

Improvement in Water Use Efficiency

New water can not be created; yet to meet the requirement of the growing population more agricultural produces are required. Two possible options are to minimize the losses of water through better management to ensure more water for crop production and improve the water use efficiency i.e., to increase the production from per unit of water. Objectives can be achieved through adaptation of innovative and state of the art technologies and continuous research

IMPROVEMENT IN WATER USE EFFICIENCY

Supplemental Irrigation to Wheat

- Increased wheat yield by 48%
- Also increased straw yield by 66%

Raingun Sprinkler

- Saved water from 47 to 137 mm in a season of Berseem over basin method of irrigation.
- Water use efficiency in basin irrigation was 0.27 t/ha/mm whereas in sprinkler irrigation water use efficiency was 0.402 t/ha/mm
- Sprinkler irrigation gave 50% more water use efficiency over basin method

Trickle Irrigation Technology

- The application uniformity of low head trickle irrigation system was more than 90%.
- Trickle irrigation system is the best method for using low quality water and providing optimum soil water condition.

Raised Bed Technology

- Saving of 30% irrigation water was obtained by growing wheat and maize crops on raised beds.



Summer maize cultivation on furrow-bed irrigation system



Wheat crop on raised bed

Variation in Rainfall

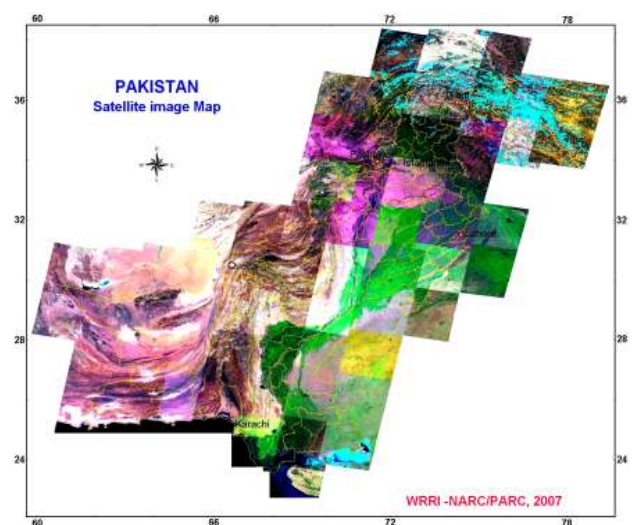
- Satrameel received rainfall more than pan evaporation by 40%.
- Fatehjang received 27% lesser rainfall than the pan evaporation.
- These information will help to better manage rain water.

RS image Processing

- 67 scenes of Landsat ETM+ mosaiced in a band combination of 5,4,2.
- The mosaic covers all the provinces and the northern areas.
- Mosaic being used for features identification, boundary demarcation, and landcover analysis.

Watershed Analysis

- Draban catchment of D. I. Khan in Rod Kohi area was delineated using SRTM Data Elevation Model (DEM).
- The relief map was developed indicating elevation range in the catchment area.
- Maximum area lies in the relief class of 1500-2000 masl.



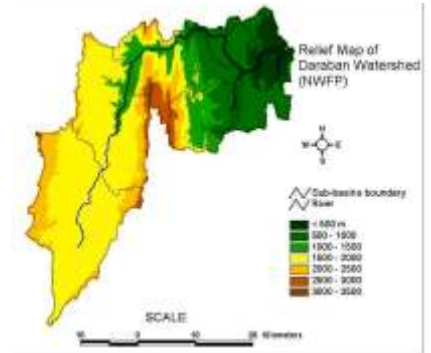
Mosaic of Landsat ETM+ data for Pakistan

IMPROVEMENT IN WATER USE EFFICIENCY

- Drainage network of the basin was generated from the DEM
- The watershed was classified as sixth order basin.
- The map generated will be used for watershed management and water conservation.

Crop Databases Development

- Crop databases of Agricultural Statistics Division of MINFAL were transformed to vector data format of GIS system.
- Database of major Rabi and Kharif crops was used to identify the major existing cropping patterns.
- Cropping pattern map of Pakistan generated.
- Higher degree of heterogeneity in crop sequences at district level was observed.



Drabran watershed relief and drainage network

Water Distribution Structures

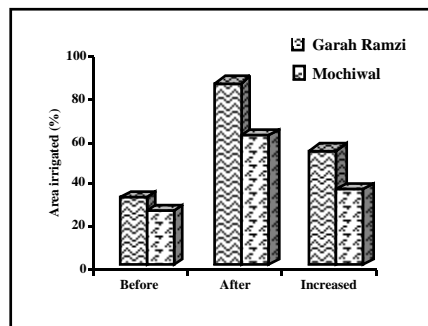
- Water distribution structures in Rod-Kohi areas helped in controlling and managing flood water.
- Distribution structures saving time, labour and money.
- Structures reduced chances of conflicts over water.
- These structures brought sustainable equity in water distribution.



Variability in cropping pattern of Pakistan

Water Diversion and Application Structures

- The water diversion and application structures increased the command area by 50% during 2006-07.
- The structures almost eliminated the drudgery of Rod-Kohi farmers involved in water diversion.



Area increase through spate water diversion structures



Spate water distribution structures

AZRC, Quetta

- Small runoff water management trial established at AZRC field to collect local runoff generated at AZRC fields to control soil erosion, improve local ground water recharge at AZRC, use harvested water for supplemental irrigation and plantation of low delta crops.
- A low cost technology to minimize the water course losses was devised at Quetta, Pishin and Mastung. Treatments include locally made PE (poly-ethylene) 300 to 350 μ thickness black plastic film with ultra violet stabilizer, Bitumen treatment and farmers practice. Initial results showed that the discharge loss (cusec) per meter recorded in PE sheet treatment was 0.001 as compared to Bitumen and control treatments of 0.002 and 0.005 respectively. The discharge loss (ft³/day) per 100 m recorded in the three treatments is 8640, 17280 and 43200, respectively. The average cost of PE and Bitumen treatment was Rs 50.7 and Rs 97.5m, respectively.