

**The CAP and national priorities  
within the EU budget  
after 2020**





INSTITUTE OF AGRICULTURAL  
AND FOOD ECONOMICS  
NATIONAL RESEARCH INSTITUTE

# The CAP and national priorities within the EU budget after 2020

*Editors:*

*dr Marek Wigier*

*prof. dr hab. Andrzej Kowalski*

*Proceedings of the International Scientific Conference*

*"The CAP and national priorities within the EU budget after 2020"*

*Multi-Annual Programme 2015-2019*

*"The Polish and the EU agricultures 2020+. Challenges, chances, threats, proposals"*

*11-13 June 2018*

*Lidzbark Warmiński, Poland*



THE POLISH AND THE EU AGRICULTURES 2020+  
CHALLENGES, CHANCES, THREATS, PROPOSALS

**Warsaw 2018**

This monograph was prepared under the Multi-Annual Programme 2015-2019  
“The Polish and the EU agricultures 2020+. Challenges, chances, threats, proposals”.

The publication is a collection of selected papers delivered at the 23rd edition of the International Scientific Conference organized by the Institute of Agricultural and Food Economics - National Research Institute. The theme of the conference was “The CAP and national priorities within the EU budget after 2020”. The conference was placed on 11-13 June 2018 in Lidzbark Warmiński in Poland.

In the Scientific Committee of the Conference was participated: Prof. Andrzej Kowalski (IAFE-NRI, Poland), Prof. Drago Cvijanović (University of Kragujevac, Serbia), Prof. Thomas Doucha (IAEI, Czech Republic), Nouredin Driouech, PhD (CIHEAM, Italy), Prof. Szczepan Figiel (IAFE-NRI, Poland), Prof. Masahiko Gemma (Waseda University, Japan), Prof. Wojciech Józwiak (IAFE-NRI, Poland), Prof. Jacek Kulawik (IAFE-NRI, Poland), Prof. Yuriy Oleksiyovych Lupenko (IAE, Ukraina), Prof. Věra Majerová (CULS, Prague), Prof. Dimitre Nikolov (IAE, Bulgaria), Maire Nurmet, PhD (EMÜ, Estonia), Prof. Gabriel Popescu (ASE, Romania), Norbert Potori, PhD (AKI, Hungary), Prof. Włodzimierz Rembisz (IAFE-NRI, Poland), Piotr Szajner, PhD (IAFE-NRI, Poland), Prof. Alina Sikorska (IAFE-NRI, Poland), Prof. Jonel Subić (IAE, Serbia), Prof. Samuele Trestini (UNIPD, Italy), Prof. Olga Varchenko (Bila Tserkva National Agrarian University, Ukraine), Dipl.-Ing. Klaus Wagner (AWI, Austria), Marek Wigier, PhD (IAFE-NRI, Poland), Prof. Józef St. Zegar (IAFE-NRI, Poland)

In the Organising Committee of the Conference was participated: Małgorzata Bułkowska (IAFE-NRI, Poland), Anna Hankiewicz (IAFE-NRI, Poland), Joanna Jaroszewska (IAFE-NRI, Poland), Joanna Korczak (IAFE-NRI, Poland), Krzysztof Kossakowski (IAFE-NRI, Poland), Irena Mikiwicz (IAFE-NRI, Poland), Małgorzata Mikołajczyk (IAFE-NRI, Poland), Lech Parzuchowski (IAFE-NRI, Poland), Ewa Sierakowska (IAFE-NRI, Poland), Paulina Smakosz (IAFE-NRI, Poland), Leszek Ślipki (IAFE-NRI, Poland), Marek Wigier, PhD (IAFE-NRI, Poland).

Reviewers:

*Professor Dimitre Nikolov, Institute of Agricultural Economics, Sofia, Bulgaria*

*Professor Gabriel Popescu, The Bucharest University of Economic Studies, Bucharest, Romania*

Proofreaders:

*Joanna Gozdera*

*Katarzyna Mikulska*

Technical editors:

*Krzysztof Kossakowski, Katarzyna Mikulska, Barbara Pawłowska, Ewa Sierakowska, Leszek Ślipki, Kamila Tomaszewska, Barbara Walkiewicz*

