60.7	4.34	124				33.4	2.39		124				15.1	1.08	
Wheat	86		none	50	45.8	3.27	86		Vetiver c. bund	12.5	22.9	1.64	-57	29				45.8	3.27	
D. Alfalfa	0				0.0	0.00	0				0.0	0.00	95	95		none	50	5.7	0.41	
Fallow	38				94.5	6.75	38				57.3	4.09	-38	0				0.0	0.00	
Total	2,141				41.1	2.94	2,141				18.8	1.35		2,141				14.6	1.04	
Wheat	1,477				30.2	2.16	1,477				12.2	0.87	-57	1,420				12.2	0.87	
D. Alfalfa	0				0.0	0.00	0				0.0	0.00	287	287				3.4	0.24	
Fallow	664				65.4	4.67	664				33.7	2.41	-230	434				29.9	2.14	
Rangeland																				
Proposed Plan for Rangeland																				
AB 49%	529				70	50.4	3.60	529			70	35.1	2.51		529			70	35.1	2.51
AE 38%	216				30	25.1	1.79	216			30	17.4	1.24		216			30	17.4	1.24
AP 53%	148				50	43.7	3.12	148			50	27.0	1.93		148			50	27.0	1.93
SH 52%	474				75	54.5	3.89	474			75	37.2	2.66		474			75	37.2	2.66
EA 43%	431		none	70	50.3	3.59	431		Protection	70	37.7	2.69		431		Protection	70	37.7	2.69	
OE 41%	155				50	38.0	2.71	155			50	28.2	2.01		155			50	28.2	2.01
QC 54%	811				75	99.4	7.10	811			75	78.5	5.61		811			75	78.5	5.61
QH 48%	440				90	57.8	4.13	440			90	38.5	2.75		440			90	38.5	2.75
QB 53%	157				75	86.6	6.19	157			75	66.2	4.73		157			75	66.2	4.73
Total	3,361				65	63.0	4.50	3,361			65	46.3	3.31		3,361			65	46.3	3.31
Farmland	2,141				41.1	2.94	2,141				18.8	1.35		2,141				14.6	1.04	
Rangeland	3,361				63.0	4.50	3,361				46.3	3.31		3,361				46.3	3.31	
Sub-Total	5,502				54.5	3.89	5,502				35.6	2.54		5,502				34.0	2.43	
Village	21				0.0	0.00	21				0.0	0.00		21				0.0	0.00	
River Bed	126				0.0	0.00	126				0.0	0.00		126				0.0	0.00	
Rock	721				9.7	0.69	721				9.7	0.69		721				9.7	0.69	
Sub-Total	868				8.1	0.58	868				8.1	0.58		868				8.1	0.58	
Total	6,370				48.1	3.44	6,370				31.9	2.28		6,370				30.4	2.17	

Soil Erosion Protection Project

1,724	44.7	3.19	1,724	Contour bund	20m	19.0	1.36	1,724	Contour bund	20m	15.1	1.08
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(Note)

- 1) Detail analysis are in Table D-5-2-3(5) for Present, in Table D-5-2-9(5) for Scenario-1, in Table D-5-2-10(5) for Scenario-2.
- 2) Scenario-1 is based on same land use as present, and soil protection plan is prepared for it.
- 3) Scenario-2 is the Plan satisfying the Soil Protection Criteria. In order to satisfy the criteria, dry type alfalfa of 287 ha is introduced.
- 4) Most of farmland steeper than 50% slope is cropped with dry type alfalfa without contour bund in Scenario-2.

10.6.5 Rangeland Vegetation Improvement

Improvement of rangeland vegetation is carried out in order to mitigate over grazing and to protect soil from erosion. Considering the topography (sharp slope) and climatic (low rainfall) conditions and unusual encroachment of farmlands into natural vegetation, no structural measures (seed sowing) are undertaken in this sub basin.

In fact this area is deteriorated and prone to erosion, thus no livestock should move in. On the other hand by prohibiting the grazing in this area, the animals would rush to adjoining areas, causing serious *overgrazing and degradation, which is not the desire of a sustainable development*. So attempt will be made to improve the grazing areas and utilize them according to a rotational program.

