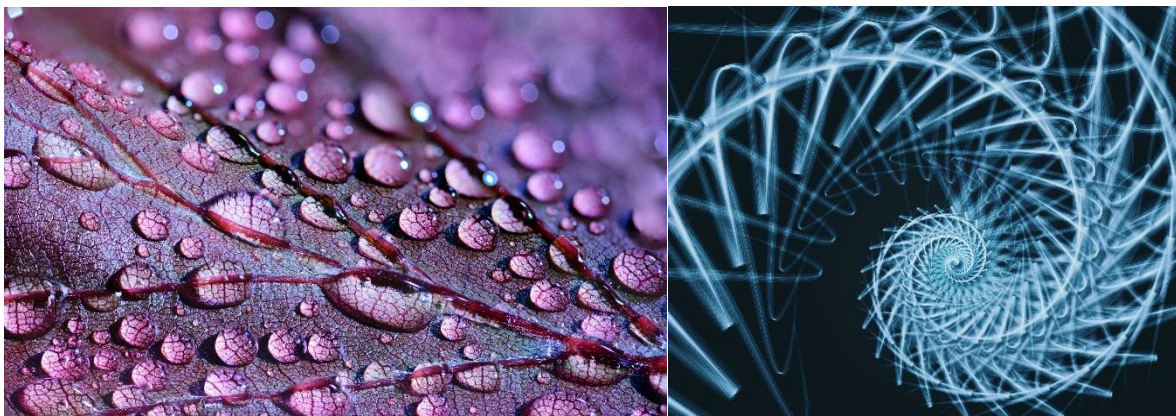


**JBM**

Research and Innovate

**JOURNAL  
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## Research and innovate

The Journal of Bio based Marketing (JBM) provides a forum for academics, researchers, entrepreneurs, young experts, professionals, educators to analyze global aspects of bio-based marketing as a theoretical idea and real business model in value chain of bio-based products. Covering all aspects of knowledge regulation and order including organizational issues, technology support, knowledge representation, transfer of knowledge and knowledge valorization. JBM focus on the following topics:

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## NATURE AND ROLE OF CONFLICTS IN THE MANAGEMENT OF BUSINESS ENTERPRISES

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### ABSTRACT

The purpose of this article is to analyze the nature of conflict as a social phenomenon in the business organization and to reveal the factors that determine it within the strategic corporate governance. From the literature analysis of the problem the following can be summarized and concluded: (1) conflict arises from the opposition of individuals or groups that oppose on the basis of difference. This difference may be based on differences in goals, ideas, behavior in specific situations or interests. Conflict can also be dictated by the objective scarcity of resources available to the individual to solve a particular problem. The causes of conflict are numerous, but they are a "trigger" of a process that ends in a result. the conflict inevitably ends with a certain result; (2) conflicts in business organizations are inevitable, which determines two main approaches to their management - prevention and promotion. Which of the two approaches is chosen by the manager depends on the situation in which he manages; (3) Through conflicts, business organizations develop organizationally, which determines both functional and dysfunctional consequences for people in the organization.

**KEY WORDS:** conflicts, firm roles, conflict factors, conflict skills, management of conflicts

### ABSTRAKT

Ziel dieses Artikels ist es, das Wesen des Konflikts als soziales Phänomen in der Unternehmensorganisation zu analysieren und die Faktoren aufzuzeigen, die ihn im Rahmen der strategischen Unternehmensführung bestimmen. Aus der Literaturanalyse des Problems lassen sich folgende Schlussfolgerungen ableiten: (1) Konflikte entstehen aus der Opposition von Individuen oder Gruppen, die sich auf der Grundlage von Unterschieden gegenüberstehen. Dieser Unterschied kann auf unterschiedlichen Zielen, Ideen, Verhaltensweisen in bestimmten Situationen oder Interessen beruhen. Ein Konflikt kann auch durch die objektive Knappheit von Ressourcen bedingt sein, die dem Einzelnen zur Lösung eines bestimmten Problems zur Verfügung stehen. Die Ursachen von Konflikten sind zahlreich, aber sie sind "Auslöser" eines Prozesses, der in einem Ergebnis endet. Der Konflikt endet unweigerlich mit einem bestimmten Ergebnis; (2) Konflikte in Unternehmensorganisationen sind unvermeidlich, was zwei Hauptansätze für ihre Bewältigung bestimmt - Prävention und Förderung. Welcher der beiden Ansätze vom Manager gewählt wird, hängt von der Situation ab, in der er verwaltet; (3) Durch Konflikte entwickeln sich Unternehmensorganisationen organisatorisch, was sowohl funktionale als auch dysfunktionale Folgen für die Menschen in der Organisation hat.

**STICHWORTE:** konflikte, feste Rollen, konfliktfaktoren, konfliktfähigkeit, konfliktmanagement

## RÉSUMÉ

L'objectif de cet article est d'analyser la nature du conflit en tant que phénomène social dans l'organisation des affaires et de révéler les facteurs qui le déterminent dans le cadre de la gouvernance stratégique des entreprises. L'analyse de la littérature sur le problème permet de résumer et de conclure ce qui suit : (1) le conflit naît de l'opposition d'individus ou de groupes qui s'opposent sur la base d'une différence. Cette différence peut être basée sur des différences d'objectifs, d'idées, de comportements dans des situations spécifiques ou d'intérêts. Le conflit peut également être dicté par la rareté objective des ressources dont dispose l'individu pour résoudre un problème particulier. Les causes de conflit sont nombreuses, mais elles constituent un "déclencheur" d'un processus qui aboutit à un résultat. Le conflit aboutit inévitablement à un certain résultat ; (2) les conflits dans les organisations commerciales sont inévitables, ce qui détermine deux approches principales pour leur gestion - la prévention et la promotion. Laquelle de ces deux approches est choisie par le manager dépend de la situation dans laquelle il gère ; (3) à travers les conflits, les organisations d'entreprises se développent sur le plan organisationnel, ce qui détermine des conséquences à la fois fonctionnelles et dysfonctionnelles pour les personnes au sein de l'organisation.

**MOTS CLÉS:** conflits, rôles dans l'entreprise, facteurs de conflits, compétences en matière de conflits, gestion des conflits

## INTRODUCTION

Identifying the factors that determine the occurrence of conflicts in business enterprises requires studying the holistic nature of conflict as a phenomenon in these business organizations. Conflict is the subject of research both in psychology and in the theory of economic management. Most researchers of this phenomenon argue that management is primarily a psychological interaction between individuals in the organization, which determines the inevitability of a situation of opposition and apparent conflict. In this part of the dissertation we strive to define the nature of conflict as a phenomenon and process based on basic statements in the psychology and theory of economic management.

The purpose of this article is to analyze the nature of conflict as a social phenomenon in the business organization and to reveal the factors that determine it within the strategic corporate governance.

## RESULTS AND DISCUSSION

***Nature of the conflict.*** There are a wide variety of definitions explaining the meaning of a social phenomenon called conflict. Most of them state that the conflict manifests itself in the collision of various factors that determine the personality of the individual. The definitions of Nedyalkov and Yordanov are in the fullest scope of the essence of the conflict. According to Nedyalkov (2007) "conflict is a conflict of countries, individuals or societies, determined by their opposing interests, claims and intentions." The

other author declares that "conflict is a situation in which two or more parties perceive their goals and / or interests as incompatible. They strive for the same limited resources at the same time. "According to Khatam (1999)," conflict occurs when two or more people interact and realize incompatible differences or threats to their goals, ideas, attitudes or behavior and this makes them react is a prerequisite for the existence and escalation of conflict. From the above definitions it can be summarized that the conflict arises from the opposition of individuals or groups that oppose on the basis of difference. This difference may be based on differences in goals, ideas, behavior in specific situations or interests. Conflict can also be dictated by the objective scarcity of resources available to the individual to solve a particular problem. The causes of conflict are numerous, but they are a "trigger" of a process that ends in a result. the conflict inevitably ends with a certain result. According to Follett, 1947 "the results of a conflict can be grouped into 4 categories according to the victory-defeat criterion:" attitudes or behavior and this makes them react is a prerequisite for the existence and escalation of conflict. From the above definitions it can be summarized that the conflict arises from the opposition of individuals or groups that oppose on the basis of difference. This difference may be based on differences in goals, ideas, behavior in specific situations or interests. Conflict can also be dictated by the objective scarcity of resources available to the individual to solve a particular problem. The causes of conflict are numerous, but they are a "trigger" of a process that ends in a result. the conflict inevitably ends with a certain result. According to Follett, 1947 "the results of a conflict can be grouped into 4 categories according to the victory-defeat criterion:" attitudes or behavior and this makes them react is a prerequisite for the existence and escalation of conflict. From the above definitions it can be summarized that the conflict arises from the opposition of individuals or groups that oppose on the basis of difference. This difference may be based on differences in goals, ideas, behavior in specific situations or interests. Conflict can also be dictated by the objective scarcity of resources available to the individual to solve a particular problem. The causes of conflict are numerous, but they are a "trigger" of a process that ends in a result. the conflict inevitably ends with a certain result. According to Follett, 1947 "the results of a conflict can be grouped into 4 categories according to the victory-defeat criterion:" that conflict arises from the opposition of individuals or groups that oppose on the basis of difference. This difference may be based on differences in goals, ideas, behavior in specific situations or interests. Conflict can also be dictated by the objective scarcity of resources available to the individual to solve a particular problem. The causes of conflict are numerous, but they are a "trigger" of a process that ends in a result. the conflict inevitably ends with a certain result. According to Follett, 1947 "the results of a conflict can be grouped into 4 categories according to the victory-defeat criterion:" that conflict arises from the opposition of individuals or groups that oppose on the basis of difference. This difference may be based on differences in goals, ideas, behavior in specific situations or interests. Conflict can also be dictated by the objective scarcity of resources available to the individual to solve a particular problem. The causes of conflict are numerous, but they are a "trigger" of a process that ends in a result. the conflict inevitably ends with a certain result. According to Follett, 1947 "the results of a conflict can be grouped into 4 categories according to the victory-defeat criterion:" Conflict can also be dictated by the objective scarcity

of resources available to the individual to solve a particular problem. The causes of conflict are numerous, but they are a "trigger" of a process that ends in a result. the conflict inevitably ends with a certain result. According to Follett, 1947 "the results of a conflict can be grouped into 4 categories according to the victory-defeat criterion:"

- A can win on B;
- B can win on A;
- A and B compromise;
- A and B can cooperate and win both.

