



Institute of Soil Science
and Plant Cultivation
State Research Institute



Economical potential of unutilised agricultural area in Poland. Scenario of crop production resumption, the first approximate evaluation

Rafał Pudelko, Małgorzata Kozak, Anna Jędrejek, Małgorzata Gałczyńska

Department of Bioeconomy and Systems Analysis
Institute of Soil Science and Plant Cultivation – State Research Institute, Poland



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Outline:

- 1. Introduction to the problem of abandoning agricultural land in Poland**
- 2. Potential assessment – Geo-oriented analysis in the scale of parcels**
- 3. Scenario of crop production resumption**

1. Introduction to the problem of abandoning agricultural land in Poland



before the transformation of the political system in the 1990s, there was practically no unutilised area

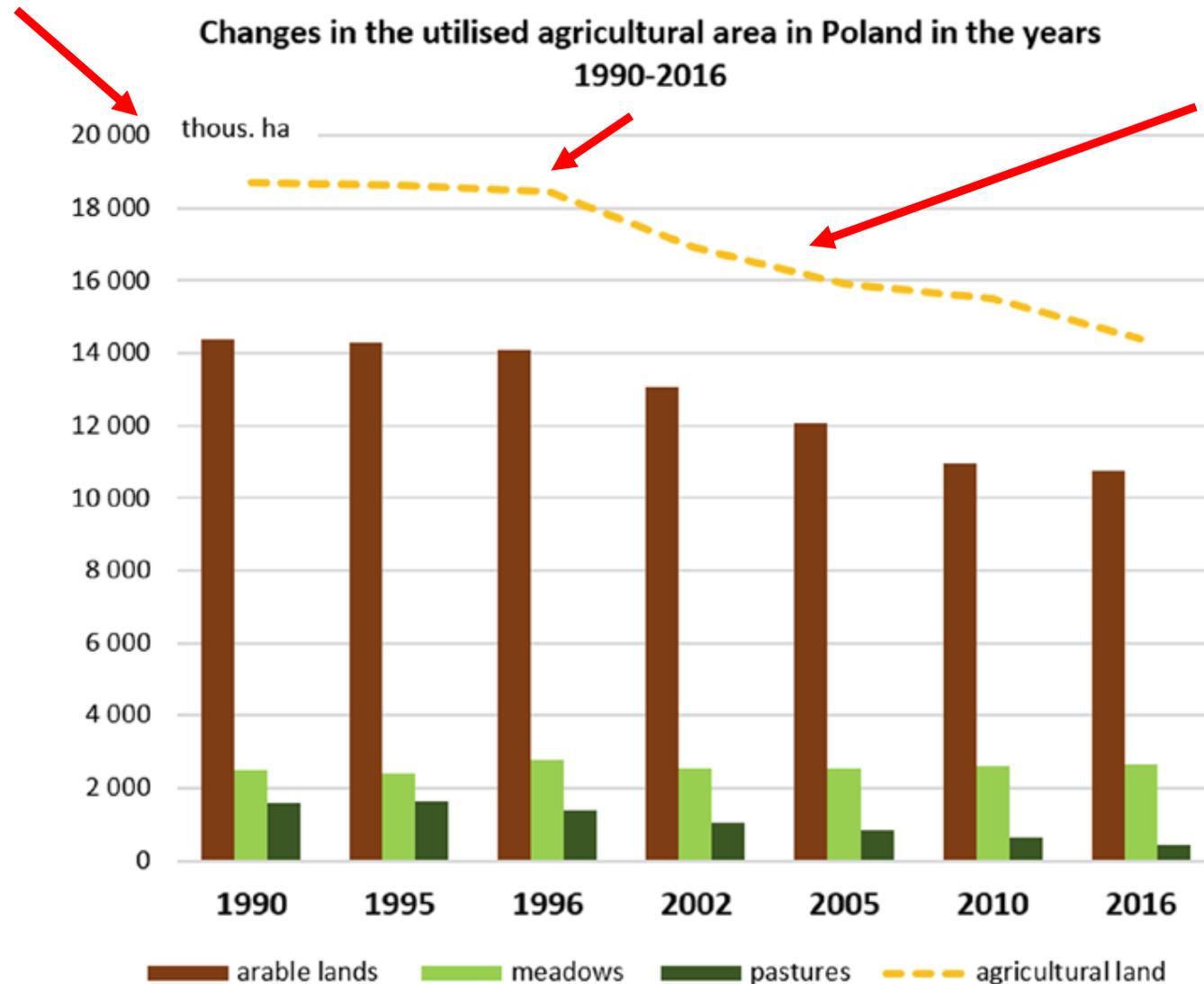


in accordance with the law, uncultivated agricultural land was nationalized

Source: <http://pulawy.naszemiasto.pl>

1. Introduction to the problem of abandoning agricultural land in Poland

1989 Transformation



2004 PL -> EU member

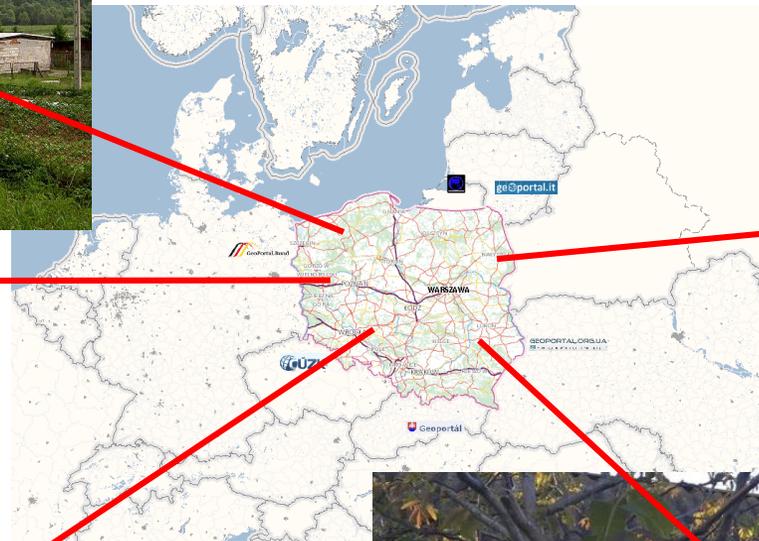
Changes = LUC + abandoning

Sources:

1. Statistic Poland (GUS): www.stat.gov.pl
2. Pudelko et al., (2018). Regionalisation of unutilised agricultural area in Poland. Polish Journal of Soil Sciences. 51, 1: 119-132

1. Introduction to the problem of abandoning agricultural land in Poland

After the political transformation at the turn of 1990s the problem of abandoned agricultural land appeared.

