

# **FINAL REPORT**

## **ON**

### ***ASSOCIATION OF WOMEN FOR WASTELAND DEVELOPMENT IN KEIBI TARETKHUL VILLAGE, IMPHAL (EAST) DISTRICT, MANIPUR***

**Submitted to:**

**Department of Science & Technology  
Government of India, Technology Bhavan  
New Mehrauli Road, New Delhi-16**

**Implementing Institute**

**Manipur Science & Technology Council  
Central Jail Road, Imphal – 795 001**

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1. Title of the project : *Association Of Women For Wasteland Development In Keibi Taretkhul Village, Imphal (East) District, Manipur.*
2. Principal Investigator : Shri Th. Surendranath Singh  
Manipur Science & Technology Council  
Central Jail Road, Imphal
3. Implementing Institution : Manipur Science & Technology Council  
Central Jail Road, Imphal
4. Date of commencement : 20.4.1999
5. Date of completion : 19.4.2003.
6. Duration of the project : 4(four) years.
7. *Sanction Order No. & Date :*
8. **Summary of the project:**

Implementation of this project started on April 99. The beneficiary women groups are divided into two groups of beneficiaries such as

- A) Keibi Taretkhul Awang Leikai and
- B) Keibi Taretkhul Makha Leikai (Shown in the List of Beneficiaries).

The place is about 20 km from Imphal city, Manipur. The decision for implementation was done after many meetings with the villagers at the time of the project proposal.

The women beneficiaries were trained how to raise the nursery and its management. They raised nurseries under the direct supervision of project supervisor and 97% approximately alive. The full-grown seedlings about 70cm height at about 140 days old were transplanted during September 99. The plantation was made under the supervision of project supervisor; the transplanted seedlings are adapted to the new soil of the hill slopes.

As per recent visit of the project site by the Principal Investigator and Field Supervisor, it has been confirmed that 50% of the plants are found alive. The survivability rate of 50% was due to social fencing. These days, villagers have been protecting from wild fire (Lammei Thaba) and free assessment of cattle grazing in the project sites.

**9. Project Site:**

The project site is situated in the north eastern side of the Imphal city. Manipur lies between latitude 25°30' 45" North and longitude 93°10'5" and 94°35'55" East.

Climate : Both tropical and sub tropical.

Annual rainfall : 1452 mm

Temperature range : 0° to 36° Celcius.

Altitude : 1092m to 1166m above the msl in the project site.

**10. Objectives:**

- i) To make awareness amongst the villagers for ecological imbalance due to mass cutting down trees, burning of planted trees for charcoal and cultivation.
- ii) To impart technical knowledge to prevent the increasing expansion of wasteland through classroom type teaching, field works, film shows, etc.
- iii) To inject needs of teamwork for a successful result with direct involvement of the women beneficiaries.
- iv) To make the area evergreen and nature friendly through afforestation
- v) To supplement income through plantation and nursery seedlings.
- vi) The produces of the branches of the trees and fruits can be acquired by the village authority for their common uses.
- vii) Involving women's group/association in the programme.
- viii) Utilising of degraded land for plantation of trees over the next 3 years to reclaim the degraded community reserved land.

**11. Methodology:**

The project area 150 ha should be upgraded with afforestation. Due to the adequate rains in the rainy season except occasional watering, irrigation is not needed for nursery and plantation. The plants are adapted to the new soil of the hill slopes. The records concerning about wasteland were obtained from the satellite imageries with topo maps followed by spot verification by the applicant agency. Site selection for the project proposal was made on the basis of the degree of social and economic commitment shown by the villagers.

The project was initiated after giving all the technical knowledge. A field supervisor was appointed on 20th April 99 to supervise the maintenance of nurseries, transplanting, imparting technical knowledge about afforestation, distribution of wages and other supervisory works etc.