In the presence of common interests, individuals have the prerequisite to cooperate and by cooperating their efforts to solve a problem that they recognize as common. Under these conditions, the result will be cooperative behavior. When individuals have different interests, they fall into a state of competition (rivalry), ie. a precondition is created for these individuals to compete, which is reflected in the emergence of conflict. Depending on what means the countries use to achieve their goals, the conflict could escalate into a crisis.

**Object and subject of conflict.** The object of conflict is this specific value (tangible or intangible), which the interacting parties seek to possess. The subject of the conflict is the objectively existing problem, which is the reason for the conflict between the parties.

**Theories explaining the causality of the conflict.** Knowing the causes of conflicts helps to better analyze the conflict situation and to explain more easily its development and the behavior of its participants. According to researchers of the social phenomenon, there are two groups of theories explaining the causality of conflict - subjective and objective.

**Subjective theories.** They are based on the following understanding - people, with all the peculiarities of their individual and group psyche, are the main reason for the existence of conflicts. Each of the subjective theories defends a different thesis about what makes people come into conflict:

- *Bit concept:* according to this theory, human is mortal by nature, limited and extreme as a body in time and space, a huge and uncontrollable layer of anger and conflict is layered in him. As a representative of this conceptual thesis we could point out Fedorov, 1965.
- *Genetic concept:* human is conflicted by the very nature of his genetic nature and his innate and inalienable instincts for rivalry. One of the most prominent proponents of this thesis is Sigmund Freud.
- *Crisis concept:* each person goes through special, long periods of crisis within their individual development, characterized by abrupt psychological changes, which changes are the main reason for the manifestation of hostile behavior (Eric Erickson).
- *Motivational concept:* according to this thesis, when the motivation of the individual, aimed at meeting his needs, is hindered in some way, a moment of conflict arises.
- *Socio-psychological concept:* according to her, the peculiarities of the human psyche play a decisive role in the emergence and course of conflict interactions, and their regulation is achieved by influencing certain mental structures.



**The objective theory** explain the reasons for the conflict with various factors beyond the subjective psyche of human. These theories are grouped into two concepts - which are complementary - the concept of unequal interests and the concept of objective contradictions.

- *Concept of unequal interests:* the analysis of the most diverse and seemingly very different conflicts shows and proves that any specific and subjective reasons underlying the actions of the parties to the conflict ultimately come down to and reflect the opposing, incompatible interests of the parties. .
- *Concept of objective contradictions:* the mechanism of reasoning in this type of concept in schematic form looks as follows - the conflicts in today's societies are generated and are a manifestation of objectively existing social contradictions. Contradictions in society are the essence of its genesis, without them it cannot develop.

In all concepts there is the same understanding that the conflict is the type, degree, form, severity of the manifestation of the contradiction. Out of contradiction there is no conflict, and without object there is no contradiction. In a broader sense, the cause of conflict is the phenomenon that determines its manifestation, subsequent development and, ultimately, its end.

**Conflict as a process.** Conflict is usually not a one-time action that develops for a short time, but an ongoing interaction between two people or two parties who hold opposing views on a common problem. This process is often long, develops over time and goes through various stages. According to McCortney (2003), "in its development, conflict goes through several stages that form a cycle of conflict":

- *Pre-conflict stage;*
- *Explicit stage of the conflict;*
- *Post-conflict stage.*

*Pre-conflict stage:* can be described by the following most characteristic features - increasing social tensions, highlighting the interacting countries, real harm to the interests of the parties, which is perceived as such (area of disagreement), own emergence of a real pre-conflict situation. Already in the first phase of the pre-conflict stage there are attempts to solve the objectively existing problems (the area of disagreement) through non-conflict methods, namely: through clarifications, requests, information, etc. If all these ways do not give a specific, mutually acceptable result , the next phase of the stage is realized.

The second phase at this stage is the pre-conflict situation. The most important feature is that the interacting parties are clearly and immediately aware of the real violation of their interests, unlike the first phase, where there is only potential damage to interests.

*Explicit stage:* in order for the conflict situation to turn into an open conflict, a formal occasion is needed to encourage the interacting parties to take active action. This formal occasion is the incident, which is the first phase of taking active action. According to Ouchi (1985), "an incident may occur accidentally or be deliberately provoked by one or both parties". In its natural course of development, however, after the incident comes the second phase of the open stage of the conflict - escalation. "The escalation of the conflict is characterized by a sharp escalation of the confrontation between the two

countries." The escalation can be continuous - with a constant increase in voltage, when the voltage is cyclical, we are talking about wavy escalation. The escalation may culminate.

*Post-conflict stage:* the end of the conflict can be described as "a transition from active and intense opposition between interacting parties". The area of disagreement is generally objective, it is a crossroads where the opposing interests of both sides in the conflict intertwine. After the end of the conflict, tensions and confrontation were significantly reduced. Conflict can end in partial normalization, complete normalization and lack of normalization.

*Partial normalization* - is the case when the cooperating parties have partially satisfied their own interests in the area of disagreement.

*Complete normalization*- we have in the case when the two interacting parties have found a mutually acceptable solution to the conflict.

*Lack of normalization*- is essentially a precondition for the outbreak of a new conflict, as neither side has received even partial satisfaction of its interest.

**Types of conflicts.** According to Lau (2010), "essentially initial is the so-called internal personality conflict, the conflict of personality that gives rise to other types of conflicts in society." For the purposes of the research process in the science of psychology, there are the following types of conflicts:

*Intra-personal conflict.* This is a kind of negative mental state caused by the struggle of opposite tendencies in the substructural formations of the personality, which hinders the adaptation and only the realization of the individual in difficult situations. The emergence of internal-personal conflict requires the presence of personal and situational conditions. Personal conditions: rich inner world, complex hierarchy of needs and motives, high level of sensuality, tendency of the individual to self-analysis. Situational conditions: threat to significant values, obstacles to meeting needs, public prohibitions, etc.

The main types of internal personal conflicts are:

- *Motivational conflict:* it is caused by a collision in the consciousness of the individual of motives different in nature (Behluli, Borisov and Hajdari, 2020);
- *Moral conflict:* it is present when there is a discrepancy or contradiction between the desires and interests of the subject on the one hand and generally accepted and socially determined moral principles and norms;
- *Unfulfilled wish:* it is a conflict determined by the contradictions between the needs of the individual and the real reality that does not allow them to be met (Heemskerk, EM, Heemskerk, K., & Wats, MM) (2017).
- *Role conflict:* it is expressed in the inability to perform several social roles simultaneously by one individual (Khan, K., Abbas, M., Gul, A., Raja, U., 2013), as well as in the inability to meet different requirements, which he puts before himself in the performance of a certain social role (Lau, RS, Cobb, AT, 2010).
- *Adaptation conflict:* this is a conflict between the requirements of reality and the real capabilities of the subject (Meriac, JP, 2015.)

- *Conflict of inadequate self-esteem*: and high and low self-esteem can lead to interpersonal conflict (Hambrick, DC 2007).

Intra-personal conflict can be constructive and lead to: (1) complication of mental life (Nedyalkov, 2007); (2) basis for moral development (Hill, 1996); (3) plays a role in the formation of personal qualities (Jehn and Bendersky, 2003); (4) also contributes to the formation of adequate self-esteem, which in turn contributes to the self-knowledge and self-realization of the individual (Li and Hambrick, 2005). 1) reduction of work efficiency (Pelled, Eisenhardt & Xin, 1999); (2) slows down personality development (Reomer, Rispens, Giebels, Euwema, 2012.) (3) forms an inferiority complex (Lee, Cheng, Yeung, Lai, 2011); (4) worsens interpersonal relationships (Lee, Cheng, Yeung, Lai, 2011); (5) worsens mental health.

According to Nedyalkov (2007), "the ways to resolve this type of conflict are most often associated with the mechanisms of psychological protection. They are:

- *Displacement*: avoiding the conflict by actively excluding from the consciousness of the unacceptable motive / forgetting or not being aware of the events /;
- *Negation*: it does not accept information that may lead to internal conflict;
- *Regression*: represents, repetition of patterns of behavior formed much earlier;
- *Projection*: it is manifested by transferring to another person one's own feelings, desires and inclinations, which one does not want to admit, understanding their social unacceptability;
- *Value experience*: there are two subtypes: change of the value-motivational system as a result of which there is no longer a conflict; upholding the positions of values - if until the achievement of this degree the values belonged to the person, then when it is achieved the person already belongs to them and in their service he finds the meaning of his life."(Nedyalkov (2007).

