Carbon Land Use Change Projects - Tool for Steppe Restoration

This project is funded by the EU

STEPPE CONSERVATION

- Opportunities:
  - Little virgin steppe left
  - 5 mill ha degraded land in Ukraine alone
  - Steppe productivity goes hand in hand with biodiversity
  - Extensive beef production is economic
  - Agricultural management is a perspective for nature protection

This project is funded by the EU

ECONET AS TOOL

- ECONET regional scheme development -
  - legal and organisational frame for large scale steppe restoration through formation of steppe pastures
  - For priorisation of input of means
- Steppe grassland and degraded land are necessary resources to be developed as corridors for virgin steppe

This project is funded by the EU

CARBON

- Healthy steppe soil has 8-10% humus
- Yearly reduction of humus by arable farming 0.1%
- Present humus 2-4 %
- Result
  - Reduced water capacity
  - Soil structure worsening
  - Increased erosion and water pollution
  - Reduced productivity

This project is funded by the EU

CARBON SEQUESTRATION

- Potential for carbon fixation increase 1.5 – 4 ton /year
- CO2 fixation 2.5 – 5.5 ton per year
- Increased productivity
- Less vulnerable for drought
- Possible for arable farming and pasturing

This project is funded by the EU

KYOTO PROTOCOL

- Carbon tradable **by land use change**, not by agricultural improvement
- Tradable volume minimal 100.000 ton/year

This project is funded by the EU

CARBON FINANCING

- Limitations
  - Only large quantities tradable
  - Global Area needed 100.000 ha
  - Difficult to organise social
  - Dispersed ownership
  - Little trust in authorities
  - Only for JI countries not for CDM countries
  - Economic management measures cannot be included like no-tilt and low tilt

This project is funded by the EU

CARBON FINANCING

- Carbon need to be combined with economic use
  - Extensive beef farming
- Need
  - Business sector development
-

This project is funded by the EU

APPROACH

- Grassland, degraded land, steppe inventory
- ECONET analysis
- Nature resource analysis
  - Land use plans
  - Socio-economic plans
- Improved management
- Public / private cooperation
- Common circular management

This project is funded by the EU

CARBON FUNDING

- Carbon Land Use Change Project includes:
  - Steppe pasture establishment on degraded arable land, and
  - Improved arable farming
  - Land Use optimization for (1) reduction GHG emission and (2) rural area economic development
  - Extensive livestock farming as a (1) steppe restoration management tool, (2) rural economic development, (3) carbon sequestration enlargement tool

PIN DEVELOPMENT

- Eligibility studies
  - Estimation possibilities and quantification
  - Estimation available surface
  - Defining tradable stock
- PIN for Moldova (for area of 57,000 of arable lands)
- PIN farm in Lugansk (3,000 ha both arable lands and steppe pasture, extendable till over 100.000 ha)

This project is funded by the EU

PIN EXAMPLE MOLDOVA

- PIN for Moldova:
  - Period from 2012 till 2021
  - Baseline scenario:
    - Annual Emission Reductions – 144,529 t CO_2 eq.
    - Cumulative Emission Reduction – 1,445,292 t CO_2 eq.
  - Annual Emission Reduction Value – 2,312,467 US$
  - Cumulative Emission Reduction Value – 23,124,672 US$
  - PDD preparation cost – US$ 160,000

This project is funded by the EU

PIN EXAMPLE MOLDOVA

- PIN for Moldova - project description and proposed activities:
  - Annual humus losses - 0,7 t/ha/y
  - C content in soil: original 2,9% - 3,5%, status on 2000 – 1,5% - 1,7%
  - 10% of degraded arable land, or 57,000 ha
  - With extension up to 50%, or 285,000 ha

This project is funded by the EU

PIN SCENARIO BASELINE

- PIN for Moldova – technology to be employed:
  - Baseline scenario of crops rotation:
    - Pea + annual grass crops
    - Winter wheat
    - Sunflowers
    - Winter barley
    - Maize

This project is funded by the EU

PIN SCENARIOS 1

- PIN for Moldova – technology to be employed:
  - Scenario 1: crops rotation with permanent grasses:
    - Lucerne or esparcet + ryegrass
    - Pea + annual grass crops
    - Winter wheat
    - Sunflowers
    - Winter barley + winter wheat
    - Maize

This project is funded by the EU

PIN SCENARIOS 2

- PIN for Moldova – technology to be employed:
  - Scenario 2: crops rotation with permanent grasses and green manure:
    - Lucerne or esparcet + ryegrass
    - Pea + annual grass crops
    - Winter wheat + green manure
    - Sunflowers
    - Winter barley + winter wheat + green manure
    - Maize

This project is funded by the EU

PIN SCENARIOS 3

- PIN for Moldova – technology to be employed:
  - Scenario 3: crops rotation with permanent grasses and mineral fertilizer :
    - Lucerne or esparcet + ryegrass
    - Pea + annual grass crops
    - Winter wheat + 150 kg ammoniacals/ ha/y
    - Sunflowers + 100 kg ammoniacals/ ha/y
    - Winter barley + winter wheat + 100 kg ammoniacals/ ha/y
    - Maize + 100 kg ammoniacals/ ha/y

This project is funded by the EU

PIN SCENARIOS 4

- PIN for Moldova – technology to be employed:
  - Scenario 4: crops rotation with permanent grasses and livestock manure (60 t/ha/y):
    - Lucerne or esparcet + ryegrass
    - Pea + annual grass crops
    - Winter wheat
    - Sunflowers
    - Winter barley + winter wheat
    - Maize

This project is funded by the EU

PIN MOLDOVA

- PIN for Moldova – Environmental Benefits & Risks:
  - Baseline Scenario - Risks:
    - Soil degradation, including humus content, soil structure and soil water capture ability, soil washing out etc
    - Area desertification
  - Project Scenarios:
    - GHG Emission reduction up to 2.54 t CO_2 /ha/y
    - Soil quality improvement, including water capacity
    - Existing degraded steppe plots less grazing pressure
    - Small river water quality improvement due to decreasing of soil washing out from the fields

This project is funded by the EU

PIN LUGANSK

- Steppe organic matter production 60-65% underground
- Natural productivity Above ground 1.5 – 2.8 ton / ha, total 4 - 8 ton / ha
- Depth of carbon sequestration goes upto 4 meter
- 80% in the top 50 cm
- Necessity of soil cover (grasses)

- Profitability beef farming euro … / ha

This project is funded by the EU

PIN LUGANSK

- In present 0.4 – 0.8 ton / ha
- Carbon sequestration over 5 ton CO2 per ha / y (above and underground)
- Cost restoration cost one time euro 250 /ha
- Carbon funding euro 50 / ha
- Profitability beef farming euro >euro 100-200 / ha

This project is funded by the EU

CONCLUSIONS

- Carbon funding needs to go hand in hand with economic cost/benefit calculation
- Lack of steppe seeds Need for seed bank development
- Carbon useful for risk reduction and first investment
- Need for Green Investment fund
- Only feasible in combination with improved land use → **Development of land use management tools**
- Need to set up regional social structure to organise large scale Carbon sequestration
- Need for new organisational structure for protected areas

This project is funded by the EU

Sustainable Integrated Land Use of the Eurasian Steppe

This project is funded by the EU