Translated by

*Summa Linguae S.A.*

Cover Project

*Leszek Ślipki*

ISBN 978-83-7658-751-6

DOI: 10.30858/pw/9788376587516

*Instytut Ekonomiki Rolnictwa i Gospodarki Żywnościowej*

*– Państwowy Instytut Badawczy*

*ul. Świętokrzyska 20, 00-002 Warszawa*

*tel.: (22) 50 54 444*

*faks: (22) 50 54 636*

*e-mail: [dw@ierigz.waw.pl](mailto:dw@ierigz.waw.pl)*

*<http://www.ierigz.waw.pl>*

# Contents

The CAP and national priorities within the EU budget after 2020 .....	11
<i>Dr Marek Wigier</i>	
1. CAP between 2020 and 2027 – legislative proposals of the European Commission.....	19
<i>Prof. dr hab. Andrzej Kowalski</i>	
1.1. CAP financing .....	19
1.2. Market regulations .....	21
1.3. Direct payments .....	23
1.4. Rural monitoring.....	26
References: .....	26
2. Holistic risk management as a response to budgetary constraints .....	27
<i>Prof. dr hab. Jacek Kulawik, mgr Grzegorz Konat, dr Michał Soliwoda, dr Joanna Pawłowska-Tyszko</i>	
2.1. Introduction .....	27
2.2. The holistic risk management concept.....	28
2.3. Holistic risk management in agriculture – key issues of concern .....	31
2.4. Holistic risk management in agriculture on the example of the United States of America .....	35
2.5. Summary and conclusions .....	38
References.....	38
3. Economic and social features of contemporary development of the Czech agriculture and rural areas .....	40
<i>Prof. Věra Majerová, Ing. Jiří Sálus, Ing. Tereza Směkalová</i>	
3.1. Introduction .....	40
3.2. Globalisation and its effects (consequences) .....	41
3.3. Characteristic features of contemporary development .....	42
3.4. Change of food autarchy concept .....	43
3.5. Consumer behaviour of households .....	44
3.6. Dual quality of food.....	45
3.7. Social farming .....	46
3.8. Summary and conclusions .....	47
References.....	48
4. To whom belongs the future of rural prosperity 2020+? .....	50
<i>PhD Rita Vilké, PhD Živilě Gedminaitė-Raudonė</i>	
4.1. Introduction .....	50
4.2. Theoretical assumptions for rural prosperity .....	51

4.3.	Methodology .....	54
4.4.	Results and discussion.....	56
4.5.	Summary and conclusions .....	60
	References.....	60
5.	The specificity of economic integration processes in agriculture .....	63
	<i>Prof. Julian Krzyżanowski</i>	
5.1.	Introduction .....	63
5.2.	Objectives and methods .....	65
5.3.	Research results and discussion .....	65
5.4.	Summary and conclusions .....	69
	References.....	70
6.	The Common Agricultural Policy of the European Union – main challenges for a new budget .....	72
	<i>PhD Justyna Góral, Prof. Anatolii Pilyavskyy</i>	
6.1.	Introduction .....	72
6.2.	Agricultural policy post-2020 .....	76
6.3.	Summary and conclusions .....	81
	References.....	82
7.	Problems and risks linked with investment supports in agrarian sector – the Czech experience .....	85
	<i>PhD Marie Šimpachová Pechrová, Prof. Tomáš Doucha, MSc Ondřej Chaloupka</i>	
7.1.	Introduction .....	85
7.2.	Material and methods .....	87
7.3.	The assessment model for application of farms for investment supports .....	89
7.4.	Summary and conclusions .....	91
	References.....	91
8.	The adoption of agricultural insurance to manage farm risk: preliminary evidences from a field survey among Italian and Polish farmers.....	93
	<i>Prof. Samuele Trestini, PhD Elisa Giampietri, PhD Magdalena Śmiglak-Krajewska</i>	
8.1.	Introduction .....	94
8.2.	Data and methodology .....	95
8.3.	Results .....	97
8.4.	Summary and conclusions .....	99
	References.....	100
9.	The Common Agricultural Policy and the farm households' off-farm labour supply .....	102
	<i>PhD Jason Loughrey, Prof. Thia Hennessy</i>	
9.1.	Introduction .....	103

9.2.	Theoretical framework.....	103
9.3.	Methodology .....	105
9.4.	Data.....	108
9.5.	Results – farm operator.....	110
9.6.	Results – farm operator and spouse.....	114
9.7.	Summary and conclusions .....	115
	References.....	116
10.	Comparison of potential effects on the profitability of the US MPP application on dairy farms in Veneto (Italy) and Wielkopolska (Poland) .....	117
	<i>MSc Federico Vaona, PhD Cristian Bolzonella, Prof. Martino Cassandro, Prof. Tomasz Szwaczkowski</i>	
10.1.	Introduction .....	118
10.2.	Materials and methods .....	119
10.3.	The situation in Veneto.....	120
10.4.	The situation in Wielkopolska .....	121
10.5.	Summary and conclusions .....	123
	References.....	124
11.	The risk management and the insurance of agricultural production .....	125
	<i>Prof. Drago Cvijanović, PhD Željko Vojinović, Prof. Otilija Sedlak, PhD Dejan Sekulić</i>	
11.1.	Introduction .....	125
11.2.	Theoretical basis .....	126
11.3.	Characteristics of the plant production insurance in Serbia.....	128
11.4.	The position of farmers in the system.....	132
11.5.	Research results.....	133
11.6.	Summary and conclusions .....	138
	References.....	142
12.	Distribution of interventions of the Rural Development Programme and Regional Operational Programmes in 2007-2013 in the context of territorial development .....	144
	<i>Dr Paweł Chmieliński, Dr hab. Marcin Gospodarowicz, prof. IERiGŻ-PIB</i>	
12.1.	Introduction .....	144
12.2.	Types of intervention of the RDP and 16 ROPs.....	145
12.3.	Support for local development in the rural and regional policy between 2007 and 2013 .....	151
12.4.	Discussion and summary .....	155
	References.....	156

13. The role of organic farming in the CAP, the rural development programme, with particular regard to subsidies.....	158
---	-----

*PhD Gábor Gyarmati*

13.1. Introduction .....	158
13.2. Organic farming's characteristics.....	159
References.....	171

14. Agricultural policy in the servitized economy.....	173
--	-----

*PhD Dalia Vidickiene, PhD Zivile Gedminaitė-Raudonė*

14.1. Introduction .....	173
14.2. Reasons to use servitized business model in agriculture.....	174
14.3. Summary and conclusions .....	178
References.....	179

### 15. The Model of Innovative Rural Entrepreneurship Development

Designing.....	181
----------------	-----

*Prof. Lesia Zaburanna, PhD, Associate Professor Tetiana Lutska*

15.1. Introduction .....	181
15.2. The aim and methodology of the research .....	184
15.3. The research results .....	186
15.4. Summary and conclusions .....	200
References.....	200

