

Exploring challenges to sustainability in the provision of ecosystems services by upland forests in *Scotland* and *Ukraine*

Maria Nijnik

The James Hutton Institute, United Kingdom
maria.nijnik@hutton.ac.uk

Mariana Melnykovych

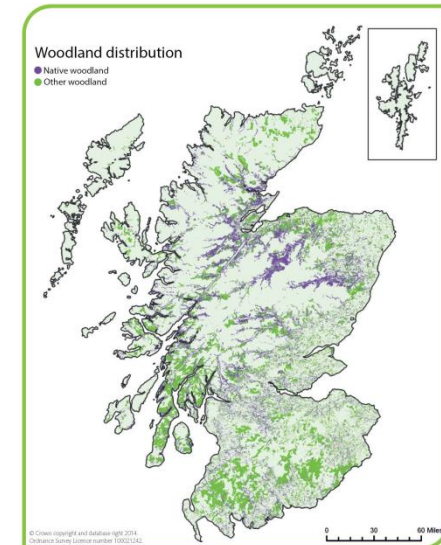
The James Hutton Institute, United Kingdom &
Ukrainian National Forestry University, Ukraine
mariana.melnikovych@ukr.net

Countries' profile: FOREST



Ukraine

- forested area **15.8%** of the total land;
- Coniferous 42.6%** (mostly pine trees);
- Deciduous forests 57.4%** (mostly beech (*Fagus sylvatica*) and oak (*Quercus robur*))

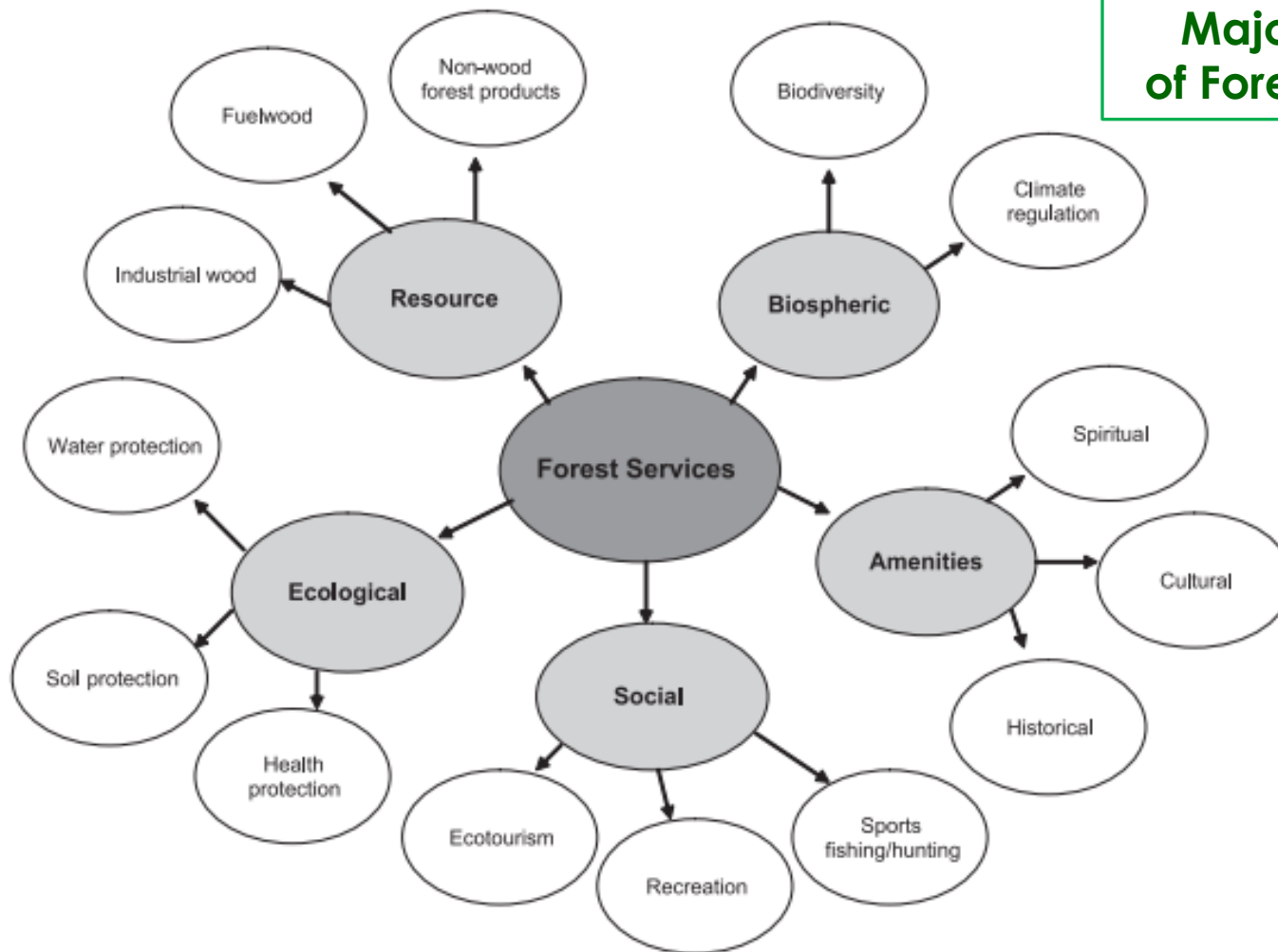


Scotland

- wooded cover is **18%**;
- 70% coniferous forest** (mostly Sitka spruce)
- The **Caledonian Forest** – the ancient old-growth temperate rainforest of Scotland (mostly Scots pine (*Pinus sylvestris* L.) covering 180 square km

Services Provided by Forests and Woodlands

Major Classes of Forest Services



Source: Millennium Ecosystem Assessment, 2005. Forest and Woodland Systems

Forest Ecosystem Services (FES) provided in mountains

Provisioning FES

- **Timber** for use in buildings and infrastructure development;
- **Fuelwood** (critical for local populations);
- **Non-timber forest products**, including game, foods (mushrooms, berries, edible plants, remedies, scotch production, ect.);
- The availability of **grazing for subsistence farming**.

