

Key Challenges in Forestry

(and importance of education in forestry)

Andrej Breznikar, Slovenia Forest Service, Slovenia

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Structure of this presentation

1. Presentation of main challenges in forestry sector and their impact on forest management

(DEMAND, MOTIVATION and DISTURBANCES)

2. About implementation of adapted forest management policies and strategies through professional education

Key challenges

Key challenges for forestry sector are:

1. Demand for wood and non – wood (social, environmental) products from forests is growing
2. Forest resources are under - utilised due to property fragmentation, lack of knowledge and motivation in private part of forestry sector
3. Climate changes, its impact on forests and a need for adaptation of forest management strategies on sustainable basis

Key challenges – growing demand

A growing demand for wood in Europe:

- Total expected demand of 853 million m³ in 2030 (present felling cca 600 million m³)
- 'solid' uses will grow steadily, new chemical uses will emerge
- Wood fuel +1.5% growth per year, 585 million m³ in 2030
- Expected to lead to -> scarcity of wood, stronger competition and structural shifts in the forest sector.



EFI/Rach Colling

Key challenges – growing demand

A growing demand for ecological and social functions of forests:

- The forest sector is contributing around 0.8% to GDP (Gross Domestic Product) in Europe
- Importance of ecological functions is growing: protection of forest land and stands, a hydrological function, biodiversity and protection of biotopes, climate function
- The social functions are contributing larger and larger part of BDP: protection of infrastructures, recreation, tourism, learning, research, hygiene and health, the function of protecting the natural and cultural heritage and other environmental assets ...



