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*Wojciech Lis*



*Erika Loučanová<sup>1</sup>, Martina Kalamárová<sup>2</sup>, Miriam Olšiaková<sup>3</sup>*

## THE IMPORTANCE OF INNOVATION IN BUILDING MATERIALS IN TERMS OF SUSTAINABLE GROWTH

**Abstract:** The paper deals with the importance of innovation in building construction materials for sustainable growth focusing on assembled wooden houses. We compare the conventional building materials and innovated alternate materials used in building construction. We compare and demonstrate the advantages of these materials based on selected indicators. The results confirm the importance of material innovation for sustainable growth in all pillars of sustainable development.

**Key words:** innovation, innovated building materials, sustainable growth.

### INTRODUCTION

The concept of sustainable development deals with the economic growth covering the society requirements by creating the welfare conditions in short term, medium term but mainly in long term horizon. Demographic and economic development naturally increases the demand for natural resources. The mining, processing, usage and disposal of non-renewable resources cause a wide range of environmental problems such as the increase in waste and emissions. Generally applied methods for assessing the business performance such as product life cycle analysis, portfolio analysis or material flow analysis are the tools helping to analyse and manage the processes and subsequently influence the impact on environment. Long-term sustainable development will then result in optimizing the use of resources, information flows, improving communication between the offer and everybody in the chain, increasing coordination and cooperation, as well as education of individual stakeholders in the sector. Constant innovation of approaches to corporate social responsibility support the continual commitment to contribute to the sustainable development. It secures company competitiveness on the global market with the help of innovations of individual key elements adapted to customers and the trend in world markets in applying the principles of sustainable development and environmental protection.

The European Union accepted the Strategy of sustainable development in order to enforce the sustainable development principles in different sectors. This is a strategy that is based on the assumption of an increase in the effort to meet current needs so as not to endanger the possibilities of continued growth for the next generation. Its goal is to ensure high level of environmental protection, social equality and economical prosperity. The strategy is based on the need to change the society in various spheres such as more responsible consumption, detection of new and sustainable forms, strengthening the economic growth, new alternative sources of energy, use of smart natural resources, more effective transport and global society, what implies the involvement of all actors of social life. Each principle is moving to national level and to each society. National strategy of sustainable development (MINZP SR, 2005) stated solving of the issues in the field of environment, agriculture, trade, production, science and technologies and fiscal policy on macroeconomic level. In particular, it focuses on achieving sustainable economic growth, employment and raising the standard of living while maintaining financial stability in connection with global sustainable development. Within the priorities to ensure the above principles, an environmental strategy is presented to implement sustainable country policies with an emphasis on

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cooperation in the area of institutional and personnel capacity building and technology transfer. Sustainable development securing is actually one of the priorities of European Union policy. Cardiff Initiative of Council of Europe proposed to apply the two-pillar model of sustainable development. It was supplemented by the third pillar, socio-economic, at Lisbon Summit in March 2000, in order to ensure the integration of environmental policy with economic policy. The effort to introduce a new economy based on higher competitiveness and the dynamics of knowledge is included among other strategic objectives of the strategy. Subsequently, the Sustainable development strategy proposal "Sustainable Europe for a Better World" was developed. It focuses on 6 priority issues – climate change, negative impacts on population health, increasing pressure on the use of natural resources, poverty and social disparities, population dynamics and environment pollution. The dominant sectors are: agriculture, energy, transport, industry and tourism, whose development is not taken into account without regard to environmental conditions and perspectives (Loučanová a kol, 2014).

In total the environmental requirements in innovative product management in relation to corporate social responsibility (CSR) based on the principles of sustainable development are implemented through the program of environmentally oriented management (Kollár V., Brokeš P. 2005). By means of environmentally oriented management of product portfolio it is necessary to realize activities which help to overcome the contradictions among market, society and environment. Therefore the companies make the most of their efforts to improve the environmental performance of their products. The environmental performance of the product evaluates its environmental considerations at all stages of its life cycle, from procurement of materials, research and development, production, distribution, use, disposal and recycling. The company takes into account also social and economical aspect during the environmental performance assessment for more secure product use by consumer when creating added value of a product. The connection of innovation product management and corporate social responsibility when applying environment protection creates the system of environment management based on three pillars – product environment performance, innovation quality for customer and added value of the product (Figure 1).

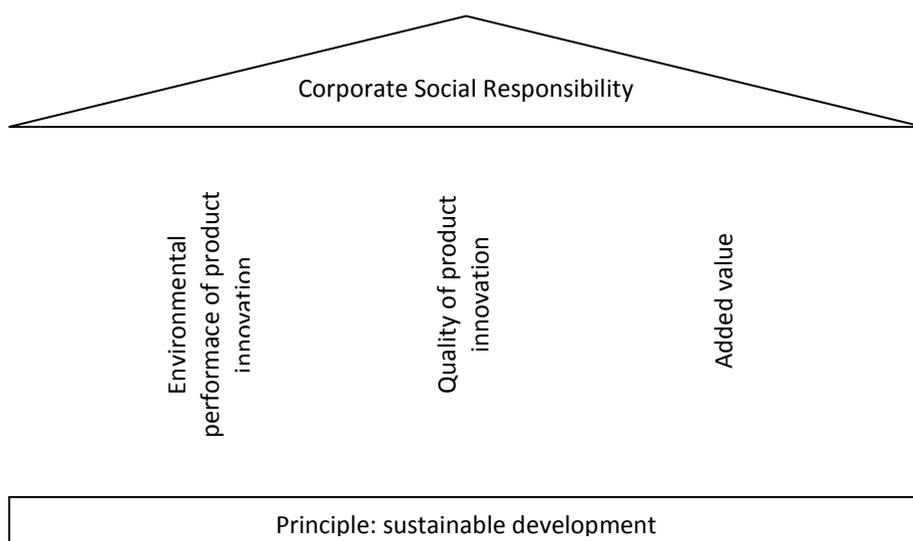


Figure 1. Pillars of corporate social responsibility based on the principle of sustainable development

Sustainable development is a strategy of development based on sustainable sources use within the increasing importance of socio-economic approach. It concerns also environmental issues with regard to development of quality social conditions and society. Innovation product management and CSR based on sustainable development represent the continuity of product innovation with environment oriented strategy of the company for ensuring a long-term perspective on the market. These modern approaches to system management and innovation activities assessment lead to creation of a product respecting responsibility. It helps to create complex system which definitely ensures environmental sustainability as well as socio-economic development.

The role of innovation in this effort will be explained in this paper, which aim is to evaluate importance of innovation of material for building construction in terms of sustainable growth.

## METHODS

The analytical-synthetic method was used to examine the importance of building materials innovations for sustainable development with a focus on wooden assembled buildings. The analysis was conducted according to *heat transfer coefficient (U)* and *thermal resistance (R)* of analysed materials for building construction. Subsequently, through the comparison of the obtained data, the significance of the innovations for sustainable growth at the level of all three pillars ensuring the integration of environmental policy with economic policy was identified.

## RESULTS

The comparison of material characteristics was used for demonstration of the innovation importance for sustainable growth from the perspective of materials for buildings construction, see Table 1.

Table 1. Comparison of analysed characteristics of materials for building construction

Monitored variables	Masonry buildings				Wooden buildings	
	Ferro-concrete	Brick - full	Brick - perforated	Inovovative material YTONG – insulated/ non-insulated zateplený/ nezateplený	Wood	Assembled building structure
R m <sup>2</sup> K/W	0.31	0.35	0.47	7.42/3.45	2.67	7.45
U W/(m <sup>2</sup> K)	3.23	2.86	2.14	0.14/0	0.37	0.14
Difference in contrary to innovated material YTONG	-3.09/-3.23	-2.72/-2.86	-2.0/-2.14	0	-0.03	0
Difference in contrary to assembled building structure	-3.09	-2.72	-2.0	0	-0.03	0

Source: Vajová, 2016

Regarding the results presented in Table 1, the most suitable construction materials are the innovated ones – innovated construction material YTONG and assembled buildings, which achieved much better values in the monitored indicators compared with the traditionally used

materials. Traditionally used materials, such as ferro-concrete, full or perforated brick have high values of heat transfer coefficient and therefore are less cost efficient in contrary to innovated materials (difference  $-2.72 \text{ W}/(\text{m}^2\text{K})$  between full brick and innovated material, difference  $-2 \text{ W}/(\text{m}^2\text{K})$  between perforated brick and innovated material).

Furthermore wood as a construction material achieves significantly better values than the original materials used for building construction and, compared to the innovated material YTONG has minimal differences, but positive. According to that we can state that building materials innovations are of great importance for sustainable growth as they act economically, as demonstrated by the savings of the heat coefficients of the innovated materials against the traditionally used materials. At the same time, these innovations also fulfil the ecological function by saving energy for heating the buildings where innovated materials are used, due to lower heat transfer coefficient and thermal resistance. Additionally, wooden assembled buildings, in contrary to innovated material YTONG, are constructed from heterogeneous natural material, which is more consistent with nature. Moreover, less energy will be used to produce these innovated materials than to produce original materials used for building construction, what is making these innovated materials more environmentally friendly (zdravydom.sk). Owners of buildings from innovated materials can use economic savings from operating these buildings for other purposes and because of a much shorter construction time the social aspect of sustainable growth is fulfilled. It can be concluded that the innovations of building materials are of great importance for sustainable growth and wooden assembled buildings that underline even more.

## CONCLUSION

Innovation, as well as sustainable growth has a very important role in the current market economy. Sustainable growth is still an evolving and important component in a globalized world. It is built on three pillars, economic, social and environmental. Based on our findings, we can state that buildings from innovated materials are more affordable, thus fulfilling the economic aspect of sustainable growth. In addition to the price, however, a number of positive aspects can be mentioned. It is a considerable saving of time compared to the construction of buildings from the traditionally used materials, significant thermal resistance of the walls, almost half the thickness compared to the classical wall, which increases the useful area, the energy saving, fulfilling the social aspect. As the innovated building materials are health and environmentally friendly, also environmental aspect of sustainable growth is fulfilled. Thus, we can conclude that innovations are of great importance for sustainable growth in terms of building materials.

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*Irena Bekier*<sup>4</sup>

## **SOCIAL PERCEPTION – HOW PEOPLE PERCEIVE EACH OTHER**

**Abstract:** The article analyses the theory of perception of human behaviours in the context of contacts between staff members and clients. It presents the psychological mechanisms and barriers which cause intensified deformations of perception. The article analyses the role of first impressions in contact with clients, the attribution process and attribution errors. It describes methods of controlling perception and understanding people better. The article stresses the importance of knowledge, improvement of social skills and development of empathy in order to limit and eliminate deformations of perception and create conditions for better communication and cooperation.

**Keywords:** perception, perception errors, first impression, attribution, attribution errors, controlling perception, empathy

### **INTRODUCTION**

One of more important human skills is the perception of people's behaviours, understanding their causes and consequences for interpersonal relations. The ability to understand one's own behaviours, being aware of their influence on the reactions of individuals and seeing how other people influence us are equally important and very difficult skills in interpersonal contacts. This social perception of people, their mental states and personal traits in a broad sense takes place during the process of interaction between them. In many occupational situations, e.g. in contacts with clients, adequate perception has fundamental influence on interpersonal relations and communication. However, it is necessary to be aware of the fact that the perception of other people is a complex and selective process [Hartley 2006]. This means that we evaluate other people and give opinions about them too soon and too hastily. Human perception is a subjective process – we perceive others through the prism of our earlier experience. We become deluded, being guided by superficial first impressions as well as seeing and hearing what we like. It is so because we need to confirm that the information present in our mind is in agreement with the information received [Adler et al. 2007]. Errors and deformations of perception become more intense because of different physiological, cultural, social and psychological factors [Adler et al. 2007].

Among these factors there are negative stereotypes of a shop assistant, clerk or difficult client, which affect our attitude and behaviour towards these people. It is necessary to distinguish between a client's negative attitude to a particular institution, company or a category of services and the attitude to a particular individual. It is an important problem, because when one's job involves regular contacts with clients, where it is necessary to assess people and cooperate with them, inadequate perception may cause negative consequences. It is particularly important when it is necessary to assess a client's credibility and understand the motives of their conduct. These are essential elements in a job involving client service.

Social psychologists have revealed that the process of perceiving people entails numerous errors and deformations, where first impressions are particularly important [Leary 2003].

First impressions are made during the first seconds of contact e.g. with a client. During this short time a person's image is formed. It is long-lasting, resistant to change and it strongly influences an individual's behaviour. The first impressions experienced by a client contacting a staff member are very important. Therefore, they should not be ignored. On the contrary, it is necessary to take due care so as to guarantee that the first impressions are as good as possible. Therefore, it is worth remembering that a person's image is based on the following elements:

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- external features (appearance),
- generally acceptable good manners,
- neat surroundings in a place where the client is met (it expresses one's attitude to the client and their own business).

A staff member represents the company and makes the first impression on the client. Therefore, it is necessary to make sure that the client is well served at the very moment they have contact with the company. A professional client-oriented attitude and behaviour should be manifested by the following reactions:

- paying attention to the client,
- establishing eye contact,
- open body posture,
- using simple words, which are easy to understand,
- smile,
- nice tone of voice,
- voice modulation,
- relaxed speech tempo,
- maintaining appropriate distance in space.

The client registers not only what they can hear but also what they can see. Apart from words spoken, an individual also sends signals through their body language and vocalisation, usually not being aware of this fact [Sobczak-Matysiak 1997].

The role of first impressions in the creation of another person's image is indicated not only by common observations but also by numerous results of studies. Scientific research has revealed that people tend to make attributions. It means that they try to draw conclusions about human behaviours, their causes, emotional states and traits of personality. This complex cognitive process consists in attributing a specific meaning and motives to a particular person and their behaviour [Stewart 2014].

The human tendency to go beyond available data and observations in contact with other people causes a large number of attribution errors, including [Crips 2015]:

- concentration on an external situation without noticing the causes of another person's behaviour (e.g. tapping one's fingers on a desk is perceived as a sign of being in a hurry rather than as a bad manner or being nervous),
- underrating the influence of one's own behaviour on another person's behaviour (e.g. a client's excessive compliance or aggressiveness is largely the consequence of a staff member's behaviour and situational context),
- individual differences between people's private concepts of personality and its traits (so-called hidden theories of personality). People often consider what is in their minds rather than their observations of another person's behaviour [Argyle 1999],
- the effect of first impressions, which consists of the influence of first information on our perception of another person and their resulting behaviour. According to R. Rosenthal & L. Jacobson, we can observe not only the effect of first impressions but also the effect of a self-fulfilling prophecy. For example, the information that the client appreciates us and our company makes us treat them in a more rewarding and encouraging manner than other clients [Aronson et al.1994]. The presence of these mechanisms explains why two people may perceive a particular client in a completely different way. Although they currently have the same information about the client, but their first impressions were different,



- the halo effect is another example of deformation of the perception of other people. The effect can be positive or negative. It is positive when one positive trait (e.g. one's good image) causes us to attribute other positive traits to this person (e.g. high intelligence). A negative halo effect occurs when finding one negative trait in a person (e.g. obesity) causes us to attribute other negative traits to this person (e.g. laziness) [Argyle 1999].

The halo effect has double significance in contacts with clients. It is necessary to be aware of the reciprocal nature of first impressions and the tendency to formulate reciprocal assessments. It is possible to make errors of perception and hasty generalisation. It is worth remembering that the effects of deformed perception of other people have unconscious nature and positive or negative traits can be unfoundedly attributed to other people. The knowledge of this fact may prevent serious errors in assessing clients and prevent the consequences of these misjudgements.

Distorted perception also affects communication. It is the main argument that speaks in favour of learning the methods of controlling perception and better understanding of other people.

Social psychologists indicate the following two tools:

- control of observations,
- development of empathy.

Control of observations is a method of sharing one's interpretation with others. Full control consists of three elements: description of behaviour, giving two possible interpretations of this behaviour and asking for explanation how to interpret it. Control of observations is an example of a cooperative approach to communication, because apart from improved adequacy of perception, it also signalises the attitude of respect and concern about another person, e.g. 'I don't know if you're kidding or serious.' [Adler et al. 2007]. Control of observations makes the process of information decoding more adequate. However, it does not provide enough information to understand another person fully. Full understanding requires another ability, i.e. empathy. It is defined as the capacity to reconstruct another person's frame of reference and experience the world from their point of view [Adler et al. 2007, p. 94].

There are three dimensions of empathy:

- intellectual (related with a change of perspective) – it is the ability to adopt another person's point of view,
- affective (related with emotions) – it is the ability to experience the same feelings due to the spreading of emotions,
- concern for another person's good.

It is very important for the person who is perceived empathically that there is someone who shows concern for them, listens to them and does not make judgements. This is how they can learn to trust other people, improve their self-esteem and in consequence, it is possible to find and keep one's clients [Adler et al. 2007, pp. 96-98].

## CONCLUSIONS

Mutual perception and understanding is a serious challenge. Physiological deformations, psychological barriers and sociocultural conditions create distance between people. However, the knowledge and improvement of psychosocial skills, the development of empathic capacity and the determination to level deformed perceptions favours building bridges of understanding between people. It is the only way to achieve appropriate and satisfying interpersonal relations.

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*Irena Bekier*<sup>5</sup>

## STRESS AND STRESS MANAGEMENT STRATEGIES

**Abstract:** The article discusses the problem of stress and the possibilities of its effective management. The author presents definitions of stress, presents stressful situations and explains why not all difficult situations become stressors. The article describes people's characteristic reactions to stress and lists symptoms of stress. It indicates that one's well-being and functioning depend on the level of stress and discusses the consequences of stress. The author explains how to cope with stress, characterises stress management strategies and points to the need to take preventive actions to eliminate excessive psychophysical overload and to create adequate health and safety conditions in one's work environment as these elements are frequent sources of stress and stressful situations.

**Keywords:** stress, difficult situations, stress symptoms and levels, resistance, stress management strategies

### THE CONCEPT OF STRESS

The term 'stress' was introduced to science by Hans Selye, the biologist and physicist who defined it as 'a non-specific response of the body to any demand placed upon it' [1]. The definition was widely accepted. However, there still is not one, generally recognised stress theory in psychology. T. Kocowski defines stress as a complex of interrelated processes in the organism and nervous system, which is an individual's general reaction to stimuli and extraordinary, difficult, dangerous, unpleasant and harmful situations, aka stressors [2]. Thus, we can assume that stress is a state of the organism resulting from overload of the nervous system due to exposure to harmful factors.

Both in psychology and related sciences the term 'stress' usually refers to two meanings:

- the biological approach – a complex of physiological changes in the organism caused by stressors,
- the psychological approach – changes in psychological mechanisms and activities resulting from various difficult situations [3].

Although both meanings refer to a different range of reactions of the organism, they are closely related. They make the basis for the psychophysiological nature of stress.

### STRESSFUL SITUATIONS AND CHARACTERISTIC REACTIONS

In many cases difficult situations may cause stress. The induction of stress depends on numerous factors, such as one's experience, type of the nervous system, state of health and personality, e.g. self-esteem, level of optimism, internal control, hierarchy of values and structure of needs. The following difficult situations can be classified as stressful:

- deprivation – when one's biological and mental needs are blocked,
- frustration – when there is an obstacle complicating the achievement of one's goal,
- pain – when an individual can feel physical or mental pain,
- danger – when one might lose valuable things,
- motivational conflict – when one needs to make a choice and the choice of one value causes the loss of another or involves unpleasant experience,
- overload – when one is not in good psychophysical condition and cannot achieve one's goal for this reason,

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- complications – when there are no instruments or tools to do the task.

Each stimulus causing a stress reaction is called a stressor. However, it is also important why a stimulus becomes a stressor. Sometimes it happens so as a result of cognitive interpretation, i.e. through the significance given to the stimulus. Otherwise, a stimulus becomes a stressor as a result of a sensory or metabolic process, which is stressful by nature. People react to the environment according to their own interpretation of the stimuli they experience. According to H. Selye, it is not important what is happening to us, but how we take it [4].

Stress is a process which consists of phases. We can distinguish the following three phases:

- a) the alarm phase – a state of tension disorganising one's behaviour develops in response to a stressful situation. The following reactions are possible, depending on the character of emotions experienced:
  - stupor – inhibition of activity,
  - aggression – physical or verbal aggression is targeted at people, objects or oneself. Destructive behaviour might be aimed at the source of the situation or shifted to the objects which give a possibility to ease one's tension relatively safely,
  - escape – moving away from the source of the situation, e.g. by doing other activities
  - fixation – persistent repetition of an activity that does not produce the expected effect,
  - regression – behaviour characteristic of earlier phases of development, e.g. an adult kicks a closed door.
- b) adaptation – long duration of a stressful situation or its recurrence results in making attempts to learn to manage it. These could be defensive actions, which reduce tension and fear. The use of energy resources and defence mechanisms enables adaptation to higher requirements.
- c) exhaustion – further duration of the same stressor or the emergence of others as well as the lack of a tension-reducing strategy causes a decrease or depletion of energy and defence resources. It results in negative consequences.

As is commonly noted, stress has negative features, but it is also noteworthy that there are some positive aspects of stress as well. H. Selye distinguishes between constructive and destructive stress. He claims that not all types of stress are harmful. Stress could be a positive strength providing motivation and causing improvement in one's subjective assessment of the quality of life. The author describes positive stress as 'eu-stress' (eu means 'good' in Greek) and negative stress as 'di-stress' (di means 'bad' in Greek) [5].

## **WELL-BEING AND FUNCTIONING VS STRESS LEVEL**

Figure 1 shows how one's well-being and functioning depends on the stress level. Neither high nor low stress level is good. The optimal (medium) stress level positively affects one's well-being and it makes one's activity effective. There are individual differences between people in the optimal stress level. It depends on congenital biological conditions, e.g. related with one's resistance, as well as current physiological and behavioural conditions, e.g. one's trained efficiency [6].

### **Stress levels, their consequences and symptoms**

1. Low stress level:
  - disengagement, disinterest, energy outflow
  - sense of boredom, apathy,
  - the belief that nothing makes sense
  - depression,

- simple tasks, in objective terms, are too difficult to be done
2. Optimal stress level:
    - relaxation, energy flow,
    - self-confidence
    - interest, engagement, greater attention,
    - awareness of good functioning,
    - tasks are easy to do
  3. High stress level:
    - physical indisposition, e.g. indigestion, sweating, chills, weakness,
    - psychomotor coordination disorder,
    - slower reaction time,
    - fear and sense of confusion
    - disordered concentration and thinking

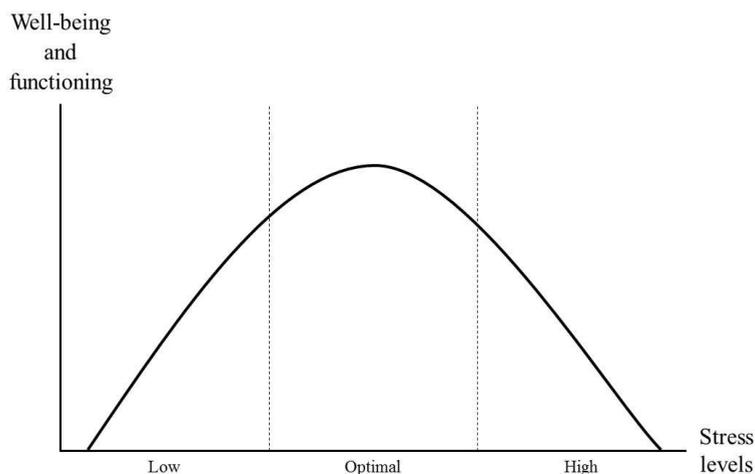


Figure 1. Well-being and functioning vs stress level

Source: S. Orłowski, *Istota i skutki stresu*, in: Sobczak-Matysiak J., *Psychologia kontaktu z klientem*, Poznań 1997.

#### Stress symptoms:

##### 1. physiological symptoms:

faster heart rate, muscle tension, sweating, headache, backache, indigestion, blood pressure changes, frequent urination, insomnia, other somatic ailments

##### 2. thinking-related symptoms:

general disinterest, schematic action, concentration disorder, memory lapses, forgetfulness

##### 3. emotional symptoms:

fear, anger, irritation, embarrassment, nervousness

#### 4. behavioural symptoms:

isolation from other people, impulsivity, speech problems, e.g. stuttering, nervous tics, shivering, high and nervous laughter, gnashing, distraction, unreasonable drug use, excessive drinking of alcohol, intense smoking, etc.

#### 5. philosophy of life:

helplessness, questioning values, changing the orientation from the future to 'here and now', impersonal approach to tasks [7].

Stress releases defensive energy in case of psychophysical overload. This alarm mechanism has been present in humans for generations. Its aim is to guarantee survival by mobilising one to escape or to fight if there is direct danger. The development of civilisation caused changes in the specificity of dangers. At present there is a much wider list of harmful stimuli and direct danger is ranked after noise, crowd, haste, fatigue, unkindness, excessive demands in the environment, growing rivalry, etc. These stimuli are commonplace and they accompany people in their everyday lives. The impossibility to ease one's tension naturally makes one's primary defence mechanism destructive. Long-lasting and recurrent stress causes psychosomatic diseases such as gastrointestinal ulceration, cardiovascular diseases, including heart attack, stroke, hypertension, gallstones and others [8].

As far as health and effective functioning is concerned, it is important to recognise stress symptoms promptly, be able to manage stress, prevent it and cope with it.

#### **Stress management**

The following factors are decisive to stress management:

- type of a stressful situation,
- stress intensity,
- the stage of development of the person experiencing stress
- a map of one's personality

People should remember that their personality is constantly developing and it may undergo creative changes. It will be possible if people are aware of the process of their activity and do not concentrate on its effect only. Self-discovery lets us achieve greater sensitivity, which is chiefly oriented at the way we act and what we do.

Many people are unable to cope with stress because they apply ineffective strategies such as:

- escape coping – escaping problems through alcohol, illegal and designer drugs, sedatives, mood-enhancing drugs, replacement activities, seeking company, escape into the world of dreams and fantasy,
- emotion-oriented coping – concentration on reducing the emotional tension, on the emotional state and thinking about the problem without taking any action.

Task-oriented coping is the most desirable – one concentrates on actions, e.g. analyses the situation, takes the right action, learns from mistakes, uses the experience of earlier effective behaviour, etc. [9].

The ability to act effectively depends on one's resistance to stress. This resistance can be increased as one gains more experience and receives special training. There are special techniques and exercises, which teach people how to manage time, think positive and set achievable goals without being emotionally overloaded. The techniques which show how to manage excessive stress are easily accessible. In practice, relaxation techniques are the most common, e.g.:

- meditation,
- autogenic training, neuromuscular relaxation,
- diaphragmatic breathing [10].

It is necessary to emphasise the fact that the ability to cope with stress can be achieved when:

- one's attitude, behaviour and lifestyle changes,
- one can control one's thoughts and speak to oneself constructively,
- one can manage time effectively,
- one understands the importance of relaxation techniques.

## **CONCLUSIONS**

Stress understood as a state of the organism caused by overload of the nervous system is one of many determinants of human health. Stress has accompanied people for ages and it has been a defence mechanism enabling survival. The continuous civilisation, technological and social development results in an increasing number of situations causing mental discomfort. It applies to many areas where people function. However, the work environment is a special place of the occurrence of stressors. This situation concerns both employers and employees. For this reason it is important for health care staff to be aware of the problem of stress at work. Stress may cause diseases and health problems related to work. However, it may also considerably influence the final result of the activity of a particular organisation. According to prognoses, we can expect that the role of appropriate working conditions will be increasing so as to ensure health and safety at work [11].

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## COMMUNICATION INFRASTRUCTURE AND FOREIGN DIRECT INVESTMENTS INFLOW INTO THE REGION

**Abstract:** The goal of this study is to specify correlation between enrichment of communication infrastructure of individual voivodeships and foreign direct investment inflow. In the first part of this article direct investments were characterized and communication infrastructure was shown as a factor of FDI location. In the second part of this article, on the basis of statistical data, a correlation between the level of communication infrastructure development and foreign direct investment inflow in individual voivodeships in years 2011-2015 was examined.

**Key words:** foreign direct investments, communication infrastructure.

### INTRODUCTION

Extension and modernization of individual elements of communication infrastructure is one of the means to increase the attractiveness of a country (region) not only to domestic investors but also to foreign entities. It is very important due to the fact, that inflow of foreign financial resources and capital goods has become a central driver of many modern economies. Generally, one can distinguish two types of foreign investments, indirect (they are characterized by acquisition of securities of a participating nature and foreign debt issuers) and direct.

It seems, that foreign direct investments (FDI) are of significant matter for the development of a host country and operating there entities. They constitute nowadays a crucial sphere of conducting business entities and they are often a proof of a market maturity of business entities.

The aim of this paper is to define relations between enrichment of communication infrastructure of individual voivodeships and foreign direct investments inflow. A need for this type of research is based on the assumption, that poor infrastructure constitutes a crucial barrier in FDI inflow. Information about local attractiveness of FDI (determined, inter alia, by infrastructural investment), can be used to create strategies of FDI acquirement.

The analysis included all 16 voivodeships in Poland. A synthetic indicator of communication infrastructure level was made for this research and a correlation analysis was conducted. The main criterion of variables selection was their completeness and their availability for all entities analyzed in years 2011-2015. The main source of data describing individual elements of infrastructure and volume of FDI in individual voivodeships was Local Data Bank (LDB) of the Central Statistical Office.

### FOREIGN DIRECT INVESTMENTS

In the literature direct foreign investments do not have one commonly acceptable definition. The most often cited definitions of direct foreign investments, which are often regarded as model definitions are the definitions provided by the International Monetary Fund (IMF) and the Organization for Economic Cooperation and Development (OECD). According to the IMF definition, direct foreign investments are a category of international investments, which are made to create a lasting impact on performance of foreign business entity [*Balance of Payments Manual* 1993, p. 86]. According to the OECD guidelines [*OECD Benchmark Definition of Foreign Direct Investment ...* 1996, p. 7-8] FDI shall mean investments made by resident of one economy ("direct investor") in order to obtain a lasting interest in an enterprise resident in an economy other than that

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of the investor (“direct investment enterprise”). Lasting interest implies the existence of a long-term relationship between the direct investor and the direct investment enterprise and a significant degree of influence by the investor on the management of the enterprise. A valued threshold which allows to gain the alleged influence is to have at least 10% of ordinary shares or entitlement to the 10% voting rights.

W. Karaszewski defines direct investments as “capital investments made outside the investor’s residence country to establish there a business entity from the very beginning or acquisition of property rights from existing business entity in the degree which allows a direct participation in the management” [Karaszewski 2004, p. 19]. I. Michałków describes FDI as a form of an abroad long-term capital investment, which involves establishing a new business from the very beginning or buying out such shares, which could enable to control it [Michałków 2003, p. 48]. In the theory of economics the first type of investment is defined as *greenfield investment* and buying out the whole of a business or part of it in a degree which allows to control it is called *brownfield investment*.

Both natural and legal persons can be the investors to undertake a business entity according to the FDI in the host country. Not only big entrepreneurs (trade corporations) can be foreign direct investors in the business practice, but also smaller entities which want to improve results for the business (e.g. by lowering the manufacturing costs). Foreign direct investments can inflow to the host country in different forms. For the economy of the host country key are aforementioned *greenfield investments*. This FDI form is based on building a branch or a department abroad from the very beginning. Such measures are usually chosen by the biggest corporations with well-known brand and which are operating globally or at least regionally, because of the high costs of entering and gaining the position on market. Those entities are well prepared in terms of people and technology to operate in turbulent environment, and they are adapting their strategies to changing conditions of the environment, that their establishments are working in [Ancyparowicz 2009, p. 13]. What matters, such investments are generating a multiplier effect, which is revealed by thousands of small orders for the domestic businesses. In result they contribute to the creation of new workplaces, increase of remuneration and employees expenses and improving the occupational qualifications [Michałków 2003, p. 49-50].