**Interpersonal conflicts.** "This is a direct clash between at least two countries, which manifest in this interaction their different needs, motives, interests and values "(Nedyalkov, 2007). The factors that give rise to this type of conflict are:

- *Information* - distortion of information (rumors, misinformation, etc.) (Angelov, 2006);
- *Behavioral* - striving for superiority (Lu, L., Yuan, YC, & McLeod, PL (2012); display of selfishness and aggression (O'Reilly, C., 1989); failure to keep promises (Lau, RS, Cobb, AT, 2010), undermining authority (Jehn, KA, Bendersky, C., 2003), etc.
- *On the relationship*: imbalance in the relationship;
- *Values* - attachment to group norms;
- *Structural* - the management system; distribution of property, etc.

**Intergroup conflicts.**This is a confrontation in which at least one of the parties is a small social group (Jehn, 1995) The study of these conflicts is carried out within three main approaches: motivational, situational and cognitive.

- *Motivational approach*: proceeds from the fact that such phenomena as intergroup interaction, hostility, discrimination, etc., are a reflection of internal problems in the group itself and it needs external conflict to solve them (Heemskerk, Heemskerk & Wats, 2017) .;

- *The situational approach*: describes intergroup conflicts as a consequence of external conditions of a competitive nature;
- *Cognitive approach*: Factors determining conflicts are the attitudes (feelings) of its members (O'Reilly, 1989)

Different types of conflicts are experienced by the individual at all levels of manifestation, as they have the ability to very easily transform from one species to another.

**Conflict forecasting and prevention.** Conflict prevention is a type of managerial activity of the subjects of social interaction, which excludes or minimizes the likelihood of conflicts between them (Angelov, 1998). Measures aimed at identifying and eliminating the causes (sources), the factors that cause or facilitate the emergence of conflicts are called prevention. Prevention requires forecasting the symptoms and planning the impact of factors affecting the conflict situation. The main factors that must be taken into account in the implementation of prevention are: (1) the behavior of people in conflict situations; (2) the imposed style of human relations and (3) knowledge of the typical mistakes made by people in conflict.

**Behavior of people in a conflict situation.** In the analysis of the conflict and especially in the process of choosing adequate management methods and techniques for interaction on it, it is necessary to know and take into account the typical patterns of behavior of the individual in the conflict. According to Dmitriev, "there are three main types of behavior of the individual in a conflict situation:

- *Destructive type*: this type of person has a tendency to constantly incite conflicts and intensify them, even to the point of complete physical destruction and neutralization of the opposite side. These are authoritarian types of individuals who in their activities seek to subordinate others at the expense of their interests. The destructive type of personality initially underestimates the opponent by negatively perceiving and evaluating his personality. The most common characteristics of this type of personality are - aggression, impulsiveness, rudeness, cruelty, selfishness, etc.
- *Constructive type*: the most important feature of this type of person is that he seeks to find a mutually acceptable solution with the opposing party. This type of person is characterized by restraint and self-control, willing to enter into negotiations of any type for conflict resolution, treating the opponent in good faith.
- *Conformist type*: this type of person is prone to concessions, preferring to obey rather than engage in real conflict. Another characteristic feature of this type of personality is that it is inconsistent in defending its interests and opinions, while at the same time it is too easy to come to terms with the point of view of the opposite party. "(Nedyalkov, 2007).

The personality type of the participant in the conflict is determined by two groups of factors: external and internal.

*Internal* - personality type (Yordanov, 2003) - introvert, choleric, phlegmatic, etc. ; value system - morality (Tsvetanska, 2007); education (Angelov, 1998); tolerance (Hatam, 2009); sense of justice, education and level of intelligence (Ouchi, 1985.) *External* - situation (Jehn, Bendersky, 2003), reaction of the opponent (Henry, 2009), social status (Angelov, 1998);

It can be concluded that internal and external factors together with the experience of the individual in a conflict situation form his style of attitude.

**Attitude.** Attitude style is understood as some persistent stereotypes of consciousness and behavior, accepting in some organizations the nature of traditions and habits (Jehn, 1997). Of course, they can be different. Depending on the nature of the group are divided into: mature, with a high level of developed positive relationships and immature. Adherence to a mature team with positive relationships successfully prevents the emergence of negative ones. Only such groups have anti-conflict immunity. According to Ouchi (1985), "These groups have the following characteristics:

- Stable relationships between group members;
- Existence of pride in the team;
- Opportunity to develop the potential of the group members;
- Resolving conflicts arising in the group. "

Immature teams with a low level of relationships include those who have "the following principles:

- Active search for culprits in case of any failures;
- Underestimation of the collective methods by the management and authoritarian type of management;
- Conducting cumbersome and fruitless meetings;
- Emotional evaluation of the work;
- Frequent conflicts on insignificant occasions. " (Ouchi, Wilkins, 1985)

According to Andreeva (2000), "there are 5 styles of behavior. This distinction is made on the basis of how much we care about our own interests in the conflict (we strive to achieve our own) and how much attention we pay to maintain good relations with other participants in the conflict "(Tsvetanska, 2006). According to Thomas and Kilman, there are also 5 behavioral styles, but they view them on the basis of self-interest concerns of the opposing parties to the conflict. Regardless of the type of conflict, each participant involved in it constantly evaluates and relates their own interests and the interests of the opposing side. " (Nedyalkov, 2007).

**Errors in conflict behavior.** In the process of overcoming the conflict, mistakes are sometimes made as a result of the manifestations of subjectivism in the perception of the situation and the participants in it. According to Tsvetanska (2006), "some of the most common distortions in behavior during conflict are:

Mirror image: both sides perceive themselves as innocent victims. Everyone thinks he is unquestionably right and just, and the other is malicious, mean and cruel. This effect is also observed between spouses in the family.

Seeing other people's mistakes, but not your own: we usually consider ourselves good and others bad.

Double standards: what is allowed to one is not allowed to the other.

Black and white view of the situation: the conflict is viewed superficially, in one of two extremes - only as good or only as bad. Everything one does is good, and everything the other does is completely bad.

Search for a masculine image of yourself: each of the participants in the conflict seeks to impose himself, not to allow retreat from his positions, because he believes that concession and compromise are a manifestation of weakness and uncharacteristic, which is not looked upon favorably.

Ping pong effect: like the ball game, in a conflict, the disputing parties become infected with each other. The behavior of one side provokes similar behavior in the other. " (Tsvetanska, 2006)

**Conflict management methods.** The theory of psychology has a set of methods for managing the consequences of conflicts in society. The most commonly used methods of conflict management are:

- *Negotiations*: in the direct negotiation model, all information is in the countries of conflict. The process that will be followed until the decisions are reached, as well as the agreement on them, depends on them;
- *Facilitation*: implies the existence of a neutral third party to the conflict. "The role of the facilitator is to facilitate the interaction between the parties to the conflict as a guardian of good relations and compliance with pre-agreed rules for joint work and follow-up process in resolving the conflict" (Nedyalkov, 2007). All the information is again entirely in the countries, and the decisions are also theirs.
- *Mediation*: there are often cases where the parties are so emotionally involved that they do not want to see each other at all or sit at the negotiating table. Then it is necessary to introduce the model of mediation. The parties to the conflict have no direct contact with him. The information is exchanged through the mediator who wanders between the two parties. "This model also predetermines the danger of manipulating some of the information by the intermediary" (Hatam, 1999).
- *Reconciliation* is "a private, voluntary, unregulated activity in which two or more parties try to reach a mutually satisfactory solution with the help of a neutral third party" (Tsvetanska, 2006). Unlike a court decision, mediation is a process of resolving a conflict by consensus. A skilled mediator can play a very important role in guiding the parties to reach a mutually beneficial solution. The use of a mediator is especially important and indispensable when the parties have deteriorated their relations to such an extent that it is no longer possible to make direct contact, because everyone perceives the other as an enemy. The main task of the mediator is to help in the negotiation process and to resolve the dispute, not caring about the way it happened and the result itself. The only thing that matters to him is the fact
- *Arbitration*: these are statutory dispute resolution systems. In arbitration, each of the parties to the dispute consistently provides the information at its disposal, but decisions are made by a third party - the arbitrator. In the court model, the parties provide their information to their lawyers, who decide what to provide to the court.

**Conflict management tactics.** Conflict management tactics are understood as the application of different styles of conflict management. According to Nedyalkov, 2007 the following tactics exist:

*Conflict avoidance tactics:* the essence of this tactic is to ignore the conflict situation, to refuse to acknowledge its existence, to preserve the "stage" on which the conflict unfolds in self-distancing, either physically or psychologically. It is often resorted to by both the parties to the conflict and those who, by virtue of their official status, must participate in the role of mediator in its regulation. This tactic means that the person in a conflict situation prefers not to take any constructive steps to resolve or change it. Advantages:

(1) It is quickly feasible insofar as it does not require the availability of either intellectual or material resources. Thus, for example, the leader, avoiding the conflict, may not respond to another written request of a subordinate to grant one or another privilege, insofar as this request is unfounded;

(2) It provides an opportunity to postpone or even prevent a conflict, the content of which appears unfulfilled from the point of view of the strategic goals of the given organization or group.

Disadvantages:

(1) Under certain conditions, it may lead to an escalation of the conflict, insofar as the cause that caused it is not overcome by the avoidance tactics, but is only preserved. If this problem is real, significant, then this tightening can only lead to aggravation, not to conflict resolution. Conditions under which avoidance tactics are applied:

(1) In case of insignificance of the reasons that gave rise to the confrontation;

(2) For some temporary parameters of the conflict: if the conflict arises at a time when it is not possible to disperse it to regulate the conflict, as there are other, more significant urgent problems in terms of organizational goals.

