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Strategies to use Biofuel Value Chain Potential in Sub-Saharan Africa to respond to Global Change - Enhancing low-productivity Farming in Tanzania and linking to SMEs

Leibniz Centre for Agricultural Landscape Research e.V.

Leibniz Universität Hannover — Environmental Economics and World Trade

The International Food Policy Research Institute

World Agroforestry Centre

Association for Strengthening Agricultural Research in Africa

Sokoine University of Agriculture (SUA)

Wuppertal Institute for Climate, Environment and Energy

Müncheberg, 20. August 2010

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Outline

1. Background
2. Material & Methods
3. Some Results & Discussion
4. Next Steps

STORY LINES

Background

- low infrastructure / low market access
- dominance of subsistence, small farmer livelihoods
- poor implemented new bioenergy-sources

- **Wood/Charcoal**
  - 80% energy consumption based on woody biomass
  - environmental threats (over-usage of forest)

- **Jatropha**
  - low rural electrification less than 2 %
  - low level of agricultural production
  - outgrower schemes

- **Oil Palm**
  - advanced production
  - potential export
  - outgrower schemes

STORY LINES

BIOMASS PRODUCTION ?

To do the right things!

To do things right!

PROCESSING ?

USAGE ?

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WORKSHOPS

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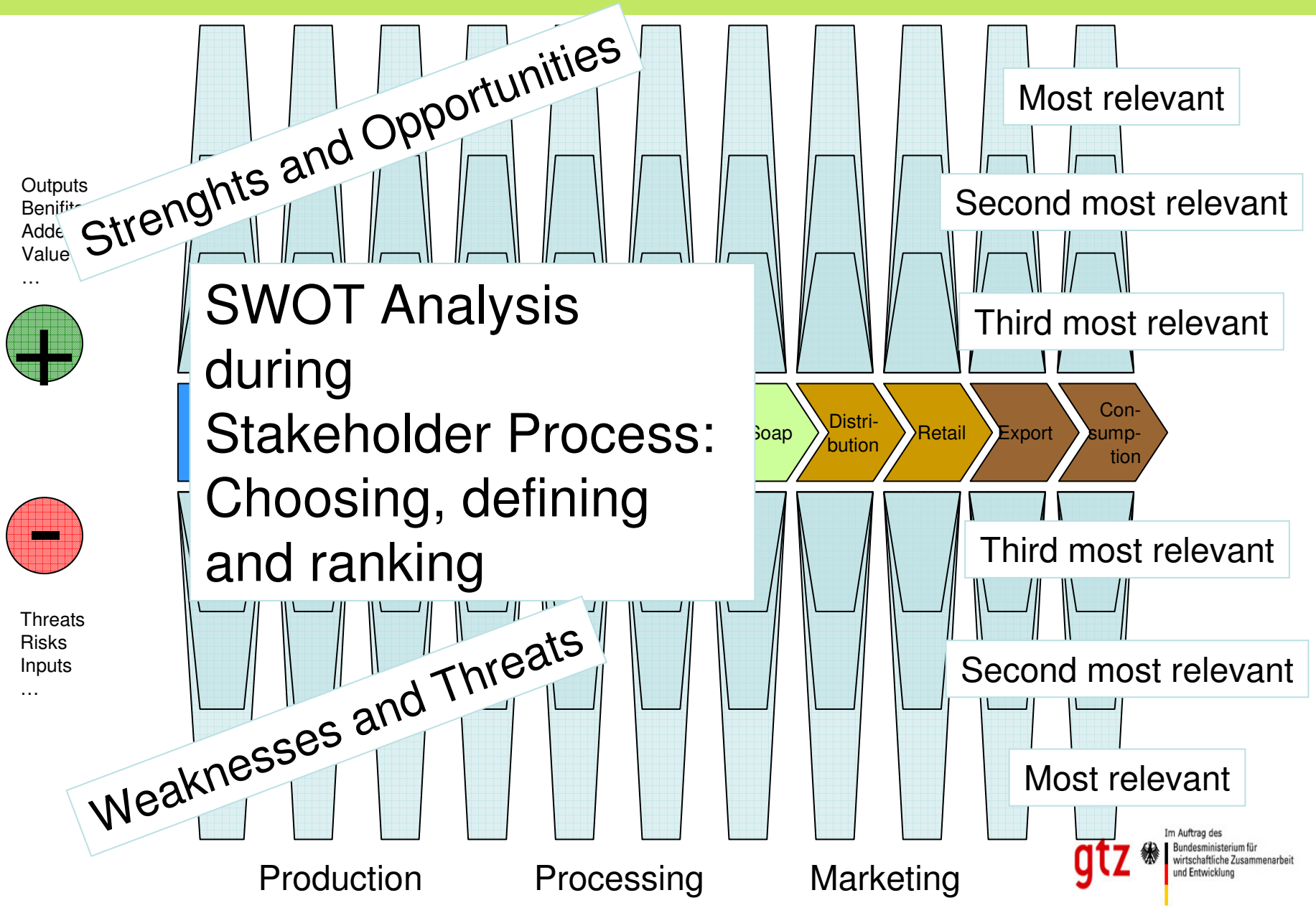
METHOD of VALUE CHAIN ANALYSIS