Table 1. The number of business in Poland with foreign capital

Specification in years	2011	2012	2013	2014	2015
The number of entities with foreign capital	24910	25914	26128	26464	25961
The number of newly born entities	1536	1 712	1489	1369	534
Greenfields	1239	1397	1214	1104	384
The inflow of FDI (millions of PLN)	47184	40458	11459	45011	50784

Source: Self-study based on the data from the Central Statistical Office and the National Bank of Poland

In the analyzed period, the biggest percentage growth in the number of businesses with foreign capital was made in the Podkarpackie voivodeship – the growth was 36,69% (the number of businesses with foreign capital grew from 387 in 2011 year to 529 in 2015 year) and in Lubelskie voivodeship – the growth was 48% (the number of businesses with foreign capital grew from 353 in 2011 year to 460 in 2015 year). The biggest number of newly born businesses was noticed in Mazowieckie voivodeship (approx. 445) and Śląskie voivodeship (approx. 97). The greatest annual average investments costs of the businesses with foreign capital were noted in Mazowieckie voivodeship (PLN 37,43 billion) and Wielkopolskie voivodeship (PLN 8,86 billion). In the analyzed period the lowest number of businesses with foreign capital was noticed in Świętokrzyskie voivodeship (annual average was 4) and Warmimńsko-Mazurskie voivodeship (approx. 8). On annual average, the biggest number of direct investment businesses were established in the trade

industry, in the maintenance of motor vehicles industry (386) and in the manufacturing industry (191).<sup>8</sup>

Table 2. The businesses with foreign capital for each voivodeship in years 2011-2015

Voivodeship	The average number of businesses with foreign capital	The annual average investments costs of the businesses with foreign capital (expressed in million PLN)	The average number of newly born businesses with foreign capital
łódzkie	1055	2751	36
mazowieckie	9975	37426	445
małopolskie	1675	3202	88
śląskie	2368	7244	97
lubelskie	409	841	22
podkarpackie	460	2363	34
podlaskie	180	496	16
świętokrzyskie	182	998	4
lubuskie	736	909	23
wielkopolskie	2290	8857	80
zachodniopomorskie	1444	2100	52
dolnośląskie	2345	5462	82
opolskie	477	905	15
kujawsko-pomorskie	579	1249	16
pomorskie	1398	3098	49
warmińsko-mazurskie	302	372	8
Poland	25875	231894	1068

Source: Based on self-study

This may lead to the question, what are motives of businesses which are making FDI on the territory of our country. The businesses are interested in investing their capital in another country, only if it means bigger profits than having an entrepreneurship in the host country. The tendency to investment depends proportionally on the size of the achieved benefits from the capital invested in different countries. Therefore, there is a connection between location of the business and manufacturing costs, the choice of foreign investment is vital from the business's perspective [Lizińska i in. 2011, p. 192]. According to the A.Golejewska the factors, that are encouraging a given business to make FDI in a given country, could be [Golejewska 2008a, p. 21] a desire: to lower the manufacturing costs, to gain or to expand a sales market and to create better economic and social impacts of the host country. To the locational advantages of the host country, which enable businesses on foreign markets to achieve economy of scale or price advantage, we can include [Golejewska 2008b, p. 177]: spatial structure of distribution of factors in manufacturing and in sale market, quality and efficiency of productive resources and pricing of the product, transport and communication costs, the scope and nature of the state intervention, investment climate, the condition of economic, transport and institutional, etc. infrastructure, psychological distance (inter alia cultural barriers), economies of scale in the scope of research and development and in the manufacturing scope. In the literature we can find varied classifications of factors which stimulate

<sup>8</sup> Own calculations based on the data from the Local Data Bank (LDB) of the Central Statistical Office.

inflow of FDI. K. Przybylska highlights determinants, which result from motives of making FDI and determinants, which result from investment climate of the host country. She includes to the first group market determinants (i.a. market capacity), cost determinants (i.a. access to natural resources and to research facilities), efficiency determinants (i.a. possibility to cooperate with local entities). To the second group the author includes conditions of functioning of foreign businesses (i.a. regulations), improvements in running of the business (i.a. providing transport and telecommunication infrastructure for a given region) and the investment risk level [Przybylska 2001, p. 100]. In the report of United Nations Conference on Trade and Development (UNCTAD) four key groups of economic factors were distinguished, which decide about attractiveness of a given economy towards direct foreign investors, namely [*World Investment Report ...2012*, p. 30]: attractiveness of the market (i.a. size of the market, purchasing power), availability of cheap labor (i.a. unit labor costs), natural resources (i.a. resources exploitation) and accessibility of infrastructure (i.a. transport infrastructure, telecommunication infrastructure).

While analyzing factors that enable inflow of FDI, one can assume without any reservations, that investors during their decisions about localization of FDI are guided with internal factors (characteristic for given entity) and submit to individual evaluation in relation with scale of the business run, branch and the specific nature of the host country. P. Siemiątkowski notes, that at the initial phase of the process of classification of the factors determining FDI one can distinguish two groups. The first one includes factors, which decide about making a decision to invest directly abroad, and the second one includes factors, which specify ongoing business of the foreign investors [Siemiątkowski 2005, p. 332].

Many studies which analyze conditions of inflow of FDI, recognize communication infrastructure as a basic determinant of making such investments. It is often argued that well developed communication infrastructure has an impact on lowering transaction costs, increasing effectiveness of private investments, enables expanding of sales market, gives an easy access to customers and suppliers. The meaning of infrastructure as a factor, which stimulates the inflow of FDI, was confirmed by research conducted in many countries. From the Ernst&Young report [*Restart Ernst & Young's 2011 European attractiveness survey 2011*, p. 39] it results, that according to the global business leaders, well developed communication infrastructure has greater meaning than i.a. facilitating access to funding, harmonization of taxation, relieves to the labor law and cutting red tape with regard when deciding in making FDI in Europe. The analysis is similar for Cushman&Wakefield report [*European Cities Monitor 2010 2010*, p. 6], that shows the result of research conducted in year 2010 among 500 European entrepreneurship, from which it was clear that, the quality of telecommunication infrastructure and domestic and international transport connections are key factors, that decide about inflow of investors to the biggest European cities. According to the opinion of respectively 55% and 51% entities, those factors were considered to be the most crucial while making location decision. F.R. Root and A.A. Ahmed were the first ones to show the positive impact of communication infrastructure on the level of FDI [Root, Ahmed 1979, p. 751-767]. Later many researchers verified and confirmed the result of their study. L.K. Cheng and Y.K. Kwan while analyzing location of the FDI in 29 Chinese regions in years 1985-1995 proved, that good infrastructural accessories, measured as the density of all types of roads, improve the inflow of FDI [Cheng, Kwan 2000, p. 379-400]. In year 2001 N. Kumar analyzed in detail the role of infrastructural availability in creation of attractiveness of countries for the inflow of direct foreign investments. While applying a composite indicator of availability of transport, telecommunication, informational and energy infrastructure, calculated for 66 countries showed, that the infrastructure plays a crucial role in stimulating of direct foreign investments. As the author claims, the obtained results suggest, that the development of infrastructure should be an integral part of FDI attraction strategy [Kumar 2001, p. 3-29]. The scale of problem of communication infrastructure in Poland, in the context of inflow of foreign investments, is noticed i.a. in the report

of World Economic Forum (Schwab 2010), concerning competitiveness of given countries. It results from this report, that the qualitative and quantitative infrastructural gap that is in Poland is significantly lowering the attractiveness for foreign investors. Due to its level of infrastructure development (72 in ranking) Poland is beaten in the ranking by: Puerto Rico (49), Barbados (23) or Namibia (54). One of the keys of the competitive disadvantage in Poland's position in this ranking is low quality of road, port and aviation infrastructure.

### CORRELATIONS BETWEEN COMMUNICATION INFRASTRUCTURE AND FDI

In the analysis below are included indicative variables, without strict variables, what allowed, to certain extent, to avoid distortions arising from specific features claimed by some of the voivodeships (e.g. much bigger area or the number of inhabitants in comparison with the rest of voivodeships). As a result of variables analysis addressing form and content, 12 sub-indices referring to the enrichment of regions in communicative infrastructure were suggested. The output set of variables were divided into 5 groups according to content criteria: 1.1. Road transport infrastructure:  $K_{11}$  – an indicator of public roads density;  $K_{12}$  – an indicator of public hard-surfaced roads density;  $K_{13}$  – an indicator of public hard-surfaced improved roads;  $K_{14}$  – an indicator of motorways density;  $K_{15}$  – an indicator of expressways density; 1.2. infrastructure of railroad transport:  $K_{21}$  – an indicator of railway lines in operation density;  $K_{22}$  – an indicator of electrified railway lines density;  $K_{23}$  – an indicator of double- and multiple-track railway lines density; 1.3. aviation transport infrastructure:  $K_{31}$  – public and non-public airports for 100km<sup>2</sup>;  $K_{32}$  – an indicator of air mobility; 1.4. postal infrastructure:  $K_{41}$  – an indicator of postal network density; 1.5. telecommunication infrastructure:  $K_{51}$  – main telephone lines for 1000 inhabitants.

Table 3. SM values of communication infrastructure in individual voivodeships

Voivodeship	SM of communication infrastructure					An average investment in years 2011-2015
	2011	2012	2013	2014	2015	
łódzkie	0,2848	0,3355	0,3414	0,3835	0,3817	4,4
mazowieckie	0,3984	0,4171	0,4168	0,4215	0,4234	3,0
małopolskie	0,4513	0,4690	0,4619	0,4819	0,4885	2,0
śląskie	0,5988	0,6037	0,6084	0,6085	0,6125	1,0
lubelskie	0,1575	0,1524	0,1584	0,1740	0,1825	14,0
podkarpackie	0,1967	0,2020	0,2132	0,2281	0,2318	12,4
podlaskie	0,1177	0,1094	0,1490	0,1174	0,1239	16,0
świętokrzyskie	0,2414	0,2477	0,2421	0,2460	0,2506	9,8
lubuskie	0,2237	0,2211	0,2709	0,2806	0,2828	9,0
wielkopolskie	0,2591	0,2611	0,2697	0,2737	0,2823	8,6
zachodniopomorskie	0,1992	0,2029	0,1953	0,1738	0,1809	13,0
dolnośląskie	0,3114	0,3101	0,3081	0,3073	0,3081	4,8
opolskie	0,2950	0,2889	0,2861	0,2962	0,3056	5,8
kujawsko-pomorskie	0,2665	0,2724	0,2765	0,2909	0,2961	7,0
pomorskie	0,2171	0,2298	0,2380	0,2384	0,2527	10,6
warmińsko-mazurskie	0,1251	0,1892	0,1825	0,1576	0,1571	14,6

Source: Self-study based on the data from the Local Data Bank (LDB)

In analyses in spatial layout it is often necessary to compare multi-characteristic objects and their arrangement. In order to quantify the level of development of transport and institution infrastructure in given voivodeships a TOPSIS (Technique for Order Preference by Similarity to Ideal Solution) method was used. Application of synthetic measure (SM) is explained by the fact,

that it replaces the description of entities examined thanks to many features (in this case variables describing equipment of voivodeships in given infrastructure elements), with a description by means of one aggregate value, what make analysis of examined entities similarities and prioritization much easier (we have defined point of reference – unlike non-model methods). The table below shows the values of SM of communication infrastructure.

While analyzing the data from the table above, one can realize, that the communication infrastructure level in Poland is diversified. Śląskie voivodeship is characterized by the tightest infrastructure SM, what results from relatively high values of given diagnostic variables in every subsystem of communication infrastructure (high number of large urban areas, which are characterized by good infrastructural facilities). A surprisingly low position of Wielkopolskie voivodeship can be noted, it may result from the fact, that the infrastructure in and around Poznań is well developed and poorer infrastructural facilities in the remaining areas of the voivodeship. The lowest SM values in the analyzed period were noted in both Podlaskie and Warmińsko-Mazurskie voivodeships where one of the lowest (for the whole country) FDI characteristics were noted. In the table 4 are shown values via values of the correlation coefficient between infrastructure SM and the number of newly born businesses with foreign capital, the general number of businesses with foreign capital, investment expenses of businesses with foreign capital and foreign capital per capita in years 2011-2015. In order to reduce a negative impact of possible outlined values on the result of correlation analysis the Spearman nonparametric coefficient of rank correlation was used.

Table 4. The Spearman coefficient of rank correlation between communication infrastructure SM and FDI in individual voivodeships in years 2011-2015

Specification in years	2011	2012	2013	2014	2015
Newly born businesses with foreign capital per capita	0,4235	0,4824	0,4471	0,4853	0,1971
The number of businesses with foreign capital per capita	0,5147*	0,4441	0,4735	0,4412	0,4676
Investment expenses of businesses with foreign capital per capita	0,6029*	0,4588	0,5529*	0,5441*	0,5471*
Foreign capital per capita	0,7353*	0,7382*	0,6059*	0,5029*	0,5000*

\* The values are statistically significant if  $p < 0.05$

Source: Based on self-study

From the table above we can see, that in the analyzed period the infrastructure SM is the most closely correlated (positively) with foreign capital per capita and with investment expenses of businesses with foreign capital per capita. Throughout the period under discussion we can only speak about average dependence of significance  $p < 0.05$  between the number of newly born businesses with foreign capital and the general number of businesses with foreign capital per capita. It is mostly provided by the fact of absorption of the considerable part of FDI by Mazowieckie voivodeship (mostly the city of Warszawa), Wielkopolskie voivodeship, Śląskie voivodeship and Dolnośląskie voivodeship. In year 2011 65,36% of all businesses with foreign capital were located in those four voivodeships, and in 2015 year the percentage was equal to 65,48% . In result the large urban areas are enjoying the most interest of investors, because those areas have well developed, complex communication infrastructure, and because of the large urban areas smaller areas are often not taken into consideration while making decisions about business location. In the table 5 coefficient of rank correlation between coefficients of given communication infrastructure assets and indicators of investment units of companies with foreign capital and the size of foreign capital per capita.

Table 5. Coefficients of rank correlation between unit investments, size of foreign capital and selected components of the communication infrastructure in individual voivodeships

	Indicator of investment unit per capita					The size of foreign capital per capita				
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015
K11	0,2618	0,1176	0,2206	0,2000	0,0912	0,3206	0,3206	0,2588	0,1676	0,1853
K12	0,4742	0,4412	0,4176	0,4235	0,3029	0,5596*	0,5618*	0,5265*	0,4235	0,4206
K13	0,4912	0,4824	0,4206	0,4783	0,3441	0,5441*	0,5588*	0,5735*	0,4798	0,4912
K14	0,2089	0,1382	0,4882	0,2294	0,3324	0,4385	0,3647	0,1147	0,1235	0,1824
K15	0,4469	0,3599	0,4030	0,5141*	0,5096*	0,4817	0,5634*	0,4415	0,4030	0,3970
K21	0,3412	0,2294	0,3824	0,3853	0,3882	0,4765	0,4559	0,4824	0,4176	0,3912
K22	0,5765*	0,4176	0,5824*	0,5294*	0,4265	0,7118*	0,7118*	0,6235*	0,5971*	0,5912*
K23	0,5147*	0,4000	0,5618*	0,4706	0,4441	0,5794*	0,5794*	0,4941	0,4471	0,4647
K31	-0,1618	-0,0618	-0,2353	-0,0706	0,1206	-0,0882	-0,0882	0,0206	-0,0529	-0,0559
K32	0,7434*	0,6889*	0,6652*	0,8074*	0,5529*	0,6853*	0,7497*	0,8134*	0,7719*	0,7659*
K41	0,5912*	0,6206*	0,6029*	0,7412*	0,6824*	0,6824*	0,6824*	0,7353*	0,6529*	0,6324*
K51	0,6971*	0,4706	0,5824*	0,6676*	0,7185*	0,7822*	0,7294*	0,5500*	0,6559*	0,6265*

\* The values are statistically significant if  $p < 0.05$

Source: Based on self-study

As shown in table 5, there is generally a positive correlation link between the size of investment units and infrastructure facilities (without  $K_{31}$  variable). Although it is necessary to highlight, that only for variables  $K_{32}$ ,  $K_{41}$  and  $K_{51}$  was noted at least four times a presence of statistically significant correlation link with the degree of significance  $p < 0,05$  in the analyzed period. For the variables which are reflecting the density of voivodeships in road and rail transport infrastructure, a presence of positive, but usually statistically irrelevant correlation link. In the analyzed period much bigger annual average values were noted while taking in consideration the size of foreign capital per capita (without  $K_{14}$ ). The only negative correlation link was noted between the symptoms of FDI inflow and infrastructure facilities of regions for the variable  $K_{31}$ , which reflects the density of voivodeships in airports (probably due to the fact that the policy of expanding airport network is highly selective).

Table 6. The correlation indicators between the number of businesses with foreign capital and the number of newly born businesses with foreign capital, and communication infrastructure in given voivodeships

	The number of businesses with foreign capital per capita					The number of newly born businesses with foreign capital per capita				
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015
K11	-0,1235	-0,1471	-0,1059	-0,0735	-0,0647	-0,1029	0,0206	0,0382	0,0735	0,1294
K12	0,0766	0,0176	0,0500	0,0382	0,0559	0,0457	0,2294	0,1647	0,2059	0,0941
K13	0,0765	0,0206	0,0500	0,0559	0,0824	0,0559	0,2618	0,2059	0,2575	0,1588
K14	0,3956	0,3176	0,3618	0,3412	0,3206	0,2430	0,0588	0,2382	0,1794	0,0765
K15	0,5360*	0,5398*	0,4148	0,4178	0,4208	0,4741	0,4690	0,3733	0,4000	0,1096
K21	0,3706	0,3235	0,3500	0,3647	0,3471	0,2618	0,2294	0,2765	0,2441	-0,1000
K22	0,3765	0,3294	0,3382	0,3382	0,3529	0,2500	0,3882	0,3588	0,2912	0,1029
K23	0,3794	0,3265	0,3206	0,3265	0,3382	0,2441	0,2441	0,2147	0,1882	-0,1176
K31	-0,1088	-0,1118	-0,0706	-0,0824	-0,0853	-0,0441	-0,0529	-0,0324	0,2324	0,1059
K32	0,6389*	0,6089*	0,6593*	0,6696*	0,6874*	0,6478*	0,7985*	0,8208*	0,7422*	0,5793*
K41	0,3000	0,2735	0,3647	0,4118	0,4500	0,2500	0,5000*	0,5353*	0,5059*	0,2471
K51	0,8088*	0,8206*	0,7765*	0,8324*	0,8029*	0,9029*	0,8441*	0,8500*	0,7853*	0,5618*

\* The values are statistically significant if  $p < 0.05$

Source: Based on self-study

From the analysis undertaken one can see, that for the majority of the elements of communication infrastructure considered, there is, at the very most, an average correlation link between general number of businesses with foreign capital and the number of newly born businesses with foreign capital in individual voivodeships and the infrastructure facilities of regions. Positive, high, and, what is important, relevant statistical correlation links were identified exclusively for variables  $K_{32}$  and  $K_{51}$ . It seems, that single infrastructural elements have no bigger meaning for the location of entities with foreign capital in the region, but what matters is complex development of communication infrastructure

## CONCLUSION

The positive effect of FDI on economy of the host country causes, that measures aimed at inflow stimulation are having much bigger meaning. Crucial are effective actions undertaken by the state and local governments which target at improving investment climate, including in terms of expanding and modernization of infrastructure (social and economic (including communication)). In this article synthetic meters of communication infrastructure development were determined on the basis of TOPSIS method, which were used to order voivodeships given the level of the phenomena analyzed. Next, the relation between the level of communicative infrastructure development and inflow of foreign direct investments in given voivodeships was examined by using Spearman coefficient of rank correlation. From the analysis conducted it results, that there is an average statistical relation between the level of communication infrastructure development and general number of businesses with foreign capital and the number of newly born entities of such type. It can result from, i.a. impact of infrastructural investments which are delayed in time on the size of financial resources coming from abroad or location requirements other than infrastructural (i.a. the quality of labor, labor costs, tax) of particular foreign investors. Because of the range of functions performed by particular elements of communication infrastructure one can assume, that it is a factor, that is necessary, but insufficient to raise the level of foreign direct investments in the region.

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## **ETHNOCENTRIC ATTITUDES AND THE DEVELOPMENT OF SUSTAINABLE CONSUMPTION IN POLAND**

**Abstract:** The article presents the essence of consumers' ethnocentric attitudes and their purchasing decisions, which affect the development of sustainable consumption. The definition of ethnocentric attitudes and sustainable consumption presented in the article has several common features which characterise consumers' shopping behaviours. According to the data of the Central Statistical Office concerning foreign trade in 2014, Polish consumers do not purchase domestic products only, but they largely buy imported products. Limited purchasing of domestic products often leads to the abandonment of their production and undermines sustainable consumption. Sustainable consumption is characterised by balance between production, purchasing, consumption and simultaneous appropriate waste management.

The main aim of this article is to demonstrate common features of consumers' ethnocentric attitudes and sustainable consumption and to present these issues on the basis of selected data of the Central Statistical Office.

**Keywords:** sustainable consumption, ethnocentric attitudes, consumer, unemployment, consumption.

**JEL codes:** E21, J11, M30.

### **INTRODUCTION**

Around the world ethnocentric attitudes are at different stages of advancement. In comparison with other countries, Poland exhibits increasing ethnocentric tendencies [Szromik, Figiel, 1997]. The study by Sharma, Shimp & Shin [Alsughayir, 2013] proved that highly developed countries were characterised not only by high consumer patriotism but also by developed sustainable consumption. It shows that ethnocentric attitudes favour the creation of sustainable consumption and have considerable influence on the development of domestic market. When consumers buy domestic products, there are numerous indirect benefits – they support domestic producers, protect people's jobs and facilitate domestic economy [Mookerjee, Mothersbaugh & Hawkins, 2010]. According to the data of the Central Statistical Office concerning foreign trade in 2014, Polish sellers did not sell many domestic products. It may have been caused by the fact that consumers were not sufficiently informed about goods offered on the domestic market. Making consumers aware of the fact that individual Polish products were produced not only in an eco-friendly way but also that they are particularly healthy [Stanaszek, Tędziągolska, 2011] may increase the sales. However, it is not easy to achieve this goal. Eco-friendly food products are much more expensive and the way they are presented does not appeal to potential consumers. On the other hand, electronic goods made in Poland are not trusted much because usually they are not well recognised on the market. In Poland we can distinguish two groups of consumers who do not always pay attention to the country of origin of a product. The first group is interested in the quality and price of a product. The other group consists of consumers who are guided only by the price of a product.

In Poland sustainable consumption and ethnocentric attitudes tend to be developing, but they are different than in highly developed countries. One of sustainable consumption criteria is the relation between production, consumption, segregation of waste and maximum reduction of environmental pollution. This sustainability can be maintained due to consumers' attitude to particular products and their awareness of the country of origin of a product. The concept of

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sustainable consumption is reflected in many forward-looking strategies<sup>10</sup>, policies<sup>11</sup>, sector development programmes<sup>12</sup> and other strategic documents<sup>13</sup>, which give prospect for the future in Poland.

The article discusses the theoretical and descriptive problem of consumers' ethnocentric attitudes and their influence on the development of sustainable consumption. The study is based on data of the Central Statistical Office concerning foreign trade. The problem was verified by analysis of reference publications and by means of induction and deduction.

#### Ethnocentric attitudes vs sustainable consumption

At present there are few publications concerning consumer ethnocentrism because the interest in this aspect of consumption began only a short time ago. Consumer ethnocentrism is interpreted as the moral duty to purchase products of domestic origin and it is popular in countries with strong economy, which is appreciated by their citizens [Shimp, Sharma, 1987].

The concept of ethnocentric attitudes is defined in different ways, depending on a particular author's approach. According to A. Figiel, consumer ethnocentrism can be defined as a sense of belonging to an ethnic group, patriotism, national awareness, cultural traditionalism, a sense of superiority over other social groups or xenophobia [Figiel, 2004]. Other authors define this concept as valuation of objects, people and behaviours by projecting the values of one's own environment, with noticeable affirmation of one's own culture and depreciation of foreign cultures [Szromik, Wolanin-Jarosz, 2013]. These definitions may be accepted or rejected but as such they have a lot of positive qualities. For a long time highly developed countries have been using the approach to ethnocentrism to support the national economy and reduce unemployment. In Poland the interest in consumer ethnocentrism began only in the 1990s, after the collapse of communism. The appearance of free market changed purchasers' attitude to imported products, which had not been available in Poland. At present consumers make their own decisions about what they want to buy and it is difficult to encourage them to purchase domestic products only. The choice of domestic products requires that consumers should have specific socioeconomic knowledge to make conscious decisions, which are in agreement with their own feelings [Sajdowska, 2003].

We can assume that it is possible to speak of sustainable consumption when we consume material goods and services to a sufficient extent, satisfy our basic needs and simultaneously attempt to achieve higher quality of life, minimise the consumption of natural resources and materials harmful to the environment at all stages of production and simultaneously not limit future generations' rights to identical consumption [Kramer, 2011]. The concept of sustainable consumption was most broadly defined in the Environmental Protection Act of 27 April 2001<sup>14</sup>.

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<sup>10</sup> The basic assumption of the Sustainable Development Strategy for Poland is to maintain the current economic growth of about 5% and indicate that the target is to increase the efficiency of using raw materials, fuels and natural resources by about four times.

<sup>11</sup> The State Environmental Policy Act – the document whose assumptions were agreed on during the Round Table Talks in 1989. It was drawn up and approved by the government in 1990. It was implemented by the Resolution of the Parliament of the Republic of Poland of 10 May 1991. The Polish Energy Policy until 2030. The strategy of changes in production and consumption models favouring stable, sustainable development. The State Transport Policy 2006-2025.

<sup>12</sup> Economic development policy, fuel and energy policy, agricultural development policy, transport policy, national and regional spatial development policy, social policy, environmental policy, financial and fiscal policy, public procurement policy, plans and programmes of development of sectors, administrative actions, legislative and institutional solutions.

<sup>13</sup> Environmental departments and the State Treasury are responsible for the ecological aspect of the Strategy.

<sup>14</sup> Sustainable development is interpreted as socioeconomic development where political, economic and social actions become integrated while the balance of nature and stability of basic natural processes are maintained

According to the National Development Strategy 2007-2015<sup>15</sup>, in 2015 Poland was supposed to be a country with high living standard, strong and competitive economy offering a wide range of employment opportunities. Apart from that, the implementation of the sustainable development policy will involve taking all steps integrating the interest of future generations. It is noteworthy that being a member-state of the EU, Poland signed the EU Sustainable Development Strategy, which was the main subject of areas of the Lisbon Strategy. Its elements can be found in another document – the strategy ‘Europe 2020’ [Czarski, 2011]<sup>16</sup>.

It is noticeable that sustainable consumption combines a wide range of social, economic and political practices at the level of individuals, households, communities, business circles and governments. It encompasses several areas of knowledge, including life and social sciences. However, this article will describe only some problems of sustainable consumption and consumer ethnocentrism, which are currently being discussed and investigated. Sustainable consumption, whose aim is to increase the use of renewable natural resources, can be expressed with the following actions [Mróz, 2012].

Table 1. Examples of actions taken to develop sustainable consumption and ethnocentric attitudes.

SUSTAINABLE CONSUMPTION	ETHNOCENTRIC ATTITUDES
<ul style="list-style-type: none"> <li>• buying and using consumer goods which least harm the natural environment</li> </ul>	<ul style="list-style-type: none"> <li>• buying consumer goods which least harm the domestic economy and consumers</li> </ul>
<ul style="list-style-type: none"> <li>• purchasing/consumption of organic products mostly</li> </ul>	<ul style="list-style-type: none"> <li>• purchasing/consumption of products made in one’s own region/country</li> </ul>
<ul style="list-style-type: none"> <li>• economical and rational use of consumer goods</li> </ul>	<ul style="list-style-type: none"> <li>• rational use of consumer goods</li> </ul>
<ul style="list-style-type: none"> <li>• limiting the acquisition of goods which involve consumption of non-renewable natural resources</li> </ul>	<ul style="list-style-type: none"> <li>• the acquisition of goods which are not produced in one’s own country</li> </ul>
<ul style="list-style-type: none"> <li>• limiting the purchase of goods forming hazardous post-consumer waste</li> </ul>	<ul style="list-style-type: none"> <li>• limiting the purchase of goods forming hazardous post-consumer waste</li> </ul>
<ul style="list-style-type: none"> <li>• buying food and utility goods which are least harmful to consumers</li> </ul>	<ul style="list-style-type: none"> <li>• buying food and utility goods which are least harmful to consumers</li> </ul>

*Source: The author’s compilation based on “Consumption and Development 2011/1”.*

The definition of sustainable consumption includes a lot of common features, which are characteristic of consumers’ ethnocentric attitudes. Both sustainable consumption and ethnocentric attitudes are characterised by consumers’ present and future choices aimed at development of their country. However, it is noteworthy that ethnocentric products are not always organic. A product can be classified as patriotic if it was made in only one country. The consumption of goods and services

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so as to guarantee that individual communities and citizens of the present and future generations can satisfy their basic needs.

<sup>15</sup> This document specifies the conditions, main goals, trends of socioeconomic and spatial development of a particular country, allowing for the rules of sustainable development.

<sup>16</sup> The strategy ‘Europe 2020’ covers the period 2010-2020 and it is Europe’s response to the increasing intensity of some phenomena and new challenges, such as the increasing competitiveness of emerging economies in India and China. The document presents a vision of social market economy. Its main assumptions are: intelligent development, sustainable development and development favouring social inclusion. In practice it means supporting innovation and development of knowledge, efficient use of resources, competitiveness and environmental protection as well as supporting employment, social and territorial integrity.

that are sufficient to satisfy one's basic needs and to achieve a high life position can be attained by minimal use of natural resources and materials that are harmful to the environment and thus, future generations' consumption will not be limited. Adequate consumer knowledge leading to changes in market behaviours, lifestyle and habits, e.g. shopping habits [Czubała, 2011, Domeradzki 2011], may help to maintain sustainable consumption.

The development of sustainable consumption considerably depends on consumers' attitudes, especially ethnocentric attitudes and purchase decisions of the community, which may have considerable influence on the future stability of a particular region and its development. Sustainable consumption is strictly correlated with ecologisation because it sets adequate proportions between present and future consumption [Kiełczewski, 2008]. The main motives of sustainable consumption are ecology, the future of our planet and reduction of hunger and poverty. These goals can only be achieved in a civil society through citizens' appropriate attitudes and their purchase decisions [Korbel, 2001].

### **CONSUMERS' DECISIONS ACCORDING TO DATA OF THE CENTRAL STATISTICAL OFFICE**

The awareness that every consumer builds the surrounding reality creates a positive or negative image of a country. The consumer can make a decision whether to buy a product, which product to buy, how to use it, etc. [Bergier, Kronenberg, 2010]. The consumer's choice often affects the model of further economic, social and natural growth and development. Attachment to domestic products and brands is often characteristic of wealthy economies. It is less common in poorer communities, where the price is the primary criterion for purchase, whereas the choice of foreign products is a sign of prestige. For this reason, consumer patriotism is the most common in highly developed countries [Czubkowska, 2014].