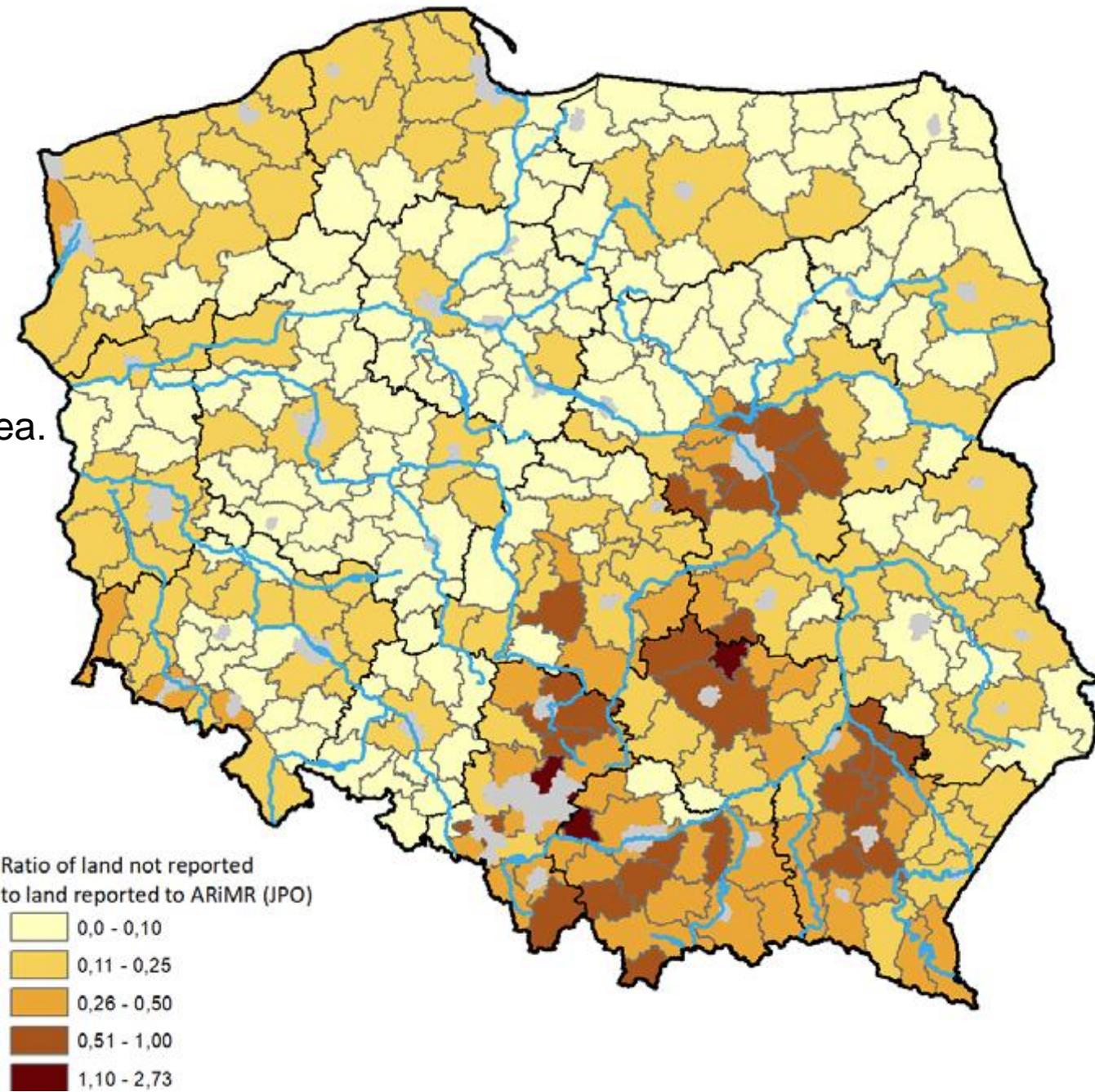


1. Introduction to the problem of abandoning agricultural land in Poland

Regionalisation of unutilised agricultural area - present situation

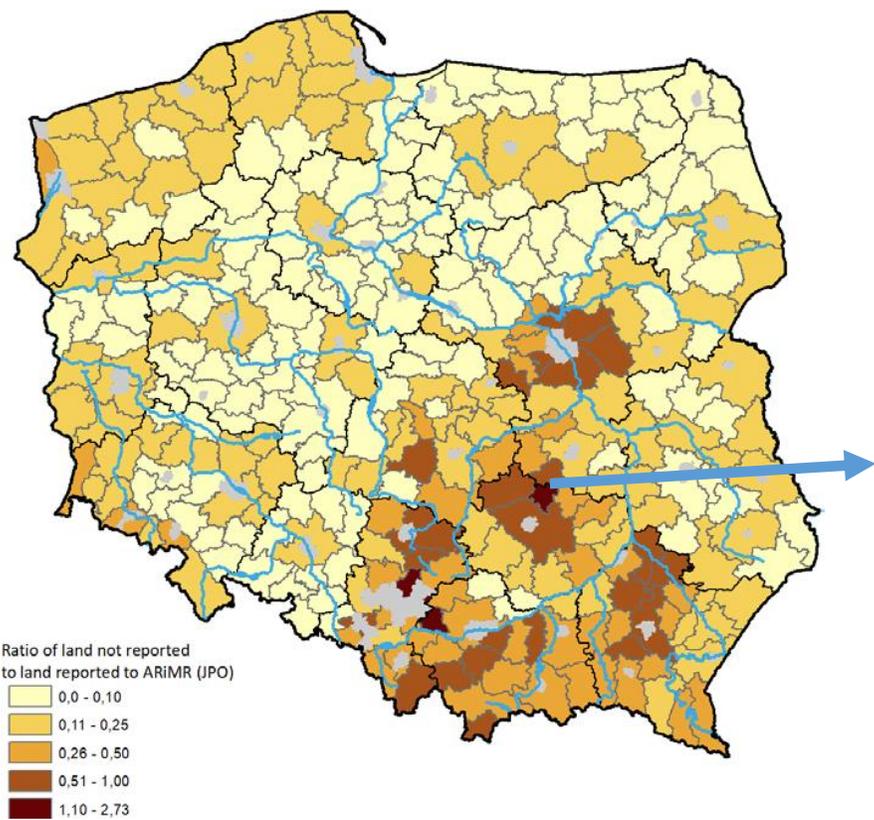
Unutilised land may cover even 2.03 million ha,
which constitutes 14.2% of the overall agricultural area.

