

# Developing Tools to Meet the Demand for Sustainable Forestry

## A Scottish case study



Forest Research  
Northern Research Station  
Edinburgh



Innovatively investing  
in Europe's Northern  
Periphery for a sustainable  
and prosperous future.





## Four Scenarios:

1. Business as Usual, i.e. the current management regime.
2. Climate change increasing the intensity of biotic threats, along with a parallel target of forested land being restored to broadleaves.
3. Restoration of intensive forested areas to a more “natural” system in order to increase both biodiversity and attractiveness for tourism.
4. Responding to climate change mitigation policies as woodfuel industries increase their demand for wood chips.

- The impact of these scenarios was measured against various sustainability indicators including **Gross Value Added, Greenhouse Gas Emission and Carbon Stock, Forest Biodiversity, Employment, and Recreation.**

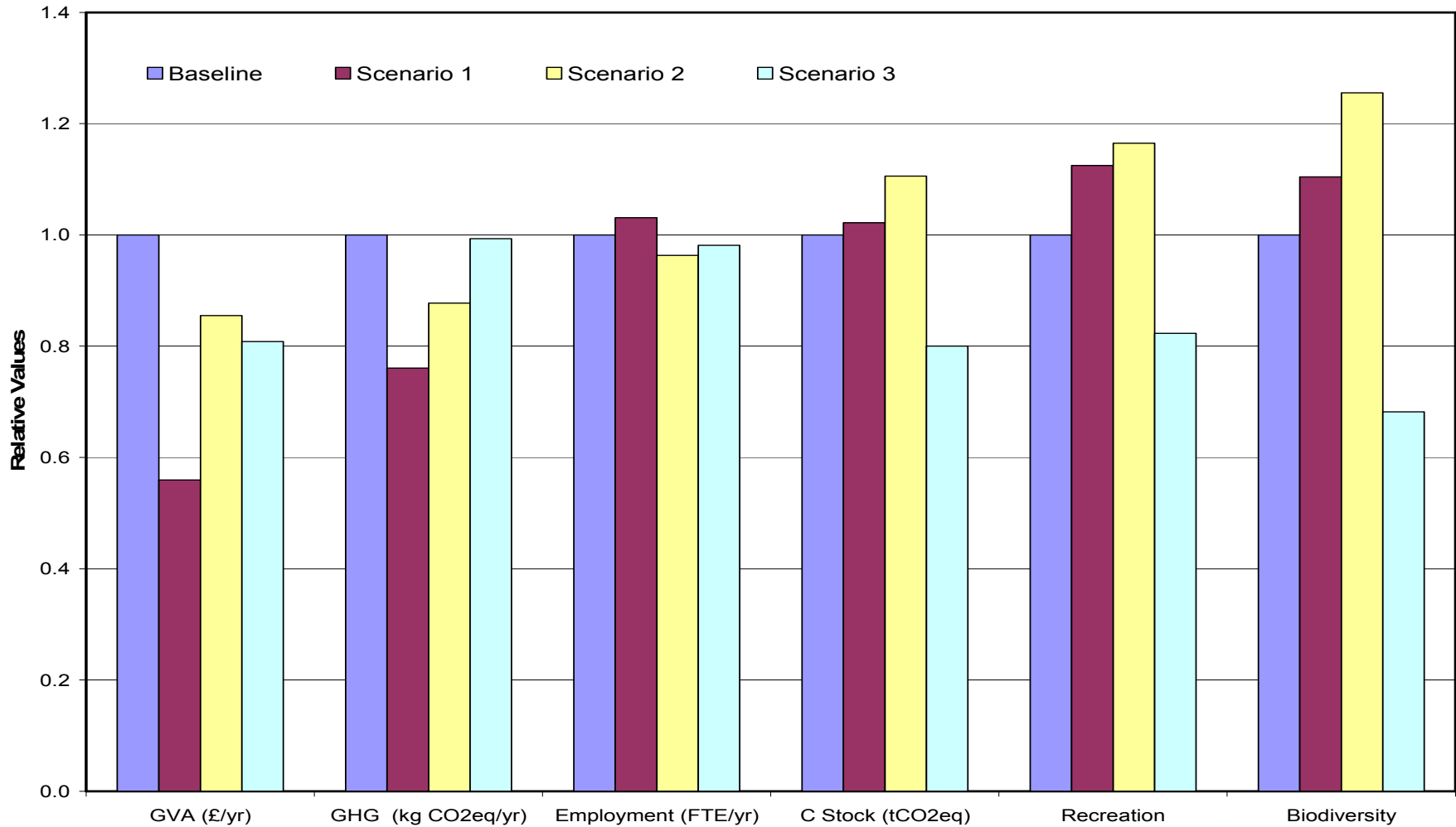
- The aggregated indicator results from the completed analysis will be presented to various stakeholder groups representing a range of industrial, environmental, and community enterprises.