Decisions taken by domestic consumers can be presented in more detail when we consider the data of the Central Statistical Office concerning foreign trade in 2014. In 2014 the turnover in foreign trade was greater than in 2013, although there was a gradual slowdown in its growth rate. There was an increase in the value of trade with developed countries, including the EU member-states, and developing countries. On the other hand, there was a decrease in the turnover with Central and Eastern European countries. It was especially noticeable in exports, which had been decreasing gradually since the previous year. As the imports grew at a slightly higher rate than the exports, the negative balance of the total trade increased. Between January and November 2014 the turnover in constant prices was greater than in the corresponding period in 2013. As the prices of imported goods dropped, the terms of trade became more favourable. The value of exports in zlotys increased by 7.0% and amounted to 693,471.6 million zlotys, whereas the value of imports increased by 7.4% and amounted to 704,567.5 million zlotys. As a result, there was negative balance in trade, which amounted to 11,095.9 million zlotys (in 2013 it was minus 8,219.4 million zlotys). The value of exports in euros increased by 7.0% and amounted to €165,773.6 million, whereas the value of imports increased by 7.3% and amounted to €168,432.3 million. The negative balance amounted to €2,658.7 million (in 2013 it was minus €1,984.0 million). The value of exports in US dollars increased by 7.9% and amounted to \$222,339.4 million, whereas the value of imports increased by 8.2% and amounted to \$225,898.5 million. The negative balance amounted to \$3,559.1 million (in 2013 it was minus \$2,642.4 million) [Kapsa, 2015].

As results from the data of the Central Statistical Office, the value of Poland's imports was greater than the value of its exports. Consumers' ethnocentric attitudes may force producers to deliver more domestic products to shops and thus limit the purchasing of foreign products, which might as well be made in Poland.

When consumers choose products made in Poland instead of their foreign equivalents, e.g. apples, pears, milk, cream, etc., they may contribute to greater amounts of these products being

delivered to shops. However, in practice, it might be unrealistic, because consumers might feel that their choice of products is limited. On the other hand, consumers have to face the fact that shops offer a wide choice of imported goods, which often seem to be more attractive than domestic products. Table 2 lists selected countries from which products are imported to Poland. These products are also made in Poland and they are purchased in large amounts.

Table 2. Goods imported to Poland from January to July 2014.

Country	Name of product	Unit of measurement	Quantity	Value (zlotys)
Germany	Whey and modified whey, concentrated or containing added sugar or other sweetening matter	kg	4,315,914	31,137,869
Germany	Milk and cream, concentrated, liquid, containing added sugar or other sweetening matter	kg	2,702,627	10,628,999
Netherlands	Fresh apples	kg	519,751	1,242,942
Netherlands	Fresh pears	kg	11,015,079	31,595,606
Spain	Potatoes, fresh or chilled, except seed potatoes:	kg	14,118,771	16,924,321
Spain	Cucumbers and gherkins, fresh or chilled	kg	13,789,866	57,314,510
France	Live ducks, not exceeding 185 g in weight	pcs	1,518,319	4,300,358
France	Meat of swine, fresh or chilled: hams, shoulders and cuts thereof, with bone	kg	4,816,710	31,761,182
France	Potatoes, fresh or chilled, except seed potatoes	kg	18,715,273	14,273,001
Portugal	Fresh pears	kg	3,772,691	12,920,752

Source: <http://hinex.stat.gov.pl/hinex.aspx/przeqladanie.aspx>. The database of the Central Statistical Office on foreign trade in 2014.

The table above lists selected imported goods, which can also be produced in Poland [Kuczevska, 2013]. Consumers might choose imported products because of better quality, lower price or other economic or non-economic factors. Domestic products are increasingly often being replaced with imported goods. It is a rare situation when only a Polish product is offered without a foreign equivalent (usually there are a few imported equivalents). This situation can be explained by the fact that at present there are fewer shops with Polish investors.

According to the data of the Central Statistical Office, in 2014 there were 26,464 entities with foreign capital. 1,369 entities with foreign capital were established in 2014, as compared with 1,489 entities established in 2013. These data show that ethnocentric attitudes are not developed in Poland, because imports replace and considerably limit domestic production. Consumers are not fully aware of the consequences of purchasing foreign goods. When they can choose between two identical products of good quality, they are guided by the price. Recently the importance of the price

in purchase decisions has grown. Studies conducted in Poland indicate that some segments of consumers exhibit a high tendency to purchase foreign products, whereas others definitely prefer domestic goods. These preferences depend on many different factors, which can be divided into two groups. The first group includes factors which refer to the product directly. Consumers are guided by the quality, price, design, technology and materials used for production. The other group includes the factors which characterise the consumer, such as: age, education, wealth, social position. These factors significantly reflect consumers' market attitudes [Mazurek-Łopacińska, 2000, 2001].

The data in Table 2 show that there is no balance in consumption, because production is decreasing, whereas the amount of goods purchased and consumed and the amount of waste is increasing. Sustainable consumption is not only related with the environment but also it directly concerns consumers' attitudes and their choices. It is now that consumers make decisions about further development of sustainable consumption. These decisions will have consequences for the present and future generations<sup>17</sup>.

## CONCLUSION

It is worth noticing that the development of sustainable consumption is strictly related with consumers' attitudes. When consumers purchase domestic products, they considerably contribute to the development of their region or even their country. Their behaviour reduces unemployment and minimises the import of foreign products. Foreign trade is very important, because Poland is not a self-sufficient country. It should import the goods which cannot be domestically produced or are not available for geographical reasons. Sustainable consumption is not so common in Poland as it is in developed countries, e.g. in Germany. People have minimal awareness of the problems caused by the rapid growth of waste and toxic emissions due to consumers' inappropriate choices. It is necessary to transfer this knowledge to people so that their attitudes will result in sustainable development of the Polish economy.

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## **ACCIDENTS AT WORK IN FORESTRY – SCALE OF PHENOMENON AND DOMESTIC LEGISLATIVE FRAMEWORKS**

**Abstract:** The aim of this article is to present issue concerning accidents at work in forestry including scale and specificity of the phenomenon and adequate legal frameworks. The article introduces basic statistical data concerning scale, structure and causes of accidents at work in forestry. Furthermore, the author also tries to characterize legal frameworks shaping basic principles regarding prevention and proceedings related to accidents at work in forestry.

**Key words:** accidents at work, human resources, forestry, law, regulations, Poland.

### **INTRODUCTION**

The phenomenon of accidents at work should be considered as very important issue from the standpoint of efficient human resources and risk management. Mentioned issues become a matter of particular importance in those economic sectors where specificity of work is linked with hazardous work conditions. There is no doubt that forestry is one of such sectors, where employees are more likely to be exposed to risk of accidents at work. Although the number of injured employees in accidents at work in forestry is relatively insignificant (less ten 1% of all employed in the sector), it does not mean that the issue of accidents at work in forestry should not be linked with potentially serious complications and severe consequences for employers [CSO 2016]. Even single accident at work has potential of triggering series of severe labor, penal and civil consequences burdening employers.

The main aim of the article is to both present scale and structure of accidents at work in forestry and to characterize the adequate domestic legal frameworks. The article includes vital statistical data picturing scale and structure of working accidents in forestry in years 2010-2015. The article also presents analysis of regulations shaping such legal aspects as obligations and liabilities of employers or injured employees' possible claims. It should be highlighted at the beginning that domestic legislator precisely and sharply shapes employers' obligations and liability. Such tone of regulation aims, in particular, at ensuring safe and healthy working conditions of all employees.

### **SCALE AND STRUCTURE OF ACCIDENTS AT WORK IN FORESTRY IN YEARS 2010-2015 IN POLAND**

Table 1 presents statistical data concerning number of employees injured in accidents at work in forestry in 2010-2015 by type of accidents and period of inability to work after accident [CSO 2016]. The analysis of data leads to first conclusion that, as regards general scale of phenomenon, working accidents in forestry should be considered a minor problem. It is worth noting that total number of employees injured in analyzed period represented only minor percent of all employed in the forestry sector (not exceeding 1%). Focusing on evolution of analyzed phenomenon, it should be primarily highlighted that total number of employees injured in accidents at work in forestry remained relatively stable with insignificant downward trend in years 2012-2015. Biggest observed fluctuations were documented in years 2012-2013 when number of injured workers experienced reduction in number of 42 individuals year to year (-10%). Biggest, and at the same time the only observed growth was evidenced in years 2010-2012 when number of injured workers increased by 13 cases (+2% in two years).

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The data presented in table 1 introduces also other significant characteristics concerning work accidents in forestry. Analyzing frequency of occurrence of different types of accidents it should be primarily noted that vast majority of registered cases was classified as light accidents (from 96% in 2015 up to 98% in 2014). At the same time, only marginal cases were classified as fatal or serious accidents, representing from 2% to 4% of all registered accidents.

Presented statistical data (tab. 1) also allows to observe some regularities concerning consequences of work accidents in forestry. It should be noted that a vast majority of registered accidents resulted in work inability lasting at least 21 days. Also inability to work lasting from 4 to 20 days was relatively frequent consequence of accidents at work. At the same time, inability to work lasting up to 3 days was evidenced only in isolated cases. Such time diversification of work inability resulting from work accidents should be considered as a negative trend. Negative consequences of such regularity are especially disadvantageous for employers who lose employed man power for considerably long periods, which may affect efficiency and volume of production in extreme cases. It is also interesting to note that there is no apparent correlation between types of work accidents and period of work inability. Despite overwhelming dominance of light accidents, not life-threatening, majority of documented working absences caused by accidents at works lasted at least 21 days.

Table 1. Individuals injured in accidents at work in forestry by types of accidents and time of inability to work in years 2010-2015

Specification	2010	2012	2013	2014	2015		
					Total	Sector	
						Public	Private
<i>in thousands</i>							
Workers in forestry (total)	46,4	48,6	49,0	49,8	50,3	24,5	25,8
<i>Injured (in absolute numbers)</i>							
Total	427	440	398	388	385	241	144
<i>By types of accidents at work:</i>							
Fatal accidents	8	9	8	4	11	5	6
Serious accidents	4	5	4	5	5	-	5
Light accidents	415	426	386	379	369	236	133
<i>Of which accidents resulting in an inability to work</i>							
1 – 3 days	5	4	6	6	4	3	1
4 – 20 days	118	116	90	115	117	86	31
21 days and more	277	302	265	241	148	106	42

Source: Forestry 2016, CSO.

Table 2 present statistical data concerning major causes of accidents at work in forestry in years 2010-2015 [CSO 2016]. Analyzing abovementioned issue it is worth highlighting that major group of causes of work accidents was directly related to wider human factor. Inappropriate employee's actions at the time and work place constituted major cause of observed work accidents (from 54% in 2013 up to 64% in 2015). Including abovementioned cause and other causes related to employee's conduct (inappropriate mental-physical condition, inappropriate willful employee's action, not using protective equipment, inappropriate use of material agent) it should be clearly underlined here that majority of observed work accidents in forestry was directly related with

inappropriate conduct of employees (jointly from 69% in 2012 up to 78% in 2014 of all registered cases).

The analysis of data presented in table 2 also leads to the conclusion that causes independent from employees (inappropriate condition of material agent, inappropriate organization of work and work place) were responsible for a small minority of registered work accidents in forestry (average 14% in each of studied years). Such structure of causes may suggest that organization of work and work place in forestry is generally carried out correctly. Furthermore, it may also suggest that mechanical state of machines and equipment (material agent) basically guarantee safe working conditions,

The essence of work accidents in forestry lays mostly in inappropriate attitude and conduct of sector's employees. It appears that in order to reduce scale of work accidents, public and private employers should focus especially on adopting appropriate human resources policy. Desired effects may be achieved through introducing such measures like precise work monitoring, thorough health and safety at work (OSH) training or more strict employees' liability for careless and incompetent behavior during performance of work duties. We cannot forget that not respecting safety standards at work place may be hazardous for other employees.

Table 2. Causes of accidents at work in forestry in years 2010-2015

Specification	2010	2012	2013	2014	2015			
					Total	Sector		
						Public	Private	
Total	799	836	762	721	677	390	287	
Inappropriate condition of material agent	56	54	49	35	56	30	25	
Inappropriate organisation of:	work	24	25	30	25	27	12	15
	work post	33	46	33	39	15	10	5
Absence of inappropriate use of material agent	39	32	43	35	30	14	16	
Not using protective equipment	6	11	14	15	6	5	1	
Inappropriate wilful employee's action	56	47	46	47	31	13	18	
Inappropriate mental-physical condition of employee	20	24	15	17	22	13	9	
Inappropriate employee's action	453	459	414	449	432	237	186	
Other	112	138	118	59	67	56	11	

Source: Forestry 2016, CSO.

Statistical data presented in tab. 3 and 4 allows to conduct analysis of work accidents in forestry from the point of view of such aspects as work seniority and age of injured employees. The analysis leads to the conclusion that middle age (30-49 years) workers with longest work seniority (16 years and more) should be considered as working group most vulnerable to work accidents. On average, every third registered injured employee had 16 years or more of work seniority. In case of age, every fourth employee was between 30 and 49 years old. Second most represented group of

workers was characterized with shortest work seniority (on average 23% of injured employees). Among injured in work accidents in forestry, the workers with work seniority between 4 and 5 years and in teenage age (18-19years ) or in retirement age (65 or more) had weakest representation in registered accidents. Weak representation in indicated work groups is especially linked to the fact that workers in indicated age group represent marginal percentage of total number of employed in the forestry. On the other hand, the fact that majority of injured employees was characterized with rich professional experience should be considered as surprising regularity. It appears that most experienced employees working for many years, in connection to their experience and skill, would be the least, not the most, exposed to the risk of work accidents. Statistical data seems to undermine such assumption and indicates that precisely most experienced workers in middle production age are most accident-vulnerable group. It should be considered as important clue for employers who should focus especially on this particular work group in terms of implementing policies of safe working conditions.

Table 3. Injured individuals in accidents at work by work seniority in forestry in years 2010-2015

Specification	2010	2011	2012	2013	2014	2015
<i>in absolute numbers</i>						
Total	427	443	440	398	388	385
<i>by work seniority (in years):</i>						
18 and less	90	104	79	109	104	87
2 - 3	73	47	55	49	54	50
4 - 5	33	52	56	27	27	34
6 – 10	55	55	64	61	48	54
11 – 15	52	55	44	33	23	29
16 and more	124	130	142	119	132	131

Source: Forestry 2016, CSO.

Table 4. Injured individuals in accidents at work by age in forestry in years 2010-2015

Specification	2010	2011	2012	2013	2014	2015
<i>in absolute numbers</i>						
Total	427	443	440	398	388	385
18 and less	-	-	-	-	-	-
18 – 19	1	2	1	2	3	1
20 – 29	77	74	73	61	65	49
30 – 39	104	114	100	90	88	95
40 – 49	117	120	104	97	99	89
50-54	60	64	81	54	44	52
55 - 59	51	48	51	63	56	60
60 – 64	16	19	28	29	29	37
65 and more	1	2	2	2	4	2

Source: Forestry 2016, CSO.

## **LEGISLATIVE FRAMEWORKS CONCERNING ACCIDENTS AT WORK**

### **LEGAL DEFINITION OF ACCIDENT AT WORK**

Precise legal definition of accidents at work is included in the article 3 of Act of 30 October 2002 on Social security in respect of accidents at work and occupational diseases. According to the abovementioned article, an accident at work is defined as sudden event caused by external factor causing injury or death, which occurred:

- a) in the course of or in connection with performing by employee ordinary duties of superior's instructions,
- b) in the course of or in connection with performing by employee duties for employer, even without direct instruction or
- c) at the employer's disposal on route between place where employer is established and workplace defined in employment contract (art. 3.1. of Act 2002).

According to art. 3.2 of Act 2002, the same classification should be employed in cases of employee's accident which occurred:

- a) during travel on official duty
- b) during general self-defense trainings or
- c) in the course of fulfilling tasks assigned by trade unions operating at the work place.

The Act of 2002 also provides for other specific factual elements that should be considered as work accidents due to its connection to performing activities similar to work tasks. For example, fatal accident is defined as work accident resulting in death of employee which occurred in period not exceeding 6 months after day of accident (art. 3.4 of Act 2002). Furthermore, serious accident should be defined as accident resulting in serious injury in form of blindness, deafness, loss of speech, infertility or other injury or bodily harm infringing basic humanly functions or as terminal or life threatening disease, permanent mental disease, total or impartial incapacity to work or permanent, radical deformation of body (art. 3.5 of Act 2002).

To sum up, proper domestic regulations create vast catalogue of factual situations considered as work accidents or as equivalent event. As the most important factors of work accident we should consider:

- a) suddenness of event, defined as its transience,
- b) external cause defined as determiner not related to employee's organism,
- c) effects in form of injury or death of employee and
- d) relationship between accident and work in terms of time, place and function [Jaśkowski, Maniewska 2016].

### **THE EMPLOYER'S OBLIGATION CONCERNING ACCIDENTS AT WORK**

The employer's responsibilities related to accidents at work should be divided into two groups – prior and follow-up. Prior duties are preventive and related to assuring safe and healthy working conditions, while follow-up obligations mainly concern such issues as elimination of occurred threats, identifying causes and providing necessary assistance to injured employees.

The prior duties are:

- a) not admitting to work employees without necessary qualifications, skills and OSH training (art. 237<sup>3</sup> § 1 k.p.),
- b) providing employees with training and instructions in the fields of OSH regulations before work admittance (art. 237<sup>3</sup> § 2 and art. 237<sup>4</sup> § 1 k.p.),
- c) completing OHS training in the fields necessary for performing employer's duties (art. 237<sup>3</sup> § 2<sup>1</sup> k.p.),
- d) issuing detailed instructions and directives concerning OSH related to work places (art. 237<sup>4</sup> § 2 k.p.),



- e) providing employees with free of charge measures of individual protection, working clothing and shoes and to guarantee its proper state (art. 237<sup>6</sup>, 237<sup>7</sup>, 237<sup>9</sup> and 237<sup>10</sup> k.p.),
- f) not admitting to work employees not using necessary measures of individual protection, working clothing or shoes (237<sup>9</sup> § 1 k.p.),
- g) consulting actions related to OSH with employees or their representatives (237<sup>11</sup> a k.p.) and
- h) creation of health and safety services or health and safety commission in case of employing more than 100 or 250 employees (art. 237<sup>11</sup> and 237<sup>12</sup> k.p.).

There are also prior duties specific for forest and wood industry:

- a) respective safeguards of woodworking machines protecting against accidental recoil or ejection (§ 3 of Regulation 2000 ),
- b) proper checkup of fire protection installations (§ 4.1 of Regulation 2000 r),
- c) appropriate placement of machines and its elements protecting against life threats (§ 5 of Regulation 2000 r),
- d) admit only qualified individuals to fix devices and equipment (§ 10 of Regulation 2000),
- e) assuring minimal standards and parameters in using wood machines (§ 8-25 of Regulation 2002),
- f) proper training of employees using machines (§ 4 of Regulation z 2002),
- g) submitting machines to inspection before and after installation (§ 26 of Regulation 2002 r),
- h) assuring appropriate access of employees to data and manuals concerning machines (§ 30 of Regulation 2002 ),
- i) assuring proper state of work organization protecting against manual moving of loads (§9 of Regulation 2006),
- j) not admitting to work employees with health or mental problems (§ 9 of Regulation 2006),
- k) sufficient safety of forest work area by a clear mark of hazardous zones (§ 10 and 11 of Regulation 2006),
- l) not carrying out works during abundant rainfalls, strong winds, during storms, at temperature below -20° C and in cases of works on standing trees - below temp. -5° C and during limited visibility (§ 12 of Regulation 2006 r),
- m) assuring proper state of machines and equipment (§ 13 of Regulation 2006 ) and
- n) not transporting workers in manner of place not intended for such use (§ 15 of Regulation 2006).

The employer, due to occurrence of work accidents, is responsible for

- a) transferring injured employee to an appropriate position if an employee is not able to perform current work duties in result of an accident (art. 231 k.p.),
- b) undertaking necessary measure to eliminate or limit the danger,
- c) ensuring that first aid is provided to injured worker,
- d) establishing the circumstances and causes of accident,
- e) applying appropriate measures preventing similar accidents (art. 234 § 1 k.p.),
- f) notifying the relevant district labor inspectors as well as the prosecutor about fatal, serious or group accident (art. 234 § 2 k.p.) and
- g) keeping a register of accidents at work (art. 234 § 3 k.p.).

## THE EMPLOYER'S LIABILITY AND EMPLOYEE'S CLAIMS RELATED TO ACCIDENTS AT WORK

In order to fully understand legal aspects of accidents at work it is necessary to present fundamental instruments shaping both employer's liability and related claims granted to injured employees. It should be highlighted at the beginning that non-compliance with rules or principles of OSH is punishable for employers or responsible subordinates by fines of 1.000 – 30.00 PLN (art. 283 § 1 k.p.). Similar sanction shall be applies in cases of:

- a) failure to notice competent authority about fatal, serious or group work accident
- b) concealing occurrence of work accident or
- c) providing false data, evidences or documents related to work accidents (art. 283 § 2 pkt. 6 k.p.).

All above-mentioned acts are considered as offences against employees' rights, punishable by severe sanctions.

Accident at work may be also coupled with criminal responsibility of employer. According to art. 220 § 1 of Penal Code (k.k), anyone failing to perform responsibilities related to OSH at work, and thereby exposes an employee to an immediate danger of loss life or serious injury, is liable to imprisonment for up to three years [Faulkner 2012]. Such act done unintentionally is punishable by a fine, the restriction of liberty of imprisonment for up to one year. [Ziółkowski 2016]. Naturally, the employer is not always a liable party as he or she can appoint competent subordinate to fulfill OSH duties at work. However, such transfer of duties does not mean that employer is fully exempted from his obligation concerning care about appropriate working conditions.

Besides labor and criminal liability, the occurrence of accident at work may be also related with civil liability of employer. Injured employee or his/her family (in case of death), after satisfying their social security claims, may also submit civil claims against employer. Such procedure is possible in the case where awarded accident benefits do not cover whole suffered property and non-property damages [Witoszko 2008]. Injured party is entitled to submit claim for:

- a) single compensation for bodily injury or health disorder causes by accident at work, covering medical costs and training of injured employee for another occupation (art. 444 § 1 k.c.),
- b) monetary compensation for the harm suffered (art. 445 § 1 k.c.),
- c) appropriate annuity for employee in case of his complete or partial inability to work or if his future perspectives have diminished (art. 444 § 2 k.c.),
- d) reimbursement of medical cost and the funeral costs to the person incurring them in case of employee's death (art. 446 § 1 k.c.),
- e) annuity for closest people in case of his death (art. 466 § 2 k.c.),
- f) appropriate compensation to closest family of the deceased employee if as a result of his death their living standard has deteriorated significantly (art. 446 § 3 k.c.) and
- g) appropriate monetary recompense to closest members of deceased's family for the harm suffered (art. 446 § 4 k.c.) [Kucharska 2015].

Civil liability of the employer is an example of strict liability based of risk principle (art. 435 k.c.). The employer may be exempted from liability only in cases when the damage was caused by force majeure or by fault of third or aggrieved party (art. 435 k.c.). As it appears, eventual employer's civil liability for accidents at work is very strict and may result in compensations estimated in hundreds of thousands or even millions PLN.

Lastly, it is important to characterise employee's claims on field of social security. According to art. 237<sup>1</sup> k.p., worker having suffered from an occupational accident is entitled to obtain series of defined social benefits. The catalogue of such benefits is defined in art. 6 of Act on Social security in respect of accidents at work and occupational diseases and is composed of:

- a) sickness benefit for employee,



- b) rehabilitation services for employee not able to work after period of collecting sickness benefit,
- c) compensatory benefit due to remuneration decrease,
- d) single compensation due to chronic or long-lasting damage to health,
- e) work incapacity pension,
- f) training pensions due to necessity of requalification,
- g) coverage of dental, vaccination and orthopaedic equipment costs,
- h) single compensation for closest family of deceased employee
- i) survivor's pensions for closest family of employee entitled to collect work accident benefits,
- j) supplement to survivor's pensions for orphan and
- k) care allowance (Act of 2002).

The above-mentioned benefits are covered with use of funds from the Accident Fund. The Fund is fed from many sources, especially from employers' premiums. It is worth to note that accident benefits from the social security system have primary nature and civil claims should be considered as supplementary ones that may be submitted only in case when social benefits turned out to be not sufficient for total harm and damage coverage resulted from accident at work [Lach, Samol, Ślebza 2010].

## CONCLUSION

The issue of accidents at work in forestry has remained at stable level in recent years. Having regard to scale of the analyzed phenomenon, is it justified to consider accidents at work in forestry as marginal issue. Concurrently, it is worth noting that majority of registered work accidents was qualified as light accidents (96%). Low rates of fatal and serious accidents should be considered as very promising regularity. However, it is necessary to point that majority of registered accidents resulted in relatively long absence from work (lasting over 21 days). Such scale of absence should be assessed as negative. It should be noted that each accident at work has negative consequence to employer, who experience long-lasting decrease in manpower.

Human factor should be considered as main group of work accidents causes. It seems that faulty, careless or incompetent behavior of workers was most common cause of registered accidents at work in forestry. The average injured employee can be described as worker with relative long work seniority (at least 16 years) and in age between 30 and 49 years. As it appears, the youngest and unexperienced workers are not most vulnerable groups of employees.

Having regard to domestic legal frameworks concerning accidents at work, it should be primarily noted that domestic legislator has introduced very wide and complex regulation. We can find very wide and precise definition of work accident and equivalent events. There is also complex regulation concerning employer's liability and responsibilities concerning preventing and eliminating consequences of accidents at work. It should be also noted that each accident at works is related to numerous employee's claims designed to compensate his injures and harms. Furthermore, is should be highlighted that the employer's liability concerning work accident included labor, civil and criminal liability.

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## LIABILITY FOR GAME ANIMAL DAMAGES

**Abstract:** The main aim of the article is to present topic of liability for game animal damages to crops in Poland. The article includes basic statistical data regarding both scale of damages caused by game animals and structure of paid hunting compensations. Furthermore, the author tries to characterize domestic regulations both defining entities responsible for compensating game animal damages and forming rules of determining, estimating and awarding hunting compensations.

**Key words:** hunting, hunting animal damages, hunting compensations, liability, law, regulations, Poland.

### INTRODUCTION

Game animal damages to crops are not rare occurrence. Over 60 thousand damages caused by game animals are registered each year in Poland [Explanatory memorandum 2016]. Occurrence of hunting damage is related to severe financial consequences charging defined entities, including tenants and administrators of hunting districts of event State Treasury itself. Average total value of annually paid hunting compensation is estimated at 68 million PLN [CSO 2016]. Such size of analyzed phenomenon shows that the topic of liability for game animal damages should be considered as a high-profile issue requiring further investigation

The main aim of this study is to present scale of game animal damages and structure of paid hunting compensations and to characterize adequate regulations. The article includes statistical data defining scale and structure of both occurred game animal damages and paid hunting compensations in Poland in years 2010-2015. The author also characterize domestic provisions forming principles of certain entities' liability for game animal damages to crops. It is worth mentioning here that domestic legislator, by means of newest amendments, have decided to modify significantly legal subject and procedural principles valid for over 20 years

### SCALE AND STRUCTURE OF HUNTING COMPENSATIONS IN POLAND IN YEARS 2010-2015

Table 1 contain statistical data regarding number of damages and court cases related to hunting compensations paid by tenants or administrators of hunting districts in years 2010-2014. Indicated data comes from explanatory memorandum to the draft Act on game animal damages and on amendment of Hunting Act [Explanatory memorandum 2016]. The analysis of data regarding number of registered damages leads to the conclusion that phenomenon of game animal damages has remained stable over defined period of years (with about 57-63 thousand registrations). Furthermore, the biggest decline in number of damage registration could be observed in years 2011-2013 and the most apparent growth was documented in years 2013-14. Growth or decline rates in listed periods wasn't significant and was estimated to -4% (2011-2012) and +5% (2013-2013) respectively. Stable level of registered game animal damages could be considered as favorable evidence of analyzed phenomenon as it proves that intensity of problem have not increased. Furthermore, indicator of the damages' number maintaining at comparable levels enables the responsible subjects to follow sound and effective financial policy under which they are able to anticipate future funds necessary for hunting compensations' expenses. However, stable number of registered damages could be considered as evidence of weak prevention against analyzed issue.

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Insignificant changes in number of registered damages may suggest that no efficient measures reducing scale of phenomenon had been applied in analyzed period.

Statistical data presented in table 1 may also characterize other significant issues related to liability for game animal damages done to agricultural crops. Taking into consideration numbers related to registered court cases, favorable for farmers rulings and relations between court cases and number of registered damages it should be stated that issue of judicial enforcement of compensation is a marginal problem. Barely 0,17% of all registered cases resulted in rulings favorable for farmers. Clearly, vast majority of judicial proceedings related to hunting compensations ends at prejudicial stage.

Table 1. Number of damages and court cases concerning hunting compensations in hunting districts leased by hunting clubs in Poland in hunting years 2010-2014

Specification	2010/2011	2011/2012	2012/2013	2013/2014	Average
Number of registered damages	60 059	57 715	60 657	63 162	60 398
Number of court cases	79	109	106	110	101
Number of cases won by farmers	27	36	29	20	28
Court cases ended in favor of farmers (%)	34,2	33,0	27,4	18,2	28,2
Percent of court cases (%)	0,13	0,19	0,17	0,17	0,17

Source: explanatory memorandum to the draft Act on game animal damages and on amendment of Hunting Act, Parliamentary document 327.VIII.

Table 2. Hunting compensations in Poland in years 2010-2016

Specification	2010/2011	2012/2013	2013/2014	2014/2015	2015/2016	Average
	<i>in thous. PLN (current prices)</i>					
Total	57376,2	68510,4	75278,0	67344,9	72939,6	68289,8
State Forests National Forest Holding	9939,6	11298,4	11618,0	9734,9	9792,6	10476,7
Agricultural Property Agency	586,6	-	-	-	-	-
Polish Hunting Association	46850,0	57212,0	63660,0	57610,0	63147,0	57695,8

Source: Forestry 2016, CSO.

Table 2 includes statistical data picturing structure and changes in value of hunting compensation paid by obliged entities in years 2010-2016 [CSO 2016]. Analyzing indicated issue it should be primarily noted that both total value of awarded compensations and value of compensations paid by particular entities did not remain at stabled and experienced apparent fluctuations. Period of years 2010-2014 could be characterized with apparent growing trend.

Significant decrease in value of compensations could be observed in another period (2014/2015), however in last of observed periods (2015/2016) there was apparent increase in value of awarded compensations (estimated to approx. 8%). At the same time, it should be highlighted here that total value of hunting compensations in analyzed period was shaped with general upward trend resulting in total growth in value estimated to 15563 thous. PLN regarding value documented in years 2010/2011 and 2015/2016.

Table 3. Hunting compensations paid from sources of the State Budget by voivodships in 2015

Voivodships	Total	For the damage caused by:			
		Wild boars, moose, deer, fallow deer and roe deer	Game species under year-round protection		
			Total	of which paid by:	
				Voivodship executive board	State Forests National Forest Holding
<i>in thous. PLN (current prices)</i>					
Polska ogółem	8172,8	3472,5	4700,3	4541,4	158,9
Dolnośląskie	20,9	20,9	-	-	-
Kujawsko-Pomorskie	63,4	51,4	12,0	-	12,0
Lubelskie	556,0	315,7	240,3	238,2	2,2
Lubuskie	274,1	274,1	-	-	-
Łódzkie	111,0	55,2	55,8	55,8	-
Małopolskie	101,1	101,1	-	-	-
Mazowieckie	1761,0	126,2	1634,8	1543,5	91,3
Opolskie	9,8	-	-	-	-
Podkarpackie	1875,0	1875,0	-	-	-
Podlaskie	2380,0	25,2	2354,6	2340,2	14,3
Pomorskie	23,5	23,5	-	-	-
Śląskie	87,2	87,2	-	-	-
Świętokrzyskie	11,1	2,0	9,1	9,1	-
Warmińsko-mazurskie	492,5	98,7	393,8	354,6	39,2
Wielkopolskie	179,4	179,4	-	-	-
Zachodniopomorskie	226,9	226,9	-	-	-

Source: Forestry 2016., CSO.