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PROCEDURE of PARTICIPATORY ADJUSTMENT of „Sustainability Impact Assessment“ (SIA) INDICATORS

Anaysing VALUE CHAINS

1. Step: Define value chain and specify factors in order of relevance

Factors that will be found, colud be subsumized under the three dimensions of sustainability. But:

- Crosscuttings are possible
- Accountability for bilances / aggregations are difficult
- Often just assumptions or hypotheses are existing

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PROCEDURE of PARTICIPATORY ADJUSTMENT of „Sustainability Impact Assessment“ (SIA) INDICATORS

Anaysing VALUE CHAINS

1. Step: Define value chain and specify factors in order of relevance

2. Step: Relative weighting factors within specific value chain

Objective is to build up an indicator system to cope generic principles:

- Indicators should be mostly quantified or methodological derived.
- In the field of innovation also a strong role of so called „weak factors“ like acceptance, risk tolerance, etc.)
- Transparency in the assessment process: definitions of „high“, „medium“ and „low“ for each factor

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PROCEDURE of PARTICIPATORY ADJUSTMENT of „Sustainability Impact Assessment“ (SIA) INDICATORS

Anaysing VALUE CHAINS

1. Step: Define value chain and specify factors in order of relevance
2. Step: Relative weighting of factors within specific value chain
3. Step: Compare different value chains

Objective is to build up a comprehensive visualisation for decision support and fast identification of best practices between and within the different value chains:

- Combination of aggregated sustainability issues in one image in order of their relevance
- Aggregation via assessment tool derived from principles
- (This tool is to be developed and adjusted for biofuels)

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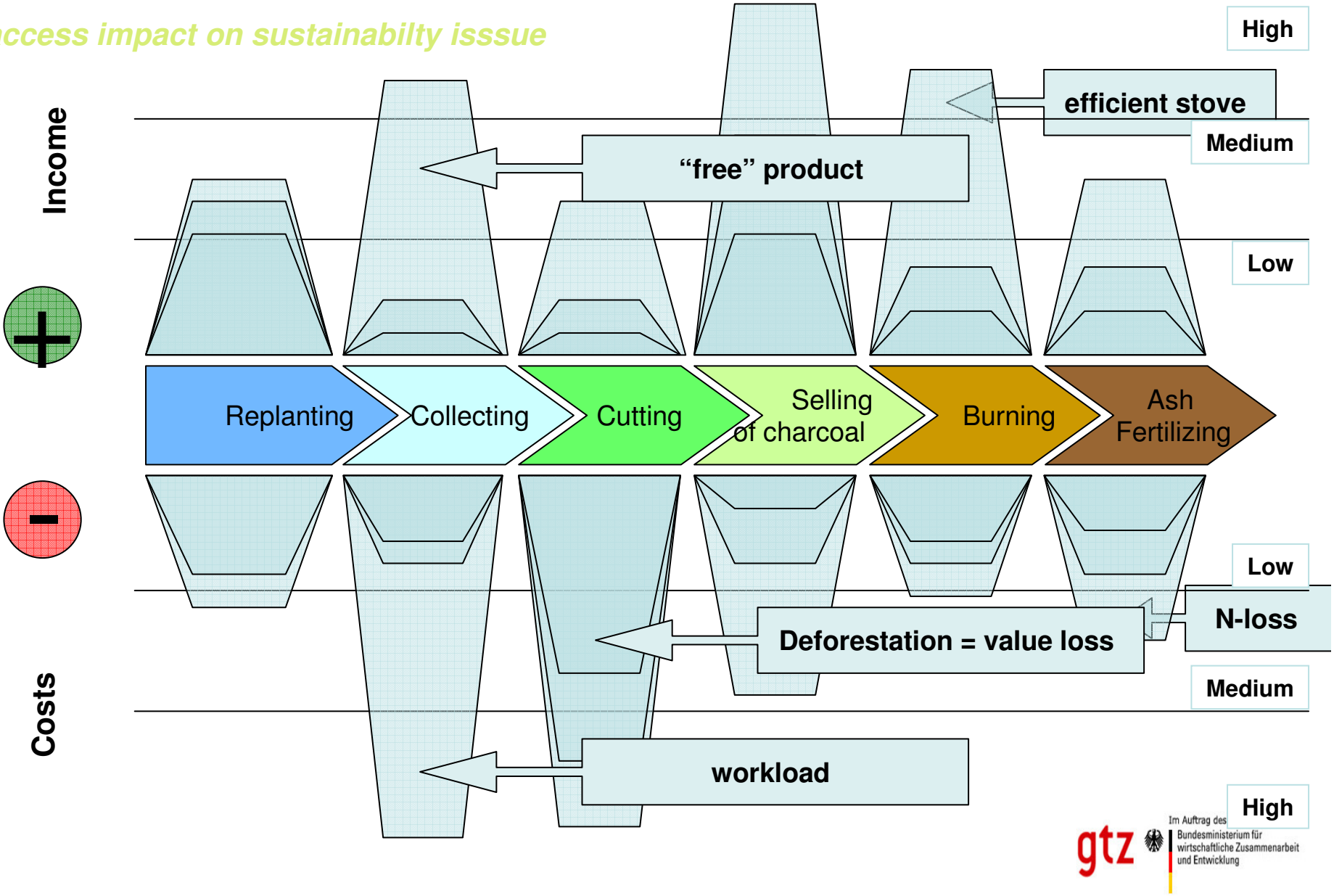
VALUE CHAIN WOOD ⟶ ECONOMICAL