16. Smart Manufacturing – potential of new digital technologies and big data in the food industry .....	202
---	-----

*PhD Katarzyna Kosior*

16.1. Introduction .....	202
16.2. Smart manufacturing.....	203
16.3. Big data analyses – basis for the development of smart enterprises.....	204
16.4. Digital twin paradigm.....	206
16.5. Smart manufacturing in the food industry in Poland.....	207
16.6. Summary and conclusions .....	211
References.....	211

17. A paradigmatic view on the possibility of applying the provisions of the Common Agricultural and Fisheries Policy of the EU in the agrarian sector of the economy in Ukraine.....	214
---	-----

*DSc (Econ) Vasyl D. Zalizk, Prof. DSc (Econ) Nataliia M. Vdovenko, Sergiy S. Shepeliev*

17.1. Introduction .....	214
17.2. The development of the EU Common Agricultural Policy and Common Fisheries Policy and its impact on the competitiveness of the fisheries sector .....	215



17.3.	Components of the Common Fisheries Policy of the EU in the context of the conservation system and sustainable usage of fisheries resources.....	218
17.4.	Fundamental principles of CFP reforms.....	219
17.5.	Results of aquaculture producers activities on the possibilities of provisions' implementation of the Common Agricultural and Fisheries Policy of the EU in fisheries during AGRO-2018.....	223
17.6.	Summary and conclusions .....	229
	References.....	229
18.	Direct producer support measures and level of harmonization with Common Agricultural Policy in Bosnia and Herzegovina .....	232
	<i>MSc Alen Mujčinović, Merima Makaš, Prof. dr Sabahudin Bajramović</i>	
18.1.	Introduction .....	232
18.2.	Materials and methods .....	234
18.3.	Economic and agricultural development of the country.....	235
18.4.	Budgetary support to the agricultural sector .....	236
18.5.	Direct producer support measures .....	239
18.6.	Direct payments .....	241
18.7.	Summary and conclusions .....	242
	References.....	243
19.	The Hungarian and Polish agricultural trade in the light of CAP budgetary restrictions .....	245
	<i>PhD Tamás Mizik</i>	
19.1.	Introduction .....	245
19.2.	Methodology and data sources.....	247
19.3.	Importance of the agriculture .....	247
19.4.	Trade characteristics of the Hungarian agriculture .....	250
19.5.	Trade characteristics of the Polish agriculture.....	253
19.6.	Comparison of the Hungarian-Polish agricultural trade.....	255
19.7.	The future of the Hungarian-Polish agricultural trade in the light of the possible budgetary changes .....	256
19.8.	Summary and conclusions .....	258
	References.....	259
20.	Implementation of innovation projects in the context of agribusiness 4.0 in Ukraine .....	262
	<i>Prof. Lesia Kucher</i>	
20.1.	Introduction .....	262
20.2.	Methodology .....	264
20.3.	Implementation of the most important innovation projects in agribusiness in Ukrainian regions: current state and problems of their financing sources .....	265

20.4.	Cluster analysis of the implementation of investment and innovative projects in agribusiness in Ukrainian regions .....	269
20.5.	Summary and conclusions .....	275
	References.....	276
21.	The impact of globalization on farmers income. Evidence from Poland and Romanian agriculture .....	279
	<i>MSc Călin Henriette Cristiana, MSc Izvoranu Anca Marina, MSc Todirica Ioana Claudia</i>	
21.1.	Introduction .....	279
21.2.	Literature review .....	280
21.3.	Globalization impact on rural areas.....	282
21.4.	Globalization impact on small farmers – foreign investment in Romania and Poland.....	288
21.5.	Summary and conclusions .....	290
	References.....	291
22.	Land concentration and competitiveness of agricultural enterprises in Ukraine .....	292
	<i>PhD Anatolii Kucher</i>	
22.1.	Introduction .....	292
22.2.	Methodology .....	294
22.3.	Status and trends of land concentration in agricultural enterprises of Ukraine .....	294
22.4.	The level of concentration and the intensity of competition in the land rental market: the case of Ukrainian agroholdings .....	300
22.5.	Impact of the level of land concentration on the competitiveness of agricultural enterprises.....	303
22.6.	Summary and conclusions .....	309
	References.....	310
	Instead of a summary .....	312
	Annex I .....	314

## **2. Holistic risk management as a response to budgetary constraints**

*Prof. dr hab. Jacek Kulawik, mgr Grzegorz Konat, dr Michał Soliwoda,  
dr Joanna Pawłowska-Tyszko  
Institute of Agricultural and Food Economics – National Research Institute  
Warsaw, Poland  
kulawik@ierigz.waw.pl, grzegorz.konat@ierigz.waw.pl,  
michal.soliwoda@ierigz.waw.pl*

**DOI:** 10.30858/pw/9788376587516.2

### **Abstract**

The latest perspective of the Common Agricultural Policy (CAP) focuses in particular on risk management (RM) issues due to the need for aligning the CAP to the new agricultural operating conditions. The future of agricultural policy has become, as never before, increasingly climate-dependent and threatened by typical agricultural issues of concern, including strong dependence on weather conditions, price volatility, natural disasters or risk of new diseases that can potentially destabilise the farmers' income. Changing tendencies of the existing agricultural policy can also underlay the uncertainty of farm functioning. The on-going debate focuses on income stabilisation tools and shifting from the existing programmes oriented at direct payments and other agricultural support measures. Thus, reorientation of agricultural policy brings the risk of losing the existing support and the need for seeking the new income stabilisation tools. The CAP proposes a holistic approach to risk management and a set of instruments addressing the budgetary constraints. It is, therefore, appropriate to state that limiting budgetary support may contribute to development of a more comprehensive risk management system in agriculture.

