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Addressing challenges of evaluating impacts of RDPs on biodiversity wildlife
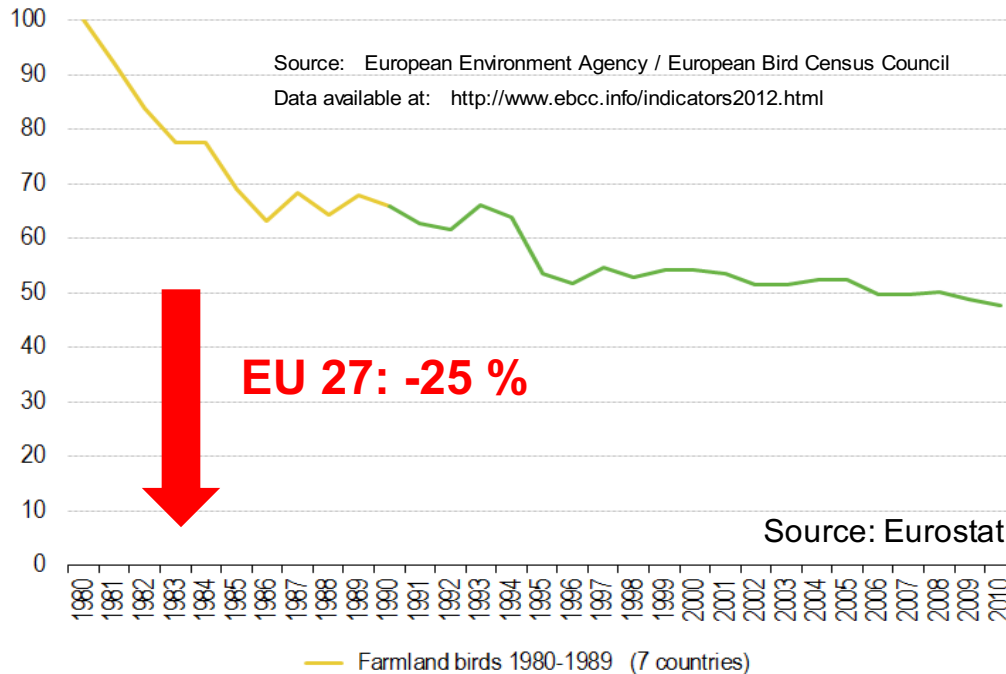
Experiences from case studies in Hungary and Lithuania

Péter Tóth – Szent István Univeristy
**Žymantas Morkvėnas – Baltic Environmental Forum**

Challanges in preserving agricultural biodiversity

Source: European Environment Agency / European Bird Census Council

Data available at: http://www.ebcc.info/indicators2012.html

EU 27: -25 %

Source: Eurostat

Farmland birds 1980-1989 (7 countries)

UK: - cca. 50 %

All (128)
Wetland (26)
Seabirds (19)
Woodland (38)
Farmland (19)

Source: RSPB, 2015

HU: - 25 %

Source: Szép et al, 2012

Serious declines among formerly common bird species:

- Grey partridge
- Tree sparrow
- Turtle dove
- Red-backed shrike

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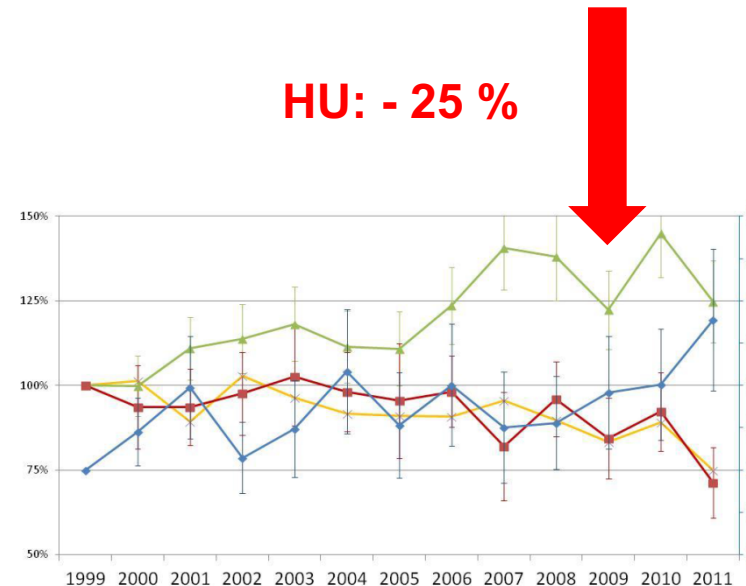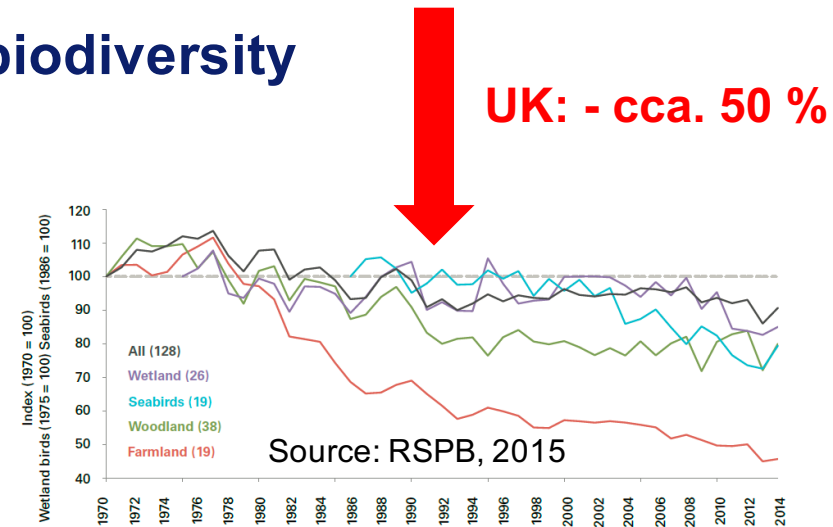
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Potential reasons of the decline of agricultural biodiversity

- **Intensification:**
  - Increase of input (artificial fertilizer, use of pesticides – more effective chemicals)
  - Technology development (eg. speed of mowing >15 km/h, plastic bales, etc.)
- **Decreasing crop diversity:** corn + wheat + sunflower: cca 2/3 of arable lands in HU
- **Changes in the agricultural habitats:** decreasing coverage of grasslands, more forest, spread of urbanized areas)
- **Climate change**
- **Erosion of field margins :** loss of green infrastructure in agricultural habitats

Source: Hungarian Central Statistical Office

— Agricultural area in HU (1000 ha)

— Gross production index of plant production % (1960=100%)
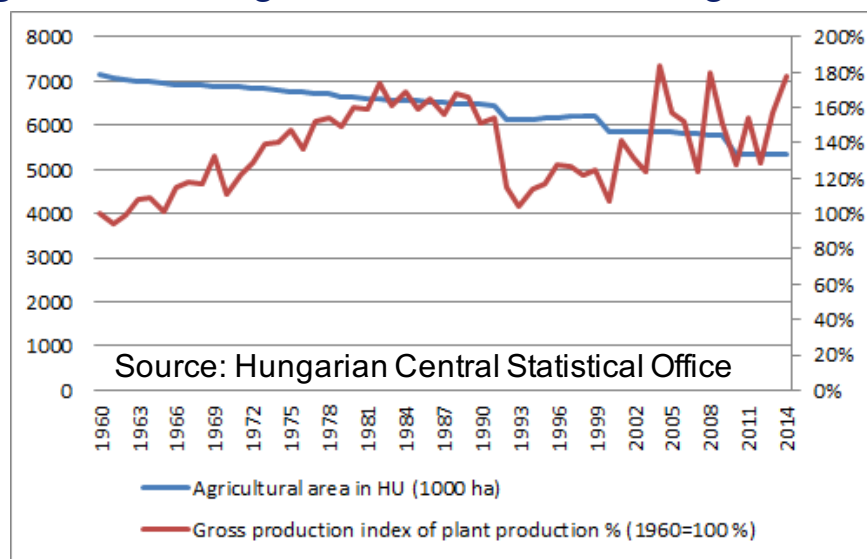
As CAP payments are one of the key driving forces of EU land use, the evaluation of the potential impacts is necessary

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WHAT evaluation challenges have been targeted ?

Hungary:

- establishing robust causal linkages at macro and micro levels between changes in biodiversity indicators and the uptake of relevant rural development measures
- Explore new ways of utilizing existing data sets in order to describe the impacts of key policy measures

Lithuania

- indicator gaps at micro level - missing robust indicators to evaluate net-effects of specific agri-environmental measures on biodiversity wildlife at micro level;
- lack of coordination and integration of available data between agriculture and environmental sectors

HOW were the assessments carried out ?

