

Significant Forest Invasive Alien Species

Pakistan's status
**Practices and
Prospects**

Brief introduction to the Biodiversity on Pakistan

- Geography of Pakistan
 - Location of the Country on the Globe

Pakistan lies in Southern Asia, bordering the Arabian Sea, between India on the east and Iran and Afghanistan on the west and China in the north

Area:

total: 803,940 sq km

land: 778,720 sq km

water: 25,220 sq km



Brief introduction to the Biological resources in Pakistan

Province	Total area ('000 ha)	Forest area ('000 ha)	Percentage
NWFP	10 170	410	13.9
AJK	7 040	770	11.0
Balochistan	34 720	720	2.1
Sindh	14 090	680	4.8
Punjab	20 630	630	3.1
Northern Areas	1 330	360	27.0
Average	87980	4570	5.2

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Location of the Country on the Globe



Pakistan's Biodiversity

- Habitat Diversification
 - 0 levels to 8000+ m asl giving rise to a great variety of habitats in
 - High Mountains, Wetlands, Deserts, Coastal Area
 - Diverse Habitat types associated with the above
- Species Richness and
- **Low** Endemism

Species Richness:

- Some 6000 species of plants out of which 7% are Endemic to Pakistan
- 200 Species and subspecies of Mammals
- 666 species of Birds, many of which migratory and some Endangered
- More than 500 species of Fishes, both Marine and Fresh Water
- Diverse Reptilian Fauna
- 16 species of Anuran Amphibians

SPECIES & HABITAT LOSS

Highly correlated with Human population increase.

Population also influences directly and indirectly as well as socially & culturally on the habitat destruction.

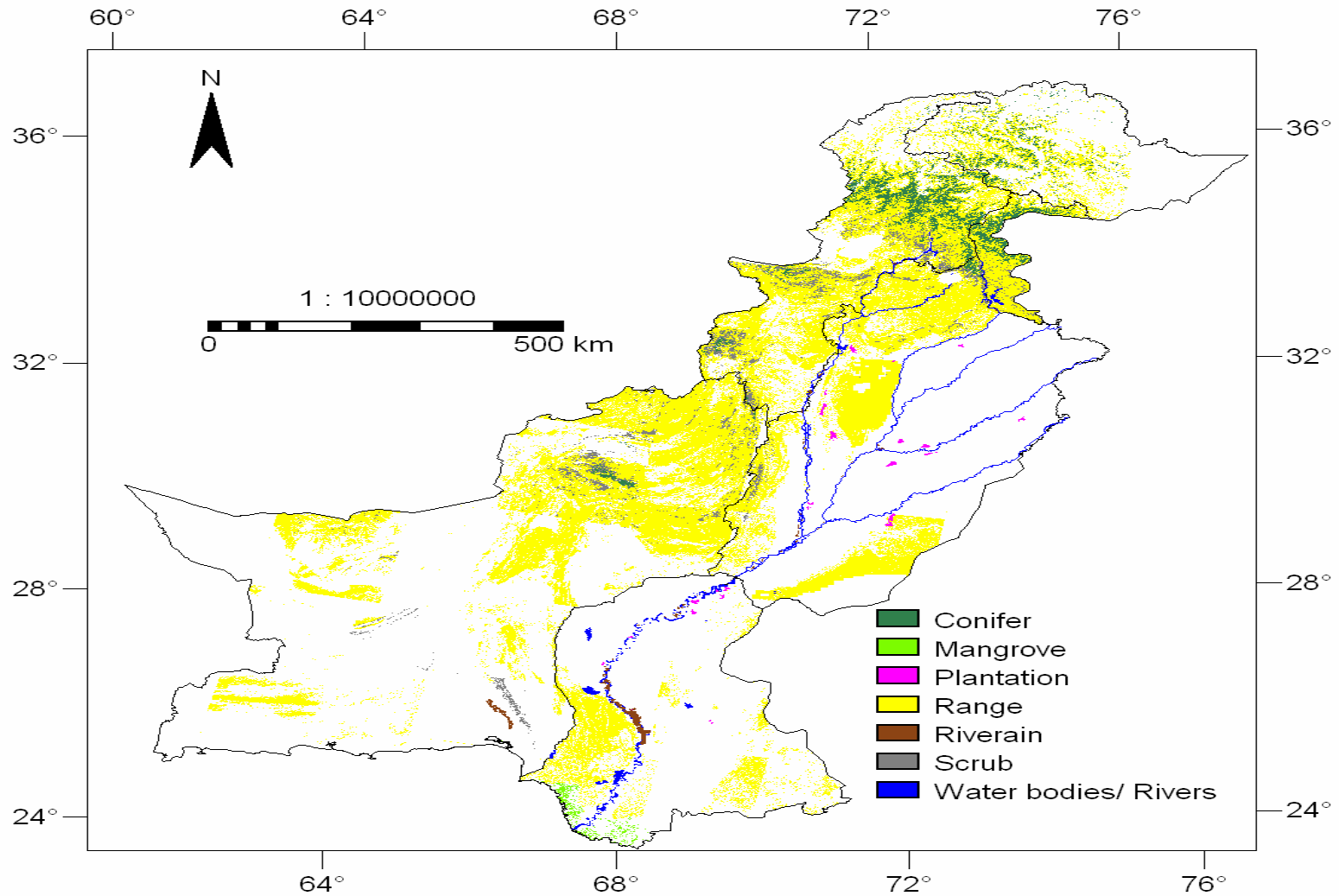
To overcome this, well developed Protected Area System is developed

