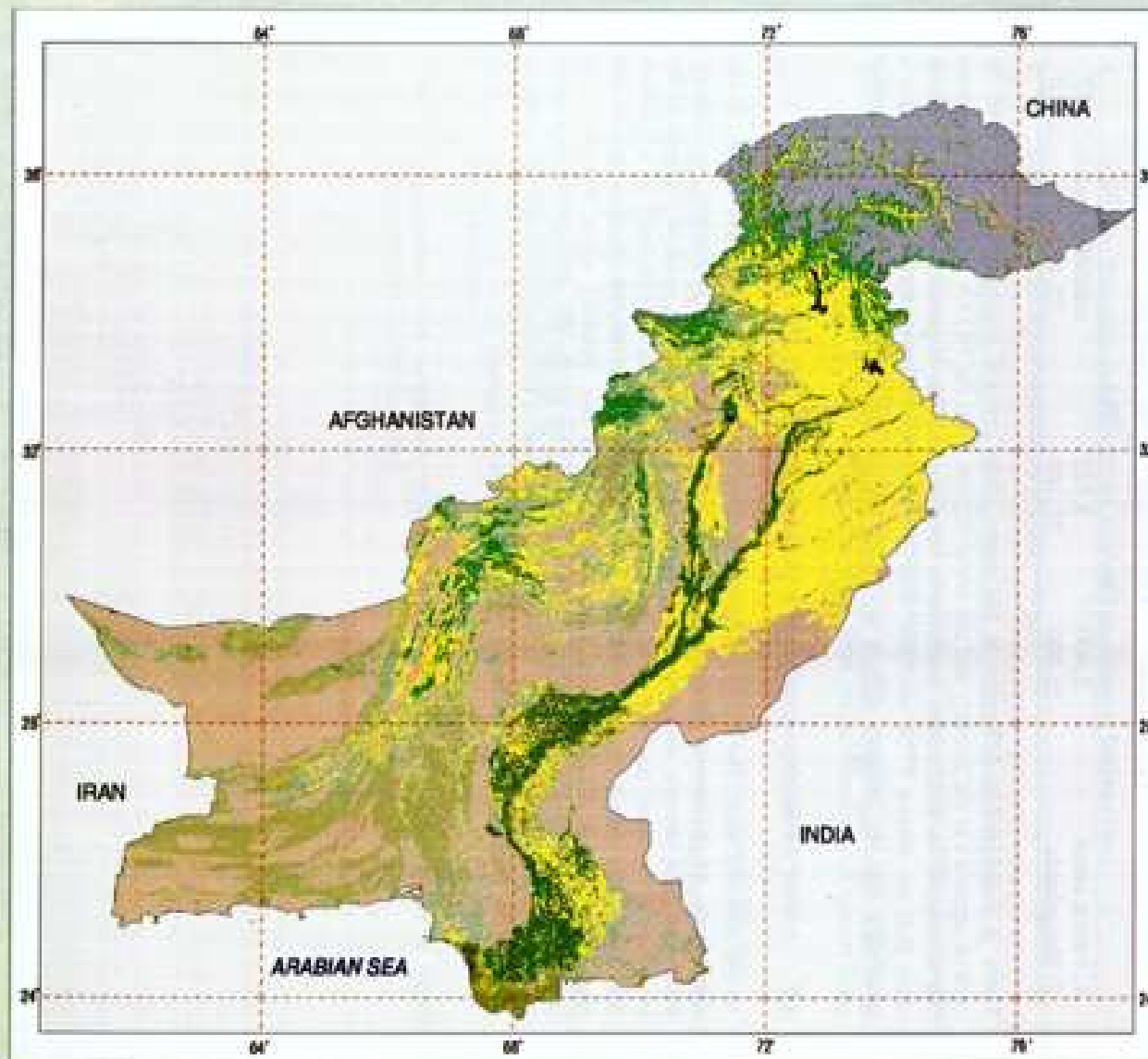


Forest Monitoring System in Pakistan

Objective

To develop a framework and set of technical guidelines to monitor and assess forests leading to its sustainable management

