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## **NATURA 2000 SITES IN POLAND AND THEIR IMPACT ON THE FUNCTIONING OF FARMS**

Key words: Natura 2000 sites, RDP 2014-2020, farm, Polish FADN, farm income

**ABSTRACT.** The paper described the network of Natura 2000 sites in Poland, the state of spending funds on Package 4. “Valuable habitats and endangered species of birds in Natura 2000 sites of the Agri-environmental-climate measure implemented under the RDP 2014-2020” (Package 4. of the AECM under the Rural Development Programme 2014-2020) as of 31.12.2017 and also assessed the functioning of farms belonging to beneficiaries of this package against a background of farms from outside Natura 2000 sites, which kept accounts for the Polish FADN in the years 2015-2017. It has been determined that, in Poland, the share of areas covered by the Natura 2000 network in the land area of the country is 19.6%, however, in the case of voivodeships and districts, it is varied. In addition, it has been determined that the state of spending funds under Package 4 has, so far, been PLN 518.8 million and has accounted for 29.6% of total funds spent as part of the AECM under the RDP 2014-2020. It turned out that farms belonging to beneficiaries of Package 4, against a background of other farms which kept accounts for the Polish FADN in the years 2015-2017, were characterised, inter alia, by lower production intensity and lower productivity of production factors. Moreover, those farms obtained lower income per 1 ha of UAA. Analyses have been carried out based on the data from the General Directorate for Environmental Protection, the Central Statistical Office in Warsaw, the Agency for Restructuring and Modernisation of Agriculture, the Polish Farm Accountancy Data Network (Polish FADN) and the Institute of Soil Science and Plant Cultivation National Research Institute.

### **INTRODUCTION**

In the European Union (EU), there are still negative trends as regards the state of protection of many agriculture-related habitats valuable in natural terms<sup>1</sup>. Hence, as particularly important, all measures taken in the EU with a view of improving this situation must be taken into consideration. In this context, we must distinguish, inter alia, the EU biodiversity strategy to 2020, adopted in 2011, and priority 4 of the European Union Common Agricultural Policy (EU CAP) 2014-2020, which refers to the need to restore, protect and enrich agriculture- and forestry-related ecosystems [EC 2011, COM(2011) 244 final,

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<sup>1</sup> In the EU, the conservation status of 77% of valuable natural habitats is insufficient or poor, moreover, the farmland bird index, population of wild bees and meadow butterflies are still decreasing [EC 2014, COM(2015) 478 final, Eurostat 2019].

OJ L 347.2013 2013]. The existing assumptions of the EU CAP after 2020 are equally important in this regard. In the proposal for Regulation of the European Parliament and the Council No COM (2018) 392 final, it has been pointed out that one of nine specific objectives of the EU CAP after 2020 will be to contribute to the protection of biodiversity, enhance ecosystem services and preserve habitats and landscapes [COM(2018) 392].

Given the above, it should be stressed that the role of agriculture in the protection of habitats with high nature values covered by the European Ecological Network Natura 2000 (Natura 2000 sites) is particularly important. In Poland, in Natura 2000 sites, there are currently 22.6 thousand farms belonging to beneficiaries of Package 4. “Valuable habitats and endangered species of birds in Natura 2000 sites of the agri-environmental-climate measure implemented under the Rural Development Programme 2014-2020” (Package 4 of the AECM under the RDP 2014-2020)<sup>2,3</sup> [MRiRW 2018c].

The objective of analyses carried out under this paper is to describe the network of Natura 2000 sites in Poland, describe the state of spending funds on Package 4 of the AECM under the RDP 2014-2020 and assess the functioning of farms belonging to beneficiaries of this package against a background of farms from outside Natura 2000 sites which kept accounts for the Polish FADN in the years 2015-2017.

