



life+mgn
making good natura

CONVEGNO INTERNAZIONALE
DARE VALORE ALLA NATURA
I Servizi ecosistemici per “nutrire il pianeta”
venerdì 12 giugno 2015
EXPO 2015 - MILANO

“Partnering Business & Nature to preserve freshwater ecosystems in agricultural landscapes



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politiche agricole
alimentari e forestali

EXPO
MILANO 2015
FEEDING THE PLANET
SMOOTH FOR LIFE



Deteriorating ecosystem services and socio-economic environment – Tisza floodplain

**INTENSIVE AGRICULTURE,
MISMANAGED FLOODPLAIN**

**FREQUENT AND
UNPREDICTABLE
FLOODS, DROUGHTS**

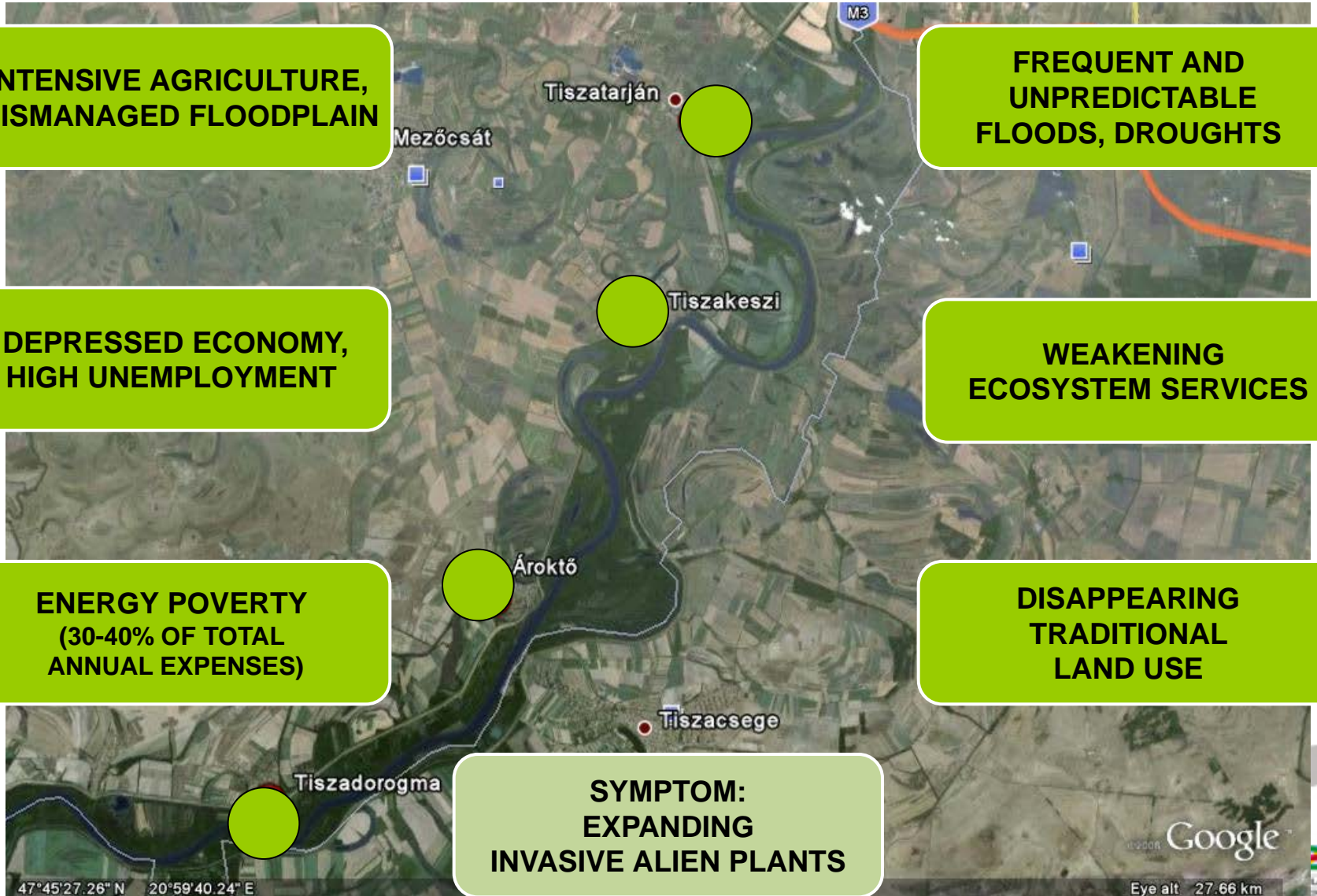
**DEPRESSED ECONOMY,
HIGH UNEMPLOYMENT**

**WEAKENING
ECOSYSTEM SERVICES**

**ENERGY POVERTY
(30-40% OF TOTAL
ANNUAL EXPENSES)**

**DISAPPEARING
TRADITIONAL
LAND USE**

**SYMPTOM:
EXPANDING
INVASIVE ALIEN PLANTS**



Eye alt 27.66 km

alimenti e forestali





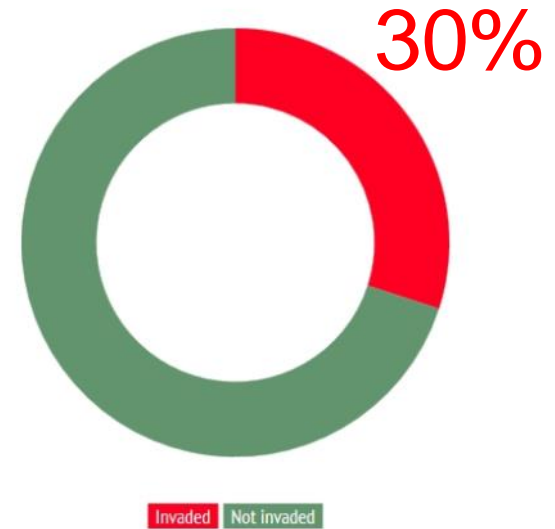
Expansion of invasive plants is a symptom of weakening ecosystem services



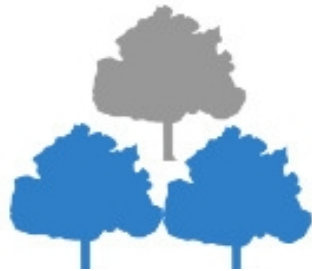
...that are harmful to economy, communities and to nature...

