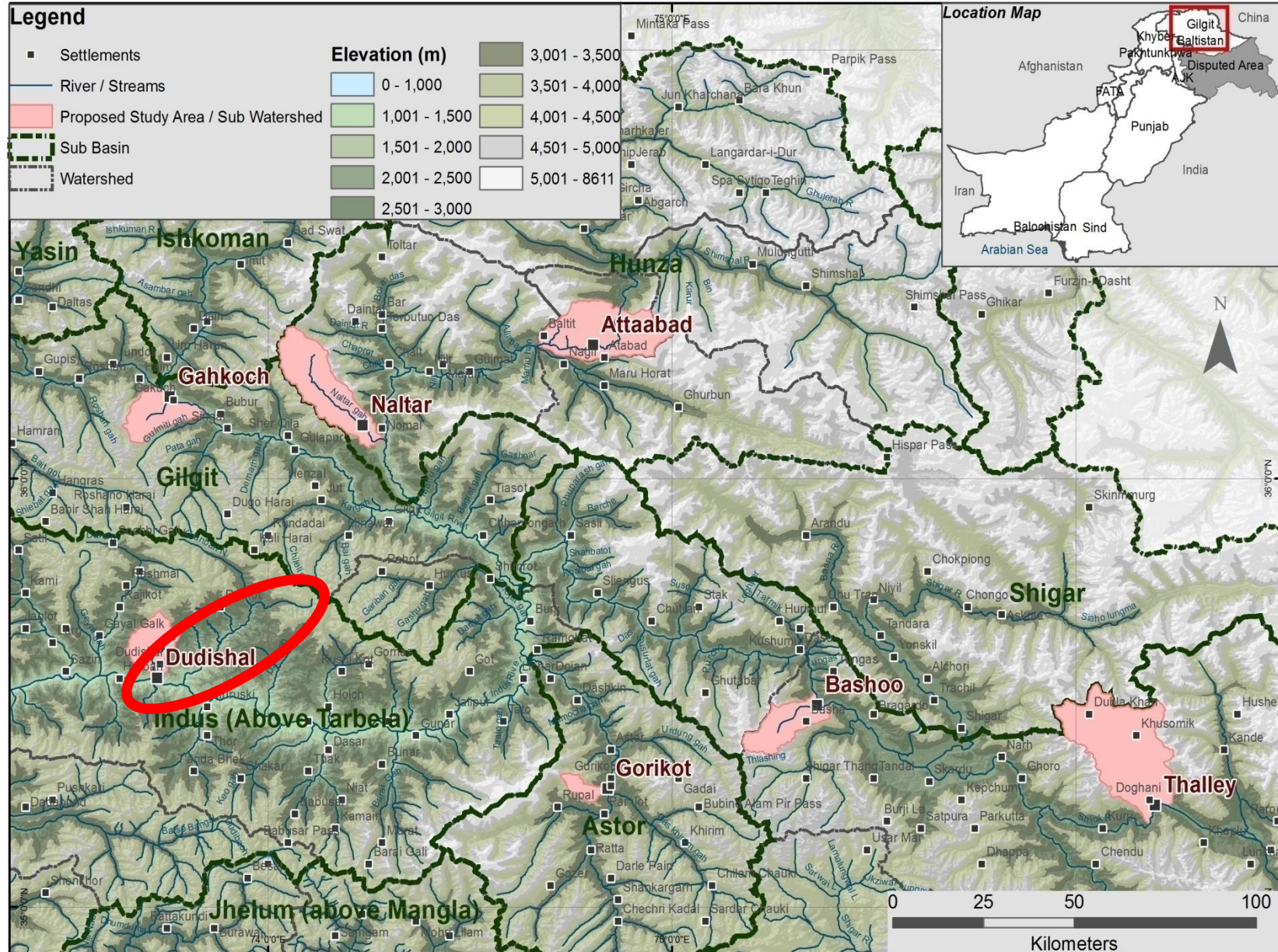


# SUSTAINABLE AND INTEGRATED WATERSHED MANAGEMENT IN DAREL

CHARACTERISTICS OF DAREL WATERSHED

LOCATION



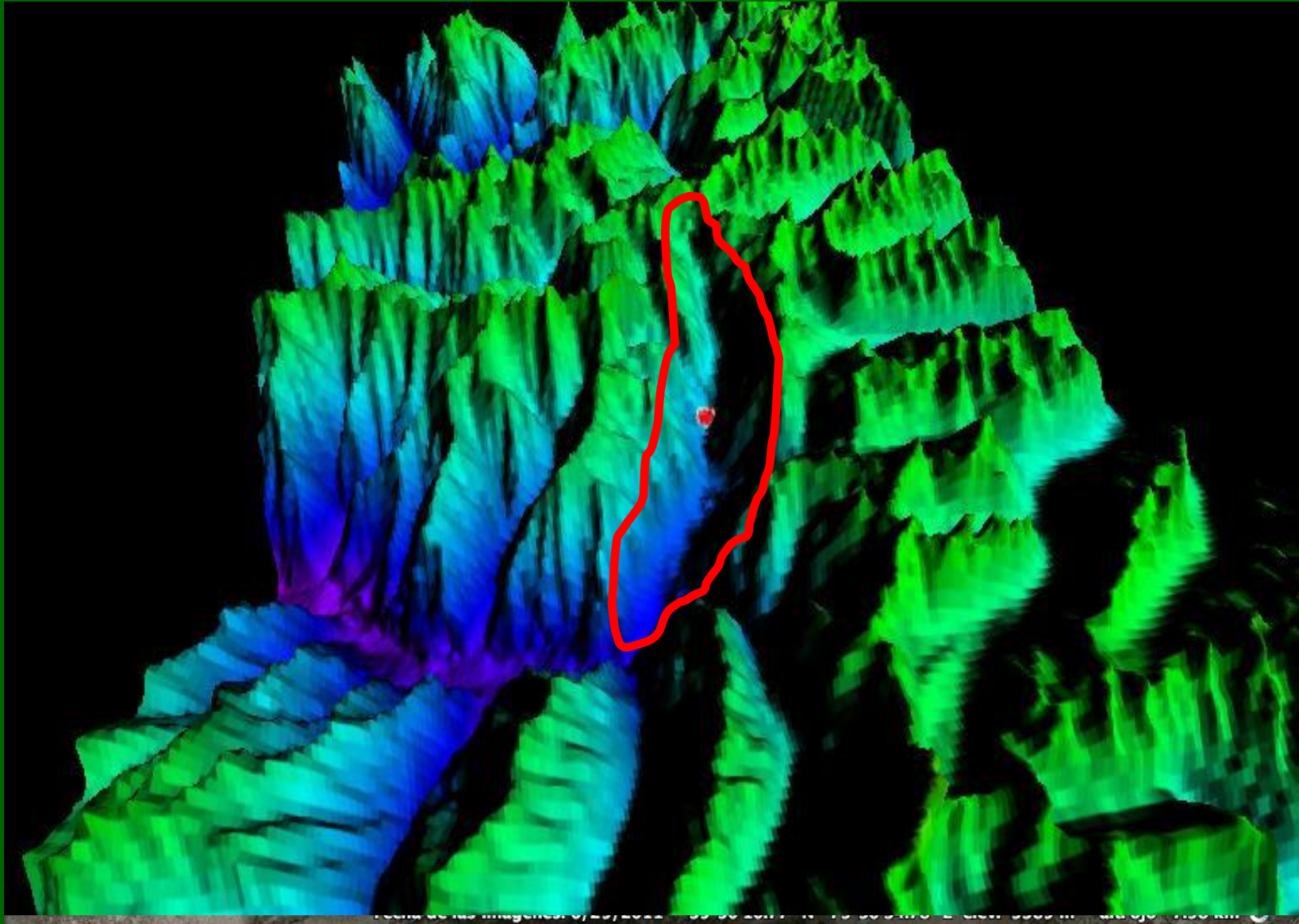
# SUSTAINABLE AND INTEGRATED WATERSHED MANAGEMENT IN DAREL



CHARACTERISTICS OF DAREL WATERSHED



LOCATION

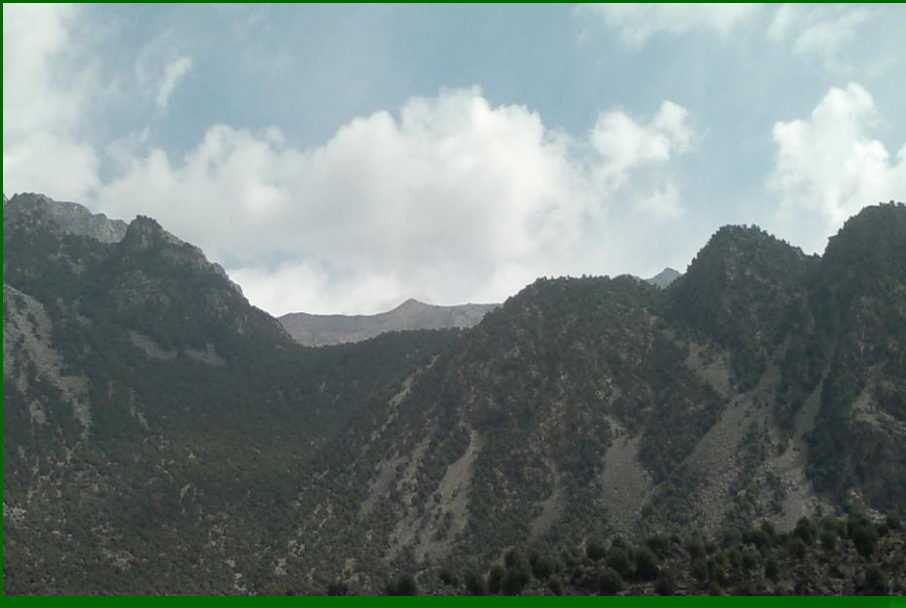


# SUSTAINABLE AND INTEGRATED WATERSHED MANAGEMENT IN DAREL



CHARACTERISTICS OF DAREL WATERSHED

LOCATION



## SUSTAINABLE AND INTEGRATED WATERSHED MANAGEMENT IN DAREL

### SOCIAL CHARACTERISTICS OF DAREL WATERSHED

- POPULATION = 5500
