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WEIHENSTEPHAN-TRIESDORF
UNIVERSITY OF APPLIED SCIENCES

Wissenschafts Zentrum
STRAUBING

Short Rotation Forestry (SRF) - a Way to Sustainable Agribusiness

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Outline

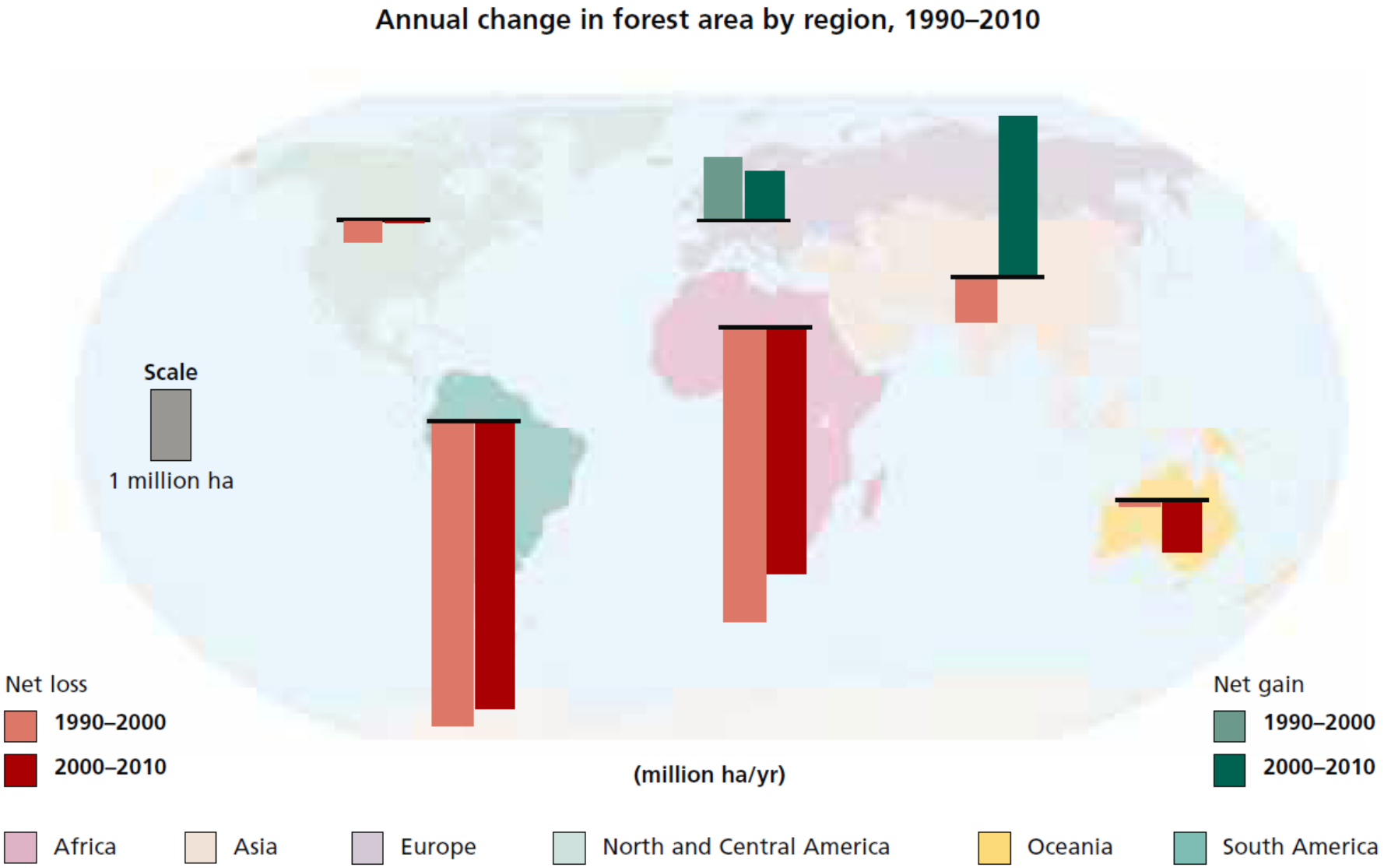
1. **Introduction**

2. **Management practices and economic feasibility of SRF in**

- Germany/ Europe
- India/ Asia

3. **Comparison of SRF in Asia and Europe**

Introduction



Source: FAO 2010

Pressure on natural forests

What is Short Rotation Forestry ?