Landuse Map of Pakistan



Map 15
PAKISTAN
NOAA AVHRR DATA
14 October 1992
Land Cover

LEGEND

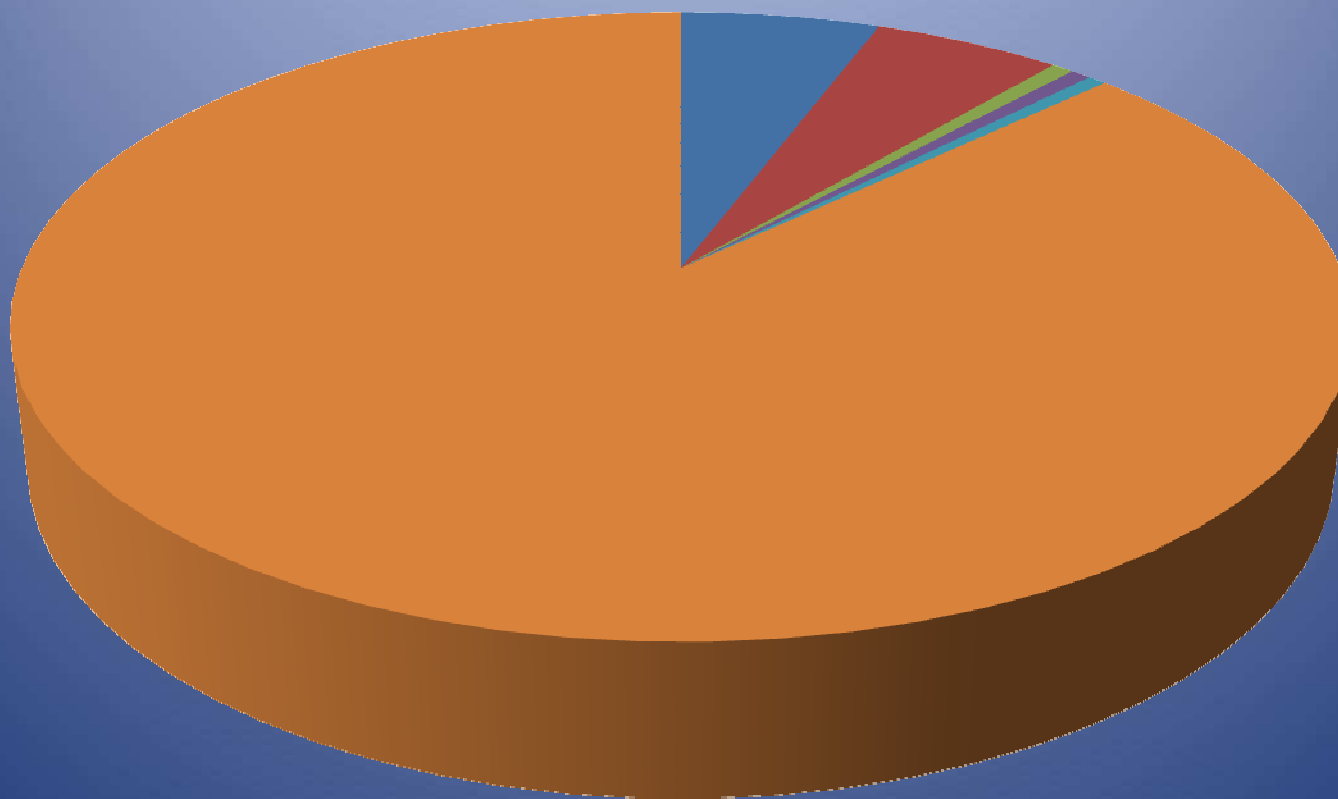
- Snow and ice
- Water Bodies
- Agricultural Land
- Forest (Coniferous etc.)
- Mangrove Forest
- Riverain Forest
- Rangeland
- Degraded Rangeland
- Barren Land