The biggest unitary growth in value of compensations was observed in period 2010/2011 when total value of paid hunting compensations increased by 11134,2 thousands PLN, i.e. by 19%. It is also worth mentioning that in the same period we could notice biggest unitary growth in value of paid compensations in cases of all obliged entities. Size of characterized growth was especially apparent in case of Polish Hunting Association (PHA) which was responsible for paying hunting

compensations in total value higher by 10362 thousands PLN (i.e. by 22%) in comparison to prior period. It is also worth highlighting here that PHA is also the biggest payer of hunting compensation, awarding approx. 85% of all due compensations related to game animal damages.

Analysis of data regarding both number of registered damages (tab. 1) and paid compensations (tab. 2) leads to conclusion that value of awarded hunting compensation is not related to number of registered damages holding specified entities accountable. As it is apparent, value of compensations increased repeatedly in given period regardless of relatively stable levels of registered game animal damages. Therefore, it can be stated that issue of game animals damages should be considered as qualitative rather than quantitative problem where higher total value of awarded compensation can result from lower number of determined factual elements.

Data presented in table 3 allows to conduct analysis of structure and territorial diversification of hunting compensation burdening the State Treasury. It leads to the conclusion that majority of damages observed in 2015 was caused by game species under year-round protections which were responsible for 58% of all compensations awarded from the State Treasury. It is also worth mentioning that competent voivodship executive boards turned out to be main body responsible for paying majority of hunting compensations. Almost 97% of compensations related to damages caused by game species under year-round protection was paid by these entities.

Analyzing territorial diversification of awarded hunting compensation it is worth noting that problem of game animal damages affecting the State Treasury's funds occurred in highest intensity in case of three voivodships – Podlaskie (responsible for 29% of paid compensations), Podkarpackie (23%) and Mazowieckie (22%). The Podlaskie voivodship was also responsible for highest value of hunting compensation paid for damages caused by game species under year-round protection (over 50% of all compensations in the category), while the Podkarpackie voivodship was liable for majority of compensation pair for damages caused by wild boars, moose, deer, fallow deer and roe deer (up to 54%).

## **LEGAL FRAMEROWRKS CONCERNIG LIABILITY FOR GAME ANIMAL DAMAGES**

While studying legislation concerning liability for game animal damages caused to crops we should, in particular, study three listed below legal acts:

- Hunting Law Act of 13 October 1995,
- the Law amending the Hunting Act of 22 June 2016 and
- the Regulation of Minister of Environment on proceedings related to estimating damages and paying compensations for damages caused to crops.

Indicated legislation bot fully regulates problematic of determining parties liable for game animal damages and shapes principles of determining, establishing and awarding hunting compensations. However, it must be also noted that crucial amendment of Hunting Act entered into force on 1<sup>st</sup> January 2017. The abovementioned amendment significantly modifies such legal aspects as parties liable for game animal damages or principles of conducting inspections and estimations of damages. It also should be highlighted that given act has caused some transitional confusion as its part entered into force on 1<sup>st</sup> January 2017 and other part will be in force only from 1<sup>st</sup> January 2018.

## **OBJECTIVE AND SUBJECTIVE SCOPE OF LIABILITY FOR GAME ANIMAL DAMAGES**

Objective scope of regulation has not experienced any significant modifications yet. The basis for liability of defined parties is conditional on:

- a) damages caused to agricultural crops by wild boars, moose, deer, fallow deer and roe deer and other game animals under year-round protection (art. 46.1 of Act 1995),
- b) damages caused during hunting (Art. 41.1 p. 2 of Act 1995 in the version applicable until 1<sup>st</sup> January 2018).

Only two abovementioned factual elements enable analyzed form of liability for game animal damages to be applied.

Subjective scope of regulation will be affected by more important and complex modifications. In actual legal situation (applicable until 1<sup>st</sup> January 2018) tenant or administrator of hunting district is considered as main liable party in all cases of damages caused to agricultural crops during hunting or by wild boars, moose, deer, fallow deer and roe deer by considered as main liable party (art. 46.1 of Act 1995). The State Treasury's liability is limited only to damages caused by game animals under year-round protection and for damages occurred on area not entering hunting districts (art. 50.1 and 50.2 of Act 1995). In such cases, the hunting compensation is paid by:

- a) State Forests National Forest Holding – for damages occurred on forest hunting districts and
- b) competent voivodship executive board - for damages occurred on field hunting districts and areas not entering any hunting districts (art. 50.2. p.1 and p.2 of Act 1995).

At the end of 2017 year, the above characterized principles of game animal damage will experience significant change. Starting from 1<sup>st</sup> January 2018, the State Treasury will be liable for paying majority of awarded hunting compensation. According to art. 46.1 of Act 1995 in version applicable from 1<sup>st</sup> January 2018, the State Treasury will be liable for damages caused to agricultural crops by wild boars, moose, deer, fallow deer and roe deer, including other game animals under year-round protection while tenants or administrators of hunting districts will be liable only for damages caused during hunting.

Hunting compensations burdening the State Treasury will be paid by competent voivodes and funds for this purpose will be provided from:

- a) the Compensation Funds – in case of damages caused on hunting districts with exception of damages caused by game animals under year-round protection and
- b) direct funds of the State Treasury – in other cases.

Subjective modification will also address subjects responsible for conducting inspection and damage estimation proceedings. In previous legal status only individuals appointed by tenants or administrators of hunting districts were responsible for game animal damage inspections and estimations. Starting from 1<sup>st</sup> January 2017, only bodies appointed by competent voivodes are entitled to conduct required inspections and estimations in all cases of damages caused to agricultural crops by wild boars, moose, deer, fallow deer and roe deer (art. 46a.1 of Act 1995). The competence of representatives of hunting districts' tenants or administrators has been limited only to inspections concerning damages cause during hunting.

## **THE COMPENSATION FUND**

The abovementioned amendments also create the Compensation Fund which funds will be allocated in order to cover vast majority of occurred game animal damages burdening the State Treasury. As a purpose-fund, the Compensation Funds will be held subject to the Minister of the Environment who as the authorizing officer of funds will be responsible for managing and establishing annual financial plans (art. 50a.2 and 5 of Act 1995 in version applicable from 1<sup>st</sup> January 2018).

The Compensation Fund will be powered with revenues from:

- a) annual premiums paid by tenants and administrators of hunting districts,
- b) gifts and bequests,
- c) subsidies from state budget and
- d) other obtained profits (art. 50.4 of the Act 1995.).

As can be seen from the above aspects, legal situation of tenants and administrators of hunting districts will experience major change. Indicated bodies will be no longer directly responsible for paying hunting compensation but they will be obliged to pay annual premiums to 15 June of each

year (art.50b.1 and 2 of Act 1995). The contribution rate will be estimated by competent voivodes up to 15 May of each year and due premiums, under proper decision, can be paid in instalments (art. 50b.4 and 4 of Act 1995). Voivodes will not be free to set value of premium which value will be estimated as product of number of game animals planned to be obtained in given hunting years and flat rates for game animals (art. 50b.6 of Act 1995). Furthermore, value of contributions will be subject to cyclic growth proportional to percent of unachieved hunting plan in the year preceding the year of current premiums' estimation (art.50b.8 of Act 1995).

Such form of financial principles concerning hunting compensation can be considered as a rational solution. Instead of direct financial liability of tenants and administrators of hunting districts, more solidarity-based regulations are implemented. Central fund will cover costs of hunting compensations from premiums paid by all hunting districts. Such regulation may ease financial burden of hunting districts experiencing biggest number of damages in given year. It may be considered that such financial principles of hunting districts' tenants and administrators' liability will adopt form of solidarity ("janosikowe") contribution where hunting districts not experiencing severe damages will participate (indirectly) financially (through their premiums) in covering serious damages observed in other districts. Also the possibility of powering the Compensation Fund with state subsidies may be considered as a kind gesture towards hunting community in Poland. Depending on current policy of the government, such possibility may become another instrument of improving financial condition of hunting districts in Poland.

## CONCLUSION

Number of registered game animal damages remained at relatively stable levels and experienced only minor fluctuations in recent years. At the same time, only minor percentage of registered damages ended with court cases. Such low rate of court cases may suggest that proceedings concerning awarding hunting compensation are amicable, serviceable and objective and usually end with voluntary payment of compensations by liable parties. It should be also noted that the total value of paid hunting compensation has increased in analyzed period and that Polish Hunting Association was the main liable party. However, it would not be justified to link number of registered damages (which remained at relatively stable levels) with value of awarded compensations (apparent upward trend). Moving to the field of the State Treasury's liability, majority of compensations paid in 2015 covered damages caused by game animals under year-round protection and the problem of game animals damage affected especially three voivodships - Podlaskie, Podkarpackie and Mazowieckie.

Considering legal issues forming principles of liability for game animal damages to agricultural crops, we should primarily focus on importance and size of implementing amendments. The amendment of the Hunting Act, which was introduced in 2016, has revolutionary character and attempts to implement crucial changes of previously functioning legal order. Shifting the direct liability burden from hunting districts to the State Treasury may be considered as significant kind gesture towards hunting community in Poland. New legislation, which, to a large extent, will come into force on 1<sup>st</sup> January 2018, may seriously improve financial condition of hunting districts in Poland.

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## CRIME AND THE STANDARD OF LIVING IN POLAND

**Abstract:** The purpose of the paper is to conduct a statistical analysis that will examine the problem of crime against the standard of living. The paper attempts to determine the relationship between the level of crime in Poland, and the standard of life. A ranking of provinces, determining the level of crime and quality of life, was created. In order to sort the objects the method of multidimensional comparative analysis was used. By using this method, the hierarchy of provinces was created. The research enabled indicating groups of objects that are similar in the examined phenomena.

**Key words:** crime, standard of living, statistical analysis

### INTRODUCTION

The period of transitions in the political system in Poland is associated with social transformations. The observed transformations also have their negative dimension. Problems such as inequality and social stratification, emergence of new business elites and wealth, on the one hand, and poverty, on the other, are reflected in increased disturbance and development of social pathologies. The intensification of criminal phenomena had its apogee in the years 2002-2003, followed by a gradual decrease in the number of registered crimes. This trend was accompanied by an increase in social trust in the Police, as well as increase in effectiveness of its work (manifesting itself for instance in increased crime detection).

Crime, in its essence, is a social phenomenon, and research on spatial aspects of crime has its "roots" in sociological papers (Jałowicki 1980; Wódcz 1989). Along with the emergence of more efficient tools of elaboration and analysis of statistical data, interest in research on the problems of crime in Poland clearly grew. Published papers relate both to the analysis of crime alone, in the light of police statistics (Mydel, Kozimor 1989; Maik 1995; Gronowski 2003; Mordwa 2006, 2011) and social perception of the phenomenon and its consequences (Marcinićzak, Siejkowska 2003, 2004; Bogacka 2009).

Crimes are a very important factor influencing standard of living of the inhabitants of Poland. The problem of crime gets more and more serious and draws attention not only of citizens but also scientists who analyse the relation between the number of committed crimes and quality of life indexes.

The purpose of this paper is to conduct a statistical analysis that will examine the problem of crime against standard of living. In order to achieve the established aim of the research, the level of crime in Poland over the years 2008-2013 was presented and the quality of life in sixteen provinces was described.

### STATE OF SECURITY IN POLAND IN THE YEARS 2008-2013

The most frequently committed crimes in Poland are: fights, beating up, health impairment, homicide, extortion, rapes, thefts, thefts with burglary, theft of a car and damage to objects. They account for more than 60% of all crimes registered in Poland and are from the social point of view the most burdensome.

The above crimes are classified as common crime due to the inconvenience for an ordinary citizen who predominantly has no contact with an organized criminal group. Therefore, the above listed crimes have a strong impact on the standard of living.

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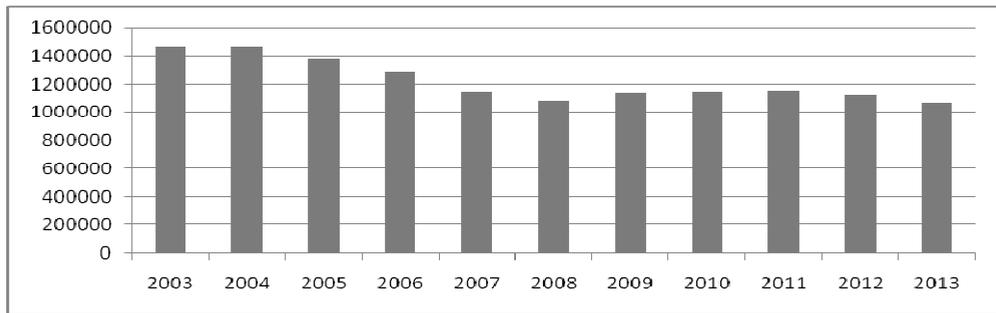


Fig. 1. The number of criminal offences in Poland (2003-2013)

Source: study based on Report on the state of security in Poland (2013)

It can be easily noted that in Poland for a dozen of years the recorded crimes have shown a downward trend (figure 1). In 2013, the police confirmed 1 063 703 crimes in our country. In comparison with the previous year (1 119 803 crimes in 2008), it means a decrease by 5%. In the years 2009-2011, we can see a slight increase in crimes, after a prior big drop recorded in the years from 2004 to 2008. It is also worth noting that in 2013 the smallest number of crimes committed in Poland over the past decade was recorded. In comparison with 2003, when almost 1.5 million crimes were committed, it is a number smaller by about a third (27.5%). In the scale of the whole country, however, almost half of acts criminal are reported (Siemaszko 2009).

General downward trend noticeable in the overall number of crimes confirmed by the police has a close connection with their detection. Over the last decade, we have been dealing with clear growth in the detection of committed crimes (chart 2).

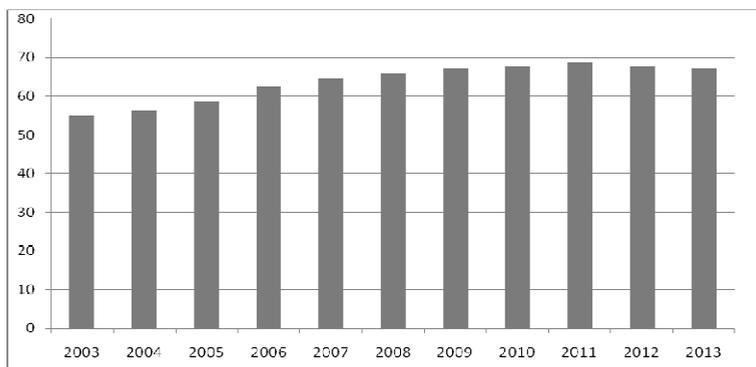


Fig. 2. Crime detection in the years 2003-2013 (%)

Source: study based on Report on the state of security in Poland (2013)

The index of crime detection in 2013 was 67.1% and was comparable with the year before when it recorded 67.8%. The best result in the last ten years was the result of 2011, when the index of detection was 68.7%. In 2003, detection was only 55.2%, therefore the index of detection increased over ten years by 11.9 percentage points.

In 2013, the police could not determine 438 662 suspects of crime. It means that the number of the determined suspects decreased by 12.3% as compared to the previous year, when this number

was 500 539. In the years 2008-2012, the number of people suspected of crimes was stable and was running on a similar level (chart 3).

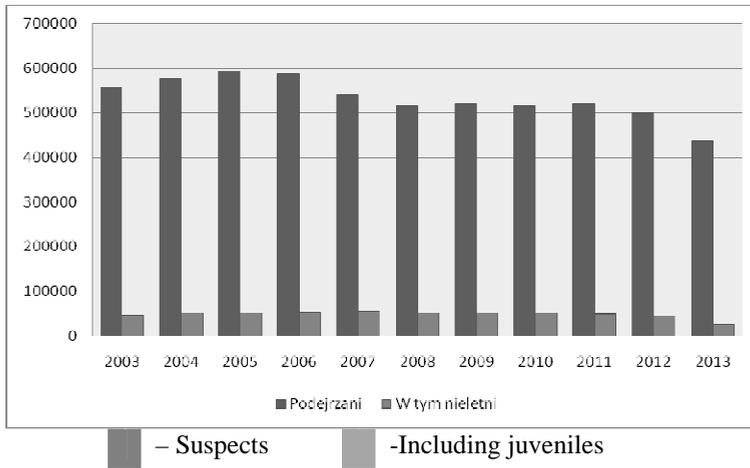


Fig. 3. The number of suspects established by the police in the years 2003-2013

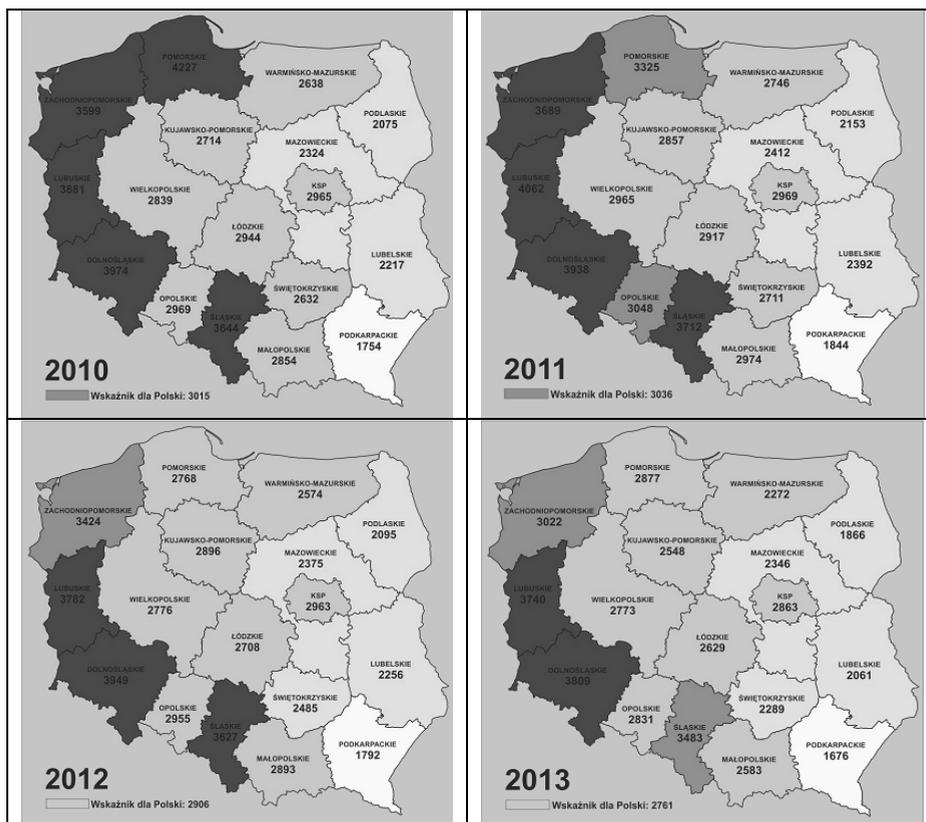
Source: study based on Report on the state of security in Poland (2013)

In 2013, among 438 662 suspects only 25 248 were juveniles, which is a very good result. In comparison with 2012, decrease was recorded by 42.4%, when 43 847 were juveniles). In 2013, juveniles accounted for only 5.8% of suspects, and in 2012 this percentage was 8.8%.

Average hazard of crimes per one hundred thousand inhabitants in 2013 was 2761 and was one of the lowest over recent years. The index changes along with total confirmed crimes and over the last years it was as follows:

In 2010, the index for Poland was 3015. The highest values of crime vulnerability index in total per 100 thousand inhabitants were recorded in western provinces: Pomorskie, Zachodniopomorskie, Lubuskie, Dolnośląskie and Śląskie, and they exceeded the value of 3000. The highest index was recorded in Pomorskie Province (4227) and it was the only region where the value of the index exceeded 4000: on the other hand, it was the smallest in Podkarpackie Province, where it was 1754. In other provinces, the index was within the range of 2000-3000.

- In 2011, the index increased slightly as compared to the previous year and it was 3036, namely it increased by 21. The highest values were recorded in western provinces, like in 2010. The value of 3000 was exceeded, however, by another province – Opolskie, where the index was 3048. The lowest index was recorded in Podkarpackie Province (1844). The highest index was recorded in Lubuskie Province, and it was 4062.
- In 2012, the crime vulnerability index per 100 thousand inhabitants was 2906, thus it recorded regress as compared to the previous years and fell down below 3000. In 2012, only four Provinces exceeded 3000. No region recorded the index of 4000. This time, the highest value was recorded by Dolnośląskie Province: 3949. The lowest index was obtained by Podkarpackie Province (1792).
- In 2013, the index for the whole country was 2761. It is definitely the lowest crime vulnerability index in Poland in the analysed period. In comparison with the previous year (2011), it fell down by as much as 145. The lowest index was invariably recorded in Podkarpackie Province (1676). No province exceeded 4000, however, the highest index was recorded in Dolnośląskie Province and it was 3809.



Picture 1. Crime vulnerability index in the years 2010 – 2013 (Index for Poland)

Source: Report on the state of security in Poland (2013)

## STANDARD OF LIVING IN POLAND

In statistical, sociological and economic literature, the term of standard of living happens to be diverse and not entirely unified. The term of "conditions of living" is often used and it is defined most often as relations in which society, an individual or a household are living currently. The standard of family's living is determined, among others, by the possibility of satisfying its individual needs (*Jakość życia i spójność społeczna 2011*). Research on standard of living make use of mathematics, statistics, economy, sociology, psychology and philosophy (*Owsiński, Tarchalski 2008*). Living conditions are predominantly determined by several basic elements:

- Level of economic welfare.
- Degree of equipping - municipal and residential infrastructure.
- Degree of equipping with social infrastructure.
- Natural conditions of the environment where the human lives.

Within these groups, to describe living conditions it becomes necessary to conduct further disaggregation of components which are connected with specified human needs (*Zróżnicowanie regionalne poziomu życia ludności w świetle wybranych wskaźników z badań Statystyki Publicznej 2014*).

In recent years, gradual growth has been recorded in the significance of subjective indexes in research on quality of living, conducted by both public statistic and international organizations, and research centres (*Mieszkańcy Polski o swojej jakości życia 2014*).

The category of quality of life and problems related to its statistical measurement in the recent years have become the object of significant interest of not only science domains, but also general public and state authorities (*Jakość życia, kapitał społeczny, ubóstwo i wykluczenie społeczne w Polsce 2013*).

To determine standard of living, socio-economic indexes were used: they were grouped in the following categories describing the phenomenon:

1. Employment, working conditions, unemployment.

- Employment index (number of the employed per 1000 people at working age) - [S].
- Registered unemployment rate (share of the unemployed who are registered in the overall number of professionally active people) – [D].
- Long-term unemployment rate (share of the unemployed who are looking for job above twelve months in the overall number of professionally active people) – [D].
- Number of the unemployed against vacancies (number of unemployed people per one vacancy) – [D].
- Accident rate (people injured in accidents at work per 1000 working people) – [D].
- Employees in hazard conditions (number of people employed in hazard conditions per 1000 employees) – [D].

2. Income of population, housing conditions, material resources.

- Average available income, namely average monthly income per one person in a household, calculated in PLN – [S].
- Index of house maintenance costs. It consists of the cost of maintaining apartment and energy carriers per one person in households in % of total expenses – [D].
- Density of apartments. This variable is divided into two categories:
  - Average floor area of an apartment per one person in square meters – [S].
  - Average number of people per one room – [D].
- Material resources, this variable shows percentage share of households with: passenger car [S]; personal computer with access to the Internet [S]; dishwasher [S].

3. Social exclusion and poverty.

- Use of social benefits: it shows the number of people who receive such benefits (e.g. social aid) per 10 thousand inhabitants – [D].
- Index of hazard with relative poverty, namely percentage of the society living in a household with income lower than the poverty level – [D].
- Index of material deprivation: it shows percentage of people with at least three from nine symptoms of poverty – [D].
- Index of the lack of material deprivation. This index shows percentage of people in society who are not affected by poverty – [S].

4. Economic development.

- Gross Domestic Product per capita in PLN – [S].
- Value of fixed assets in PLN, per capita, calculated gross – [S].
- Index of degree of region's attractiveness:
  - Inflows and outflows of local community (migration balance) per one thousand inhabitants – [S].
  - Newly registered entities in the REGON register per 10 thousand people – [S].
- Value of expenses on research-development activities per capita in PLN – [S].

5. Economic infrastructure.

- Railway transport: it presents operated railway lines in kilometres per 100 km<sup>2</sup> – [S].
- Infrastructure of public roads: the index shows the number of kilometres of roads with hard pavement per 100 km<sup>2</sup> – [S].
- Business entities, namely entities registered in REGON per 10 thousand people of local community – [S].

Constant weight, equal to 1, is assigned to all indexes. It enables giving them equal meanings. With the use of taxonomic methods, variables were brought to mutual comparability. Group indexes were calculated for each region, thanks to which a synthetic index was calculated: it is arithmetic average of group indexes.<sup><sup>21</sup> Obtained thus values of the synthetic index enable ordering and assigning objects to four groups:</sup>

- M<sub>I</sub> – with the highest standard of living.
- M<sub>II</sub> – with the average standard of living.
- M<sub>III</sub> – with the low standard of living.
- M<sub>IV</sub> – with the lowest level of living.

## RESEARCH FINDINGS

The crime vulnerability index per 100 thousand inhabitants was serving as a de-stimulant, whereas the index of standard of living were stimulants. It should also be mentioned that in the case of indexes concerning quality of life, we have been dealing with de-stimulants and stimulants, however, to calculate indexes all variables were converted to stimulants.

Table 1. Ranks of provinces by particular indexes

Province	Crime vulnerability index per 100 000 inhabitants	Index of standard of living					
		I	II	III	IV	V	VI
-	-	I	II	III	IV	V	VI
Dolnośląskie	16	8	5	6	5	5	7
Kujawsko-Pomorskie	7	14	12	10	9	9	12
Lubelskie	3	10	13	14	15	15	14
Lubuskie	15	11	9	12	8	13	11
Łódzkie	9	5	1	11	7	4	8
Małopolskie	8	3	7	9	4	2	3
Mazowieckie	6	1	1	1	1	3	1
Opolskie	11	7	2	5	16	1	9
Podkarpackie	1	12	15	16	2	12	13
Podlaskie	2	9	8	3	11	14	6
Pomorskie	12	6	3	7	2	6	4
Śląskie	14	2	4	2	10	1	2
Świętokrzyskie	5	13	16	15	13	7	16
Warmińsko-Mazurskie	4	16	1	13	14	16	15
Wielkopolskie	10	4	6	4	5	8	5
Zachodniopomorskie	13	15	10	8	6	10	10

I – Employment, unemployment and working conditions,

II – Income of population, material resources,

III – Poverty and social exclusion,

IV – Economic development,

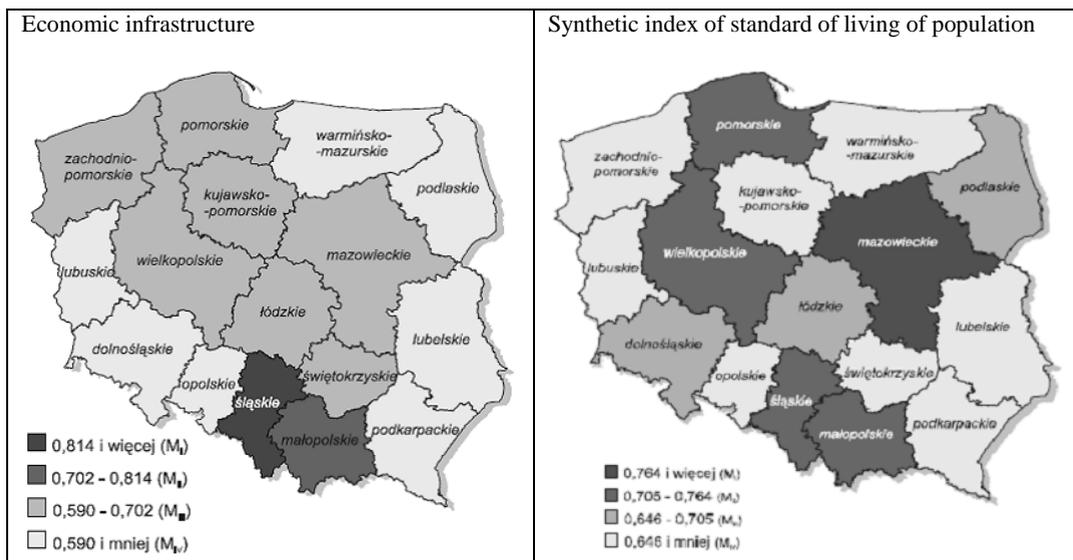
V – Economic infrastructure,

VI – Synthetic index of standard of living.

Source: Prepared by the author based on GUS data

<sup>21</sup> [http://stat.gov.pl/cps/rde/xbcr/lodz/ASSETS\\_referat\\_zroznicowanie\\_regionalne\\_poziomu\\_zycia.pdf](http://stat.gov.pl/cps/rde/xbcr/lodz/ASSETS_referat_zroznicowanie_regionalne_poziomu_zycia.pdf) (dostęp na dzień 12.03.2015)





Picture 2. Gradation of provinces in terms of standard of living taking into account the category of socio-economic indexes

Source: [http://stat.gov.pl/cps/rde/xbcr/lozdz/ASSETS\\_referat\\_zroznicowanie\\_regionalne\\_poziomu\\_zycia.pdf](http://stat.gov.pl/cps/rde/xbcr/lozdz/ASSETS_referat_zroznicowanie_regionalne_poziomu_zycia.pdf) (date of access: 05.02.2015)

When analyzing the relation between development and the analyzed phenomena, the Spearman's rank correlation coefficient was used.

Table 2. Spearman's rank correlation between the crime rate and living standard indexes

	$r_{crime\ index\ I}$	$r_{crime\ index\ II}$	$r_{crime\ index\ III}$	$r_{crime\ index\ IV}$	$r_{crime\ index\ V}$	$r_{crime\ index\ VI}$
Value of rank correlation coefficient	-0.262	-0.547	-0.385	-0.420	-0.442	-0.390

Source: own calculations

When examining dependencies between particular indexes of standard of living and the crime index, the strongest association occurred between the crime index and the index describing the material situation ( $r_{crime\ index\ II} = -0.547$ ). Worse income situation, low condition of material resources result in increased crime index. The weakest, but also unfavorable relation can be noted between the crime index and the index related to employment ( $r_{crime\ index\ I} = -0.262$ ).

The Spearman's coefficient for the synthetic standard of living as well as the crime index ( $r_{crime\ index\ VI} = -0.390$ ) confirms negative relation between the index of crime and the level of living. Worsening standard of living affects increase in crime.

## CONCLUSIONS

The conducted research proved downward trend of the number of crimes committed between 2003 and 2013. Crimes over this period fell by approximately a third (27.5%).

General downward trend noticeable in the number of crimes confirmed by the police has a close connection with their detection. In the recent decade, we have been dealing with clear growth in detection of committed crimes. In 2003 it accounted for 55.2% and this ratio increased over ten years by 11.9 percentage points.

In the examined period, the number of suspects drops as well. As a result of drop in crime, safety of Poles increases, which results in increased standard of living.

The analysis of the standard of living in Polish provinces showed large diversity between regions, mainly in two categories. In the case of the index regarding economic development, the range was as much as 0.903. High diversity was recorded also for the index of business infrastructure (0.455).

The Spearman's rank correlation coefficient showed a negative relation between all indexes of standard of living and the crime index. Decrease in employment, deterioration in material conditions, economic development and business infrastructure may result in growing crime level.

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## SUSTAINABLE CONSUMPTION VS SOCIAL CONNECTIONS BETWEEN ORGANIC FOOD PRODUCERS AND PURCHASERS

**Abstract:** The aim of the article is to present selected aspects of sustainable consumption and their social dimension. The article characterises organic farming as the main factor of sustainable development and social benefits resulting from the sales of organic products. It gives an example of networks connecting producers and consumers of organic products. These networks are an example of good practice in shortening the food chain and they prove the ecological awareness of healthy food producers and purchasers. It is necessary to pay attention to the fact that as far as the aspect of social relations and connections between these groups is concerned, it is possible to notice very important premises for the creation and tightening of mutual bonds.