Fast growing
tree species

Photo: Hauk, S.

Photo: Hauk, S.

What is Agro Forestry ?

SRF & agriculture

Photo: Chauhan, S.

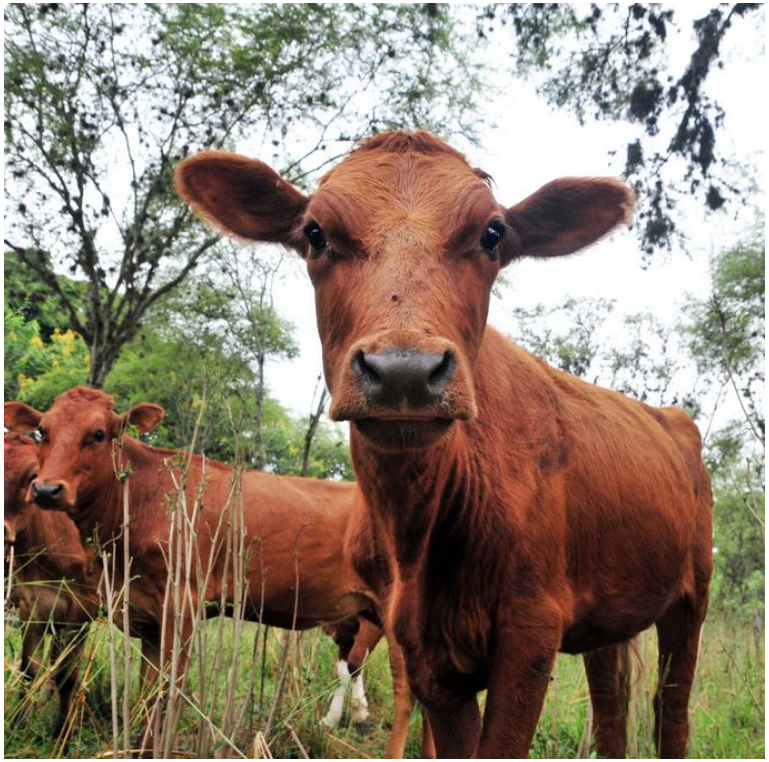
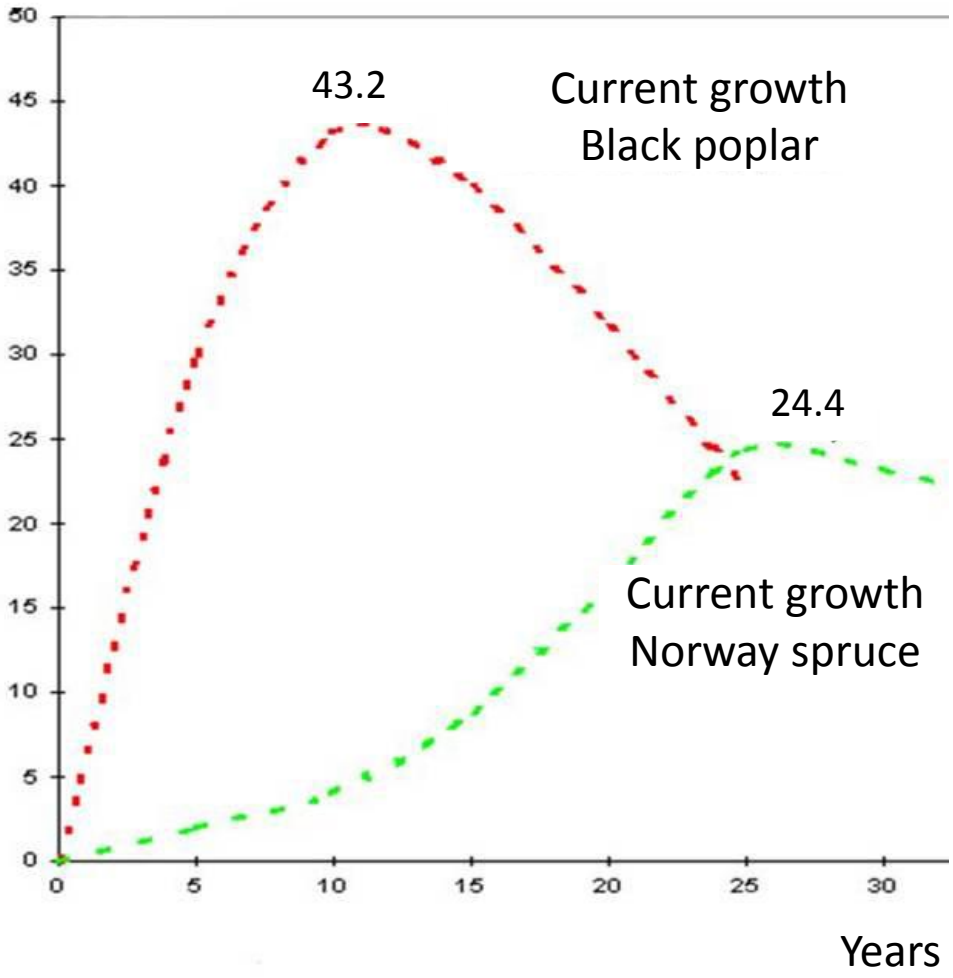


