Changes in pro-environmental behaviour and its determinants during long-term period in a transition country as Lithuania

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Abstract

The changes in pro-environmental behaviour, whether people become more environmentally friendly or not, have been analysed very scarcely. Therefore, the aim of this paper was to analyse the changes in pro-environmental behaviour and its determinants in Lithuania as a transition European Union country comparing years 2011 and 2020. Applying Chi-Square and t test statistics, the results showed a significant increase in performance of pro-environmental behaviour in 2020. Waste sorting and purchase of environmentally friendly goods increased the most, meanwhile water and energy saving behaviour increased the least. Applying the value-belief-norm theory and leaner regression analysis, we analysed whether the same determinants influenced pro-environmental behaviour in 2011 and 2020. The results revealed that the impact of determinants differed. In 2020, the main factor of pro-environmental behaviour was the perception of environmental problems but not self-transcendence values dimension. Furthermore, self-enhancement values and awareness of behavioural consequences negatively influenced pro-environmental behaviour in 2020. Analysing the changes in these factors, an insignificant difference was observed in self-enhancement values. The changes in other factors were significant, particularly the changes in the level of environmental responsibility was the biggest. Therefore, implementation of environmental education and information programmes and various environmentally friendly public initiatives positively contributed to the enhancement of environmental awareness and pro-environmental behaviour.

Keywords Pro-environmental behaviour · Environmental responsibility · Environmental problems · Values · Environmental education

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1 Introduction

Authors analysing environmental impact stated that unsustainable consumption or environmentally unfriendly behaviour are related to environmental issues (Schröder et al., 2019; Paddock, 2016; Brizga et al., 2017; Vergragt et al., 2016). The pro-environmental behaviour and sustainable consumption is related to the promotion of sustainable production as converting organic waste into clean fuels (Fahmy et al. 1982, 2017, 2020). Therefore, according to literature reviews, a large number of researchers applying various theories have examined the determinants of pro-environmental behaviour and how to promote it (Farrow et al., 2017; Lange & Dewitte, 2019; Li et al., 2019; Yuriev et al., 2020). Considering that researchers have very extensively analysed pro-environmental behaviour and provided tools how to enhance this behaviour, the changes in these factors were scarcely examined. Therefore, it is of primary importance to analyse the changes in pro-environmental behaviour and to reveal whether people have become more environmentally friendly or not.

In this study we analysed the changes in pro-environmental behaviour comparing years 2011 and 2020. This study encompassed a stabilized economic period, without any disturbances of economic crisis or pandemics. In this paper, the value-belief-norm and goal framing theories were applied. In recent years, Van Riper et al. (2019), Liu et al. (2018), Hiratsuka et al. (2018), Liobikienė and Poškus (2019) and Zhang et al. (2020) also used value-belief-norm and Polhill and Gotts (2017) applied goal framing theory. Bronfman et al. (2015), Janmaimool and Khajohnmanee (2020) and Parajuly et al. (2020) stated that the value-belief-norm theory is arguably the most usable of moral theories in exploring the factors of pro-environmental behaviour. In our previous research we analysed the impact of (i) self-enhancement, (ii) self-transcendence values as well as (iii) environmental problem perception, (iv) awareness of behavioural consequences and (v) assumption of responsibility on pro-environmental behaviour in Lithuania in 2011 (Liobikienė and Juknys, 2016). The task of this paper was to prove whether the same determinants still influenced pro-environmental behaviour in 2020. It was important to analyse whether the determinants have changed during the analysed period. If the answer were positive, then policymakers should use the same tools to promote pro-environmental behaviour, if negative—policymakers should choose different ways to enhance pro-environmental behaviour. Furthermore, it was important to evaluate whether the level of determinants has changed during the analysed period and what could have contributed to these changes. The aim of this paper was to analyse the changes in pro-environmental behaviour and its determinants during a long-term (9 years) period. To the best of our knowledge, none of previous authors have analysed the changes in pro-environmental behaviour and its determinants. This study provides new insights for policymakers and evaluates the effectiveness of implementing tools.