Regulating and Supporting FES

- Critical **stability /protection function** – forest cover enables soil retention and act as a barrier to the impact of avalanches and rockfalls on valley communities;
- **High water retention capacity**, intercepting and storing water-maintaining hydrological cycles , limiting peak stream flow rates, reducing soil erosion and the severity of avalanches and downstreaming flooding ;
- **Carbon sink** with ongoing carbon sequestration for climate change mitigation;
- Represent value as a rich **biodiversity** place, which is linked to game, tourism, recreation and fishing.

Cultural FES

- **Spiritual and aesthetic values;**
- **Recreational opportunities.**

Source: Mountain Forest In Changing World..., 2011

Key purpose of investigation

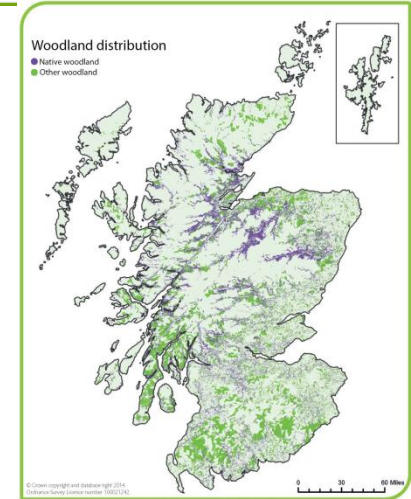
Because **wood** is currently the **most important forest product** in both countries, the following is needed **for increasing of well-being of local people in rural areas**:

- ◉ **Multi-functionality** (vertical or horizontal),
- ◉ More active/wide involvement in decision-making processes of forestry associated **stakeholders**,
- ◉ **Social innovation** in rural areas (especially in remote forest-dependent areas)

Scotland

Public attitudes to sustainable forestry

- Q-method applied;
- studied respondents opinion to the integration of more woodlands in rural landscapes;
- public priorities and of factors that can hamper ecosystem based adaptation policies and management practices (Nijnik and Mather, 2008);
- attitudes towards forestry practices and the key objectives of the future of forestry in uplands (Nijnik et al., 2009).



Results



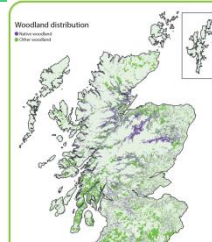
The James
Hutton
Institute



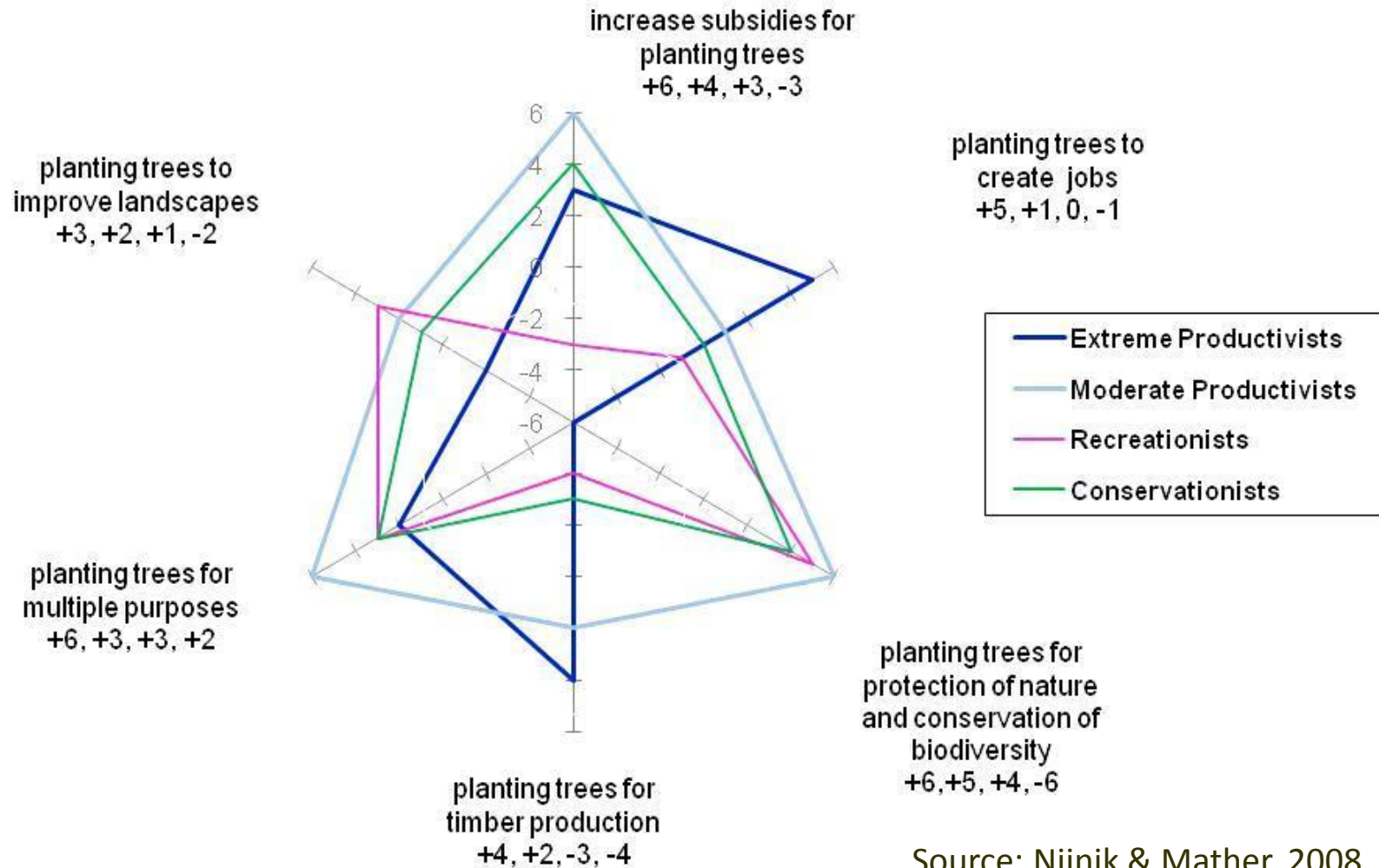
important role of woodlands for the development of upland areas
(range of benefits to the people, environment and economy)