(3) In case of limited available information about the conflict, in the absence of necessary information and impossibility for additional work on data collection, which would ensure effective end of the conflict.

(4) In the absence of one of the parties to the conflict of sufficient forces capable of resolving the conflict quickly and successfully.

*Tactics of force suppression:* this method is in many respects the opposite of the method of escape. Its use indicates a higher degree of readiness to resolve the conflict as a last resort in one of the parties. Its essence is to enforce one of the parties to its decision. The use of this tactic requires the existence of certain prerequisites conducive to its success:

(1) Decisive predominance of one of the parties in the available material and psychological resources, for example, predominance of the administration, which is in conflict with the working staff of the plant.

(2) Emergence of an emergency situation requiring immediate action.

(3) Suddenly there is a need to make an unpopular decision, which will be clearly negatively received by the other party.

(4) Subject to indisputable legality of the actions of the party having force majeure.

(5) In case of any manifestations of destructive forms of behavior on the part of the members of the organization, such as, for example, drunkenness, drug addiction, waste of property, absence from work for disrespectful reasons, violation of safety precautions, etc.

*Tactics of compromise, of mutual concessions:* compromise is understood as the path of mutual concessions, of the mutually beneficial deal, the creation of conditions for albeit partial satisfaction of the interests of the opposing parties. Compromise, thus, is a kind of agreement based on mutual correctness in the positions of both parties on the issues under discussion, seeking a mutually acceptable position on controversial issues. Difficulties arising in the practical application of compromise tactics are:

(1) Refusal of one of the parties from the initially occupied position due to the discovery in the course of the negotiations of its unrealistic nature;

(2) The prepared decision, due to the mutual concessions contained in it, may be contradictory, unclear and therefore difficult to implement;

(3) The element of renunciation of the initially occupied position contained in each compromise agreement to one degree or another, its correction to some extent may subsequently entail a challenge to the adopted decision.

*Tactics of negotiations:* they, as a form of social interaction, have a number of distinctive features. Negotiations are conducted in a situation with diverse interests of the parties, ie. their interests are not absolutely identical or completely opposite. Advantages:

(1) In the process of negotiations direct interaction of the parties shall be carried out;

(2) The parties to the conflict have the opportunity to control as much as possible the various aspects of their interaction, including to independently determine the time frames and limits of discussion, to influence the negotiation process and their outcome, to determine the framework of the agreement;

(3) Negotiations allow the parties to the conflict to choose an agreement that would satisfy each of the parties and would avoid long-term judicial mediation, which could end in loss for one of the parties;

(4) The decision taken, in case of reaching agreements, is often of an official nature, being the personal work of the contracting parties;

(5) The specific nature of the interaction between the parties to the conflict during the negotiations allows for the preservation of confidentiality.

***Strategic conflict management in business organizations.*** Given the analysis of the statements and theses that are defended, it can be summarized that this type of social phenomenon has significant



consequences on the organizational development of the business organization. This, in turn, poses challenges to managers who pursue the goals of effective management. The inevitability of conflicts in the business organization requires managers knowledge and skills in managing this factor of the organizational environment. Skills to enable them to manage organizational conflicts in such a way that their functional consequences are in the direction of relieving tension in work teams and achieving secondary beneficial effects on the activities of the entire organization. In addition to the clear social significance of the conflict, it has a "direct and systemic impact on the economic condition of the business organization" (Ouchi, Wilkins, 1985), which determines the imposition of a strategic approach by management in conflict management. In this part of the dissertation emphasis is placed on the strategic management of conflicts in the business organization, analyzing the main sources of conflicts in business organizations and approaches to strategic management.

**Strategy and conflict.** The term strategy has ancient Greek origins and means "the ability to organize hostilities in such a way that the war is won" (Borisov and Behluli, 2020). This is a system of scientific knowledge about the phenomena and patterns of war as a struggle. It is the main component of the art of war and covers the theory and practice of ensuring the military security of the state. Therefore, strategy is a way of thinking and planning, leading to a better game than your opponent in order to achieve victory. When managing conflicts in the business organization, it is necessary to use a strategy. In this sense, "the strategy is a way of thinking and planning to prevent or manage conflicts in the organization, so that they do not escalate into crises. The manager is the strategist" (Borisov, 2021)

The workplace provides the company employee not only a livelihood, but it is also a place for social communication. The different characters and goals of company associates are the reason for the creation of conflict situations, which can be a reason to reduce the effectiveness of management of the organization.

People often associate conflict with aggression, danger, dispute, hostility, war, etc. Therefore, they are convinced that conflict is always an undesirable phenomenon that should be avoided or resolved immediately if possible. This understanding is rooted in the school of scientific management and the school of human relations. The brightest representatives of these two schools believed that the conflict had a negative role in governance and needed to be prevented. Their approaches to the effectiveness of the organization were largely based on the definition of tasks, procedures, rules, interactions between officials and the development of a rational organizational structure. According to them, these mechanisms remove the conditions for the emergence of conflicts and can be used to resolve them. Modern researchers are of the opinion that even in organizations with effective management, some conflicts are not only possible, but even desirable. Of course, conflict is not always positive. In many cases, it helps to create a variety of perspectives, provides additional information and helps to formulate a large number of alternatives. It makes the decision-making process more efficient and gives people the opportunity to express their thoughts. In this way, they meet their personal needs for respect and authority. provides additional information and helps to formulate a large number of alternatives. It makes the decision-making process more efficient and gives people the opportunity to express their thoughts. In this way, they meet their personal needs for respect and authority provides additional information and helps to formulate a large number of alternatives. It makes the decision-making process more efficient and gives

people the opportunity to express their thoughts. In this way, they meet their personal needs for respect and authority.

**Sources of conflict in the business organization.** There is a lot of research in the field of identifying the main factors that cause conflicts in business organizations. The most common sources are the following:

- *Resource scarcity* (Borisov and Nikolov, 2014): on the one hand, resources are always limited, and on the other hand, needs are objectively unlimited, which leads to conflicts. Management decides how to allocate limited resources between different groups in order to achieve the organization's goals in the most effective way. Since no leadership can do without an allocation of resources, this allocation almost inevitably leads to different types of conflicts;
- *The type of organizational structure*: often the source of conflict can be the organizational structure of the firm (Hambrick, & Mason, 1984). Conflicts often break out when imposing an organizational structure that does not respect the principle of unity.
- *Commitment of tasks*: the possibility of conflict between tasks exists wherever "the task of one person or group depends on the performance of the task of another person or group" (Angelov, 1998). To the extent that all organizations are systems consisting of interdependent elements, in the case of inadequate work of one person or one unit, the interdependence between the tasks can cause conflicts.
- *Differences in goals*: the possibility of conflict increases due to the specialization of the constituent parts of the organization. "Specialized units formulate their own goals and can pay more attention to achieving their own goals than the goals of the organization as a whole." (Pawirosumarto, Sarjana and Gunawan, 2017)
- *Differences in ideas and values*: "The perception of a situation depends on the desire to achieve a certain goal." (Pelled, 1996) Instead of objectively assessing a situation, people can only consider some of its alternatives, views and aspects that they believe are favorable to their group. or their personal needs.
- *Difference in behavior*: these differences "always create the possibility of conflict" (Raja, Haq, De Clercq and Azeem, 2020). People with specific character traits become authoritarian and dogmatic. They are indifferent to concepts such as self-esteem, independence, tolerance and very quickly come into conflict. "Differences in life experience, values and education reduce the degree of mutual understanding and cooperation between representatives of different departments in the organization.
- *Bad communications*: poor transmission of information is both a cause and a consequence of the conflict. It can play a "catalytic role in the conflict, preventing individual collaborators and groups from understanding the situation or the other's point of view" (Rosette & Tost, 2010).

Conflict can be functional and lead to "increased management efficiency in the organization" (Rus, Knippenberg, and Wisse, 2010). However, it can also be dysfunctional and lead to "reduced personal satisfaction" (Rosette & Tost, 2010), "group collaboration and management effectiveness" (Schein, 1990). If management does not find the most effective way to manage the conflict, the following consequences can occur:

- Staff dissatisfaction (Meriac, 2015);
- Lower level of cooperation (O'Reilly, 1989);
- Strong collaborator commitment to the group (Paais and Pattiruhu, 2020);
- Perception of the other side as an enemy (Rispen and Demerouti, 2016);
- Increasing hostility between conflicting parties (Van Knippenberg & Schippers, 2007);
- Failure in communications (Angelov, 1998);
- Giving more importance to victory in the conflict than to solving the real problem.

***Approaches to conflict management in the business organization.*** The choice of approach to conflict management in the organization is determined by the accumulated experience of the manager in personnel management. Some researchers believe that "the approach is determined by the value system and intuition of the manager." (Ouchi and Wilkins, 1985). In this part of the dissertation are presented only the ultimate (radical) approaches to conflict management in the organization.