2 Literature review

2.1 Changes in pro-environmental behaviour and its determinants

In the reviewed literature, authors have analysed short-term changes in pro-environmental behaviour over one year period or behaviour before and after implementing education programme (Chankrajang & Muttarak, 2017; Leeuw et al., 2015; Meyer, 2016). Lauper

et al. (2015) explored eco-driving behaviour over four months. Rosenthal (2018) assessed the procedural information impact on recycling over one month. Other authors, as Huber et al. (2018), analysed 5 years of longitudinal US data and evaluated changes in household recycling. Otto et al. (2019) examined changes in environmental attitude and behaviour of children. Xiao and Buhrmann (2019) investigated how environmental attitudes and beliefs supported the self-reported environmental actions and environmental policies in 1997 and 2012 in US.

Authors analysing behavioural spillover effects have taken time series data and analysed the impact of the past behaviour. A positive spillover reveals that one type of pro-environmental behaviour engages to perform additional pro-environmental behaviour. A negative spillover reduces the likelihood of additional pro-environmental behaviour (Geng et al., 2019; Maki et al., 2019; Nilsson et al., 2016). However, to analyse the changes in pro-environmental behaviour and to reveal taking into account long-term period whether people have become more environmentally friendly or not is necessary as well.

Furthermore, considering the main determinants of pro-environmental behaviour, Franzen and Vogl (2013) explored the changes in environmental concern. A large number of authors have investigated changes in climate change concern, scepticism, and perception (Bergquist & Warshaw, 2019; Capstick et al., 2015; Prati et al., 2018; Whitmarsh & Capstick, 2018) and its determinants. However, to the best of our knowledge, none of researchers have analysed the changes in determinants of pro-environmental behaviour as values, perception of environmental issues, awareness and environmental responsibility.

2.2 Value-belief-norm theory analysing the determinants of pro-environmental behaviour

The theory of value-belief-norm suggested by Stern (2000) includes the factors related to internal factors. According to this theory, values influence environmental attitudes, awareness of behavioural consequences and assumption of responsibility and contribute to pro-environmental behaviour. Considering value impact on pro-environmental behaviour, authors used two-dimensional structure: self-enhancement and self-transcendence values (Mayekar & Sankaranarayanan, 2019; Jakob et al., 2018; Punzo et al., 2019; Xu et al., 2018). These values are different and do not overlap (Alcock et al., 2017). Self-transcendence value is related to collective interest concern when people empathize for the welfare of the other people (Chan, 2019), while self-enhancement value encompasses egoistic values seeking self-benefits and concerning individual interest (Liobikiene et al., 2020; Chan, 2019). Authors have usually found that only people with self-transcendence values are more inclined to perform pro-environmental behaviour (Liobikiene and Juknys, 2016; Jakob et al., 2018; Ling & Xu, 2020; Thomas et al., 2016). Chan (2019) also stated that values related to collective wealth contribute to environmentally friendly behaviour, while self-enhancement values negatively influence this behaviour (Liobikiene and Juknys, 2016; Jacob et al., 2018). However, when different type of pro-environmental behaviour is considered, like a behaviour related to status image as purchase of green products, self-enhancement values positively influence this behaviour (Liobikiene and Juknys, 2016; Liobikiene 2020). Ling and Xu (2020) stated that individuals with greater self-enhancement values are more motivated to behave environmentally friendly, which is beneficial for individuals.

Considering perception of environmental problems, a large number of authors mainly focused on perception (or concern) of climate change impact on pro-environmental

behaviour. Authors have found that climate change concern (or perceived threat) is an important factor in actions (intentions) related to climate change mitigation (Masud et al., 2016; Lacroix and Gifford., 2018; Yu et al., 2019). On the other hand, Yilmaz and Can. (2019) revealed that concern had an insignificant effect on environmental behaviour. Kuthe et al. (2019) also showed that concern about climate change is not always related to willingness to act climate friendly among teenagers. However, in this paper as in previous our research (Liobikiene and Juknys, 2016), we expected perception of environmental problems to have a positive impact on pro-environmental behaviour.

In the literature, usually the impact of awareness of behavioural consequences on personal norms is analysed (Stern, 2000; Van. Riper & Kyle, 2014; Fang et al., 2019; Wang et al., 2019). However, authors analysing the direct impact of awareness of behavioural consequences on pro-environmental behaviour have found different results. Liobikiene and Poskus (2019) revealed that awareness of behavioural consequences significantly and positively influenced private but not public behaviour, while in previous our research (Liobikiene et al., 2016), awareness of behavioural consequences insignificantly effected pro-environmental behaviour.