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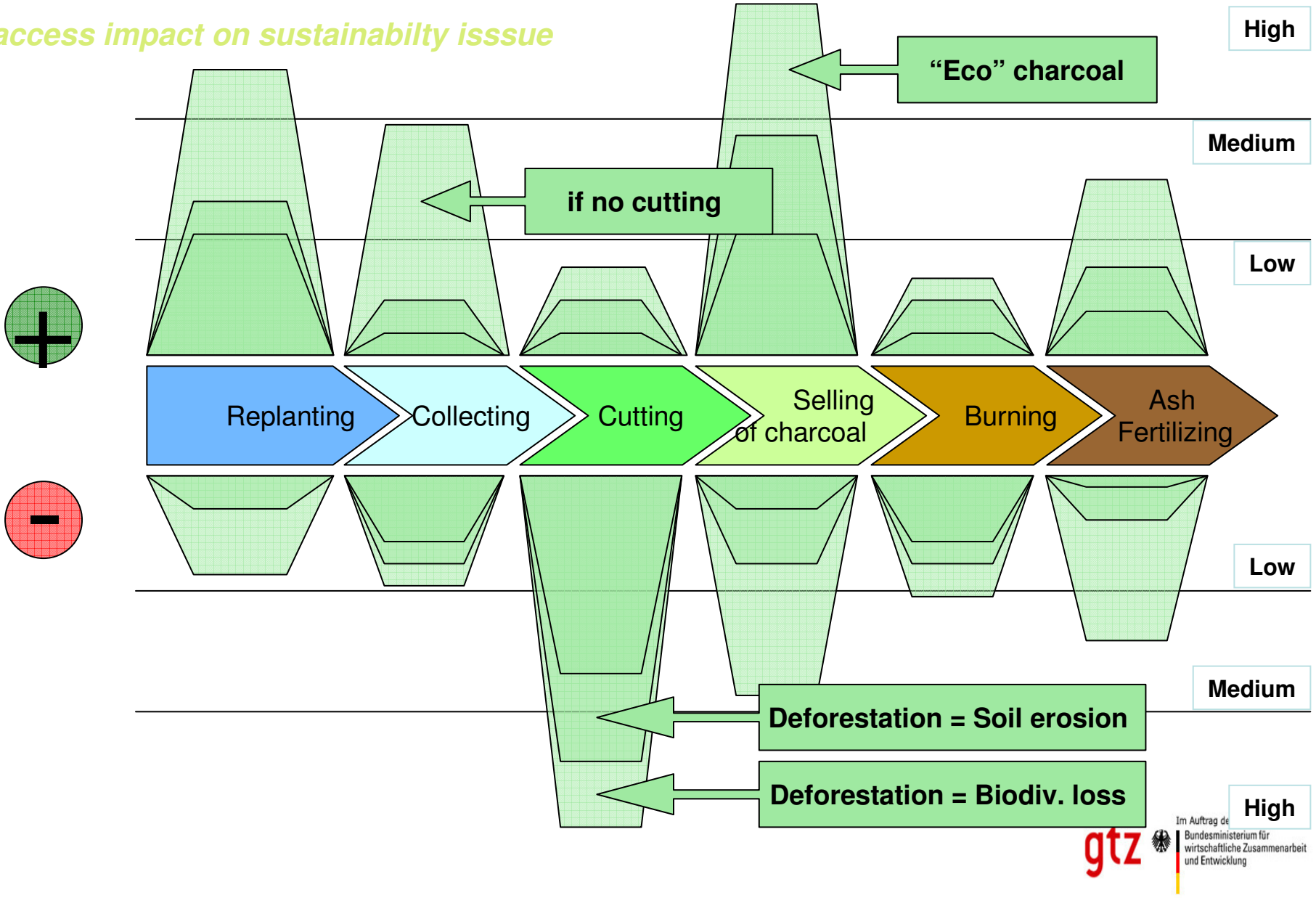