- **Biodiversity: habitat loss and fragmentation (wetland ecosystems are the most endangered) due to expansion of invasive plants**
- **vanishing traditional land use practices and livelihoods**
- **increased hydraulic roughness of floodplain, reduced flood capacity**
- **increased land management costs due to spreading invasive plants**

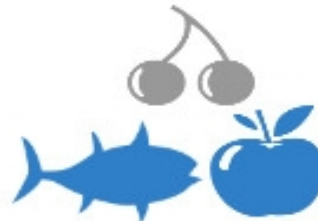
30% of the active floodplain is covered with invasive shrubs



Flood prevention



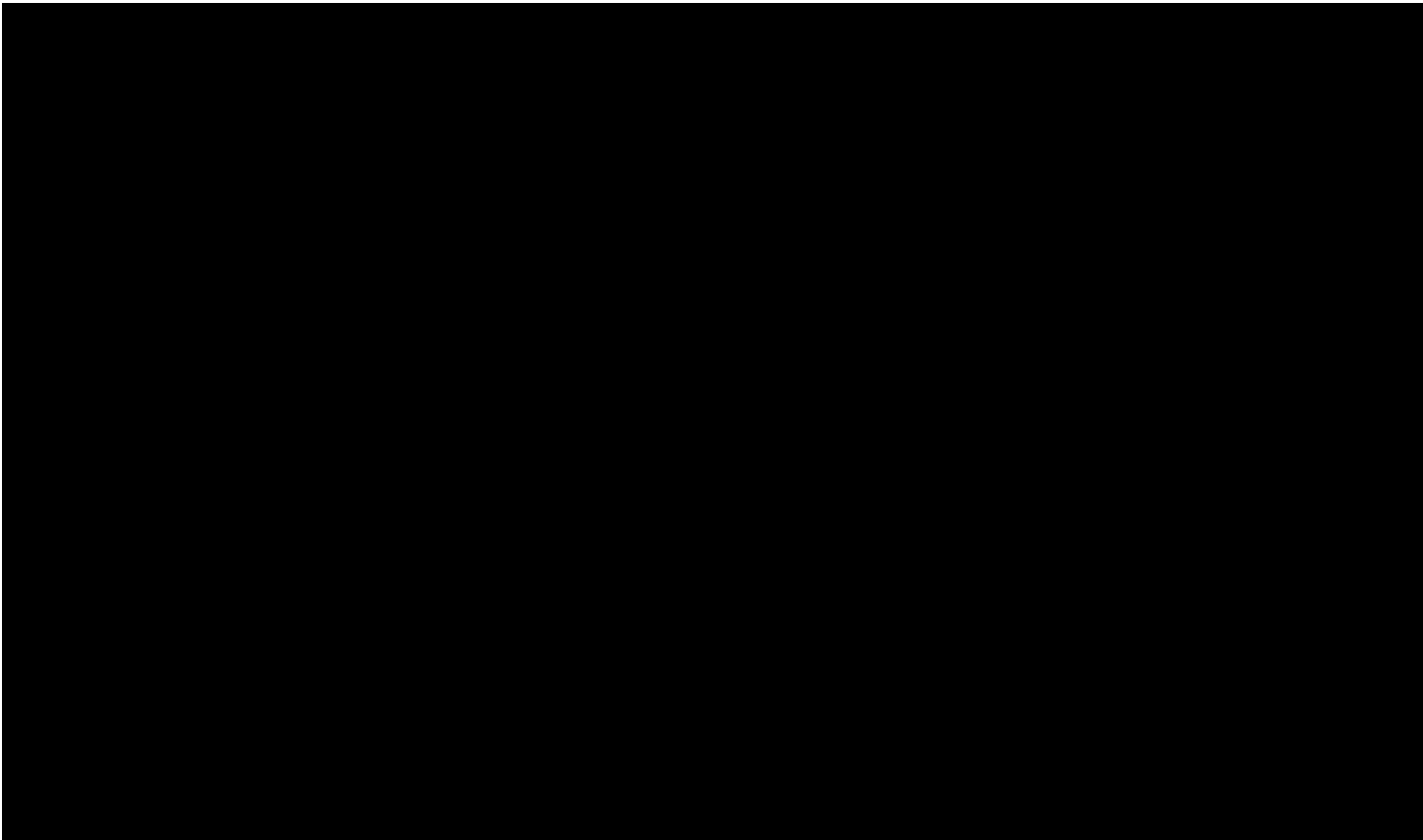
Habitat for species services