Country Boundary based on
Digital Chart of the World (DCW)
1:1,000,000 scale (1983)

0 100 200 300 Km

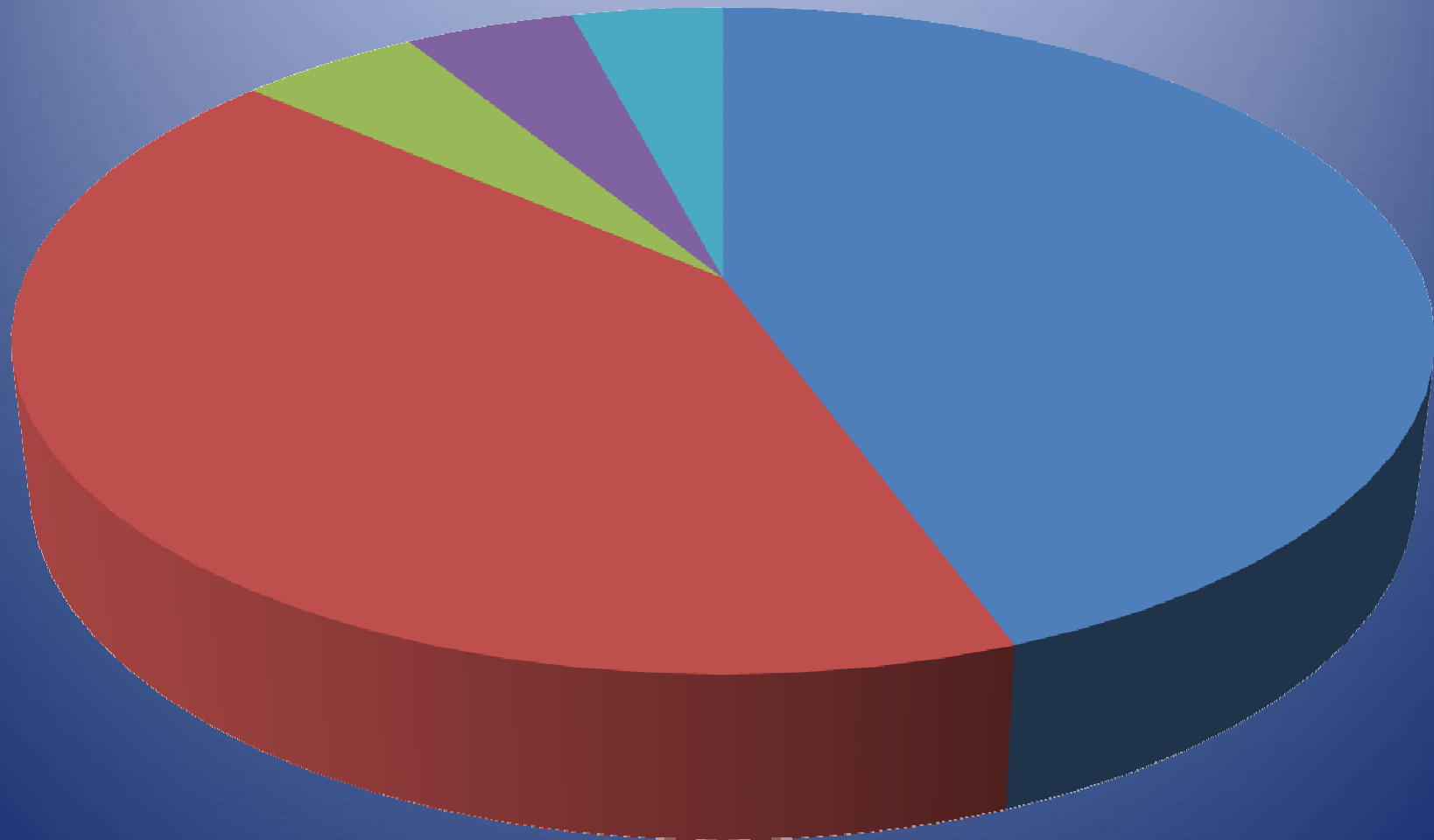


Forests and Rangelands of Pakistan



■ Conifer ■ Scrub ■ Riverain ■ Mangrove ■ Irr. Plantation ■ Rangeland

Forest Types of Pakistan



■ Conifer ■ Scrub ■ Riverain ■ Mangrove ■ Irr. Plantation

CHANGE IN FOREST AREA OF PAKISTAN (1992-2001)
(000 ha)

Vegetation Type	Five years Interval of Vegetation cover		Annual change rate %
	1992	2001	
Conifer	1913	1532	2.0 (-)
Scrub	1191	1447	2.1 (+)
Riverain	173	169	0.2 (-)
Mangrove	207	159	2.3 (-)
Irr. plantation	79	142	8.0 (+)
Farmland trees	466	781	7.5 (+)
Total	4,029	4,230	0.5 (+)

Means used for Monitoring

- SUPARCO: Space & Upper Atmospheric Research Commission
- Information received by RS centers in Islamabad and Karachi
- Ground Network: Islamabad, Karachi

Main Forest Information Products Currently used

- Forest Cover Mapping (SPOT Imagery 10m)
 - Coniferous forests
 - Scrubs
 - Rangelands
 - Agriculture
 - Water-bodies
 - Settlements
 - Barren lands

Users involved in their Internal Procedures

- Min. of Environment
- Provincial forest departments
- Agric. Census organization
- UNDP/FAO
- ICIMOD
- WWF
- IUCN
- Universities (Geology, Geography, Environment deptts., UET)
- Soil Survey of Pakistan
- Pakistan Poverty Alleviation Fund
- National Rural Support Program
- Private sector (Pakistan Tobacco Co., Mobile companies)
- Land and Revenue departments

How Forest Information is used?

- By Policy-makers and Foresters
 - Rate of forest change
- By Planners and Foresters
 - Area under forests;
 - Species composition;
 - Growth and yield;
 - Tree planting;