## MATERIAL AND METHODS

The paper firstly describes the network of Natura 2000 sites in Poland based on the data from the General Directorate for Environmental Protection (GDEP), the Central Statistical Office (CSO) in Warsaw and the Institute of Soil Science and Plant Cultivation National Research Institute (ISSPC-NRI) in Puławy. Then, the state of spending funds on Package 4 of the AECM under the RDP 2014-2020 is presented, based on the ARMA database on the course of spending financial resources in Package 4 as of 31 December 2017. The further part of the paper assesses the functioning of farms belonging to beneficiaries of Package 4. (farms of beneficiaries) against a background of farms from outside Natura 2000 sites and from the same districts (other farms) which kept accounts for the Polish FADN in the years 2015-2017. A comparative analysis covered 222 farms of beneficiaries and 1,839 other farms from 82 districts where the average share of Natura 2000 sites in total area was 48.6% and ranged between 12.4 and 88.9% (Figure 1). It must be added that, in the group of farms of beneficiaries, there were no farms with an intensive production organisation, whose impact on the protection of biodiversity in rural areas is

<sup>2</sup> Status as of 31.12.2017. This status applies to the most recent data obtained from the Agency for Restructuring and Modernisation of Agriculture (ARMA) and the Ministry of Agriculture and Rural Development (MARD).

<sup>3</sup> Applies to farms which joined Package 4 of the Agri-environmental-climate Measure under the RDP 2014-2020 and farms financed from this package as part of commitments from Package 5. Protection of endangered bird species and natural habitats in Natura 2000 sites of the Agri-environmental Programme under the RDP 2007-2013 [MRiRW 2016].

usually negative and the impact of area of high nature value on their economic effects is usually limited<sup>4,5</sup>. Hence, they are not included in the group of farms as a point of reference.

In Poland, the average agricultural production area valorisation (APAV) index is 66.8 points out of 120 achievable points [Jadczyzyn et al. 2013]. The worse situation in this regard applies to districts with farms of beneficiaries and other farms which kept accounts for the Polish FADN in the years 2015-2017. In their case, the average APAV index is, in fact, 58.7 points. What is more, in 28.7% of these districts, it is lower than 52 points which means that these are less favoured areas for conducting agricultural production (Table 1). In Poland, the average nature and tourism volubility (NTV) index is 35.6 points out of 100 achievable points<sup>6</sup>. In districts with farms of beneficiaries and other farms, which kept accounts for the Polish FADN in the years 2015-2017, this index is clearly higher and amounts to 58.7 points (Table 1).

The comparative assessment of the identified groups of farms of beneficiaries and other farms took account of utilised agricultural area (UAA) in ha, the share of land in Natura 2000 sites in UAA (%), total labour input per 1 ha of UAA, total human labour input as part of the operating activity of the farm, in hours, the capital-labour ratio determined as a ratio of capital value to total labour input expressed in Annual Work Units (AWU), total costs including direct costs per 1 ha of UAA (thousand PLN/ha of UAA), land productivity determined as a ratio of total production value on the farm to UAA (thousand PLN/ha of UAA), labour productivity determined as a ratio of total production value to the number



Figure 1. Districts with farms belonging to beneficiaries of Package 4 of the AECM under the RDP 2014-2020 and other farms which kept accounts for the Polish FADN in the years 2015-2017 (marked in black)

Source: own study based on the data of the Polish FADN from the years 2015-2017

<sup>4</sup> In this type of farms, agricultural production is conducted with a great amount of purchased feed, often using covers and irrigation.

<sup>5</sup> The paper used the method of identifying farms with an intensive production organisation developed by the IAFE-NRI and used in works on new delimitation of LFAs of lowland type in Poland since 2019 – at the stage of narrowing the selection to LFAs of lowland type (fine-tuning procedure) [MRiRW 2017, 2018a].

<sup>6</sup> Upon request of the MARD, the ISSPC-NRI determined the NTV index for communes and cadastral regions as part of work on new delimitation of LFAs of a specific type in Poland since 2019. This index is an average share of the sum of area of permanent grassland, forests, inland waters and wetlands and other areas not subject to anthropopressure in the total area of all farmland in the given commune (region) with a radius of 2 km [Łopatka et al. 2017].

Table 1. Description of the average APAV and NTV indices and the share of Natura 2000 sites in total area in Poland and in districts with farms belonging to beneficiaries of Package 4 of the AECM under the RDP 2014-2020 and other farms which kept accounts for the Polish FADN in the years 2015-2017

Specification	Average APAV index [pts]	Average NTV index [pts]	Share of Natura 2000 sites in the total area [%]
Poland	66.8	35.6	19.6
Districts with farms belonging to beneficiaries of Package 4 of the AECM under the RDP 2014-2020 and with other farms present in the Polish FADN in the years 2015-2017	58.7	54.8	48.6

Source: own study based on data [GUS 2017b, IUNG-PIB 2018, Polish FADN 2019]

of persons employed full time (thousand PLN/AWU), capital productivity determined as a ratio of total production value on the farm to average capital value (%), farm income per 1 ha of UAA (thousand PLN/ha of UAA) and share of operating subsidies in farm income (%).