- TOTAL HOUSEHOLDS = 250
- AVERAGE HOUSEHOLD SIZE = 20
- AGE DEIFFERENC = 10 PERSONS/ HOUSEHOLD BELOW 10 YEARS
- GENDER = 06 WOMEN PER HOUSEHOLD
- SOCIAL COHESION = STRONG
- SOCIAL CONFLICTS = ENMITY
- FOOD SECURITY = SEASONAL CROPS, LIVESTOCK ISSUES
- EDUCATION = HALF OF POPULATION IS ILLITERATE, NO BASIC EDUCATION FACILITIES, WOMEN EDUCATION IS IGNORED
- HEALTH = POOR CONDITIONS

# SUSTAINABLE AND INTEGRATED WATERSHED MANAGEMENT IN DAREL



## VULNERABILITY OF THE WATERSHED



- CLIMATE CHANGE (MORE HOT LESS RAINFALL, SHIFTS IN CROP ROTATIONS)
- DEFORESTATION (4% PER YEAR)
- LACK OF ACCESS TO CLEAN DRINKING WATER
- LIMITED ACCESS TO IRRIGATION WATER
- AGRICULTURAL TERRACING AND INTENSIFICATION ON VULNERABLE SLOPES
- LACK OF BASIC INFRASTRUCTURE (UNMETALLED ROADS,
- ISSUES OF FOOD SECURITY DURING WINTER (NO CROPS DURING WINTER, SHIFTS IN CROP ROTATIONS)
- DISASTER RISKS (LAND SLIDES, FLOODS)
- POPULATION GROWTH (48% INCREASE FROM 1981 TO 2004)
- GENDER ISSUES
- SECURITY ISSUES (LONG TERM ENMITIES)
- ILLITERACY (UNAWARENESS)
- LACK OF SCIENTIFIC DATA FOR PLANNING AND MANAGEMENT