## 12. Research Achievements:

### Social achievements:-

- \* Pre awareness camp, meeting in the initial stage of nursery raising.
- \* Scientific know-how of nursery raising and its maintenance.
- \* Problems and remedies about the work.
- \* They get the economic return as wages for nursery raising @ Rs 2.50 per seedling of 52,000 nos. and plantation of full-grown seedling @ Rs 3.00 per plant of 47,500 nos.
- \* They get knowledge about environmental hazards and its sorrows through awareness camp as well as day-to-day deliberation during field visit of the field supervisor. And they get the knowledge and started thinking for checking of environmental degradation.
- \* They automatically acquired the idea of agroforestry for both economic returns as well as the protection of environmental degradation, which is very much scientific idea for wasteland developments.
- \* They hope for fruits from the fruit trees and silk from the oak trees.

## 13. Physical Achievements:

Selected species for growing are as hereunder:-

	<u>No. of plants</u>	<u>Area</u>	<u>Spacing</u>	<u>Plants per ha</u>
i. Jack fruit	: 4,000	50.6 ha	12mx12m	79
ii. Tree bean	: 4,000	12.5 ha	6mx6m	318
iii. Amla	: 4,000	08.6 ha	5mx5m	460
iv. Oak	:35,500	49.3 ha	4mx4m	719
<b>Total</b>	<b>:47,500</b>	<b>120.0 ha</b>		

Note:- Plant species, Plant population, Planting system and Spacing according to original approved proposal are as under:-

	<u>No. of plants :</u>	<u>Spacing :</u>	<u>Plants per ha.</u>
i. Jack fruit (Artocarpus heterophyllus)	4,000	10mx10m	100
ii. Tree bean (Perkia roxburghii)	11,000	6mx6m	275
iii. Amla (Phyllanthus emblica)	12,000	5mx5m	400
iv. Oak (Quercus spp.)	6,250	4mx4m	625
v. Acacia (Acacia auriculiformis)	8,000	4mx4m	400
vi. Citrus (Citrus lemon) Total	6,250 47,500	4mx4m	625

Acacia and citrus are not planted due to the unavailability of seeds. The plant spacing of Jackfruit is modified to 12mx12m according to T.K. Bose and S.K Mitra, Department of Horticulture, Bidhan Chandra Krishi Vishwa Vidyalaya, Kalyani.

Again the recommended square system of the former is modified to the contour line, contour triangle and hexagonal system which increases the plant population to 15%. Nurseries are started to raise from 25th April 1999 to just before transplanting i.e., 140 days.

#### 14. Plantation :

- \* Seedlings are transported to the hill slopes by bullock carts, carrying on heads with the help of baskets and carrying on the backs with towels etc.
- \* Seedlings are transplanted on 11th of Sept. to 28th Sept. 99 in the system of contour line, contour triangle and hexagonal system of plantation to get the maximum plant population and checking soil erosion/gully control of the hill slopes.
- \* 90% of the transplanted seedlings are alive and adapted to the soils of the hill slopes.

- \* The approximate areas of the project site in aggregation as under:

**Kaborok	-	32 ha
**Thangjinghoubi	-	10 ha
**Urireirom Makhong	-	08 ha
**Heiyai Houbi	-	10 ha
**Sonupi	-	10 ha
**Laiphabam	-	06 ha
**Lamboiching	-	14 ha
**Heidrok	-	14 ha
**Heikak Ching	-	14 ha
<b>Total covered area</b>	<b>-</b>	<b>120 ha</b>

**16. Awareness camps:**

A no. of camps have been organized for –

- \* controlling, protection of the planted trees from cattle and other unwanted activities like wild fire;
- \* pruning of the planted trees;
- \* observation of the progress of the growths, mortality and casual replacement;
- \* undisturbed the natural upraising of water resistant perennial grassy vegetative covering on the gullies;
- \* gully plugs and soil erosion reclamation works.
- \* Techniques and accurate practices of agro forestry for economic returns as well as checking ecological imbalances.
- \* Planting for filler crops for congested land utilisation.
- \* Leguminous crops for increasing nitrogen content in the soil is suggested for planting among the inter spaces of the tree plants.
- \* Social fencing for the plant protection is suggested.