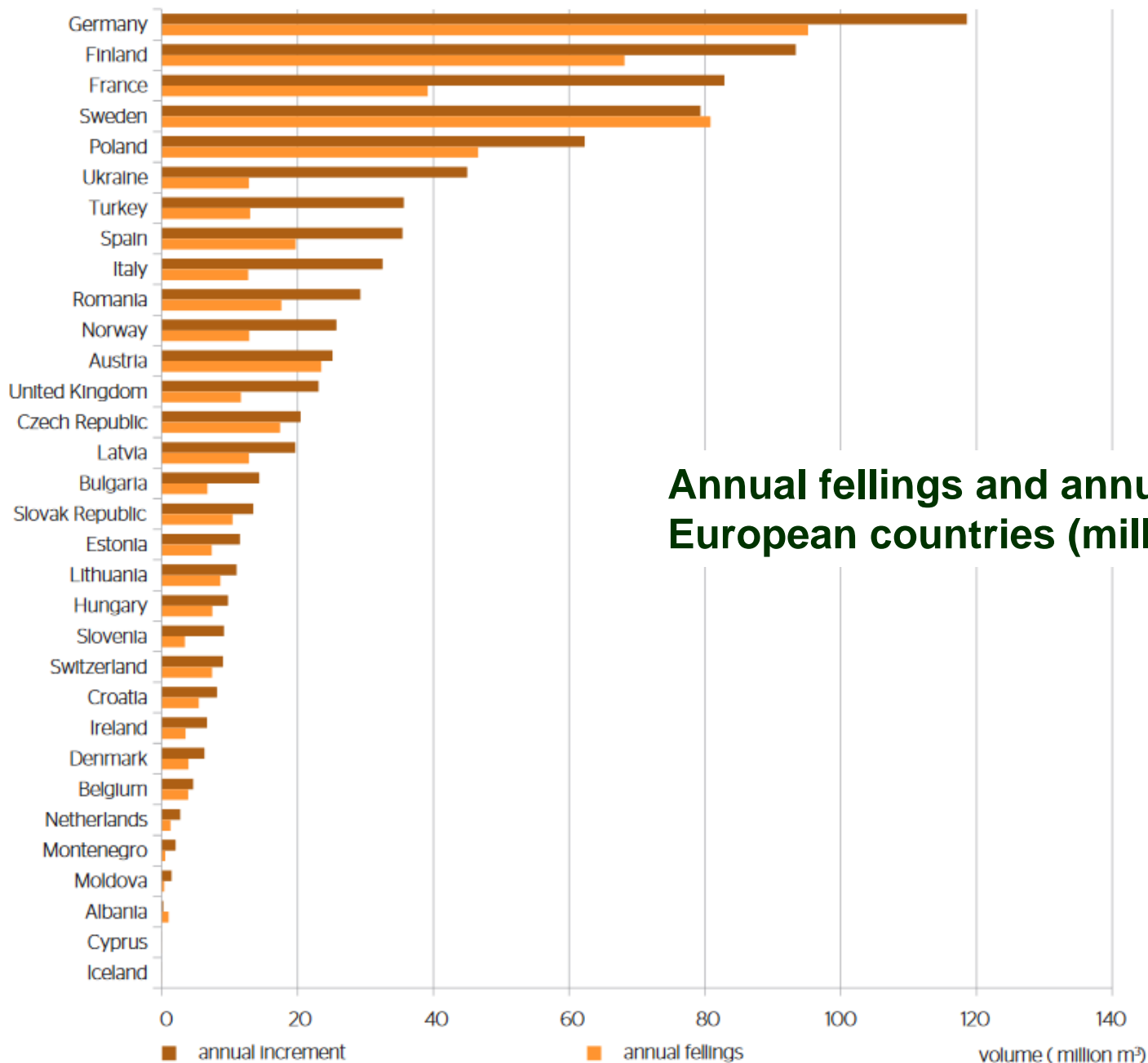
Key challenges – underused resources

Current harvesting levels below sustainable allowable cut

Theoretical potential very high, mobilisable' potential still unknown

Main potential is 'locked' in private forests

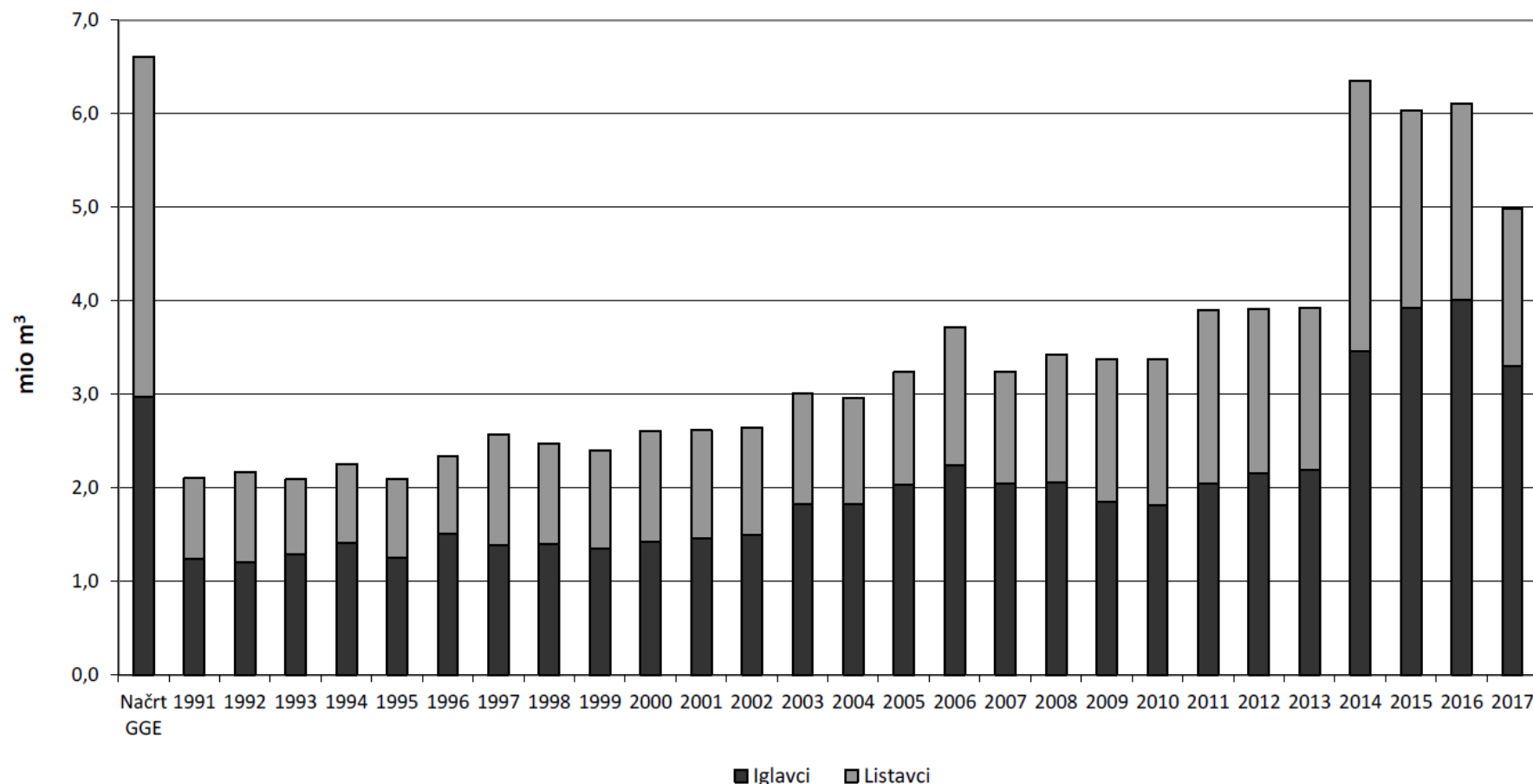




Annual fellingings and annual increment for European countries (million m³)

Key challenges – underused resources

Harvesting in Slovenian forests 1991 - 2017



Key challenges – underused resources

What are the barriers to wood mobilisation?