The vegetation improvement works will start from places where vegetation has poor condition, decreasing trend and lowest production. Field works are entrusted to experienced local people, and donkeys do transport of required materials from village to field. To apply this sustainable utilization program, understanding and cooperation of all villages, particularly, Badelon, Dareh Sohrab, Dawodiha, Sartuf and Zeras is required.

In this sub basin total area of rangeland is 3,361 ha, most of which has poor condition, decreasing trend and low production. The pastoral vegetation is chiefly comprised of shrubs and forbs of low palatability. To remove this problem and create a situation for growth of grasses, protection and rotational utilization of rangeland is planned:

(1) Protection and Rotational Utilization Program

The rangeland is divided into 10 plots of 336 ha (3,361 ha/10 year) and each year one plot is protected, by assigning watchman, with a 24-hour watching schedule, to avoid illegal entry into the area. In consequent years, upon designation of a new plot, 90% of an old plot is opened to herds and 10% remain under protection to ensure *natural dispersion of seeds into area*. Entire rangeland will receive this treatment within 10 years. This program is applied with no time gap to increase the herbage production of rangeland and ensure regular natural dispersion of seeds into area. However protected area is 336 ha, whenever rangeland utilization norm (communal/village uses) does not permits, the practiced is performed in scattered smaller pieces, sum being 336.

Protection of 336 ha of rangeland will bring-about an increment of 25.2 tons in its herbage production. With protection in an average, an increment of 75 kg/ha is expected, so $336 \times 75 = 25,200$ kg (25.2 tons/year). In an average, present herbage production of rangeland is 190 kg/ha, which with project it would be 265 kg/ha (190+75). Moreover the improved vegetation will cover an additional 15% of

bare soil, contributing to prevention of soil erosion and conservation of the environment. Present land cover is 40.9%, with project it will reach to 55.9% (40.9+15).

(2) Establishment of Watering Points for Livestock

Karoon River occurs in this area, but livestock should walk some distance to reach the river. This walking is tiresome to animals, and cause trampling of soil, which leads to erosion. To avoid this movement and provide timely water to livestock, 3 watering points are established in localities with less accessibility to water sources. The watering point is a concreted structure of 7.00 m length, 1.50 m width and 0.30 m depth, in which 600 animal units can drink water in a day. An adult female goat weighing 40 kg is one animal unit. Average water requirement of an animal unit is 5 liters/day.

With provision of watering points an increase of 4.3 tons in meat production of livestock (in grazing season=120 days) is expected. It has been known that daily supply of water to a grazing animal will bring-about an increment of 0.04 kg/day in its weight, of which 50% is meat. About 1,800 animals are directly benefited from the established watering facilities, so $0.04 \times 120 \times 1,800 \times 0.5 = 4,320$ kg (4.3 tons) of meat.

10.6.6 Milk Processing and Marketing

Zeras is severely limited in water and land resources due to steep slopes and no adequate springs. The land is exposed to severe over grazing because of less vegetation due to bareness of rangeland and farmland. Increase of fodder crop production is the most urgent subject for mitigation of over grazing in this sub-basin as well as conversion of livestock to milk cow and introduction of milk processing in order to decrease dependence on sheep and goats. For feeding livestock and mitigating over grazing, it is necessary to promote restoration of rangeland vegetation as well as introduction of dry type alfalfa in the fallow farmland. Analyzing the areas' conditions based on the above development potentials and policies, development plans would be designed for promotion of milk processing and marketing during the medium-(10 years) and long-term (20 years) as follows. It is necessary to apply the participatory approach, establishment of groups & cooperatives and proper training & education by the government for promoting these development plans. The promotion of these development plans should be required the further feasibility study and detailed design study.

