



# INDIA @ COP22



## Conservation and Management of Medicinal Plants for Climate Change Adaptation in India

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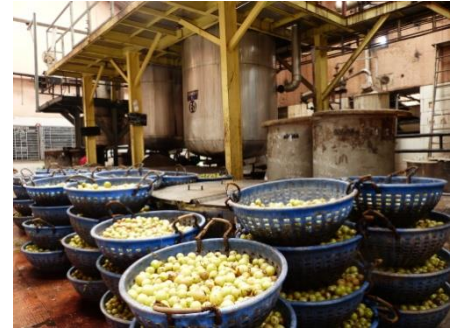
Sustainable Lifestyle = Positive Climate Action

[www.indiaatcop22.org](http://www.indiaatcop22.org)

# Discussion Plan

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- Socio-economic relevance of medicinal plants in India and their rising demand to meet needs of growing wellness sector
- Diminishing wild populations of medicinal plants and factors affecting their re-establishment
- Strategies for conservation and management of medicinal plants including for adaptation to climate change



# Importance of Medicinal Plants in India

- More than 6000 plant species used for health care in India under folk and codified Indian Medical Systems
- Raw drugs obtained from 1178 plant species are in active trade with annual trade volume of >5 lakh MT
- Trade value of medicinal herbs for the year 2014-15 has been pegged at Rs. 7000 crores (>\$ 1000 million)
- Poor forest-side people form a significant beneficiary group of this trade

# Conservation Status of Medicinal Plants

- 350 medicinal plant species have already been assessed (in 18 States) as 'Red-Listed' in India
- 100 of these 'Red-Listed' species are in active trade (36 'CR' species and 67 'EN' species)
- Wild populations of many of these species are fast reaching a level of 'No Return'
- Industry forced to use 'substitutes' (?) that may be less efficacious
- Rural people losing all-important 'Cash Income'



# Some Red-Listed Medicinal Plants



# Factors Affecting Wild Populations

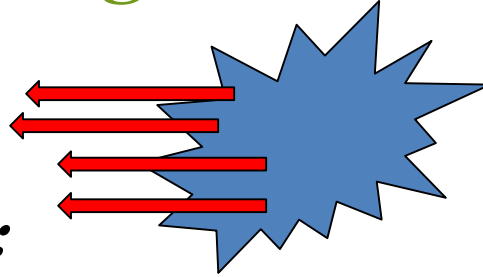
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- Excessive and destructive harvesting
- Increasing biotic pressures in harvested areas
- Overtaking of harvested areas by invasive species
- Diminishing habitats – especially niche areas
- Weakening resilience of root stock/ germplasm to re-establish

Many of these factors are triggered by changing climate

# Impacts of Climate Change – Indicating Factors?

## Early Flowering!!



*Rhododendron arboreum:*  
(February from March-May)

*Bombax ceiba:*  
(From February-March to January)

*Prunus cerasoides*  
(Now frequently seen from early October)





# Impacts of Climate Change – Indicating Factors?

## Unprecedented Spread of Invasive Alien Species!!

*Lantana camara*

*Eupatorium adenophorum*/ *Chromolaena odorata*

*Parthenium hysterophorus* (Congress grass)

*Ageratum conyzoides* (Goat weed)

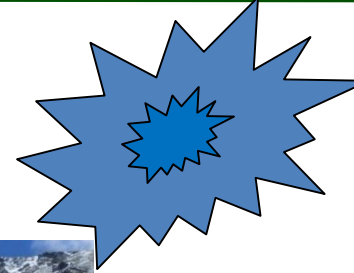


# Impacts of Climate Change – Indicating Factors?

**Vanishing Water Springs!!**



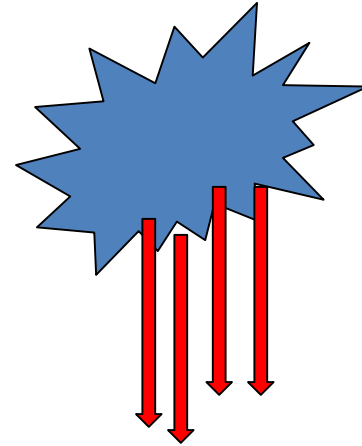
**Drying Alpine Lakes !!!**



# Impacts of Climate Change – Indicating Factors?

## Receding Glaciers

-Effect glacial melt/ moraine species...





