Structural changes and agri-environmental assessment of agriculture in Bulgaria

Prof.Dr.hab. Julia Doitchinova,

Assoc.Prof.Dr. Hristina Harizanova,

Assoc.Prof.Dr. Zornitsa Stojanova

University of National and World Economy,

Sofia, Bulgaria

Aim&tasks

The aim of the paper is:to analyze the effects of structural changes in the agri-environmental assessment of the Bulgarian agriculture.

On this base are proposed recommendations and possibilities to reduce the adverse effects of the activity of farms.

Main tasks:

- How the changes in agriculture and farms during the first programming period impact on agri-environmental characteristics of agriculture?
- What are the possible reactions of farmers to introduce environmental friendly practices?

Table of content:

- Changes in production, land and organizational structures of the agriculture;
- Agri-environmental assessment of the Bulgarian agriculture;
- Evaluation of the possible farmers reaction to introduce environmental friendly practices (analysis of results of empirical research);
- Conclusions and recommendations for improving agri-environmental assessment

Agriculture in National Economy 2007-2014

	2007	2014	%
Share of GVA for sector “Agriculture, forestry and fishery” of the total GVA	4.7	4.8	2 %
Employees in agriculture (thou)	723.9	666.5	- 8 %
Share of the employed in agriculture of the total employed	19 %	19 %	
Share of the self-employed of the total employed in agriculture	89.8 %	86.4 %	- 3.4 %
GVA for sector Agriculture, forestry and fishery (million Euro)	1443	1607	11 %
Production from branch “Agriculture”(million Euro)	3315	4009	21%

CHANGES IN PRODUCTION, LAND AND ORGANIZATIONAL STRUCTURES OF THE AGRICULTURE

Changes in Sector - Agriculture

	2007	2014	%
Production from horticulture (million Euro)	1,566	2,485	59%
Production from livestock breeding (million Euro)	1,246	1,087	- 13%
Value of production from horticulture and livestock breeding (million Euro)	2,812	3,572	27%
Production of agricultural service(million Euro)	225	247	10%
Share of production from livestock breeding of the total agricultural production	41 %	28.5 %	- 12.5 %

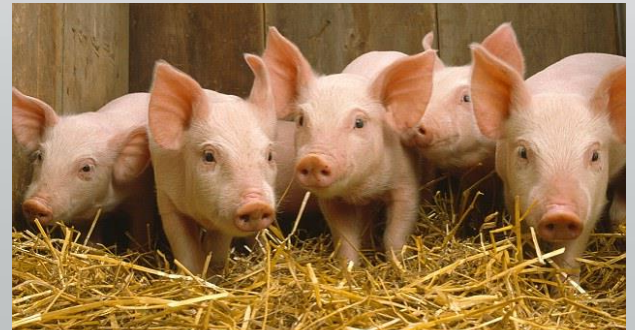
CHANGES IN PRODUCTION, LAND AND ORGANIZATIONAL STRUCTURES OF THE AGRICULTURE

Changes in the number of livestock (thousand)

Number of cattle
- 2007 – 612.800
- 2015 – 550.201

Number of cows
- 2007 – 354.200
- 2015 – 276.160

Number of sheep
- 2007 – 1876.900
- 2015 – 1334.894



Number of goats
- 2007 – 780.100
- 2015 – 276.900

Number of pigs
- 2007 – 872.400
- 2015 – 600.100

Number of hens
- 2007 -18698
- 2015 - 15600

CHANGES IN PRODUCTION, LAND AND ORGANIZATIONAL STRUCTURES OF THE AGRICULTURE

Changes in number of farms by legal status

Agricultural holdings - total
- 2007 – 481920
- 2013 – 244594

Natural persons
- 2007 – 476956
- 2013 - 363620

Cooperatives
- 2007 – 1156
- 2013 – 811

Sole traders
- 2007 – 1828
- 2013 – 1871

Companies
- 2007 – 1763
- 2013 – 4323

Associations
- 2007 -217
- 2013 -272

CHANGES IN PRODUCTION, LAND AND ORGANIZATIONAL STRUCTURES OF THE AGRICULTURE

The structure of agricultural holdings is dual and polarised

- Average holding in Bulgaria utilises 12 ha of land;
- The average economic size of an agricultural holding is € 6 847;
- 83 % of the agricultural holdings have less than 5 ha and use 4.8 % of UAL;
- 0.2 % of the agricultural holdings have more than 100 ha and use 80 % of UAL.

