

RAPID PLANNING



Federal Ministry
of Education
and Research



DLR

**SUSTAINABLE INFRASTRUCTURE, ENVIRONMENTAL
AND RESOURCE MANAGEMENT FOR
HIGHLY DYNAMIC METROPOLISES**

SESSION 6

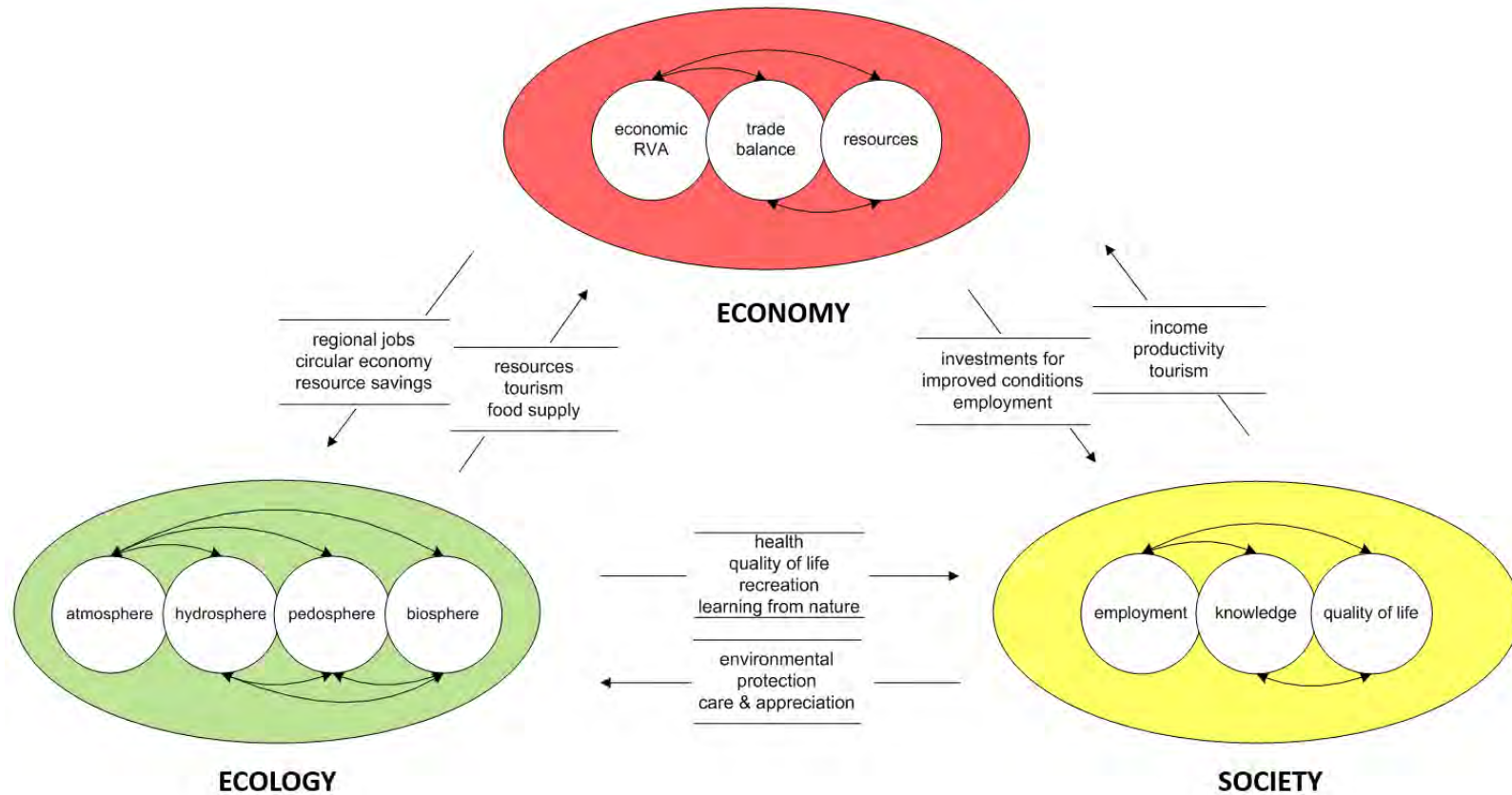
ECONOMIC EFFECTS, METHOD TRANSFER, DISSEMINATION OF RESULTS

MID-TERM CONFERENCE | 13 SEPTEMBER 2017

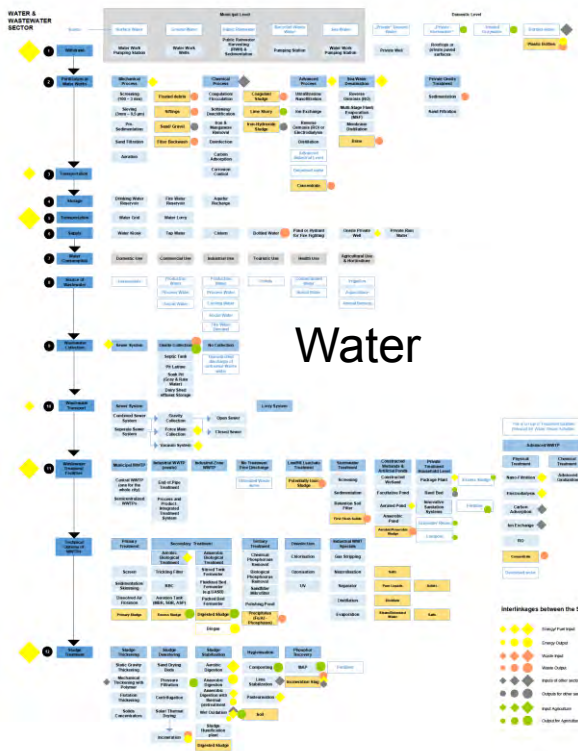
REGIONAL IMPACT ASSESSMENT OF TRANS-SECTORAL URBAN PLANNING

NADJA CARIUS, IZES GMBH

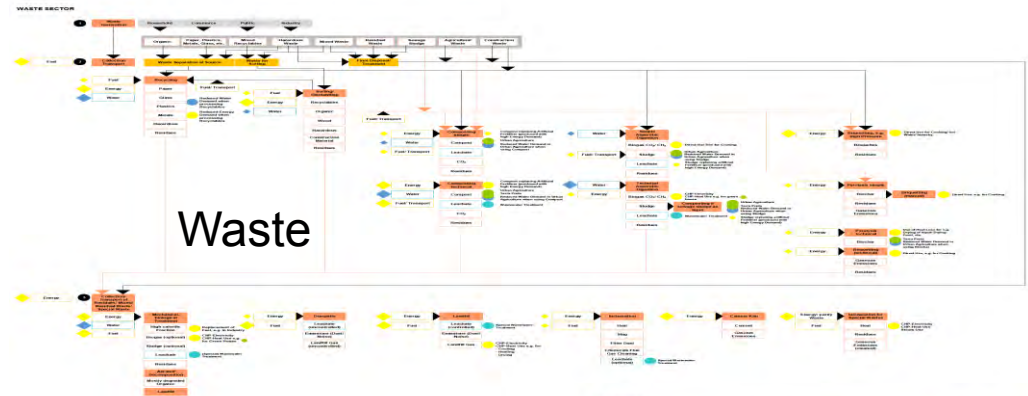
REGIONAL IMPACT ASSESSMENT



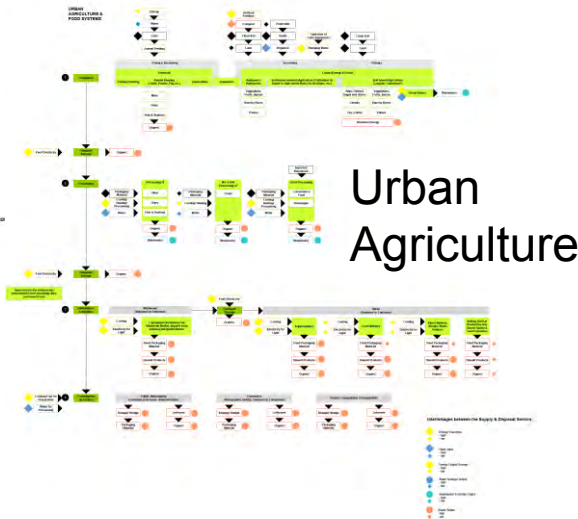
TRANS-SECTORAL INTERLINKAGES



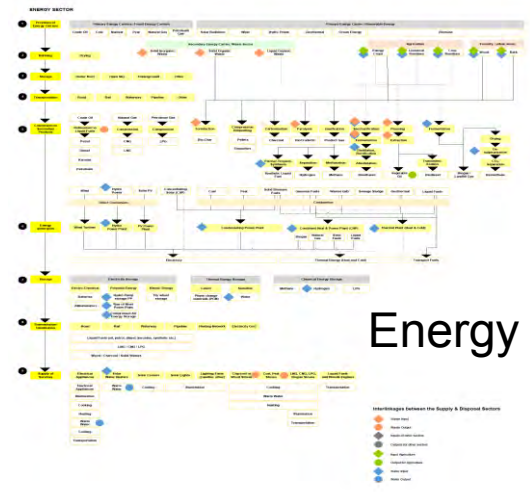
Water



Waste



Urban Agriculture



Energy

REGIONAL IMPACT ASSESSMENT

- focus area: region/city
- Regional Value Added = Regional value creation
[difference between revenues of factors of production in a specific region and their total outside purchases]
- different approaches towards the measurement of RVA
- qualitative and quantitative assessment methods