*Approach A.* The idea that advocates of this approach are defending is that conflicts exist in organizations and they cannot be avoided, so they need to be managed. The functional advantages of the conflict have a leading principle. It is therefore desirable "not to regulate the factors that give rise to conflicts, but to manage the ones that have already arisen" (Preacher & Hayes, 2008). This approach is aggressively imposed in the management of large American companies and is becoming popular as the "American" model of conflict management. Managers who use this approach tend to encourage competition between individual employees and work teams in the company so that they show their best in solving specific problems. Imposing this approach requires the manager to apply flexible methods to motivate staff not to be afraid of conflicts,

- Labor productivity (Preacher & Hayes, 2008);
- Company Revenue (Rus, Knippenberg and Wisse, 2010);
- Company turnover (Sonmez and Adiguzel, 2020);
- The number of new products and services that the company offers on the market (Thamrin, 2012.); (Borisov & Popova, (2021),

*Approach J.* It is necessary to impose a policy of conflict prevention in the organization. "Prevention is the best tool for reducing the dysfunctional consequences of conflict in the organization" (Ouchi and Wilkins, 1985). The appearance of fewer conflicts also has fewer dysfunctional consequences for the business organization. Elements in the organization used for conflict management in using this approach are:

- sources of conflicts in the organization;
- opportunities to resolve the conflict;
- potential to resolve the conflict.

Analysis of the possibilities for resolving the conflict: the following methods can be used here - brainstorming, the method of expert evaluation, game theory, etc.

Analysis of the sources of conflict and the potential of the organization to resolve it: the organization is considered as a system built of elements, the interaction of which is determined by the

structure of the system and its environment. It is possible to apply an expert approach, which relies on the analysis of factors that have the strongest influence on the process of conflict.

### **Conclusions**

From the literature analysis of the problem the following can be summarized and concluded:

- Conflict arises from the opposition of individuals or groups that oppose on the basis of difference. This difference may be based on differences in goals, ideas, behavior in specific situations or interests. Conflict can also be dictated by the objective scarcity of resources available to the individual to solve a particular problem. The causes of conflict are numerous, but they are a "trigger" of a process that ends in a result. the conflict inevitably ends with a certain result;
- Conflicts in business organizations are inevitable, which determines two main approaches to their management - prevention and promotion. Which of the two approaches is chosen by the manager depends on the situation in which he manages;
- Through conflicts, business organizations develop organizationally, which determines both functional and dysfunctional consequences for people in the organization

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## INFLUENCE OF THE CAP ON INNOVATION FACTORS IN AGRICULTURE

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### ABSTRACT

Agriculture is one of the industries that directly and intensively affect the environment. This industry is one of the few that consumes large amounts of natural resources that are non-renewable and increasingly scarce. This requires the CAP to pursue objectives such as environmental friendliness, sustainable development, social responsibility and economic efficiency. One of the main tools for achieving these goals is the promotion of innovation in the sector through the implementation of various financial schemes, measures and programs under the CAP. Innovations that allow farmers to be competitive and environmentally friendly in their activities. These financial instruments should encourage the use of productive resources and technologies on farms that put organic pressure on the environment. The purpose of the current research is to determine the influence of the CAP on viability and dynamics of innovation factors in agriculture and also to define the second order effects as a result from the process of influence.

**KEYWORDS:** CAP, innovations, agricultural innovation factors, second order effects

### ABSTRAKT

Die Landwirtschaft ist einer der Wirtschaftszweige, die sich direkt und intensiv auf die Umwelt auswirken. Sie ist einer der wenigen Wirtschaftszweige, die große Mengen an natürlichen Ressourcen verbrauchen, die nicht erneuerbar sind und immer knapper werden. Daher muss die GAP Ziele wie Umweltfreundlichkeit, nachhaltige Entwicklung, soziale Verantwortung und wirtschaftliche Effizienz verfolgen. Eines der wichtigsten Instrumente zur Erreichung dieser Ziele ist die Förderung von Innovationen in diesem Sektor durch die Umsetzung verschiedener finanzieller Regelungen, Maßnahmen und Programme im Rahmen der GAP. Innovationen, die es den Landwirten ermöglichen, wettbewerbsfähig und umweltfreundlich zu wirtschaften. Diese Finanzinstrumente sollen den Einsatz von produktiven Ressourcen und Technologien in landwirtschaftlichen Betrieben fördern, die eine ökologische Belastung für die Umwelt darstellen. Ziel der vorliegenden Untersuchung ist es, den Einfluss der GAP auf die Lebensfähigkeit und die Dynamik der Innovationsfaktoren in der Landwirtschaft zu bestimmen und auch die Auswirkungen zweiter Ordnung zu definieren, die sich aus dem Prozess der Einflussnahme ergeben.

**STICHWORTE:** Innovationen, landwirtschaftliche Innovationsfaktoren, Effekte zweiter Ordnung

### RÉSUMÉ

L'agriculture est l'une des industries qui affectent directement et intensivement l'environnement. Cette industrie est l'une des rares qui consomme de grandes quantités de ressources naturelles non renouvelables et de plus en plus rares. Elle doit donc poursuivre des objectifs tels que le respect de l'environnement, le développement durable, la responsabilité sociale et l'efficacité économique. L'un des principaux outils permettant d'atteindre ces objectifs est la promotion de l'innovation dans le secteur par la mise en œuvre de divers régimes, mesures et programmes financiers dans le cadre de la PAC. Des



innovations qui permettent aux agriculteurs d'être compétitifs et de respecter l'environnement dans leurs activités. Ces instruments financiers doivent encourager l'utilisation de ressources productives et de technologies dans les exploitations qui exercent une pression biologique sur l'environnement. L'objectif de la présente recherche est de déterminer l'influence de la PAC sur la viabilité et la dynamique des facteurs d'innovation en agriculture et également de définir les effets de second ordre comme résultat du processus d'influence.

**MOTS CLÉS:** innovations, facteurs d'innovation en agriculture, effets de second ordre

## INTRODUCTION

Agriculture as a national sector is important for the development of the economy because it forms the majority of the population's food supply and determines the way of life of a large part of this population (Nikolov, Borisov, and Radev, 2014). The sustainable development of the sector is guaranteed by the application of both national financial support and the Common Agricultural Policy (CAP), which seek to create the conditions for the sustainable development of the agricultural sector. One of the leading approaches to ensuring the sustainable development of the sector is the promotion of innovation on farms (Nikolov, Boevski, and Borisov and Radev, 2017). The majority of farms in the country are small structures characterised by strong conservatism in terms of their management by farmers. A not insignificant proportion of these farms are managed by young people, who, in our opinion, are the main prerequisites for innovative development in the agricultural sector. Young farmers are the innovation agents in the sector, taking advantage of the conditions the CAP provides for developing the innovation process (Borisov, Radev and Nikolov, 2019).

Agriculture is one of the industries that directly and intensively affect the environment. This industry is one of the few that consumes large amounts of natural resources that are non-renewable and increasingly scarce (Petrov and Borisov, 2021). This requires the CAP to pursue objectives such as environmental friendliness, sustainable development, social responsibility and economic efficiency (Garabedian, 2020).

One of the main tools for achieving these goals is the promotion of innovation in the sector through the implementation of various financial schemes, measures and programs under the CAP. Innovations that allow farmers to be competitive and environmentally friendly in their activities (Borisov and Popova, 2021). These financial instruments should encourage the use of productive resources and technologies on farms that put organic pressure on the environment.

The purpose of the current research is to determine the influence of the CAP on viability and dynamics of innovation factors in agriculture and also to define the second order effects as a result from the process of influence.

**Methodology.** In the framework of this study, indicators are used to define and measure the relation between financial support (subsidizing production on the farm) and the presence of an innovation process. The research period is 2014 - 2020 in order to cover the period of application of the CAP 2014-2020 and to draw conclusions about the effects achieved and to provide recommendations for improving the effectiveness of the CAP in terms of the innovation process in agriculture in the Republic of Bulgaria.

The following indicators are used to determine the impact of the CAP on the development of the innovation process in agriculture (Borisov, Kolaj, Yancheva and Yancheva, 2019):

- Size and dynamics of production (in value) in the agricultural sector ;
- Size and dynamics of imports, exports and trade balance of the agricultural sector
- Structure of imports and exports of the agricultural sector - traditional and new markets for Bulgarian agricultural products;
- Size and dynamics of gross value added in the agriculture sector ;
- Size and dynamics of subsidies and financial aid absorbed in the agricultural sector;
- Amount of credit resources invested in the agricultural sector
- Amount and dynamics of assets acquired in the agriculture sector;
- Amount and dynamics of buildings and land acquired in the agriculture sector;
- Size and dynamics of machinery and equipment acquired in the agriculture sector;

Through the above indicators, information will be generated and through graphical analysis of the data, patterns will be sought between the amount of financial support to agriculture and its innovative development. The main sources of information for defining and calculating the above indicators are:

- Agricultural Accounting Information System bulletins;
- Agricultural Report of the Republic of Bulgaria;
- Information bulletins of the National Statistical Institute of the Republic of Bulgaria;
- Bulletins and analyses of the Department of Agro Statistics of the Ministry of Agriculture;
- Bulletins and analyses of EUROSTAT and FAOSTAT;
- Bulletins of the Bulgarian National Bank (BNB)

## RESULTS AND DISCUSSION

***Influence of the CAP on the renewal of chemicals for agricultural purposes.*** One of the roles of the innovation process is to transform the activities of agricultural holdings to put less pressure on the environment. Of course, farmers are ready to innovate more quickly in agricultural production if, in return, they receive financial support that forms a significant part of their income.