According to value-belief-norm theory, environmental responsibility directly influences pro-environmental behaviour (Stern, 2000). A large number of authors have found that environmental responsibility significantly influenced pro-environmental behaviour (Zareie and Navimpour, 2016; Zhu et al., 2019; Fang et al., 2019; Liobikiene and Poskus, 2019). Liobikiene et al. (2020) and Sarkis (2017) revealed an insignificant responsibility impact on conservation behaviour, while environmental responsibility significantly influenced princely behaviour. In previous our analysis (Liobikiene and Juknys, 2016) we found that assumption of responsibility significantly and positively determined pro-environmental behaviour. Applying value-belief-norm theory in this paper, we analysed whether the determinants which influenced pro-environmental behaviour in 2011 also determined behaviour in 2020, and how these effects have changed during the analysed period.

3 Methods

3.1 Characteristics of two survey samples

In order to assess the changes in pro-environmental behaviour and its factors, the data of two surveys conducted in 2011 and in 2020 were used. The first part of the survey was conducted from 8 to 17 April 2011 when 1011 Lithuanian residents were interviewed. The second part of the same survey was conducted in the period from 10 January to 1 February 2020 and 1027 Lithuanian citizens were interviewed. These periods of time encompassed stabilized economic period, without any disturbances of economic crisis or pandemics. In 2020, the survey was conducted before the coronavirus pandemic. Thus, this analysis revealed how implemented environmental information and education programmes contribute to changes in pro-environmental behaviour and its determinants.

Both surveys were carried out by market analysis and research group 'RAIT' ['RAIT' has confirmed that surveys meet the relevant quality requirements of ESOMAR (European Public Opinion and Market Research Associations)]. The same target group of the Lithuanian population by age was used in both periods. Representative probabilistic sampling was used to select 15–74 years respondents, estimating on proportional distribution of the population by age and sex. As we see from Table 1 where the demographic characteristics

Table 1 Demographic characteristics of surveys in 2011 and 2020

	Percentage (number) 2011	Percentage (number) 2020
<i>Gender</i>		
Male	47 (477)	48 (491)
Female	53 (534)	52 (536)
<i>Age</i>		
15–24	16 (162)	12 (121)
25–34	12 (117)	20 (200)
35–44	17 (177)	15 (157)
45–54	19 (191)	18 (188)
55–64	17 (173)	21 (215)
65–74	19 (191)	14 (146)

are presented, these characteristics are rather similar. The statistical error of the data is 3% and the confidence interval is 95%.

3.2 Questionnaire scales

In this paper we used the same scales as in our previous research (Liobikiene and Juknys, 2016). Answers to the questions were ranged based on the Likert four-point scale from 1 (completely unimportant/strongly disagree) to 4 (very important/strongly agree). Analysing the value impact, we applied two-dimensional structure: self-enhancement and self-transcendence value dimensions. The scale of 'Perception of environmental problems' encompasses all environmental problems, including local and global problems. 'Pro-environmental behaviour' scale measured conservation, green purchase and recycling behaviours, referring to Zhao et al. (2014); Rodríguez-Barreiro et al. (2013). The internal reliability of the all scale items in both surveys was calculated using Cronbach's alpha. As we can see in Table 2, the values of Cronbach's alpha are rather similar in both years. The values of Cronbach's alpha 0.5–0.75 and <0.75 reveal a generally acceptable, respectively, moderate and highly reliable scale (Hinston et al., 2004). Therefore, the scales are stable and well-constructed.

3.3 The statistical analysis of the proposed model

In order to assess the changes in pro-environmental behaviour and its determinants the Chi-Square statistic was applied. This statistic is applied to assess the differences between dichotomous and ordinal variables. Analysing the changes in pro-environmental behaviour, perception of environmental problems, self-enhancement and self-transcendence values means, *t* test was applied. The *p* value < 0.05 was considered to be significant.