Socio-economic, technical and environmental barriers

- Demographic change
- Marginal or unstable income
- Increasing fragmentation
- Difficult access and harvesting
- Societal demand for ‘free’ ecosystem services
- Unpredictable impacts of climate change



Key challenges – underused resources

How to mobilize forest owners and intensify forest management:

1. Forest management is tradition, changes require a stable and cohesive overall policy framework, sustained investments and time.
2. The local conditions must be taken into consideration when designing and implementing policies to increase wood mobilization
3. The main barriers are of socio economic nature – motivation of forest owners
4. Broader awareness of the benefits of active and sustainable forest management is needed.
5. Forest owner associations are key actors in mobilization so we have to improve their capacity to facilitate engagement of members
6. Guarantee of the sustainability of more intensive forest management is intensive monitoring of forests
7. We have to solve the complexity and lack of transparency on wood markets

Key challenges – climate change

Climate changes are a consequence of non-sustainable use of natural resources:



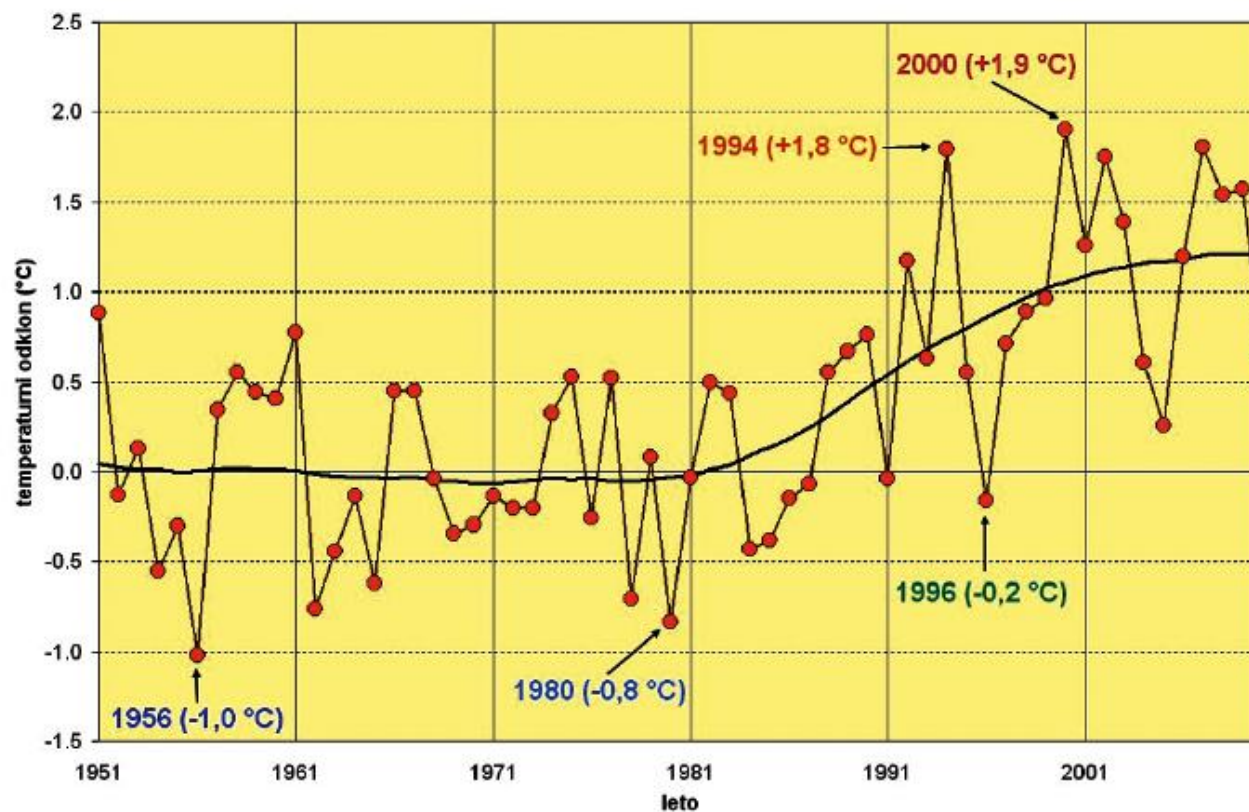
Climate changes are caused by changes in the total amount of energy from the Sun that is kept in the Earth's atmosphere. This change in energy is then distributed around the globe by winds, ocean currents, and other mechanisms to affect the climates of different regions.



Key challenges – climate change

Climate changes are a fact - Average annual temperature in Slovenia:

Annual variations in air temperature in Slovenia in relation to the reference period 1960 - 1990