**Keywords:** risk management, holism, holistic risk management, Common Agricultural Policy

**JEL codes:** Q14, Q18, G23

### **2.1. Introduction**

The next CAP perspective will be most probably related to budgetary constraints that may substantially reorientate the existing agricultural development policy in the European Union (EU). These changes bring the risk of losing the existing support and the need for seeking the new income stabilisation tools.

Thus, the newest CAP perspective focuses on risk management issues as the area to seek solutions that could ensure financial security with minor support from the state budget. The newest CAP 2020+ perspective is largely oriented towards such issues as: supporting private management strategies by enhancing farm advisory, aligning the management systems with the individual sectors and regions or development of the new financial instruments supporting risk management. The issue of risk management in agriculture is not new. Nevertheless, despite numerous concepts of risk management, vast majority of them focuses only on the most common types of risk, including production, financial or market risks. Such approach fails to consider the interlinkages between the individual risk groups as well as impact of risk on the organisation's objectives or strategy [Krysiak, 2011]. The holistic risk management concept that can respond to budgetary constraints presents a completely different approach.

The purpose of this study is an attempt to assess the possibilities of implementing the holistic approach to risk management in agriculture. The study assumes that the OECD's holistic concept is currently the most relevant to position the political interferences in risk management in agriculture.

## **2.2. The holistic risk management concept**

The contemporary concept of holism has been introduced in many scientific fields and refers to a philosophical development theory and social science methodology. Holism is a theory that establishes the primacy of viewing the social phenomena as wholes. In ontological terms, it emphasizes that a whole should be perceived more comprehensively than only as a collection of elements due to interconnections, dependencies and interactions between them, which leads to development of a new structure of specific dynamics. In methodological terms, holism is a theory that establishes the primacy of viewing the social events as wholes and claims that the focus in explaining social phenomena should be on analysing the whole rather than individual elements, since such elements – viewed autonomously without a reference to the whole – can be wrongly understood.

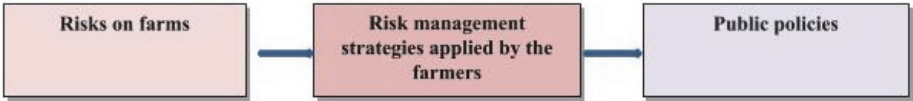
Thus, holistic risk management is an all-encompassing approach, requiring management of all types of risk to which an organisation can be exposed. According to J. Lam, analysing of individual risk groups separately, paying no attention to their interconnections, is ineffective due to dynamic structures of different risk groups and strong interlinkages between them [Lam, 2014]. These interlinkages are addressed by G. Monahan who notes that there is an inextricable link between risk and strategic objectives of an enterprise [Monahan, 2008].

For the purposes of this study an assumption was made that the holistic risk management covers, for instance, comprehensive identification (along with interaction analysis) and reduction of risk by way of implementation of risk coping instruments and strategies in agriculture into the conventional and sustainable approach frameworks.

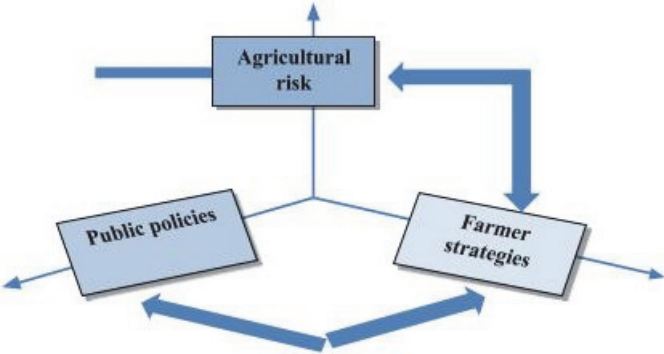
The holistic approach to risk management was proposed by the OECD in 2009. It stands up to a conventional linear concept perceiving each type of risk on a farm as a separate problem, seeks autonomous strategies for risk reduction and includes public policies into this system. The essential problem with linear approach is that it misses any interconnections between the elements, thus, it is difficult to expect that the analysis will go as planned. Therefore, the OECD proposes the holistic risk management concept constituting the integrated system composed of a set of relations between different risk groups, available management tools and strategies and public policy measures. One should note that in holistic approach all risk groups affecting the farm are interconnected and perceived as a single issue of concern that enables selecting the best possible risk reduction strategy. To perform such risk management, all elements (risk, strategies and policies) should be handled as a whole, including also interactions between these elements. Linear and holistic approach to risk management is presented on Figure 1.

Figure 1. Linear vs. holistic risk management strategy

Linear concept



Holistic concept



Source: own elaboration on the basis of *Managing Risk in Agriculture: A Holistic Approach*, OECD, Paris 2009.

One should strongly emphasize that the economic practice does not generally recommend a single and universal risk management method. On the contrary, each country needs to establish its own holistic system aligned to its preferences and primarily to its budgetary, organisational and administrative capabilities. Conceptual framework of the holistic risk management system is presented in Table 1. It shows that, while establishing such system, one needs to consider many different risk layers at different management levels, starting from normal risks of high probability and relatively low losses via market transferable risk to catastrophic risk that is infrequent, but causes a large amount of damage. In addition, the presence of catastrophic risk in agriculture is among the justifications for budgetary support, but it can be reduced within the farm by applying e.g. relevant agricultural techniques. This means that a farmer is able to face these groups of risks by optimal selection of coping strategies, which, however, requires accounting for correlations between these risks. This task may be difficult without an explicit support of public institutions.