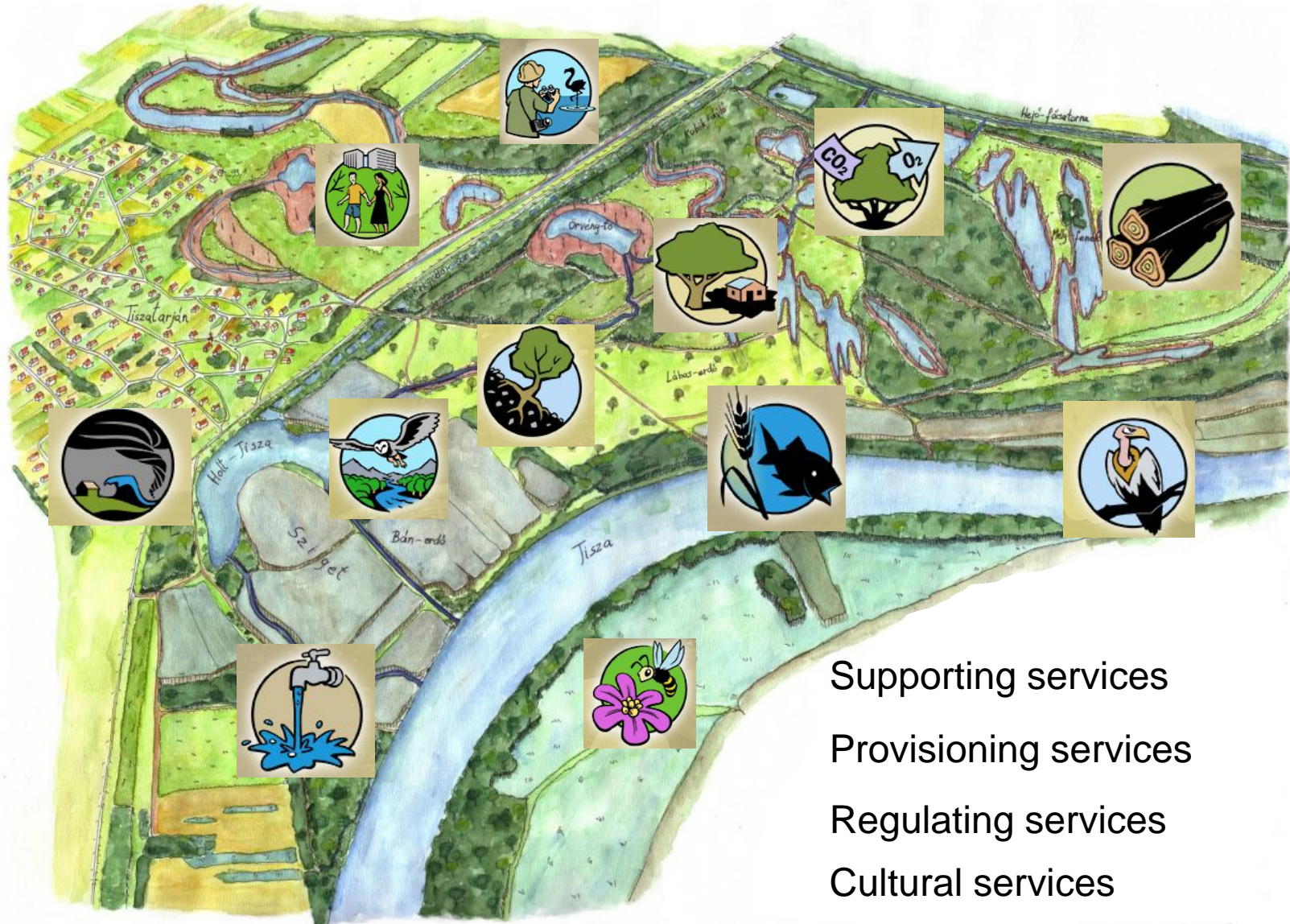
Provisioning



High land management costs



Ecosystem services of the floodplain



Supporting services

Provisioning services

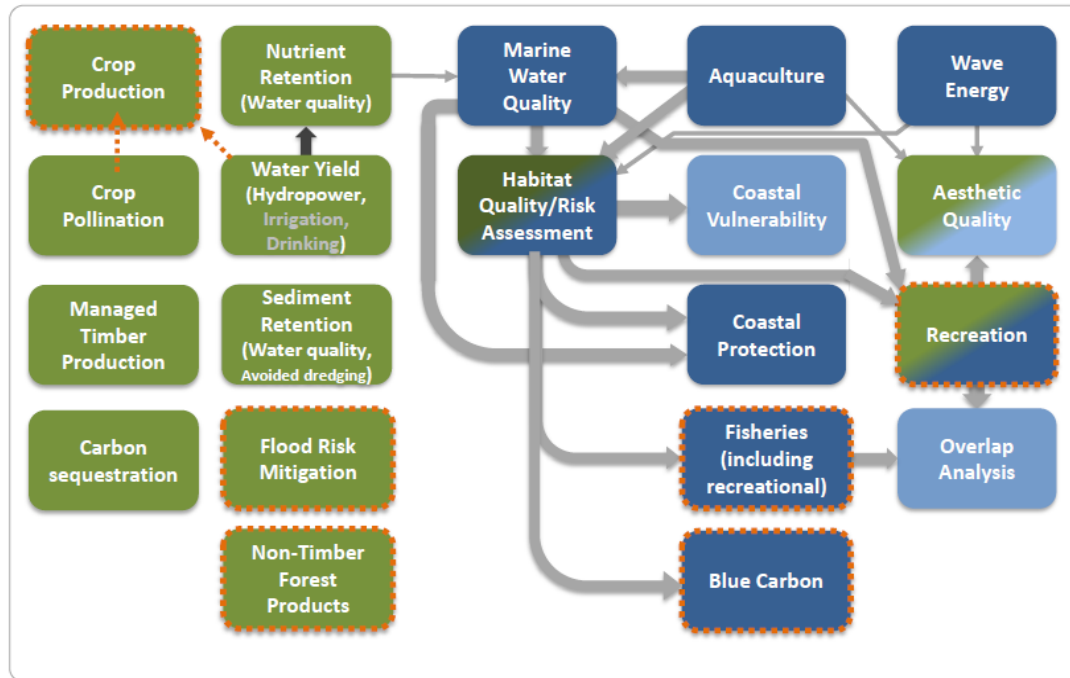
Regulating services

Cultural services



InVEST: Integrated Valuation of Environmental Services and Trade-offs

InVEST Models & Linkages

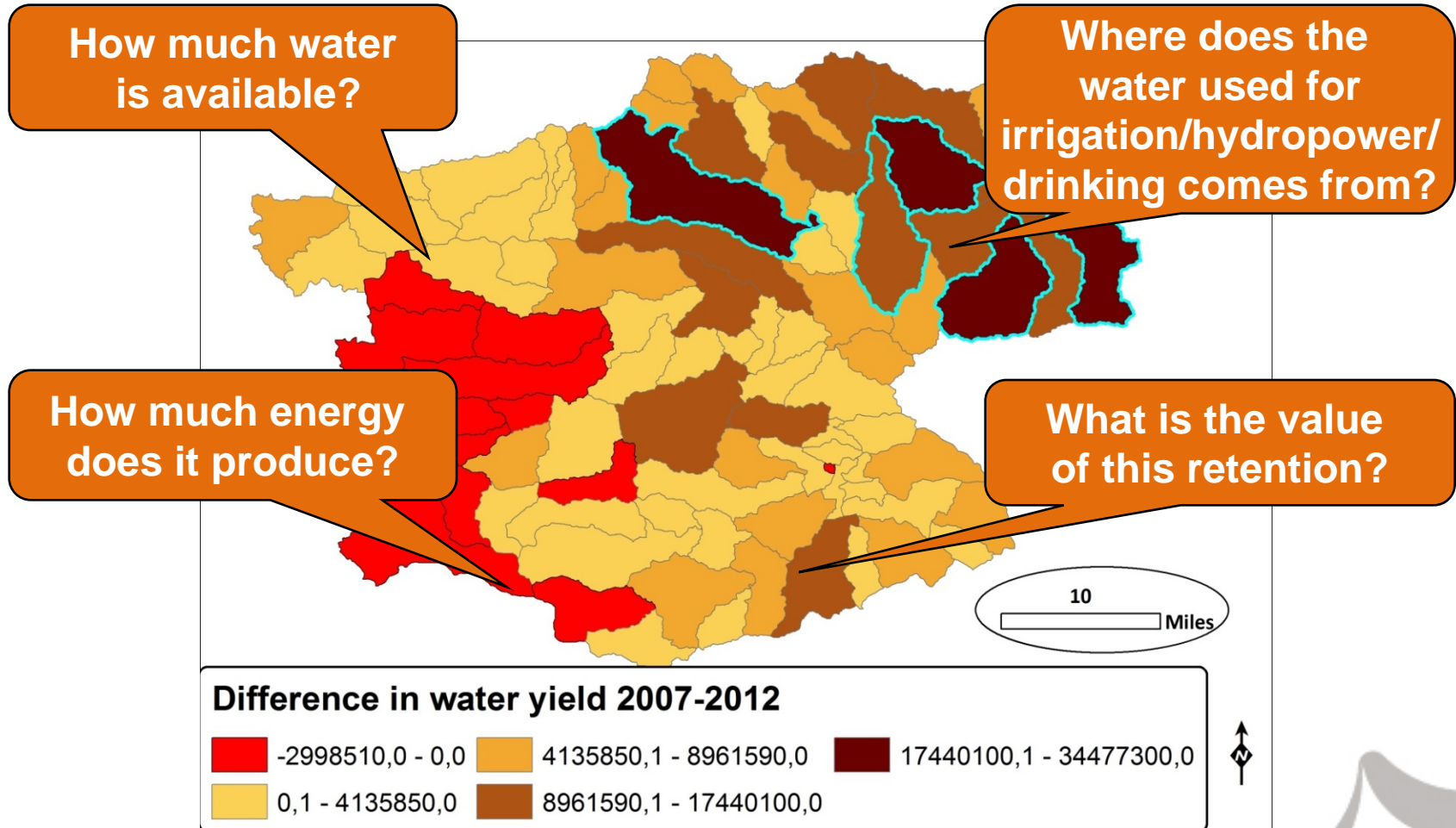


- Terrestrial/freshwater model: Tier 0
- Terrestrial/freshwater model: Tier 0
- Marine model: Tier 1
- Marine model: Tier 0
- Model coming soon!