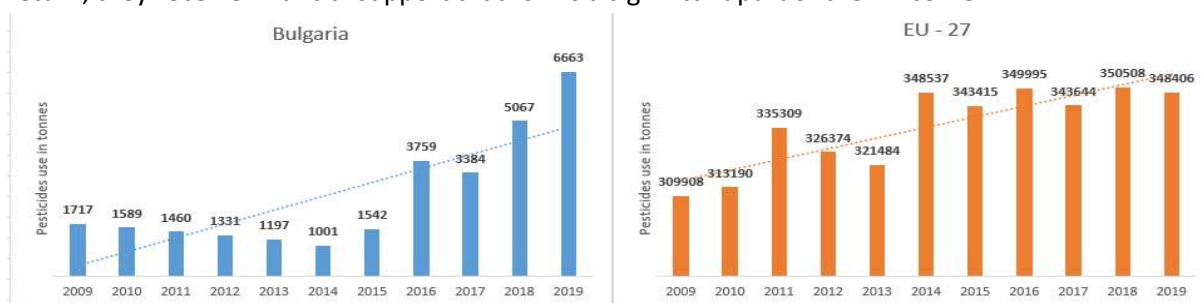


Figure 1. Use of pesticides in agriculture. Comparison between Bulgaria and the EU. (unit of measurement - tons). Source: FAOSTAT's own calculations -www.fao.org

That is why the CAP is 'tailored' to motivate farmers to use 'green' production practices. The CAP offers a huge arsenal of financial mechanisms for "greening" the activities of farms, conditionally called "green architecture", aiming on the one hand to protect the environment and on the other to increase profitability in the sector. Of course, environmental friendliness and economic efficiency as targets are difficult to reconcile, leading to complex planning and implementation of the CAP. Another important aspect of the application of green architecture is to analyze whether it leads to the desired effect, namely

reducing the pressure on the environment and protecting natural resources in the EU. In this context, the types of innovations regarding the use of chemicals in the agricultural sector have been studied.

The data show that in the period 2009 - 2014 the quantities of pesticides used in agriculture decreased and reached 1 001 tons in 2014. It should be noted that this downward trend is in the conditions of the then current CAP - 2008-2013. prove that the CAP has a positive impact on the environment, forcing farmers to use less and less pesticides in the cultivation of crops in our country. Immediately after 2014, there was an accelerated increase in the amount of pesticides used in domestic agriculture. In the period 2015 - 2019, the quantities of used pesticides increased nearly 4.3 times and reached a value of 6,663 tons. It should be noted,that in this period of time the CAP 2014-2020 will be implemented. In this programming period, based on the analysis of the previous CAP, the subsequent CAP is planned to be "greener" and to motivate farmers to use environmentally friendly technologies. The data in Figure 11 clearly show that the CAP 2014-2020, despite its "green" schemes and support measures, has failed to achieve its goal, and vice versa - the amount of pesticides that farmers use in their activities is rapidly increasing. What can reassure the general public is that the same pesticide-intensive processes are observed in the EU (see Figure 1). The data shown in Figure 1 show a steady upward trend in the amount of pesticides used in European agriculture.

In order to reduce the use of pesticides in the agricultural production process, the idea of "organic production" in the EU is beginning to be promoted.in the last 10 years. Bulgaria, as a full member of the EU, is also beginning to actively promote the approach of conversion of conventional production into organic production.

By promoting the application of innovation in the agricultural sector, a process of gradual transition to organic production is beginning. The EU-approved innovations that are being implemented are COUNCIL REGULATION (EC) № 834/2007 of 28 June 2007 on organic production and labeling of organic products and repealing Regulation (EEC) № 2092 / 91):

- crop rotation;
- growing plants that enrich the soil with nitrogen and other green crops to restore soil fertility;
- ban on the use of mineral nitrogen fertilizers;
- in order to reduce the impact of weeds and pests, farmers practicing organic farming shall choose sustainable varieties and breeds and techniques that contribute to the natural control of pests;
- promoting the natural immunological protection of animals;
- to protect animal health, farmers practicing organic farming need to prevent overcrowding.

In exchange for the introduction of these innovations, farmers in Bulgaria have access to a number of measures to compensate them for the losses arising from the specifics of the organization of organic production on farms.

Figure 2 contains information on the use of bio-pesticides in Bulgarian agriculture over the past 10 years. The data show that in 2009 bio-pesticides accounted for 1% of the total amount of pesticides used in agriculture.

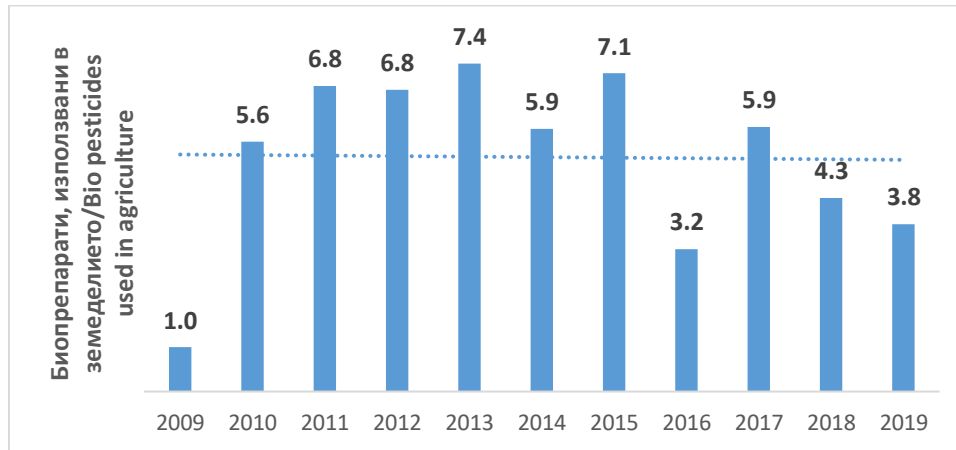


Figure 2. Use of bio-pesticides in the agriculture of Bulgaria (% of bio-pesticides from the total amount of pesticides). Source: FAOSTAT's own calculations -www.fao.org

Over the years, the share of bio-pesticides has increased, with the largest share of the total amount of pesticides applied being achieved in 2013 - respectively, bio-pesticides account for 7.4%. The CAP affects not only the uptake of pesticides, but also their 'greening'. The use of bio-plant protection products has increased almost 4 times in 10 years. This increase is due to an increase in the size of the areas occupied in organic production in our country.

Another component that is important as an environmentally friendly innovation is fertilizers that are used in agriculture. Figure 3 contains information on the dynamics of the use of fertilizers in domestic agriculture and the EU.

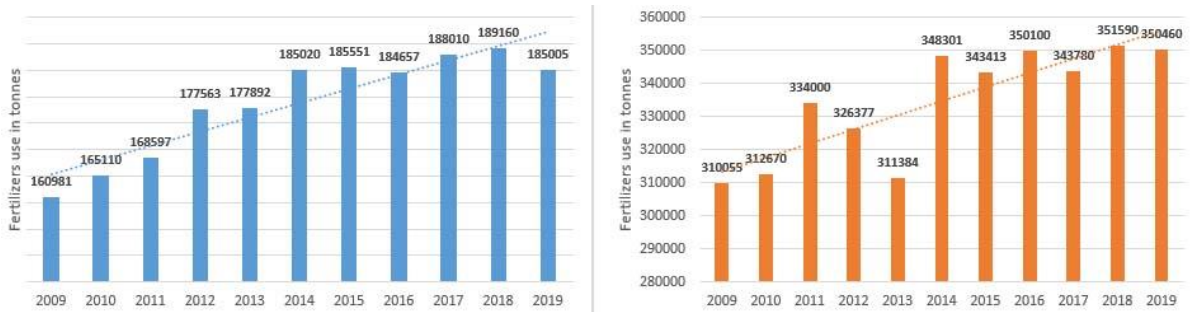


Figure 3. Use of fertilizers in agriculture in Bulgaria and the EU (tons). Source: FAOSTAT's own calculations -www.fao.org

The information provided shows that the quantities of fertilizers applied in the industry are steadily increasing over time. In 2009 the imported fertilizers amounted to 160,981 tons, and in 2019 they reached 185,005 tons, which is an increase of nearly 1.1 times. It is noted that the same trend of increasing the amount of imported fertilizers is observed at the EU-27 level. Over the last 10 years, the use of fertilizers at EU level has increased almost 1.1 times. The data show that the process at national and EU level is developing in an identical aspect.

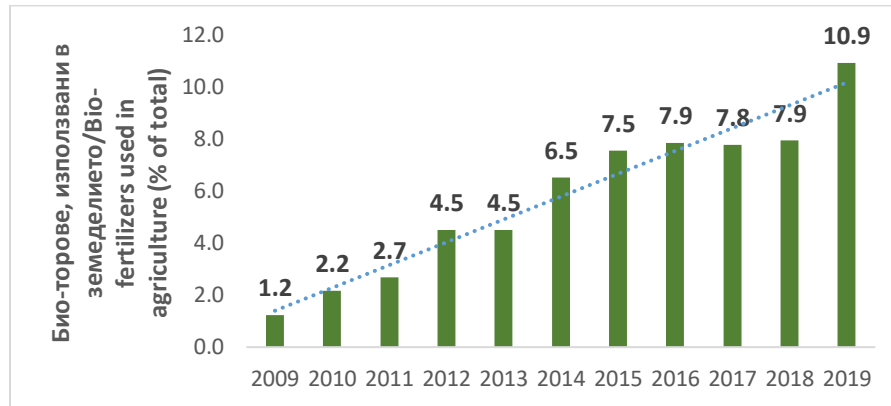


Figure 4. Use of bio-fertilizers in agriculture in Bulgaria. (% of total fertilizers imported). Source: FAOSTAT's own calculations -www.fao.org

Figure 4 presents information on the trend in the application of bio-fertilizers in Bulgarian agriculture over the past 10 years. The graph shows that the Common Agricultural Policy has had a positive effect on the share of these bio-preparations increasing over the years. Innovations in fertilization are gradually entering domestic agriculture and by 2019 bio-fertilizers account for 10.9% of the total imported fertilizers on farms. The main factor for increasing the use of bio-fertilizers in agriculture is the gradual expansion of the areas occupied by agricultural crops grown in organic production conditions.