AGRI-ENVIRONMENTAL STATE OF AGRICULTURE

The major weaknesses of the environmental perspective in the agricultural sector can be summarized as:

- Destruction and fragmentation of natural habitats;
- Change the way of land use;
- Use of fertilizers and pesticides in agriculture;
- Intensive forestry logging, deforestation;
- Overexploitation of natural plant resources;
- Overgrazing or abandonment of pastures and meadows;
- Dissemination of invasive and introduced species;

Reclamation, water use, adjusting the watercourses.

AGRI-ENVIRONMENTAL STATE OF AGRICULTURE

Areas of extensive agriculture

Share of areas for extensive arable crops (<60% of EU-27 average)– 67.5 %

Share of areas for extensive grazing (<1 LU/ha of forage area)– 30.1 %

Share of areas for extensive arable crops – 18.7 %

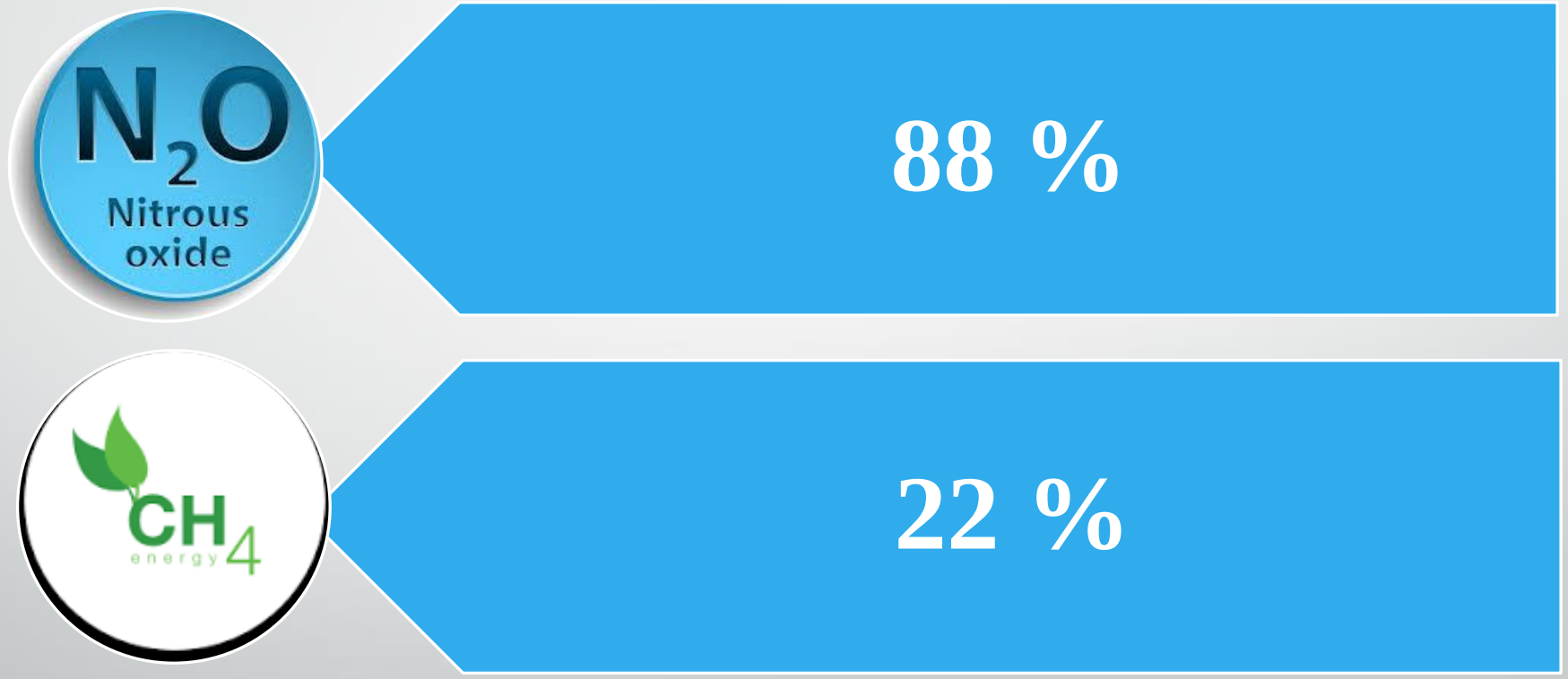
Share of areas for extensive grazing – 10.5 %