- an improved understanding of how the diversity of opinions on forestry changes could influence the selection and evaluation of sustainable forest policy measures;
- attention of respondents is paid to the recognition of the importance of **biodiversity conservation** and **nature preservation**, of **forest multi-functionality**, and people's **rights to enjoy the beauty of landscapes**
(commonalities and differences across stakeholder groups were identified)





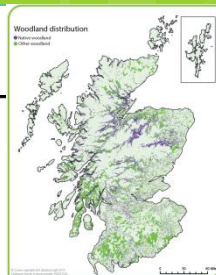
Scotland



Source: Nijnik & Mather, 2008



Scotland



Provisioning services
Maintaining forest for timber production

Provisioning services
Multiply the wealth of local communities from forest area

Regulating and supporting services

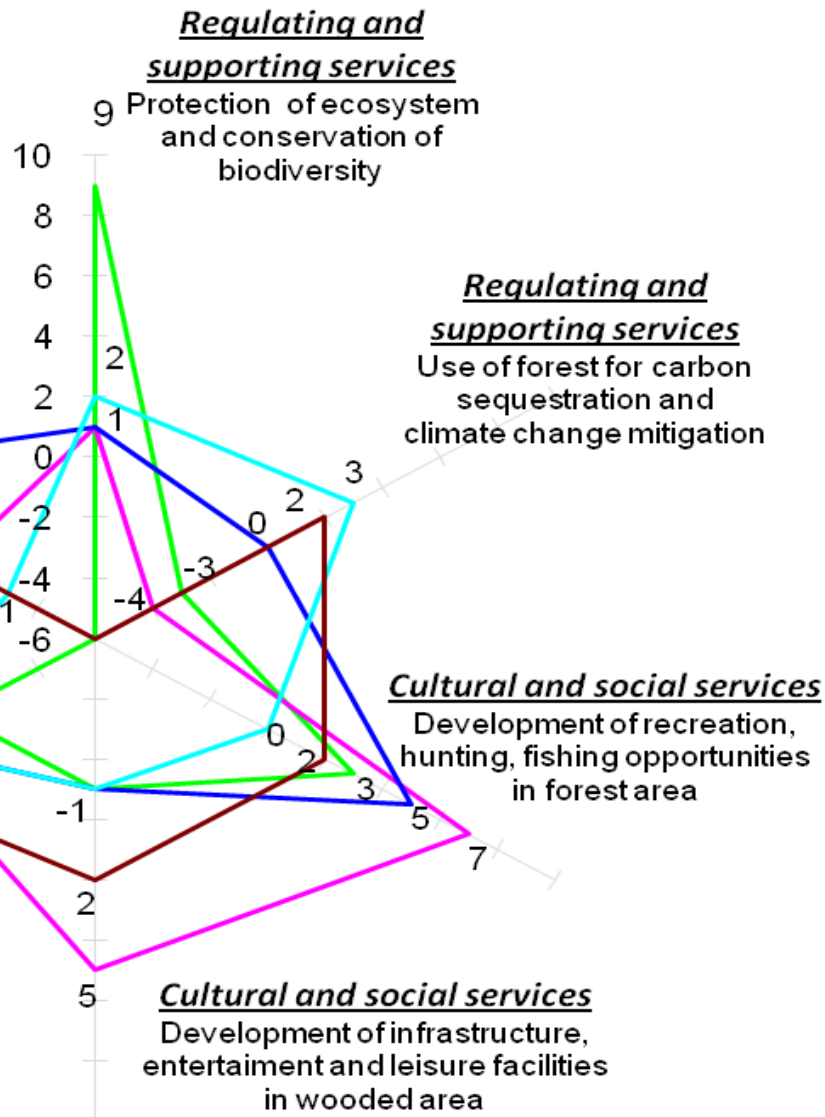
9 Protection of ecosystem and conservation of biodiversity

Regulating and supporting services
Use of forest for carbon sequestration and climate change mitigation

Cultural and social services
Development of recreation, hunting, fishing opportunities in forest area

Cultural and social services
Development of infrastructure, entertainment and leisure facilities in wooded area