Table 1. Framework of holistic risk management in agriculture

Risk management instruments and strategies	Risk layers		
	Normal risk – low but repeatable losses	Market transferable risk	Catastrophic risk – infrequent but large, systemic losses
farm-located (diversification, savings, innovation)	Each country needs to establish its own holistic system		
market (insurances, options and futures)			
<i>ex ante</i> policies (principles of <i>ad hoc</i> aid)			
<i>ex post</i> policies (providing support)			

Source: own elaboration on the basis of Evaluation on the EU Common Agriculture Policy (CAP) 2014-2020, OECD, Paris 2017.

Each country seeks to establish the holistic risk management templates to follow the interactions between the individual risk groups. Exemplary extreme solutions for selecting the risk management strategy are New Zealand and Spain (Fig. 2). In New Zealand, the state budget remains uninvolved in the risk management system, which leaves a large margin for free market functioning. The Spanish risk management policy has been shaped differently. Risk management policies and strategies dedicated to agriculture in this country are burdensome to the budget and the subsidies displace the other risk management instruments. The examples of risk management systems presented on Figure 2 demonstrate that the holistic approach enables establishing unique solutions, strongly correlated with the strategies and directions of agricultural development in a given country.

Figure 2. Risk management strategies and policy in the New Zealander and Spanish agriculture

a) New Zealand

Strategies and policies	Type of risk		
	catastrophic	market	normal
Farms			<ul style="list-style-type: none"> <li>financial management</li> <li>grazing and feed management</li> <li>flexibility in making business decisions</li> </ul>
Market instruments		<ul style="list-style-type: none"> <li>forward contracts</li> <li>interest rate security</li> <li>shares in cooperatives</li> </ul>	
<i>ex ante</i> policies	<div style="border: 1px solid black; padding: 2px; margin-bottom: 2px;">biosecurity</div> <div style="border: 1px solid black; padding: 2px; margin-bottom: 2px;">water and pest management</div> <div style="border: 1px solid black; padding: 2px;">counteracting undesired events</div>	framework for free market functioning and regulations	
<i>ex post</i> policies			

b) Spain

Strategies and policies	Type of risk		
	catastrophic	market	normal
Farms			<ul style="list-style-type: none"> <li>production diversification</li> <li>financial management</li> </ul>
Market instruments		<ul style="list-style-type: none"> <li>forward contracts</li> <li>shares in cooperatives</li> </ul>	
<i>ex ante</i> policies	<div style="border: 1px solid black; padding: 2px; display: inline-block;">hybrid insurances under the public-private partnership</div>		<div style="border: 1px solid black; padding: 2px; display: inline-block;">direct payments and price gap support under the CAP</div>
<i>ex post</i> policies	<div style="border: 1px solid black; padding: 2px;">ad hoc aid in case of disaster</div>		

Source: own elaboration on the basis of *Managing Risk in Agriculture. Policy Assessment and Design*, OECD, Paris 2011.

2.3. Holistic risk management in agriculture – key issues of concern

One of the key CAP orientations applied in risk management system is the diversification strategy that may be used as an equivalent of greening under the Common Agricultural Policy. Data presented in Table 2 demonstrate that the income volatility coefficient in diversified farms fluctuated between 0.12 in Germany and 0.42 in Spain, while in monoculture farms the value of this coefficient reached between 0.16 in Germany for sugar beet and 0.69 in Canada for

wheat and oats. According to the provided data, the farms of diversified crop structure demonstrate lower income variability comparing to monoculture farms. This applies to practically any analysed country. There is a need to emphasize that trade-off that may be reflected by the selected sowing structure, has its limitations since in many cases it requires reorientation of the existing farm development strategy. Thus, explicit and simple recommendations for the most optimal RM systems are difficult to form, since the risk is always correlated with trade-off, where on the one hand, selecting a given strategy enables the delivery of specific goals, while on the other, it may limit the benefits gained in effect of implementation of the other strategies.

Table 2. Income volatility per 1 ha for monoculture and diversified crops (volatility coefficient)

Crops	Germany	Great Britain	Estonia	Netherlands	Australia	Canada	Spain
1. Monoculture							
• wheat	0.20	0.31	0.42	0.64	0.47	0.69	0.48
• barley	0.31	0.33	0.41		0.54	0.45	0.47
• oleaginous	0.31	0.33			0.46	0.47	
• rye	0.29		0.50				
• sugar beet	0.16			0.27			
• oats			0.45			0.69	
2. Diversified	0.12	0.29	0.29	0.35	0.33	0.37	0.42

Source: own elaboration on the basis of *Managing Risk in Agriculture. Policy Assessment and Design*, OECD, Paris 2011.