Current Situation

- As with other parts of the World, forestry resources are under pressure from factors like:
 - Increasing human population
 - Poverty and other socio-economic factors
 - Natural factors
 - Biological Factors

PAKISTAN

FOREST AND RANGE AREAS



Forest invasive species

- Reviewing the available literature : several studies carried out in the last two decades to assess the extent of invasion, the impact and the possibilities to eradicate or control the infestation.
- However, most of these surveys have been conducted on a small scale mostly by academia
- Mateen, 1990, Suleman and Nadeem 1990; Suleman and Hakeem 1995; Akbar, 1994; Fatimah 1998, 2007; Shabbir, 2002, 2006; Ansari and Syed, 1999; Anwar and Shamim 2002
- Limited awareness of the problem in general and lack of capacity to address the issue in specific has resulted in the fact that issue is not given adequate importance and attention

Response of Forestry authorities

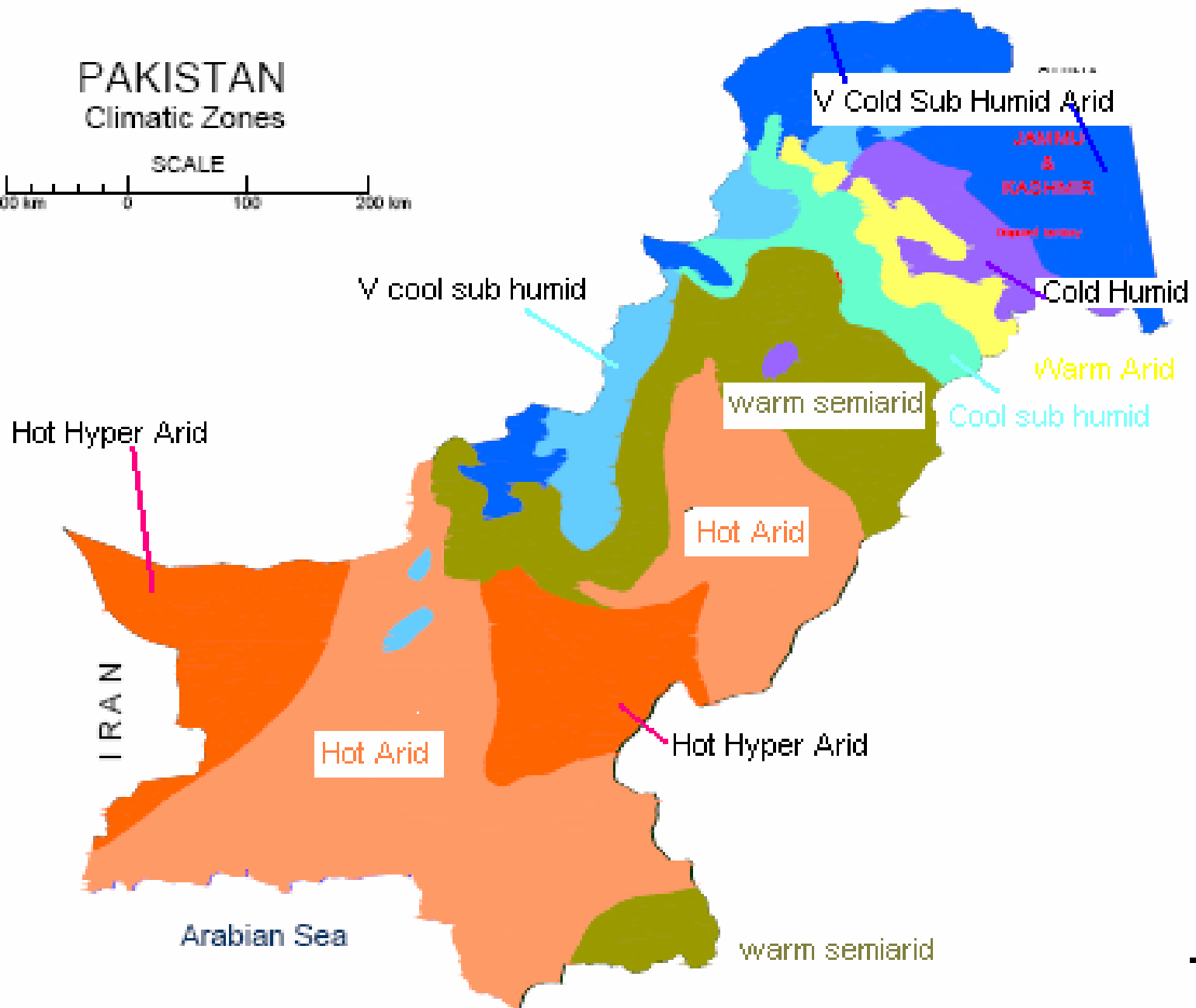
- Relatively less effective and delayed response in reporting, reacting and managing the invasive species has diluted the importance of the subject.
- Pakistan Forest Institute remains the main actor

- Global Initiative on Invasive Species: started by IUCN in 1999 with the aim of enhancing knowledge base and capacities for addressing the issue of IAS in the regional countries including Pakistan and Vietnam.
- Fourteen invasive plant species were preliminary recognized from Pakistan in an consultative process on Alien Invasive Species. Agriculture sector remained the main actor in the process.
- Species included terrestrial (trees and annual herbs) as well as aquatic weeds. However, it was presented that only a few among these poses a serious threat to the forests system and require urgent surveillance in Pakistan.