To reveal whether the same determinants influenced pro-environmental behaviour in both years 2011 and 2020, the leaner regression analysis was applied. We analysed the impact of (i) self-enhancement and (ii) self-transcendence values, (iii) perception of environmental problems, (iv) awareness of behavioural consequences and (v) environmental responsibility on pro-environmental behaviour. In previous research (Liobikiene and

Table 2 Questionnaire items used in the surveys and reliability analysis

Scales/items	Cronbach' alpha in 2011	Cronbach' alpha in 2020
Self-enhancement values	0.72	0.7
Public recognition		
Material wealth		
Authority		
Career		
Individual work		
Variety and exiting life		
Self-transcendence values	0.68	0.63
Tradition		
Clean environment		
Wealth of all people		
Family wealth		
Thrift		
Perception of environmental problems	0.91	0.88
Environmental pollution is dangerous for people's health		
Water pollution is a very important problem		
Air pollution is a very important problem		
Landscape destruction is a very important problem		
Waste problem is a very important problem		
Climate change is a very important problem		
Resource depletion is a very important problem		
Acid rain is a very important problem		
Pro-environmental behaviour	0.77	0.7
Wash clothes when washing machine is full		
Bring one's own bag when going shopping		
Switch off lights when leaving the room		
Use energy-saving light bulbs		
Turn off the tap while brushing your teeth		
Buy energy saving appliance		
Buy environmentally friendly foods		
Sort waste		
Buy environmentally friendly household goods		

Juknys, 2016), the demographic characteristics were included. In this paper, we excluded these variables, because we only focused on variables which can be influenced by environmental education and other programmes. Both models were estimated using ordinary least square regression and revealed which factor influenced pro-environmental behaviour directly and the most. All preconditions of regression analyses were checked. The

normality and collinearity diagnostics revealed that models are suitable. Standardized beta coefficients and t values showed which factors and how influenced pro-environmental behaviour.

4 Results and discussion

4.1 Changes in pro-environmental behaviour

Comparing the performance of pro-environmental behaviour in 2011 and 2020 in Fig. 1, we see that Lithuanian people in 2020 became more environmentally friendly and they were more frequently inclined to perform all types of pro-environmental behaviour. The difference between pro-environmental behaviour in 2011 and 2020 was statistically significant. The biggest change was observed in waste sorting behaviour. In 2011, respondents remarked that from all pro-environmental behaviours they sorted waste the least. Meanwhile, in 2020, a large share of respondents stated that they sort waste often or always. The main reason for citizens to sort waste more could be that during the analysed period the waste recycling has been highly developed. In Lithuania, there are well developed recycling and composting facilities in most areas. Even people in rural area have containers and can sort waste more conveniently. These tools of sorting promotion were the most preferred in Lithuania (Minelgaite and Liobikiene, 2019). Furthermore, people were more informed about waste problems. During analysed period, vast educational programmes of why and how to sort waste were implemented in kindergartens and schools. Thus, the waste policy in Lithuania has been successfully developed and the increased performance of sorting behaviour has been evaluated very positively.

In 2020, a high increase in the purchase of environmental-friendly household goods, energy saving appliances and usage of energy-saving light bulbs was observed. The latter behaviour respondents performed most frequently in 2020. The increased performance of these behaviours could be related to implementation of stricter standards on energy

Fig. 1 The tendencies of pro-environmental behaviour in 2011 and 2020

appliances and bulbs. To buy not energy-saving bulbs in Lithuania is almost impossible. Energy-saving appliances are also popular in Lithuania, and producers are mostly focused on the production of environmentally friendly appliances. During recent years, the chemical household goods were most criticized and people seeking to live healthier changed their habits and began to purchase more environmentally friendly and health-friendly goods. However, despite the high increase in the purchase of these products, this type of behaviour remains the most problematic, and people are not very inclined to buy environmentally friendly household goods. The increase in purchase of environmentally friendly food comparing with household goods was lower (Fig. 1). The growth of environmentally friendly food purchase could be related to the fact that due to successful EU Cohesion policy people became richer and had higher incomes. Furthermore, the supply of green food increased as well as eco-farming increased in Lithuania. However, respondents were the least inclined to buy environmentally friendly food in 2020.