Share of areas for extensive arable crops – 15.6 %

Share of areas for extensive grazing – 28.9 %

AGRI-ENVIRONMENTAL STATE OF AGRICULTURE

Share of agriculture in greenhouse gases (2014)



Emissions of harmful substances into the atmosphere from agriculture (tone)

Agriculture is the main source of methane (12% of national emissions) and ammonia (87%).

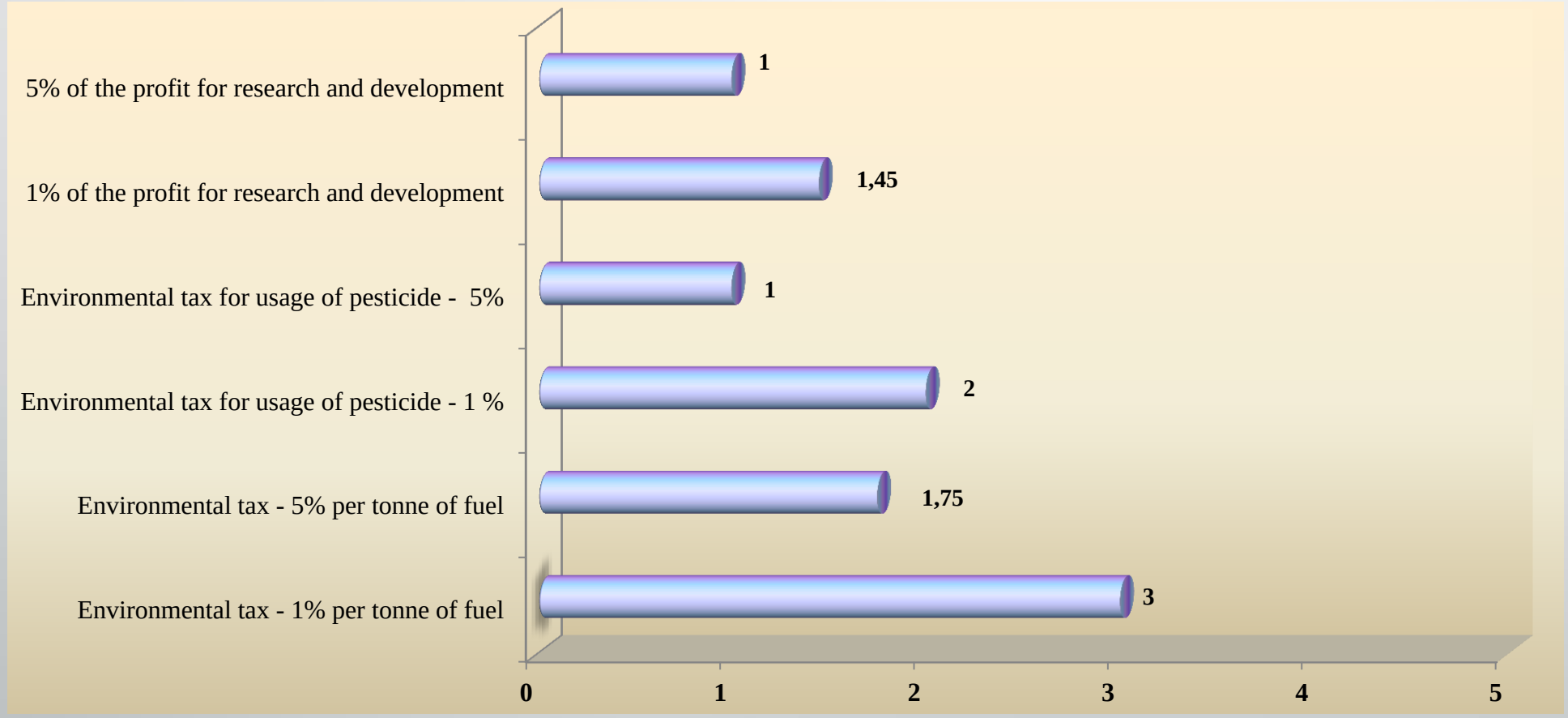
	2007	2014	%
NOx	3621	3780	104.4
Non-methane volatile organic compounds	28117	23866	84.9
CH_4	128969	84166	65.3
CO	1883	1966	104.4
CO_2	4344879	4535814	104.4
N_2O	15723	15263	97.1
NH_3	47967	27792	57.9