- **Identification of RDP measures (HU)**
  - ➢ Measure 214 Agri-environmental payments was selected as key policy measure
- **Macro level**
  - ➢ indicator: Farmland Bird Index (FBI)
  - ➢ method: with and without comparison groups, spatial analyses of quadrates
- **Micro level**
  - ➢ indicator: Number of farmland bird individuals (NBS)
  - ➢ method: with and without comparison groups, spatial analyses of survey spots

- **Identification of RDP measures (LT)**
  - ➢ Measure 212, 213 and 214
- **Macro level**
  - ➢ indicators: corncrake density, white stork breeding density & breeding success
  - ➢ method: hierarchical sampling and spatially explicit up-scaling
- **Micro level**
  - ➢ indicators: corncrake density, white stork breeding density & breeding success
  - ➢ method: multiple regression analysis

BW HU: Farmland Bird Index – macro level: Approach

Baseline biodiversity data: Common Birds Monitoring Programme (based on EBCC standards, run by BirdLife HU) - with HU set of species
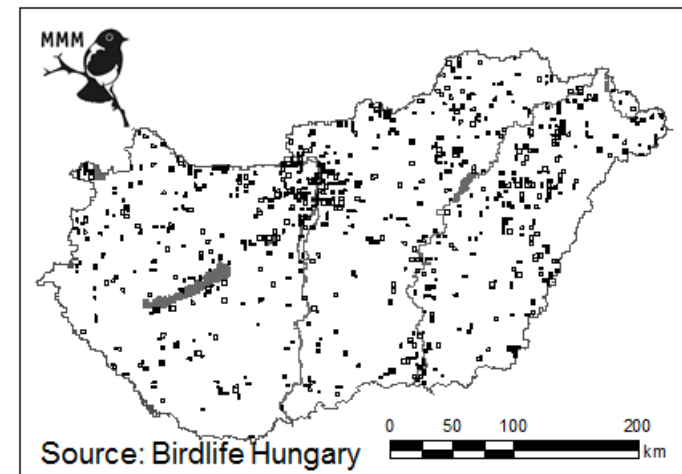
Spatial dimension: Hungary

**Sampling unit:** 2,5x2,5 km survey squares, 300-400 pcs, whole country coverage

Time scale: 1999-2014

Method: pairwise trend analyses of the FBI values of the groups of survey squares in a selected timescale (DiD approach)

Group definition: % of area of the survey

squares covered by AE measures (LPIS)