**Key words:** organic farming, producer-consumer networks, social bonds

### INTRODUCTION

Due to the industrial development in Europe in the 18<sup>th</sup> century there were dynamic changes, which started a new socioeconomic order. The development of civilisation brought measurable benefits, on the one hand, and ecological loss, on the other hand. The consequences of these changes affected the post-industrial society. As people inherited the natural environment in a state of degradation, they were obliged to take responsibility for it and in fact, it was necessary to satisfy social, economic and ecological interests at the same time. The industrial revolution led to the development of industrial society. It created a lifestyle, which in postmodern terms is referred to as consumerism. This phenomenon is a threat to balance between the development of economy allowing for the needs and interests of society and the natural environment. Adequate proportions between these aspects can be kept through sustainable consumption, which together with sustainable production makes the basis of sustainable development.

### MATERIAL AND METHODS

Sustainable production consists in applying safe means and methods, which make optimal use of natural resources, i.e. they are used with due responsibility and in reasonable amounts. When consumers purchase such products, they become part of the sustainable consumption system. It means both acquiring goods of particular quality, which were produced in an environmentally-friendly way, and purchasing products in the amounts which are justified by real needs. Thus, the consumer is a link between production and consumption. Modern forms of sales, which are developing dynamically, chiefly on the Internet, generate benefits for consumers. They save time, are comfortable to use and provide access to a wider range of products and services. This phenomenon also contributes to changes in the culture of postmodern society. It particularly causes the disappearance of direct social relations. However, there are also forms of online sales, where the consumer is not only a recipient of products, but also an entity with whom the producer establishes a personal relationship. The previous virtual contact is automatically transformed into a direct dependence resulting from the buy-sell transaction. This article gives examples of online sales to present the context of social bonds and sustainable consumption based on organic production.

### RESULTS

The purchasing of products and services favours establishing and maintaining direct relations between consumers as well as between producers and purchasers. The appearance of the Internet

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caused the disappearance of face-to-face contacts between the participants of buy-sell transactions. In postmodern society consumption is chiefly identified with new forms of purchasing products and services. Shopping centres, which are called 'temples of consumption', have become not only the places where people purchase goods but also where they spend their free time, socialise and have contact with mass culture. As a result, people visiting shopping centres have become part of the community manipulated by mass media and business elites [Gilejko 2008].

In contrast to industrial society, contemporary consumer society tends to be oriented to behaviours related with consumption rather than production. The process of consumption implemented through new means of communication causes changes in the model of consumption and lifestyle [Byłok 2009]. New forms of selling consumer goods on the telephone and Internet favour these changes. Thanks to online offers of various products and services consumers can complexly satisfy their needs [Stempnakowski 2007]. However, apart from the unquestionable benefits of technologies enabling modern forms of sales, there are also certain dangers. As Lech Zacher stresses, the ideals of culture change their significance in a consumer society. He asks the following questions: If the market creates a consumer, what creates a man of culture? Will non-market values gain advantage on the market? Who should be a positive-role model of non-market values and what reward can we expect for it? What sort of culture will develop in a society where bonds between people are loosening? Will there be any culture in an e-herd or rules of the game only [Zacher 2008]?

The consumer society begins to develop into an interactive society. Manuel Castells points to the new form of community, which is concentrated within the world wide web. In consideration of the structure, purpose and future of interactive communities the author makes references to numerous studies and theories, which are often contradictory. On the one hand, there are opinions which definitely point to the development of new, virtual communities and new forms of social bonds. Others see the development of computerisation as a cause of progressing social atomisation and personal isolation, which results in losing touch with the real world [Castells 2008]. In order to analyse these processes it is important to distinguish between strong and weak bonds. Thanks to the web it is possible to establish bonds even with a very large number of participants, but these bonds are relatively weak. However, it is an advantage of the Internet that it is possible to establish bonds even, or perhaps mostly, with strangers. Interactions have egalitarian nature. In face-to-face interactions interpersonal contacts are determined by biological and social features. By contrast, relationships established on the Internet tend to weaken the significance of these differences. In this approach, due to the fact that the Internet extends social bonds, it counterbalances individualisation processes and it may favour civic engagement. Online communication provides a perfect opportunity for sincere, open discussions. Despite weak bonds between web users, they often support each other and sometimes this support is very strong. The intensity of contacts usually does not go along with their durability. The easiness of making acquaintances, which does not require intensive engagement of the people who aspire to be members of particular online communities, is proportional to the easiness of breaking these contacts. Therefore, Castells [2008] asks the question whether virtual communities are real communities. It is not possible to give a definite answer to this question. The author finally says that these bonds can be called communities, but they are not physical communities. Nevertheless, these are real communities but they function in a virtual dimension. Although this type of community is based on weak bonds, it is highly diversified and specialised. These communities do not follow or imitate other forms of life, but they are characterised by their own quality and uniqueness. They enable participation in many communities as well as membership in so-called partial communities. Apart from that, online communities intensify trends oriented towards privatisation of socialisation. It means that social networks are concentrated around individuals and they maintain both personal contact and online relations with them.

Thus, the consumer society perceived through the perspective of interpersonal relations, which are determined by interactive contacts, generates two types of dependence – based on strong or weak bonds. As far as the role of bonds in the consumer society is concerned, it is advisable to take a closer look at the process of consumption and assess whether maintaining balance in production, distribution and consumption has positive influence or is neutral to the tightening of interpersonal relations.

Sustainable consumption refers to all these areas of human activity which involve the consumption and use of natural and material resources as well as services at different levels – ranging from the individual level to the global society. We can speak of sustainable consumption when it involves optimal use of resources and creation of new products and services allowing for the needs of people and the natural environment. Conscious use of the existing potential must satisfy not only current but also future needs. This means that producers and consumers have the duty to take care of future generations and they must leave the environment in a state that will enable optimal existence.

Sustainable consumption is a vast area for theoretical considerations focusing on different processes, mechanisms and places of its occurrence. My analysis of sustainable consumption in the aspect of social bonds connecting producers and consumers will concentrate on organic farming, which combines both areas of sustainable consumption. On the one hand, it is based on optimal use of environmental resources, including the need to maintain equilibrium in the ecosystem. On the other hand, it is based on the development of conscious consumer attitudes, which will be manifested through the preference of healthy, organic food. Organic farming plays an important role in sustainable development as it enables simultaneous achievement of social, economic and ecological goals. By fulfilling the social mission of natural, sustainable food producers and consumers, organic farming becomes not only a goal by itself but also a form of complex, modern management. It is an element of the activity of various organisations propagating environmentally-friendly, society-oriented and health-promoting ideas and attitudes to life. Organic farming can be an important component of broader socioeconomic systems, e.g. sustainable farming, socially sustainable farming, civic farming, Local Action Groups, Partnership Groups, agritourism, slow-food philosophy, ecological education, etc.

Organic farming differs from other forms of management not only in applying strict criteria to agricultural production and processing of crops but also in the marketing of organic products. Contemporary organic farming is a more modern system of agricultural production based on the experience of previous generations and latest scientific achievements. It is not commonly known that the world organic farming began in the present-day area of Poland. It is usually accepted that organic farming was invented and initiated by Rudolf Steiner, who organised the first course in biodynamic farming in 1924 in Kobierzyce near Wrocław [Osetek & Osetek 1989]. According to the International Federation of Organic Agriculture Movements (IFOAM), the primary goals of organic farming are to produce food of high nutritional value and support all life processes taking place in nature rather than make attempts to dominate it. Other goals of organic farming are to avoid all forms of contamination and pollution of the environment, use materials and substances which can be recycled within or outside the farm, provide farm animals with the conditions that meet the needs of individual species and to follow the social aspects of organic farming [<http://www.ifoam.org>].

The sales of various organic products results in financial gains for the seller and satisfaction with the transaction for the buyer. There are also additional benefits gained from the purchase of a

healthy product. Another benefit, which is not always noticed by the entities participating in the transaction is the exchange of knowledge about organic food in its broad sense<sup>23</sup>.

The first exchange network I would like to discuss in this article is the web portal 'LokalnaZywność.pl', where organic products can be purchased or exchanged. The network operates not only in Poland but also in other EU countries, which provide some products. The founders describe their portal as a private initiative of two men, who wanted to facilitate access to local (fresh, tasty, authentic) food [<http://lokalnazywnosc.pl>]. They say that their mission is to connect providers and consumers of local food. Producers and providers can promote their offers by placing free advertisements and links to their websites on the portal and the Facebook profile. Consumers can easily search for particular products, their producers and providers [<http://lokalnazywnosc.pl/strony/o-nas>]. Valuable local products are continuously offered for sale. Apart from that, they can be purchased at special events and fairs, which are organised at a specific time (once in a longer period of time or regularly). These events can be easily found or added to the calendar [<http://lokalnazywnosc.pl/wydarzenia>]. The portal acts as an agent in the sales of goods and services under the following categories: agritourism, poultry, gastronomy, eggs, local sales, local basket, meat, dairy, fruit, bread/mill, processed products, undergrowth, fish/seafood, seedlings/flowers, alcohols, vegetables, pick your own, others [<http://lokalnazywnosc.pl>].

Due to the multitude of goods and services offered and due to the large area of operation (all Poland and some other EU countries) such portals as 'LokalnaZywność.pl' chiefly give benefits to individuals. However, they have minimal if any contribution to the creation/tightening of social bonds in local communities.

Another example of a sales network is the portal 'odrolnika.pl', which was created by farmers from small family farms. The portal operates around the cities of Tarnów, Kraków and Katowice. The main goal of the portal is to create a network of direct contacts between producers and consumers. Both parties regularly meet on the website. Thanks to the portal, they can learn about customers' individual needs and preferences and they can adjust their production to these requirements. Both parties benefit from trade transactions because products do not include a high margin, which middlemen would normally impose. The elimination of a middlemen from the food chain reduces the price. In consequence, the producer imposes a low margin, which makes the sales profitable. Clients can benefit from transactions, because they can place an order for a specific amount of food produced with a particular technology by producers they know and trust. To sum up, this form of exchange (buy-sell transaction) gives small farm owners an opportunity to earn more money than from buying stations, which often pay less than the cost of production. On the other hand, consumers can buy fresh products of known origin at lower prices than on the secondary market [<http://www.odrolnika.pl>]. This cooperation structure enables trade participants to create a strong and stable network based on mutual trust, which is developed by interaction at each stage of the exchange process. The network sells only organic and traditional products made in small amounts by small family farms. The offer comprises about 75 species and 225 cultivars of crops [<http://www.odrolnika.pl>].

Portals with limited range, such as 'odrolnika.pl', are initiatives giving measurable profits to local communities. By creation and support given to the initiatives which aid further operation of small, traditional farms, cultivation of native crops and breeding of native animal species it is possible to preserve the folklore and tradition of Polish rural areas for future generations [<http://www.grupa.odrolnika.pl>].

As far as the creation/tightening of social bonds is concerned, local communities can benefit more from agrologistic initiatives of small, local exchange structures rather than from big,

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<sup>23</sup> This applies both to the knowledge about the values of organic food and methods of its production, preparation, storage, etc.

nationwide networks. The latter usually do not involve direct contact. Instead, information is exchanged on the telephone or on the Internet and products are delivered by a courier. Although broad-range portals participate in the exchange of goods and services, from the perspective of social bonds they are of minimal value in comparison with the exchange process based on regular and personal contacts between participants, who create a dense and structured network providing considerable benefits resulting from interrelations and propagation of environmentally-friendly and society-oriented values and attitudes. The development of producer-consumer networks results in connection between participants of buy-sell transactions and exchange of information about goods produced/purchased.

## **DISCUSSION**

Sustainable management based on rational exploitation of the natural environment and healthy nutrition is also a philosophy of life. Problems of environmental protection and maintenance of biodiversity as well as threats caused by intensive monocultural farming were discussed by Ulrich Beck in the concept of risk society [2004] and by Ulrich Beck, Anthony Giddens and Scott Lash in the concept of reflexive modernisation [2009].

The economic conditions in modern sustainable development systems require extended functions of organic farming. Apart from the basic alimentary function, this branch is expected and legally obliged to provide sources of renewable energy. Among different types of renewable sources biofuels, biomass and biogas are the ones of agricultural origin. In this context it is necessary to stress the role of organic farmers as renewable energy prosumers. A prosumer is both a producer and consumer of energy generated from small renewable sources, which are usually environmentally friendly. As of the end of December 2012, there were about 26,000 organic farms in Poland, occupying an area of more than 650,000 ha. According to the data of the Ministry of Agriculture, in comparison with 2011, in 2012 the area and number of organic farms increased by 10%. At present organic farms occupy about 3.4% of the total farmland. In the last decade the area occupied by organically grown crops has doubled in the EU. At present in Europe there is about 29% of the global area of organically grown crops. The following EU countries have the largest organic plantations: Spain (1.6 million ha), Italy (1.1 million ha) and Germany (1 million ha). Among the new EU member-states Poland and the Czech Republic have the largest areas occupied by organic farms [Report on Organic Farming in Poland 2011-2012].

The study conducted by the Institute of Rural Development and Agriculture, Polish Academy of Sciences in 2013 outlines the role of organic farming and its social functions in Poland. The results of the study indicate that under favourable circumstances organic farming may become both a resource and a value not only for the people who are directly involved in organic food production but it may also cause development of the community and place where it is located. The study also proved that organic farming had positive influence on the local labour market. There was almost no unemployment in the places where commodity organic farming developed on a large scale. Farmers producing organic food belong to an elite in the agri-food industry. The authors of the study found that a rooted market can develop effectively if there is a leader doing pioneer work in order to implement, develop and promote this type of production. This is usually a know-how leader. In the locations under study there were people with theoretical knowledge and practical experience, who were ready to share it with farmers interested in organic production [Organic Farming as a Factor of Local Development – an Analysis of Selected Cases].

It is necessary to stress the educational role of organic farming. As results from the study conducted by the Agricultural Advisory Centre, Kraków Branch, in 2010 in Poland there were 197 farms offering education, including 47 certified organic farms. What needs to be particularly stressed is the social mission in its broad sense, related to health-promoting education, which



mostly targets children. Simultaneously, it gives a possibility to eliminate children's false beliefs about the origin of food [Agritourist Educational Farms – Ideas and Good Examples].

The potential benefits from the sales/purchase of organic products should also be perceived in a broader context rather than only in the aspect of trade participants or social benefits. Politicians also see a value added in this activity. As can be read in the introduction to the Opinion of the Committee of the Regions on 'Local Food Systems' published in the Official Journal of the European Union on 2 April 2011 (2011/C 104/01), 'local food systems support the local and regional economy (...); short distribution channels lead to greater interaction between consumers and producers. They create relationships based on trust (...)'. Then we can read in Paragraph 18 that 'offering local products with authentic, traditional, original, sustainable, seasonal or other locally appreciated features supports social cohesion and community spirit and encourages the community to display environmentally friendly behaviour. Sales outlets for local products such as direct sales stalls and open-air markets often contribute to the process of social and professional inclusion for consumers, producers and sellers.'

## **CONCLUSIONS**

Apart from significant economic and environment-friendly functions, organic farming also has social goals. The most important social goal is to develop socially sustainable farming, which combines economic, ecological and social functions. It follows the slow food philosophy as a philosophy of life, which is also supported and promoted by the EU.

Organic production is often combined with the activity of agritourist farms, which have a wide range of significant social functions. They support and promote folk culture, healthy food and healthy lifestyle. Some agritourist farms also offer education, which results in measurable profits for agriculture and schools. Thus, we can pose the thesis that organic food, its production and distribution have positive influence on society and local communities. As far as distribution is concerned, it is necessary to stress the fact that networks developing on the Internet connect organic food producers and consumers. Web portals with broad, nationwide or even international range as well as those with local range have numerous positive functions. They shorten the food chain, facilitate access to organic products and promote them and they act for the natural environment. The analysis of these portals in terms of the establishment and tightening of social bonds shows that online sales encompassing macroregions does not favour production addressed to specific recipients and their expectations. The role of large portals is limited to being agents in buy-sell transactions, but they do not act as agents in direct contacts between producers and consumers. On the other hand, portals with regional range represent the interests of both parties and organise distribution so as to enable exchange of information and know-how about organic production and products. The manner of delivery (products delivered to the client's door or to a collecting station) favours establishing interpersonal relations between providers and recipients as well as consumers of organic products, who meet at the place of delivery. It seems that this form of purchasing is closer to traditional forms of sales based on direct relations. In reference to the thesis recounted by Castells, which assumed that the development of computerisation would intensify social atomisation, the example of a small-range web portal proves the opposite dependences, which favour building social integrity. The creation of virtual networks, which transform into real networks of connections, and offering local, chiefly organic products favours not only social integrity but it also strengthens the sense of community based on behaviours that are friendly to the natural environment. It is also necessary to stress the renaissance of traditional places where goods can be sold and purchased and which are also used for online transactions. They can be used as an alternative to large-space commercial activity because they provide space for direct social contacts. In consequence, they facilitate creation and tightening of bonds as well as sustainable consumption.

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## **DELIVERY ASSESSMENT PROJECT FOR WOOD PROCESSING PLANT**

**Abstract:** In the current situation the economic activity of wood processing companies is largely determined by the quality of the raw material. Production processes, skilled workers or similar organization rules do not allow for a significant competitive advantage. That is why the issue of supply logistics, and more specifically the assessment of supply, is the key point in the assessment and qualification of suppliers. One of such developing plants is the Wood Processing Plant located in the village near Dębica in the south-eastern Poland. The need to meet the high expectations of overseas customers forced the plant to develop a supply assessment procedure. The design of such procedure has been presented in this study.

**Keywords:** supply assessment, supply, sawmill, quality

### **INTRODUCTION**

An ever increasing competition in the market and changing customer requirements impose on the organization the obligation to constantly improve the quality of the products and services offered by them. Individuals who want to take a competitive advantage are looking for effective management methods in the market that will enable them to provide buyers with products and services that fully meet their expectations. An important element in the smooth operation of a company is the quality of the purchased materials and the semi-finished products as they determine the quality of the final product and, consequently, meet both the needs and the requirements of the customer. In order to prevent some disruptions in the production process caused by the lack of suitable materials, individual companies must ensure that the purchasing process, as well as the control of supplies and suppliers are properly followed. These processes require continuous monitoring so that the improvements can be made. [2, 3] In order to monitor these processes efficiently it is necessary to document them using special registers and forms. Many methods and tools are used to evaluate the supplier, e.g. supplier self-presentation, vendor audits, third-party references, company visits, trade fairs, trial orders, etc. In the range of these instruments it seems appropriate to indicate one suitable for a typical woodwork. This article has been devoted to this issues presenting in it one of the original solutions in this area.

### **ROAD TO QUALITY IN WOOD PROCESSING PLANT**

The analyzed deliveries were made to the Wood Processing Plant located near Dębica in the Podkarpackie Voivodship (south-eastern Poland) at the A4 motorway junction. Apart from the production hall on the premises of the company there are also located office spaces, warehouses, pick-up yards, sawmills, drying rooms and garages. The Wood Processing Plant was established in 1995 as a sawmill production company. In the late nineties the company began to manufacture and assemble wood carvings. This time and the early years of the previous decade were the period of dynamic development of this sector. The companies had no trouble selling their products, and the market demand exceeded the supply. After year 2000 the structure of sales of windows in the market began to change radically. The share of sales of wooden windows decreased in favor of PVC windows. Market growth did not compensate for structural changes and the sale of wooden windows began to soar. Unfortunately, most companies did not see the changing trends and did not make the right strategic decisions to keep the company from falling revenues. This was also the case

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with the Wood Processing Plant. The company located its products mainly in the developer market. The negotiating power of the large executive companies that were operating in this market was enormous. This, coupled with declining demand, led to a decline in sales profitability. The opportunity to get out of this situation was the production of the highest quality products. To make this possible, it was necessary to pay attention not only to the quality of the production but also to the quality of the supply. The Wood Processing Plant is a plant that is able to guide the whole process from the acquisition of oak elements through the process of their modification, until the high quality production process of the final product. The capacity of the wood modification line still allows other flooring service providers to do this. Simultaneously, the acquisition of the Swiss, German and Austrian markets forced efforts to maintain high quality. For this purpose, an improvement of supply assessment was undertaken. [1]

### AN ANALYSIS OF SUPPLIES IN THE WOOD PROCESSING PLANT

When analyzing the market of wooden products, the imbalance between the demand for high quality wood and the availability of wood begins to be visible. This is due to the specific nature of this natural raw material. It cannot be produced in large quantities. The quantity of wood material harvested is limited by its growth. For many years, it has accounted for about 60% of the mass of wood. This is due to the need to increase the so-called forest cover in Poland. The forest cut must be smaller than its growth. This causes a reduction in the age of the trees that are being cut (fewer and fewer woods are remaining), and thus the reduction of the diameter of the available wood material. Unfortunately, with the reduction in diameter the quality of the raw material is also decreasing. All this reduces the supply of quality wood, which, with even unchanged demand, needs an increase its price. In this situation, the key strategic element of the business is an access to the appropriate quality class and optimal use of the raw material. From the point of view of the Wood Processing Plant it is necessary to assess carefully the quality of the supply.

The system of sales by the State Forests promotes companies from the so-called purchasing history. This means that it is not possible to purchase any quantity of raw material at any time. The Wood Processing Plant has such the purchasing history and an infrastructure for the processing of wood material. Thanks to this, it achieves strategic security of raw material supply.

Table 1. List of wood supplies from the last quarter of 2016. Own research based upon [1].

Type of delivery	No. of deliveries X 2016	No. of deliveries XI 2016	No. of deliveries XII 2016	Total no. of deliveries	Percentage share
Oak frieze	13	16	14	43	23,50
Oak lamella	12	15	13	40	21,86
Pine sawn timber	21	20	23	64	34,97
Linden leaf	8	7	9	24	13,11
Round lime timber	1	0	1	2	1,09
Exotic frieze	2	1	2	5	2,73
Exotic lamella	2	2	1	5	2,73

By analyzing the delivery to the Wood Processing Plant one can notice that there are several deliveries each day, which comes up to a total of about 25 cars a week. Goods are ordered successively in relation to the technological process of the production. However, the company has so-called reserves in case of problems with suppliers. The stock would be enough for about 2 weeks.

In the Wood Processing Plant two types of supply can be distinguished. One group of deliveries are the supply of wood: oak frieze, oak slats, pine sawn timber, linden leaf, round lime timber, exotic frieze, exotic lamellas. The second group are additional materials such as adhesives, lubricants, lacquers. Table 1 lists the supply of wood from the 2016 quarterly survey.

Figure 1 shows the Pareto - Lorenz diagram [4, 5] of the raw material supply in the analyzed quarter. One can see that most of the pine sawn timber and oak friezes are supplied to the Wood Processing Plant. By means of the Pareto method the delivery that has the greatest impact on the delivery process in the company was chosen.

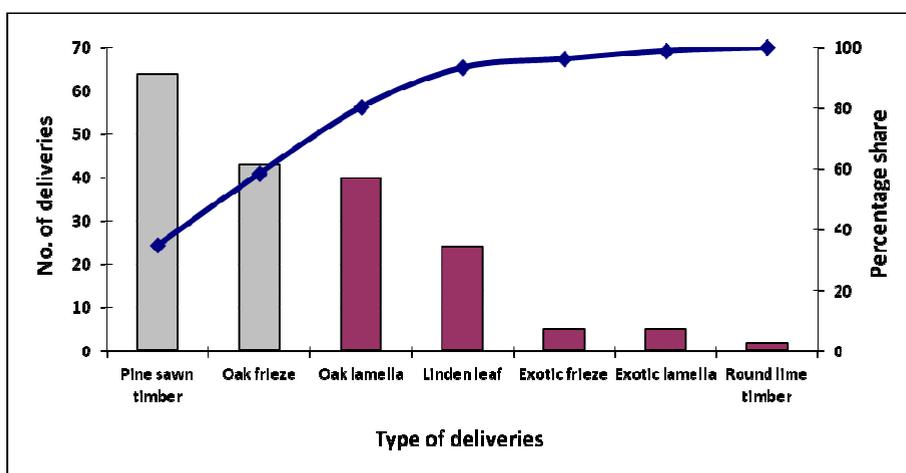


Fig. 1. Pareto-Lorenz diagram. Own research based upon [1].

Most deliveries are made by supplying pine sawn timber, hence the further part of the supplier evaluation project will be based on the evaluation of these suppliers.

In the Wood Processing Plant, the method of assessing pine sawn timber was divided into three stages:

- 1) Firstly, it was checked whether the delivered goods matched the order in terms of quantity, type and grade.
- 2) The moisture of the batch was then checked to ensure that it complied with the order. In the next step, some samples were taken randomly. A person responsible for pre-delivery evaluation, selected the samples from different locations and checked their dimensions (thickness, length, and width). This was a relatively important point because the final material had its own dimensions. When a company gets a material that is wider or smaller than the one ordered, it generates additional waste. Larger waste means less good raw material, and therefore higher losses on the batch. During this stage of the delivery the quality is also checked quality, i.e. whether the wood is not faded, moldy, blanched and the attention is paid to the number of knots. The second evaluation step is after unloading and preparation of the material for further processing.

Then there are hidden defects that cannot be checked before. Occasional poor quality of wood hidden in the middle or bottom of the pallet occurs.

- 3) In the last part of the evaluation, the waste from the batch is evaluated, which is then converted into percentages.

Table 2 shows the processing of the batch in the Wood Processing Plant, i.e. calculating how many [m<sup>3</sup>] is obtained from the finished product [m<sup>2</sup>]. In the final section the performance of the obtained sleepers in m<sup>2</sup> from 1m<sup>3</sup> was checked. Such documentation is provided for primary suppliers marked D1 or D2.

Table 2. Method of calculating the productivity of pine sawn timber.

Supplier	Range	Quantity of material taken M3	Quantity of sleepers obtained M2	Performance of the sleepers obtained in m <sup>2</sup> from 1 m <sup>3</sup> of sawn timber
D1	Pine sawn timber wet	7,000	386	55
D1	Pine sawn timber wet	26,588	924	35
D1	Pine sawn timber wet	18,400	992	54
D2	Pine sawn timber wet	23,000	1284	56
D1	Pine sawn timber wet	33,480	1508	45
D2	Pine sawn timber dry	40,787	2354	58

Source: Own research based upon [1].

In case of problems resulting from the difference between the ordered and the delivered goods, the complaint is filed. Price adjustments are usually made for material of a different class or quality, or a quantitative correction for less material. Ultimately there is a resignation from the supplier.

The lack of regular evaluation of suppliers at the Wood Processing Plant caused several quality problems. In principle no evaluation of deliveries was made, only the choice of suppliers. The past selection of the suppliers was based on the supplier's history and its good market position. It was stated that the knowledge of suppliers was synonymous with quality of supply and that it was sufficient knowledge. It turned out that changes were necessary as only one person had dealt with orders for a few years.

When evaluating the performance of a given supply, the materials from the two main suppliers were measured so far. This was not enough compared with other suppliers where such conversions did not taken place. In this case, the best way to resolve a company's current situation was to review the delivery regularly and check its performance at least once a month from the supplier. In case when such results were not comparable, a more frequent measurement should be introduced in order to control better the delivered raw material. Past inspections of deliveries only from the companies from which the Plant ordered the most was not a measure. This did not give the Plant an opportunity to consider the supply from the additional suppliers, and thus the opportunity for the supplier to become a qualified supplier. This was an activity that did not develop and did not expand the scope of the main suppliers. This means that the suppliers to whom the Plant has been ordering for several years may feel comfortable and allow the delivery of inferior material, knowing that the company will order them anyway. Suppliers are limited, but they cannot deliver poor quality or lower quality



products. The solution to this situation is the introduction of a systematic assessment of supplies and the suppliers.

### **DRAFT OF THE SUPPLY ASSESSMENT PROCEDURE FOR THE WOOD PROCESSING PLANT**

As a part of the improvement of the supply assessment process in the Wood Processing Plant the special procedure has been prepared. It is run by the competent quality control officer or the designated deputy. The main assessment document is a supply register. The basis for updating and preparing the supply register is an analysis of current deliveries. The supplies assessment written down in the F-01 Form F-01 (3) should be grouped according to the type of product delivered and the statement should be done quarterly. The protocol should be delivered to the Purchasing Manager by the end of the last business day ending the quarter.

Table 3. Protocol of supplies assessment F-01.

Protocol of supplies assessment No. ...					
Quarter, year....					
No.	Supplier	Quality assessment (month, year)	Quality assessment (month, year)	Quality assessment (month, year)	Average quality assessment

*Source: Own research*

The quality assurance review should be carried out by the QC staff in consultation with the shift manager on the production floor. The results are listed on the F-02 supply assessment sheet (Table 4).

Table 4. F-02 Supply Assessment Sheet.

Supply Assessment Sheet No. ...							
Point score (from 0 to 5)							
No.	Supplier	Quantity	Humidity	Dimensions	Visual assessment	Performance	Date

*Source: Own research*

The collected information is provided up to 2 working days from the completion of the material's performance measurements to the Purchasing Manager. Deliveries are selected at random, while maintaining a dependency: one supplier is evaluated once a month.

In the case of evaluation of supplies, the following scale is taken.

1. Delivery Quantity - from 0 to 5:
  - 5- always according to the order,
  - 4- less than 5% of the order,
  - 3- 5-10% of the order is missing,
  - 2- 10-15% of the order is missing,
  - 1- 15-50% of the order is missing,
  - 0- > 50% of the order is missing.
2. Humidity - scale from 0-5:
  - 5-piece product according to the order,
  - 4-increased humidity by 10-15%,
  - 3 - increased humidity by 16-20%,
  - 2- increased humidity by 21-30%,
  - 1- increased humidity by 31-50%,
  - 0 - total non-compliance with the order.
3. dimensions - scale from 0-5:
  - 5-dimensional board in accordance with the order,
  - 4-dimensional board size 5% larger,
  - 3- board size greater than 5-10%,
  - 2- board size greater than 10-15%,
  - 1-dimensional board larger by more than 15%,
  - 0- board size too small.
4. Visual assessment - scale from 0-5:
  - 5- good product, no visible defects (fungus, mold/ knots),
  - 4- good product, detectable defects are unitary,
  - 3-10-30% of the non-compliant batch (molded or too many knots in the boards),
  - 2-30-40% of the non-compliant batch (overgrown, too many knots in the boards),
  - 1-40-50% of the non-compliant batch (ducked, exaggerated with too many knots),
  - 0 - the product is fattened, molded.
5. performance- scale from 0-5:
  - 5- The number of obtained sleepers in m<sup>2</sup> from 1 m<sup>3</sup> to 55,
  - 4- The number of obtained sleepers in m<sup>2</sup> from 1 m<sup>3</sup> from 50-54,
  - 3- Number of obtained sleepers in m<sup>2</sup> from 1m<sup>3</sup> from 45-49,
  - 2- Number of obtained sleepers in m<sup>2</sup> from 1m<sup>3</sup> from 40-44,
  - 1- Number of obtained sleepers in m<sup>2</sup> from 1m<sup>3</sup> from 9-31,
  - 0- The amount of sleepers obtained in less m<sup>2</sup> from 1m<sup>3</sup> less than 30.

The performance evaluation of the material received is made by the shift manager on the production floor, and the results are recorded on the "F-03 Delivery Performance Assessment Sheet" (Table 5).

The collected information is provided at the end of the material performance measurement to the QC employee.

Such the procedure of the suppliers' assessment was tested in the next quarter and it turned out that the Wood Processing Plant cooperated with seven suppliers during that period. Thanks to the analysis, it was possible, for example, to identify the supplier with the highest performance. Interestingly, in the next evaluation his performance was significantly lower. The introduction of the

assessment of the supply makes it possible to capture such situations, and also forces suppliers to take care of the quality of supply.