The conservation behaviour performances as ‘turn off the tap while brushing teeth’, ‘bring one’s own bag to the shop’, ‘switch off lights’ and ‘wash clothes when washing machine is full’, changed the least comparing 2011 and 2020, particularly the latter behaviour. These behaviours in 2011 were performed the most frequently. In 2020, the same tendencies were observed, particularly concerning the conservation behaviour related to water saving (Fig. 1). These types of behaviour are attributed to habit and are not very easy to change (Liobikienė et al., 2020). However, it is positively evaluated that people are inclined to save water even when they become richer. Lithuanian citizens also rather often noticed that they bring their own bag when going shopping. This tendency is related to the fact that markets and shops are willing to reduce the purchase of plastic bags and instead offer to buy durable linen (cotton) bags, which are rather expensive. Thus, people are more motivated to bring their own (durable and fashionable) bag to the shop. The change in the performance of ‘switch off lights when leaving the room’ was one of the smallest as people were not inclined to perform this behaviour frequently in 2020. This result shows a rebound effect, when people using energy-saving bulbs are not inclined to save energy switching off the light. On the other hand, it could be related to the fact that switching off the light when leaving a room for the short time is ineffective and producers suggested doing it only if we leave the room for a long time.

4.2 Factors of pro-environmental behaviour in 2011 and 2020

To evaluate whether the factors of pro-environmental behaviour changed or not, we applied the regression analysis and analysed the same factors in both year 2011 and 2020. We analysed the impact of values, perception of environmental problems, awareness of behavioural consequences and environmental responsibility on environmentally friendly behaviour. From results presented in Table 3 we see that according to models’ summary in 2011 its explanatory variables account for 13.6% of the variance, while in 2020 for 22.5% of the variance. Therefore, the model in 2020 was more suitable.

In 2011, we found that self-transcendence value orientation influenced environmentally friendly behaviour the most. Perception of environmental problems was the second determinant which contributed to pro-environmental behaviour. The impact of environmental responsibility was the least. Thus, self-enhancement and awareness of behavioural consequences negatively but insignificantly influenced pro-environmental behaviour. In 2020, the impact of determinants was different. The perception of environmental problems became the most important factor contributing to pro-environmental behaviour.

Table 3 Regression results of pro-environmental behaviour in 2011 and 2020

	Standardized coefficients 2011			Standardized coefficients 2020		
	Beta	<i>t</i>	Sig	Beta	<i>t</i>	Sig
(Constant)		5.859	<0.001		12.321	<0.001
Self-enhancement	−0.017	−0.528	0.597	−0.093	−3.110	0.002
Self-transcendence	0.223	6.584	<0.001	0.249	7.342	<0.001
Perception of environmental problems	0.183	5.312	<0.001	0.254	6.957	<0.001
Awareness of behavioural consequences	−0.031	−0.941	0.347	−0.119	−3.960	<0.001
Environmental responsibility	0.107	3.212	0.001	0.117	3.347	0.001
<i>R</i> ²	0.136			0.225		

Self-transcendence value dimension was the second factor which influenced pro-environmental behaviour. Environmental responsibility in 2011 determined the pro-environmental behaviour the least. However, the effect of environmental responsibility strengthened in 2020. Self-enhancement values and awareness of behaviour consequences in 2020 negatively and significantly influenced pro-environmental behaviour. Therefore, despite that in 2011 the impact of these factors was insignificant, in 2020 it was big enough to decrease the performance of pro-environmental behaviour (Table 3). Considering the environmentally friendly behaviour in general, we confirmed findings of other authors that self-enhancement values negatively influence pro-environmental behaviour (Liobikiene and Juknys, 2016; Jacob et al., 2018; Evans et al., 2013). The awareness of pro-environmental behaviour consequences also negatively influenced pro-environmental behaviour. In our previous study (Liobikiene and Juknys, 2016) we interpreted these results that the gap between awareness of behavioural consequences and behaviour occurred due to the lack of environmental knowledge about real behaviour impact, time, money, etc. However, this study corrected our interpretation. We found that people who declared that their behaviour did not contribute to environmental issues were more inclined to perform pro-environmental behaviour and vice versa, people who declared that their behaviour contributed to environmental impact behaved environmentally unfriendly. To sum up, it revealed that people understand that behaving more environmentally friendly they would reduce their personal environmental impact. The promotion of awareness of behavioural consequences is important because, as Stern (2000), Hansla et al. (2008), De Groot and Steg (2007), Liobikiene and Juknys (2016) and Steg (2014) stated, it is the main prerequisite for the assumption of environmental responsibility.