Table 3. Trade-offs in risk area

crowding-out (substitutability of risk management instruments)	vs.	crowding-in (complementarity of instruments)
crop and production diversification (lower volatility)	vs.	benefits of specialisation (better effectiveness and competitiveness)
business and life safety	vs.	satisfaction from professional successes and life
risk	vs.	innovation
insurance risk (focus on in minus deviations) ( <i>downside risk</i> )	vs.	financial risk (accounting for in minus and in plus deviations) ( <i>upside risk</i> )
crop diversification plus negative correlation between crops and prices ( <i>natural hedging</i> )	vs.	farmers' income and revenue stabilisation programmes

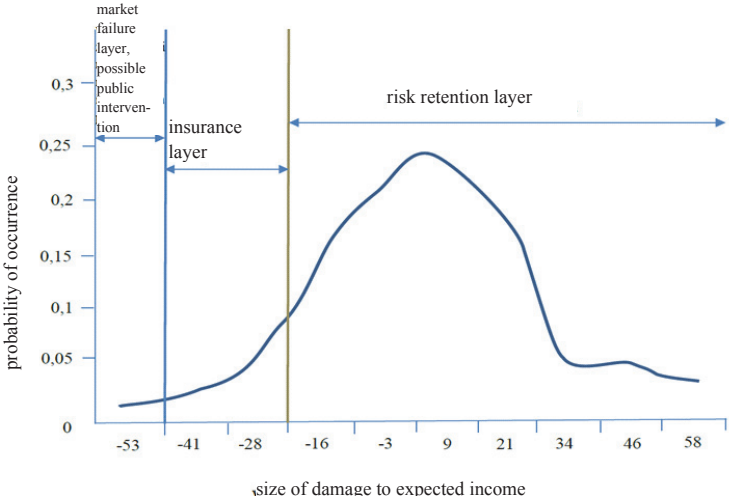
Source: own elaboration.



Table 3 presents different areas of risk trade-off. For example, budgetary support in a form of subsidies may enhance and even displace (crowding-out) the other risk management instruments as in the case of Spain. Nevertheless, the subsidies can complement the other RM instruments. The issue of greening referred to above (strategic CAP orientation) reflected by crop and production diversification and resulting in measurable and trade-off-related benefits in the form of risk decrease constitutes another example of such dilemmas. One should remember, however, that the benefits from diversification can displace the benefits of specialisation.

Another issue to be addressed is the presence of catastrophic risk in agriculture being the key argument for existence of the public support policy in the EU agricultural policy. Figure 3 presents three basic types of risk – normal, market and catastrophic. Analysis of the latter one could benefit from the probability density function being an alternative approach to the holistic concept. It should be underlined that there are some events of very low probability of occurrence, but of enormous potential damages. This is the case of catastrophic risk, in which the state involvement may become necessary and even desired. It should be added that the boundary (a specific demarcation line) between catastrophic and market risk (blue vertical line), similarly as between market and normal risk, is blurred and established on arbitrary basis, frequently with a view to social and political factors. On the example presented on Figure 3 this boundary is established by the state on arbitrary basis.

Figure 3. Probability density function and risk management layers



Source: own elaboration on the basis of *Managing Risk in Agriculture: A Holistic Approach*, OECD, Paris 2009.

According to the literature review, we can distinguish two catastrophic risk management models applied by the governments of the EU Member States (Table 4). These include [Garrido and Bielza, 2008]:

- model I – free-market, functioning in the Northern and Central Europe states with a significant role of the market based mechanism in catastrophic risk management and additional focus on trainings;
- model II – pro-intervention, functioning in the Mediterranean states with a moderate role of market based mechanism and specific support for development of new and innovative forms of insurances.

According to comparative analyses performed by the IAFE-NRI “virtually extreme approaches to catastrophic risk management in agriculture can be distinguished even within the EU: at one extreme there are countries enhancing the effectiveness of *ex ante* and risk transfer instruments, while at the other – the states with a dominating role of *ex post* instruments implemented in the case of catastrophic events” [Soliwoda, Pawłowska-Tyszko and Gorzelak, 2017, p. 685].

Table 4. Catastrophic risk management models in Europe

Specification	Model I	Model II
Countries	Northern and Central Europe (Germany, Great Britain)	Mediterranean states (Spain, Italy), Austria
Role of market based mechanism	↑↑↑	
Comments	trainings and other farmer-oriented forms	supporting development of innovative forms of agricultural insurances (e.g. index-based)

Source: adaptation of typological approach after A. Garrido, M. Bielza (2008). *Evaluating EU risk management instruments: policy lessons and prospects for the future*. In: M.P.M. Meuwissen, M.A.P.M. Van Assel-donk, R.B.M. Huirne (ed.), *Income stabilisation in European agriculture. Design and economic impact of risk management tools*. Wageningen: Wageningen Academic Publishers.

Taking account of extremely high costs related to occurrence of catastrophic event, there is a need for diversification of catastrophic risk including in particular its market facilitation – considering the fact that in many countries this is the state that takes responsibility for covering the resulting losses. The methods for involving the market based mechanism in catastrophic risk management may include [Michalski and Pajewska, 2001]:

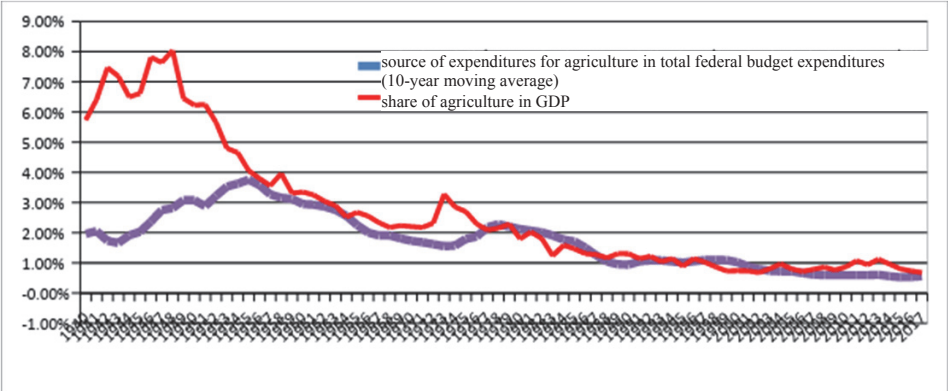
- Reinsurance of risk transfer or its part from the other insurances (assignors) to the insurer (assignee/reinsurer),
- Co-insurance – division/distribution of risk to at least two entities at the side of the insurer.