# SUSTAINABLE AND INTEGRATED WATERSHED MANAGEMENT IN DAREL

CHARACTERISTICS OF DAREL WATERSHED

DEFORESTATION

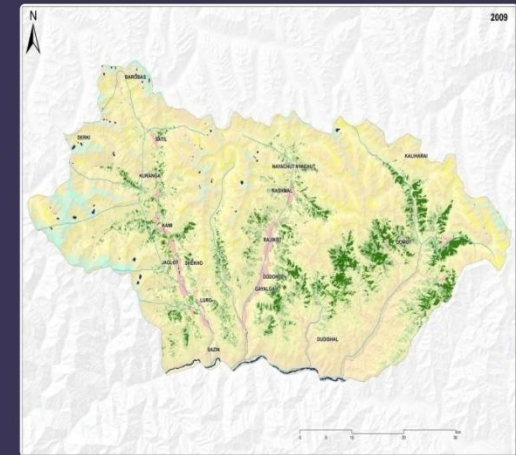
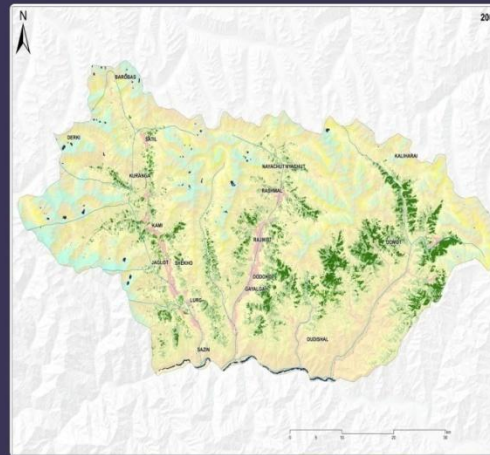
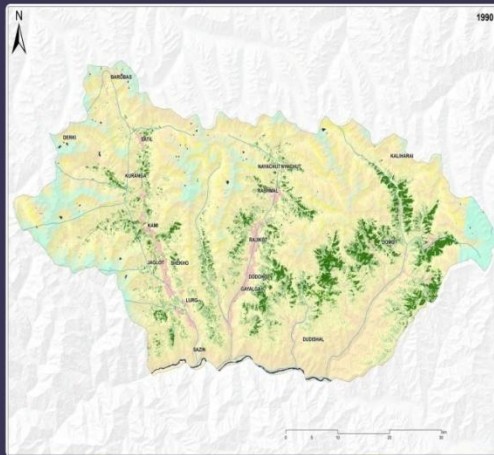
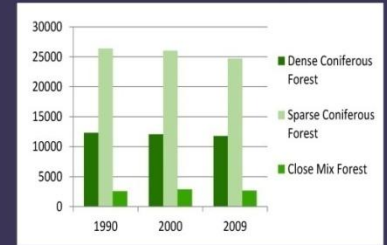
## Forest cover change dynamics during 1900 – 2000 and 2009 in the Darel-Tangir Tehsil of Gilgit-Baltistan

Currently 14.6 % of Darel and Tangir Tehsil is covered with forest.

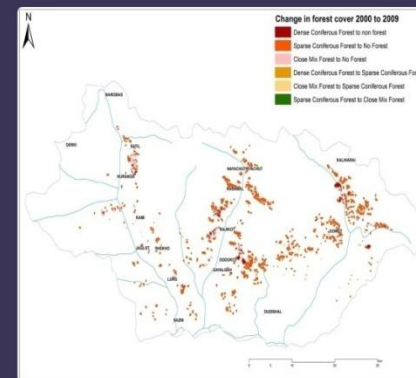
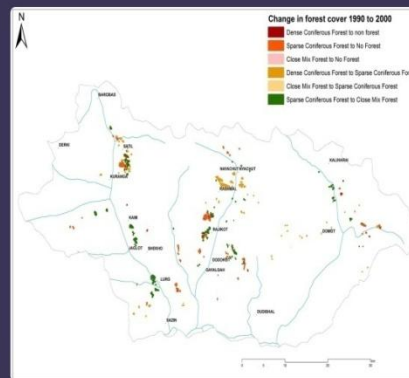
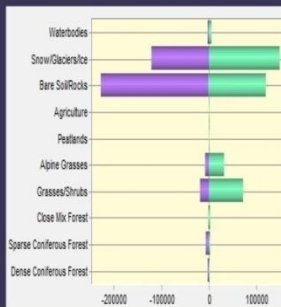
During 1990 - 2000 about 305ha area was deforested from the total of 41,250ha.

During 2000 – 2009 about 1800ha was deforested from the total of 40,945ha.