***Influence of the CAP on the technical renewal of agricultural holdings.*** Another important factor at the entrance to the innovation process is the renewal of machinery and equipment on farms. It is an indisputable fact that the CAP makes a significant contribution to the technical renewal of the agricultural sector in our country. The data in Figure 5 clearly show an upward trend in the value of newly purchased machinery and equipment on farms. In 2012, the average value of newly purchased equipment on a farm amounted to BGN 41,986, in just 6 years this value reached BGN 62,255, which is an increase of nearly 1.5 times. It is clear that the CAP has a positive impact on innovation in terms of machinery and equipment used on the farm.

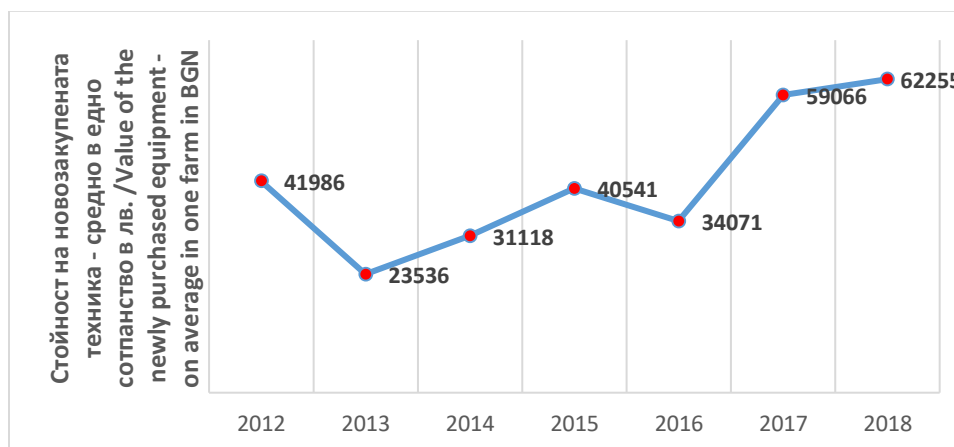


Figure 5. Value of newly purchased equipment on agricultural holdings in BGN on average per farm. Source: own calculations based on the data of the Agricultural Accounting Information System - information bulletin for 2012, 2013, 2014, 2015, 2016, 2017 and 2018.

Figure 6 contains information on the renewal of agricultural machinery in agricultural holdings in the period 2008 - 2015. The data show that before the accession of the Republic of Bulgaria to the EU the number of agricultural machinery is higher than after accession to the Union. It should be noted that the number of agricultural machines is more, but their condition is depreciated both technically and morally. Mainly used equipment during this period by Russia, which is defined as low-productivity and often undergoing repairs, which burdens the mechanization of agricultural holdings. After the accession of our country, one of the most popular measures to finance the purchase of new agricultural machinery is "Modernization of agricultural holdings", included in the portfolio of the Rural Development Program for the period 2008-2013.

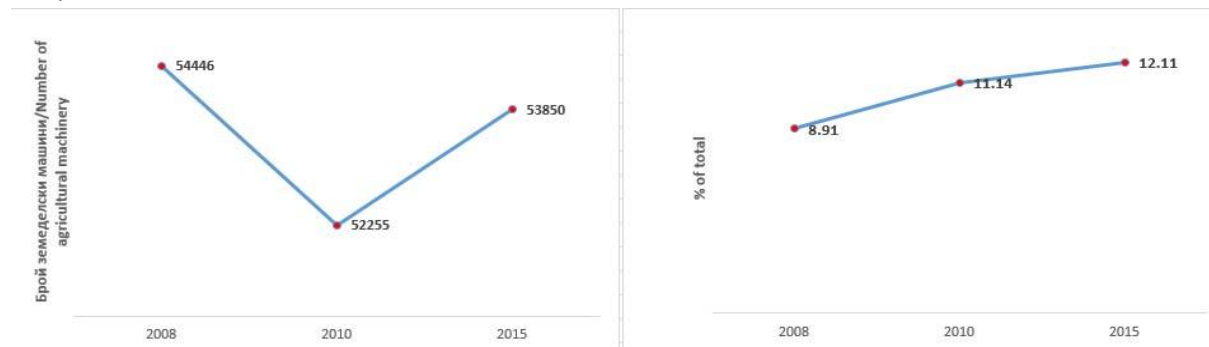


Figure 6. Dynamics of the number of new agricultural machines on the holdings (expressed as% of the total number of machines on the holding). Republic of Bulgaria. Source: own calculations based on the "Results of the Census of Agricultural Holdings - 2010 and 2015" and the NSI database - Statistical Yearbook for 2008, 2010 and 2015.

The data in the graph (see right) show that the machine-tractor fleet on agricultural holdings is gradually being renewed. In 2008 only 8.9% of the purchased machines were new on agricultural holdings, in 2010 this percentage reached - 11.1% and 5 years later in 2015 the share of newly purchased machines was 12.1% . Tractors and grain harvesters with the equipment attached to them are mainly being renovated. In this way, the CAP successfully supports the implementation of innovations in the renewal of machinery and equipment used on farms.

***Influence of the CAP on the technological renewal of agricultural holdings.*** Apart from the technical renewal as an expression of the innovation process at the "entrance" of the agricultural production system, another important factor is the development and implementation of new technologies in production. At the beginning of the 10-year study period, conventional production technologies predominated on agricultural holdings. These technologies are standards and known to farmers and they use them calmly that they will achieve good production and economic results in the management of agricultural holdings. Through the implementation of the CAP in both phases - 2008-2013 and 2014-2020, policy architects seek to make farmers adopt biological technologies as the main means of organizing a profitable business model in agriculture.

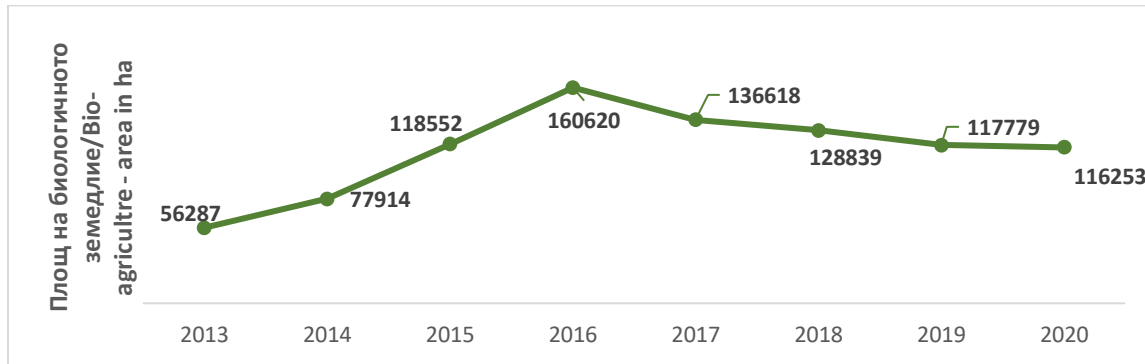


Figure 7. Area of agricultural crops grown by the method of "organic" production in Bulgaria (in hectares). Source: own calculations according to EUROSTAT data for the period 2013 - 2020.

In the figure 7 contains information on the dynamics of the areas of agricultural crops grown in the conditions of organic production. At the end of the CAP 2008-2013 implementation period, the area of organic farming was 56,287 hectares. Within 2014 - 2016 there is a "boom" in the expansion of organic farming in our country. The largest size of the areas with organic crops was realized in 2016 - respectively the total area reached 160,620 hectares. There followed a period of "cooling" to the interest in organic production and within 2017 - 2020 the areas occupied by organic crops began to decrease and reached 116 253 hectares (in 2020).

In the figure 8 provides information on the share of farms applying bio-technologies in production for the period 2013 - 2020. The data show that the CAP has a positive impact on the growth of farms moving from conventional to organic production in the industry. The largest share of these farms was achieved in 2016 - 5.9% of the total registered agricultural holdings. The same picture is observed in the previous graph, which reflected the size of the area of organic crops.

It can be summarized that within the two phases of the CAP, the widespread promotion of biotechnology as a successful technological innovation in the agricultural sector is achieved. In the period 2013 - 2020 the share of organic farms has increased 1.2 times. However, the data show that the mass introduction of bio-technologies in agricultural holdings is not happening and the percentage of organic holdings remains below 5% of the total number of registered holdings.