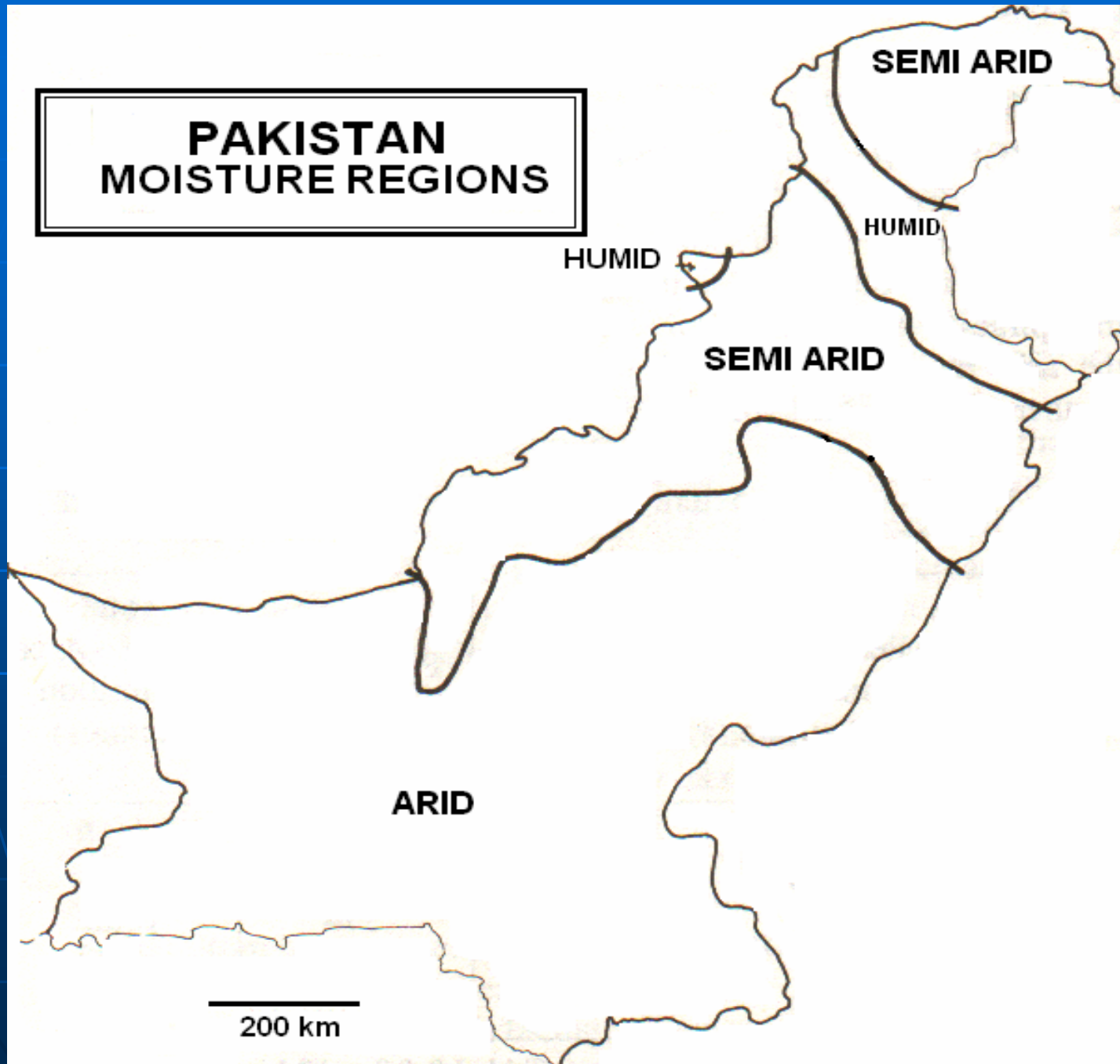
Climatic and geographic considerations

- Geographic considerations ?
- Climatic features
 - Weather
 - Temperature regimen
 - Water resources