(1) Establishment of groups and cooperatives for milk processing center (medium-term)

a) Purpose:

To change to cow-grazing and to promote the sale of milk-processed products.

b) Participants:

A group should be established, whose members should grow cows and have intention for

development. Group should be set in a cooperative. The cooperative should be formed within each village, whose size should be as same level as Iran's administration.

c) Remarks for establishment of groups and cooperatives:

- i) Cooperative will be established in each village. The cooperative will be for multi-purpose cooperative having services of all kind activities for produces and sales of agriculture, livestock, fish culture, forestry, etc. All villagers will be expected to participate,
- ii) Group will be established within the cooperative. Group will be formed based on the produce, members of which would grow same products or have intension to grow same products,
- iii) To make up the regulations and general rules, members should be well known,
- iv) To conduct election for board of directors. To decide the term of directors, and
- v) To conduct the evaluation of productions and sales activities by using the multi-purpose training facilities.

d) Structural Measures:

- i) Size of facilities: To establish the collection and distribution facilities for processed milk products. Approx. 1.0 t/day for 200 head of local cows.
- ii) Form of facilities: It should be constructed using the suitable materials for this area and environment and taking into consideration the participatory scheme. Basically, main building material is brick.
- iii) Proposed villages: Behoz and Lir Siya Shapouri; 2 places (These villages have more than 100 heads of cow at present, however, it is required to collect milk from near by villages, if the village has less than 200 heads of cow.)
- iv) Required equipment, materials and facilities for one place:

- Building: made of brick, 100m ² ;	1 building
- Incidentals: water supply, electricity, latrine	1 set
- Tables: made of wood, 1,800x900x800mm;	2 units
- Chair: made of wood	4 pieces
- Vehicle: Pick-up (for 2t/day milk)	1 unit
with tank (plastic, 50 litre, 40 pieces)	
- Mixing machine: steel, for Kashk	2 units
- Land: relatively flat land with good access, 200m ²	

When the milk processing centers are established, one village will have benefit 112,270,000 Rials (≈511,000,000-398,730,000) or total 2 villages (141 households) will have benefit 224,540,000 Rials or 1,592,482 Rials per year per household.

10.6.7 Rural Water Supply Improvement

(1) Basic Concept

The rural water supply improvement plan is established based on the purpose as follows.

- To provide water supply system to every village in the area,
- To supply enough and hygienic water to villagers,
- To achieve water supply by Level II at least in every village,
- To enhance recognition of water supply service and sanitation.

Here, domestic water demand per capita is applied to be 180 liter/day/person also according to the suggestion by SED.

(2) Proposed Plan

Badelon, Dareh Sohrab, Dareh Zangi and Gard Lidan village depends on water supply from the oposit bank of Karoon River. The other villages depend on spring which yield is not sufficient and quality is not potable. Present water demand is 246 m³/day and water demand in 2020 is estimated at 423 m³/day. Then surplus water demand is 177 m³/day. In addition, it is necessary to supply potable water to villages which have no water supply system. That amount of water is estimated at 136 m³/day. Here, it is difficult to find other water source except Karoon River. Therefore it is proposed to construct new rural water supply system which depends on Karoon River. Water demands and capacities of distribution tanks are summarized as follows. Here, capacity of distribution tank is designed to be the volume of supply for 12 hours and 30 % spare.

Table 10-6-7-1 Proposed Water Demand and Distribution

Village	Population in 2001	Water Demand in 2001 (m ³ /day)	Population in 2020	Water Demand in 2020 (m ³ /day)	Proposed Water Demand (m ³ /day)	Proposed capacity of distribution Tank (m ³)
Ali Bandeh	11	1	11	2	2	1
Badelon	200	21	201	36	15	10
Bardkal	19	2	19	3	3	2
Behoz	410	43	411	74	74	48
Cham	42	4	42	8	8	5
Dareh Sohrab	120	13	120	22	9	6
Dareh Zangi	600	63	602	108	45	29
Dawodiha	275	29	276	50	50	32
Gard Lidan	125	13	125	23	9	6
Lir Siya Mozrom	10	1	10	2	2	1
Lir Siya Shapour	280	29	281	51	51	33
Sartuf	62	7	62	11	11	7
Sebalutak	70	7	70	13	13	8
Shahghaz	40	4	40	7	7	5
Zeras	80	8	80	14	14	9
Total	2,344	246	2,350	423	313	204

Intake of this water supply system is proposed to be constructed near Behoz and vertical shaft type is applied, because large fluctuation of Karoon No.3 dam reservoir is expected. Water is pumped up by submersible pump which total head is 1,000 m and yield is 45 m³/hr. This pump is operated in 12 hours per day. And also conveyance pipeline from Behoz to Dawdiha is planned. At Dawdiha, reservoir tank is constructed and water is delivered to distribution tank in each village by pipeline network in gravity. Projects are summarized as follows.