- Optional model linkage
- Required model linkage

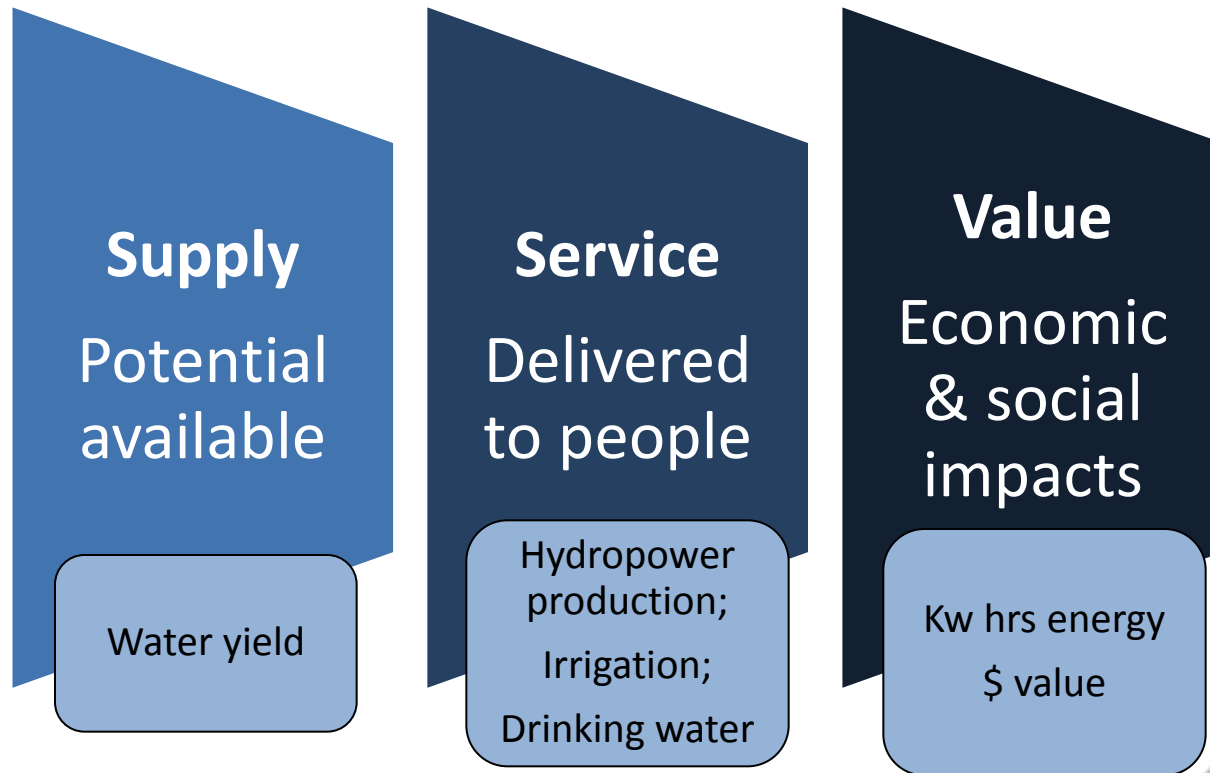


Water yield, water purification and sediment retention are typical watershed services



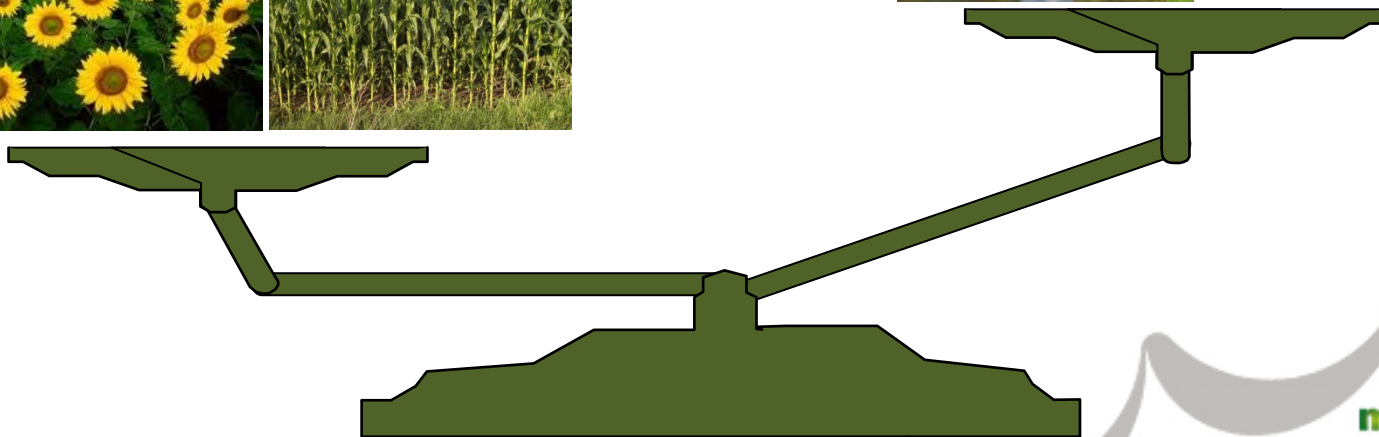
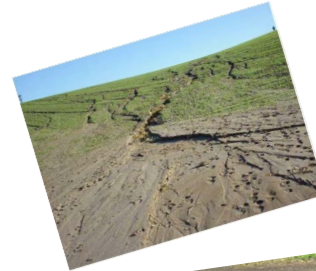
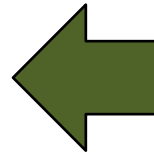