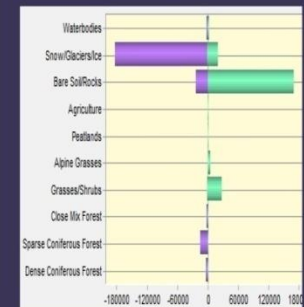
In addition forest densities has also significantly decreased as shown in Forest Cover Change Maps below.



Gain and Losses Between 1990 to 2000



Gain and Losses Between 2000 to 2009



# SUSTAINABLE AND INTEGRATED WATERSHED MANAGEMENT IN DAREL



SOCIAL CHARACTERISTICS OF DAREL WATERSHED


PICTORAL EVIDENCE




## SUSTAINABLE AND INTEGRATED WATERSHED MANAGEMENT IN DAREL



**Project Objective:** To protect, prevent and restore the degraded watersheds for socio-ecological sustainability of mountain communities of Darel Valley



- Outcomes:**
1. Resilient communities through improved socioeconomics
  2. Stable slopes leading to reduced impact of natural disasters
  3. Improved irrigation system and agricultural production
  4. Availability of scientific data for long term planning
- 



# SUSTAINABLE AND INTEGRATED WATERSHED MANAGEMENT IN DAREL (INTERVENTIONS)

## Component – I (Situational assessment)

1. Conduct biophysical survey of each land use at village level
2. Participatory need assessment at village level through focus group discussion

### Outputs:

1. Participatory Capacity and Resource Assessments [PCRA] reports available
2. Biophysical data available for further planning

## Component – II (Capacity Building)

1. Conduct two training workshops (one for women and one for men) on upland watershed management

### Outputs:

1. Almost 500 men (2 from each household) and 250 women (1 from each household) are aware and trained on issues related to IWM

## Component – III (Access to clean drinking water)

1. Construction of water filtration plants at suitable sites to give easy access to clean drinking water to the community

### Outputs:

1. 3 water filtration plants are constructed at suitable sites

# SUSTAINABLE AND INTEGRATED WATERSHED MANAGEMENT IN DAREL

## Component – IV (Access to irrigation water)

1. Development of water ponds by harvesting runoff water through diversion of stream water for domestic and small scale irrigation purpose.
2. Diversion of perennial stream for irrigation on suitable sites and construction of new and improved irrigation channels to barren lands

## Outputs:

1. 10 water ponds constructed for demonstration purposes at barren sites (02 at each sub-watershed)
2. 3 diversions are made along with improved irrigation channels to suitable sites for agricultural practices



# SUSTAINABLE AND INTEGRATED WATERSHED MANAGEMENT IN DAREL (INTERVENTIONS)

## Component – IV (Improved and diversified agriculture production)

1. Provision of improved crop varieties (seeds) to increase the agricultural production per unit of land
2. Improvement of field terraces (for demonstration purposes)
3. Support farmers in raising of fruit nurseries
4. Establish model fruit orchards on communal lands
5. Introduction of lift irrigation combined with drip irrigation system to give access to water on higher sites for plantation and slope stabilization purposes
6. Introduction of kitchen gardens with off season vegetables (for women)
7. planting fodder plants on suitable sites to reduce the pressure of grazing

## Outputs:

1. 20% increase in production per unit area
2. 15 terraces are improved for demonstration purposes
3. 3 model fruit nurseries established
4. 2 model fruit orchards established
5. 2 lift irrigation schemes are functional
6. 40 women have been trained on kitchen gardening and 20 model kitchen gardens established
7. Distributed 100 fodder plants to each household to plant on their farm lands