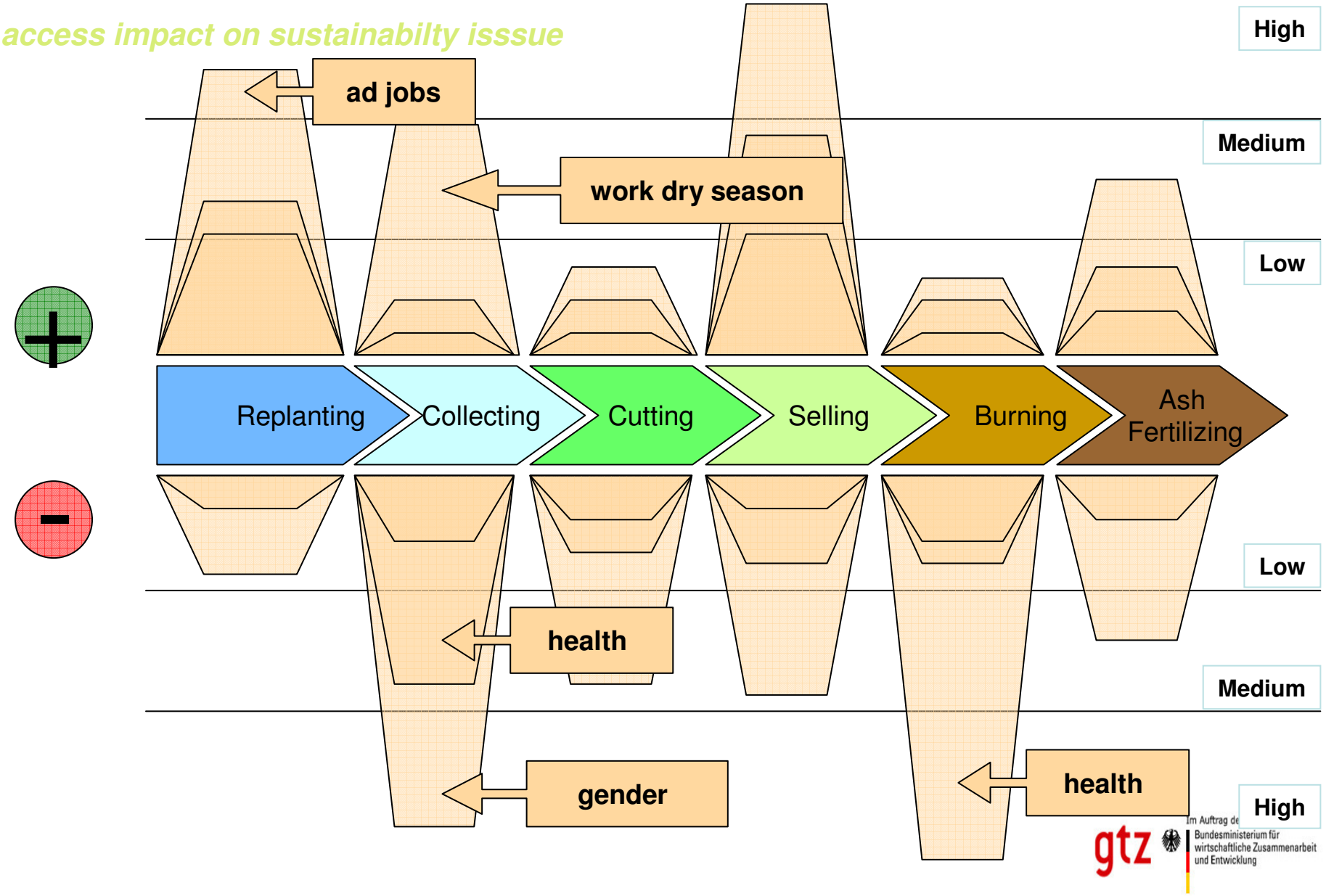
VALUE CHAIN WOOD ⟶ ECOLOGICAL