## DESCRIPTION OF THE NETWORK OF NATURA 2000 SITES IN POLAND

In Poland, the network of Natura 2000 sites has become a separate form of nature conservation pursuant to the Act of 16 April 2004 on nature conservation [Journal of Laws of 2004, No 92, item 880]<sup>7</sup>. In the country, it currently covers 6.8 million ha, of which 6.1 million is its land area. The share of sites covered by the network in the land area of the country is 19.6%. It must also be added that areas used for agricultural purposes occupy 30% of the total network area [GDOŚ 2017, EC 2017].

In Poland, the distribution of network sites is varied. In the case of voivodeships, their share in total area ranges from 3.9 to 37.8%. Their largest share is held by the following voivodeships: Zachodniopomorskie (37.8%), Podkarpackie (32.2%) and Podlaskie (31.5%), in turn the smallest share is held by the following voivodeships: Śląskie (9.4%), Opolskie (4.4%) and Łódzkie (3.9%) (Figure 2). The definitely higher diversification of the share of network sites in total area is in the case of districts and ranges from 0.02 to 93.4%. The network sites are present in 348 districts i.e. in 91.6% of all districts in the country<sup>8</sup>. It must also be added that, in Poland, there are 86 districts where the share of Natura 2000 sites in total area is at least 50% (Figure 3) [GDOŚ 2017, GUS 2017b, IUNG-PIB 2018].

<sup>7</sup> The Act of 16 April 2004 on nature conservation [Journal of Laws of 2004, No 92, item 880], treats Natura 2000 sites as a separate form of nature conservation, but stressing that these sites may cover a part or whole part of other areas of area and object nature conservation in Poland.

<sup>8</sup> In Poland, there are 380 districts, including 66 towns with district rights.

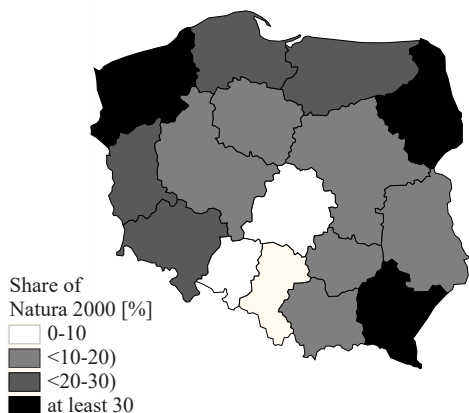


Figure 2. Share of Natura 2000 sites in the total area of voivodeships in Poland

Source: own study based on data [GDOŚ 2017, GUS 2017b, IUNG-PIB 2018]

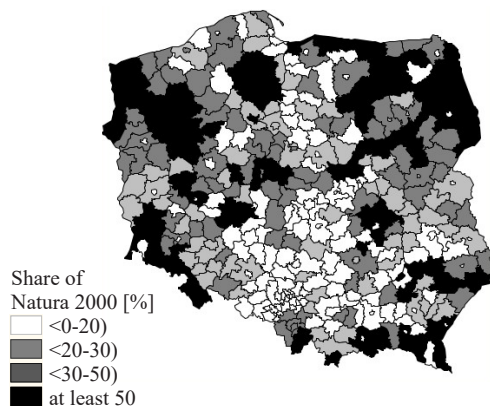


Figure 3. Share of Natura 2000 sites in the total area of districts in Poland

Source: own study based on data [GDOŚ 2017, GUS 2017b, IUNG-PIB 2018]

### STATE OF SPENDING FUNDS IN PACKAGE 4 OF THE AECM UNDER THE RDP 2014-2020

So far, the state of spending funds as part of Package 4 has amounted to PLN 515.9 of which 64.8% are funds spent as part of commitments from Package 5, “Protection of endangered bird species and natural habitats in Natura 2000 sites of the Agri-environmental Programme under the RDP 2007-2013”. The remaining 35.2% are funds spent as part of new commitments from Package 4 of the AECM under the RDP 2014-2020. It must also be added that, currently, the state of spending funds as part of Package 4 is highest among all implemented packages and accounts for 29.6% of total funds spent as part of the AECM under the RDP 2014-2020 (Figure 4) [ARiMR 2018a, MRiRW 2018b,2018c].