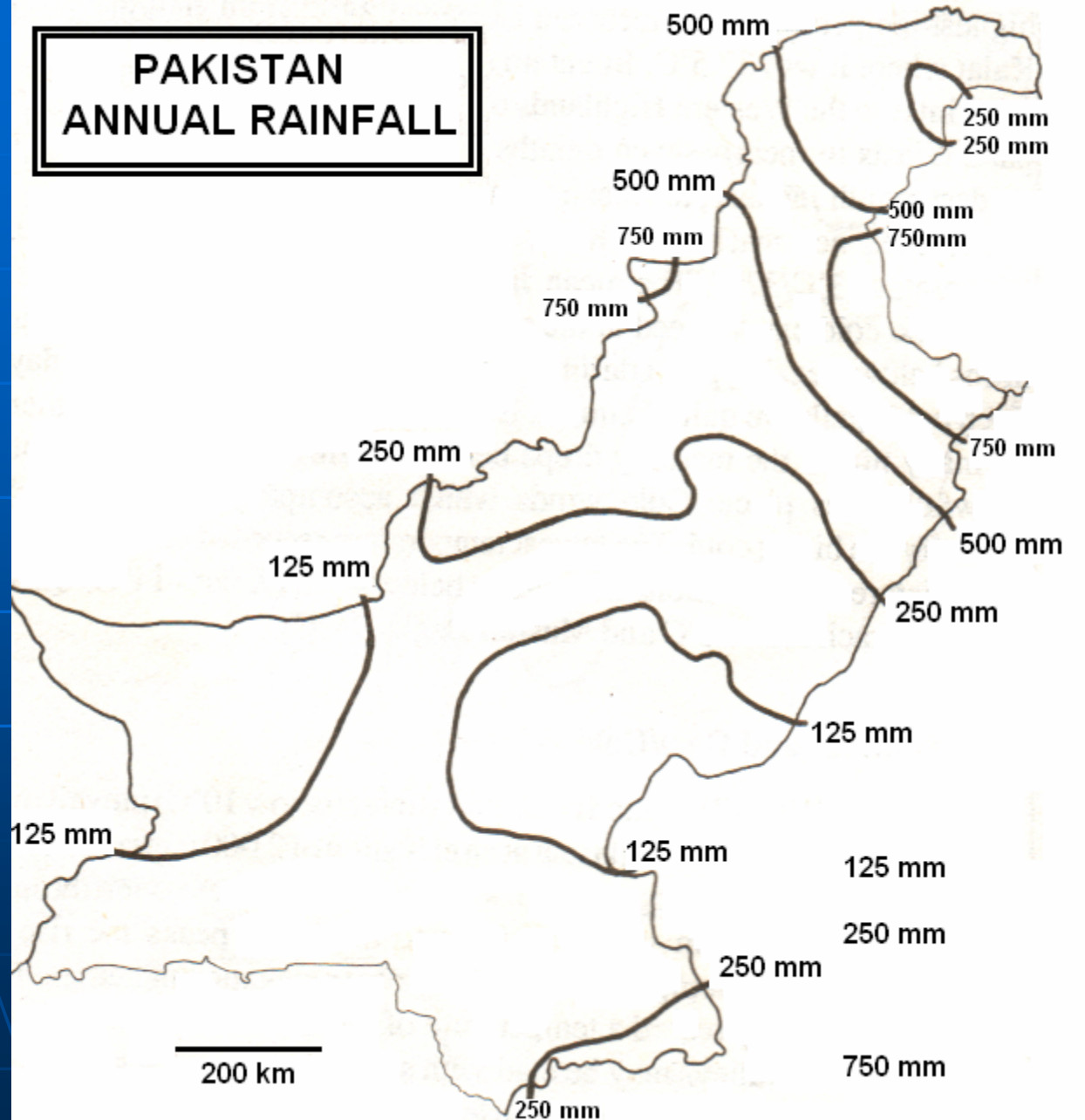
PAKISTAN Climatic Zones



PAKISTAN MOISTURE REGIONS



PAKISTAN ANNUAL RAINFALL



Some significant species

Broussonetia papyrifera

- Paper Mulberry:
East Asian in Origin
- Planted in the
Capital City during
the 1960s
- Prime objective:
 - greening the town
 - control soil erosion



DGA1237022

Broussonetia papyrifera

The species proved to be an aggressive weed

Replaced the native flora in a few decades.

pollen allergy caused specifically during the months of March and April.

The infestation has extended to other Provinces as well.

Large scale movement for eradication by the Authorities initiated.