Stališče
SMD
podnebnih
sprememb

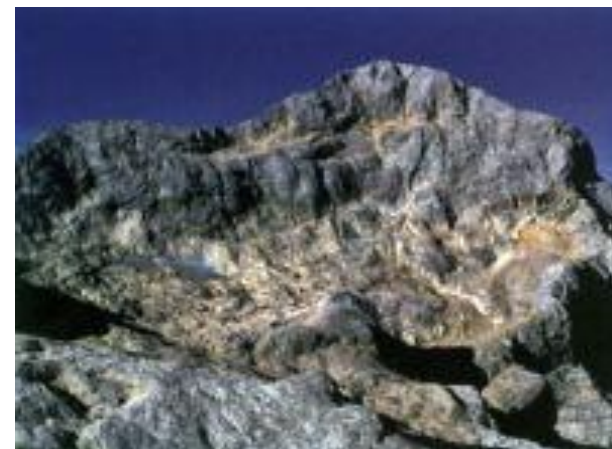
Slovensko
meteorološko
društvo
Od 1954

Slika 7. Letni odklon v povprečni temperaturi zraka dva metra nad tlemi na območju Slovenije glede na referenčno obdobje 1961–1990. S pomočjo izbora 10 postaj (Kredarica, Rateče, Postojna, Sevn, Šmartno pri Slovenj Gradcu, Celje, Novo mesto,

Key challenges – climate change

Expected changes in central Europe climate:

- increase in average daily temperature : 2 - 3 ° C
- change in precipitation regime - more precipitation in winter and less in summer
- lengthening periods of drought in the growing season
- more heat waves
- shortening the period of snow cover
- ...



Climate change impact can be seen on Triglav glacier, which has shrunk from the area of 16 ha in year 1946 to only 3,6 ha in 2015.

Key challenges – climate change

Main climate change threats to forests:

Rise of average annual temperature

Prolonged length of dry periods

Different annual distribution of precipitation –
more in winter, less in summer

Changes in tree species distribution

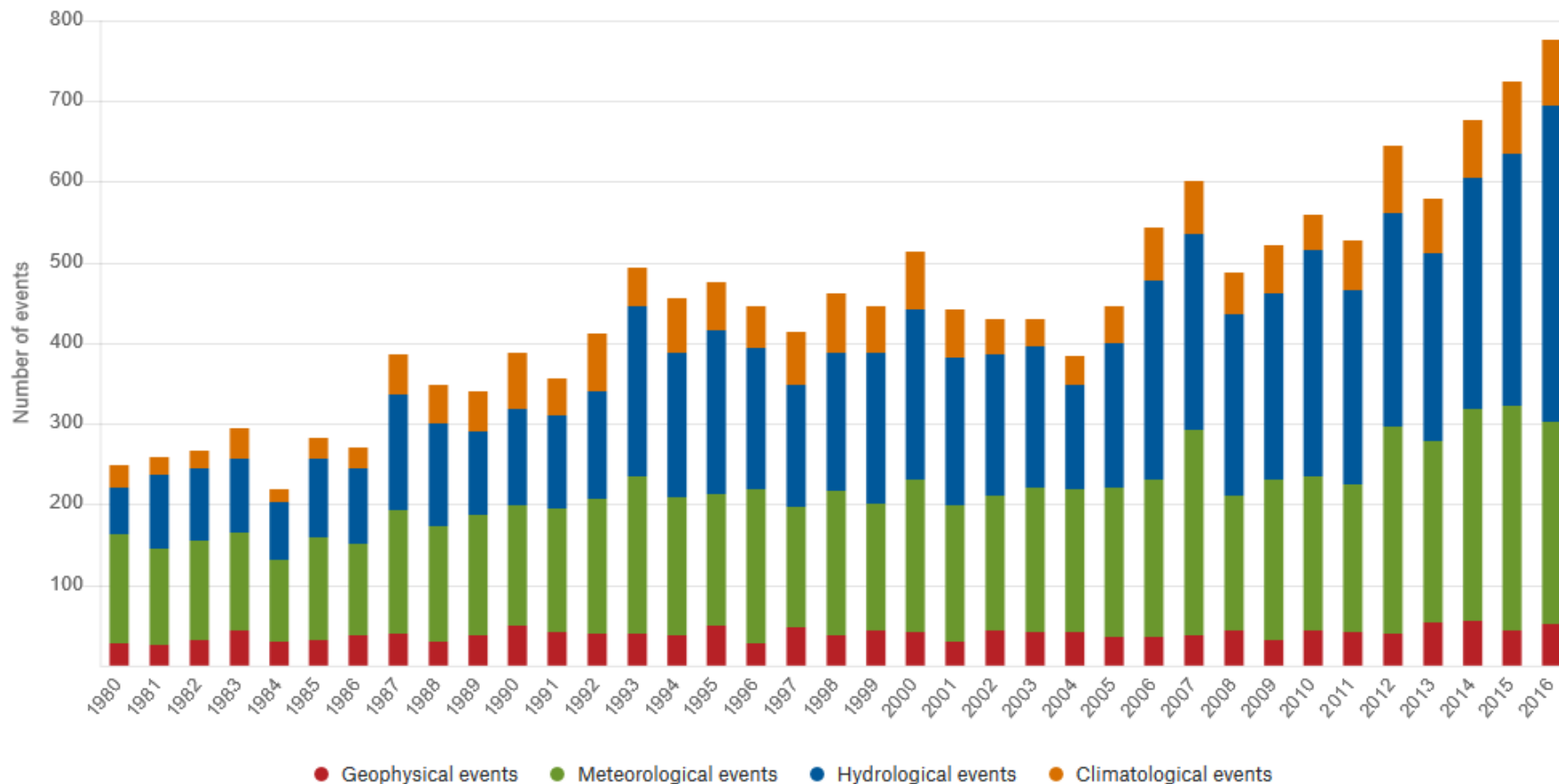
Higher risk for pests and diseases in forests
(bark-beetle), invasive species