- Construction of pumping station and conveyance pipeline
 here, pump type and capacity : submersible pump, total head 1,000 m, yield 45 m³/hr
 intake : vertical shaft ϕ 300, depth 50 m
 conveyance pipeline : ϕ 125, length 8 km
- Construction of pipeline network : ϕ 50- ϕ 125, length 17 km
- Construction of reservoir tank (Capacity : 204 m³) 1 no.
- Expansion of distribution tanks and distribution pipes 15 nos.

Table 10-6-7-2 Proposed Plan for Water Supply

Village	Distribution Tank	Pipeline
Ali Bandeh	B 1.3 m x L 1.3 m x 3.0 m	PVC pipe ϕ 50, L=50 m
Badelon	B 2.4 m x L 2.4 m x 3.0 m	PVC pipe ϕ 50, L=50 m
Bardkal	B 1.5 m x L 1.5 m x 3.0 m	PVC pipe ϕ 50, L=50 m
Behoz	B 4.6 m x L 4.6 m x 3.0 m	PVC pipe ϕ 50, L=500 m
Cham	B 1.9 m x L 1.9 m x 3.0 m	PVC pipe ϕ 50, L=100 m
Dareh Sohrab	B 2.0 m x L 2.0 m x 3.0 m	PVC pipe ϕ 50, L=160 m
Dareh Zangi	B 3.7 m x L 3.7 m x 3.0 m	PVC pipe ϕ 50, L=800 m
Dawodiha	B 3.9 m x L 3.9 m x 3.0 m	PVC pipe ϕ 50, L=50 m
Gard Lidan	B 2.0 m x L 2.0 m x 3.0 m	PVC pipe ϕ 50, L=200 m
Lir Siya Mozrom	B 1.2 m x L 1.2 m x 3.0 m	PVC pipe ϕ 50, L=50 m
Lir Siya Shapour	B 3.9 m x L 3.9 m x 3.0 m	PVC pipe ϕ 50, L=400 m
Sartuf	B 2.2 m x L 2.2 m x 3.0 m	PVC pipe ϕ 50, L=80 m
Sebalutak	B 2.3 m x L 2.3 m x 3.0 m	PVC pipe ϕ 50, L=90 m
Shahghaz	B 1.9 m x L 1.9 m x 3.0 m	PVC pipe ϕ 50, L=50 m
Zeras	B 2.4 m x L 2.4 m x 3.0 m	PVC pipe ϕ 50, L=110 m

It is desirable to execute projects on the two stages aimed to 2010 and 2020. And it is recommended to study in detail design. RWWC will operate and maintain facilities and collect water charge in cooperation with PIC. In addition, PIC will enhance villagers to recognize water charge system and desirable water use. By these projects, necessary potable water will be provided to the villagers.

10.6.8 Rural Road Improvement

(1) Basic Concept

The rural road improvement plan is established based on the purpose described below:

- To improve, rehabilitate and construct rural roads for easy access to other villages and market,
- To keep stability of access especially in winter by provision of pavement, drainage facilities, river crossing and others,
- To strengthen participate group by providing knowledge and skill about maintenance of road and appurtenance facilities.

(2) Proposed Plan

There is only one road with asphalt pavement. This road passes through the middle of area and reaches to the bridge constructed over Karoon River. However, almost all of roads are unpaved and are damaged by flush of water in many places. Especially, the road connecting Ali Bandeh, Behoz and Dawodiha is heavily damaged. Then it is planned to improve roads with gravel pavement in the consideration of frequent damage by landslide in the future. Widths of road and pavement are designed to be 4 m and 3 m respectively. In addition, it is possible to consider that main reason of damage is defective condition of side ditch and crossing facilities. Then drain system by side drain and crossing facilities should be strengthened with concrete.