Photo: http://dapa.ciat.cgiar.org/wp-content/uploads/2012/04/np_silvopastoral.jpg

Why SRF?



Energy Input-Energy Output	Land use
1:2 – 1:3 Rödl 2012	Maize for Biogas
1:9 - 1:13 Eder et al. 2009	SRF for Combined Heat and Power

Source: Pretzsch 2003

Why SRF?

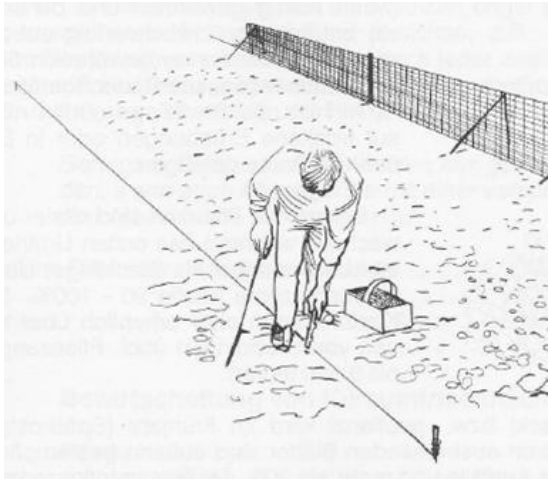
Ecosystem services:

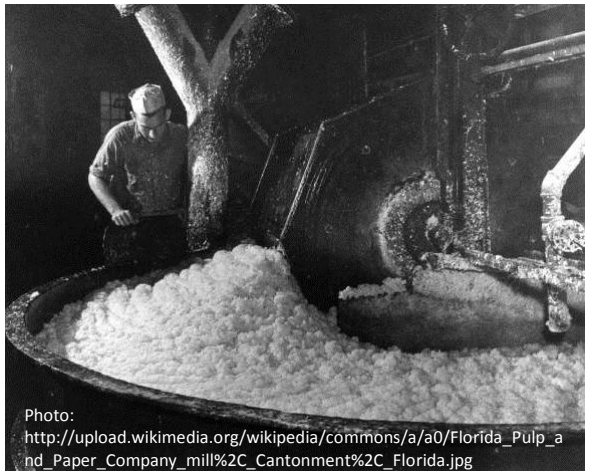
- Water
  - Quality
  - Quantity

- Protection against
  - Water erosion
  - Wind erosion
  - SRF maybe used to improve *salinized* soils
    - Influence on the groundwater table

In contrast to intensive farming

Management practice in Europe





Establishment | Harvesting | Utilization

Photos: Hauk, S.

