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

Rafał Pudelko, Małgorzata Kozak, Anna Jędrzejek, Małgorzata Gałczyńska

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

167nd EAAE Seminar - European Agriculture and the Transition to Bioeconomy
September 24-25, 2018, Institute of Soil Science and Plant Cultivation – State Research Institute, Puławy, Poland
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

Studies on regionalisation of agricultural production in Poland are one of the tasks of the IUNG – PIB Multiannual Programme (Task 1.7)
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

Changes = LUC + abandoning

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

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


Blue lines: boundaries of the cadastral parcels,
Red lines: unutilised parcels
2. Potential assessment – Geo-oriented analysis in the scale of parcels

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

**Selection criteria of landuse**

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

**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

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

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

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

Results in NUTS-4 scale:

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.
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