- This case study was an illustration of how ToSIA principles may be applied at forest stand level.
- A major advantage of the ToSIA methodology is that it allows the user to analyze not only current sustainability impacts but also impacts from potential future scenarios as well.
- The case study generated a large amount of results which were analyzed to determine the impacts each scenario had on the sustainability indicators.
- In the following bar graph, the relative values of all the calculated indicators are shown against the baseline (business as usual). Displaying the results in this way allows for a comparative analysis of the scenarios.

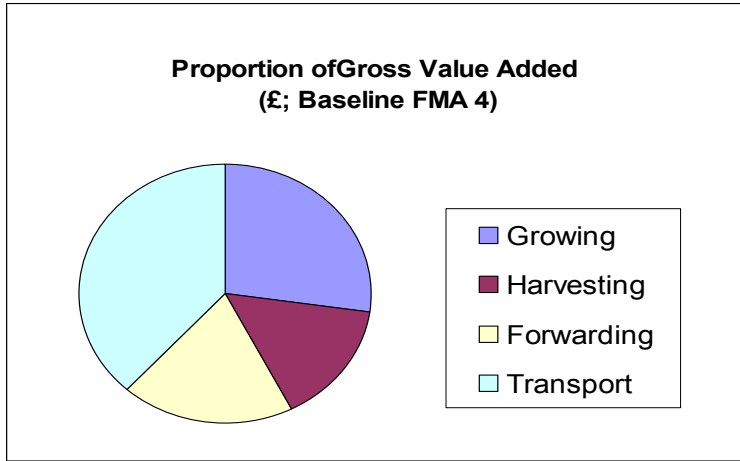


## Relative values of key indicators for 3 scenarios in comparison to the Baseline (current management)



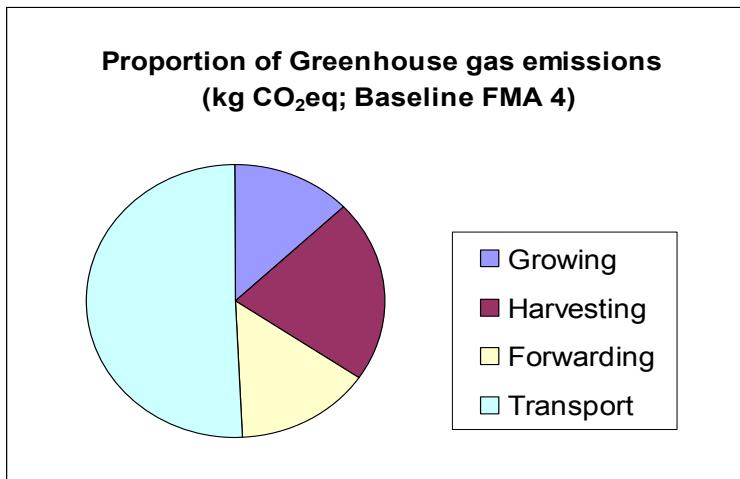


*GVA values by process for Baseline FMA 4.*

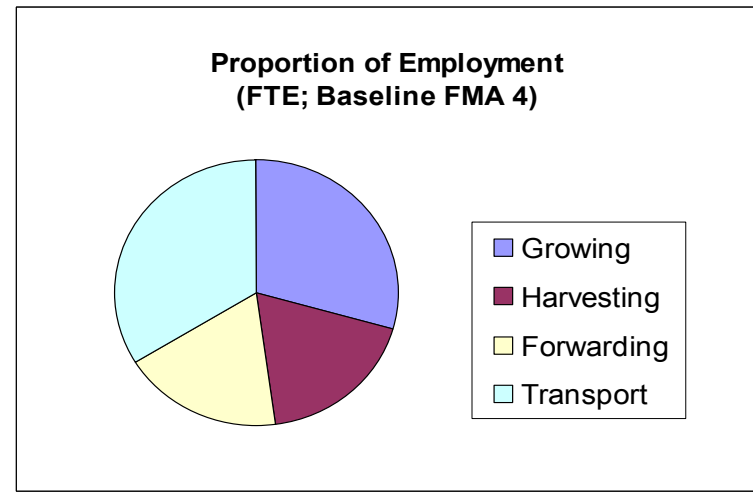


- It is also possible to assess the results in greater detail, for example, at a hectare level instead of forest stand level.
- In these figures the accumulated values of GVA, greenhouse gas emissions and employment are shown as the proportion contributed from each stage of the wood chain for FMA 4 (baseline scenario).

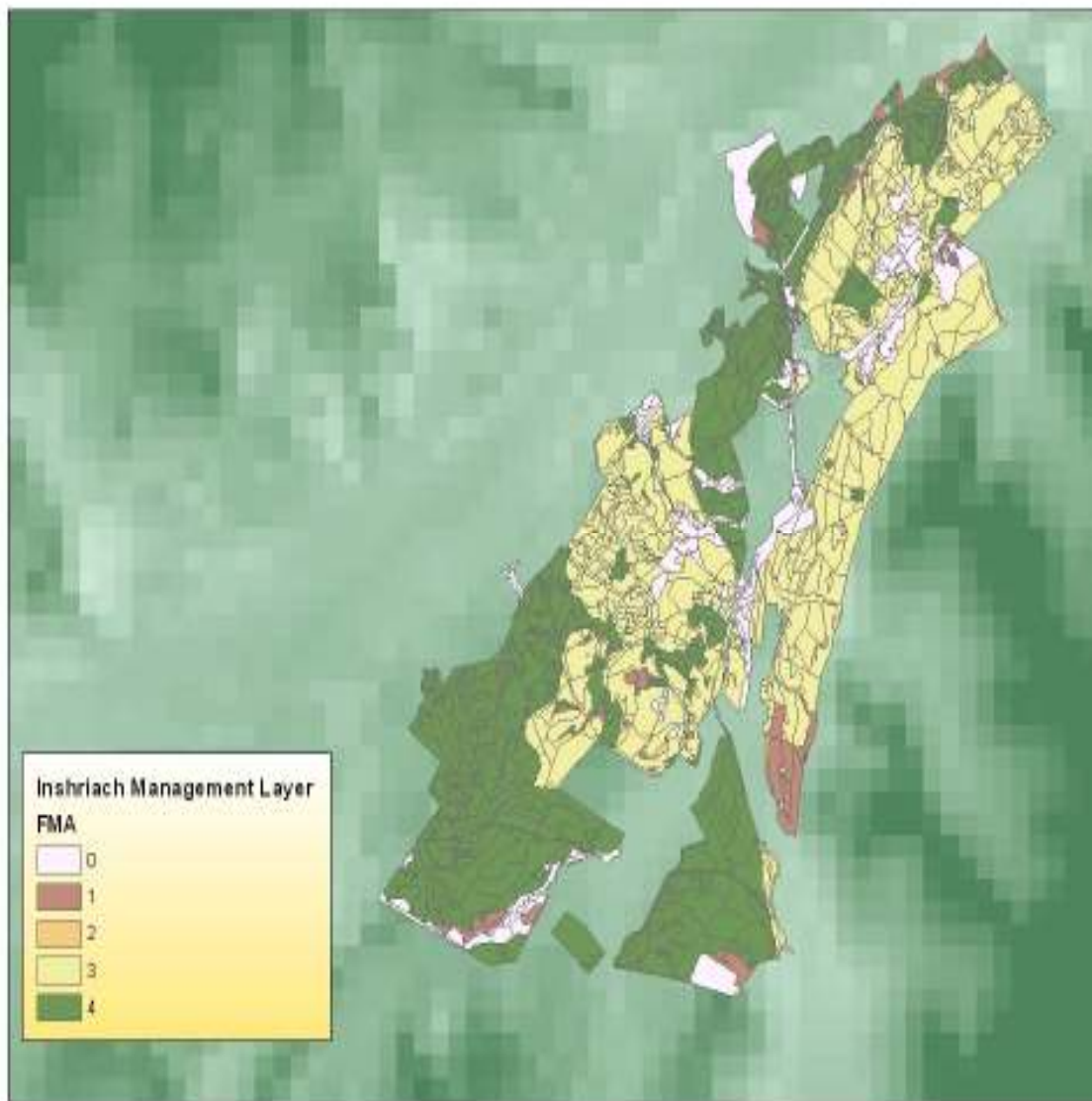
*GHG values by process for Baseline FMA 4.*