Table 5. ZDTB 5.6 / F-03 Performance Evaluation Sheet

Performance Evaluation Sheet No. ...				
Month, year .....				
LNo.	Supplier	Quantity of material taken M3	Quantity of sleepers obtained M2	Performance of the sleepers obtained in m2 from 1 m3 of sawn timber

Source: Own research

## CONCLUSIONS

The supply assessment system should be a crucial issue for the selection of suppliers. This is especially important if the company's past performance was based solely on objective information. An example of this could be the very successful Wood Processing Plant. Company development based on product quality and at the same time unstable raw material market in this area led to the need to change the approach to supply assessment. The previous assessment, based on the existing cooperation, had to be replaced by a more sophisticated approach. Therefore, a draft proposal for a procedure for the evaluation of deliveries was prepared, which should ultimately lead to the proper selection of suppliers. The score was prepared according to the criteria: quantity, humidity, dimensions, visual assessment and, above all, performance. The prepared delivery evaluation procedure during testing has shown its sensitivity to quality degradation. The supplier with a long supply history, in the general sense of providing high quality lumber, has provided low-performance material. The capture of this fact influenced his assessment, and it is hoped that in the future this supplier as well as others knowing the method of supply assessment will try their best to play the role of a qualified supplier.

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## THE SALES OF ROUND WOOD BY THE ‘STATE FORESTS’ NATIONAL FOREST HOLDING IN 2017 AND CONSECUTIVE YEARS

**Abstract.** The article presents the most important assumptions and rules of the sales and distribution of round wood by the ‘State Forests’ National Forest Holding in 2017 and compares them with the solutions applied between 2006 and 2016. The author evaluates these solutions and suggests modifications of the system.

**Key words:** distribution of round wood, ‘State Forests’ National Forest Holding

### INTRODUCTION

The work on the current system of sales and distribution of round wood by the ‘State Forests’ National Forest Holding started in July 2006. Konrad Tomaszewski, the chief analyst of the enterprise, suggested selling wood by means of a special Internet application – the Forest and Wood Portal (PLD). The Forest and Wood Committee was appointed to advise the General Director of the ‘State Forests’ National Forest Holding. The system used for the evaluation of offers of wood purchase and distribution was in operation in 2007. It was slightly modified in 2008 (Lis 2014).

Between 2009 and 2016 the sales and distribution of round wood by the Forest and Wood Portal became increasingly complicated. Products were sold to the entrepreneurs that were regular wood purchasers (the clients who had purchased wood from the ‘State Forests’ National Forest Holding before) and they were auctioned by means of the Internet application *e-drewno* (the offer was addressed to all entrepreneurs). The proportion between the wood offered on the PLD portal and the *e-drewno* application was variable. Usually 70% of wood was sold on the portal, whereas 30% was sold on the *e-drewno* application. Between 2010 and 2012 the proportions were different, i.e. 2010 – 50/50, 2011 – 55/45 on average, 2012 – 65/35 (Malinowski, Lis, Wieruszewski 2016).

In 2013 the sales of wood from the investment pool began. It was addressed to the entrepreneurs who performed tasks which significantly increased the round wood processing capacity. The amount of the pool successively increased. In 2013 3% of wood was reserved for entrepreneurs, in 2014 – 5%, in 2015 and 2016 the pool amounted to 2.5 million m<sup>3</sup>. The wood from the investment pool was sold at the PLD prices. It was usually cheaper, sometimes considerably, than the wood sold via the Internet application *e-drewno*. For this reason the investment pool was very popular among entrepreneurs and there were much more purchase offers than the amount that wood forest inspectorates offered for sale.

In 2016 the rules of sales were significantly modified. New solutions applied to tenders announced in 2017. In general these changes were good for entrepreneurs. The rules are mostly clearer, especially in comparison with the rules applied between 2010 and 2016.

This article presents the most important assumptions and criteria of evaluation of the current system of sales and distribution of wood to entrepreneurs.

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## THE EVALUATION CRITERIA OF WOOD SALES AND DISTRIBUTION OFFERS

The criteria are listed in *Directive 2016a*. A condensed list of the most important criteria can be found Table 1. The price of wood offered by entrepreneurs in their offers is the most important criterion. Its weight amounts to 65% of the total evaluation. The following other aspects are also evaluated:

- 1) the purchasing habit, i.e. checking whether the offer is similar to other offers to purchase similar amounts of wood submitted in previous years and whether the purchase transaction is located in the same forest inspectorates;
- 2) purchasing geography – there is preference for transactions in forest inspectorates located close to the seat of the enterprise.

Table 1. The criteria of evaluation of the offers of sales and distribution of round wood made by the ‘State Forests’ National Forest Holding in 2017 and consecutive years

Evaluation criterion Primary market		Weight		Evaluation criterion Development market ‘State Forests’ Enterprises	
A	Price	0.65		Price	A
B	Purchasing habit	0.25	0.35	Purchasing habit	B
C	Purchasing geography	0.1	-		
Total score for wood purchase offer			1	Total score for wood purchase offer	

Source: The author’s compilation based on Appendix 1 to the Wood Sales Directive introduced by the ‘State Forests’ National Forest Holding; The Premises, Legal and Substantial Basis and the Implementation of Provisions of the *Directive (2016b)*

## PRICE OF WOOD

Table 2 shows the range of prices listed in *Directive 2016a*. According to the Directive, the base price is distinguished as the price of the ideal state. It is offered for tender by the ‘State Forests’ IT System (SILP), which automatically evaluates purchase offers. The system also distinguishes two accessory extreme prices, i.e. the rejection price – the lowest price at which wood can be sold and the maximum price, which is supposed to eliminate price inflation and some entrepreneurs’ attempts to control the market. In 2017 the extreme prices were set at 4%, i.e. the rejection price – -4%, the maximum price - +4%.

Table 2. The rules of setting wood prices in the proper markets (in forest inspectorates) and for trade and assortment groups in 2017 and consecutive years

PRICE OF WOOD		
REJECTION PRICE	IDEAL STATE PRICE proposed in tender	MAXIMUM PRICE
-4%		+4%

Source: The author’s compilation based on *Directive 2016a*

Table 3 gives examples of price setting. The calculations were based on the prices suggested by the SILP (ideal state prices) set at 100 zlotys/m<sup>3</sup>, 200 zlotys/m<sup>3</sup> and 300 zlotys/m<sup>3</sup> of round wood.

Table 3. Examples of setting wood prices in the proper markets (in forest inspectorates) and for trade and assortment groups and their evaluation

-4%	Price of wood proposed in tender																								4%																							
	ideal state price																																															
	-12	-11	-10	-9	-8	-7	-6	-5	-4	-3	-2	-1	0	1	2	3	4	5	6	7	8	9	10	11	12																							
Rejection price										96	97	98	99	100	101	102	103	104										Maximum price																				
										1,25	2,50	3,75	5,00	<b>6,25</b>	7,50	8,75	10																															
										0,81	1,63	2,44	3,25	4,06	4,88	<b>5,69</b>	6,50																															
				192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208				Maximum price																								
			0,63	1,25	1,88	2,50	3,13	3,75	4,38	5,00	<b>5,63</b>	6,25	6,88	7,50	8,13	8,75	9,38	10																														
			0,41	0,81	1,22	1,63	2,03	2,44	2,84	3,25	3,66	4,06	4,47	4,88	5,28	<b>5,69</b>	6,09	6,50																														
												288	289	290	291	292	293	294	295	296	297	298	299		300	301	302	303	304	305	306	307	308	309	310	311	312											
												0,42	0,83	1,25	1,67	2,08	2,50	2,92	3,33	3,75	4,17	4,58	5,00	<b>5,42</b>	5,83	6,25	6,67	7,08	7,50	7,92	8,33	8,75	9,17	9,58	10													
												0,27	0,54	0,81	1,08	1,35	1,63	1,90	2,17	2,44	2,71	2,98	3,25	3,52	3,79	4,06	4,33	4,60	4,88	5,15	5,42	<b>5,69</b>	5,96	6,23	6,50													

Source: The author's compilation based on *Directive 2016a* and the amount of wood sold by the 'State Forests' National Forest Holding at the end of 2016

According to Table 3, a change of 1 zloty/m<sup>3</sup> in the tender price of 100 zlotys/m<sup>3</sup> results in the following values: 12.5% of the evaluation for all the three criteria or 8.1% of the evaluation for the wood price only. A change of 1 zloty/m<sup>3</sup> in the price of 200 zlotys/m<sup>3</sup> results in 6.3% of the evaluation for all the three criteria or 4.1% of the evaluation for the wood price only. A change of 1 zloty/m<sup>3</sup> in the price of 300 zlotys/m<sup>3</sup> results in 4.2% of the evaluation for the maximum score for all the three criteria or 2.7% of the evaluation for the maximum wood price.

Table 4 compares the prices of all wood species and quality classes, which may have occurred in all forest inspectorates in Poland at the end of 2016. The prices were grouped at 25 zlotys/ m<sup>3</sup> because the rejection price and maximum price change by 1 zloty at each 25 zlotys (according to the rule: 100 zlotys/m<sup>3</sup>/4 (%)=25 zlotys/m<sup>3</sup>). Thus, 10 groups with ideal state prices ranging from 88 zlotys/m<sup>3</sup> to 338 zlotys/m<sup>3</sup> were identified. They encompass an even wider range of real prices which entrepreneurs may have offered in tender: 85-350 zlotys/m<sup>3</sup>.

The scoring awarded to offers can be found on the right side of the table – for the price, purchasing habit and purchasing geography. In the first price group (84-108 zlotys/m<sup>3</sup>) a change by 1 zloty resulted in a change in the evaluation by 1.25 points in total or by 0.81 points for the price only. It corresponds to the change in the price of 100 zlotys/m<sup>3</sup>, because it matches the first price group, which encompasses the ideal state prices ranging from 88 to 112 zlotys/m<sup>3</sup>. In the last price group (300-324 zlotys/m<sup>3</sup>) a change in the price of round wood by 1 zloty/m<sup>3</sup> resulted in a change in the evaluation by 0.38 points in total or by 0.25 points for the price only.

The rightmost column of Table 4 shows the bonus in zlotys which entrepreneurs can receive with the price offered if they have the maximum score in the total evaluation for the purchasing habit and purchasing geography. It is 2 zlotys/m<sup>3</sup> in the first group and 7 zlotys/m<sup>3</sup> in groups 8, 9 and 10.

The bonuses are relatively low. In forest inspectorates which are not far away from each other differences in the ideal state prices proposed by the SILP for the same round wood species and quality class often amount to more than 10 zlotys/m<sup>3</sup> or in some cases they even exceed 20 zlotys/m<sup>3</sup>. It is much more important for entrepreneurs to submit their purchase offer in cheaper forest inspectorates rather than receive a bonus for the purchasing habit and purchasing geography if a much more expensive inspectorate offers a bonus.



necessary to carry out 4 procedures – the main stage and 3 supplementary ones and the procedure of wood sales and distribution should not begin later than mid-November.

### CONCLUSIONS

The system of wood distribution applied to the sales of wood in 2017 is definitely better than the system which was used between 2010 and 2016. However, it needs to be improved systematically and final decisions need to be taken more quickly.

Table 5. The evaluation of round wood purchase offers in the main and supplementary stages

Evaluation of offers in the main stage	Number of supplementary stages on the same qualification as on the main stage									
	1	2	3	4	5	6	7	8	9	10
5	9,75	<b>14,26</b>	18,55	22,62	26,49	30,17	33,66	36,98	40,13	43,12
10	19,00	<b>27,10</b>	34,39	40,95	46,86	52,17	56,95	61,26	65,13	68,62
15	27,75	<b>38,59</b>	47,80	55,63	62,29	67,94	72,75	76,84	80,31	83,27
20	36,00	<b>48,80</b>	59,04	67,23	73,79	79,03	83,22	86,58	89,26	91,41
22,5	39,94	<b>53,45</b>	63,92	72,04	78,33	83,21	86,99	89,91	92,18	93,94
25	43,75	<b>57,81</b>	68,36	76,27	82,20	86,65	89,99	92,49	94,37	95,78
27,5	47,44	<b>61,89</b>	72,37	79,97	85,48	89,47	92,37	94,47	95,99	97,09
30	51,00	<b>65,70</b>	75,99	83,19	88,24	91,76	94,24	95,96	97,18	98,02
<b>32,5</b>	<b>54,44</b>	<b>69,25</b>	<b>79,24</b>	<b>85,99</b>	<b>90,54</b>	<b>93,62</b>	<b>95,69</b>	<b>97,09</b>	<b>98,04</b>	<b>98,67</b>
35	57,75	<b>72,54</b>	82,15	88,40	92,46	95,10	96,81	97,93	98,65	99,12
36	59,04	<b>73,79</b>	83,22	89,26	93,13	95,60	97,19	98,20	98,85	99,26
37	60,31	<b>75,00</b>	84,25	90,08	93,75	96,06	97,52	98,44	99,02	99,38
37,5	60,94	<b>75,59</b>	84,74	90,46	94,04	96,27	97,67	98,54	99,09	99,43
38	61,56	<b>76,17</b>	85,22	90,84	94,32	96,48	97,82	98,65	99,16	99,48
39	62,79	<b>77,30</b>	86,15	91,55	94,85	96,86	98,08	98,83	99,29	99,56
40	64,00	<b>78,40</b>	87,04	92,22	95,33	97,20	98,32	98,99	99,40	99,64
42,5	66,94	<b>80,99</b>	89,07	93,71	96,39	97,92	98,81	99,31	99,60	99,77
<b>45</b>	69,75	<b>83,36</b>	<b>90,85</b>	94,97	97,23	98,48	99,16	99,54	99,75	99,86
46	70,84	<b>84,25</b>	91,50	95,41	97,52	98,66	99,28	99,61	99,79	99,89
47	71,91	<b>85,11</b>	92,11	95,82	97,78	98,83	99,38	99,67	99,83	99,91
48	72,96	<b>85,94</b>	92,69	96,20	98,02	98,97	99,47	99,72	99,86	99,92
49	73,99	<b>86,73</b>	93,23	96,55	98,24	99,10	99,54	99,77	99,88	99,94
50	75,00	<b>87,50</b>	93,75	96,88	98,44	99,22	99,61	99,80	99,90	99,95
51	75,99	<b>88,24</b>	94,24	97,18	98,62	99,32	99,67	99,84	99,92	99,96
52	76,96	<b>88,94</b>	94,69	97,45	98,78	99,41	99,72	99,86	99,94	99,97
53	77,91	<b>89,62</b>	95,12	97,71	98,92	99,49	99,76	99,89	99,95	99,98
<b>54</b>	78,84	<b>90,27</b>	95,52	97,94	99,05	99,56	99,80	99,91	99,96	99,98
55	79,75	<b>90,89</b>	95,90	98,15	99,17	99,63	99,83	99,92	99,97	99,98
56	80,64	<b>91,48</b>	96,25	98,35	99,27	99,68	99,86	99,94	99,97	99,99
57	81,51	<b>92,05</b>	96,58	98,53	99,37	99,73	99,88	99,95	99,98	99,99
58	82,36	<b>92,59</b>	96,89	98,69	99,45	99,77	99,90	99,96	99,98	99,99
59	83,19	<b>93,11</b>	97,17	98,84	99,52	99,81	99,92	99,97	99,99	99,99
60	84,00	<b>93,60</b>	97,44	98,98	99,59	99,84	99,93	99,97	99,99	100,00
65	87,75	95,71	98,50	99,47	99,82	99,94	99,98	99,99	100,00	
67,5	89,44	<b>96,57</b>	98,88	99,64	99,88	99,96	99,99	100,00		
70	91,00	<b>97,30</b>	99,19	99,76	99,93	99,98	99,99	100,00		
75	93,75	<b>98,44</b>	99,61	99,90	99,98	99,99	100,00			
80	96,00	<b>99,20</b>	99,84	99,97	99,99	100,00				
85	97,75	<b>99,66</b>	99,95	99,99	100,00					
90	99,00	<b>99,90</b>	99,99	100,00						

Source: The author's compilation based on the amount of wood sold by the 'State Forests' National Forest Holding at the end of 2016

1. The evaluation of wood for the purchasing habit should be abandoned, or at least its form should be modified. In particular, it is unacceptable to compare the purchasing history in the last 3 years with the amount of wood purchased in the last year especially when there is high variability between forest inspectorates in their offers of wood assortments and quality classes. Undoubtedly, this process is independent of entrepreneurs. There was considerable confusion brought by offers of log wood as many forest inspectorates did not have them in previous years. There was not any direct purchasing habit referring to these offers, nor were there any equivalents given.
2. The purchasing geography is generally a good assumption. However, the place of purchase does not always depend on the entrepreneur's decision, because, as was mentioned before, there is high variability between forest inspectorates in their offers. Apart from that, as there are considerable differences between forest inspectorates in the ideal state prices for the same wood type and quality class, the positive effect of this factor is significantly reduced. It is difficult to assume that the entrepreneur will make a voluntary and conscious decision to pay more for transport over a longer distance. The purchasing geography can be replaced by the assumption of entrepreneurs' intuitive and conscious decisions taken to their own advantage.
3. Using the price of wood as the only evaluation criterion is justified when a large group of clients offers the maximum price at each stage of the purchasing procedure. This situation could be observed in 2017. Will there be any changes?
4. It is necessary to set the maximum price to prevent excessive price inflation caused by a narrow group of clients who are interested in taking over the market in a longer perspective or in blocking it.
5. It is not necessary to reduce the offers with minimal interest. At present the orders where the interest is close to zero are reduced proportionally to their evaluation. In 2017 this unnecessary reduction amounted to 1.2%, whereas the price changed by 10 zlotys/m<sup>3</sup>. It was too much and not necessary.

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## DETERMINANTS OF INNOVATION IN AGRITOURISM

**Abstract:** The established character of agritourism on the market influences types of innovation in agritourism. The objective of this study is to identify determinants of innovation by agritourism farms and agritourism-related entities. The first part is an introduction concerning theories of innovation and its types on the tourism market. The author has also presented basic terminology of agritourism and focused on an agritourism product which is the direct subject of innovation in market practice. The research mainly encompassed the classification of entities that innovate, indication of innovation areas with the assessment of determinants of its implementation in agritourism. The whole study focuses on the thesis that agritourism is not likely to be subject to product innovation although, in practice, this type of innovation is most often undertaken.

**Key words:** innovations, tourism market, agritourism, agritourism product

### INTRODUCTION

Agritourism is a form of rural tourism with a unique and established character and is connected with the functioning of an agricultural farm which expands its activities onto providing tourism services. This has significant implications for introduction of innovation. The article is theoretical and conceptual. The subject, types and determinants of innovation in agritourism have been deliberated. The study analyses factors determining applying innovative solutions by agritourism farms, local authorities and institutions connected with agritourism. A special attention was given to agritourism product which is the subject of innovation. The objective of this study is to identify determinants of innovation by entities of the agritourism market. The paper is based on theoretical studies on innovation, tourism economics and agritourism. The following research methods were applied: a critical analysis of literature on the subject, logical operations, heuristic methods. The result of the study indicates determinants connected with applying innovative solutions by agritourism service providers, local authorities, agritourism organizations. The main factor limiting innovation in agritourism is the operational character of agritourism farms understood in a traditional way and the structure of agritourism product. The other factors are, among other things, the size of agritourism farms, the market coverage, access to funds, the level of cooperation between agritourism service providers and related entities.

### INNOVATIONS ON THE TOURISM MARKET

Innovations are an important factor for shaping and developing modern markets. The term innovation means a combination of the following factors, with their functional interdependencies [Niedzielski 2008]:

- launching new products or improving existing ones,
- implementing new or improved production technology, including new methods of providing services,
- introducing new ways of selling and buying, including new ways of creating interaction with customers, together with appropriate customer care systems,
- opening a new market, both in terms of supply, production or sales,
- using new raw materials, materials and tools,
- implementing changes in the organization of production, including changes in the organization of the service providing process.

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When taken in a general view, one may regard innovation as a process of introducing new products, ideas or way of acting. Thus, these would include all positive implemented changes which are perceived as new from the perspective of the entity that introduced them [Westland 2008]. Innovations are connected with creating new market offers. However, normally these are not completely new products but rather improvements of already existing products, which are given new practical values or increased quality parameters. Thus, the vast majority of innovations consists in creative imitation of already existing solutions.

Typical innovative undertakings in terms of services include:

- creating new service concepts,
- new forms of cooperation with the client,
- new systems for providing services,
- using modern IT solutions [Den Hertog 2002].

The following types of innovation can be distinguished as a result of introducing new concepts for business operation on the market:

- product - in terms of offer structure, diverse range of products,
- process - in terms of changes in the creation process and in the methods of providing products,
- organizational (managerial) - in terms of methods of operations, including creating new organizational structures, implementing new management techniques in relation to the market,
- marketing - focused on the course of action and interaction between the organization and the client,
- institutional - referring to new forms of collaboration between market participants or changes in the legal form of business operation of an entity [Hjalager 2010],
- social - new types of innovation which should take place with the participation of society and aim at achieving social goals [Szymańska et al. 2017].

Similarly, as on any other markets, innovation plays a key role on the tourism market in achieving sustained competitive advantage by entities from the supply side of the market. The ongoing globalization processes demand not only increased innovation activity from tourism enterprises but also from tourist destinations as it determines their survival and further growth and development. Tourism enterprises have a decisive role in the development of tourism market innovation. The innovation of tourism enterprises is determined by independent actions of these entities but also by sources of innovation that come from: suppliers, competitors, employees, consumers [Peters, Pikkematt 2005], advisory and consultancy firms, tourism policy entities. Introducing innovation on the tourism market is also a result of the actions undertaken by tourist destinations [Panasiuk 2013] creating and offering regional tourism products.

## **AGRITOURISM**

The literature does not offer a widely-accepted definition of agritourism. The most common one is the definition proposed by M. Drzewiecki [2001] according to which “agritourism is a form of recreation undertaken in rural areas with an agricultural character, based on accommodation facilities and recreational activities connected with agricultural farms or equivalent ones and other related to them (environment, production, services)”. A. Wiatrak [1995] interprets agritourism as “organizing tourist stays by a farming family in their own agricultural farm”. On the other hand, J. Sikora [2012] claims that agritourism is a specific type of (alternative) rural tourism<sup>32</sup> organized by

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<sup>32</sup>Rural tourism is a wider term which scope includes forms of tourism undertaken and organized in rural areas [Bott-Alama 2004].

farming families using resources of an agricultural farm and tourism resources of a region where an agricultural farm is located.

Generally, it is considered that agritourism is one of the forms of tourism activities in rural areas taking place in close relation to an agricultural farm located within a typical village or in a typically rural area. The range of services provided to tourists as part of agritourism activities can be very diverse and concern: accommodation, catering and various forms of qualified tourism or equipment rental [Panasiuk, Tokarz 2007]. Agritourism combines using spatial values of the rural environment with the socio-economic potential benefiting local communities and simultaneously is characterized by a limited range of activities.

When considering the issue of agritourism, one should emphasise its specificity consisting of providing tourism services to agritourists in a real agricultural farm together with all its social and economic functions. Any other business activity that offers tourism services in rural areas is not agritourism and it falls within the conceptual range of rural tourism or tourism in rural areas. This important substantial reservation is significant for further deliberations pertaining to innovation in agritourism.

### **AGRITOURISM PRODUCT**

The initial premise of indicating the areas of innovation in agritourism and its determinants is the concept and structure of an agritourism product. A starting point for interpreting this term should be formulating the concept of a tourism product.

A tourism product shall be interpreted in terms of two perspectives: narrow and broad. From a narrow perspective, a tourism product concerns services offered by tourism industry entities and purchased by tourists (e.g. accommodation, catering, transport services). The remaining elements, connected with tourist impressions and feelings, are connected with the definition of a tourism product in a broad perspective. It is a spatial and multifaceted category of a complex structure. A tourism product understood in such a way is developed by spatial entities (tourist destinations) and mainly by tourism regions, metropolitan and peripheral areas. This product is complex and includes a tourism area offer created by business entities (tourism enterprises) operating on the tourism market with the support of local authorities as well as tourism organizations. It is a product understood at a macro level which encompasses goods, services and other offers provided to consumers in an area of tourism reception [Panasiuk 2014b]. An integral part of a tourism product understood in a broad sense is tourism services which are considered to be products in a narrow sense.

Therefore, a tourism product of a region is a complex product developed by many entities and consisting of many single elements which are connected in terms of function. Two groups of elements can be distinguished in the structure of tourism product of a regions, that is:

- a) tourism goods and facilities:
  - basic (tourism values, tourist attractions),
  - complementary (tourist facilities),
- a) tourism services:
  - basic (accommodation, catering, transport),
  - complementary (facilitating the use of basic tourism goods).

From a spatial perspective, a tourism product as a rule involves elements connected with an impact on all types and forms of tourism movement in a given area. An extensive tourism product can be divided into specialist products connected with developing offers concerning particular forms of tourism, e.g. rural tourism product - in non-urbanized areas and its special type, that is an agritourism product.

An agritourism product is a category encompassing services in terms of agritourism offered by individual agritourism service providers as well as in terms of areas (rural areas). Therefore, a

tourism product is a combination of material and non-material values connected with a tourist stay in an agricultural farm and the surroundings, together with tourism goods and services offered by this farm which aim at satisfying tourists' needs and providing experiences and impressions that tourists can get during and after their stay in an agricultural farm [Sikora 2012]. An agritourism product encompasses natural and cultural values of rural areas [Sawicki, Mazurek-Kusiak 2010] and is based on daily (natural) functions of an inhabited and functioning agricultural farm with connections between this farm and its surroundings. The table 1 shows the structure of an agritourism product understood in a broad sense.

Table 1. Structure of agritourism product

Agritourism values		Agritourism facilities		Services	
natural	anthropogenic	accommodation and catering facilities	complementary facilities	basic	complementary
<ul style="list-style-type: none"> <li>• landscape</li> <li>• farmland</li> <li>• mountains</li> <li>• lakes</li> <li>• rivers</li> <li>• forest</li> <li>• fresh air</li> <li>• quiet</li> <li>• peace</li> <li>• closeness of nature</li> </ul>	<p style="text-align: center;"><b>material</b></p> <ul style="list-style-type: none"> <li>• agricultural farm</li> <li>• architecture</li> <li>• handicraft</li> <li>• folk art</li> </ul>	<ul style="list-style-type: none"> <li>• guest rooms</li> <li>• separate residential units</li> <li>• campsite</li> <li>• chalets</li> <li>• boarding houses</li> <li>• shelters</li> <li>• inns</li> <li>• areas for outdoor catering</li> </ul>	<ul style="list-style-type: none"> <li>• stables</li> <li>• tourism equipment rentals</li> <li>• tourist routes (cycling, horseriding, walking)</li> <li>• transport facilities</li> <li>• facilities for other forms of tourism</li> </ul>	<ul style="list-style-type: none"> <li>• accommodation</li> <li>• catering</li> </ul>	<ul style="list-style-type: none"> <li>• wickerwork or pottery courses</li> <li>• child care</li> <li>• hunting</li> <li>• fishing</li> <li>• mushroom picking</li> <li>• organization of sleigh rides, rack wagon rides</li> <li>• campfire cooking</li> </ul>
	<p style="text-align: center;"><b>non-material</b></p> <ul style="list-style-type: none"> <li>• folk culture (folklore)</li> <li>• cuisine (fresh produce, recipes, manner of serving meals)</li> <li>• lifestyle</li> </ul>				
<p><b>stay and recreation in an agricultural farm and its surroundings, participation in a daily life of a family living and working in it, the possibility of direct participation in the functioning of a farm</b></p>					

*Source: based on [Panasiuk 2008]*

Tble 1 presents the scope of the most typical elements creating an agritourism product. The issue, which serves as the basis for indicating its proper character, permeates particular elements of a product and, at the same time, is the fundamental function of agritourism, i.e. stay and recreation in an agricultural farm (agritourism) and in its natural surroundings, together with the possibility of direct participation of an agritourist in the life and work of the occupants of this farm. Agritourism understood in a formal way and simultaneously the structure of an agritourism product resulting from its essence serve as an initial verifying factor for undertaking innovative activities in agritourism.

### ENTITIES INTRODUCING INNOVATION IN AGRITOURISM

The essence of agritourism and the structure of an agritourism product prove their local character and, in most cases, limited market reach, mainly regional, more rarely national and incidentally international. The structure of a widely understood agritourism product is attributed to

entities directly and indirectly participating in creating its elements. Simultaneously, these entities are responsible for undertaking innovative initiatives in agritourism. The fundamental role in innovative activities is played by direct agritourism service providers and entities cooperating with them and supporting their activities, i.e.:

- a) agritourism farms which can introduce innovation independently to their activities,
- b) agritourism associations innovating with regard to agritourism farms they are associated with,
- c) local authorities (mainly communes) supporting agritourism farms operating in their region, also by introducing innovation to tourism areas,
- d) other entities related to agritourism, supporting and initiating innovative solutions in agritourism, including: local tourism organizations, agricultural advisory centres, local action groups.

The multitude of entities that are likely to influence innovations in agritourism and the structure of local agritourism product determine wide possibilities of innovating, and each of the mentioned entities can independently introduce and provide innovations to entities cooperating in a given area where agritourism is developed.

### **AREAS OF INNOVATION IN AGRITOURISM**

When interpreting areas of innovation in agritourism, one should take account of the essence of agritourism and the structure of agritourism product elements. As it was emphasised before, the deliberations on agritourism show that it is understood as a tourist's stay in a functioning agricultural farm (agritourism) where services offered to tourists are supplementary to this farm.

When meeting needs of tourists expecting typical characteristics of agritourism and elements of an offer (arising from the structure of an agritourism product), one should take account of the necessity of maintaining the functioning of an agritourism farm in the same condition as it would function without providing agritourism services. Thus, it significantly limits the possibilities of innovating. The majority of possible innovations would cause loss of natural functions of an agritourism farm. However, it should be noted that at some stage of the development of an agricultural farm innovation has been introduced which extended its tourism activities by, among other things, basic adjustment of facilities to serve tourists. Such innovation is mainly of a product character as well as process, organizational, marketing and even institutional (through forming agritourism associations) and social character. It is likely that any further innovation concerning the scope of activities of the farm aiming at influencing tourist needs distorts its previous activities as they contribute to losing its traditional functions and, in some cases, cause a decrease in its attractiveness.

At this point, an initial assessment can be formulated that some types of innovation introduced by agritourism farms, also in their surroundings (spatial, institutional), can negatively influence the assessment of agritourism offer by tourists. In this context, innovations should be limited to these which do not interfere with the traditional environment of a farm. Therefore, only some types of innovation can serve as the basis for the integrity of an offered agritourism product. It is necessary that entities introducing innovation to agritourism, especially agritourism farms, settle the issue of the relation between agritourism and innovation. It should be noted that innovation may cease to make sense and make agritourism lose its scope. Such a risk can be observed when analysing the structure and findings of the research on the role of innovation in agritourism conducted by, among others, D. Puciato and B. Woś [2011] as well as E. Pałka [2015]. The research indicates a direct possibility of introducing innovation, especially in terms of products connected with attractions in the village and farm, which leads to changes in the functions of an agritourism farm - focusing on non-agricultural activities and losing partially its previous character.

What position should be adopted is that, from the point of view of an agritourism product, undertaking innovative activities should have a very well-thought-out character and, at the same time, a limited influence on its structure. The tourist's choice of an agritourism offer is, as a rule, driven by willingness to use a standard (typical) agritourism product. Therefore, innovations should not infringe traditional elements of this product and should concentrate on innovative activities not interfering into this product directly. Thus, the areas of innovation in agritourism which do not hinder an agritourism product understood in a traditional way can be ones that concern:

- process - new technologies installed in a farm (starting from water and sewage system, through sewage treatment plants, heating, renewable energy, access roads),
- organization - connected with cooperation with other farms in terms of full use of service potential, joint organization of offers for agritourists,
- marketing - own website, independent promotional activities or in cooperation with other farms, cooperation with sales agencies and local tourist information office,
- institutions - forming agritourism associations, creating a regional agritourism product, promotion, including attending trade fairs,
- society - building social bonds, cooperation in order to develop a commune (village), impact on the local labour market.