Higher probability of extreme events
(windbreaks, snowbreaks and forest fires)



Key challenges – climate change

NatCatSERVICE – Global natural disasters 1980 – 2016; Number of events is rising



Key challenges – climate change

The society has 3 possible responses to climate change:

ACCEPTANCE of negative effects – “business as usual”

MITIGATION of impacts - measures to reduce the speed and volume of anthropogenically induced climate changes

ADAPTATION measures to reduce the negative effects of climate change on human well-being

Adaptation and mitigation are the two main responses to climate change. They are two sides of the same coin: mitigation addresses the causes of climate change and adaptation its impacts.

Key challenges – climate change

MITIGATION – what can forestry contribute:



**Preservation and
increase of forest
area**



**Accumulation of
wood increment**



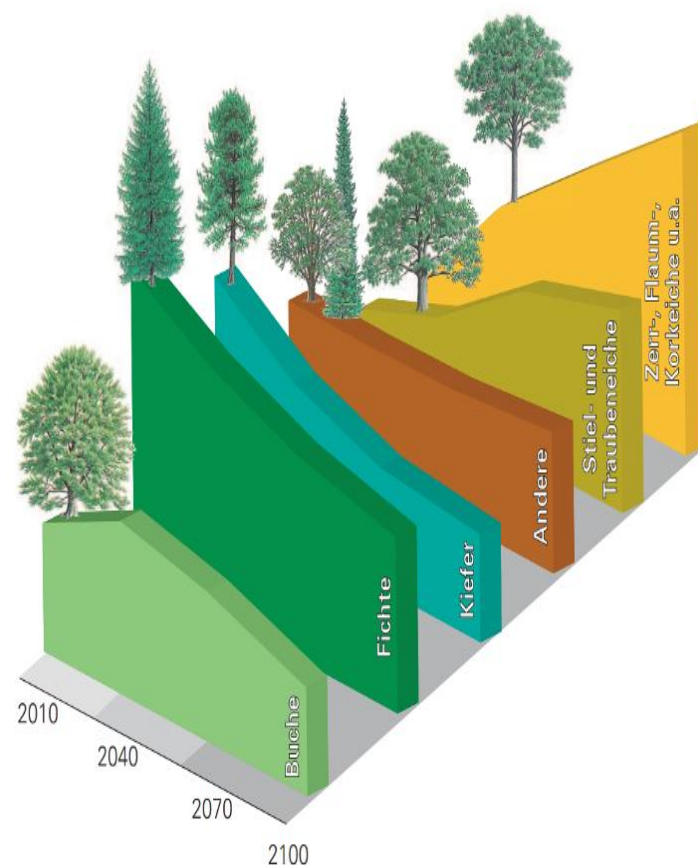
**Use of wood as
energy source**



Adaptive management

Reasons for immediate adaptation:

- Climate change can not be avoided
- Climate change may proceed faster and more pronounced than current estimates suggest
- Timely adjustments are effective, but above all cheaper than adaptation at the last minute
- Better adaptation to existing climate variability and extreme weather events can bring immediate benefits



Projection of tree species abundance in Europe:

Adaptive management

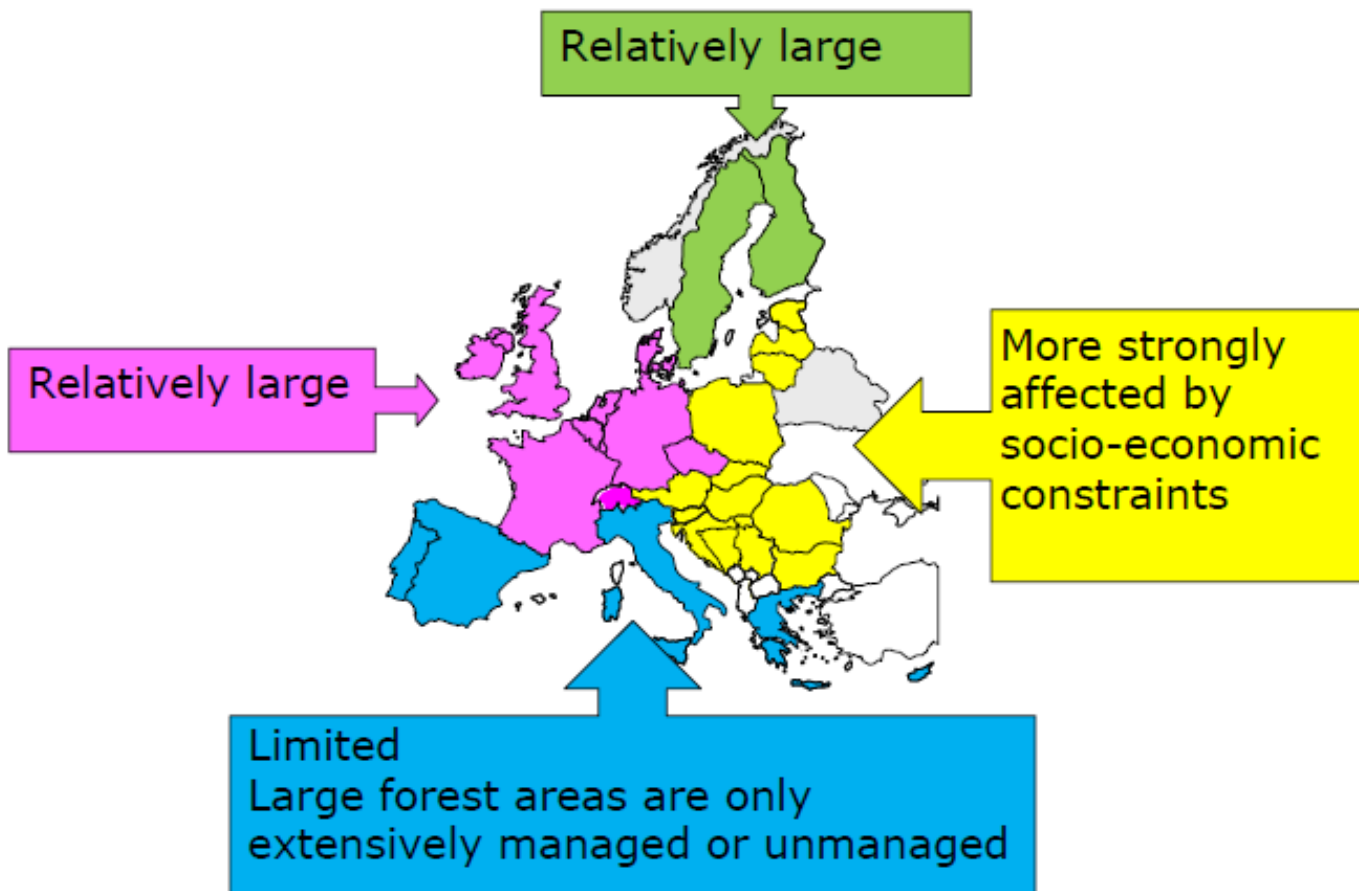
What is an adaptive forest management?

- Climate change uncertainties are large, any management scheme should be prepared for continuous readjustment
- The term 'adaptive management' describes such a flexible management approach
- Main characteristic are iterative cycles of planning, managing, monitoring, revised planning on so on
- Adaptive management is based on assumption that current knowledge about ecosystem functioning is limited and the future even more uncertain.

Sustainable forest management (SFM) is an effective framework for climate change response

Adaptive management

Adaptive capacity of forestry sector in different European countries



Icebreak in Slovenian Forests

30.1 – 10.2.2014

602.000 ha (51 %) of forests

9,3 mio m³ damaged wood



Bark beetle attack in Slovenia

2015 – 2017 (3 years)