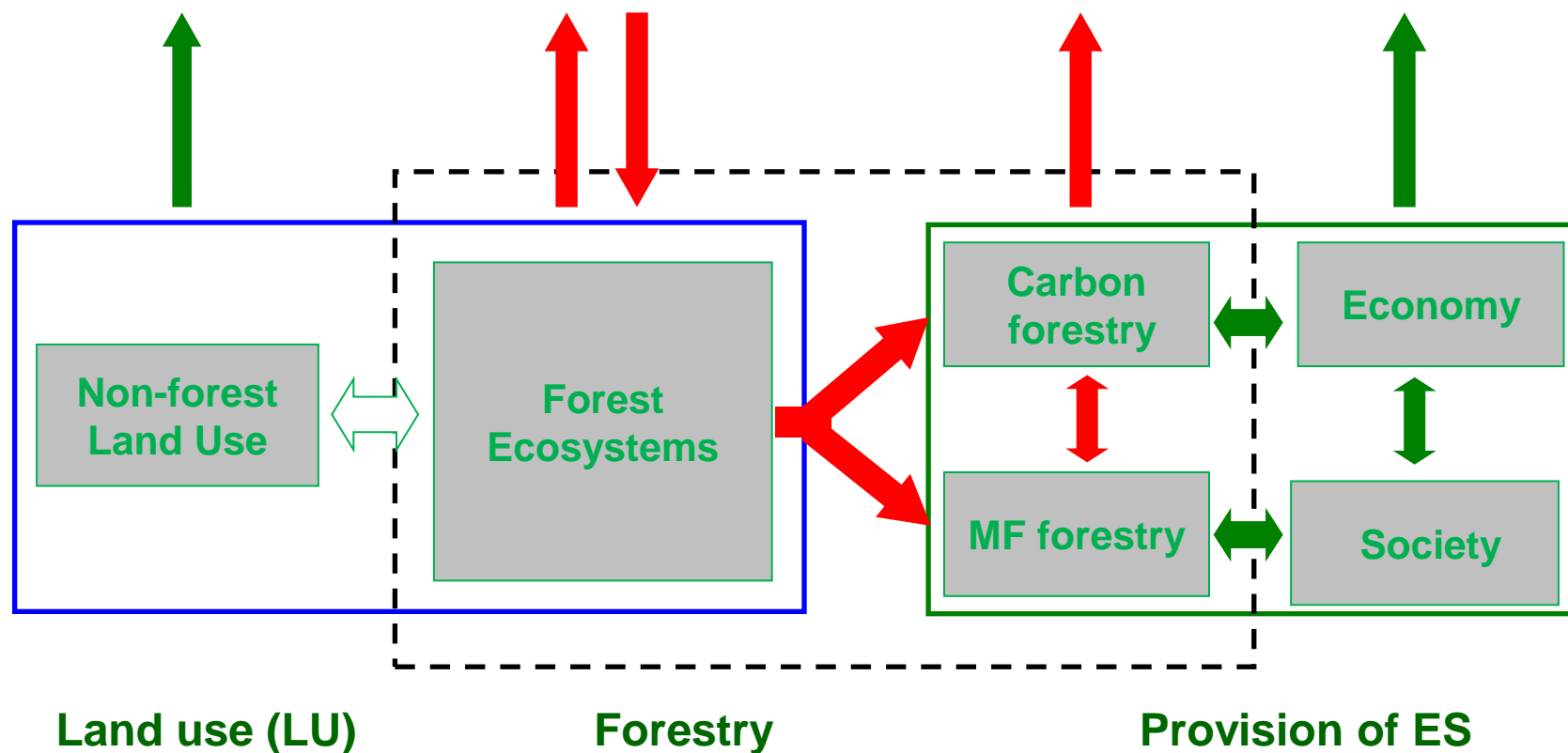
- group of responders 1
- group of responders 2
- group of responders 3
- group of responders 4
- group of responders 5



Source: Nijnik et al., 2009

FOCUS: Scotland's forests and their services

Minimizing net emissions: living within environmental limits
(resilience, innovation and adaptability)

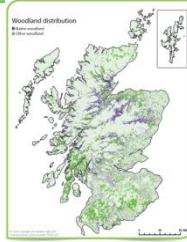


Realizing the potential of nature: achieving a sustainable economy

Source: FP0703 COST Action ECHOES

Adapted from the materials of COST Action FP0703 (Peyron, Nijnik *et al*, 2010)

Scotland



Main policy directions identified:

- **More** investments into forestry to attain a proper balance between nature preservation & timber production forest functions;
- **Shift** of the efforts and new investments to improve forest landscapes and to enhance nature protection measures;
- **Shift** towards enhancement of private forestry, farming activities & urbanisation with the development of infrastructure in remote rural areas;
- **Shift** towards overall S-E development of remote rural areas to improve life of local communities.

The Ukrainian Carpathians

Studied:

- attitudes of forestry associated stakeholders and local people towards the place of woodlands in livelihoods of the communities living in study areas and
- role of woodland development in raising of their well-being;
- stakeholder attitudes concerning access of local communities to obtaining forest multiple ecosystem services, including timber and non-timber forest products, and services (Melnykovych & Soloviy, 2014);
- **'face-to-face' questionnaire surveys** of respondents: *local communities, forest professionals, and business representatives;*