# Impacts of Climate Change – Indicating Factors?

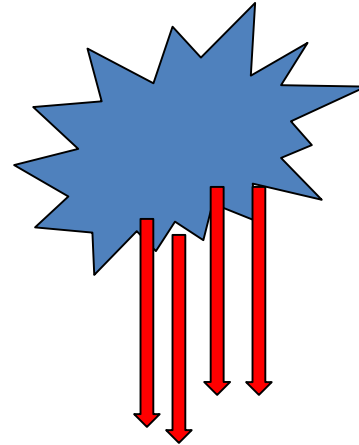
## Receding Plant Populations

(Once common to now extremely  
Rare in Shimla hills)

*Lilium polyphyllum*

*Habenaria susannae* (= *Pecteilis gigantea*)

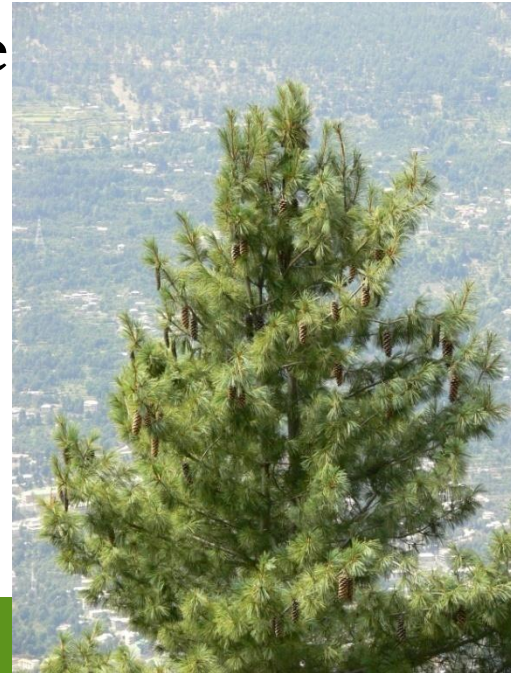
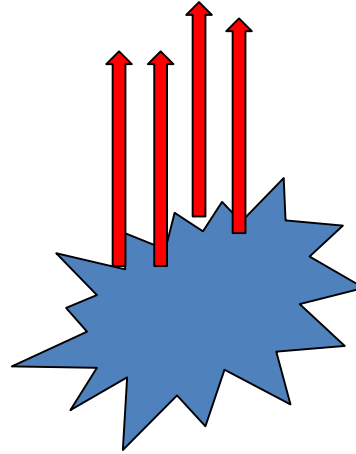
*Cyperipedium cordigerum*



# Impacts of Climate Change – Indicating Factors?

## Upward Movement of Plant species

-Species/ treeline moving up the altitude  
(viz. *Pinus wallichiana*)





# Conservation and Management Strategies

- Survival of local health traditions and livelihood of wild gatherers being critically dependent on wild resource, banning wild collection of medicinal plants does not seem to be a practical solution
- Cultivation of all species neither possible nor desirable
- The solution, thus, lies in strengthening the already depleting wild populations of Red-Listed medicinal plant species – turn ‘Negative’ lists into ‘Action’ lists

# Conservation and Management Strategies

- Delineate *in situ* conservation reserves for priority medicinal plant species for long term conservation of genetic resource of these species
- Generate time series data to assess the impact of climate change – establish permanent plots in different agro-climatic regions
- Create awareness amongst wild gatherers and build their skills about sustainable harvesting practices

# Conservation and Management Strategies

- Community supported cyclic wild harvest protocols – Community Medicinal Plants Reserves (CMPRs)
- Water and moisture conservation to maintain habitat
- Keep a check on the spread of invasive alien plant species to critical habitats
- Augmentation of wild populations of priority species through assisted regeneration – soil working, seed sowing, plantation, weed management, etc.

# Conservation and Management Strategies

- Develop a cadre of ‘barefoot taxonomists’ to monitor wild populations of priority medicinal plant species
- Develop infrastructure and skills of wild gatherers in post-harvest handling of raw drugs
- Establish field gene banks of priority medicinal plants for research and multiplication of germplasm
- Encourage cultivation of priority medicinal plant species through farmer clusters



# Thank You

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