Expanding a traditionally understood agritourism product offer exceeds the meaning of agritourism and concerns rural tourism or tourism in rural areas. The example of that can be creating, in rural areas, attractions typical for cities and e.g. health resorts such as spa & wellness centres, what is not directly connected with an agritourism offer. In terms of a product aspect, agritourism is traditional in general and is not likely to be subject to innovation.

#### **FACTORS DETERMINING INNOVATION IN AGRITOURISM**

Innovations in agritourism can lead to the transformation of the existing agritourism product into offers connected with rural tourism or tourism in rural areas. On the one hand, it is a beneficial process as it determines the possibility of developing an offer and adjusting its needs to various market segments. A decisive factor in favour of undertaking innovations in agritourism is the possibility of subsidizing development through access to funds from the European Union programmes, including Regional Operational Programmes [Panasiuk 2014a]. Funds from the EU have been allocated to agritourism directly or indirectly through the pre-accession programmes as well as, after the Poland's accession to the EU, through subsequent EU financial perspectives. The funds are mainly used by local authorities, agritourism-related institutions but the final beneficiaries of the funds are agritourism farms. Initiatives involve subsidizing developing local infrastructure, creating local tourism products, including organizing events, developing service potential of agritourism farms, promoting tourism.

A significant factor determining innovation, connected with the EU funds, is also creating specialist agritourism product which are addressed to profiled market segments. However, these activities to a great extent exceed a formal and typical understanding of agritourism, but they extend tourism offer in rural areas. They are even more crucial as from the point of view of a tourist and a single agritourism farm it can be complementary to services provided in this farm. Such offers can coexist on the local tourism market. Among them, the examples of types of innovative tourism products can be distinguished: in terms of horse riding, regional cuisine or trips to regions connected with mushroom picking, herbs picking, observing wild animals.

Tourism product can take a comprehensive structure. In market practice, it should be analysed separately for specific types of offers, including also other sub-markets of rural tourism. In the structure of potential types of products, there are common elements resulting from tourism area potential and connected with service of every tourism form, that is tourism values (natural and

cultural), tourism base (accommodation, catering, transport, additional ones) and typical tourism services, including those offered by agritourism farms.

Among factors limiting innovation in agritourism, one should in addition consider the following:

- a traditional character of the functioning of agritourism farms,
- small size of agritourism farms,
- local market impact,
- lack of own funds for innovation,
- no preparation of owners to undertake innovation and, knowledge and skills to apply for funding.

The premises that can positively influence innovation in agritourism include:

- access to the EU funds addressed to agriculture and rural areas,
- institutions developed around agricultural farms, including agritourism ones, what results in the possibility of undertaking institutionalized cooperation in terms of developing, funding and providing agritourism product.

## CONCLUSION

Undertaking innovative activities in agritourism entails numerous limitations. They stem from both features of agritourism activities and determinants connected with the functioning of agritourism farms.

In addition to activities of individual agritourism farms, it is particularly significant that local authorities, tourism organizations (including local tourism organizations) and agricultural advisory centres support their functioning. On the basis of activities of the aforementioned entities and the agritourism industry, there is a possibility of developing an extensive agritourism product which bases on the values of a rural area, agritourism infrastructure and provided services. Undertaking integrated activities by local authorities, the industry and tourism organizations leads to achieving results in developing an image of a commune focused on agritourism, benefiting from cooperation arising from common promotion, joint market research and developing sustainable tourism in rural areas.

It is likely that all possible types of innovations can be added to the development of business activities of an agritourism farm. Such decisions depend on entities that take them and available funds. However, it should be observed that product innovations can negatively influence how tourists understand a tourism product and they should be undertaken in a well-thought-out manner and not only with a view to potential benefits.

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## **METHOD OF CALCULATING THE LENGTH OF MANUFACTURING CYCLE FOR PRODUCTS IN WOOD INDUSTRY ENTERPRISES**

**Abstract:** The paper discusses principles of establishing the duration of manufacturing cycle for a batch of parts using the computational method. A classification of manufacturing cycle components appropriate for this method is presented, as developed based on the classifications proposed in literature on the subject. The paper gives characteristics of the cycle components, for which the time periods are established. Formulas used to determine the length of manufacturing cycle are presented. Individual types of formulas are applicable depending on the availability of data and demand for a specific degree of result accuracy. Formulas are presented for the engineering period of a cycle taking into consideration serial, parallel and mixed serial-parallel production for a batch of parts.

**Key words:** woodworking industry, the duration of manufacturing cycle, a batch of manufactured parts, run of a manufactured batch

### **INTRODUCTION**

Time is the primary measure of the execution of manufacturing process (Liwowski, Kozłowski 2007). Time is used to determine the amount of time required or consumed for the performance of a manufacturing task by employees (labour consumption) and a given workstation (workstation requirement). Duration of a manufacturing process is measured in relation to its one run, i.e. a single cycle. In general terms the time (duration, length, length of time) of a manufacturing cycle for a product<sup>34</sup> refers to the period contained between the starting point and the moment of completion of a single run of manufacturing process for a single product or a group (batch or series) of products. In relation to parts comprising the final product the cycle time begins at the moment of collection of materials from input warehouses or warehouses located between successive technological stages of manufacturing process, while it ends at the time worked parts are released to the completion warehouses. For final products the cycle time begins when the materials are collected for production from input warehouses and ends with the release of manufactured products to the final production warehouse.

The object of work, in relation to which cycle time is established may be: a single element, subassembly, assembly or a final product, or a group (batch) of parts or a group (series) of final products. Typically the length of a cycle is established for a batch of manufactured elements – as a simple cycle, or a batch of manufactured complex parts – as a complex cycle. The duration of a cycle is measured in such units as seconds, minutes, hours, shifts, calendar days or workdays, less frequently in calendar units (1-, 3- or 5-day). Time units are selected based on the length of a cycle and the accuracy required of its determination.

Methods used to establish the duration of a manufacturing cycle of a product may be divided into two groups. One comprises aggregate methods. These methods are used to determine the length of a cycle as a whole, disregarding its structural components. Aggregate methods are used first of all when the organisation of production in an enterprise is of a low standard, which is manifested by a lack of time standards.

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<sup>34</sup> In this study the term "product" is applied in a general sense and refers to arbitrary objects of work. However, in situations requiring a greater precision the term "product" is replaced or supplemented accordingly with specific descriptors, e.g. part, final product.

The other group comprises analytical methods and includes a computational and a graphic method. Both methods use components of the cycle structure and their lengths. The computational method is applied primarily to determine the duration of the manufacturing cycle for a single simple product or a batch of manufacturing parts. In contrast, the graphic method is used mainly to determine cycle time for a complex product or a series of complex final products (Pasternak 2005).

The aim of this paper is to present principles used to establish the duration of the manufacturing cycle of a product when applying the computational method. Manufacturing processes in wood industry enterprises are typically well-organised. This is manifested e.g. in the establishment of time standards in production planning and its calculation. These standards are sources of data, on the basis of which time periods of manufacturing cycles are determined using the computational method, particularly for technological periods. For this reason this method may successfully be used in medium and large wood industry enterprises.

### THE STRUCTURE OF MANUFACTURING CYCLE OF A PRODUCT

The structure of manufacturing cycle of a product (the structure of a manufacturing cycle) is composed of manufacturing operations, natural processes and intervals between these components. Within these three main components we may distinguish more specific components. Literature on the subject presents various variants of two basic classification systems of manufacturing cycle components, which may be used to establish cycle time applying the computational method.

The first method of grouping cycle structure components is to distinguish two types of periods (Lis 1984, Pasternak 2005, Durlik 2007). During the first period products are subjected to actions, which cause changes in their properties or preserve these properties. Such types of times for actions and operations were included in the working period (active period). In turn, the second period is composed of intervals, in which products are inactive. These cycle components and their times are included in the interval period (inactive period, waiting period).

In the case of the latter type of classification process components are grouped based on time segments, during which changes in product properties are introduced, caused by technological operations and natural processes as well as segments, in which such changes do not occur, although actions maintaining such changes may be performed in such time segments, e.g. during manipulation operations. Based on such a criterion we distinguish operation and interoperation periods (Wróblewski 1993).

The **operation period** (active period) comprises times of technological operations and natural processes. In their case product properties change. The **interoperation period** (inactive period, waiting period) includes interoperation intervals<sup>35</sup>, resulting from the organisation of the manufacturing process and organisation of the workday. Intervals resulting from the organisation of the manufacturing process includes times of manipulation operations (auxiliary operations: control, maintenance, warehousing and transport) as well as storage times of manufactured batches, including waiting time for release of a workstation. In the interoperation period no final changes are made in product properties. Intervals selected for the establishment of the duration of the cycle manufacturing may not overlap with other intervals or the other components of the manufacturing process.

Both types of classification for components of the time of the manufacturing cycle for a product differ in the method of grouping manipulation operations and actions comprising warehousing operations. Applied methods of grouping cycle components have no effect on the obtained final results, i.e. established time. In both cases the results are identical. However, in the computational method a significant role is played by the availability and labour intensity of the

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<sup>35</sup> The interoperation interval is defined as a period, which passes between the performance of two successive technological operations or natural processes on a single product or a batch of products, when executing their manufacturing cycle.

identification of data, which need to be used in formulas. In this respect more advantageous conditions are provided by the latter classification of cycle components, using the division of the cycle into the operation and interoperation periods. For this reason in this study this method is indicated as the preferred approach to be applied in the computational method. Figure 1 presents structure components of the time of a manufacturing cycle for a product following the principles of the second classification method. In the next parts of this paper when discussing problems concerning the manufacturing cycle only components identified using the classification presented in Fig. 1 will be used.

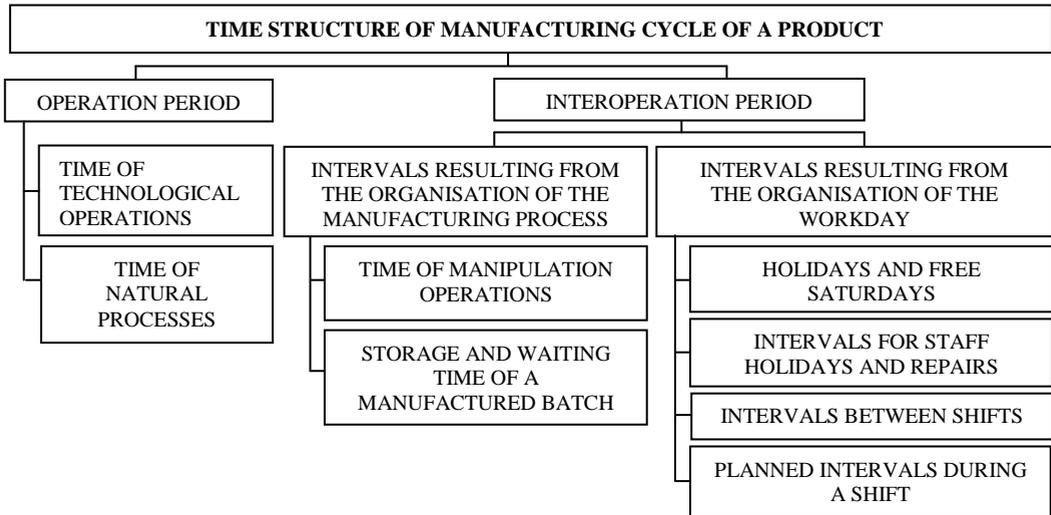


Fig. 1. Time structure of a manufacturing cycle of a product divided into the operation and interoperation periods

Source: own study.

## DETERMINATION OF DURATION OF THE TECHNOLOGICAL CYCLE OF A BATCH OF PARTS

**The computational method** makes it possible to establish cycle time based on several variants of formulas. They differ in the degree of aggregation of the measures, from which they were constructed. A greater degree of aggregation of the measures used in the formula means that fewer details (components) of cycle structure were included. In this way the calculated cycle time may be characterised by lower accuracy. Selection of a formula appropriate for the needs depends on the labour intensity of collection of data required for the calculations and the expected accuracy of the result. Numerical data used in the computational method are established based on normative (catalogue) values, reading of these values from the manufacturing documentation or as a result of measuring actual times when executing the manufacturing cycle. This measurement may be conducted using the chronometric method, activity study or job sampling<sup>36</sup>. The cost of data collection is lowest when using standard values, while it is highest when measurements are taken.

Using the computational method the length of a manufacturing cycle of a batch of parts (or a cycle of a simple product) may be established based on a general dependence:

<sup>36</sup> Radwańska K., Sobolska-Kutner A.: Próba ustalenia wielkości przerw międzyoperacyjnych w cyklu produkcyjnym wyrobów przemysłu meblarskiego. "Przemysł Drzewny" 1976, nr 9.

$$CCP = COT + CPN + COM + CSP + PDR, \quad (1)$$

where:

- CCP – time of the manufacturing cycle of a batch of parts (or time of a cycle of a simple product),
- COT – period of technological operations,
- CPN – time of natural processes,
- COM – time of manipulation (auxiliary) operations,
- CSP – storage and waiting times of a manufactured batch,
- PDR – intervals resulting from workday organisation.

All time segments of process components, which were applied in formula (1) comprise the serial system (a simple series). This means that times of these components may not overlap with others as a whole or in part.

According to the cycle structure presented in Fig. 1 the first component (COT) found in formula (1) is a period of technological operations. Their determination method depends on the applied type of run of the manufactured batch during the cycle. Technological operations comprise a technological cycle, which time is established for an isolated run of a batch of parts, i.e. not considering the effect on its length by previous batches produced in the same manufacturing unit. It is a model cycle<sup>37</sup>. In such a case cycle time is only dependent on the system of transfer (run) of a manufactured batch between operations and on the number and times of successive operations in the cycle. During the execution of a cycle certain workstations may still be occupied by operations and manufactured batches belonging to the previous cycle. For this reason operations and manufactured batches performed within the current cycle have to wait for the workstation to be released. The duration of a cycle under commercial scale production conditions is longer than the time of the model cycle, calculated for an isolated run of a manufactured batch.

The second component of formula (1) comprises times of natural processes (CPN). Individual natural processes during calculations may be treated analogously as technological operations, considering them as operations of natural processes. They comprise the cycle of operations of natural processes. They are generally found in a serial system. In such a case the component (CPN) is a sum of times of natural processes. In certain cases in manufacturing processes there may be situations, when a part of time of a natural process of a manufactured batch overlaps with the time of the next manufacturing operation. Then this fact is included in the calculations reducing adequately the time of the natural process by the overlapping segment.

Next components of formula (1) comprise the interoperation period. It is a supplementary element, which increases the length of the cycle by including intervals resulting from the organisation of the manufacturing process and organisation of work time. In the calculations only these intervals and idle time are considered, which do not overlap. For example, warehousing operations and public holidays may not be included in the calculations simultaneously if they occur in the same period.

The first group of intervals comprises manipulation (auxiliary) operations. Analogously as technological operations, they comprise a cycle of manipulation operations. Since during their execution no changes are introduced to properties of work objects, manipulation operations are treated as a type of intervals in technological processes. Manipulation operations include transport operations, which need to be clearly distinguished from transport activities. A transport operation takes place only when it is executed by a specified worker, who handles only such an operation. In all the other cases transport activities are classified to handling time (TO), which is included in the

<sup>37</sup> The model form of a cycle is defined in literature on the subject as a model or theoretical cycle.

unit time standard. Based on this standard the duration of operations on a manufactured batch are established.

The second group of intervals comprises storage and waiting periods for a manufactured batch for the execution of the next operation in the cycle. Most frequently a batch waits in front of the workstation, since the operation on the previous manufactured batch has not finished. Warehousing operations and intervals connected with storage of work objects need to be adequately distinguished. Warehousing operations take place when work objects are stored in specially designated manufacturing spaces and the movement of stored objects is registered (acceptance and release) by specified workers. If these criteria are not met, we observe storage of objects, typically on the shop floor, waiting for the execution of the next cycle operation. Warehousing operations and storage times for a manufactured batch need to be distinguished to prevent their repeated incorporation in formula (1).

Intervals resulting from workday organisation are the last group of components distinguished in Fig. (1). In formula (1) intervals from that group were included as one measure (PDR), expressing jointly the number of days and shifts off work during a cycle. The measure PDR is expressed in a unit of time, in which the time of the entire manufacturing cycle is expressed.

In certain situations the application of formula (1) may cause problems resulting from a lack of a complete set of data required for calculations, particularly connected with the interoperation period. Then the length of the manufacturing cycle may be established in a simplified manner in relation to formula (1), based on one of the two formulas: (2) or (3). The appropriate formula is selected depending on the type of available data, based on which we may estimate the time of missing components, with accuracy sufficient for the planning and production control processes implemented in the enterprise. In the case when the mean interval per one technological operation is available, the duration of a manufacturing cycle may be established according to the formula:

$$CCP = COT + CPN + k \cdot SCM, \quad (2)$$

where:

- k – the number of technological operations included in the cycle,
- SCM – mean time of interoperation periods, determined per one technological operation,
- the other denotations as in formula (1).

In manufacturing enterprises data concerning times of technological cycles may be collected from manufacturing documentation. This makes it possible to establish the time of a technological cycle (COT) faster and more accurately than in the case of the other components of the manufacturing cycle. This fact was used in the second, simplified method to determine cycle time. The value of the interval is established based on the technological cycle extension index. Its applications facilitates calculation of the time of a manufacturing cycle using the formula:

$$CCP = COT \cdot (1 + WCT) + CPN, \quad (3)$$

where:

- WCT – the technological cycle extension index,
- the other denotations as in formula (1).

Establishment of WCT requires previous measurement of times of manufacturing cycles for a batch of parts under actual manufacturing conditions. Times are measured separately for each product representing a group of technologically similar products. Determined indexes are next applied in relation to the cycles of products belonging to the same groups. This reduces costs of determining times of manufacturing cycles in comparison to a situation, when they are established separately for each type of product. This index is based on the formula:

$$WCT = (CCR - (COT + CPN)) / COT, \quad (4)$$

where:

- CCR – time of manufacturing cycle for a batch of parts, measured under actual production conditions,
- the other denotations as in formulas (1 and 3).

Formula (4) specifies the share of the interoperation period in the time of a technological cycle.

The time of the technological cycle (COT) is a significant component in the time of the manufacturing cycle for a batch of parts. It is used as a parameter in formulas (1) – (4). Its length depends on the method (system), which was applied to transfer the batch of parts between workstations (operations). We distinguish three methods to transfer the manufactured batch: serial, parallel and serial-parallel. The duration of the technological cycle, for its model form, is determined based on standardised unit times (NTJ). When necessary they are appropriated adjusted based on the standard time utilisation index (Brzeziński 2013), according to the formula:

$$STJ = NTJ / WNC, \quad (5)$$

where:

- STJ – adjusted unit time for a single operation step performed on a single part,
- NTJ – standardised unit time of a single operation step performed on a single part,
- WNC – the standard execution index for the standard time of the unit time of a single operation step [-].

Based on the adjusted unit time (STJ) we calculate the duration of an operation cycle (a single operation step) for a batch of manufactured parts, according to the formula:

$$CCO = TPZ + (N / (LSR \cdot LCP)) \cdot STJ, \quad (6)$$

where:

- CCO – duration of an operation cycle for a batch of manufactured parts
- TPZ – changeover or setup time for a production workstation, on which this single operation step is performed,
- N – the number of parts in the manufactured batch,
- LSR – the number of parallel, interchangeable workstations<sup>38</sup>, which simultaneously perform a given single operation step,
- LCP – the number of parts in the manufacturing (processing) lot, processed simultaneously during the execution of the single operation step on the workstation,
- the other denotations as in formula (5).

In the case of machine or machine-manual workstations, which require time-consuming changeovers the amounts of TPZ are standardised and included in formula (6). On manual workstations, if setup operations are relatively short, the TPZ length is not established separately and technical and organisational handling operations of the workstation are included in NTJ.

<sup>38</sup> Interchangeable workstations are workstations, on which the performance of the same operation does not change its workstation requirement. #

A single operation step is performed in a job splitting mode if  $LSR > 1$ . **Job splitting** means that a single operation step is performed simultaneously on two or more identical or technologically interchangeable workstations. Then parts comprising the batch are assigned to parallel workstations in the number proportional to their efficiency. In the case when  $LSR = 1$ , the single operation step is performed on one workstation. Such a situation is found for most technological operations.

A single operation step is executed simultaneously on several parts constituting a **manufacturing** (processing) **lot** if  $LCP > 1$ . This is observed e.g. during operations of veneering panels in multi-platen presses. Then several panels are veneered simultaneously in one operation. Otherwise, when  $LCP = 1$ , a single operation step is performed on a single part.

In terms of organisation the serial system is the simplest system of transferring a batch of parts between operations within a cycle. In this run the times of successive operations do not overlap (except for changeover times of workstations), thus the serial run is characterised by the longest cycle time. The length of the technological cycle, during which the serial run of a batch of parts takes place, is specified by the formula:

$$CCT = CCS = TPZ_1 + (N \cdot \sum_{i=1}^k STJ_i) / (LSR \cdot LCP), \quad (7)$$

where:

- CCS – time of a technological cycle for a batch of parts in a model serial run,
- TPZ<sub>1</sub> – changeover time or setup time of the first operation in the cycle,
- N – the number of parts in the manufactured batch, constant during the cycle,
- k – the number of technological operations included in the cycle,  $i = 1, \dots, k$ ,
- the other denotations as in formulas (5-6).

If TPZ<sub>1</sub> is not found in the first operation of the cycle, formula (7) is reduced to the second component. Changeover times for the workstation for the other operations in the cycle are covered each time by the times of operations performed on preceding workstations. For this reason they do not affect cycle time and are not included in formula (7). Also the time of transport operations connected with the transfer of the manufactured batch from a previous workstation to the next are not found as separate values in formula (7). The time of transport activities is included in unit time and considered in its standard or is included in the time of transport operations.

The technological cycle of a batch of parts in the form of a parallel run is executed most frequently on manufacturing lines. The parallel run is characterised by the greatest overlapping of times of successive operations. For a parallel run the time of a technological cycle for a batch of parts is specified by the formula:

$$CCT = CCR = TPZ + [(N - 1) \cdot STJ_{\max} + \sum_{i=1}^k STJ_i] / (LSR \cdot LCP), \quad (8)$$

where:

- CCR – time of a technological cycle for a batch of parts in a model parallel run,
- TPZ – changeover time for a manufacturing line, on which this cycle is performed,
- STJ<sub>max</sub> =  $\max \{STJ_i\}$  – the longest adjusted unit time among all operations in the cycle,
- the other denotations as in formulas (5-7).

Changeover time (TPZ) for a manufacturing line is the sum of changeover times for all workstations in the line if workstation changeover is performed successively. When simultaneous changeover is performed on several workstations (e.g. by a team of workers), then the TPZ time is respectively shorter and constitutes a sum of non-overlapping segments of changeover times at individual workstations of the line.

The parallel run may be asynchronous or synchronous. If for the  $i$ -th single operation step  $STJ_i \neq STJ_{i+1}$  (excluding  $i=k$ ), the process is asynchronous. Then individual single operation steps are executed non-continuously (there are microintervals), except for operations with the longest time. Formula (8) refers to the asynchronous run. If for each  $i$ -th single operation step in the cycle  $STJ_i = STJ_{i+1} = STJ$ , then the process is synchronous. In such a case in formula (10) values of  $STJ_{\max} = STJ$  and  $STJ_i = STJ$ . After substituting these values and transformations, formula (8) is reduced to the form:

$$CCT = CTR = TPZ + [(N - 1) \cdot STJ + k \cdot STJ] / (LSR \cdot LCP), \quad (9)$$

where:

$STJ = STJ_i$  – adjusted unit time of a single operation step for the parallel synchronous run,  
– the other denotations as in formulas (5 and 8).

In the serial-parallel run a manufacturing batch is divided into transport batches, which are transferred from operation to operation (from workstation to workstation). We have partial coverage of times of successive single operation steps. The length of a technological cycle for a batch of parts for a model serial-parallel run is determined by the formula:

$$CCT = CCK = TPZ_1 + [N \cdot \sum_{i=1}^k STJ_i - (N - P) \cdot \sum_{i=i_{\min}}^{k-1} STJ_{i_{\min}}] / (LSR \cdot LCP) \quad (10)$$

where:

$CCK$  – duration of a technological cycle for a batch of parts in a model serial-parallel run,  
 $i_{\min} = i$ :  $STJ = \min\{STJ_i, STJ_{i+1}\}$  – adjusted unit time for a single operation step shorter in each pair of successive single operation steps in the cycle. Index  $i_{\min}$  denotes the number of the shorter single operation step selected from each pair. In the case when for a pair of single operation steps  $STJ_i = STJ_{i+1}$ , then we assume the number of the single operation step with a higher index value,

$k$  – the number of pairs of single operation steps,

$P$  – the number of parts in the transport batch; for  $N = \text{const}$  and  $P = \text{const}$ ,  
– the other denotations as in formulas (5-8).

In the presented form formula (10) is applied if changeover time of a workstation is found in the first operation of the cycle. Otherwise component  $TPZ_1$  is disregarded. Changeover times of workstations during the execution of the other operations in the cycle are covered by times of operations on preceding workstations and they are not considered in formula (10).

Formula (10) is applied when the number of parts in a manufactured batch ( $N$ ) and in all transport batches ( $P$ ) transferred between two successive single operation steps is identical throughout the entire cycle. If this condition is not maintained, formula (10) takes the form:

$$CCT = CCK = TPZ_1 + [\sum_{i=1}^k (N_i \cdot STJ_i) - \sum_{i=i_{\min}}^{k-1} (N_{i_{\min}} \cdot STJ_{i_{\min}}) + \sum_{i=i_{\min}}^{k-1} (P_{i_{\min}} \cdot STJ_{i_{\min}})] / (LSR \cdot LCP), \quad (11)$$

where: denotations as in formulas (5) – (10).

The number of parts in a manufactured batch may change e.g. as a result of defects occurring during an operation in the cycle. Also the number of parts in transport batches, into which the

manufactured batch is divided, may change between successive operations. This may result e.g. from changes in the capacity of used means of transport. If such situations may be predicted and planned, then formula (11) applies.

A more accurate determination of the time of manufacturing cycle for a batch of parts is possible based on the principles applied in the development of manufacturing schedules. They include intervals resulting from the fact that the manufactured batch waits for the release of a workstation. In such a case we additionally need to determine the order of activated batches of parts. This facilitates a precise determination of the effect on the length of cycles of other batches of parts executed in the same manufacturing cell. However, the calculation process based on these principles is labour-intensive and may be executed efficiently using an appropriate computer programme.

## CONCLUSIONS

The calculated time of manufacturing cycle for specific products is the basis for the determination of standard values of this time. They are next used in production planning. It is first of all on their basis that the latest admissible times may be specified for the initiation of execution of orders, for which dates of execution of deliveries were established. Thus obtained dates make it possible to create manufacturing plans and schedules. They are the primary tool in manufacturing process control. The higher the organisational standard of the enterprise, the more precisely and accurately the standardised manufacturing cycles need to be specified, which is facilitated by the computational method.

The length of manufacturing cycle is essential for the financial results of enterprise operations. During the cycle the costs of frozen financial means for work processing are aggregated. The longer the cycle, the greater the costs. Frozen funds are released only after the sales of final products. For this reason corporate management boards are interested in the reduction of manufacturing cycles. This may be attained using e.g. the computational method in the determination of the time of manufacturing cycles and its components. This method may be a useful analytical tool. When it is applied we may rationally identify cycle components, which duration may be shortened at the lowest outlays.

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## **MATERIAL DEPRIVATION AS EXEMPLIFIED BY SELECTED COUNTRIES OF THE EUROPEAN UNION**

**Abstract:** This paper attempted to identify the population at risk of material deprivation. The deprivation itself was treated as a consequence of insufficient satisfaction of needs such as: a week-long leisure trip for all household members once a year, heating, a car, and funds for unexpected expenses. EU-SILC (European Union-Survey of Income and Living Condition) results were used in the analysis. Material deprivation was the sole focus in the evaluation of financial situation. Four EU member states were investigated: Bulgaria, Croatia, Cyprus, and Greece. An attempt was made to define the term, followed by the indication of material deprivation levels in these countries with the use of ratio analysis. It was stated that the inhabitants of Bulgaria have the greatest problem with satisfying their elementary needs. It was noted that the period of membership in the EU does not correspond to the material deprivation level. The research results lead to the assumption that the risk of deprivation depends on the socio-economic development of the given country.

**Key words:** material deprivation, social exclusion, European Union

### **INTRODUCTION**

One of the main goals of the EU social policy is to fight poverty and social exclusion. Poverty remains a crucial issue in Europe despite numerous achievements with regard to the improvement of living standards. This issue does not affect the poorest countries only: as a result of economic crisis, it has become apparent in highly developed countries. The status of poverty applies to individuals who fulfill one of the three criteria: living at the poverty line despite social assistance, inability to satisfy their elementary needs, or living in households with low work intensity. This paper focuses on the second of these factors, i.e. material deprivation. Research regarding subjective evaluation of one's own material situation is a vital, dynamically developing branch of social statistics. Works pertaining to the analysis of household welfare are not limited to objective income conditions but also account for the issue of deprivation, which covers numerous aspects of life, including subjective deprivation. The knowledge of how the income satisfaction is conditioned may help shape the social policy and mitigate the results of subjective poverty (Dudek, Landmesser, 2013). The aim of this paper is to determine the degree of material deprivation in the population on the example of four countries: Bulgaria, Croatia, Cyprus, and Greece. The countries were chosen based on the information regarding the period of membership in the EU and the similarity with regard to generating revenue to the national budget.

### **DATA AND METHODOLOGY**

The empirical data regarding material deprivation were found in EU Statistics on Income and Living Condition partial research. EU-SILC is the main EU survey which provides internationally comparable data on income, poverty, exclusion, and other living conditions. The survey includes basic information on households and their members, including (Wolf et al., 2010):

- demographic characteristics of household members and their participation in the process of education,
- labor market activity and health evaluation,
- sources of income,
- durable goods,
- living conditions,

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- selected symptoms of deprivation (non-monetary symptoms of poverty).

Surveys have been conducted since 2003 (initially in Austria, Belgium, Denmark, Greece, Ireland, and Luxembourg, thereafter since 2004 – in all EU member states) in order to monitor the social policy with the Open Method of Coordination (OMC) (Kalinowski and Jabłońska-Porzuczek, 2016). The population surveyed as a part of the EU-SILC includes all private households and their current members who inhabit the country during data collection. The survey covers all household members but the surveyed group consists of members aged 16 and above.

## **POVERTY AND MATERIAL DEPRIVATION – PROBLEMS WITH DEFINITIONS**

Reduction of poverty and social exclusion as well as any activities connected therewith are one of the main interests of the European Commission. As a part of the Europe 2020 strategy, the Commission aims at five main goals, including social integration through reduction of poverty. By 2020, 20 million people are to get out of poverty (Copeland, Daly, 2012). A vital element of measuring poverty is defining the term beforehand. In practice, the definition is full of discrepancies as it changes over time and varies across territories (Panek, Zwierzchowski, 2013). In the literature, poverty is defined as failure to satisfy needs on a desirable level (Drewnowski, 1977). The United Nations Development Programme defines poverty as the deprivation of possibilities and choices essential to human development with regard to long, healthy, and creative life.

Within the definitions, two types of poverty are distinguished: absolute and relative. The former regards the financial situation which does not suffice to satisfy the minimal needs as the criterion of poverty, however, this minimum to be adjusted to the conditions of a given community (Rybczyńska, 1995). The latter is connected with the idea of elementary human needs and includes, aside from the financial aspect, the infrastructural aspect (access to drinkable water, sanitation, transport services, health services, education services, and cultural services), social elements (the role of the individual in the community, employment, education, parenthood), and cultural elements (customs and celebrations) (Rusnak, 2011). Relative poverty stresses the importance of not only the absolute income but also of the distance resulting from it. The relativity of essential human needs strictly connected to the community of a given individual is considered to be the starting point. In marginal cases, an assumption could be made that the feeling of insufficiency may appear even in the event of an increasing income, but only when the income of our surroundings increases at a faster rate than our own (Rybczyńska, 1995).