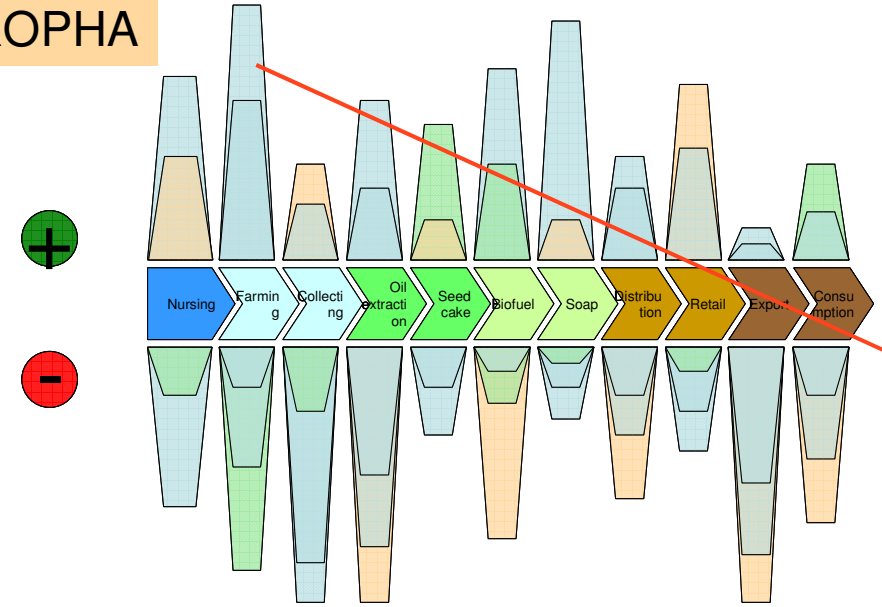


VALUE CHAIN WOOD → SOCIAL



COMPARE VALUE CHAINS → „LABOUR“

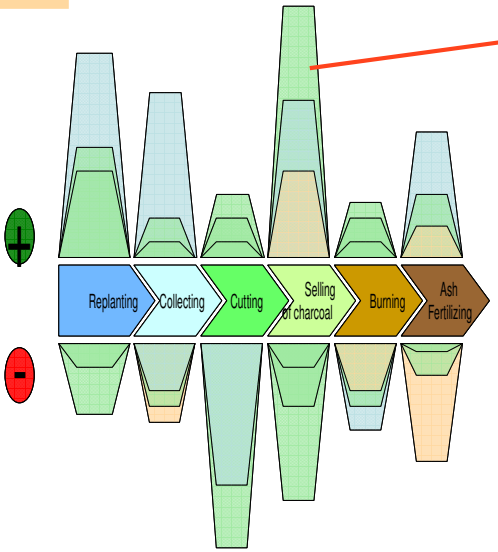
JATROPHA



Aggregation with remaining information

„Marginal Lands“

WOOD



Eco-Charcoal

- Visualisation tool
- Decision support
- Identify „Best Practice“

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WOODFUEL

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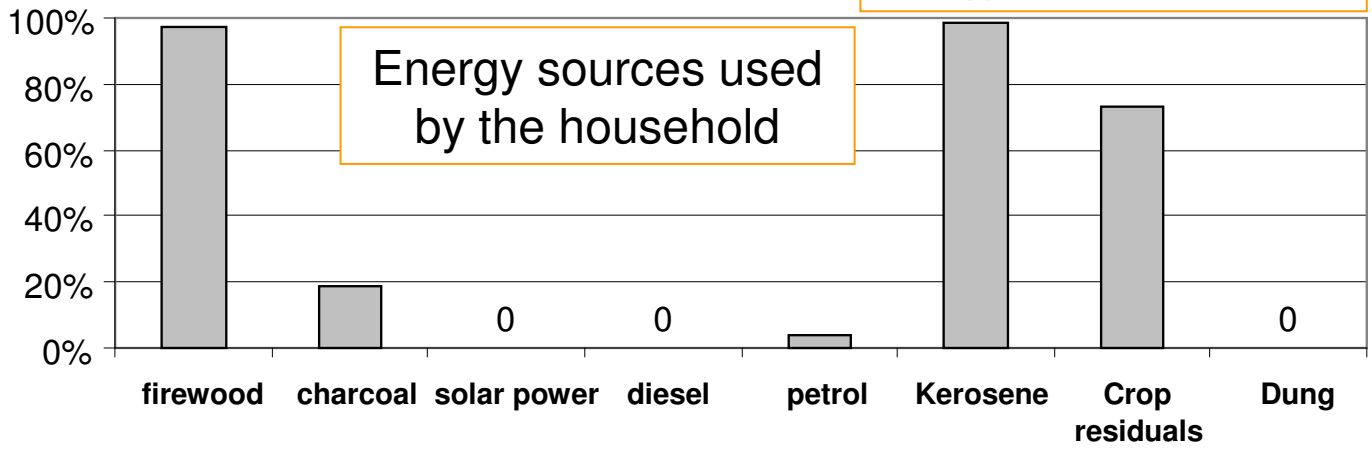
CONSUMPTION PATTERNS – energy usage