### ASSESSMENT OF FUNCTIONING OF ANALYSED FARMS BELONGING TO BENEFICIARIES OF PACKAGE OF THE AECM UNDER THE RDP 2014-2020 AGAINST A BACKGROUND OF OTHER FARMS

Average UAA in farms of beneficiaries and other farms amounted to, respectively, 43.8 and 38.2 ha. This means that, in farms of beneficiaries, this area was by 14.7% higher than land resources in other farms. Moreover, farms of beneficiaries had an average share of 43.6% in land in Natura 2000 sites in UAA. However, it must be added that in analysed farms of beneficiaries and other farms, average UAA was much larger than average UAA in all farms conducting agricultural production in districts selected for analysis (82) and in all districts (380) in Poland (Table 2, Figure 5).

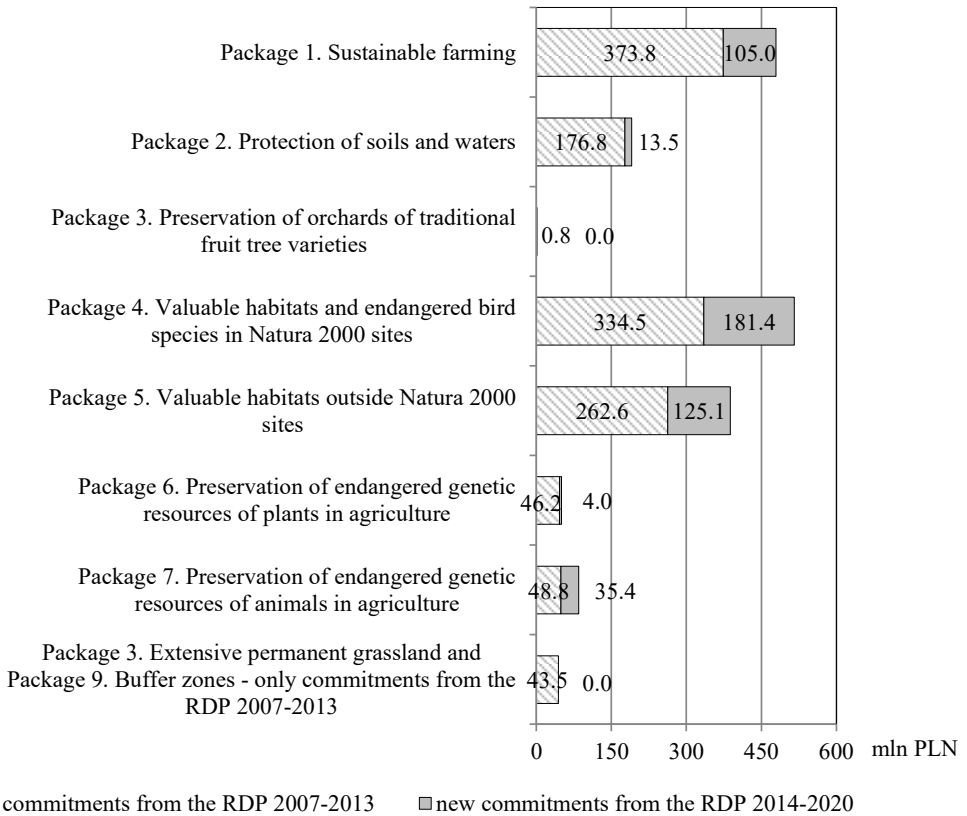


Figure 4. State of spending funds on implementing packages of the AECM under the RDP 2014-2020 by commitments from the RDP 2007-2013 and new commitments from the RDP 2014-2020 (status as of 31.12.2017)

Source: own study based on data [ARiMR 2018b, MRiRW 2018b,2018c]

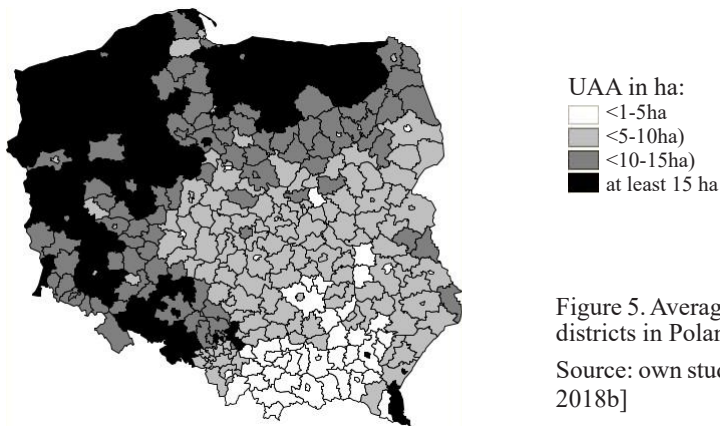


Figure 5. Average UAA (ha) of the farm in districts in Poland in 2017

Source: own study based on data [ARiMR 2018b]

Table 2. Average UAA in analysed farms of beneficiaries and other farms, average UAA of all farms in districts selected for analysis and in all districts in Poland.