CDA had so far chopped 36, 000 mature trees,

14,000 in the last two years

Claims are made about the reduced pollen count: 270 per cubic meter in spring 2007 and 30 per cubic meter in 2008

Considerable measures are still required to ensure the control of paper mulberry from high infestation area and the adjacent regions

Lantana camara

- A perennial weed commonly found in the semiarid regions of the Indo-Pakistan subcontinent
- *Lantana*: native to the US and one of the ten worst weeds of the world
- Form continuous thickets at the infected sites in Pakistan.
- Exhibited a fast-growth and aggressive behavior that has taken a big toll from native flora
- wooden barriers are visible in highly infested Margalla Hills, around Rawal Lake and in Potohar plateau and the Salt Range



Lantana camara

- Covered over sizeable areas of natural vegetation
- Occupied a lot of natural grazing ground & is threatening wildlife.
- The health hazards to animals and humans
- The leaves and seeds of *Lantana camara* are toxic to many animals (livestock)
- Plant acts as potential breeding place for Tsetse Fly
- Studies show the allopathic impacts on soil micro flora & fauna
- Status of weed as invasive species is yet not established.
- Positive role in uplifting the economic conditions is established in India (Handicrafts etc)
- The weed exists extensively in most parts of the country. A detailed survey is indispensable to estimate the extent of infestation in order to develop an effective control strategy.

Parthenium hysterophorus

In Pakistan, weed is invading aggressively in:

- wasteland,
- degraded areas,
- rocky crevices,
- along water channels,
- roadsides, and railway tracks.
- It also has recently been reported in cultivated land



Parthenium hysterophorus

This noxious weed affects

- crop production
 - animal husbandry
 - human health
 - and biodiversity
- The weed was introduced in India and has lately invaded Pakistan
 - Originally infesting the roadsides, empty plots and surrounding the rice paddies in Punjab province, the weed has invaded the forest lands



Prosopis Julliflora

- Recognized as a tree the desert, tree of the poor, *Prosopis* is thought one of the most valuable species
- With introductions, indigenous knowledge rarely followed, and species remained under-utilized and unmanaged
- Colonizes disturbed, eroded, over-grazed or drought-affected land, forming dense, impenetrable thickets.
- Invasion into agricultural land, along irrigation channels and water courses is also a problem.
- The trees are believed to deplete groundwater reserves and to reduce growth of neighboring crops.
- The species has invaded to most parts of Sindh and NWFP provinces and areas with lesser rainfall



Committment

- An allocation of Rs. 102 Million for the project “Combating the Spread of Invasive Alien Species in Pakistan” reflects its priority
- Partners include:
 - Biodiversity Directorate of Ministry of Environment
 - CABI SA
 - PFI
 - KU

New project:

- Due to the significance of the subject and IAS as a focal area recognized by CBD, Government of Pakistan considers working on a project on IAS.
- Significant components of the proposal includes:
 - assess the distribution and ecology of invasive alien weeds
 - Aquatic weeds like *Salvinia molesta*, *Eichhornia crassipes* and *Pistia stratiotes* get the focus

Objectives

- Review available information on:
 - a. the growth,
 - b. distribution,
 - c. ecology and management
 - d. plant's taxonomic status
 - e. field characteristics
 - f. life history, phenology and
 - g. occurrence overseas and in Pakistan.

Objectives

continued

Impacts on ecosystem, habitat quality, aquatic flora and fauna and migratory birds.

Socioeconomic studies to assess the impacts of alien aquatic weeds on the livelihood/community dependent on this natural resources resource

Develop management strategies for the control of alien aquatic weeds.

Raise awareness regarding invasive species impacts and their control.

Rationale & outcome

- Article 8(h) CBD demands to “prevent the introduction of, control or eradicate those alien species which threaten ecosystems, habitats or species”.
- *Ramsar Convention.....*
- Apart from the visible impacts of activities of the project, in the very first instance, the project will help to sensitise the stakeholders on the significance of the issue that otherwise remains diluted