60% of forests

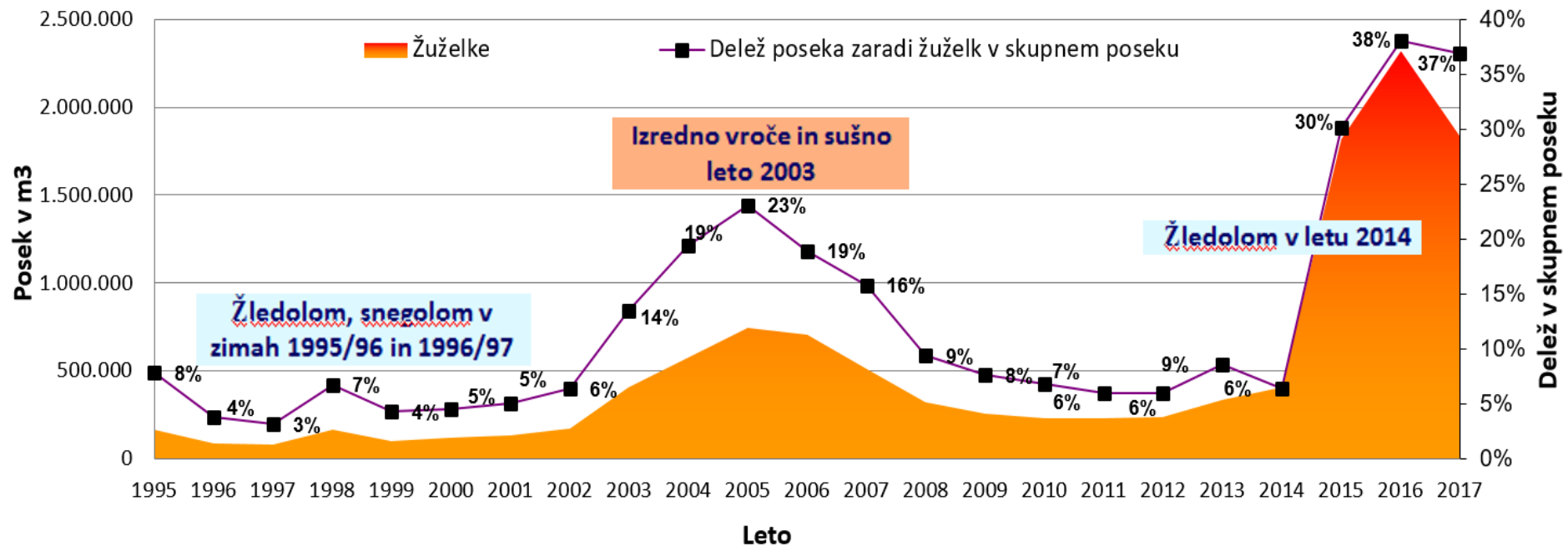
7 mio m³ damaged wood

Bark beetle attack

2015 – 2017 (3 years)

60% of forests

7 mio m³ damaged wood



Windbreak in Slovenia

11. – 13. 12. 2017

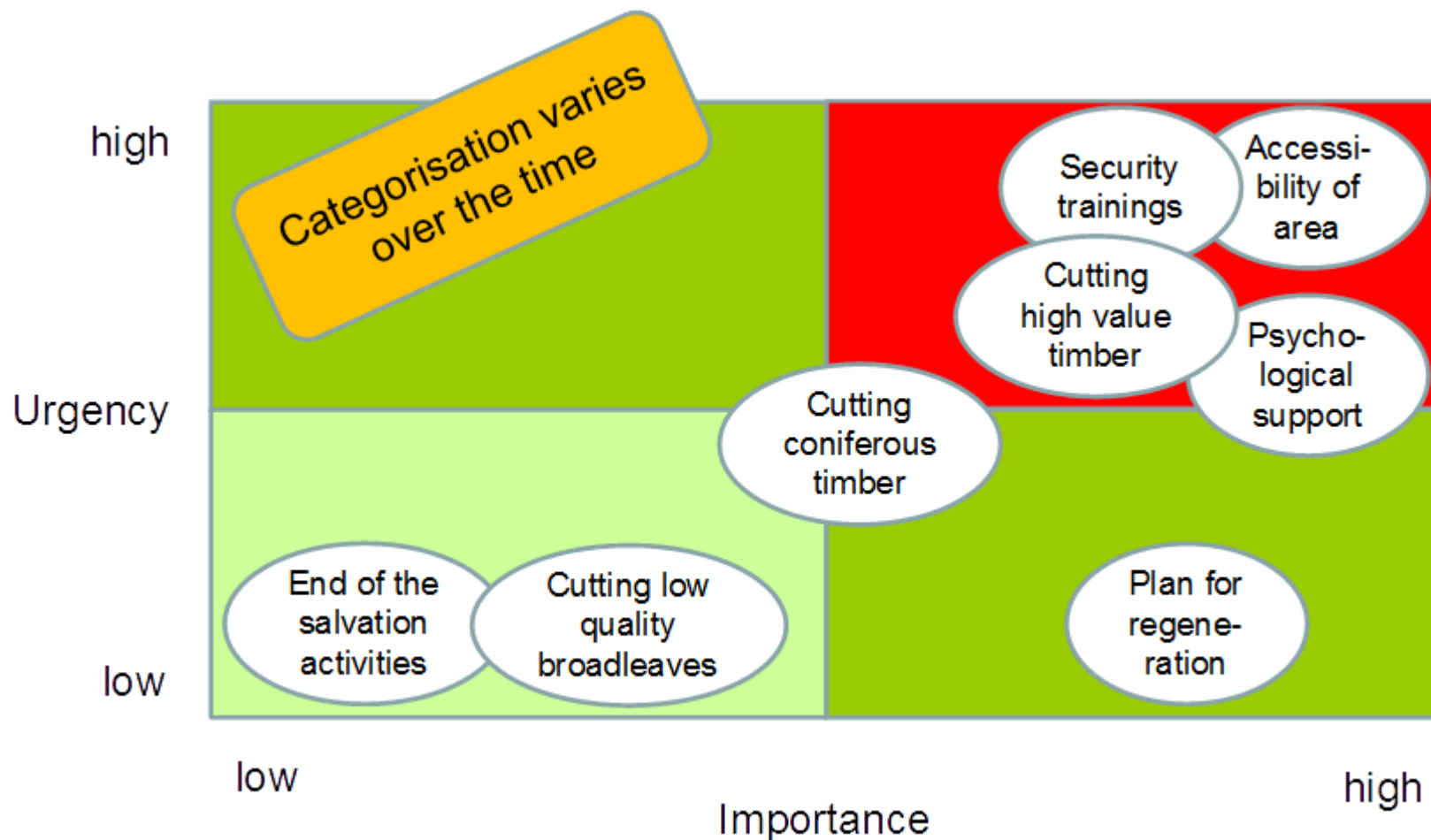
20% of forests

2,2 mio m³ damaged wood



Adaptive management

Measures after catastrophic events: Urgency and Importance matrix:



Planning of adaptation measures in forest management

Impact of climate change on forests

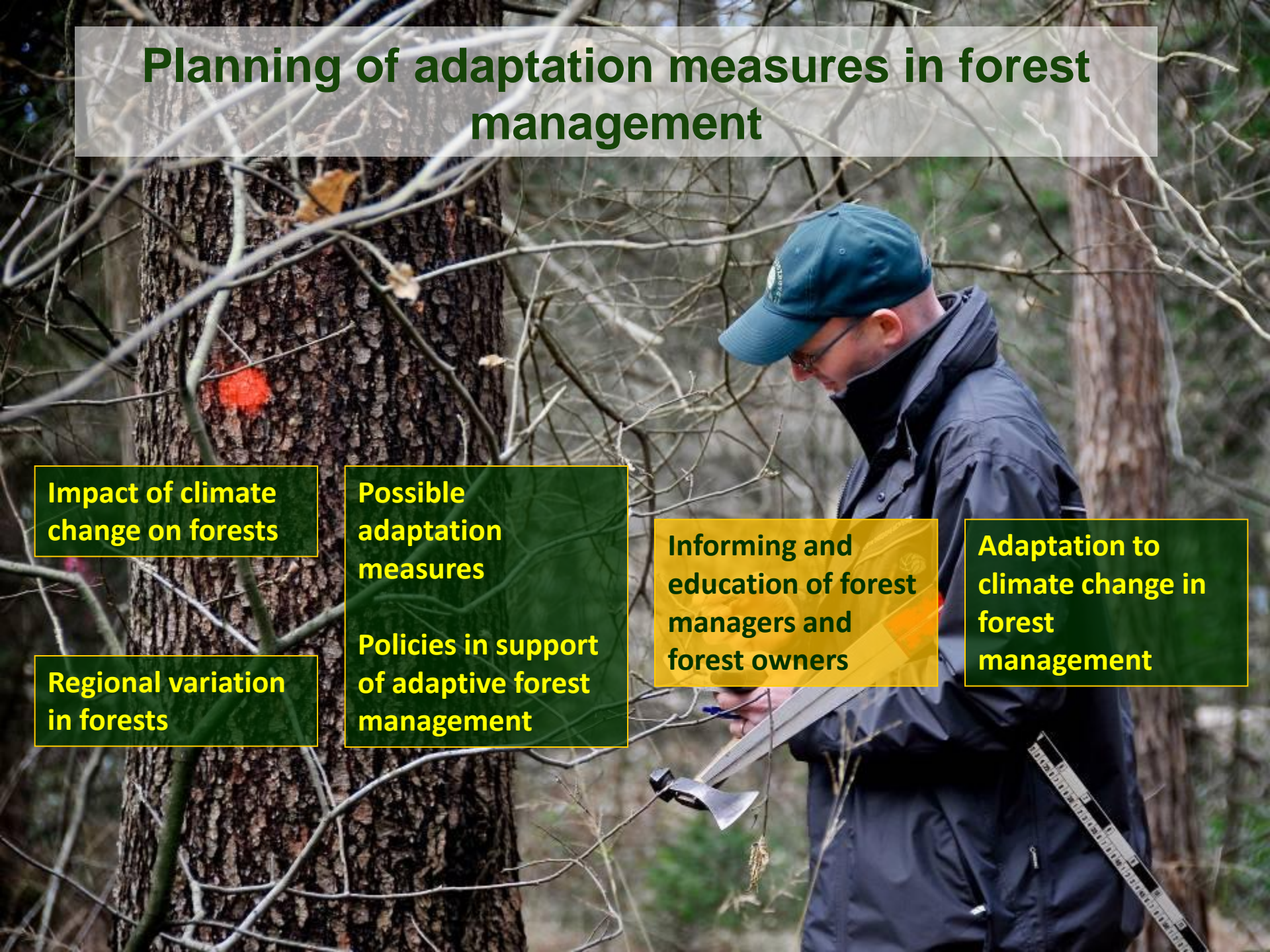
Regional variation in forests

Possible adaptation measures

Policies in support of adaptive forest management

Informing and education of forest managers and forest owners

Adaptation to climate change in forest management



Adaptive management

Importance of education in forestry sector:

1. Real adaptation to climate change occurs at the local level and by local actors in the forest.
2. Policy support, resources for education, training of and the dissemination of knowledge to target groups in forestry are needed.
3. There will be a continuous challenge to provide scientific knowledge in a form that local managers and policy makers can also utilize.
4. The awareness and knowledge of forest owners and practitioners improve the implementation of adaptation measures.
5. The remaining uncertainties about the climate change impacts, the adaptive capacity and the suitability of the adaptation measures create a need for the monitoring of impacts and the evaluation of adaptation response.



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