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- Improvement of road with gravel pavement

here,	route from Dawdiha to Behoz and Ali Bandeh	10 km
	route from Conjunction of Dawodiha Highway to Cham, Badelon and Gard Lidan	13 km
	access route to Zeras	2 km
	access route to Sebalutak	2 km
- Transfer of technology for maintenance of road and side drain 5 years
- Construction and maintenance of farm road by farmers 285 km

10.6.9 Establishment of Cooperatives

Analyzing the areas' conditions based on the above development potentials and policics, development plans would be designed for handicraft during the short-term (5 years) and for changing to cow

grazing during the medium-(10 years) and long-term (20 years) as follows. It is necessary to apply the participatory approach, establishment of groups & cooperatives and proper training & education by the government for promoting these development plans. The promotion of these development plans should be required the further feasibility study and detailed design study.

- ① Establishment of groups and cooperatives for handicraft: short-term
- ② Establishment of multi-purpose training center: short-term
- ③ Training and education plan by government: short-, medium-term
- ④ Others (for formerly mentioned plan: establishment of groups and cooperatives for milk processing center)

(1) Establishment of groups and cooperatives for handicraft (short-term)

a) Purpose:

To emphasize villagers and promote the sale of produces and processed products made of and from raw materials grown in this area.

b) Participants:

A group should be established, whose members should grow the raw materials and have intention for development. Group should be set in a cooperative. The cooperative should be formed within each village, whose size should be as same level as that of Iran's administration.

c) Remarks for establishment of groups and cooperatives:

- i) Cooperative will be established in each village. The cooperative will be for multi-purpose cooperative having services of all kind activities for produces and sales of agriculture, livestock, fish culture, forestry, etc. All villagers will be expected to participate,
- ii) Group will be established within the cooperative. Group will be formed based on the produce, members of which would grow same products or have intension to grow same products,
- iii) To make up the regulations and general rules, members should be well known,
- iv) To conduct election for board of directors. To decide the term of directors, and
- v) To conduct the evaluation of productions and sales activities by using the multi-purpose training facilities.

d) Structural measures:

- i) Size of group: It will be set that one unit is 100 households in village. Size of group is of 20 members within the said village.
- ii) Proposed villages: Badelon, Behoz, Dareh Sohrab and Dawodiha; 4 places
- iii) Required equipment, materials and facilities for one place (In case of production of gilim

and carpet):

- Horizontal weaving machine: 2m x 3m; 5 units
- Vertical weaving machine: 2m x 3m; 5 units
- Building: made of brick, 100m²; 1 building
- Land: relatively flat land with good access, 200m²

However, in case of establishing multi-purpose training facilities, it should be used the said facilities for it.

(2) Establishment of multi-purpose training center (short-term)

a) Purpose:

To promote villagers, groups members for production and sales by area's processing and handicraft activities as well as to train and educate them for area's development.

b) Size of facilities:

Participants would be group members, cooperative members and villagers. If all villagers will happen to attend the meetings, a school or other larger place would be selected as venue. The standard size of multi-purpose training facilities should be for 50 persons. Facilities include building and play-yard.

c) Remarks for establishment of multi-purpose training facilities:

- i) To be established by villagers' participatory scheme,
- ii) To use the raw materials which is produced in this area and/or usually used in this area,
- iii) Size of facilities should be taken suitable for size of group and cooperative,
- iv) After constructed the facilities, regulation for usage should be made up and users should be well known, and
- v) A housekeeper would conduct the activities of operation and maintenance. The housekeeper should be selected by election.

d) Structural measures:

- i) Size of facilities: Based on one village 100 households, required multi-purpose facilities to be constructed will be as large for 50 persons. Approx. 50m².
- ii) Form of building: It should be constructed using the suitable materials for this area and environment and taking into consideration the participatory scheme. Basically, main building material is brick.
- iii) Proposed villages: Behoz, Dareh Zangi and Lir Siya Shapouri; 3 places
- iv) Required equipment, materials and facilities for one place:
 - Building: made of brick, 100m²; 1 building
 - Tables: made of wood, 1,800x1,200x800mm; 10 units