The notion of poverty applied to those who fulfil one of the three criteria: living at the poverty line despite social assistance, inability to satisfy their elementary needs, or living in a household with low work intensity. The second of these criteria is also called deprivation. Specifically, material deprivation describes a situation in which the main reason for not satisfying the elementary needs is the financial situation (Panek, 2011). The definition of material deprivation set forth by Eurostat (Europe 2020 strategy) states that it is a forced, rather than voluntary, inability to satisfy four out of nine elementary needs. These needs include: the ability to pay rent and utilities, proper heating, the ability to cover unexpected expenses, eating meat every other day, a week-long leisure trip, possession of a washing machine, television, a phone, and a car. The Central Statistical Office points to the interpretation of the material deprivation indicator. As this indicator is highly complex, it should be noted that it was constructed on the basis of diverse needs with regard to subjective evaluation and objective measurements. Any change to the set of needs included in the indicator would alter its value.

## **RESULTS**

The material deprivation indicator should not be treated as an indicator of a living standard but rather as one of the indicators of material insufficiency. The lack of possibility to satisfy the needs considered as elementary – given European conditions and resulting from financial issues within the community – was taken into account in the calculations. Despite the general welfare in the

European Union, the material deprivation indicator in the analysed countries is relatively high (Table 1).

Table 1. Selected statistics of investigated countries in 2015

Specification	Date of accession to the EU	Area (km <sup>2</sup> )	Population	Material deprivation indicator - % of individuals in households
Bulgaria	01 Jan 2007	110 994	7 202 198	34.2
Croatia	01 Jul 2013	56 594	4 225 316	13.7
Cyprus	01 May 2004	9 251	847 008	15.4
Greece	01 Jan 1981	131 957	10 858 018	22.2
EU28	-	4 512 898	505 429 076	8.1

Source: Own elaboration based on Eurostat data.

In 2015, ca. 8% of EU citizens lived in households affected by severe material deprivation. In 2011, almost every tenth EU citizen (8.8%) was affected by material deprivation (in line with the assumed definition). In the following years the indicator exceeded 9% and then decreased to 8.1% in 2015 (Table 2).

Table 2. The development of the material deprivation indicator in the years 2011-2015

Specification	2011	2012	2013	2014	2015
Bulgaria	43.6	44.1	43.0	33.1	34.2
Croatia	15.2	15.9	14.7	13.9	13.7
Cyprus	11.7	15.0	16.1	15.3	15.4
Greece	15.2	19.5	20.3	21.5	22.2
EU28	8.8	9.9	9.6	8.9	8.1

Source: Own elaboration based on Eurostat data.

In the years 2011-2015, a significant decrease in the percentage of people living in households which were not able to satisfy their elementary material needs was observed. Among the investigated countries, the value of the indicator of severe material deprivation in 2011 was highest in Bulgaria (43,6%). In the following years, a steady decrease of the indicator was observed, with the exception of the year 2012 when the indicator increased slightly. A similar situation presented itself in Croatia, although the percentage of people who could not satisfy their elementary needs was significantly lower than in Bulgaria. Greece is the only of the investigated countries where the value of the indicator increased steadily each year (increase by 5 percentage points in 2015 as compared to 2011). The noted increase in the level of material deprivation was determined by the financial crisis which drove numerous EU economies into recession, caused an increase in unemployment, and aggravated the debt spiral (Kawiorska, Witoń, 2015). In each of the surveyed countries, the percentage of people affected by material deprivation was several times higher than EU mean: twice as high in Greece and Croatia and four times as high in Bulgaria.

The process of aging in communities creates the necessity to monitor the changes in socio-economic situation, including the material situation of older generations. The generally accessible

Eurostat contains numerous data entries, including age, thus there is a possibility to observe the financial situation of the elders. Age, and the possibility to isolate the elders as a group, is taken into consideration in most of the structural indicators. Aside from monetary indicators of financial poverty, it is possible to access data regarding selected aspects of material deprivation among elders (Perek-Biafas, 2013). The results of material deprivation analysis of people aged 65 and over indicate that among the investigated countries, the elder citizens of Cyprus are in the least unfavourable situation (close to EU average). The worst conditions are observed in Bulgaria where in 2011 over 50% of citizens aged 65 and over failed to satisfy at least three out of nine needs taken into account in the evaluation of material situation in the case of material deprivation analysis. It should be noted that the situation improved yearly. The material deprivation indicator for people aged 65 and over can be observed to decrease in Bulgaria (almost 13 percentage points in 2015 as compared to 2011), Croatia and Cyprus (almost 2 percentage points) (Table 3). The effects of the economic crisis of the recent years affected the situation of older generations in these countries.

Table 3. Material deprivation indicator in the selected countries in the age group of 65 and over in the years 2011-2015 (%)

Specification	2011	2012	2013	2014	2015
Bulgaria	53.7	53.2	50.7	40.3	40.9
Croatia	16.3	15.5	16.9	14.7	14.5
Cyprus	7.1	7.5	9.0	7.4	5.1
Greece	13.1	14.3	13.7	15.5	15.2
EU28	7.3	7.4	7.0	6.3	5.5

Source: Own elaboration based on Eurostat data.

Despite the idea of an open society, there seems to be a co-occurrence of social mechanisms which promote unjustified exclusion of certain groups of people from the enjoyment of tangible and intangible goods to varying extents. Such exclusion appears to result not as much from the rights the individuals have but rather from gender differences. Social division caused by gender stereotypes is the underlying cause of conflicts and the symptom of the existing inequalities between people (Blicharz 2013: 39). It is also connected with the disadvantageous situation of women in many aspects of social life (Pokrzywa 2015: 197). Cyprus is the only country in the investigated group where men fail to satisfy their needs more often than women. It is estimated that 15% of women and 15.9% of men were affected by material deprivation in 2015 in the entire EU. Every third woman in Bulgaria cannot afford to satisfy her elementary needs due to financial reasons. In Greece and Croatia, the issue of material deprivation affects men and women to similar extents. The discrepancies between the indicators do not exceed 0.5 percentage point. In Greece, every fifth citizen cannot satisfy their needs while in Croatia this is the case for every tenth inhabitant (Fig. 1).

As has been indicated hereinabove, deprivation occurs whenever an individual cannot sufficiently or entirely enjoy standard living conditions, i.e. food, utilities, benefits, and services. In Bulgaria in 2015, 34.2% of the inhabitants could not satisfy four out of nine elementary needs, a number four times greater than EU average (Table 2). This is the highest value of the indicator among all EU member states. The lowest value of the indicator was noted in Sweden (0.7%). With regard to the satisfaction of specific needs, 60.4% of Bulgarians and over 65% of Croats could not afford a week-long leisure trip (EU: 34.3%). Nevertheless, this is not the highest value among the member states. The highest value of 67.6% was observed in Romania. Every second Greek and every third Bulgarian could not afford to pay rent and utilities. Over 39% of Bulgarians, the highest

percentage in the EU, could not afford to heat their apartments. Every fourth Bulgarian and every seventh Croat could not afford to eat a balanced meal (with meat or fish) every other day (EU: 8.5%).

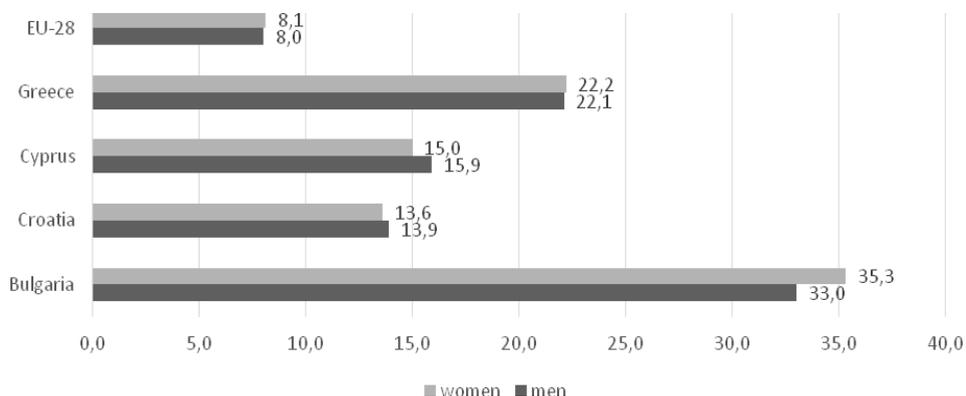


Figure 1. Material deprivation indicator in the selected countries of the EU in 2015 (%)

Source: Own elaboration based on Eurostat data.

The percentage was slightly lower in Greece (ca. 13%), while Cypriots had fewer problems with satisfying this need (3.9%, second best in the EU), only Sweden scored lower (slightly over 1%). In 28 EU member states, an average of 40% of people had no financial security for unexpected expenses as most assets covered current costs or other goals. In all investigated countries, the percentage significantly exceeded the EU average, i.e. the majority of inhabitants had no savings whatsoever.

Table 4. Individuals within households reporting the inability to satisfy a given need due to financial reasons in selected countries in 2015 (%)

Specification	week-long leisure trip	rent and utilities	unexpected expenses	eating meat every other day	proper heating
EU-28	34.3	11.5	37.3	8.5	9.4
Bulgaria	60.4	33.6	53.4	36.8	39.2
Croatia	65.9	29.6	59.8	14.5	10.0
Cyprus	53.5	31.6	60.5	3.9	28.3
Greece	53.7	49.3	53.4	12.9	29.2
EU highest	67.6	33.6	72.2	36.8	39.2
EU lowest	4.2	4.5	14.6	1.3	0.4

Source: Own elaboration based on Eurostat data.

The increasing pace of living forces people to move rapidly thus they most often decide to purchase a car. It is a rather large expense though only 8% of Europeans could not afford it (Table 5). Only several per cent of Cyprus citizens could not afford a car. Bulgaria, leading in every category, had problems in this case as well. Nevertheless, more people could afford a car than a week-long leisure trip with their families. In Greece and Croatia, every tenth inhabitant could not afford a car (Table 5).

Table 5. Individuals within households reporting the lack a given item due to financial reasons in selected countries in 2015 (%)

Specification	car	washing machine	TV	phone
EU-28	8.4	1.1	0.4	0.6
Bulgaria	24.1	10.0	2.0	3.1
Croatia	8.8	1.1	0.5	0.7
Cyprus	2.2	0.3	0.4	0.0
Greece	10.4	1.4	0.5	0.7
EU highest	35.5	10.7	2.0	3.1
EU lowest	2.0	0.1	0.2	0.0

Source: Own elaboration based on Eurostat data.

In Greece and Croatia the indicator is close to the European average (10%). The other three material goods indicators are on a significantly lower level. A car can be substituted with public transportation but the lack of phones or washing machines is not as easily compensated for. In Bulgaria, 10% of the inhabitants declare not to have a washing machine while in the other countries the indicator is near the EU average (ca. 1%). Bulgaria leads in every category: 2% of citizens claim not to have access to television, 3% have trouble with communication due to the lack of phones. EU average for these indicators is 0.5%, similarly in Greece and Croatia. Every Cypriot has access to a phone.

## CONCLUSIONS

Poverty is a common phenomenon which concerns especially the developing countries. The same is true for material deprivation. Research shows that even the citizens of developed countries cannot satisfy their elementary needs. Despite a high living standard in EU countries, some of its inhabitants are still on "the margin of humanity". On the basis of the conducted research, it has been stated that Bulgarians have the most problems with satisfying their elementary needs. It has also been indicated that the period of membership in the EU does not affect the levels of material deprivation. It may be assumed that the risk of deprivation is related to the socio-economic development of a given country.

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## **AGRITOURISM IN PERSPECTIVE OF THE EXPERIENCE ECONOMY**

**Abstract:** The paper presents the reflections on the agritourist product in the context of the current, more and more popular concept of the experience economy. In the first part the concept and essence of agritourism was discussed and the idea of the economy based on experience was characterized. In the following the feelings, impressions and experiences accompanying the tourist when using the different components of the agritourist product and spending holiday in the rural environment were presented.

**Key words:** the experience economy, agritourism, feelings, experiences, sensations, impressions.

### **INTRODUCTION**

Tourism is currently regarded as one of the most important experience markets and is analyzed as an area of consumption of sensations more and more often [Marciszewska 2010]. As was noted by A. Stasiak [2013], travels from the earliest times were accompanied by the element of learning about the unknown, experiencing exciting adventures or gaining new experiences. In this respect tourism can be seen as a perfect exemplification of the experience economy, a specific 'holiday experiences industry'. Such approach is also reflected in the tourist product, which is treated, inter alia, as a whole impression experienced by the tourist. Today's tourists are not satisfied with traditionally understood relaxation, combined with sightseeing. They want to take part in something unusual and unique and be permanently surprised, as the purpose of the trip is to experience exceptional holiday adventure. Travelers expect to stay in a special place that will provide them with authentic, vibrant emotions, engage all their senses, guarantee original personal experiences and unique memories. Therefore it can be said that the source of impressions and sensations is the authenticity of the tourist experience, as well as its original character. As J. Heath and A. Potter [2010] add, 'tourists want to experience authenticity - they look for deep, valuable and unique experiences'. Priority in this case is lack of commodification: authentic items are hand-made, with natural materials and have a traditional (non-commercial) purpose.

One of the forms of tourism that provides many different experiences is agritourism, which has been developing in Poland since the early 1990s. This type of rural tourism, compatible with an idea of alternative tourism and built up on the basis of functioning farms, is also considered relatively non-commercial and characterized by considerable authenticity and naturalness, what brings great value for the conscious traveler. The purpose of this study is therefore to specify and characterize the unique impressions and original experiences of staying in an agritourist farm.

### **THE CONCEPT AND ESSENCE OF AGRITOURISM**

The concept of agritourism in Polish and foreign literature appeared in the late 20th century. It was created from a combination of two words agro and tourism. The prefix 'agro' originates from the Greek term 'agros', meaning cultivating land and 'agronomos', referring to the management of agricultural property [M. Sznajder, L. Przezbórska 2006].

In everyday life, and sometimes even in the literature, agritourism is often associated with rural tourism. Despite the fact that these concepts are strongly intertwined, it should be emphasized that they are not synonymous, as rural tourism is a much broader idea. A.P. Wiatrak [1996] defines it as a whole of the tourist economy taking place in the countryside. It is equally widely understood also by M. Dębniwska and M. Tkaczuk [1997], who argue that rural tourism is such one, which takes place in the countryside, is adapted to the local conditions and rationally uses local natural values,

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as well as J. Sikora [1999], for whom rural tourism covers all the tourist activities organized in the countryside. The main purpose of rural tourism is to oppose the attractions and tourist conditions of the countryside against urban environment. Slightly differently rural tourism is defined by J. Majewski [1994], describing it as an any form of tourism taking place in the rural environment and using its rural values (nature, culture, landscape, buildings, etc.), which are the main attraction there. Moreover, the accommodations in this case are small pensions, hostels, private cottages, guest rooms or small campsites [Majewski 2000]. According to M. Drzewiecki [1995] rural tourism is a form of recreation that takes place in the area of a *real* village and includes many types of recreational activities. As it can be seen, there is no one, generally accepted definition of rural tourism. However, the authors cited above, considered to be an experts in this area, describe it similarly and fairly broadly. Yet, one concept of rural tourism covers all types of tourism in rural areas, while the other emphasizes the values of rusticity.

Agritourism in its assumptions is a form of rural tourism closely related to agriculture and a functioning farm, as was emphasized by J. Majewski [1994], who argues that plant production and animal breeding are one of the attractions for visitors staying at the farm. Also A.P. Wiatrak [1996] notes that this type of tourism involves arranging tourists' stay by the owner and his family in their farm, as well as M. Drzewiecki [1995], who emphasizes the importance of a farm, defining agritourism as a form of leisure in rural areas of an agricultural nature, based on accommodation and leisure activities related to the farm or its equivalent<sup>41</sup>, and its surroundings (natural, productive, service). Also J. Sikora [1999] differentiates the concept of rural tourism and agritourism, which involves staying on the farm, as well as various forms of spending free time and tourist services provided within it. M. Sznajder and L. Przezbórska [2006] note that agritourism de facto is a term introduced by representatives of supply side, representing the interests of agricultural farms providing tourist services. This has resulted in a significant extension of the concept to all activities related to the service not only for tourists, but also holidaymakers. Hence, the term *agritourism* is often understood differently by tourists and agritourist service providers. For the first the agritourism means the tourist activity of a man who intends to learn about agricultural production and/or rest in a rural and agricultural environment, while the second include into the term *agritourism* various forms of accommodation, gastronomy, recreation, leisure, sports or even treatment and rehabilitation.

It is also worth noting that the essence of agritourism can be seen in several meanings:

- ✓ as a form of rural and countryside development towards a multifunctional model, especially the development of the reception function;
- ✓ as a non-agricultural activity, concentrated on hosting guests in a farmer's household, bringing income and giving jobs to the host and the whole sphere of services and production in the countryside;
- ✓ as a certain way of travel and spending free time in a true village environment; its purpose is to provide attractive leisure, improve health, especially mental and physical fitness, explore the culture of the region, life and work in the countryside, meet new people [Mikuta, Żelazna 2004].

The presented agritourism definitions obviously do not cover all of terms that can be found in the rich literature of the subject. On the basis of these, however, list of several important features, characteristic for a tourist destination, which should be fulfilled by this kind of tourism, may be mentioned - and these will be:

- ✓ limit to agricultural areas, instead of rural ones in an administrative sense only;

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<sup>41</sup> Equivalent activities are understood as, inter alia, gardening, orchard activities, beekeeping, fish farming, production of seeds, tree nursery, production of ornamental plants, cultivating mushrooms, breeding and production of animals' seed material, birds and utility insects farming.

- ✓ strong connection with the farm, understood as a use of residential and/or farm buildings to provide the accommodation services;
- ✓ enabling active leisure in the natural environment of the farm, including plant and/or animal production.

Therefore to sum up considerations about the concept of agritourism, the author defines it as a form of rural tourism closely related to a functioning farm, while the agritourism farm is a farm where tourism is conducted next to the agricultural activities.

## ECONOMY BASED ON EXPERIENCE

Contemporary economy is an extremely complex, complicated and dynamic domain. The phenomena that occur in it are more and more often coming out of frames of the theories, which so far were successfully used to characterize and explain conventional mechanisms. These types of trends certainly include consumerism, which essence should be seen in the ritualization of the consumption process - apart from utilitarian value, goods and services become carriers of experiences and the consumer is their active seeker. Also new type of consumer has appeared, referred to as a prosumer, who actively and consciously participates in the design and manufacture of the products and services that he will use, which in turn leads to a widespread customization of the offer [Dziewanowska, Kacprzak-Choińska 2012], what means its adapting to the needs of the user.

Another, characteristic for today's economy trend is the commodification of the offer, which source should be seen in intense competition observed at the level of particular types of goods and services, as well as brands. The effect of this process is the improve of the quality of the offered products, as well as aligning their standards, what results in almost total lack of ability to distinguish a particular offer on the market and forces manufacturers to compete primarily by price policy. An example could be the 'no limit' offer, proposed by various mobile operators, which gives buyers the ability to send unlimited text messages and allow long-lasting calls. The offer of particular service providers is similar one to another, and the only criterion of their choice is often just price.

Recognizing these trends, B.J. Pine and J.H. Gilmore [1999] in the late 1990s have published a book titled *The Experience Economy: Work Is Theater & Every Business a Stage*. They prove that in the course of history the market is constantly evolving and the reasons of that can be found, among other things, in technological progress, competition (as a determinant of innovation) and the continuous economic and social development of societies, reflecting the increase of their wealth. The essence of Pine and Gilmore's approach is that the dominant on market object of exchange is constantly evolving. On this basis, they distinguish four main types of markets, referring historically to the different stages of the world economy's development.

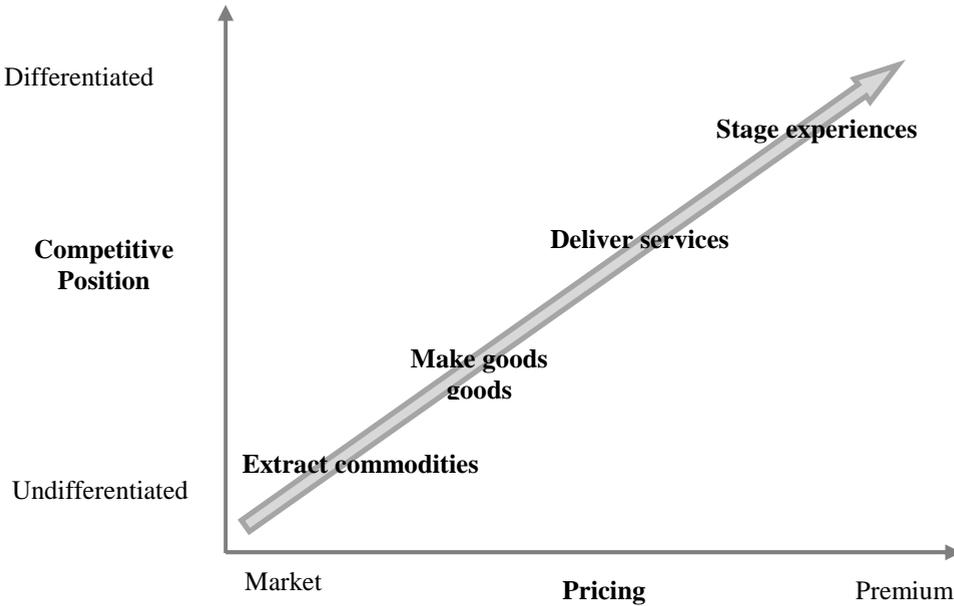
Initially, the essence of the economy was mainly the exchange of raw materials and simple agricultural products. Subsequently, the goods that was produced in workshops and factories as a result of the processing of raw materials became objects of exchange, and their production was characterized by large scale and repeatability. The next stage in the evolution of the economy was related to services that became highly personalized (customized) at the end of this period, by their significant individualization and adaptation to the needs of individual buyers. Now, as Pine and Gilmore point out, the economy is based on the experiences and impressions of consumers. Goods and services have already become insufficient product for buyers, what is a result of their market large availability, similarity and indistinguishability. Producers, who want to become more competitive, must enrich the goods and services they sell with original and unique experiences and feelings<sup>42</sup>. Experiences cannot, however, function independently, but can be combined with

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<sup>42</sup> An interesting work about transforming ordinary products into extraordinary experiences is the book of D. LaSalle and T.A. Britton: *Priceless. Turning ordinary products into extraordinary experience*. Harvard Business School Press, Boston 2003.

traditional goods and services, becoming their most important part and the main cause of customers' satisfaction. Such enriched products gain the highest value for the purchasers, making it possible to realize the greatest profits for entrepreneurs [Stasiak 2015].

Diagram 1. Progress of economic value in the perspective of an economy based on experience



Source: B.J. Pine, J.H. Gilmore (1998), *Welcome to the Experience Economy*. Harvard Business Review, July, p. 98

As Pine and Gilmore argue, experience is not an amorphous invention - it is as real as a service or good, thus another item of exchange in developing economy, which evolution in this context is presented in the table 1:

Table 1. Evolution of economic value in particular types of economy

<b>Economic Offering</b>	<b>Commodities</b>	<b>Goods</b>	<b>Services</b>	<b>Experiences</b>
Economy	Agrarian	Industrial	Service	Experience
Economic Function	Extract	Make	Deliver	Stage
Nature of Offering	Fungible	Tangible	Intangible	Memorable
Key Attribute	Natural	Standardized	Customized	Personal
Method of Supply	Stored in bulk	Inventoried after production	Delivered on demand	Revealed over a duration
Seller	Trader	Manufacturer	Provider	Stager
Buyer	Market	User	Client	Guest
Factors of Demand	Characteristics	Features	Benefits	Sensations

Source: B.J. Pine, J.H. Gilmore (1998), *Welcome to the Experience Economy*. Harvard Business Review, July, p. 98.

Many companies in today's service-based economy add extra experiences and emotions to their traditional offerings, what should increase dynamics of sales. However, to make this possible product designers must consciously plan and integrate into their goods experiences that will be

captivating to the buyer. Such requirement seems to be vital for all companies that want to remain a part of the economy evolving towards full commodity by raising their offer to the next level of economic value. The authors of this conception compare the contemporary market to theater. Experiences occur when companies consciously use their services as a scene (with goods as props) to intrigue buyers and provide them an unforgettable event. Recipients of experiences and impressions - 'guests' - especially appreciate what the company reveals to them during the 'show'. It is important here to perceive experiences as personal products, as they exist only in the mind of the individual who engages in the emotional, intellectual and even spiritual way. Due to the fact that the impressions are the result of the interaction between the presented event and the state of mind of the individual, they will be personal and distinct from those experienced by other participants [Pine, Gilmore 1999]. The role and significance of experience in the modern economy is emphasized by many researchers. Z. Bauman [2000] stresses that consumer is not driven by the desire to buy and possess, nor he is interested in the accumulation of goods in the tangible, material sense. His priority is to excite new, previously unknown experiences. Consumers are first of all collectors of impressions, they collect things only secondary, as derived from experiences. K. Krzysztofek [2004] adds that competing in the sphere of intense sensations brings the greatest profit. However, in such situation it is important to convince the recipient that collecting those sensations is necessary to achieve a high status and fullness of life.

### EXPERIENCES AND FEELINGS IN AGRITOURISM

The uniqueness and originality of the experiences and feelings available for tourists during farm holiday is a result of agritourism specificity. Such form of rural tourism, being a part of alternative tourism, offers visitors numerous unique and authentic attractions, unavailable outside the countryside.

Potential experiences, sensations and impressions resulting from staying in a rural farmhouse were analyzed based on the structure of the agritouristic product. It consists of some distinctive elements and derived sensations.

One of the basic parts of a tourist product (including agritourism) is accommodation. In the case of mass tourism, the accommodation services are very similar to each other and primarily their quality is determined by the price, reflecting their standard<sup>43</sup>. However, when considering an agritourism farm, such question does not look similar. Also in this case the standard of the facility will undoubtedly be very important, but a key role here will play the interior design. Its idea and equipment, according to the tradition and folklore of the visited region, will give inside an unique character and a kind of cultural authenticity. Tourist staying in such room will have the feeling of specificity and distinctiveness of the area he visits, and the accommodation there will undoubtedly be more satisfying and exciting than staying in a non-genuine hotel room. Another, unattainable nowhere else than in rural areas, experience will be the sound of breeding birds and other livestock kept on the farm, as well as other animals living in the countryside. The proverbial motif of the awakening by crowing rooster can for one tourists be an emotional experience, known only from heard stories, while for others would become sentimental memory from childhood.

Second, right after the accommodation, basic element of the tourist product is food. For many tourists the desire to taste sophisticated and original dishes, prepared accordingly to traditional recipes or served only in specific regions, is even the main motive of the trip, which determines the development of culinary tourism. However, it should be noted that in the vast majority of catering and accommodation facilities, dishes proposed for mass tourism, although tasty and often prepared with high quality products, are similar to each other and usually do not represent anything original.

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<sup>43</sup> Exceptions in this case may be *boutique hotels* (sometimes described as *design hotels* or *lifestyle hotels*), characterized by a very high standard, intimate atmosphere, and, above all, the unusual character of interiors.



An example could be standardized European (continental) or English breakfast, served to hotel guests in most of the world. A completely different culinary experience can bring a stay in an agritourist farm, where meals are often prepared from the products of the visited farm and are characterized by the highest quality and freshness. Especially attractive in this respect are eco-agritourism entities, where no chemicals are used for plant protection.

For people interested in exploring new flavors, a valuable experience may be rest at farms referring in their offer to the specific traditions of the region. Cuisine of Podlasie, Podhale, Kurpie, Kujawy, Warmia and Mazury regions abounds in unique traditional and regional dishes, which cannot be tasted anywhere else in Poland. Very important is the knowledge and experience of housewives, whose (often secret) recipes and formulas are passed from generation to generation. Thus, during the preparation of such dishes visitors are satisfied from broadening their culinary skills. There is also a great interest in various types of workshops related to herbalism, apitherapy, making cheese or home-made tinctures, which may become source of positive experiences long after returning home...

Apart from the meal itself, the way of serving it is also very important. Breakfast or lunch in the orchard among blooming apple trees can be a unique experience, both tastefully and aesthetically, unattainable in any other type of tourism. Moreover, it should be noted that in the case of agritourism the time spent at the table has also cognitive, social and integration value. Meals are often eaten in the company of the hosts, what strengthens bond among the banqueters, helps in the exchange of information and the better acquaintance of the unique characteristics of rural life, thanks to the listening the hosts' stories about history and cultural values of the region.

The main function of agriculture is to provide agricultural produce. However, cultivating the role and growing plants, as well as animal breeding can also be very interesting for tourists visiting rural areas. They are mainly inhabitants of cities, therefore their knowledge is mostly inferior. The opportunity to expand this knowledge for many of them may be through extremely exciting participation in the seasonal works at the farm, like harvesting, haymaking or digging. Unforgettable experience can also be (especially for children) in watching, feeding and grooming animals, which enables their better recognition and through developing ecological awareness and respect for living creatures has an educative value. Moreover, it is a good opportunity to get more familiar with the manufacturing process and acquiring many food products. Also some agricultural machines may be interesting for tourists. Learning about their construction, ways of working or self-service is often very unusual experience.

Many tourists are coming to the countryside because it offers the possibility to rest in peaceful and quiet surroundings and contact with nature. Staying in pure, attractive landscape is also a source of many experiences and impressions (mostly aesthetic) that result from the beauty and specificity of non-urbanized areas. Positive emotions can be provided by realizing passions (like painting or photography) or hobbies, such as fishing, gathering (mushrooms, herbs, blueberries, blackberries, wild strawberries) and many others. Those activities, taken up in the rustic atmosphere of the village, provide satisfaction and sense of fulfillment. In the countryside also important is ability to use space for various forms of active recreation. The cycling trip among the flourishing meadows will in this case be a more attractive experience than riding in crowded urban cycling paths, which moreover expose the cyclist to many traffic dangers.

A significant value is also the cultural aspect of rural areas. Vanishing traditions, blurred customs and practices, unique, often unknown and mysterious rituals or colorful ways of celebrating religious festivals bring the whole range of impressions, emotions and feelings related to folklore of the village and become invaluable and exciting experience for the visitors. Examples may include attending religious rituals, May masses and colorful processions alongside countryside crosses or chapels. It is no less exciting to participate in folk handicraft workshops, which aim is to sustain or recreate many of the dying professions, like weaving, wickerwork, smithery, sculpture and many

others. Souvenirs from products of such unique activities may be a source of satisfaction and joy long after returning home. Staying in the countryside is also an opportunity to get acquainted with exciting beliefs, rituals, legends or folk tales, which, with their authenticity, mystery, and sometimes thrill, will enchant and fascinate even experienced travelers.

## CONCLUSIONS

Due to the complexity and interdisciplinarity of the agritourism product, still expanding typology of agritourism farms and resulting from that multidirectionality of the specialization of possible actions, the presented content certainly does not cover the vast subject of experiences and impressions of tourists resting in the countryside. Therefore this study is only a contribution to further research and a fuller exploration of the described topic. The need to initiate a wider research on agritourism in the perspective of the experience economy is a result of progressive commodification of the market offer, which deprives agritourism entities the possibility of creating a competitive advantage. Therefore conclusions and insights of the scientific penetration of this area will lead to a more effective search for new ways of distinguishing those entities on the market and stimulate the development of agritourism. Finally, this should result in greater variety and intensity of emotions, sensations and feelings experienced by tourists relaxing in agritourism farms.

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