**The question is:
how many unutilised area can be effectively
resumpted to food production**



Sources: Pudelko et al., (2018). Regionalisation of unutilised
agricultural area in Poland. Polish Journal of Soil Sciences.
51, 1: 119-132

1. Introduction to the problem of abandoning agricultural land in Poland



Blue lines: boundaries of the cadastral parcels,
Red lines: unutilised parcels

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Selection criteria of land use

1. Agricultural Land (AL)

is a **cadastral parcel (or a part of it)** having the attributes of an agricultural land (**arable land, meadow, pasture, orchard, arable land with trees or shrubs**) –

2. Unutilised Agricultural Land (subset of AL)

- which is not included in the **declarations** submitted to ARiMR (in applications for direct payments: **LPIS - Land-Parcel Identification System**)

3. Exclusions

Agricultural land such as **agricultural land under buildings, roads, ponds or ditches** were excluded from the analysis

Notice:

- > 34.7 million SHP polygons and covered the whole rural area (> 18 million ha)
- > 67.3 million records in EGiB (national cadaster DB) data base
- > 21.7 million records in LPIS (farmer's declarations)

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Scenario of **crop production resumption**, the first approximate evaluation**

Selection criteria of land suitability for crop production resumption (arable only):

Good quality land - Good Quality Land - (fertile land) the following quality classes are distinguished, denoted by the symbols I, II, III a

Class I - Arable soils of the best quality;

Class II - Arable soils of very good quality

Class III (a) Arable soils of medium-good quality;

Medium quality land - (medium fertile land) the following quality classes are distinguished, denoted by the symbols III b, IV a, IV b

Class III (b) - Arable soils of medium-good quality

Class IV (a) - Arable soils of medium quality, higher

Class IV (b) - Arable soils of medium quality, lower

Bad quality land - (barren land) the following quality classes are distinguished, denoted by the symbols V, VI

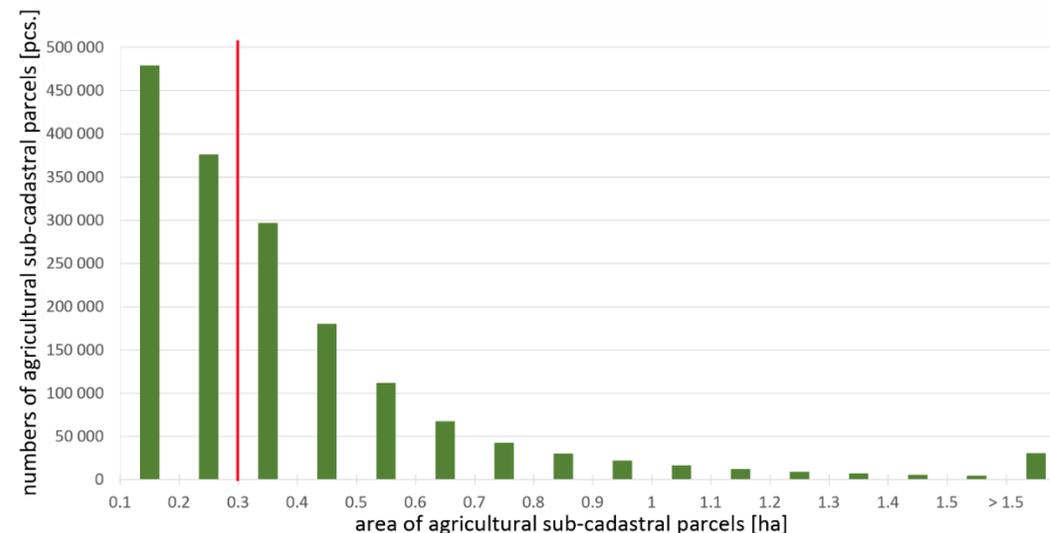
Class V - Arable soils of poor quality

Class VI - Arable soils of the poorest quality

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Selection criteria of parcels size:

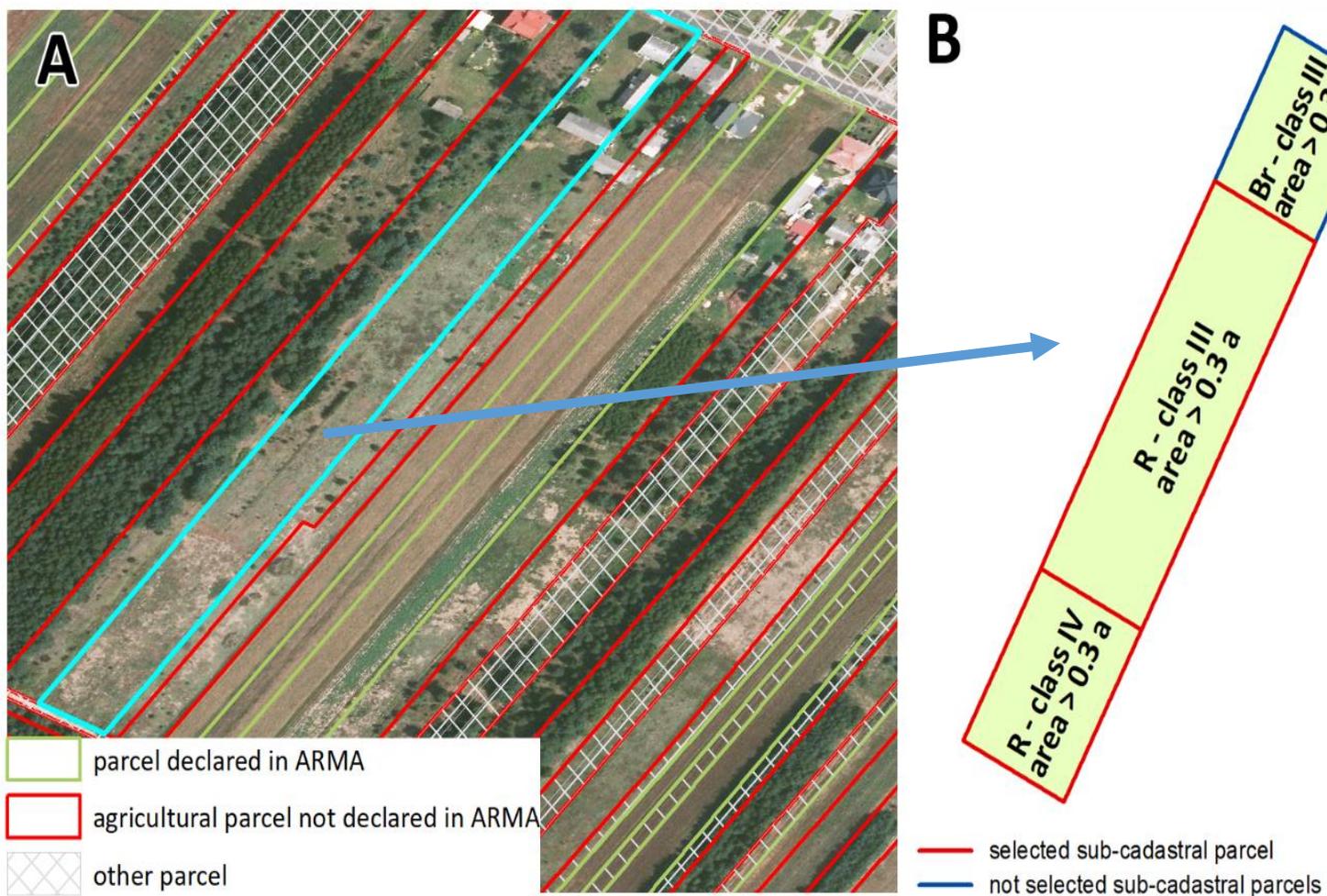
- Sub-parcels smaller than 0.1 ha do not fulfil the criteria for area payments
- Small cadastral parcels with attributes “arable” are often, in fact, building plots



For the purpose of economic potential assessment areas exceeding 0.3 ha were used