Specification	Farms which kept accounts for the Polish FADN in the years 2015-2017		Total farms from	
	of beneficiaries	other	districts selected for analysis (82)	all districts (380) in Poland
Average UAA [ha]	43.8	38.2	14.6	10.3

Source: own study based on data [Polish FADN, ARiMR 2018b, GUS 2017a]

Labour input per 1 ha of UAA played a less important role in farms of beneficiaries. In those farms, labour input per 1 ha of UAA was, on average, 94 hours, which corresponded to 88% of incurred labour input in other farms. In farms of beneficiaries, lower labour input per 1 ha of UAA was accompanied by a lower capital-labour ratio by 6.4%. This means that farms of beneficiaries were slightly worse equipped with agricultural machinery and devices and livestock buildings (Table 3).

Table 3. Total labour input per 1 ha of UAA and capital-labour ratio of analysed farms of beneficiaries and other farms which kept accounts for the Polish FADN in the years 2015-2017

Specification	Unit	Farms	
		of beneficiaries	other
Total labour input per 1 ha of UAA	hours	94.0	107.0
Capital-labour ratio	thous. PLN	349.5	373.5

Source: own study based on data from the Polish FADN

Based on the data from Table 4, it may be concluded that in farms of beneficiaries restrictions related to their participation in Package 4 of the AECM under the RDP 2014-2020 resulted in lower production intensity. In those farms, when compared to other farms, total costs per 1 ha of UAA were by 30.3% lower. The same situation applied to direct costs per 1 ha of UAA which, in the case of farms of beneficiaries, were lower by 38.7% (Table 4).

Table 4. Production intensity of analysed farms of beneficiaries and other farms which kept accounts for the Polish FADN in the years 2015-2017

Specification	Unit	Farms	
		of beneficiaries	other
Total costs, including:	thous. PLN/ha	3.9	5.6
– direct costs		1.9	3.1

Source: as in Table 3

A lower level of production intensity in farms of beneficiaries than in other farms resulted in lower productivity of production factors – land, labour and capital. In farms of beneficiaries, land productivity was lower by 34.8%, labour productivity – by 26.1% and capital productivity – by 1.5 percentage points (Table 5).

Table 5. Productivity of production factors in analysed farms of beneficiaries and other farms which kept accounts for the Polish FADN in the years 2015-2017

Specification	Unit	Farms	
		of beneficiaries	other
Land productivity	thous. PLN/ha	4.3	6.6
Labour productivity	thous. PLN/AWU	100.9	136.6
Capital productivity	%	33.7	35.2

Source: as in Table 3

In terms of the income level per 1 ha of UAA, the worst situation applied to farms of beneficiaries. In those farms, income was by 17.2% lower than in other farms. Attention should also be paid to the fact that, in farms of beneficiaries, this income was implemented, to a greater extent, thanks to obtained subsidies for operating activity, including subsidies received as part of their participation in Package 4 of the AECM under the RDP 2014-2020 (Table 6).

Table 6. Economic situation, share of operating subsidies in farm income, in farms of beneficiaries and other farms which kept accounts for the Polish FADN in the years 2015-2017

Specification	Unit	Farms	
		of beneficiaries	other
Farm income per 1 ha of UAA	thous. PLN	2.4	2.9
Share of operating subsidies in farm income	%	81.6	57.1

Source: as in Table 3

## SUMMARY AND CONCLUSIONS

The paper described the network of Natura 2000 sites in Poland and the state of spending funds in Package 4 of the AECM under the RDP 2014-2020 as of 31.12.2017 and also assessed farms of beneficiaries of this package against a background of farms from outside Natura 2000 sites from the same districts which kept accounts for the Polish FADN in the years 2015-2017. A comparative analysis covered 222 farms of beneficiaries and 1,832 other farms from 82 districts. Based on the analysis carried out it has been determined that:

1. In Poland, the network of Natura 2000 sites covers 6.8 million ha, of which 6.1 million ha is the land area of the country. The share of districts covered by the network in the land area of the country is 19.6%, however, in the case of voivodeships and districts, it is varied.



