COST ACTION FP 0703

Echoes: Expected Climate cHange and Options for European Silviculture

Country Report: Major points

POLAND

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Introduction

- The total area of forests in Poland is 9,048 million ha. They cover 28.9% of the country. Till the end of 20 century, the main task of Polish forestry was afforestation, conversion of coniferous stands, insects/pests threats, and “ecologisation” of forestry.
- Polish forests play important role in the process of mitigation of expected climate change.

I. Impacts
I.1. Observed impacts

- Draughts,
- Frequency and severity of natural disasters (hurricane, forest fires, frost, floods)
- Water deficit,
- Change in length of growing season,
- Change in species range (upward shift),
- Expansion of some herb layer - sweet woodruff, wild raspberry, purple toothwort – gradually migrate to higher altitudes within their range,
- Increase in so called “secondary pests” in coniferous forests.

I.2.Expected impacts

- Increase in susceptibility to pests and diseases,
- Changes in species composition (Scots pine, common birch, aspen and hornbeam will be the benefit; Silver fir, sessile oak and pedunculate oak, small-leaved lime, and beech will increase their range; Norway spruce will suffer – in the pessimistic variant ($2xCO_2$) spruce will totally disappear in Poland moving to the north and east of Europe),
- Changes in ecosystem productivity - increase in growth of standing stock; increase in increment growth rate,
- Increase in the level and frequency of disturbances.

I.3.Impact monitoring

- Monitoring of carbon content in herb layer on 530 forest biological monitoring plots in a 16x16 km grid
- Net exchange of CO_2 between forest and forest ecosystem – 34m high measurement station was established in Tuczno Forest District (central-west Poland).

II.2. General adaptation strategy or policy

- National Policy on Forests adopted by the Government in 1997,
- National Policy on Ecology (1991),
- II National Policy on Ecology (1994),
- Ordinance No.11 of the Director General of the State Forests (1995) – ecology based improvement of forest management, introduction to practice the principle of balancing and optimizing all forest functions especially protection on biodiversity.

II.3. Forest adaptation measures

- Stand conversion towards species composition better adjusted to habitat conditions (approx. 20-25 t C/ha)
- Introduction of understory (improvement of growing stock – approx. 1.1 m3/ha/year and C accumulation – approx. 0.4 C/ha/year)
- Change of the management method from clear-cutting to shelter-wood system and from artificial to natural regeneration (clear-cut cause release of about 24 t C/ha; abandonment of clear-cut can increase accumulation of C to approx. 0.4 t C/ha/year)
- Tending cuts, especially thinning, enable using timber from so called increment thinning
- Afforestation of post-agricultural land (approx. 80 t C/ha).

II.4. Research studies on forest adaptation

- “Climate change and forest ecosystem: carbon stock in Polish forests and the direction of forest management adaptation” (realized by FRI - financed by GDSF)

III. Mitigation
III.1. Carbon accounts

- It is estimated that Polish Forests contain **736 million tons** of carbon accumulated in forest biomass of which **562 million tons** accumulates in the aboveground biomass, **168 million** – in the belowground biomass and **6 million** - in dead wood.

III.2.Forestry as a source of bioenergy

- Promotion of timber as a substitute for energy-consuming raw materials and products, as well as a direct source of energy – cooperation with the building, timber and power industries.

III.3. Processes, instruments and strategies

1. Afforestation of post-agricultural land and wasteland; change of afforestation techniques by avoiding intensive soil preparation; promotion of natural regeneration and seeding.
2. Widespread introduction of sustainable forest management principle:
- Promotion of natural regeneration,
- Limitation of clear cuts,
- Limitation of tending intervention (mechanical soil preparation),
- Increase in the intensity of tending cuts,
- Soil protection and increase in organic matter retention in forest ecosystems (introduction of underwood, second storey),
- Application of environmentally friendly forest utilization technologies,
- Abandonment of burning splash,
- Use of bio-oils in forest equipment.

3. Extension of wood products' life cycle – their period of use should be equal or exceed the production period.
4. Increase of utilization to 70-75% of increment.

III.4. Research studies on mitigation

- “Carbon balance in the biomass of major forest tree species in Poland” (financed by GDSF)
- “Interrelationship between climate changes and forest ecosystems in Poland - Exchange of CO_2 between forest ecosystems and the atmosphere” (Tuczno Forest District) (financed by GDSF)
- “Determination of carbon content in different tree fragments and different forest ecosystem elements”.

Thank you for your attention