Changes in ecosystems → Changes in ecosystem services and their values



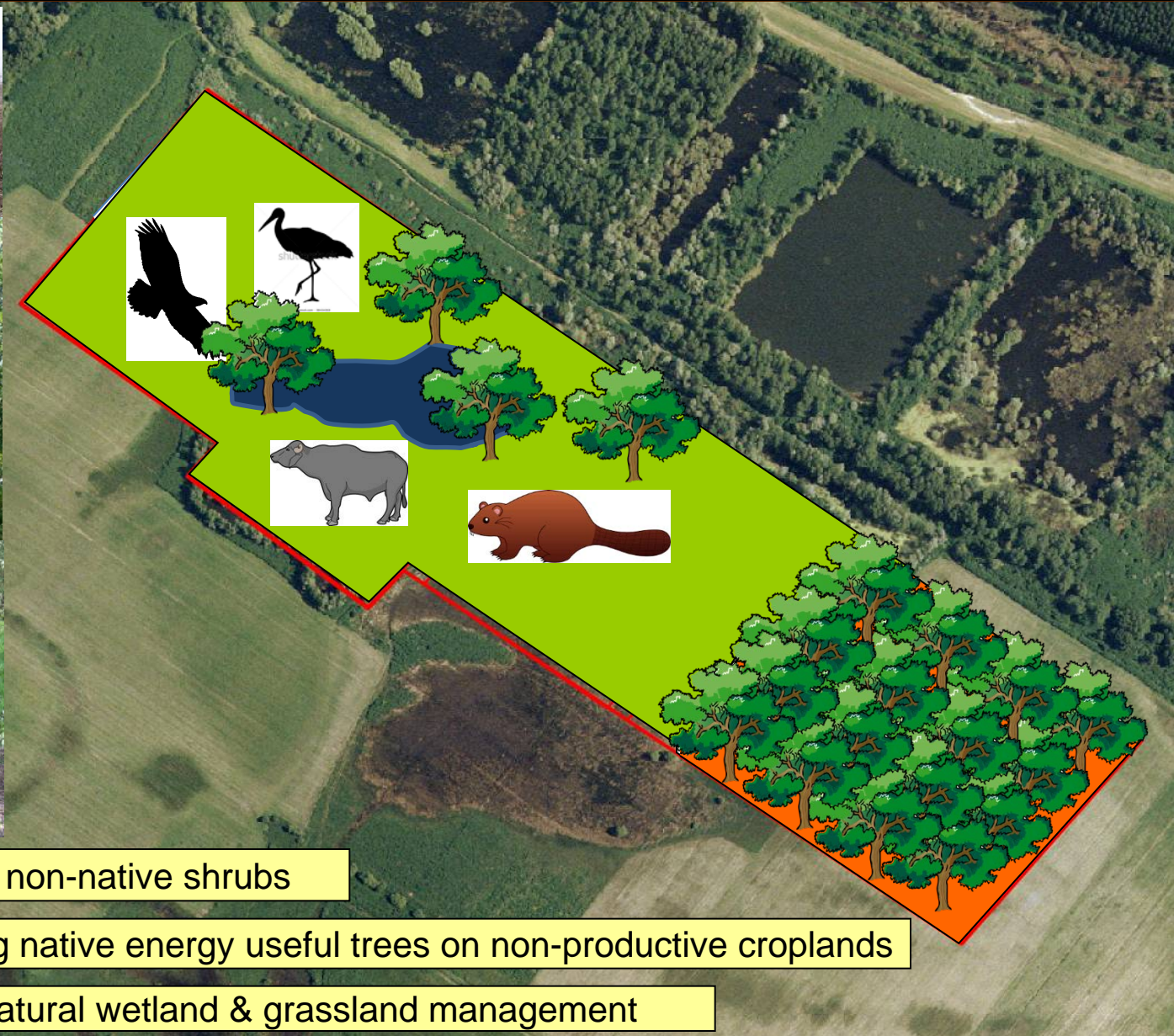
Trade-offs among ecosystem services

Biofuel.
Market value?





Market value of biomass > Invasives to energy



1) Cutting non-native shrubs

2) Planting native energy useful trees on non-productive croplands

3) Semi-natural wetland & grassland management



Investment in natural capital can enhance human development and conservation > Nature RE-turns

Ecosystem management:

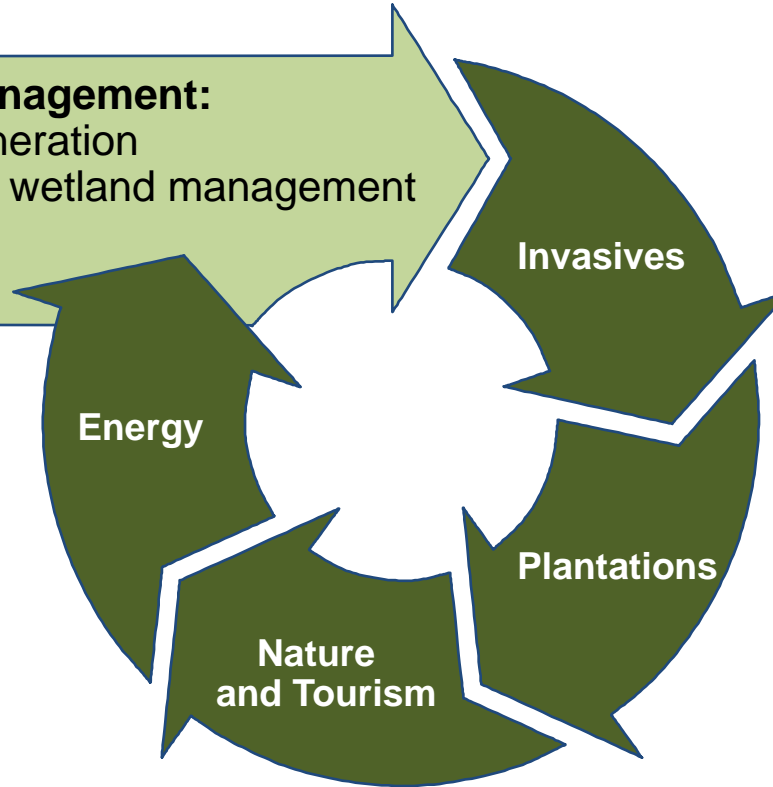
- Bioenergy generation
- Grassland and wetland management
- Ecotourism



Invasive shrubs and wood from plantations are used as bioenergy source. Public buildings are heated by bioenergy. Expensive natural gas replaced.



Land partly given back to nature. Beavers, buffaloes, grey cattle introduced to diversify the landscape and attract visitors. **Supporting, regulating and cultural services.**



Floodplain areas covered with **invasive plants are cleared**, by unemployed people. Invasive shrubs are used as raw material for bioenergy. **Payment for provisioning service.**