Software package used: SPSS

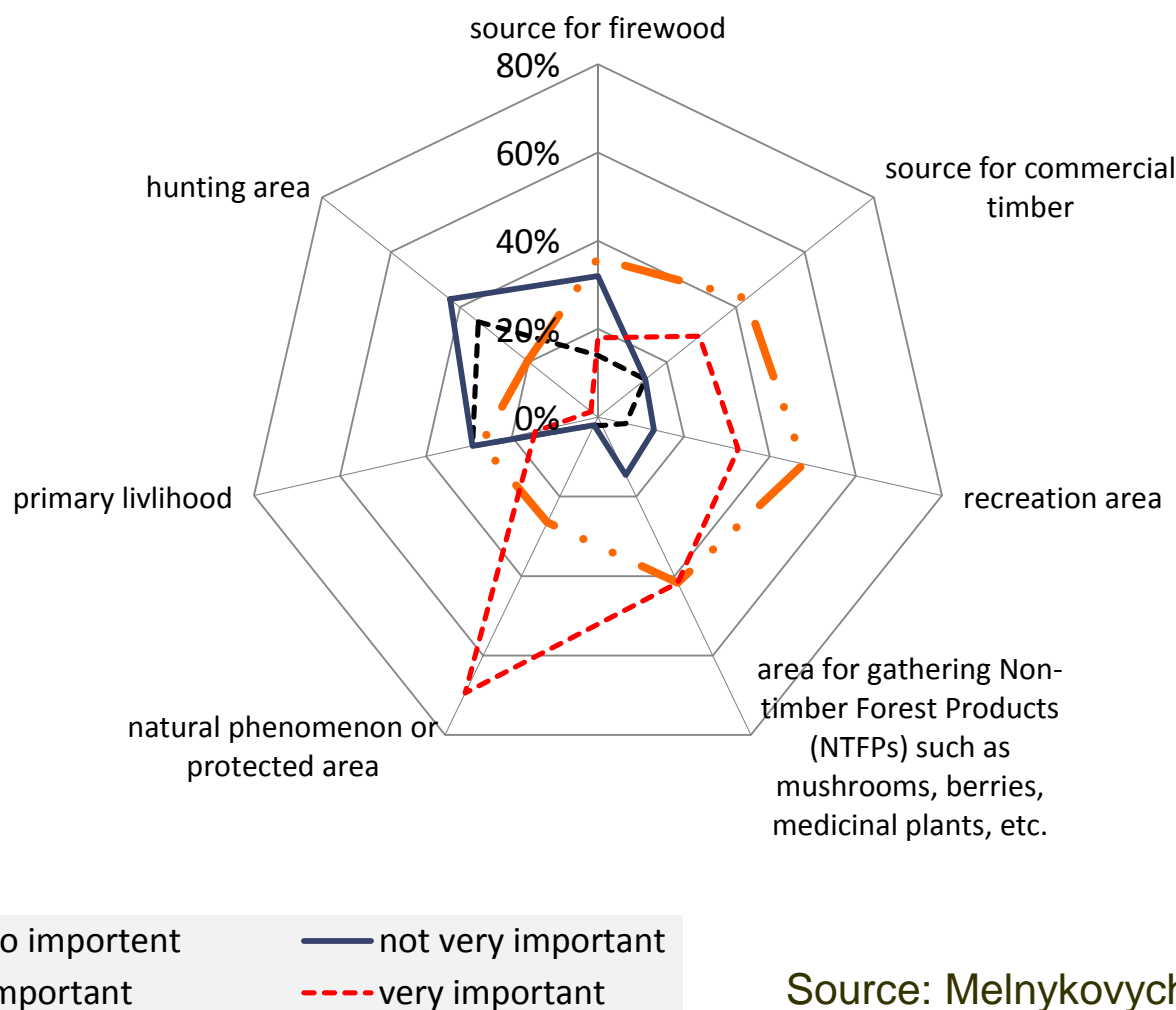


The Ukrainian Carpathians: a study area

- located in the south-west part of Ukraine;
- area of 56 500 km² (**9.4%** of the Ukraine's territory);
- population is about 6.1 million people (**13%** of the population of Ukraine);
- Main forest types: **Pine** (*Pinus sylvestris*), **Oak** (*Quercus robur*), **Beech** (*Fagus sylvatica*), **Spruce** (*Picea abies*), **Birch** (*Betula pendula*), **Alder** (*Alnus glutinosa*), **Ash** (*Fraxinus excelsior*), **Hornbeam** (*Carpinus betulus*), **Fir** (*Abies alba*).
- Forests occupy **53.5%** of the Carpathian area and play an important role in socio-economic life of the mountain communities.



What does forest mean for the community?