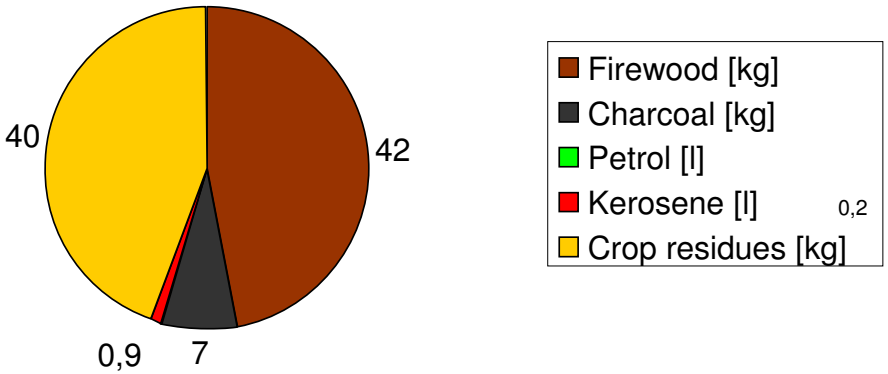
CASE STUDY TANDAI

Average number of energy sources: 2,9



Average heads per household: 5,9

Average consumption of used energy devices per household in kilogram or liter per week



	Num of plots per H	Agriculture area in acre
Average	**3,7**	**6,7**
SD	**1,5**	**6,3**
Min	**1,0**	**0,5**
Max	**9,0**	**30,0**
Total	**256**	**454,3**
n =	**70**	**68**

~2,7 hectare

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CONSUMPTION PATTERNS – firewood sources

- ***96 % of HH think, that it is meaningful to protect the forest completly so no extraction is allowed at all (n = 70)***
- ***A quarter of habitants participate in activities of forest protection (tree planting)***

ENVIRONMENTAL CHANGES - biodiversity

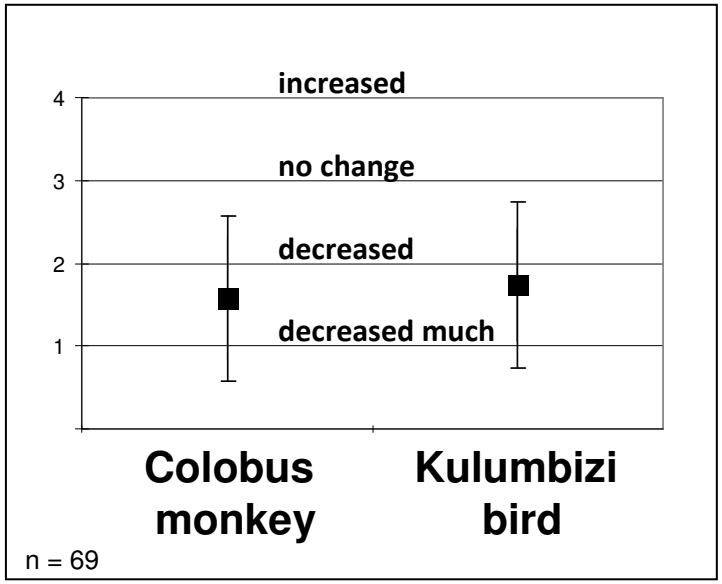
Indicator:
„Forest species Kulumbizi bird and Colobus monkey“
(Assessment of HH-heads)

Black and White Colobus Monkey

Colobus angolenais Palliatus

Uluguru Bush-shrike “Kulumbizi bird“

Malaconotus alius



Impact: Population growth and overusage of firewood reserves >> decrease of montane cloud forest, habitat of Colobus monkey

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- Production systems (hedges, … large scale)
- Small scale farmers and outgrowers
- Different products