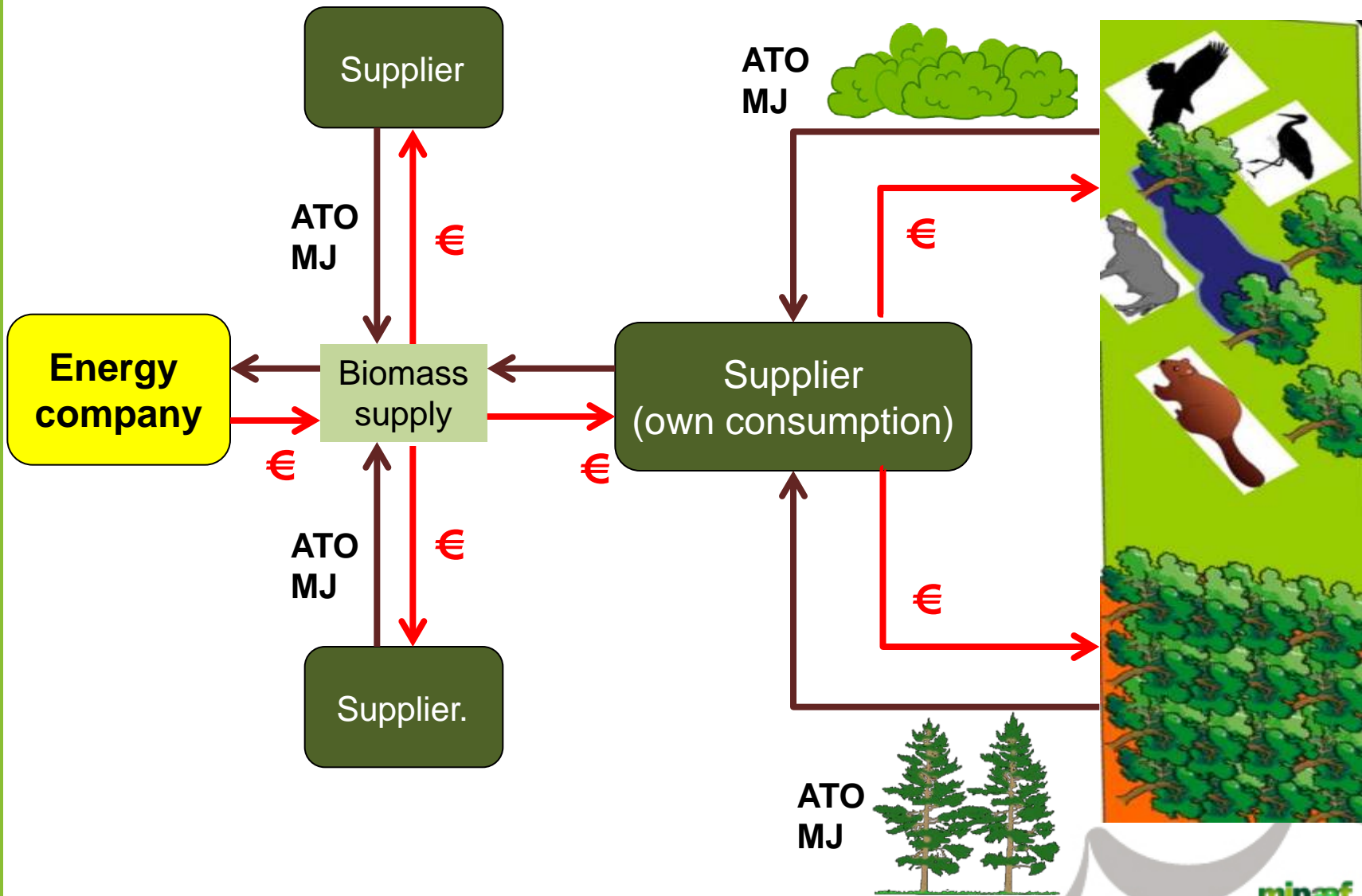


Profit is channelled back: Land partly converted to native, energy useful tree plantations, established and managed by unemployed people. **Provisioning and regulating services.**





Market based conservation mechanism





Better ecosystem management has synergistic effects



JPG Preview service@clipartof.com



Jobs for 35 unemployed people



40,000€ saved cost annually (energy)



100 ha floodplain restored



100tons CO2 and 55,000m3 natural gas replaced



450kW installed capacity 1500GJ(year)



Strengthened
Provisioning/Regulating
and Cultural ecosystem
services

Energy security

More open space for
species

Better flood
security,
reduced flood
risk

Better resilience
to climate
change

Gain
market
experience

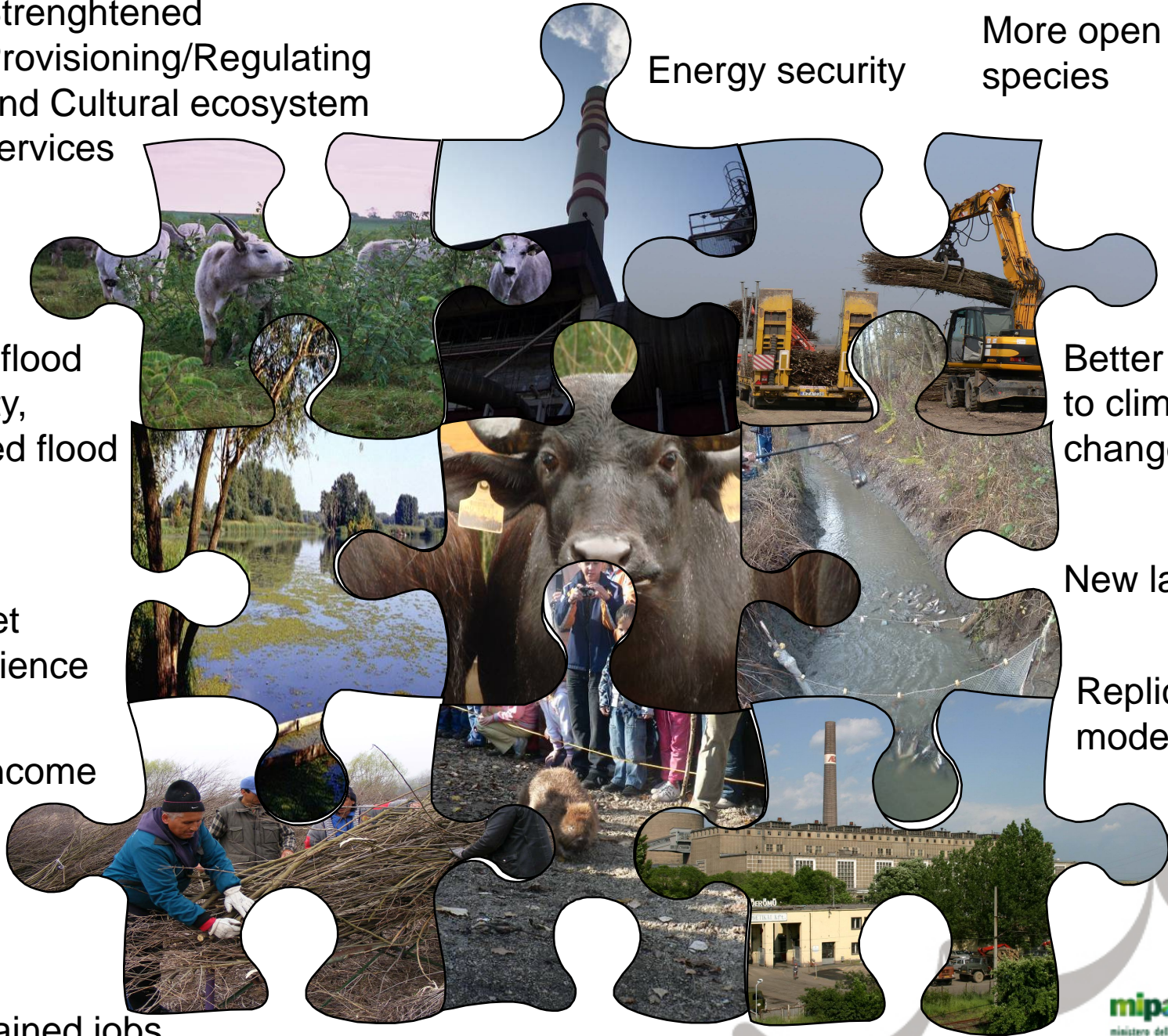
New labour skills

New income

Replicable
model

New,
maintained jobs

Ecotourism





Take aways

Valuating ecosystem services opens door to:

Focus activities on areas that contribute most

Design/change **management practices** that lead to minimal loss

Create **payment programmes**

Identify **places** where other economic activities will cause conflicts

Calculate how much ...will we **gain/lose** under future development plans

Key questions to ask:

What do you **aim** to achieve by valuating ecosystem services?

What questions **are decision-makers asking** that your analysis can inform?

Who has a stake in the decision? Who has **decision-making authority**?

What ecosystem services and biodiversity information do they **need** for their decision-making?

How will ecosystem service information **alter the decision-making process** and ultimate decisions that are made?