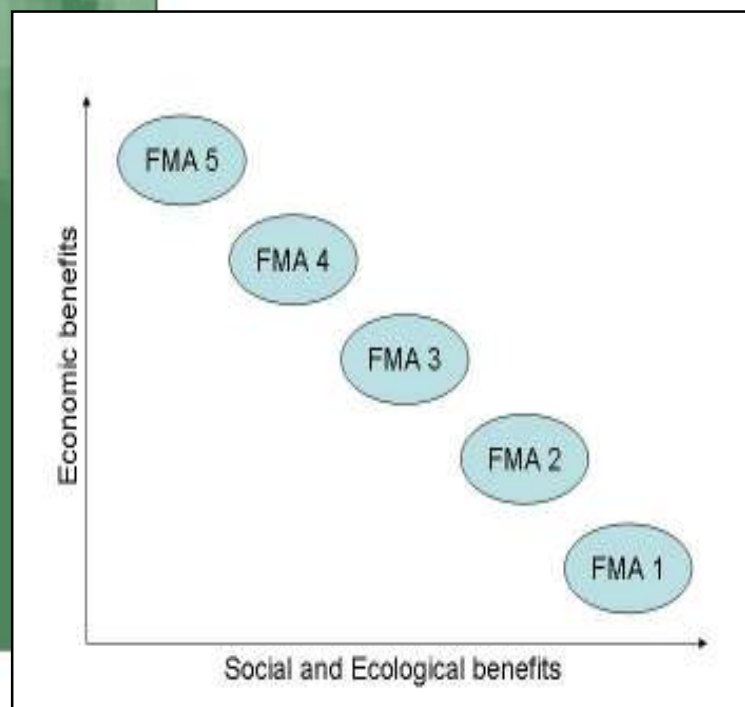
*Employment values by process for Baseline FMA 4.*



## Next steps: GIS spatial analysis for baseline and scenarios Forest Management Alternatives



- FMA 1 is a forest nature reserve
- FMA 2 is continuous cover forestry
- FMA 3 is combined objective forestry
- FMA 4 is intensive even-aged forestry
- FMA 5 is wood biomass production.





- Expand case study methodology throughout the Cairngorms National Park
- Visualise sustainability indicators spatially
- Develop Recreation and Biodiversity/Connectivity indicators using landscape modelling techniques
- Engage with stakeholders to understand relative impacts of scenarios and validate the outputs of the approach
- Investigate how the approach would be incorporated into planning