



Sveriges lantbruksuniversitet  
Swedish University of Agricultural Sciences



Norwegian University  
of Life Sciences



HELSINGIN YLIOPISTO  
HELSINGFORS UNIVERSITET  
UNIVERSITY OF HELSINKI



NIBIO  
NORWEGIAN INSTITUTE OF  
BIOECONOMY RESEARCH



NTNU  
Norwegian University of  
Science and Technology

# Forest, and forest-based sector carbon budget

— Finland, Norway and Sweden 1960-2015

Hans-Fredrik Hoen, Tomas Lundmark, Gustav Stål, Stein M. Tomter, Cristina-Maria Iordan, Francesco Cherubini and Pekka Kauppi



# Study area

- ~Fennoscandia - unic datasets from ~100 years of NFI.
- Long tradition of forest management.
- Forest industry is a big part of the economy
- Energy as bi-products from forest industries.

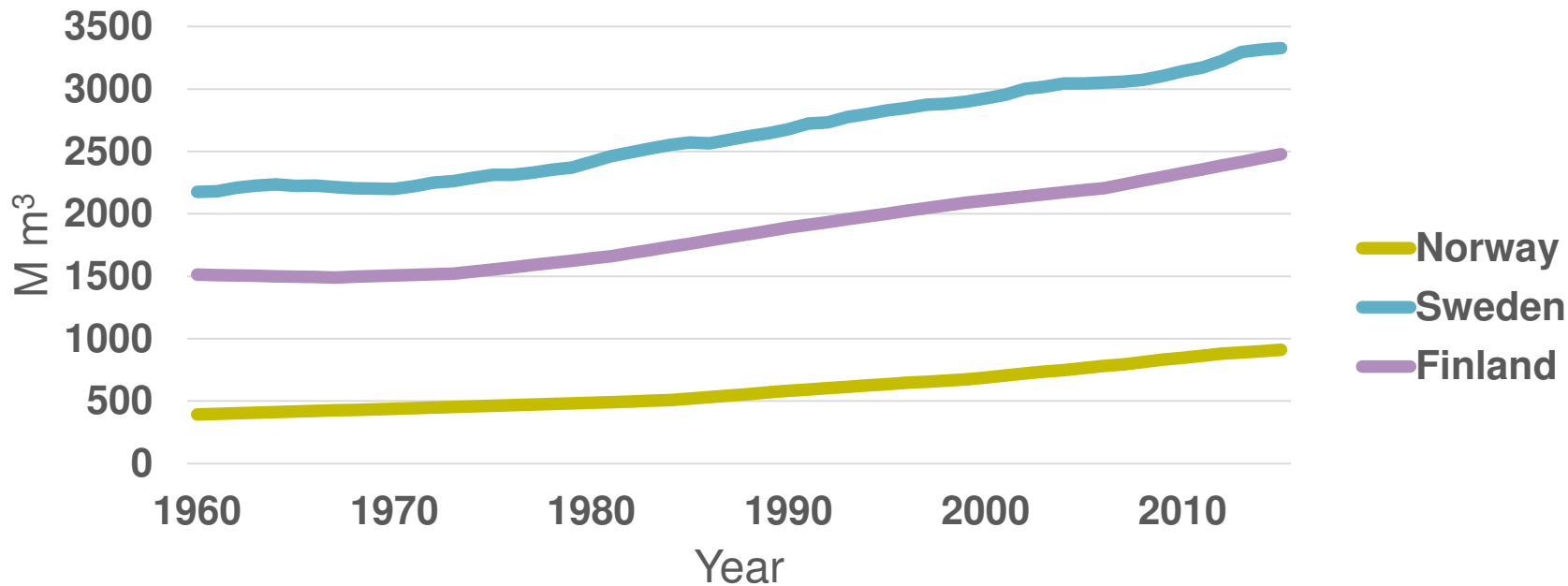


# Carbon cycle of the FBS

## Main elements:

- Forest growing stock and forest soil
- Harvested wood products
- Product and energy substitution
- Changes in net annual increment