- limiting factor: data availability

→ Indicator-based Value Chain Assessment

INDICATORS FOR REGIONAL IMPACT ASSESSMENT

Economic Indicators

Investment/Profitability
/Value Added

Stability of Market

Local Economy/Trade
Balance

Resources

Social Indicators

Quality of Life

Knowledge/Education

Employment

Fair Access/Self-
supply

Gender equality

Ecological Indicators

Atmosphere

Hydrosphere

Pedosphere

Biosphere

Material & Energy
Balance

REGIONAL IMPACT ASSESSMENT & SDGs

Economic Indicators

Investment/Profitability
/Value Added

Stability of Market

Local Economy/Trade
Balance

Resources

Social Indicators

Quality of Life

Knowledge/Education

Employment

Fair Access/Self-
supply

Gender equality

Ecological Indicators

Atmosphere

Hydrosphere

Pedosphere

Biosphere

Material & Energy
Balance



REGIONAL IMPACT ASSESSMENT & NEW URBAN AGENDA

Economic Indicators

Investment/Profitability
/Value Added

Stability of Market

Local Economy/Trade
Balance

Resources

**End poverty and
hunger**

**Promote sustained,
inclusive and
sustainable economic
growth**

Social Indicators

Quality of Life

Knowledge/Education

Employment

Fair Access/Self-
supply

Gender equality

**Improve human health
and well-being**

**Reduce inequalities
(esp. public goods and
quality services)**

Achieve gender equality

Ecological Indicators

Atmosphere

Hydrosphere

Pedosphere

Biosphere

Material & Energy
Balance

**Forster resilience and
reduce vulnerabilities**

**Protect environment
(incl. sustainable
consumption and
production)**

REGIONAL IMPACT ASSESSMENT & PARIS AGREEMENT

Economic Indicators

Investment/Profitability
/Value Added

Stability of Market

Local Economy/Trade
Balance

Resources

Social Indicators

Quality of Life

Knowledge/Education

Employment

Fair Access /Self-
supply

Gender equality

Ecological Indicators

Atmosphere

Hydrosphere

Pedosphere

Biosphere

Material & Energy
Balance

Climate resilience

SYNERGIES OF AGRICULTURE AND WASTE IN DA NANG: COMPOSTING

→ use of organic waste as fertiliser

Opportunities:

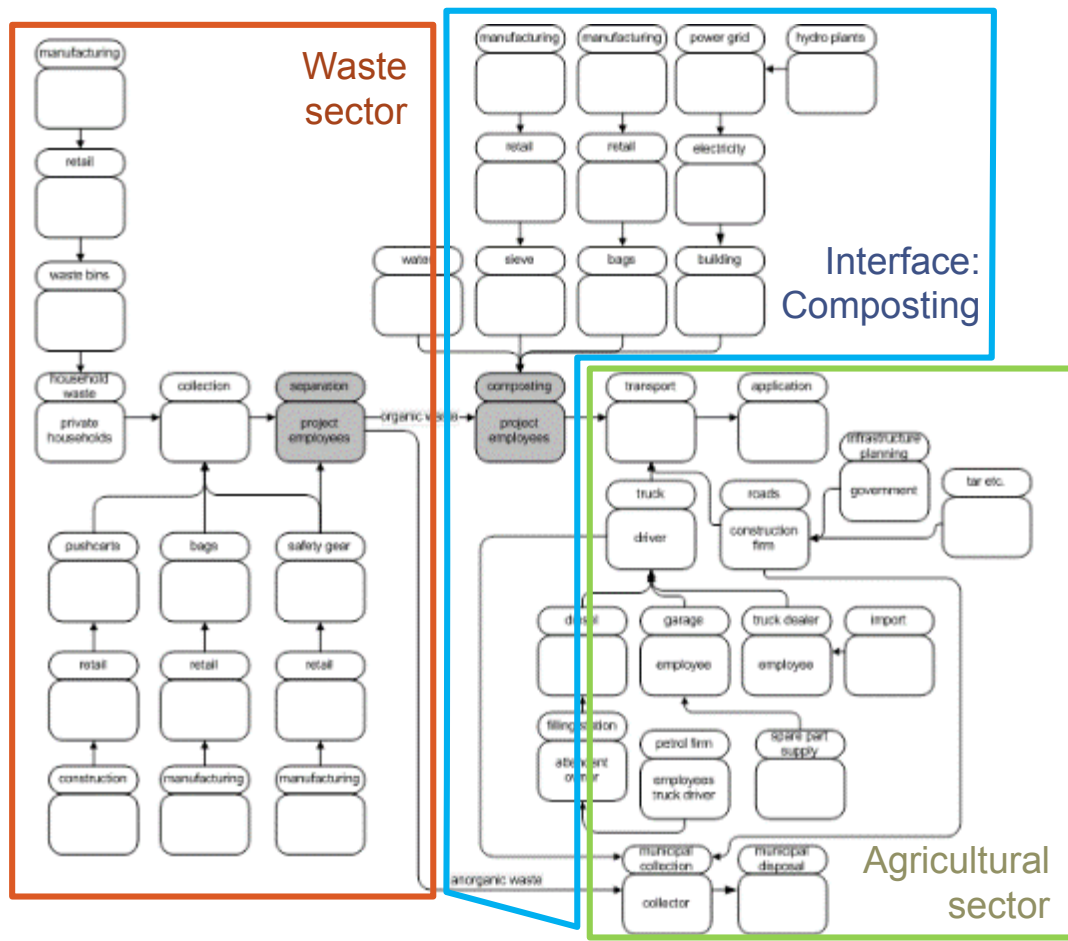
- High demand for organic carbon (soil erosion)
- Potential of co-composting other inputs (manure, sewage sludge)
- reduction volume of MSW on landfills
- Composting stabilises organic matter

Barriers:

- lack of knowledge (composting, application) and willingness (age of farmers)
- Quality requirements/certification/marketing
- Complicated, non-transparent and lengthy licensing procedure for large-scale plants



COMPOSTING VALUE CHAIN APPROACH



- Definition of regional part of value chain
- Definition of a reference scenario
 - 1) Organic waste to landfill
 - 2) Mineral fertilizer
- Determination of value added with selected indicators