Source: Melnykovych & Soloviy, 2014

Results

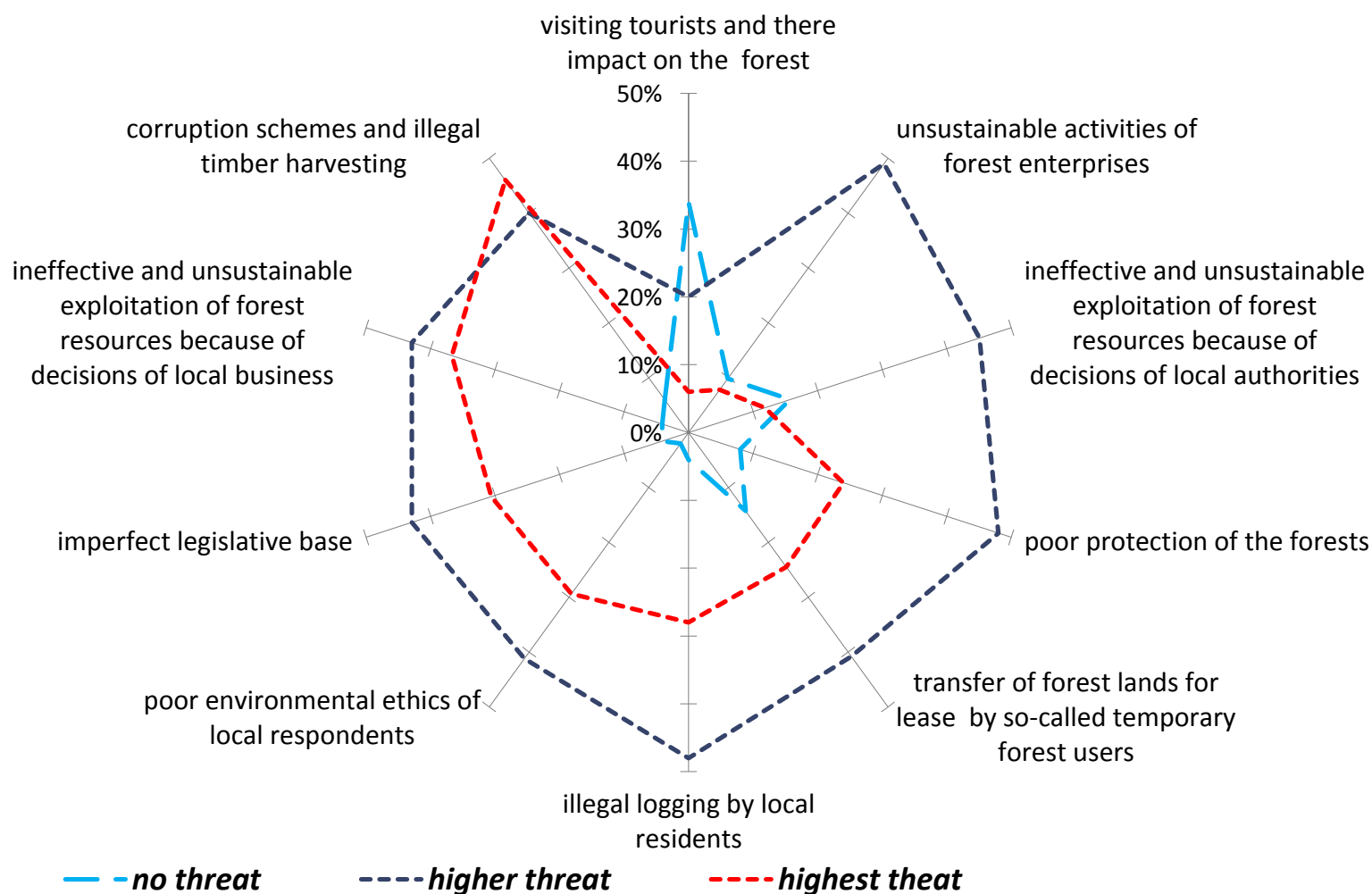
- in a broad sense, the economic, environmental, social, cultural and aesthetic functions of forests contribute considerably to the well-being of forest-dependent communities living in the vicinity of the Carpathian Mountains;
- illegal logging is among key threats to a sustainable provision of forest ecosystem services and the well-being of communities living in the uplands (opinion of 54% (!) of respondents).



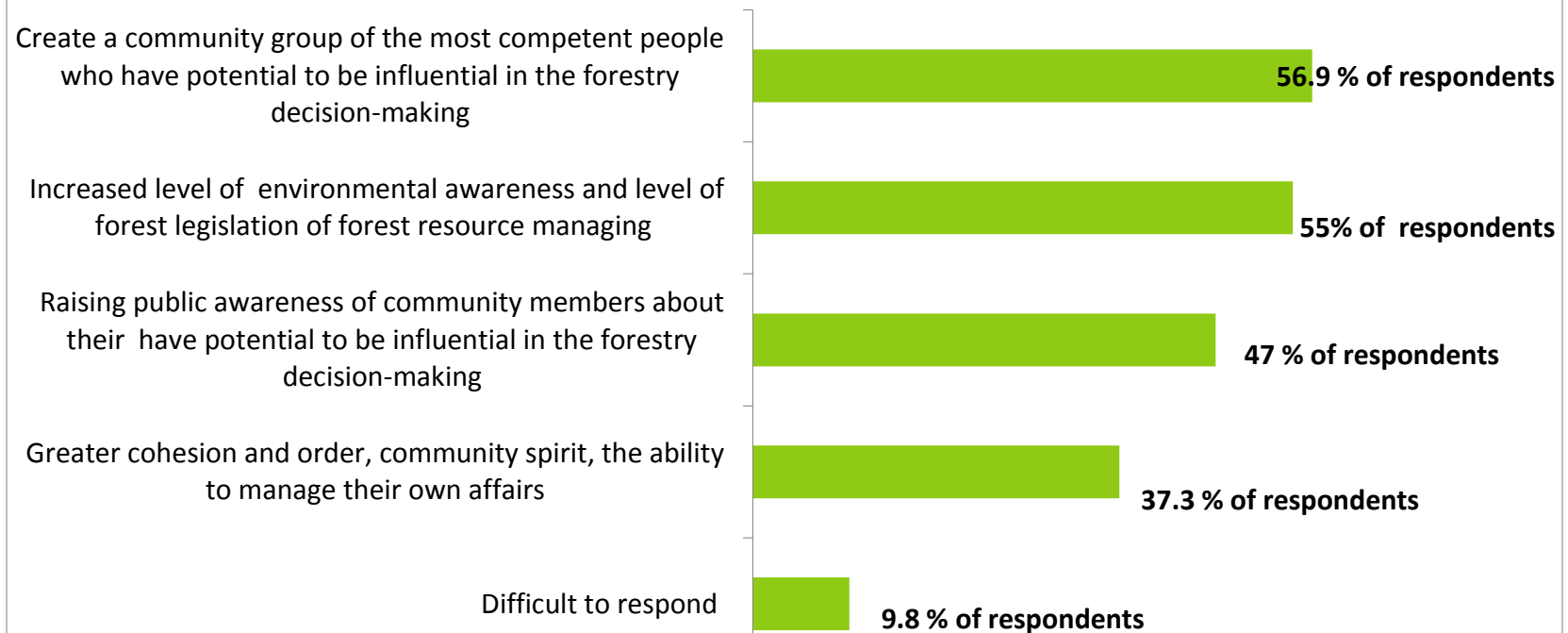
Photo credit: Y. Bihun



Key factors influencing sustainability of forest management: opinion of stakeholders in Ukraine