Reinsurance capacity of the insurance market may pose a barrier, which brings the need for support by the international companies. Internationalisation leads, however, to the new issues of concern, including the occurrence of foreign exchange risk that will require addressing.

**2.4. Holistic risk management in agriculture on the example of the United States of America**

Apart from the previous examples of the countries such as New Zealand or Spain, which adopted the models of risk management in agriculture that can be considered holistic, it is worthwhile to have a closer look at the US agriculture being an example of continuous evolution and development of the risk management system. Let us start with emphasising the fact that since the second half of the 1940s, the share of agriculture in the United States’ GDP has continued to drop (Fig. 4). Following the growth period in the 1940s and early 1950s, the share of expenditures for agriculture in total federal budget expenditures has been also decreasing on quite regular basis. Interestingly, the trend for maintaining the share of expenditures for agriculture in total budget expenditures below the agricultural share in GDP has been observed in the US for the last several years.

Figure 4. Share of expenditures for agriculture in total federal budget expenditures of the United States in 1940-2017 (%).

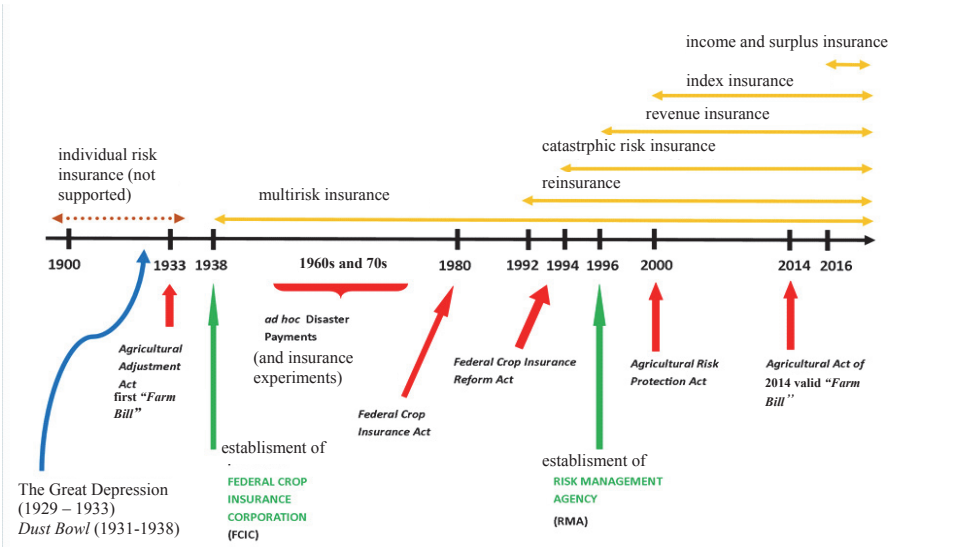


Source: own elaboration on the basis of BEA and Office of Management and Budget of The White House data.

Long-term quantitative trends described above are accompanied by qualitative changes, including in particular in the area of subsidizing the property insurance in agriculture. The history of governmental support for insurances in the US agriculture dates back to the 1930s, when, in effect of the Great Depression and the so-called Dust Bowl, it was decided to take actions in this area (Fig. 5).

At the same time, in 1933, the first agricultural act (the so-called Farm Bill) was enacted, followed by establishment of the Federal Crop Insurance Corporation in 1938 – to manage the first federal crop insurance programme. The next four decades account for the period of primarily *ad hoc* disaster payments under subsequent Farm Bills and experiments with the governmental crop insurance support. The situation has begun to change since 1980s with implementation of partial subsidies for crop insurance premiums. Since 1996, the crop insurance support programmes have been managed by dedicated Risk Management Agency. Since the early 1990s, a regular growth of a group of insurance products supported by the federal government has been observed. After several decades of supporting only the multirisk insurances, the last twenty five years brought the support for reinsurance, catastrophic risk, revenue and index insurances, followed by – in the last two years – income and surplus insurances. This extension of the range of supported instruments can be considered an evolution towards the holistic approach to risk management in the US.

Figure 5. Evolution of the governmental support for insurances in agriculture of the United States

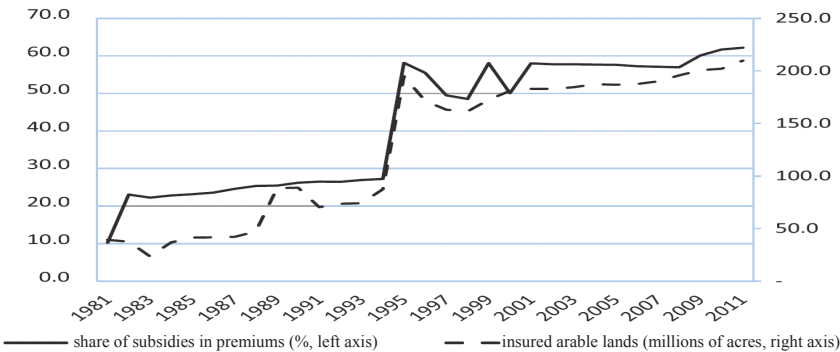


Source: own elaboration.