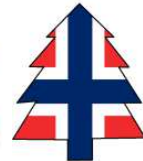
## Growing stock



**Norways growing stock has increased more than 100%.**

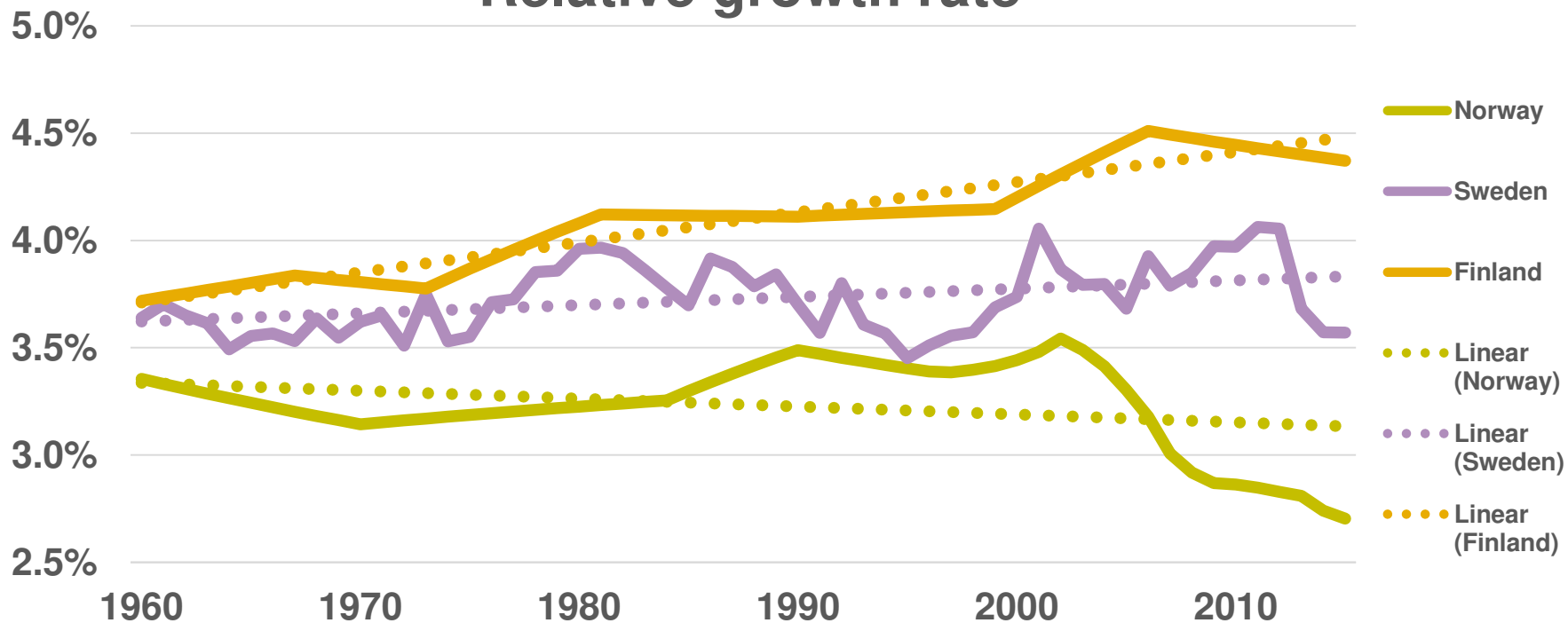


1960



2015

# Relative growth rate

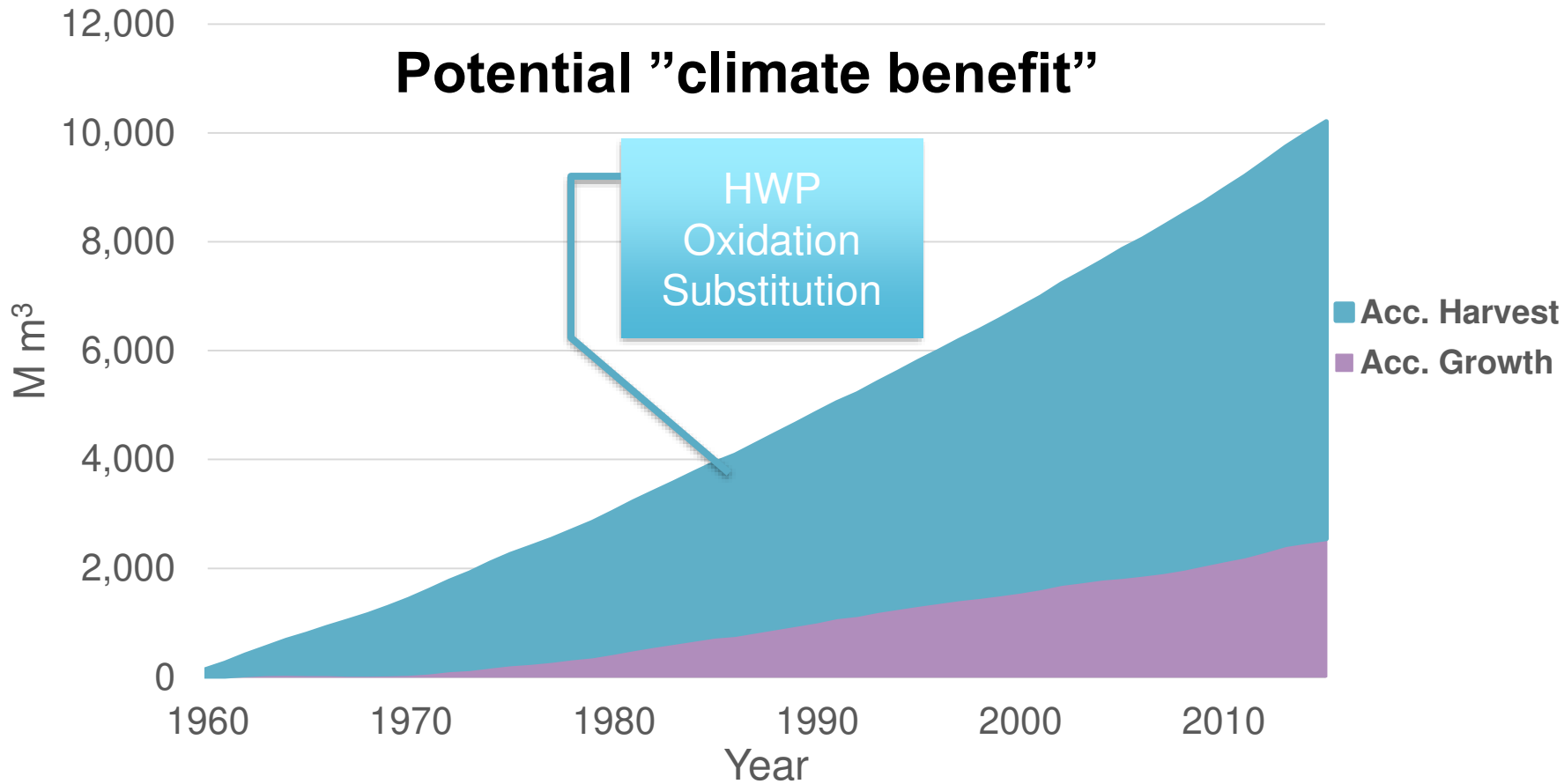


Finland and Sweden **DOUBLED** the  
**HARVEST.**

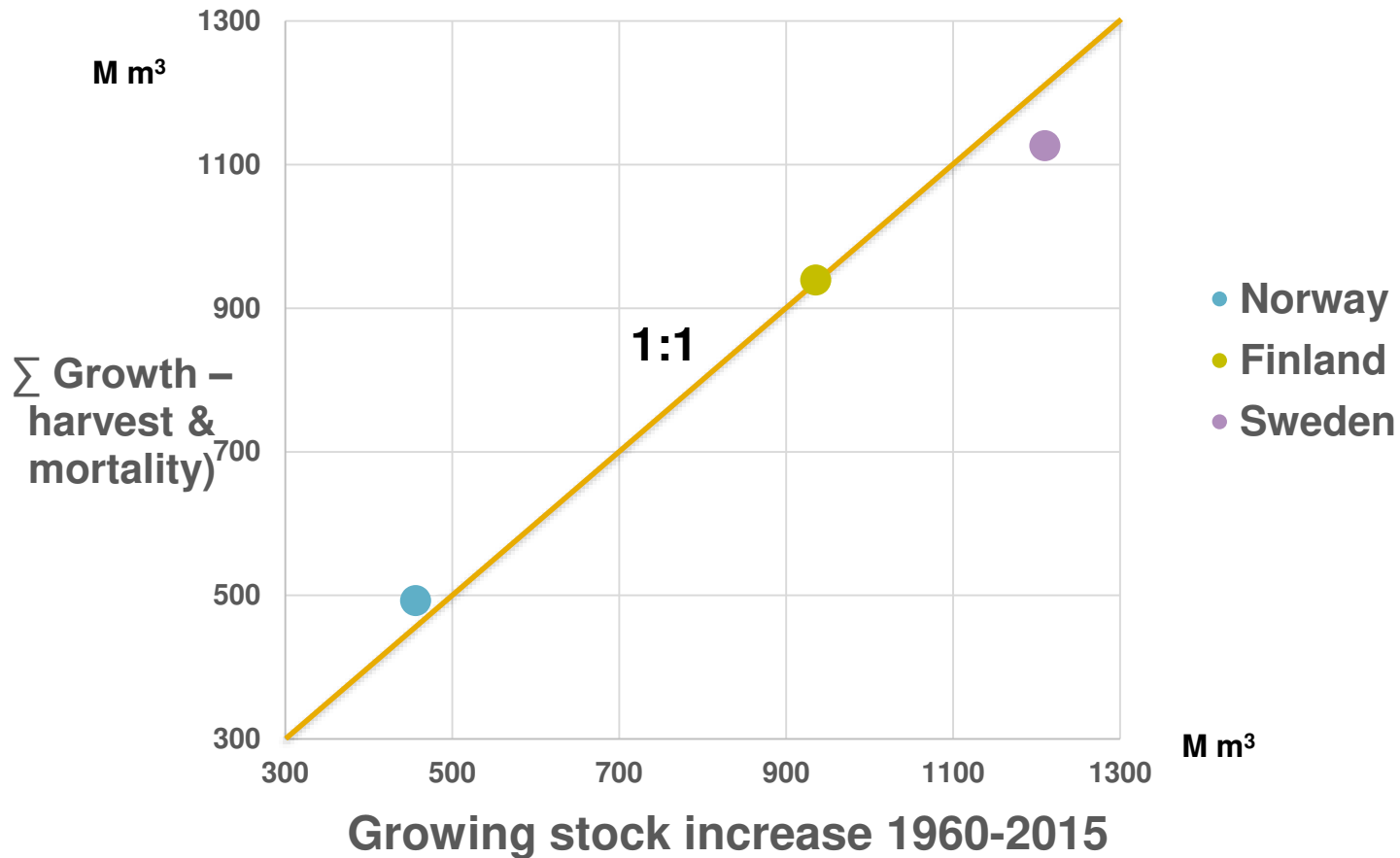
still,

The **GROWING STOCK INCREASED** by  
more than **50%**.

# Potential "climate benefit"









# Hypothesis

The cumulative effect of substitution will dominate over the effect of stock changes when it comes to the impact of the FBS on the amount of carbon (CO<sub>2</sub>) in the atmosphere.

The observed patterns could become recommended as models for global, universal mitigation goals “to harvest, to substitute and to save”. Also, the findings from Fennoscandia demonstrate that forests have a great long-term potential in climate mitigation.



**Focus** - Climate change mitigation potential of Boreal forest and forest management.

**Challenges** - Large carbon stocks which is in danger of climate change induced disasters. Can the forest supply enough wood for future needs? How can we increase volume increment?

**Suggestions** – Use existing research to manage forest for resilience to climate change and to improve forests productivity.



**Thank you for listening!**