Source: Birdlife Hungary

BW HU: Farmland Bird Index – macro level: Results

Source: Szép et al, 2015
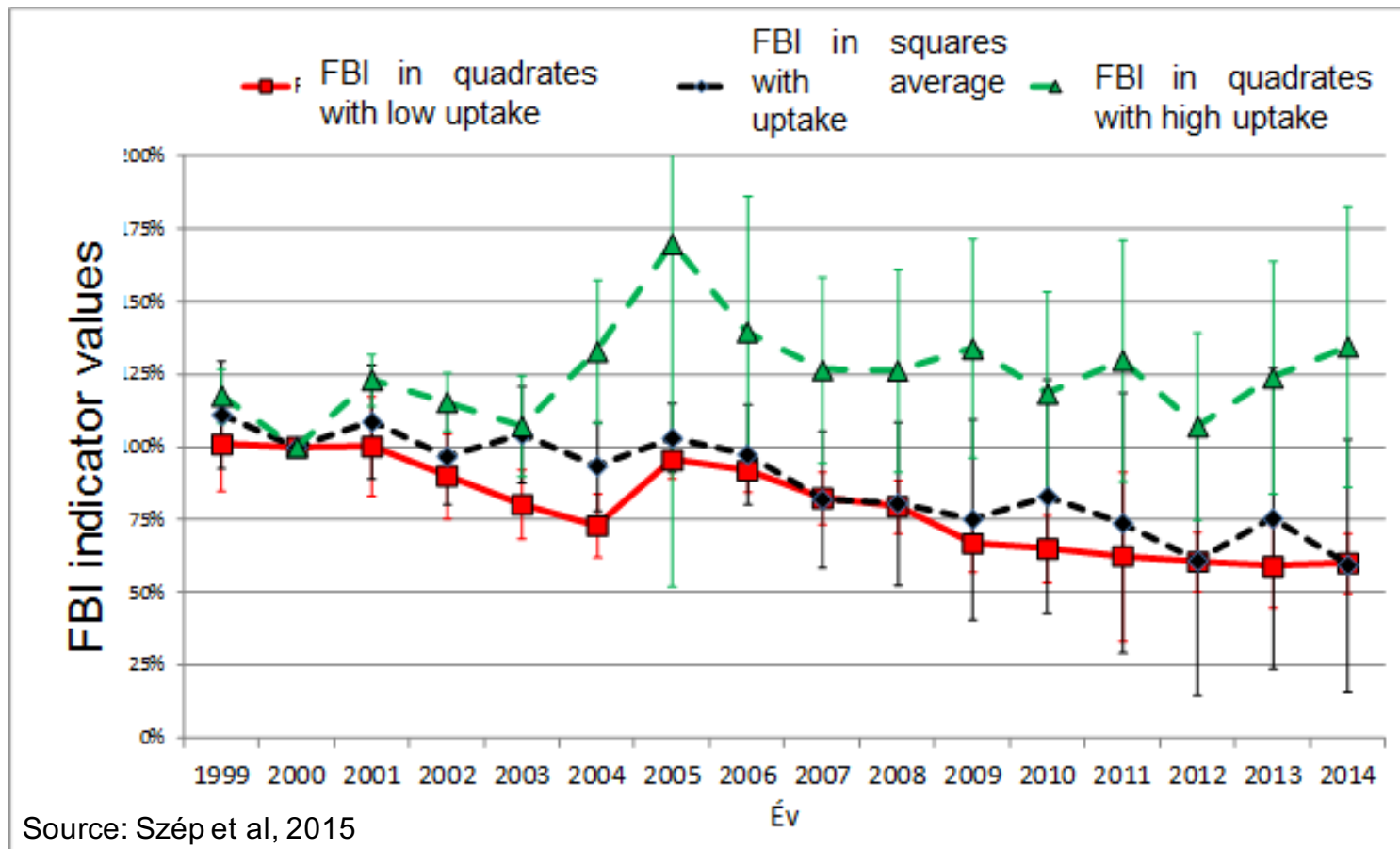
FBI decrease is significant in those quadrates where there is no, little or average coverage of agri-environmental scheme areas present (Szép et al., 2015)

BW HU: Numer of Farmland Birds – micro level: Approach

Baseline biodiversity data: Common Birds Monitoring Programme (based on EBCC standards, run by local NGO) - with CEE set of species

Spatial dimension: Heves-plain HNVA case study area

Sampling unit: Baseline survey spots of CBMP, 285 pcs of 100 m radius survey spots

Time scale: 2009-2014

Method: pairwise trend analyses of the FBI values of the groups of survey spots in a selected timescale (DiD approach)