Measures towards a more efficient use of forest resources and increasing level of well-being of forest dependent communities



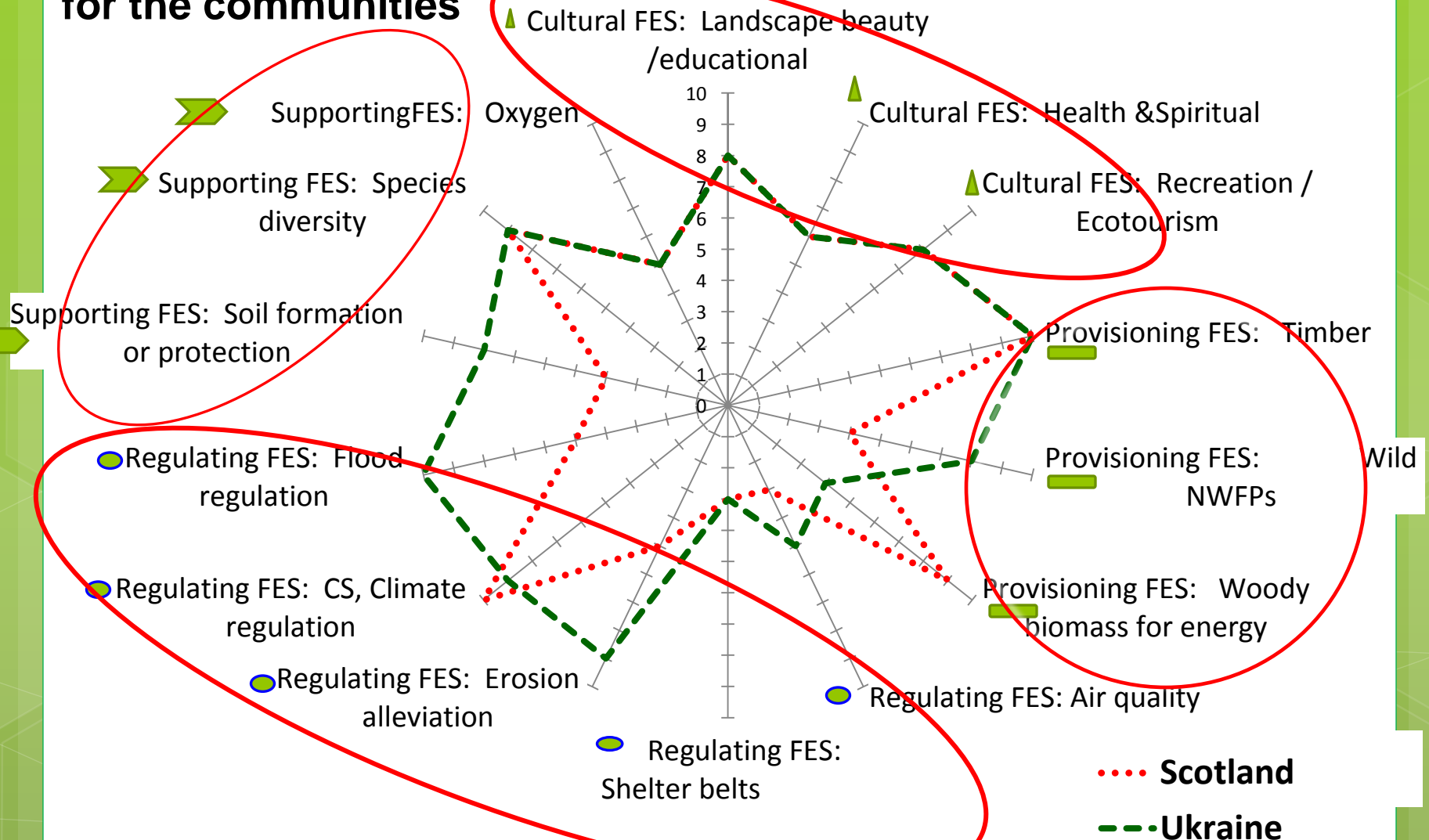


Comparison in the provision of ecosystems services by upland forests in Scotland and Ukraine