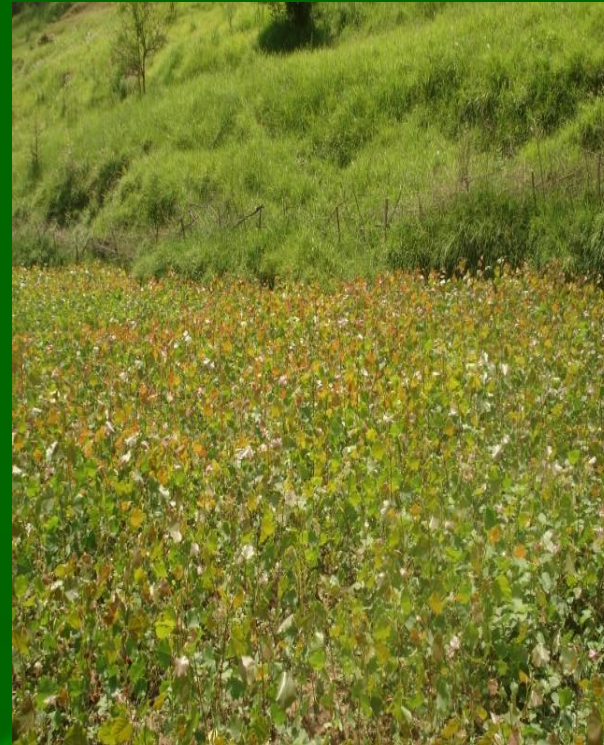
# SUSTAINABLE AND INTEGRATED WATERSHED MANAGEMENT IN DAREL

## Component – IV (Promote farm forestry)

1. Distribute multipurpose tree plants for planting on agricultural lands
2. Establish community based model broad leaved plant nurseries on communal lands

## Outputs:

1. Distributed seedlings to 30 farmers and planted
2. Established 02 model broad leaved nurseries for demonstration for introduction of farm forestry



# SUSTAINABLE AND INTEGRATED WATERSHED MANAGEMENT IN DAREL

## Component – IV (Promote farm forestry)

1. **Restore and improve degraded forest areas** afforestation and reforestation in local forest patches to restore and increase the local forest cover
2. Establish community forest nurseries to ensure the sustainable supply of locally hardened seedlings for further afforestation and reforestation activities

## Outputs:

1. Reforestation of identified forest degraded lands
2. Established 02 community based plant nurseries for demonstration purposes



# SUSTAINABLE AND INTEGRATED WATERSHED MANAGEMENT IN DAREL



## STAKEHOLDER ANALYSIS



Actors	Degree of Influence (Medium, High, Low)	Primary interest	Strategies	Key contribution
Local Community	High	Social organization and network	Meeting/ dialogues	community mobilization and participation
Agriculture Department	High	Improved agricultural production	Coordination and collaboration	Provision of Improved crop varieties and off season vegetables, trainings on kitchen gardening, terrace improvement, improve irrigation system
Livestock Department	High	Improved livestock breeds, alternative fodder options during winter, controlling livestock diseases	Coordination and collaboration	Trainings on improved livestock breed varieties, veterinary services,
Forest department	High	Environmental rehabilitation and protection and restoration of degraded watersheds through watch and ward, afforestation and reforestation	Awareness sessions, plantation campaigns, implementation of planting activities, monitoring, reporting and evaluation	Provision of seedlings for plantations, HR and logistics, designing and planning further project activities
Local Government	medium	Law & Order	Collaboration	Security
Education department	Medium	Education	Motivation	Introduction of related subjects in curriculum at grass root level

# SUSTAINABLE AND INTEGRATED WATERSHED MANAGEMENT IN DAREL



## STAKEHOLDER ANALYSIS



Actors	Degree of Influence (Medium, High, Low)	Primary interest	Strategies	Key contribution
Public Works Department	medium	Infrastructure development	Coordination and collaboration	Technical expertise, alternative energy sources, Provision of construction materials
Print and electronic media	High	Information Dissemination	Communication and coordination	News, TV and radio talks/ programs
Pakistan Red Crescent Society	medium	Mitigation & DRR	Awareness campaigns	Relief & capacity building
Agha Khan Rural Support Program	Medium	Improvement of rural living standards	Coordination meetings	Shelter, Clean drinking water, utensil's etc
Building and Construction Improvement Program	High	Cost effective low carbon sustainable housing and energy sources	Cooperation and collaboration	Technical inputs, provision of fuel efficient stoves
Religious Leaders	High	Religious Education	Meetings	Community mobilization
Political Leaders	medium	Socio economic Development	Meeting & coordination	Project Funding Opportunities

# SUSTAINABLE AND INTEGRATED WATERSHED MANAGEMENT IN DAREL



Steering Committee, Represented by Elders, Local Government, Religious leaders, Political Leaders, and the Project Manager

NGO's and Religious Leaders

Project

Water Department

Water

Agriculture Department

Agriculture

Forest Department

Forest

Livestock Department, and  
Construction Department

Livestock

Local Government

Security

Health and Education Department

Health, Education, Gender

Planning Department

MIS