**17. Soil:-**

Soil is laterite soil, loamy red soil and clay loam soil are available, humus is also present. Laterite soil- clay formed by weathering of rocks in a tropical climate composed chiefly of iron and aluminum hydroxide. It is residual clay formed under tropical climatic conditions by the weathering of igneous rocks, usually of basic composition. Consists chiefly of hydroxides of iron and aluminum. It contains a high percentage of iron and aluminium oxides. It is reddish brownish or yellowish in color. The degree of soil acidity is of pH value ranges from 6.6 to 7.1 which is almost neutral but tending to acidity because the neutral is at pH value 7.

**18. Planting System ;**

Contour line system of planting, contour triangle, hexagonal system of plantation have been made.

**19. Mode of erosion:**

- \* Sheet erosion-Erosion of thin covering of the soil surface by means of rain drops and run off of water
- \* Rill erosion- when the sheet erosion is not checked rill erosion is occurred. Minute finer shaped grooves that are occurred in this stage such thin channeling is seen towards formation of rill erosion.

- Gully erosion -When the rill erosion is not checked the small channels become wider and deeper which may assume huge size. This shall form gully erosion.

= > Now the above erosions have been checked to certain extent.

## 20. Method of checking :

- \* Mulching:- Whether straw leaves or pebbles covering on the soil surface to suppress the growth of weeds or to reduce fluctuation of soil temperature and soil moisture content may be said to be wide mulch. Wide mulch covering are practiced for checking erosion, to reduce evaporation, increase infiltration, to prevent weeds and to improve soil structure etc.
- \* Growing of perennial/annual grasses: - Some grasses like Para grass (*Brachria mutica*) used as fodder and water resistant perennial habit, guinea grass (*Panicum maximum*, Fam Grammineae) time of planting is March to August) Thatch grass (*Imperata cylindrica*, Fam Gramineae), Lemon grass (*Cymbopogon* spp.), Doop grass (*Cynodon dactylon*) which are draught and waterlog resistance fodder plants are grown on the hill slopes and foothills.
- \* Making of brush wood dams and diversion channels are made and the diversion contour trenches are at the end are curved upwards to increase the rate of infiltration.
- \* Contour hedge: - Plants are grown as contour hedges at the distance of 20.m or more apart are made.
- \* Contour furrows:- Contour furrows about 1-2 m. apart are made on the hill slopes to increase the infiltration rate and perennial grasses are planted alongwith the furrows to increase the rate of vegetative cover. Making of brush wood dams at favorable gaps to get slower the flow of the current so that the infiltration rate will be increased. Then the erosion by the action of the water force are reduced and again the roots of the swallow depths are not disturbed to take out of the top soil of degraded land for plantation of trees.



## 21. Commercial Application:

- \* Jack fruits and Tree bean pods are easily marketable in the domestic markets.
- \* Amla fruits and its pickles are profitably marketable in domestic and foreign markets.
- \* Oak tasar silk is a good item for commercial application as the produce can profitably be marketed in domestic and foreign markets.

## 22. Earth Dams/Gully Plugs

As a part of soil erosion control and soil moisture conservation measures, it has been identified 5(five) gullies and checked with earth dams/brush wood dams at the following places:

### a) Earth Dam/Gully

i)	Sonupi	5' width range	i) Gully control
ii)	Water Supply Makha	5' width range	@Rs.4000/- each
iii)	Heiyaihoubi	6' width range	
iv)	Khoknembi	4'width range	ii) Vegetated/Grass
v)	Kaborok	5' width range	waterways
			@Rs. 4,000/- each

## 23. Expected results:

It is known that roots of standing trees serve as sponge which release water gradually and perennially. Several lakhs of tonnes of woods are removed annually as fuel and timber could exist the disaster and fragile eco-system. On completion of the project, we shall have a demonstrable wasteland developed side due to regular awareness conducted systematically so as to make the beneficiaries consciously co-operate and participate in the implementation of conservative schemes taken up to save the land and water resources.