2. Potential assessment – Geo-oriented analysis in the scale of parcels

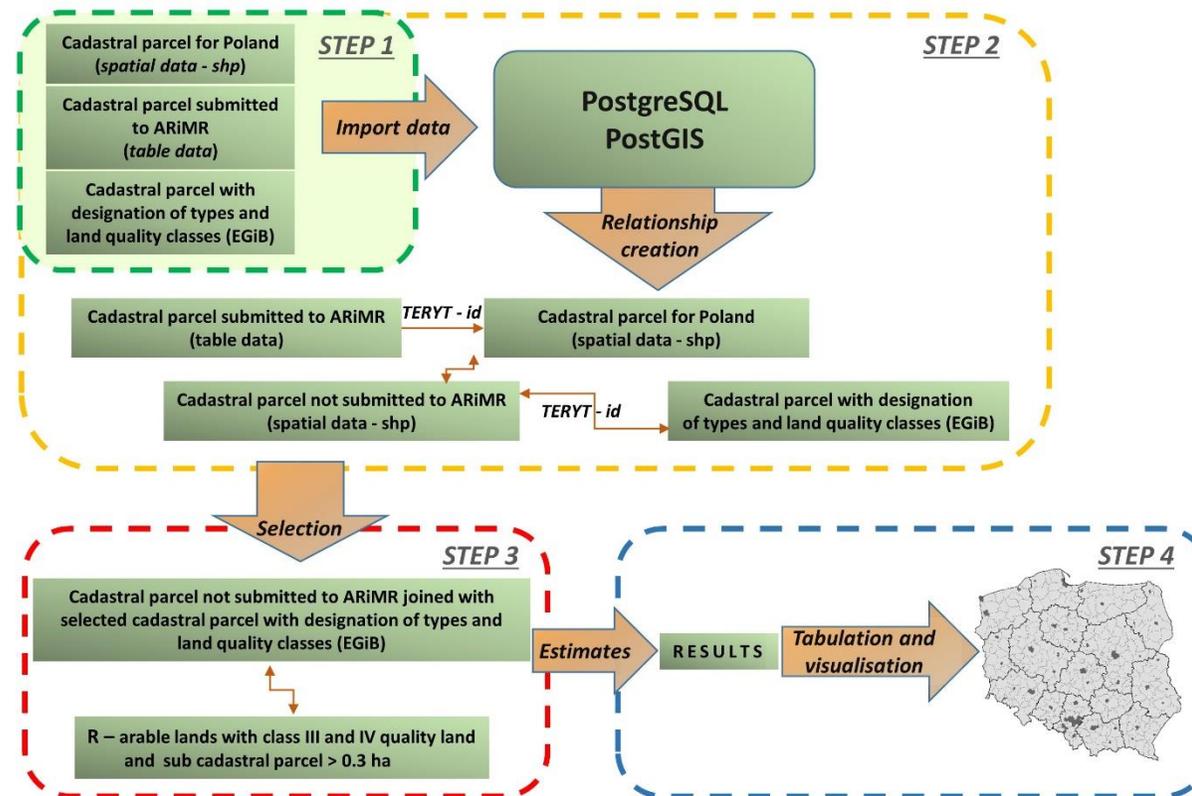
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Sub-parcels:

- Arable,
- > 0.3 ha
- medium fertile land (IIIb, IVa, IVb)
- Non-declared by farmers

2. Potential assessment – Geo-oriented analysis in the scale of parcels



Results of geoprocessing:

- > **830 thousand** sub-parcels, fulfilling the assumptions, were selected
- these plots have a total area of ~ **440 thousand ha**