Management practice in Asia

Establishment

Harvesting

Utilization

Photos: Chauhan, S.

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Other ways of wood production

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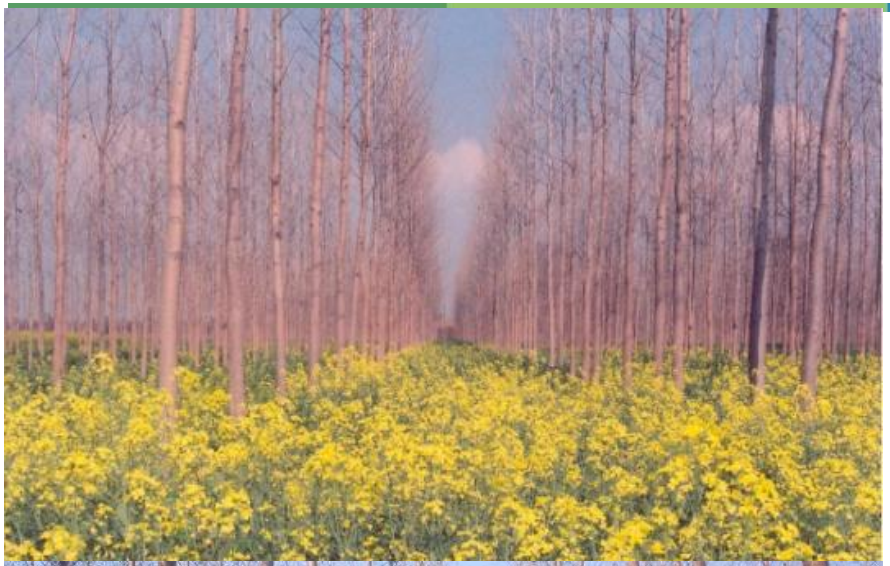
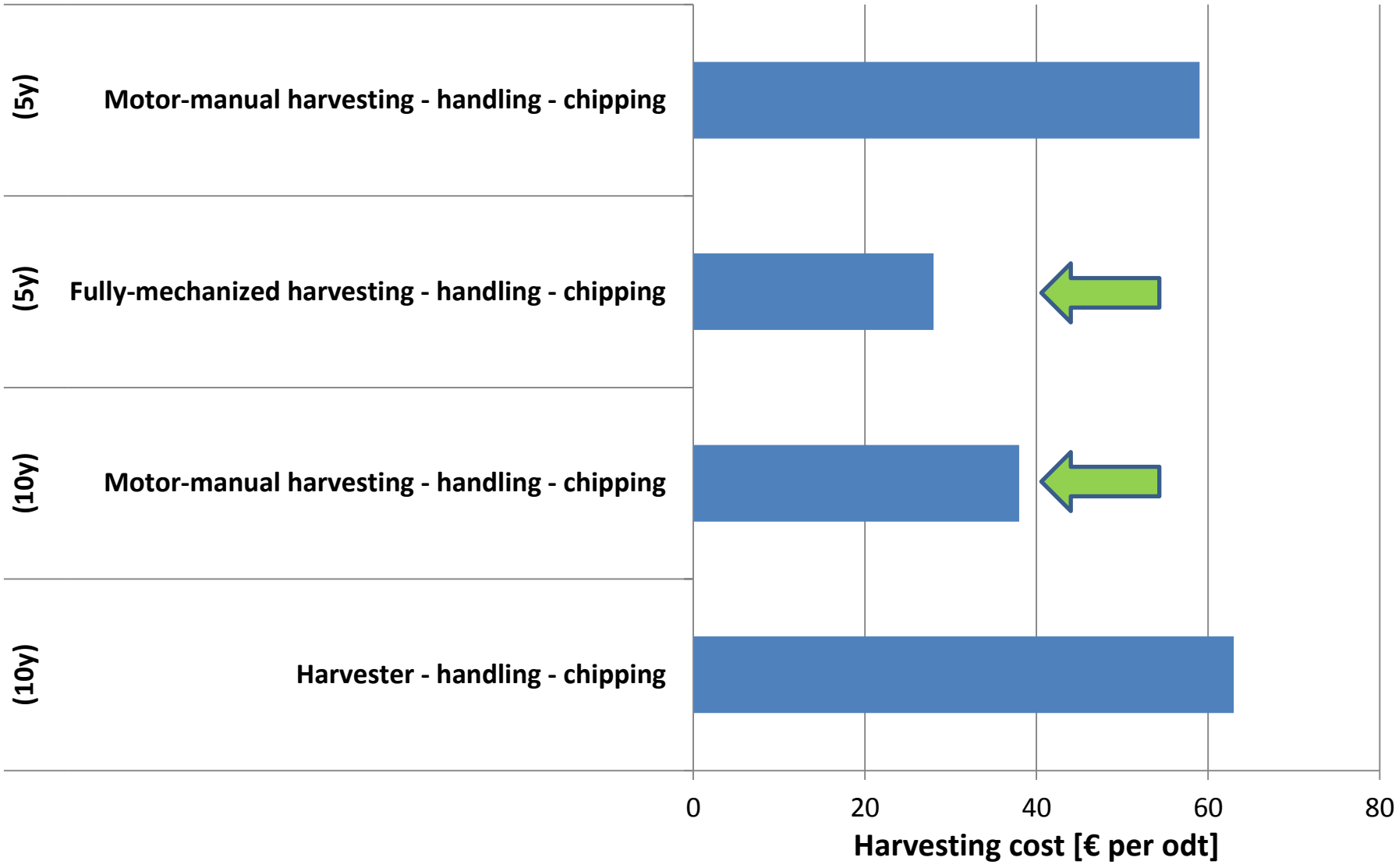