Following may be the expected results:

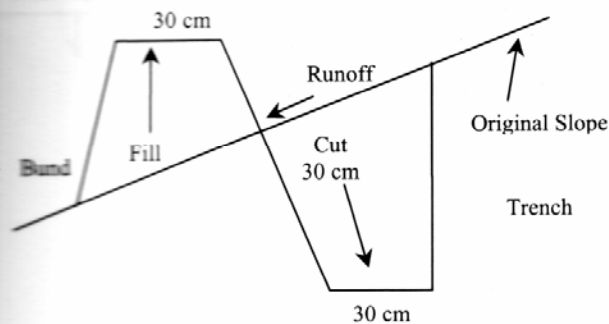
- a) Regeneration of the depleted soil.
- b) Proper land use system in the hills of the project area.
- c) Adoption of hexagonal plantation techniques in the hill slopes for more plantations cover and control gullies in the hill slopes.
- d) Well versed in nursery raising techniques.
- e) Profitable returned from the fruits of the trees
- f) Enough fuel wood stock in the area

- g) Minimum irrigation facilities from the check dams which were absent before implementation of the project.
- h) Motivation of women and giving them a sustained occupation will prove the project successful.

## **Soil Conservation Measure**

The following soil and moisture conservations measures/structures are taken up under the project "Association of Women for Wasteland Development in Keibi Taretkhul Village of Imphal (East), Manipur".

### **1. Contour trenching**



It reduces runoff and conserve moisture, thus helping the establishment and growth of trees.

Spacing adopted is 7.5 to 9 m in the hill slopes.

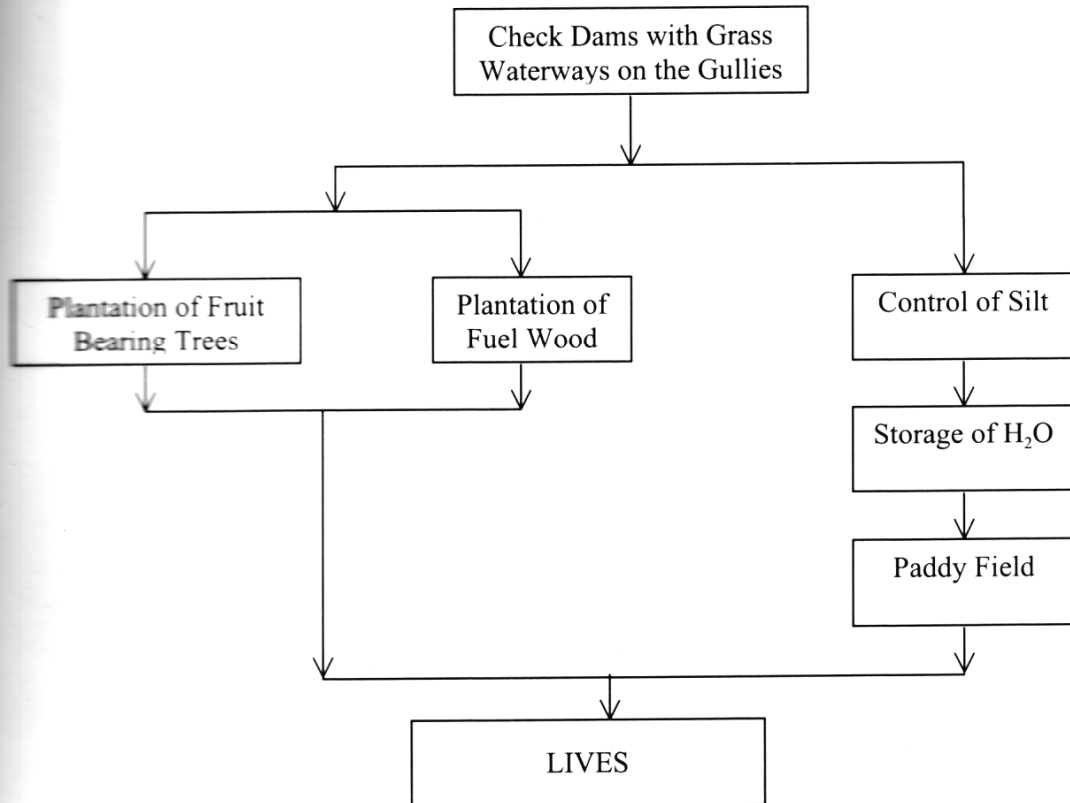
### **2. Vegetated/Grass Waterways**

It checks runoff thereby reducing soil erosion and conserving moisture in the channels/gullies. Any water resistant perennial grass species have been conserved in the channels.