4.3 Changes in determinants of pro-environmental behaviour

The value dimension impact on pro-environmental behaviour is important. However, our study revealed that values are rather constant. Considering self-transcendence values, changes in family wealth and wealth of all people from 2011 to 2020 were insignificant. The biggest change was observed of tradition value and it influenced that self-transcendence values differed in 2011 and 2020 significantly. Therefore, the globalization process reduces the following of traditions. The fast economic growth and consumerism during analysed period also statistically significantly decreased the thrift value. The clean environment in 2020 became more important than in 2011 (Fig. 2(left)). It can be

Fig. 2 Tendencies of self-transcendence (left) and self-enhancement (right) values in 2011 and 2020

related that people understand more about the value of clean environment and its influence on people's well-being.

Considering the self-enhancement, all values (except material wealth) of this dimension differed statistically significantly. From 2011 to 2020, the public recognition and authority value became significantly reduced but career, individual work and varied and exciting life increased significantly with the latter dimension increasing the most. It is related to enhanced ability to travel and spend more money on entertainment. Altogether, the changes in self-enhancement values were insignificant (Fig. 2 (right)). Our study confirmed that values are rather constant as was stated by other authors (Brown & Kasser, 2005; Hansla et al., 2008; Papagiannakis & Lioukas, 2012; Stern et al., 1995; van der Werff, 2013; Van Riper & Kyle, 2014).

The perception of environmental problems increased significantly comparing 2011 and 2020. The biggest increase was observed in perception of waste problem and water pollution. The information about waste and increase in landfills was disseminated the most during the analysed period. Furthermore, all environmental education programmes were mainly focused on waste management. The increased importance of water pollution is related to the fact that in the last year several scandals occurred in Lithuania, related to water pollution from big producers as 'Grigeo', when Curonian Lagoon was polluted. An increased pollution of rivers was also observed. All these scandals were uncovered by active public. Therefore, water pollution was the most important problem in 2020 in Lithuania. Other local environmental problems as air pollution, landscape destruction and waste problems, which increased as well, were important problems in Lithuania. Therefore, we confirmed findings of our previous research and other authors that local environmental problems remain more important comparing to regional or global problems (Liobikienė and Juknys 2016; Nistor, 2008, Zsoka et al., 2013).

The importance of climate change increased in Lithuania also rather highly. Despite the increase in information provision about climate change, this problem is evaluated rather low in Lithuania. Out of all analysed environmental problems climate change, acid rain and resource depletion were evaluated as the least important environmental problems (Fig. 3). The low importance of climate change could be related to the occurrence of 'psychological distance' (Broomell et al., 2015) described in detail by Brügger et al. (2015) and McDonald et al. (2015). Climate change is an abstract phenomenon, which is difficult to assess and not always related to personal experience (Weber, 2015; Van der Linden et al., 2015). Therefore, people are not interested in this problem. In 2011, environmental pollution as a danger for people's health was evaluated the highest. However, analysing the differences between 2011 and 2020, this change was the least as compared to other environmental problems (Fig. 3). Therefore, in Lithuania the

Fig. 3 Changes in importance of environmental problems in 2011 and 2020

environmental quality did not worsen very much and the situation did not become very dangerous for people's health.

In 2011, the awareness of behavioural consequences was the lowest, when only about 14% of respondents stated that they absolutely agree that their behaviour contributes to environmental issues (Liobikienė and Juknys, 2016). In 2020, a significant increase in awareness of behavioural consequences was revealed (Fig. 4). People got more informed about the consequences of behaviour. In 2020, 22% of respondents stated that they absolutely agree that their behaviour is related to environmental problems.