Group definition: % of area of the survey
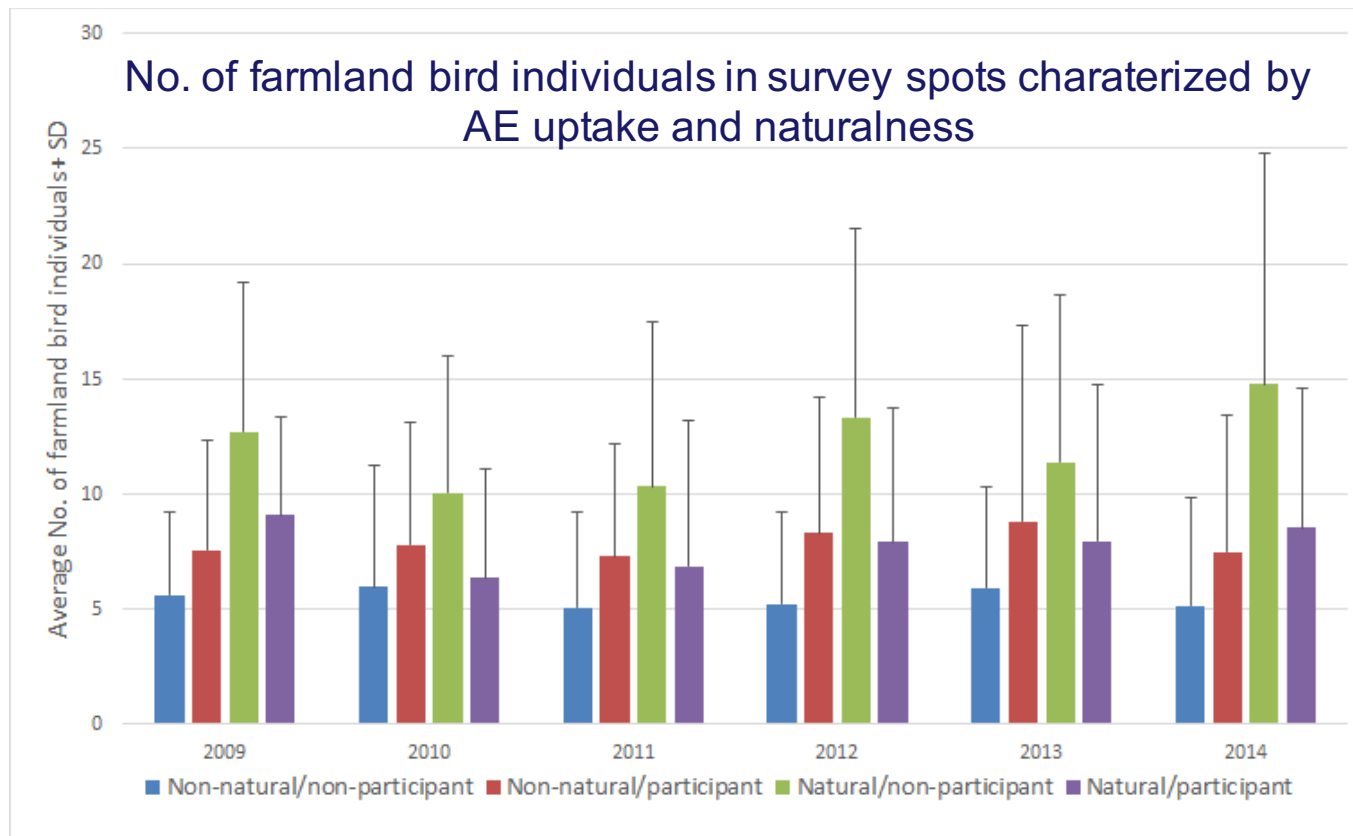
squares covered by:

- AE measures (LPIS) and

- Natural areas (CORINE – HNV selection method)

Natural/Participant, Natural/Non-participant

Non-Natural/Participant, Non-Natural /Non-participant

Survey spot
FBI quadrates
N2000 213
LFA 212
AE 214

BW HU: Numer of Farmland Birds – micro level: Results

No. of farmland bird individuals in survey spots charaterized by AE uptake and naturalness

- Number of farmland bird individuals significantly higher in N/NP spots
- Slightly increasing trend is observed in NN/P spots
- Natural areas with higher uptake showed different trend than others with low uptake

HOW were the assessments carried out?
Case study in Lithuania

- **Identification of RDP measures (LT)**
- ➢ Measure 214
- **Micro level**
- ➢ indicators: corncrake density
- ➢ method: Pearson corelation, One way „Anova" for multi comparison between RDP groups

BW LT: micro level: Number of singing Corncrake (Crex crex) males

Baseline biodiveristy data: Corncrake census (national biodiversity monitoring program);

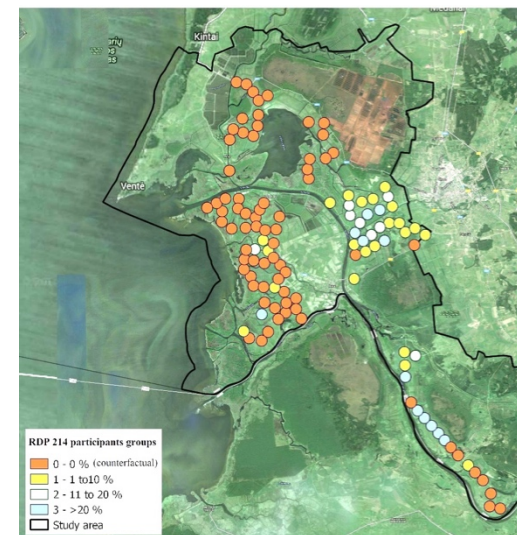**Spatial dimention:** Nemunas river delta flooded meadows;

Sampling unit: monitoring survey spots – 300 m radius

Time scale: 2011

Method: Pearson corelation, One way „Anova" for multi comparison between RDP groups

Group definition: % of area of the survey;

Squares covered by: AE measures (LPIS); type of habitat;

Comparison groups

Sample plots + AEM

BW LT: micro level: Results

Corncrake numbers increase in 214 measure participation;

- Statistically reliable data (p <-0,05)
- One way Anova testing shows statistically strong (p<0,01) increase of corncrake number in plots where 214 measure takes more than 10 % and up.