Photos: Chauhan, S.

Other ways of wood production

Photos: Chauhan, S.

Cost of harvesting methods



Source: Burger 2010

Economics of different harvesting systems

Overview of assumptions	Poplar, 3 year rotation cycle; Lifetime 30 years	Poplar; 10 year rotation cycle; Lifetime 30 years
Biomass price [€/odt]	90	90
Biomass yield [odt/ha*a]	10	12
Interest Rate	6	6
Costs [€]		
Establishment [€]	2580	1580
Land rent [€/a]	210	210
Maintenance [€/a]	0	0
Harvest & Transport [€]	826	4770
Recultivation [€]	1400	1400
Annuity [€/a]	514	598

Source: own calculations

Personal use of wood chips

Fuel (Nominal thermal capacity: 60 kW)	**Heating oil**	**Firewood**	**Wood chips**	**Pellets**
Capital costs [€/a]	1,356	2,002	**2,370**	2,196
Fuel costs [€/a]	6,193	4,944	**2,781**	5,361
Sum of operating costs [€/a]	352	565	**838**	745
Costs of heat supply [€/kWh]	0.085	0.081	**0.064**	0.089

Data for Germany; Source: FNR (2007)

Comparison of SRF in Asia and Europe

- Shortage of woody biomass in India is already noticeable
- SRF, especially Agroforestry, plays an important role in Asia
- Competitiveness of agriculture is strong in Europe => little SRF area
- In Asia SRF/AFS is more viable than in Europe

- For both:
    - Demand for woody biomass is increasing
    - Energy crops with positive environmental impact are required

Compendium

- High efficient tree species providing:
  - Biomass
  - Ecosystem services
  - Labor
  - Income and welfare for rural areas
  - Can be mixed with cash crops
  - Reduce pressure on natural forests
  - Can help to meet climate objectives

Thank you for your attention!

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