The changes that have taken place in the agricultural support system in the US since the 1980s were reflected primarily in the increasing support for insurances that resulted in higher interest of the US agricultural producers in insuring their crops. According to Figure 6, this interest – measured by a size of insured arable lands – is closely correlated with the amount of governmental support

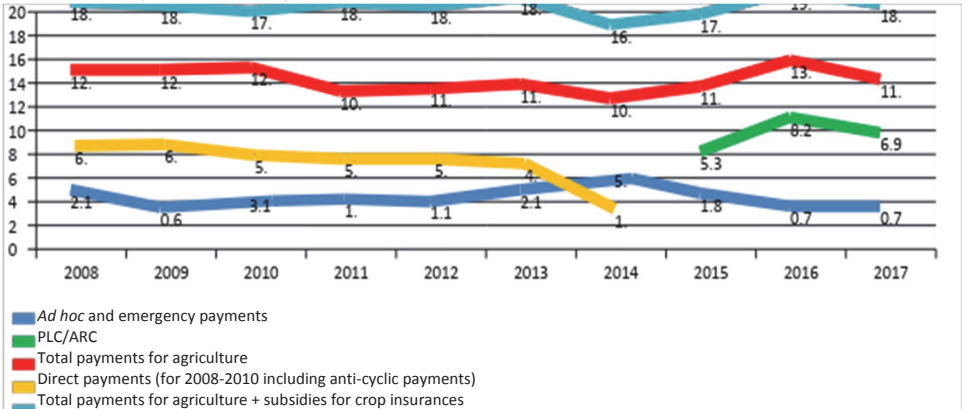
measured by the share of subsidies in the value of insurance premiums. This correlation poses a challenge to the economic authorities in the US that must face one still unsolved issue: how to decouple the interest of the farmers in property insurances from the value of related federal support.

Figure 6. Subsidies and insured arable land for six main crops in the United States in 1981-2011



Source: K.E. Coble, B.J. Barnett, "Why Do We Subsidize Crop Insurance?", *American Journal of Agricultural Economics*, 95(2), January 2013, p. 502.

Figure 7. Governmental support provided to agriculture in the United States in 2008-2017 (USD billion)



Source: own elaboration on the basis of U.S. Farm Income Outlook (2015, 2018) and Federal Crop Insurance Corporation Summary of Business Report (2005-2014, 2015-2018)

The changes to the support system for agriculture in the USA have been taking place not only throughout decades but also within the last years. According to empirical data, during the term of the latest agricultural act [Farm Bill, 2014] the US Government managed, for instance, to reduce the scale of emergency and *ad hoc* payments and simultaneously increase the involvement of

federal government in the promotion of non-insurance risk management instruments to replace the existing direct payments; subsidies to crop insurances maintained at the stable level (Fig. 7).

## 2.5. Summary and conclusions

The key conclusions from the possibility of applying the holistic management system are as follows:

- The policymakers and agricultural administration take the primary responsibility for making use of the potential of reasonable expenditure of public funds contained in the holistic risk management concept.
- The EU farmers, brought up in a specific subsidy culture are reluctant to accept the recommendation that managing normal risks lies upon them.
- The occurrence of catastrophic risk in agriculture justifies the budgetary support, however, the amount of this support and ratios between the individual risk management instruments depend on financial capacities and preferences of individual countries.
- Budgetary constraints in the new CAP perspective may pose an incentive for development of a comprehensive risk management system in which each stakeholder will hold a set of mutually complementary instruments.

## References

4. Coble, K.E., Barnett, B.J. (2013). "Why Do We Subsidize Crop Insurance?", *American Journal of Agricultural Economics*, 95(2).
5. Federal Crop Insurance Corporation (2014). Summary of Business Report for 2005 thru 2014, United States Department of Agriculture.
6. Federal Crop Insurance Corporation (2018). Summary of Business Report for 2015 thru 2018, United States Department of Agriculture.
7. Garrido, A., Bielza, M. (2008). Evaluating EU risk management instruments: policy lessons and prospects for the future. In: M.P.M. Meuwissen, M.A.P.M. Van Asseldonk, R.B.M. Huirne (ed.), *Income stabilisation in European agriculture. Design and economic impact of risk management tools*. Wageningen: Wageningen Academic Publishers.
8. Krysiak Z. (2011). Silna kultura zarządzania ryzykiem jako cecha nowoczesnych organizacji. *e-mentor* 2(39), pp. 24-33.
9. Lam, J. (2014). *Enterprise Risk Management. From Incentives to Controls*. New Jersey: John Wiley&Sons.
10. Michalski, T., Pajewska R. (2001). *Ubezpieczenia gospodarcze*. WSiP, Warsaw.
11. Monahan, G. (2008). *Enterprise Risk Management. A Methodology for Achieving Strategic Objectives*. New Jersey: John Wiley&Sons.
12. OECD (2009). *Managing Risk in Agriculture: A Holistic Approach*, Paris.

13. OECD (2011). *Managing Risk in Agriculture. Policy Assessment and Design*, Paris.
14. OECD (2017). *Evaluation on the EU Common Agriculture Policy (CAP) 2014-2020*, Paris.
15. Schnepf, R. (2015). "U.S. Farm Income Outlook for 2015", Congressional Research Service Report, R40152.
16. Schnepf, R. (2018). "U.S. Farm Income Outlook for 2018", Congressional Research Service Report, R45117.
17. Soliwoda, M., Pawłowska-Tyszko, J., Gorzelak, A. (2017). Zarządzanie ryzykiem katastroficznym w rolnictwie – wybrane problemy. Perspektywa międzynarodowa i Polski. *Finanse, Rynki Finansowe, Ubezpieczenia*, 1(85), 681-693. DOI: 10.18276/frfu.2017.1.85-54.