3. Scenario of crop production resumption

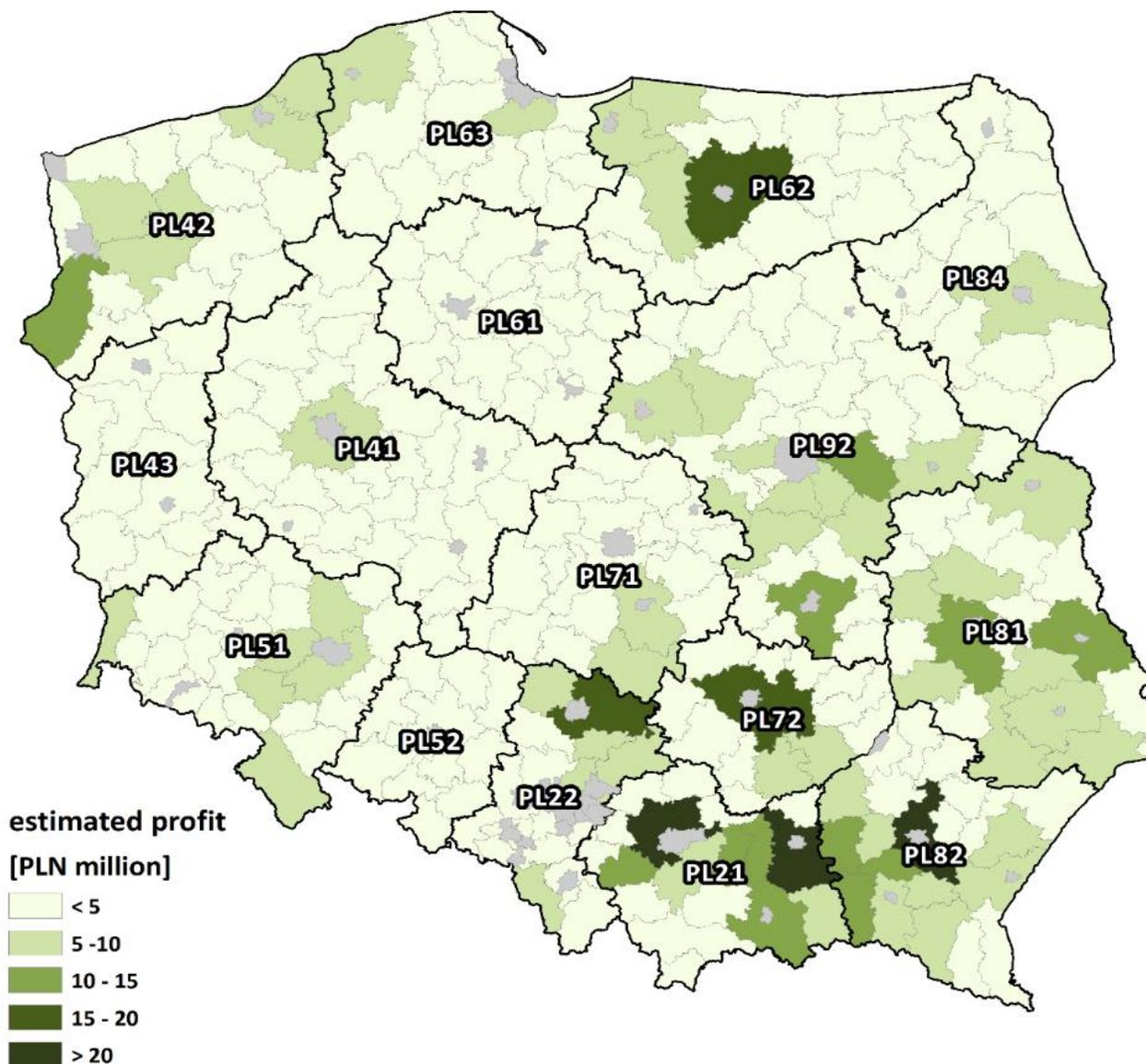
Results in NUTS-4 scale:

Economical profits were calculated based on the following assumptions:

- Average yield of triticale = 4 t/ha,
- Ratio straw/grain = 0.9
- Technical availability of straw = 70%
- Ratio EUR/PLN = 4,2
- Price of grain = 650 PLN/t
- Price of straw = 130 PLN/t

Results in national scale:

- Area for resumption ~ **440 thousand** ha
- Grain production ~ **1.8 million** tonnes
- Straw surplus = ~ **1.1 million** tonnes
- Theoretical profit **310 million** EURO per year