EVALUATION OF THE POSSIBLE FARMERS REACTION TO INTRODUCE ENVIRONMENTAL FRIENDLY PRACTICES

- The research is made in 2015 by collecting data of agricultural structures operate in grain sector. Findings and conclusions in the paper are made on the basis of structured interviews with owners of agricultural holdings in grain sector.
- The main indicator for selection of regions to conduct the survey is the total UAA of grain production. Regions in which this indicator is high or average were selected. The research includes North, North Central, North East and South East planning region of Bulgaria. In each selected region were chosen farms which total area covers more than 5% of the UAA under cereals.
- Agri-environmental assessment of the grain sector is made by special part questions (included in the questionnaire) dedicated to the environment. Selected and evaluated indicators are qualitative.

EVALUATION OF THE POSSIBLE FARMERS REACTION TO INTRODUCE ENVIRONMENTAL FRIENDLY PRACTICES

Assessment of impact of taxes implementation on the economic state of grain holdings

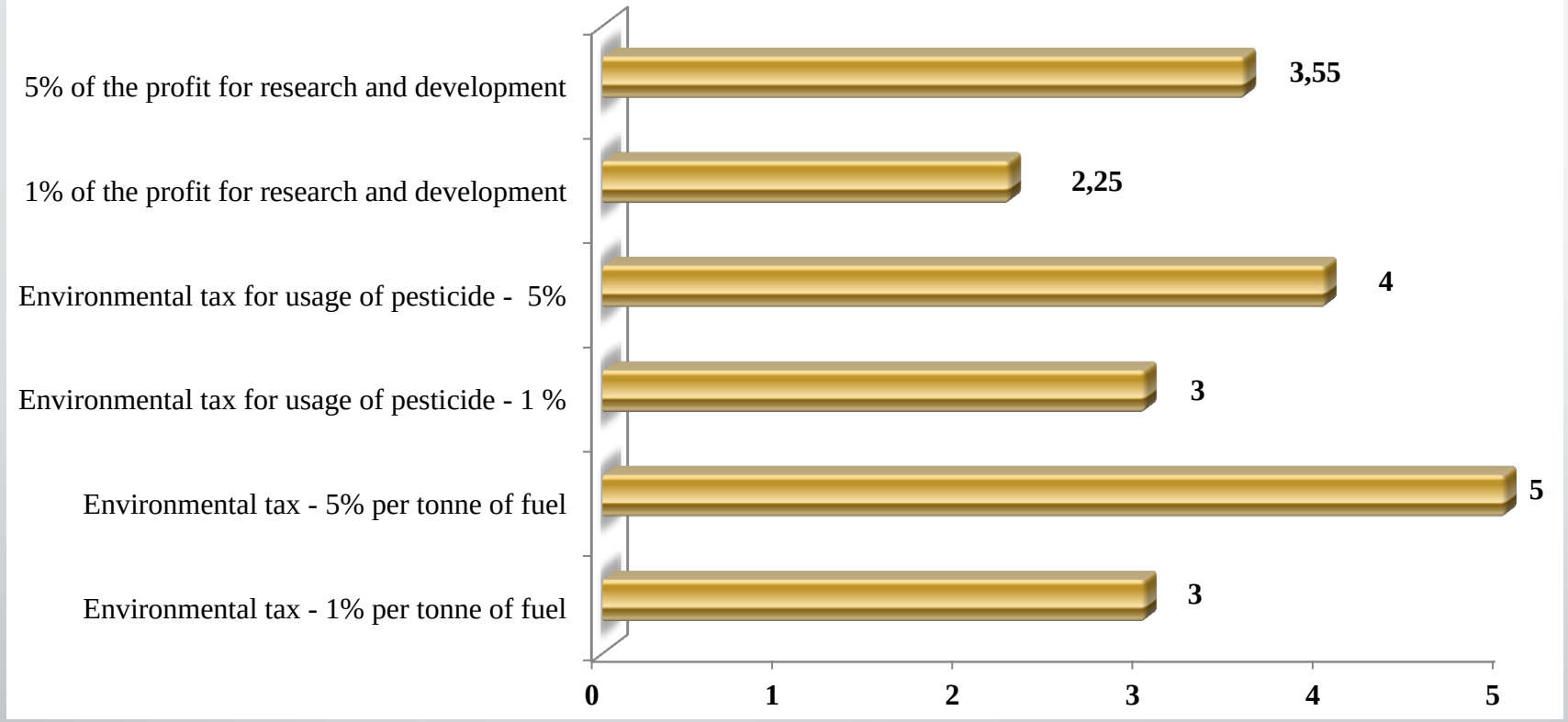


Legend : 1 - negative impact

5- positive impact

EVALUATION OF THE POSSIBLE FARMERS REACTION TO INTRODUCE ENVIRONMENTAL FRIENDLY PRACTICES

Assessment of impact of taxes implementation on the environment

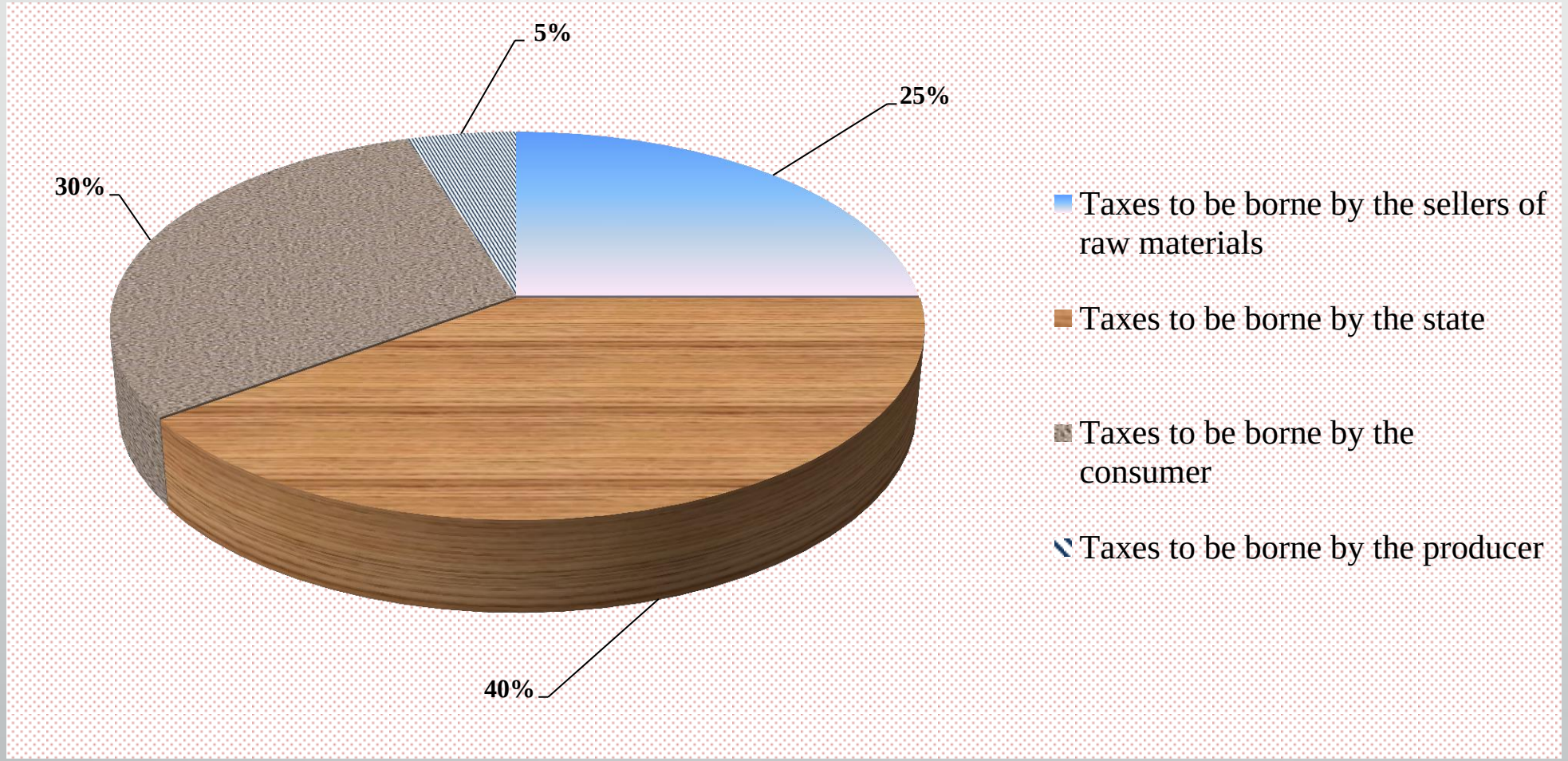


Legend : 1 – low positive impact

5- high positive impact