2. In Poland, in Natura 2000 sites, biodiversity is particularly protected by 22.6 thousand farms of beneficiaries of Package 4 of the AECM under the RDP 2014-2020.
3. The state of spending funds as part of Package 4 of the AECM under the RDP 2014-2020 has so far been PLN 518.8 million and accounts for 29.6% of funds spent in total as part of the AECM under the RDP 2014-2020. It must be added that the amount of funds spent on Package 4 under this measure has so far been the highest.
4. Analysed farms of beneficiaries against a background of other farms were characterised by a slightly larger UAA. They incurred lower labour input per 1 ha of UAA and were characterised by a lower capital-labour ratio. These farms had a lower production intensity and, consequently, lower productivity of production factors. Moreover, such farms had a lower income per 1 ha of UAA, which was implemented, to a greater extent, thanks to obtained subsidies to operating activity, including subsidies received as part of their participation in Package 4 of the AECM under the RDP 2014-2020.

The analysis carried out showed that farms of beneficiaries, having restrictions related to their participation in Package 4 of the AECM under the RDP 2014-2020, when compared to other farms, are in the worst economic situation. However, it must be added that the analysis covered farms with a higher production potential against a background of average farms from analysed districts and all districts in Poland. Therefore, it should be assumed that the presented differences in the economic situation of farms of beneficiaries and other farms cannot fully reflect the differences taking place with regard to all farms of beneficiaries and other farms in Poland.

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(UE) nr 1307/2013 (Proposal for a Regulation of the European Parliament and of the Council establishing rules on support for strategic plans to be drawn up by Member States under the Common agricultural policy (CAP Strategic Plans) and financed by the European Agricultural Guarantee Fund (EAGF) and by the European Agricultural Fund for Rural Development (EAFRD) and repealing Regulation (EU) No 1305/2013 of the European Parliament and of the Council and Regulation (EU) No 1307/2013 of the European Parliament and of the Council. COM(2018) 392 final.

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## OBSZARY NATURA 2000 W POLSCE I ICH WPŁYW NA FUNKCJONOWANIE GOSPODARSTW ROLNYCH

Słowa kluczowe: obszary Natura 2000, PROW 2014-2020, gospodarstwo rolne, Polski FADN, dochód z gospodarstwa rolnego

### ABSTRAKT

W opracowaniu dokonano charakterystyki sieci obszarów Natura 2000 w Polsce, opisano stan wydatkowania środków na pakiet 4. „Cenne siedliska i zagrożone gatunki ptaków na obszarach Natura 2000”, działania rolnośrodowiskowo-klimatycznego realizowanego w PROW 2014-2020 (pakiet 4. DRŚK w PROW 2014-2020) do 31.12.2017 roku. Dokonano także oceny funkcjonowania gospodarstw rolnych beneficjentów tego pakietu na tle gospodarstw rolnych spoza obszarów Natura 2000, które prowadziły nieprzerwanie rachunkowość dla Polskiego FADN w latach 2015-2017. Analizy wykonano na podstawie danych Generalnej Dyrekcji Ochrony Środowiska, Głównego Urzędu Statystycznego w Warszawie, Agencji Restrukturyzacji i Modernizacji Rolnictwa, Polskiego Farm Accountancy Data Network (Polski FADN) oraz Instytutu Uprawy Nawożenia i Gleboznawstwa – PIB w Puławach. Ustalono, że w Polsce udział obszarów objętych siecią Natura 2000 w powierzchni lądowej kraju wynosi 19,6%, chociaż w przypadku województw i powiatów jest on zróżnicowany. Ponadto ustalono, że stan wydatkowania środków w ramach pakietu 4. wyniósł dotychczas 518,8 mln zł i stanowił 29,6% środków ogółem wydatkowanych w ramach DRŚK w PROW 2014-2020. Okazało się, że gospodarstwa beneficjentów pakietu 4. na tle pozostałych gospodarstw, które prowadziły rachunkowość dla Polskiego FADN w latach 2015-2017 charakteryzowała m.in. mniejsza intensywność produkcji oraz mniejsze produktywności czynników produkcji. Ponadto gospodarstwa te uzyskały mniejszy dochód w przeliczeniu na 1 ha UR.

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