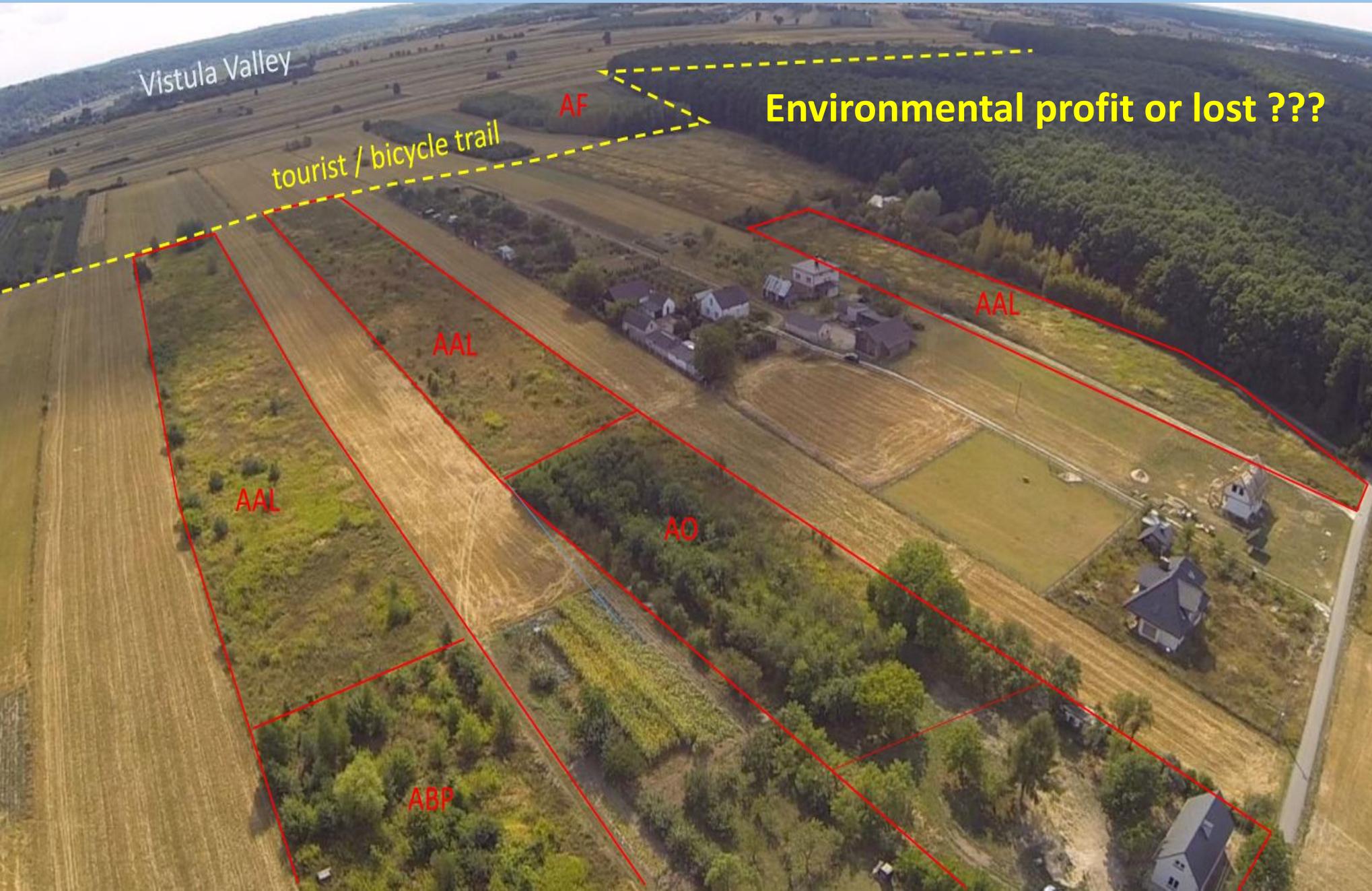
Sources:

1/(Noworolnik, 2009); 2/GUS; 3/Agroservices; 4/BioBoost Project

4. Discussion

- As observed in recent years, the area payments scheme and Rural Development Programme packages (PROW) do not always succeed in restoring fallow land for agricultural production. It can be proved by the fact that more than 2 million of agricultural land is still fallowed.
- Despite the great potential of fallowed/abandoned land, its restoration for agricultural production is an extremely complex issue. Demographic changes that occurred in rural areas make it virtually impossible in small holdings characterized by high fragmentation of fields
- Another idea promoted by the EU for rural development was to focus production on biomass for energy and industrial purposes. But farmers are not interested in this idea mainly due to unstable policy of financing renewable energy, e.g. lack of guaranteed long-term contracts with biomass producers.

4. Discussion



- AAL constitute refuges for wildlife and fit well into the landscape, especially in regions with high fragmentation of farms and protected areas
- They also favour the development of tourism and recreation
- The alternative and cost-efficient option for such land can be a supervised conversion to ecological land (e.g. apiarian) or even to natural afforestation or rewilding

4. Conclusions

- In Poland there are over **440 thousand** ha of arable land which can be effectively restored to crop production
- After landuse change of the mentioned area, a potential increase in cereal production by **~ 6 %** is expected, which can be equivalent of **~1.8 million** tonnes of triticale
- Besides, **~1.6 million** tonnes of straw can be produced for soil conservation, animal production and bioenergy purposes
- The economic theoretical potential of total agricultural production can be estimated at around **310 million** EURO per year

Thank you for your attention



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Czartoryskich 8 Str.,
24-100 Pulawy,
Poland

www.iung.pulawy.pl/eng/