- Chair: made of wood 30 pieces
- Incidentals: water supply, electricity, latrine 1 set
- Land: relatively flat land with good access, 200m²

(3) Training and education plan by government (short-, medium-term)

a) Purpose:

To instruct, train, educate and transfer the technology to group and cooperative members and villagers for development of areas.

b) Extension service organization:

To improve the organization so as to be able to instruct, train, educate and transfer the technology to group and cooperative members and villagers.

c) Remarks for organization of extension service:

- i) To take the participatory scheme. To act with villagers from the beginning of plan formulation,
- ii) To improve the township level organization taking into consideration the area's conditions,
- iii) To establish each crop group for training and education and to conduct together with section in charge,
- iv) To train and educate the members of groups and cooperatives, villagers or villagers in several villages, and
- v) To promote the trained group members so that they will train and educate the other members within the groups.

d) Structural measures: None.

Each plan is basically independent. However, there would be rooms for reciprocal affection or common usage. Development plan should be implemented step by step. Suitable development could be led by conducting the monitoring, evaluation and feed back step by step taking into consideration the levels and situations of around development.

10.6.10 Community Enhancement

(1) Purpose

Community enhancement plays a key role to realize sustainable development in the Master Plan Areas. To maintain expected effect of the development project, villager's participation in the development process is quite important. Purposes of the community enhancement are as follows;

- a) To promote villager's participation in the projects implementation,

- b) To build up villager's mind for mutual aid, and capability against natural disasters,
- c) To strengthen villager's living environment.

(2) Organizing Villagers

To realize above purposes, village organization is planned to establish. Relevant government organizations, both in central and local levels, have to facilitate the establishment of the village organization, in cooperation with Village Islamic Councils. Village Islamic Council is positioned in the lowest level of administrative hierarchy in Iran, and is helpful to promote villager's participation. All villagers are naturally member of the village organization. But, the member of the organization should be formed case by case, based on the purpose of the project. Such type of project as profitable and, therefore, villager have to bear a part of project cost, should be organized by those villagers who have a willingness to the development. Followings are procedure for establishment of village organization.

- a) Relevant government organization, both in central and local government, establish committee for M/P project which promote implementation of proposed projects and facilitate the establishment of village organization.
- b) The government committee holds meeting with representatives of Village Islamic Councils to explain the project purpose, project components, implementation method, etc.
- c) Representatives of Village Islamic Council hold small meeting at each villages to explain outline of the project.
- d) The government committee facilitates to establish villager's organization based on the villager's willingness to participation in the project.
- e) The village organization discusses and establishes organizational structure, rules and regulations of operation, detail plan for participation in the project, etc., under the support by the government committee and Village Islamic Councils.

(3) Remarks of Establishment of Village Organization

- a) All villagers are naturally member of the village organization. Number of household in each villages are as follows.

Table 10-6-10-1 Number of village and household in Zeras

No.	Village Name	Household	No.	Village Name	Household
1	Ali Bandeh	1	9	Gard Lidan	25
2	Badelon	30	10	Lir Siya Mozrom	1
3	Bardkal	3	11	Lir Siya Shapouri	56
4	Behoz	85	12	Srtuf	12
5	Cham	7	13	Sebalutak	10
6	Dareh Sohrab	20	14	Shahghaz	6
7	Dareh Zangi	120	15	Zeras	15
8	Dawodiha	42	—	—	—

Source: Village Survey, August 2001.

- b) The member of organization should be formed in accordance with component of the project. It is quite important that those villagers who have a will to participate into the development project organize the village organization.
- c) Project Coordination Committee should facilitate establishment of the village organization in cooperation with Village Islamic Council. The council is helpful to promote villager's participation, and to establish rules and regulations of the organization, and to arbitrate villager's conflict if it happens,
- d) Participatory approach should be taken into consideration at the beginning of the establishment. It is recommended to hold workshop to pull out villager's frank opinion when plan of operation and monitoring are formulated by villagers themselves,
- e) Selected leader will manage and coordinate communal activities, and to communicate with relevant officers from local and/or central government,
- f) At the time of establishment of rules and regulation, including account system, general meeting should be held with all members' participation. It is quite important that all villagers participate in the decision making of important issue. Such issue as member's rights, duties, and penal regulation are also the matter of general meeting,
- g) All villagers in the organization, including member of Village Islamic Council, should have a vote as an individual right of members. It is important that all members have equal right to participate in their decision-making.
- h) Leadership training, organized by rural government officers, should be provided to the leaders of organization, so that they could train and educate the other members within the organization, and
- i) Meeting with other near village organizations should be regularly scheduled under the leadership of the rural government officers. Important issue among village organization should be discussed in an open forum.