### **3. Temporary Gully Control Structure**

Small and temporary barriers such as Wooven Wire Dam, Brush Dam, Loose Rock Dam, Plank Dam etc. which have been constructed with locally available materials are recommended for construction in the gullies/streams for checking the runoff velocity.

26. Check Dams for gullies control:



#### **A - Keibi – Taretkhul Awang Leikai.**

1. Th. Premi Chanu
2. Th. Thoibi
3. M. Inao Chanu
4. Th. Sumati
5. Th. Chandramukhi
6. S. Tammu
7. M. Ruhini
8. M. Ibethoibi
9. M. Ningthembi
10. M. Kullapati
11. M. Bembem
12. S. Lata
13. S. Prabha
14. S. Panthoi
15. S. Sanajaobi
16. S. Angoou
17. Th. Memton
18. M.Yaima
19. M. Subadani
20. S. Sumati
21. S. Sanahanbi
22. Mayengbam Bembem
23. Soibam Banoka
24. Soibam Ekashini
25. Moirangthem Rashitombi
26. Thiyam Thoibi
27. Soibam Sanajaobi
28. Soibam Lata
29. Soibam Thadoi
30. Soibam Ibem
31. Ch. Kundalei
32. Soibam Maipakpi
33. Soibam Pakpi
34. S. Ibetombi
35. Th. Mema

#### **B - Keibi – Taretkhul Makha Leikai**

1. Thangjam Nani
2. Ayekpam Sanahanbi
3. Thangjam Bimola
4. Thangjam Ibeyaima
5. Ayekpam Thoibi
6. Wahengbam Nganthoi
7. Longjam Panthoi
8. Longjam Hemabati
9. Longjam Memcha
10. Longjam Pramo
11. Abujam Tombirei (Macha)
12. Abujam Hemolata
13. Abujam Tombirei (Achoubi)
14. Hijam Kamala
15. Khaidem Itobi
16. Yumnam Khomdon
17. Ningthoukhongjam Nungsitombi
18. Ningthoukhongjam Bembem
19. Ningthoukhongjam Mema
20. Okram Bina.
21. Laishram Landhoni
22. Thangjam Pishak
23. Thangjam Ibeyai
24. Thangjam Mema
25. Thangjam Keinahanbi
26. Thangjam Borkeina
27. Khuraijam Rashi
28. Khuraijam Ibeyai
29. Khuraijam Moirang
30. Thangjam Abem
31. Sagolsem Apabi
32. Khuraijam Nungshirei
33. Sagolsem Sana
34. Sagolsem Ngangbiton
35. Sagolsem Premita
36. Sagolsem Shanti
37. Irengbam Tombi
38. Elangbam Thoinu
39. Yambem Ibemhal
40. Yambem Ibemcha
41. Ningthoukhongjam Santi
42. Ningthoukhongjam Ahanbi
43. Ningthoukhongjam Memcha
44. Ngariyanbam borni
45. Ngariyanbam Ahanbi
46. Sagolsem Memcha
47. Longjam Lohini
48. Longjam Bijenti
49. Laishram Memi
50. Laishram Ibemma
51. Laishram Piolata
52. Laishram Thambal