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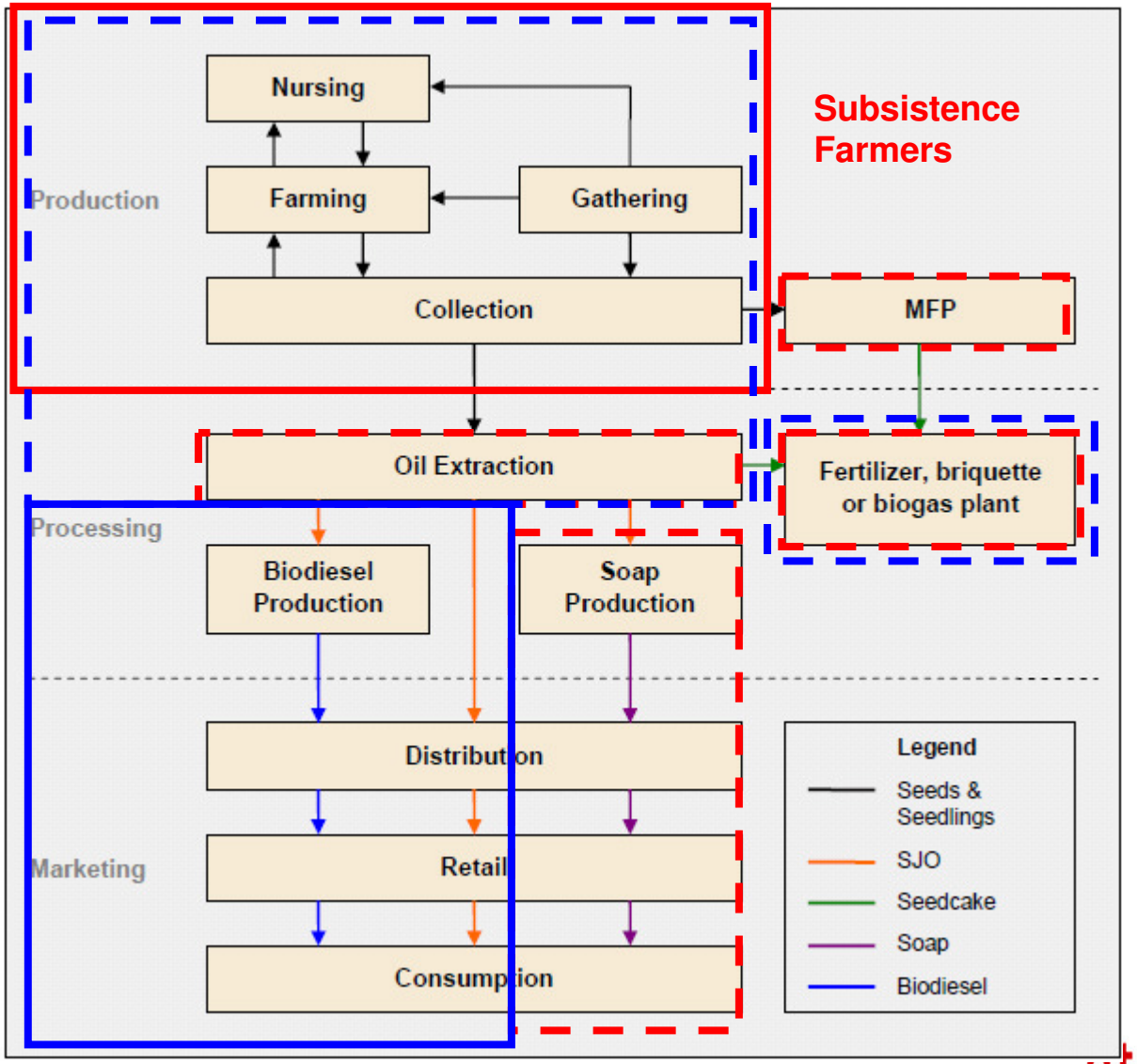
VALUE CHAIN „Jatropha curcas“

Industry/ Cooperative



Source: Messemaker, L. (2008): The Green Myth? Assessment of the Jatropha value chain and its potential for pro-poor biofuel development in Northern Tanzania. P. 41.

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ENVIRONMENTAL CHANGES - Jatropha

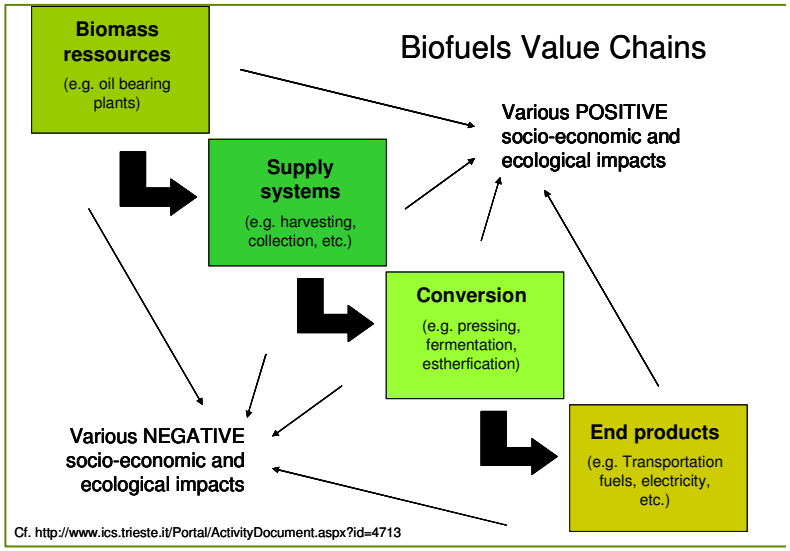
Indicator:
„Jatropha new planted “
Assessment of HH-heads