EVALUATION OF THE POSSIBLE FARMERS REACTION TO INTRODUCE ENVIRONMENTAL FRIENDLY PRACTICES

Distribution of weight of taxes implementation



EVALUATION OF THE POSSIBLE FARMERS REACTION TO INTRODUCE ENVIRONMENTAL FRIENDLY PRACTICES

Assessment of some environmental indicators influenced by the grain sector and have influence on it

INDICATORS	How much grain sector influences? 1 – no influence 5 – high influence	How much grain sector is affected? 1 - not affected 5 - high affected
Loss of habitat and biodiversity	**2,80**	**1**
Abandonment of land	**3,50**	**4**
Deterioration of habitats	**2**	**2**
Soil erosion	**5**	**5**
Acidification and soil dehumisation	**5**	**5**
Soil contamination	**4,2**	**4,8**
Pollution of surface and groundwater	**3,5**	**4**
Air pollution	**3**	**4**
The use of chemical fertilizers and chemical synthetic pesticides	**5**	**5**
Use of water with high nitrate content	**1**	**1**

CONCLUSIONS AND RECOMMENDATIONS FOR IMPROVING AGRI-ENVIRONMENTAL ASSESSMENT

2007

- 311 farms
- 16 662 ha

2014

- 4092 farms
- 74 358 ha - all areas in the control system (transition and transitioned)

- Compared with 2006, the last year before the accession of Bulgaria to the EU, the number of operators grew more than 13 times.

- Changes necessary for the transition to organic production are related to investments for the development of environmental friendly plant protection, development of new crop varieties and innovations in production technology.

CONCLUSIONS AND RECOMMENDATIONS FOR IMPROVING AGRI-ENVIRONMENTAL ASSESSMENT

- Implementation of integrated production, whose main element is integrated pest management. By applying this method will be reduced the use of pesticides, excluding highly toxic and usage of selective, less toxic or biological preparation. This will impact positively on restoration of natural biological balance and regulation.

- In terms of conservation of land and overcoming problems as erosion and soil pollution, acidification and dehumisation is necessary to introduce more stringent measures against the abandonment of land, better implementation of best agricultural practices, realizing a crop rotation, afforesting around agricultural land etc.

CONCLUSIONS AND RECOMMENDATIONS FOR IMPROVING AGRI-ENVIRONMENTAL ASSESSMENT

- In regard with the protection of surface and groundwater and overcoming problems with their pollution are necessary milling industries which are directly related to the activity of grain producers to implement treatment plants and be able to use recycled water in the processing of grain. At the same time they must use products that are not deposited in water sources.

- Use of biofuels that emit lower quantity of emissions and renewal of machinery will impact positively on air protection. In this regard, the state support is indispensable in the form of subsidies and credits for the purchase of new equipment and modernization of farms.

Thank you for attention!