53. Laishram Inaobi
54. Laishram Rani
55. Laishram Muktarei
56. Thangjam Ashalata
57. Ningthoujam Kumari
58. Thounaojam Tombi
59. Thounaojam Maloti
60. Thounaojam Ibeyai
61. Thounaojam Lagini
62. Thounaojam Ichal
63. Thounaojam Chaobi
64. Athokpam Ibemhal
65. Athokpam Keinahanbi
66. Ngangbam Mukhi
67. Ngangbam Chaobi
68. Ngangbam Chamu
69. Ningthoukhongjam Khombi
70. Ningthoukhongjam Memchoubi
71. Ningthoukhongjam Ibecha
72. Ningthoukhongjam Ibeton
73. Ningthoukhongjam Chaoba
74. Ningthoukhongjam Paotombi
75. Ningthoukhongjam Thoibi
76. Ningthoukhongjam Petori
77. Ningthoukhongjam Tombimacha
78. Ningthoukhongjam Chombi
79. Ningthoukhongjam Yaima
80. Thangjam Radhamani
81. Ningthoukhongjam Memcha
82. Kangabam Khomdonbi
83. Kangabam Rani
84. Kangabam Gita
85. Kangabam Jati
86. Kangabam Mikoi
87. Longjam Bunesha
88. Pheiroijam Radhamani
89. Abujam Shundari
90. Abujam Sangita
91. Abujam Leibaklei
92. Abujam Romashini
93. Khaidem Menaocha
94. Laishram Mema
95. Thangjam Khambiton
96. Thangjam Ashalata
97. Gurumayum Amushana
98. Abujam Rani
99. Abujam Tamphamani
100. Ayekpam Ibema
101. Ayekpam Panibala
102. Abujam Shakhi
103. Abujam Sabitri
104. Thoudam Bimola
105. Thoudam Tamabati
106. Thounaojam Khambiton
107. Ningthoujam Manglembi
108. Ningthoujam Manglembi
109. Longjam Inaotombi
110. Ningthoukhongjam Chansana
111. Tayenjam Meratombi
112. Tayenjam Yumshangbi
113. Ngangbam Tombirei
114. Ngangbam sobita
115. Ngangbam Hanbi
116. thangjam Hanbi
117. Ngangbam Momon
118. Ngariyanbam Bimola
119. Yambem Ngoubi
120. Yambem Ngoubi
121. Laishram Naocha
122. Laishram Nungsisana
123. Abujam Apabi