	Number of Tree Species	Overall Number of trees	Number Jatropha trees	Jatropha average age	New planted Jatropha
Average	**5,4**	**173**	**52**	**3,1**	**31**
SD	2,6	450	176	4,5	160
Min	0	0	0	0	0
Max	11	3.022	1.000	30	1.000
Total	381	11.946	3.581	133	1.187
n =	70	69	69	43	38

- Purpose of J: Majority plants J. as supporting tree, minority uses J for medicine or seedlings
- Main production system is intercropping, other purpose is hedging (borders)

PALM OIL – CASE STUDY (FELISA)

- **Nucleus farm and processing plant**
- **Small scale farmers and outgrowers**



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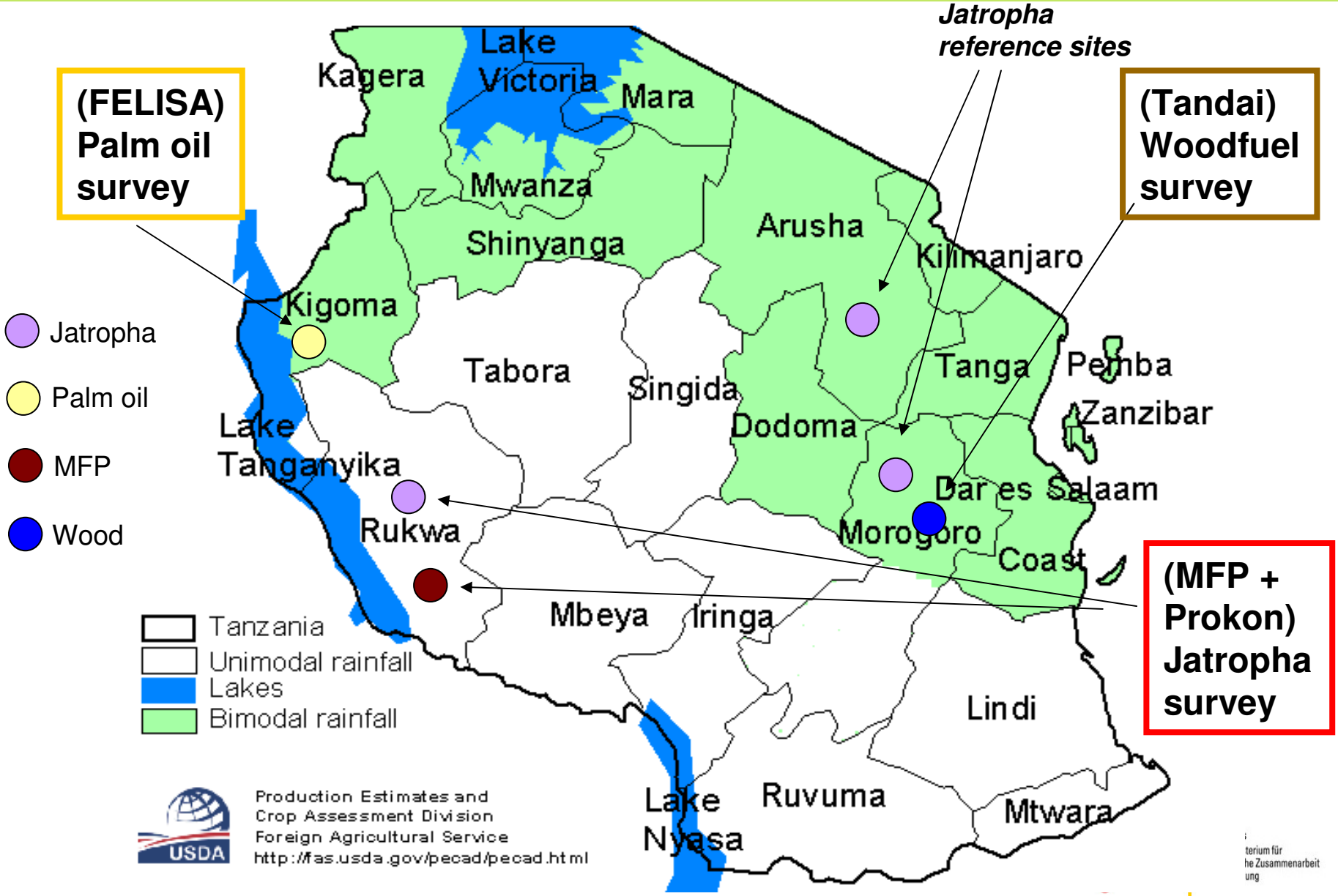
NEXT STEPS - SURVEYS



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Thank for your attention!

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