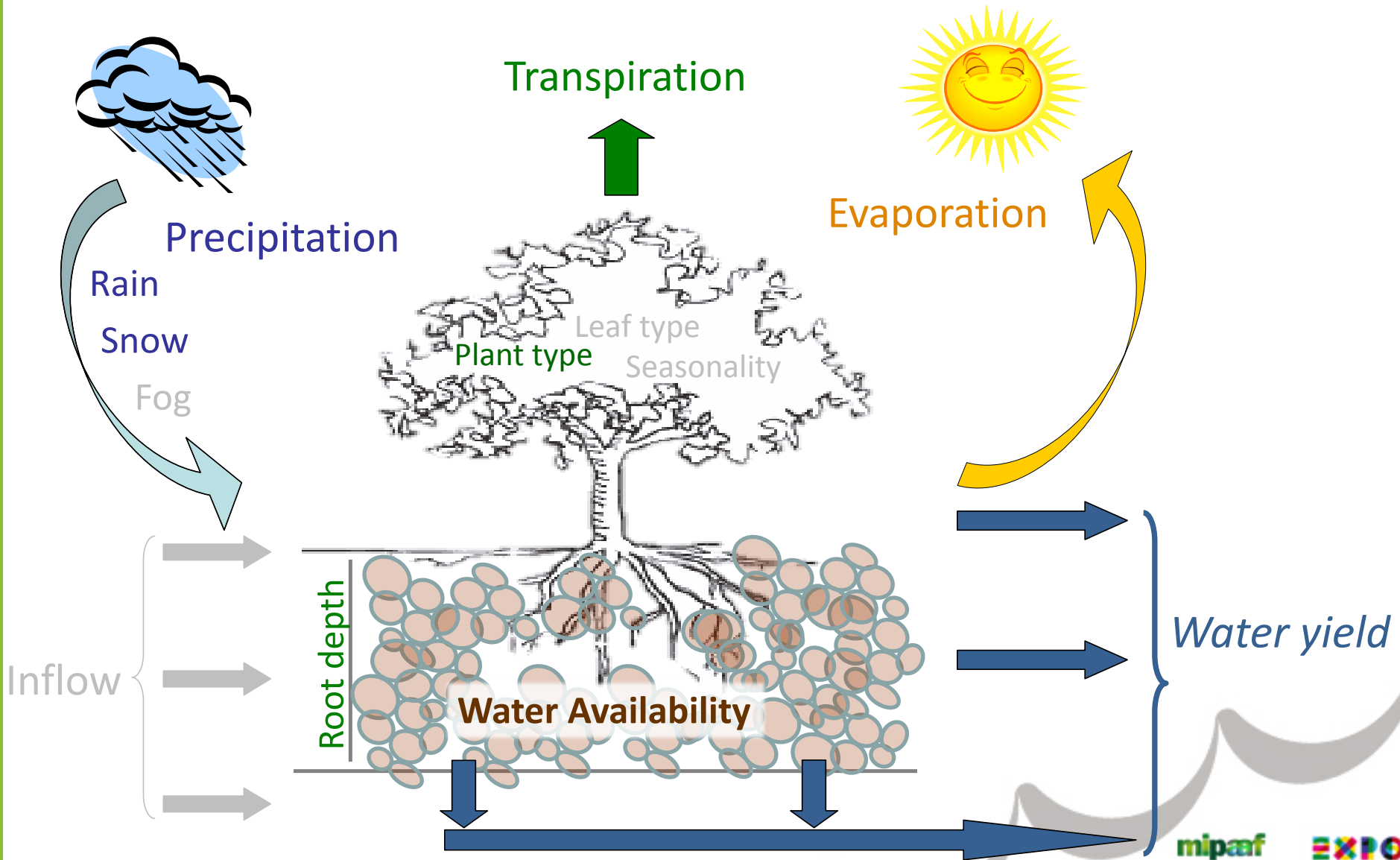
Thank you for your attention

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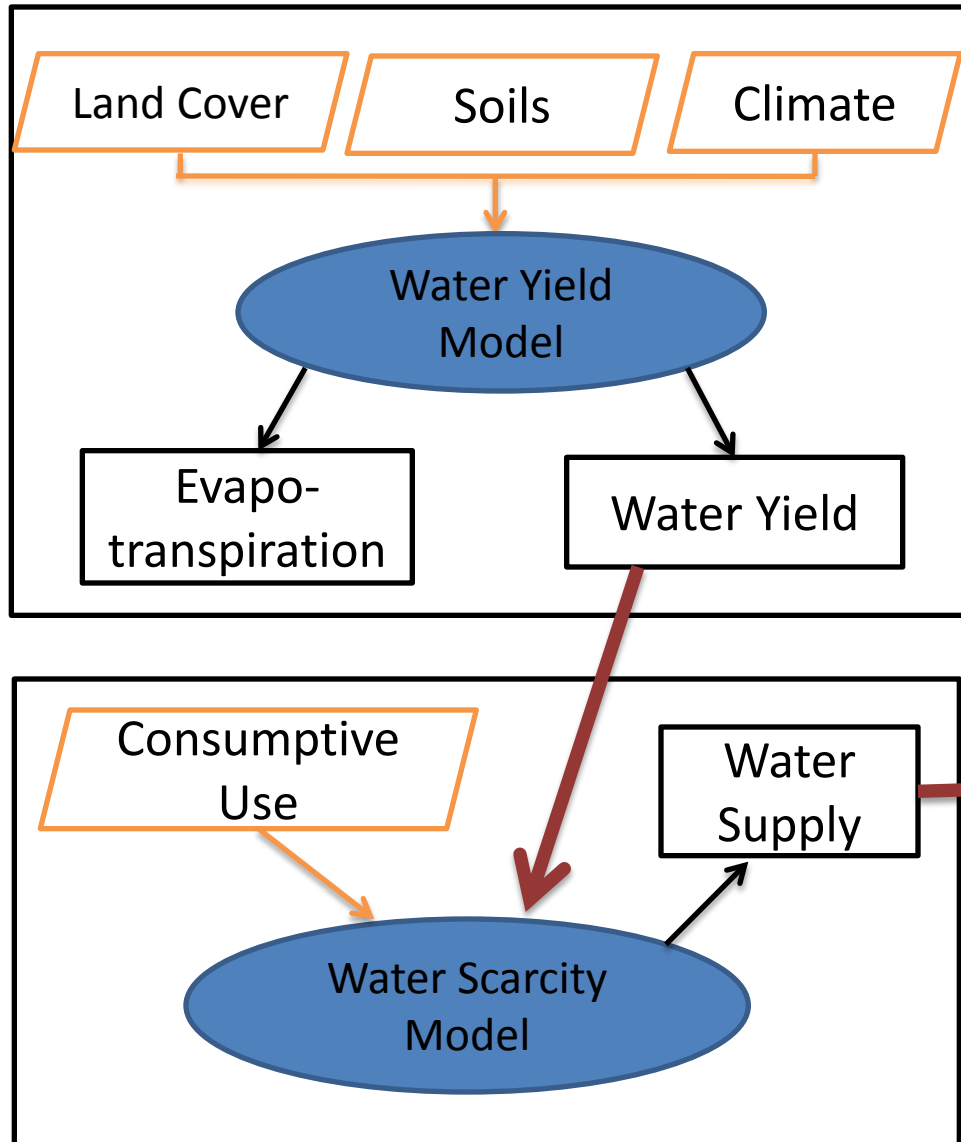