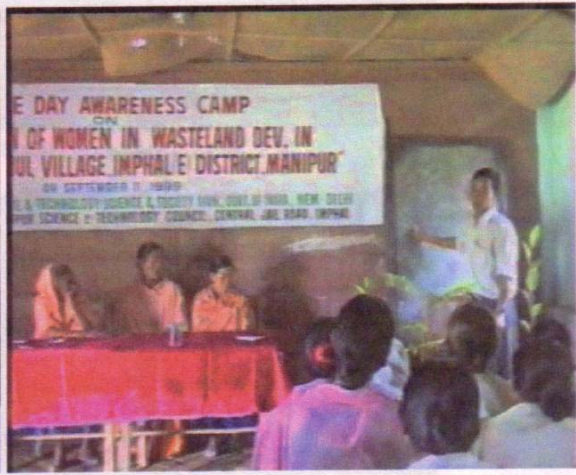
Full grown nurseries

**Site Preparation**



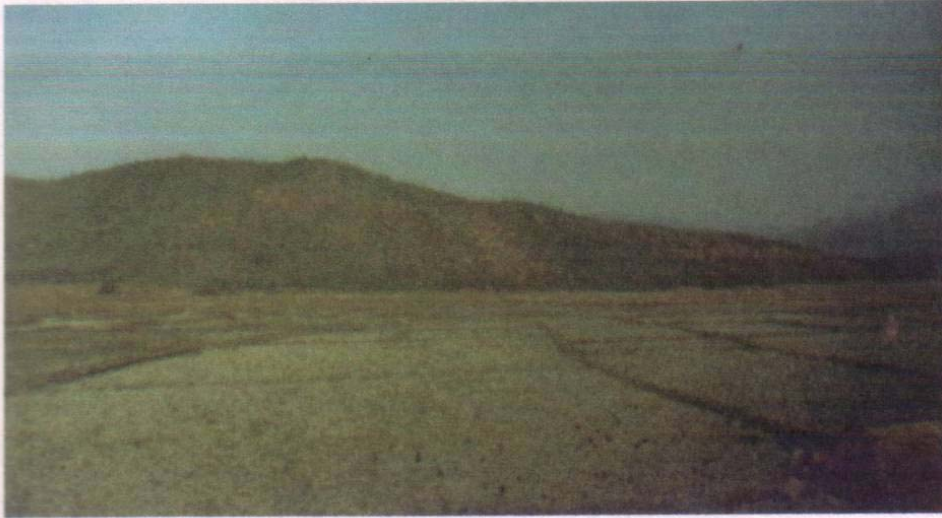


**Full grown nurseries**

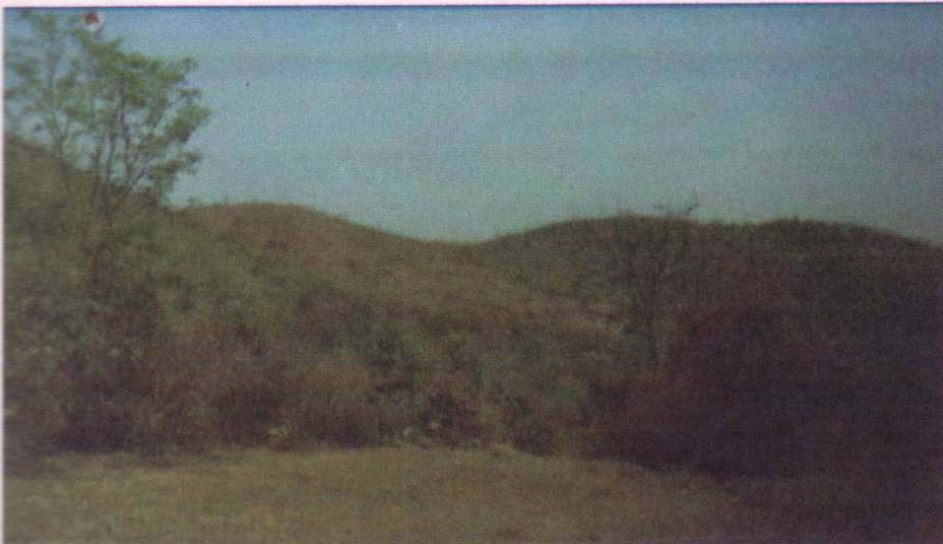


Awareness Camp





Pre Implementation (project site)



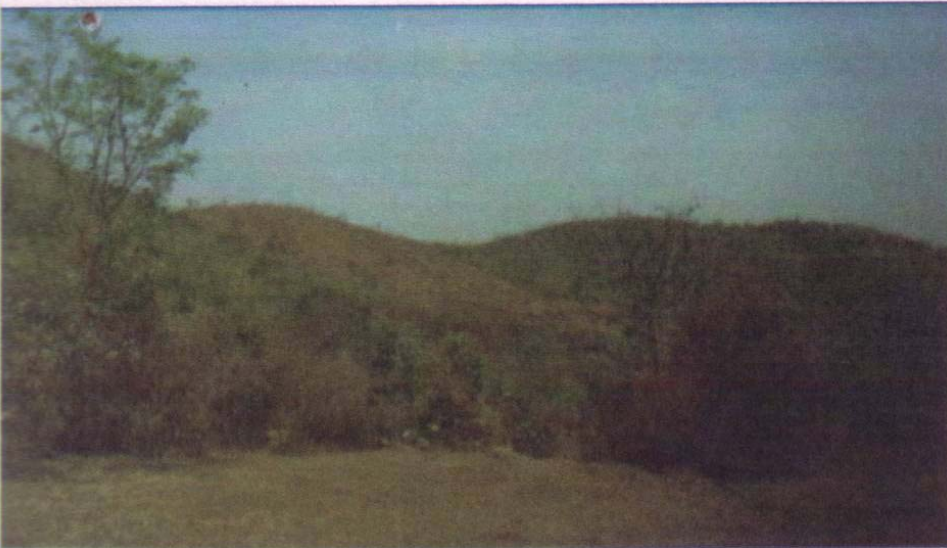
During Implementation ( project site )



After Implementation (project site)



Pre Implementation (project site)



During Implementation ( project site )



After Implementation (project site)