Analysing the environmental responsibility in 2011, people mostly attributed responsibility of environmental problems solution to industry and government, but not to themselves (Liobikienė and Juknys, 2016). In 2020, the situation remained the same (Fig. 4). Respondents remarked that government and industry are most responsible for solving

Fig. 4 Changes in awareness of behavioural consequences and attribution of responsibility for solutions to environmental problems

environmental problems. However, the personal environmental responsibility increased the most and almost achieved the level of responsibility attributed to industry and government. These tendencies are evaluated very positively. The growth of environmental responsibility is required seeking enhancement of pro-environmental behaviour. The increase in environmental responsibility could be related to the fact that citizens noticed the failure of government to solve environmental problems. In the face of scandals, citizens noticed that industry seeks more the profit but not better environmental standards. Furthermore, the emergence of various environmental initiatives as 'A Day without a Car', 'Let's Do It! World' or 'Earth Hour', which became very popular 5–9 years ago, could contribute to an increase in environmental responsibility. Particularly young people are most active and enthusiastically participate in these initiatives (Hayward, 2012; Poškus, 2017, 2018). The movement 'Friday for future' which was initiated by Greta Thunberg two years ago could also have influenced an increase in environmental responsibility in Lithuania.

5 Policy implications

Implementing various environmental programmes and initiatives the main target is to increase the environmental awareness and environmentally friendly behaviour of citizens. Analysing the changes in environmentally friendly behaviour, we found that respondents were more inclined to behave in pro-environmentally way in 2020 than in 2011. Thus, the implemented environmental policy, environmental information and education programmes, successfully promoted pro-environmental behaviour in Lithuania, particularly waste sorting behaviour. However, despite the high increase in purchase of environmentally friendly household goods and foods, these types of behaviour remain the most problematic. Thus, policymakers should promote green food consumption more by facilitating eco-farm certifications, increasing the supply, which can reduce the cost differences of eco and conventional products. Meanwhile, the performance of conservation behaviour increased the least, particularly switching off lights when leaving the room. Therefore, the citizens need concrete information on how to save energy switching off lights in the rooms.

Analysing the determinants of pro-environmental behaviour, the effect of environmental responsibility on pro-environmental behaviour strengthened in 2020. Therefore, the provision of information about environmental problems remains the main tool in order to enhance pro-environmental behaviour. The assumption of environmental responsibility should be enhanced as well. Respondents, who declared that they contribute to environmental impact, should be motivated by getting more knowledge about how to decrease the environmental impact and about benefits of these behaviours. Furthermore, considering that values are rather constant, environmental policymakers can contribute to the promotion of pro-environmental behaviour by highlighting and enhancing the status or benefit of these behaviours.

Considering that people are not interested in global problems, they should be more informed about the climate change, resource depletion and its consequences in particular. The level of environmental responsibility increased the most. Implementation of environmental education and information programmes, various environmentally friendly public initiatives positively contributed to the enhancement of environmental awareness. However, a small share of respondents still do not agree or partially disagree that they should be solving environmental problems. Therefore, environmental programmes should be further extensively implemented.

6 Conclusions

The changes in pro-environmental behaviour, whether people become more environmentally friendly or not, have been analysed very scarcely in literature. The aim of this paper is to analyse the changes in pro-environmental behaviour and its determinants comparing years 2011 and 2020 in Lithuania as a transition country in the European Union. Analysing the changes in environmentally friendly behaviour, we found that respondents were more inclined to behave in pro-environmentally way in 2020 than in 2011, and this difference was significant. The waste sorting and purchase of environmentally friendly goods increasing the most. Meanwhile, the performance of conservation behaviour increased the least. The change in the performance of switching off lights when leaving the room was one of the least and people were not inclined to perform this behaviour frequently in 2020.

Analysing the main factors of pro-environmental behaviour in 2011 and 2020, we applied the value-belief-norm theory. The results revealed that the impact of analysed determinants differed. In 2020, the main factor of environmentally friendly behaviour was the perception of environmental problems, but not self-transcendence values dimension. The effect of environmental responsibility on pro-environmental behaviour strengthened in 2020. Self-enhancement values and awareness of behavioural consequences negatively influenced pro-environmental behaviour in 2020. Analysing the changes in determinants of pro-environmental behaviour in 2011 and 2020, insignificant differences were observed in self-enhancement values. The changes in self-transcendence values, perception of environmental problems, awareness of behavioural consequences and environmental responsibility were significant. The level of environmental responsibility increased the most.

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