0%   **1-10%**   **11-20%**   **>20%**

Jumping numbers between comparison groups may be related to relatively low data samples and/or
Other side factors influencing the indicator
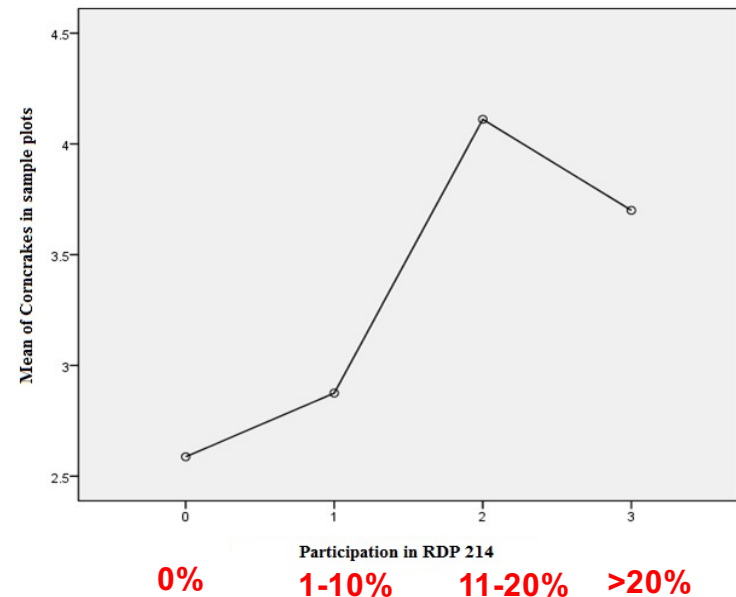
To WHAT extent could the targeted evaluation challenges be addressed?

Strengths (HU)

- FBI:Widely used indicator with easily accessible data
- NBS: Relatively good responsiveness to micro level, based on the FBI baseline data

Weaknesses (HU)

- FBI: Micro level impacts are difficult to capture
- NBS: Micro-macro level consistency needs further adjustment

Restricting factors & gaps (HU)

- FBI/NBS: Data collection is carried out with volunteers
- FBI: Coverage of AE measures in survey spots is not predictable at the beginning of data collection
- NBS: Robust statistical analyses needs further development

Methodological lessons (HU)

- selected and developed methods are applicable for capturing real environmental impacts of the RDP

Policy lessons (HU)

- macro level: AE payments may have positive impacts
- micro level: naturalness of the different survey spots may have greater impacts on biodiversity values than the impacts of the policy measures

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To WHAT extent could the targeted evaluation challenges be addressed?

- **Strengths (LT)**
  - ➢ Data is already regularly gathered by the national monitoring program financed by State budget (to fulfil Birds Directive reporting requirements)
  - ➢ Robust evaluation on micro level serving as complementary to FBI

- **Weaknesses (LT)**
  - ➢ Need improvement of data gathering methodology (delaying second count to the date close to time of mowing);
  - ➢ Selection of sample plots does not consider land plots participating in AEM (such information is not available on the time of selection of monitoring plots);

- ➢ **Policy lessons (LT)**
- ➢ The approach illustrates good potential and need of data sharing and collaboration between agriculture and environment sectors. This would improve data availability and cost-effectiveness of evaluation

Recommendations

BW HU:

- Long term cooperation is necessary with data collection organizations
- designation of survey squares shall be carried out at the beginning of the programming period based on the spatial distribution of the contracted parcels.
- NBI: statistical analyses needs further development

BW LT

- Applicable to evaluate impacts of 214 measure at micro level. This indicator is relevant to be used in combination together with FBI evaluation to deliver comprehensive results.
- Methodological improvements needed for data gathering;
- Long term cooperation is necessary between sectors for for data collection organization and sharing

Further research needs:

1. More research on Corncrake as "umbrella species" to deepen knowledge on casual relationship to farming practices (RDP related);
2. More research on corncrake breeding success;

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BW HU acknowledgements:

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Thank you for your attention!

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