(4) Facility

Multi-purpose training center, which is proposed in the project for establishment of cooperative, will be available to used for the activities of village organization. The center will be established in those villages where more than 50 households live in, and 3 villages in the project area, Behoz, Dareh Zangi, and Lir Siya Shapouri, meet the condition. Other 9 village organizations should use the multi-purpose training center in the neighboring villages or other communal facilities. Notice board should be established in these villages to provide such information as date and kinds of disaster drills, extension services, etc. to all villagers. In case all villagers will happen to attend the meetings, a school or other larger place located inside or outside of village should be selected as venue.

(5) Activities

Activities of village organization should be planned and implemented through discussion among

members in the organization. Followings are basic activities to attain the purpose of community enhancement.

Participation in implementation, operation and maintenance of the projects in cooperation with local and/or central government.

Participation in monitoring and evaluation of the projects in corporation with relevant government officers,

- a) Participation in enlightenment activities against disasters such as landslide, and soil erosion. Enlightenment activities will be carried out at least once after flood season. Relocation of village is proposed to Lir shia shapouri village, and this kind of matter should be discussed among the village organizations to build up mutual aid system in the project area.
- b) Promotion of health services and nutritional education, environmental education such as fuel consumption.
- c) Meeting with other village organizations and relevant government organization to exchange information and experience which obtain through the projects.

Community enhancement will be promoted step by step in the process of project implementation. Relevant government organization, especially in the provincial levers, should assist and facilitate the enhancement of the village organization. There are three steps in the process of the project implementation to enhance function of the village organization.

First step is at the beginning of the project implementation, and the village organization will be established based on the villager's willingness to participation in the projects. All members belong to the village organization will participate in the decision making process of their organization, and participate in the activities of the organization. Through these activities, a sense of participation will be formulated.

At the time of commencement of the project, plan of operations and detail activities of the villager are already designed by the government. The village organization, therefore, just receive the planned project. It should be noted that some of the members of village organization is dubious about for the result and effect of the project. The government officers have to make close communication with the village organization and build up intimate relations with them.

Second step is at the time of monitoring of the project. In the monitoring activities, villagers grasp the problem faced in the project implementation, and discuss how overcome the problems. The results of the monitoring are put into next activities. The village organization reviews their activities and improves their original plan by themselves. Through these activities, villagers can formulate and enhance a sense of ownership for the development projects.

Third step is at the time of completion of the project. At this time, government organization will hold the workshop for project evaluation under participation by village organization. The result of the project evaluation will be put into the next project activities. The village organization will choice next activity among the master plan projects, or will make new project plan based on their willingness to development. The government organization for project implementation have to support and facilitate villager' selection of next activities.

10.6.11 Increment of Household Income and Job Creation

Increasing household income and job opportunity is one of the most important matters in the villages in the Study Areas. Development plan will include the contents of increasing household income and job creation. These, in case of being fully developed, are shown as income generating activities below:

Table 10-6-11-1 Job Creation and Yearly Income Increment (with plan, fully developed)

Items	Job Creation (number)	Income Increment (Rials)	Increased income per household or person (Rials/H H or person)
Milk processing center (2 villages)	141 households	224,540,000	1,592,482 per h.h.
	10 operators	64,750,000	6,475,000 per p.
Handicraft facilities (4 places)	80 members	101,720,000	1,271,500 per p.
	80 weavers	96,000,000	1,200,000 per p.

Note: Details are referred to ANNEX L Economic and Financial Evaluation, Annual O/M Cost and Value of Output.