Water yield Model aspects

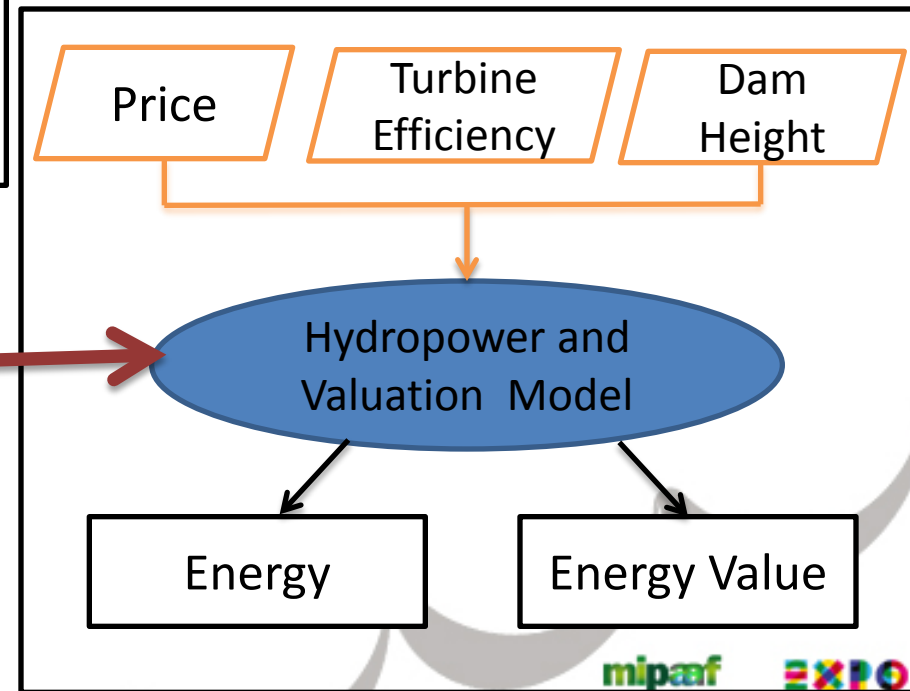




Model Architecture



Water yield – water consumed
= **water available for hydropower**





Valuating Ecosystem Services to show the **VALUES**

Actual Evapotranspiration

mm/year

Water yield

mm/year

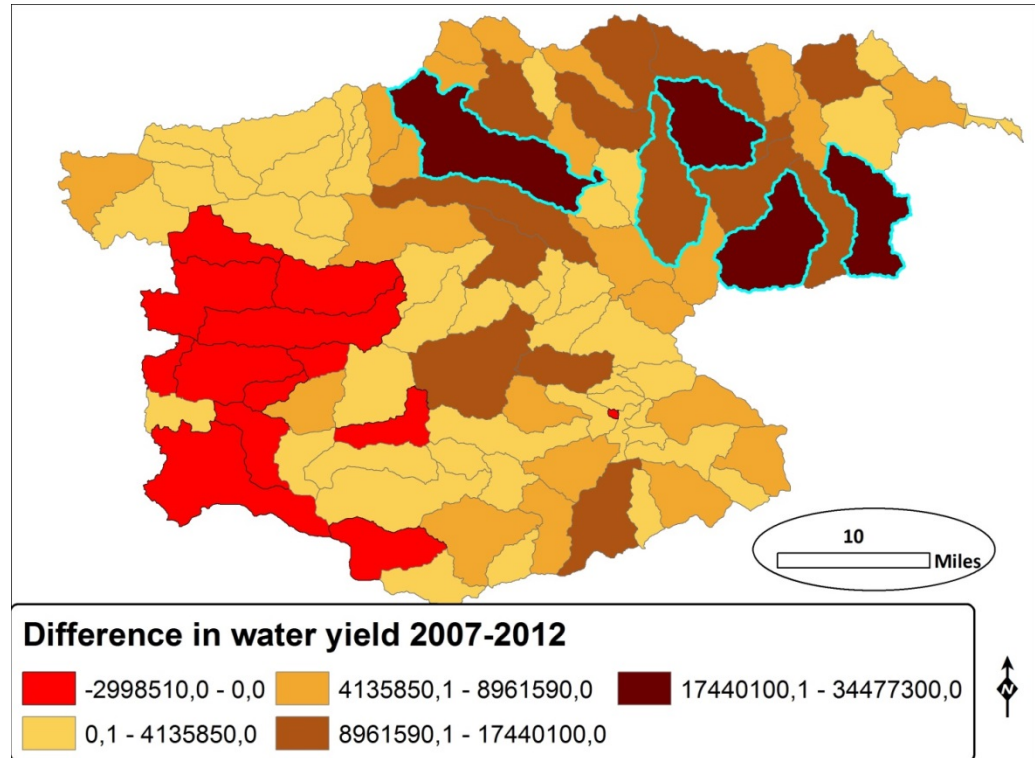
Water supply

m³/year

Used in valuation

Energy/value for hydropower

Kw/currency over timespan





Local bioenergy = New economy = More Nature

Invasive shrubs

40tons/ha/y
20% moisture
18MJ/kg
High density



Plantations

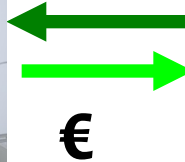
10tons/ha/y
45% moisture
16MJ/kg
Controlled



Energy company



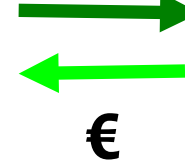
Biomass



€



Biomass



€

Local heating



Get the context!

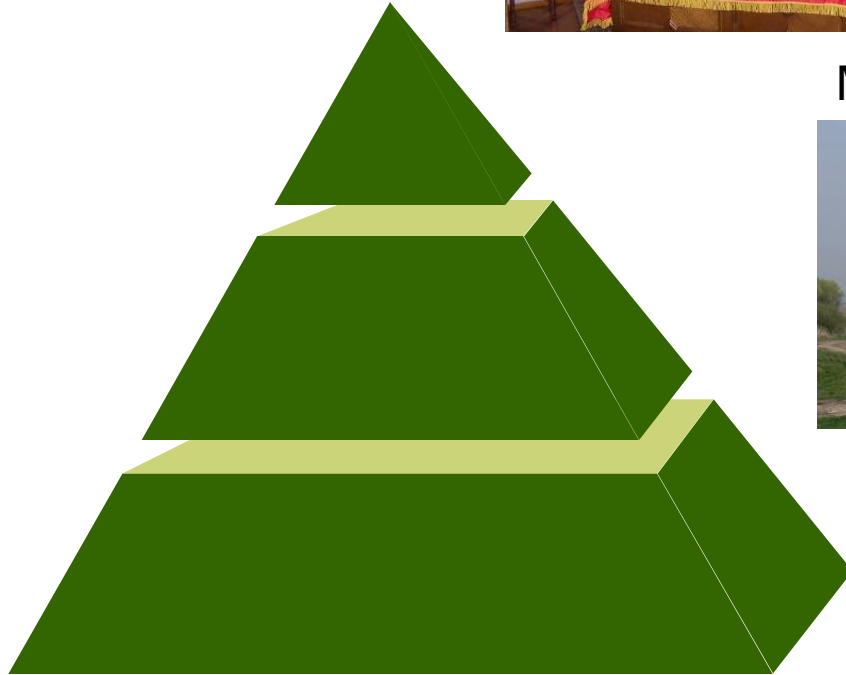
Contracts



Market



Property rights





Invasives and plantations nearby serve as as spot market