 - Forest harvesting
 - Baseline maps (settlements, roads, rivers, glaciers, etc.)
- By General Public, CBOs, Foresters
 - Tenure status
 - Conflict resolution
 - Benefit-sharing
 - Protection
 - Infrastructural facilities

Current Plans for Modifications & Improvements

- Harmonization of forest monitoring assessment & reporting system for better uses
- Standardization of data
- Procedure for data collection (multi-stage sampling)
- Standardization of forest definition
- Resolution of imagery (SPOT: 10m)
- Scheme of classification
- Ground truthing and plot sizes
- Area under forests
- Tree species and composition
- Changes in forest area
- Extent of damages done to forests (forest fires, human interference, earthquakes, etc.)

Critical Gaps to be Addressed

- Forest monitoring, assessment and reporting are not linked to forest policy
- Absence of standard definitions of forests
- Standardization of landuse classification
- Continuous updating of the knowledge; owing to the advancements in technologies and improved software
- Intermittent monitoring, assessment and reporting (FSMP, 1992; PFRI, 1997; SLUP, 200; MoE, 2004)
- Spatial and temporal inconsistencies
- Metadata and its standards are not uniform
- Insufficient databank
- Absence of coordination between various data users
- Duplications
- Restrictions on the use of data (e.g. topographic sheets)
- Monopolies of users

Remedial Measures

- Harmonization and standardization
- RS-based forest monitoring
- Survey-based forest monitoring
- Authentication
- Networking of data users and coordination on regular basis
- Continuous enhancement of knowledge through HRD
- Uniform and standardized landuse classification