ECOLOGICAL IMPACT

	Composting	Landfill & mineral fertilizer
Quantities	Input: 100,000 t/a organic waste Output: 50,000 t/a compost	Input: 100,000 t/a organic waste Input: 9,000 t/a mineral fertilizer
Atmosphere	17,500 t CO ₂ eq/a [-60,300 t CO ₂ eq/a]	77,800 t CO ₂ eq/a (landfill) (3,000 t CO ₂ eq/a for mineral fertilizer)
Land use	5 ha	0.8 ha/a
Soil quality	Increase of organic matter in soil Contribution to carbon sequestration Improves soil fertility	Soil erosion Decrease of water holding capacity (nutrient leachate)
Biodiversity	Support of organic agriculture and biodiversity	

SOCIAL IMPACT

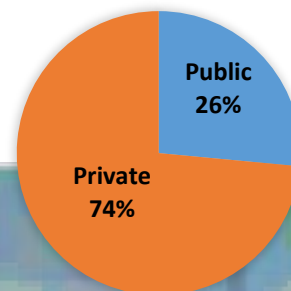
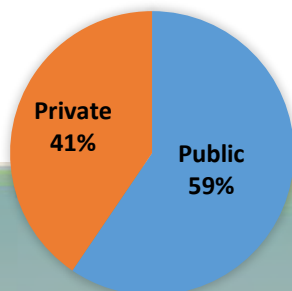
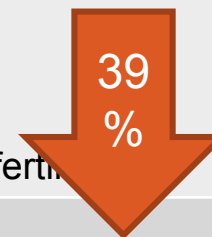
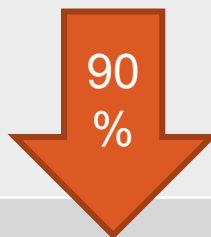
	Composting	Landfill & mineral fertilizer
Employment	Labour intensive process Creation of jobs at composting plant (lower qualified), additional employees in marketing and sales (higher qualified)	Low salaries at landfill
Knowledge	Employees in marketing and sales Environmental education (organic agriculture)	Low-qualified people
Health	Risk of health impacts (diseases)	High risk of health impacts at landfill (diseases) Health risks at application of mineral fertilizer
Quality of Life	Better working conditions Production of own products (regional identity)	

ECONOMIC IMPACT

	Composting	Landfill & mineral fertilizer
Quantities	Input: 100,000 t/a organic waste Output: 50,000 t/a compost	Input: 100,000 t/a organic waste Input: 9,000 t/a mineral fertilizer
Costs	31 EUR/t input with collection: 8 EUR/t transport: 6.20 EUR/t composting: 16.80 EUR/t	16.8 EUR/t (waste disposal) with collection: 8 EUR/t transport: 6.20 EUR/t landfill: 2.60 EUR/t
WTP/Price	15 EUR/t	195 EUR/t (mineral fertilizer)
Stability of Market	Self-supply within the region	Fertilizer demand depends on fluctuating price level
Trade Balance	Import of trucks and fuel	Import of mineral fertilizer, trucks and fuel
Resources	Recycling of organic waste	

ECONOMIC REGIONAL VALUE ADDED

	Composting	Landfill & mineral fertilizer
Quantities	Input: 100,000 t/a organic waste Output: 50,000 t/a compost	Input: 100,000 t/a organic waste Input: 9,000 t/a mineral fertilizer
Total Costs	3,100,000 EUR/a	3,488,625 EUR/a with 1,680,000 EUR/a (landfill) 1,808,625 EUR/a (imported fertilizer)
RVA	2,790,000 EUR/a	1,370,000 EUR/a
Sources of financial flows	Private: 1,256,000 EUR/a (waste fees and compost) Public: 1,844,000 EUR/a	Private: 2,564,625 EUR/a (waste fees and mineral fertilizer) Public: 924,000 EUR/a



SUMMARY: REGIONAL IMPACT OF COMPOSTING

- High RVA (90% regional)
- Higher costs for public body
- Ecological benefits with regard to GHG emissions, soil quality and water quality
- Social benefits regarding health, employment, environmental education

NEXT STEPS

- Verification of data with other partners and their results
- Guideline for application
- Application and adaptation to selected main synergies in the case cities
- Integration into RP scenario simulation tool