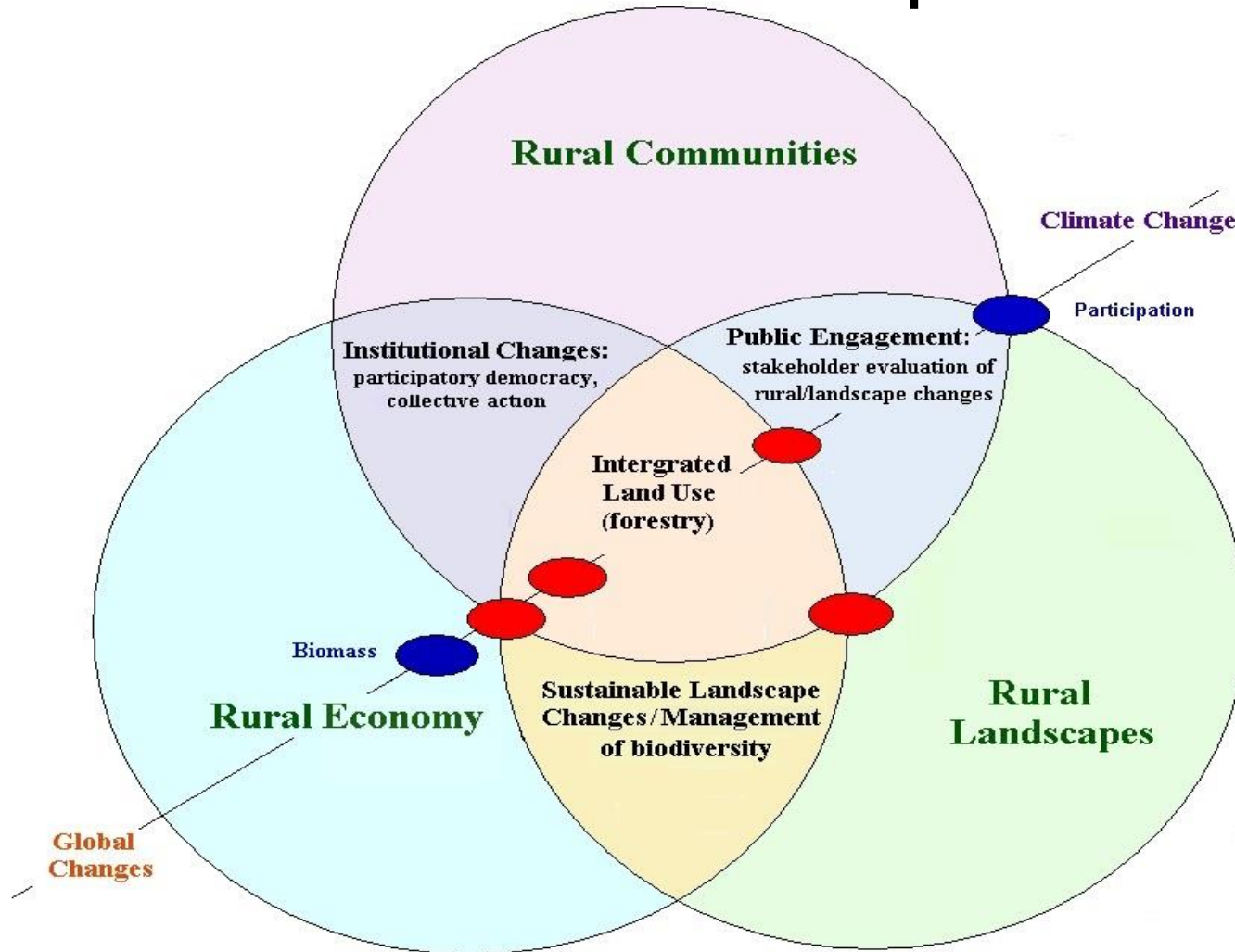
Examples of ES	Scotland	Ukraine
Provisioning		
Timber	+10	+10
Non-timber products	+4	+8
Woody biomass for energy	+9	+4
Regulating		
CS, Climate regulation	+10	+9
Erosion alleviation	+5	+9
Shelter belts	+3	+3
Air quality	+3	+7
Flood regulation	+5	+10
Cultural		
Recreation	+8	+6
Landscape beauty	+8	+8
Health	+6	+6
Supporting		
Oxygen	+5	+5
Soil formation or protection	+4	+8
Species diversity	+9	+8

Provision of ES

by upland forests in Scotland and Ukraine for the communities



Framework for sustainable development of wooded areas in the uplands



Conclusions

- to create employment in rural areas,
- to qualify and consolidate existing employment in rural areas,
- to improve the attractiveness of rural areas for residents, enterprises and tourists,
- to improve tourism/ recreation in rural areas,
- to promote the utilization of energy potentialities, located in rural areas,
- To strive for a more sustainable use NWFPs & S and develop SMEs networks,
- to implement rural development policies based on income generation from nature-based activities .

Smart development of mountain territories and communities requires new specific strategies based on **eco-innovations** that would **integrate scientific and local/traditional knowledge** of multiple forest ecosystem goods and services.

Forest management strategies and practices should allow for **increasing of human well-being** without destroying mountain ecosystems' sustainability.



Key preconditions for sustainability

- Reconciling sustainable forestry (SF) development with the **economic, environmental & social dimensions** of sustainable livelihoods in remote mountain areas.
- **Flexibility of the policy** to amend or incorporate additional decisions or involve other actors, under conditions of the changing drivers.
- **Horizontal tuning** of policies, including of SF, and their correlation with local plans in order to better target the provision of ecosystem services and improve nature conservation measures.
- **Vertical tuning** of SF policy when executive structure of institutions have to respond to local policy/governance structures as well as to community needs.
- **Feasibility** of the policy of transitional changes, including SF policy targets in uplands & practicability of implementation phases.
- **Task orientation**, with clear & enforced definition of responsibilities between all actors involved.
- **Transparency and acceptability** of policy documents by the public, forest dependent communities
- **Stakeholder involvement** in decision making processes.

Thank you!



The James
Hutton
Institute



Maria Nijnik¹, Mariana Melnykovych²

¹ The James Hutton Institute, United Kingdom
maria.nijnik@hutton.ac.uk

² The James Hutton Institute, United Kingdom
Ukrainian National Forestry University, Ukraine
mariana.melnykovych@ukr.net



Scotland



Ukraine