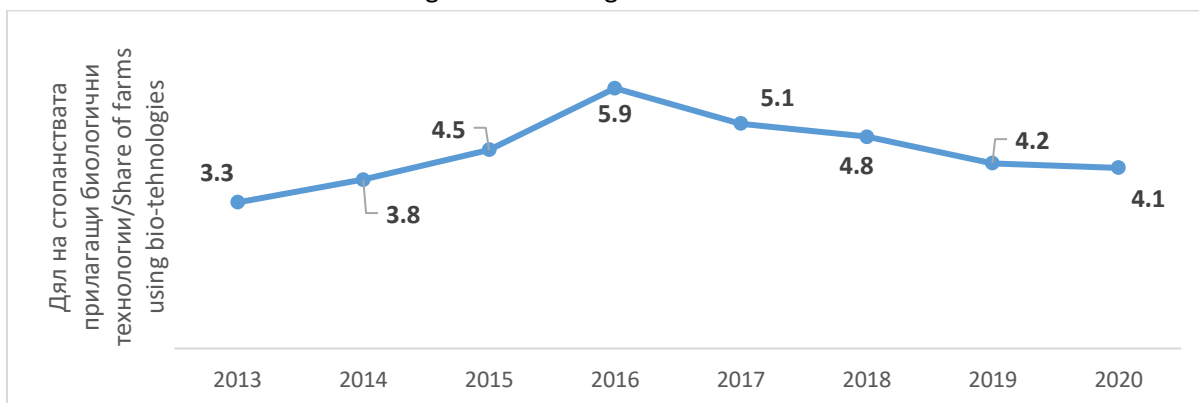


Figure 8. Share of agricultural holdings applying organic production technologies (% of total agricultural holdings). Source: EUROSTAT database.

***Influence of the CAP on the acquisition of new knowledge, skills and training of farm staff.*** One of the important elements of the innovation process in the agricultural sector is the retention and development of staff in agricultural holdings. Creating innovation requires the transfer of knowledge and the valuation of that knowledge into new goods, services or business models in the sector. Agriculture is characterized as a sector in which working conditions are not one of the most attractive. This is the main reason that limits the influx of young people to be the bearer of the change in the traditional models that have become established in the native agriculture. Undoubtedly, attracting young people to the industry as well as creating new skills are principles enshrined in the CAP. Basically, through the Phase I and Phase II Rural Development Program, the CAP seeks to improve the skills of farmers and encourage young entrepreneurs to become actively involved in the sector.

According to EUROSTAT data, the number of people employed in the agricultural sector is 439,740 on average for the period 2018-2020. According to EUROFOUND, the share of people employed in the sector who have participated in training or trainings enabling them to acquire new knowledge and skills directly work-related workplace increases over the years (see Figure 9). In 2005 the share of those trained in the sector was 7.7% and immediately after the accession of our country to the EU this share increased sharply and in 2020 amounted to 21.1%.

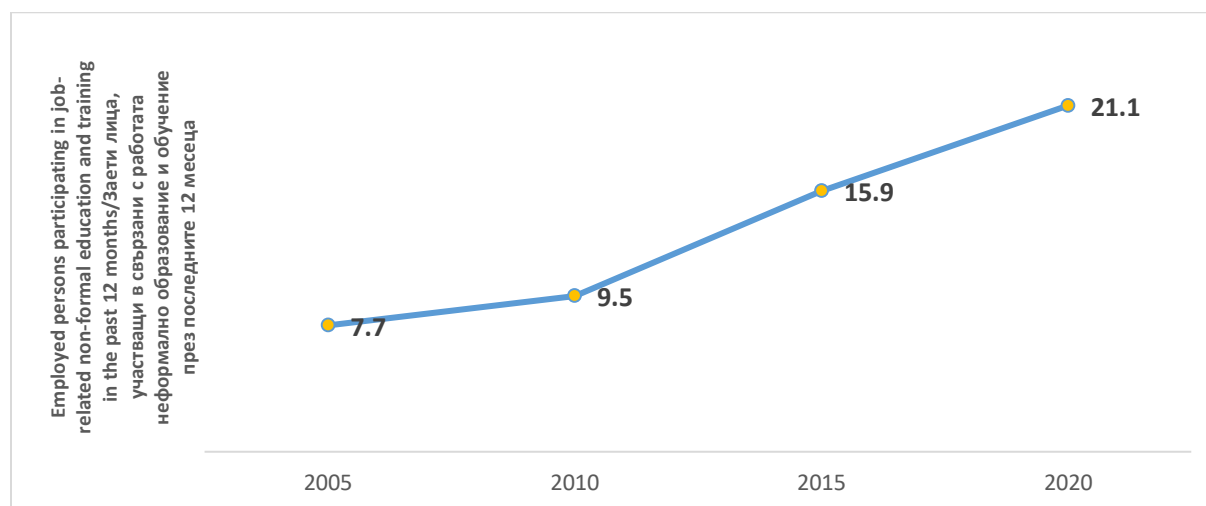


Figure 9. Proportion of employees in agriculture who have received training related to the work they perform at their workplace in the last 12 months. Source: Eurostat data, 2020.

Another indicator of the transfer of knowledge in agriculture is the share of employees who have acquired secondary and higher education. According to the data presented in Figure 10, the share of employees with secondary education gradually decreased. In 2013, 15.1% of employees had secondary education and by the end of 2019, their share reached 12.4%. Contrary to this trend is the trend of employees who have acquired higher education. In this group of employees, the share is gradually increasing and from 1.9% in 2013, it reached 3.2% in 2019.



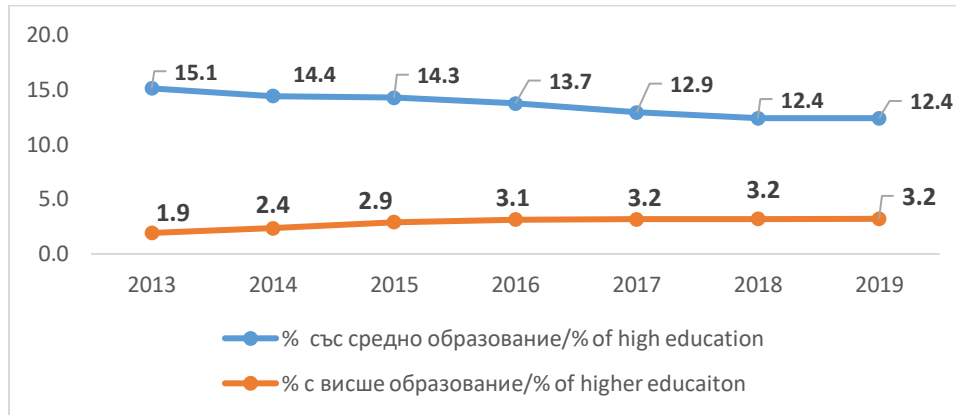


Figure 10. Share of employees in agriculture with secondary and higher education. Source: own calculations according to EUROSTAT data for the period 2013 - 2019.

However, the share of employees with higher education remains low compared to the EU - 27 level - according to EUROSTAT, the share of employees in agriculture with higher education is close to 6.5%. In addition to upgrading skills, the process of acquiring new skills is an important factor in the innovation process in agriculture. According to data from a field study conducted in 2018 among 120 farmers, the formation of skills for managing financial flows and investments is one of the main priorities among the farming community - 35% have undergone training related to the formation of such skills. The share of farmers who have been trained in the development of skills for overall management of the agricultural holding is significant - 30% of the total respondents (see Figure 11).

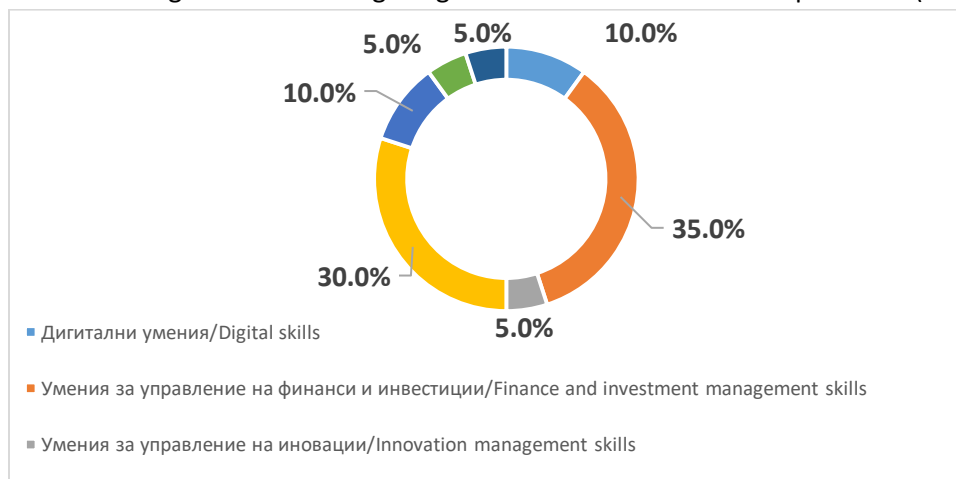


Figure 11. Skills acquired by farmers. Survey among 120 farmers from the South Central region of the Republic of Bulgaria for the period 2016-2018. Source: Field survey within the AgriEco project funded by the ERASMUS 2016-2018 program.

Digital skills, as well as human resource management skills, were also a priority among the farming community, with about 20% of respondents saying one of the two skills was important to them and trained to acquire it.

***Influence of the CAP on the innovative products that the farm offers on the market.*** In addition to the analysis of the "input" of the innovation process, it is necessary to analyze the extent to which the CAP affects the "output", namely the extent to which farms have diversified their activities and offered

new products to their customers. CAP, supports the investments of farms in the diversification of the product range, mainly through the measures set out in the Rural Development Program, such as measure 311 "Diversification into non-agricultural activities" (RDP 2007-2013) and measure 11 "Organic farming" (RDP) 2014-2020). As innovative products in agriculture we perceive those that provide new value to the customer. In the last few years, such products are defined as organic products and products that are defined as new to the Bulgarian market.

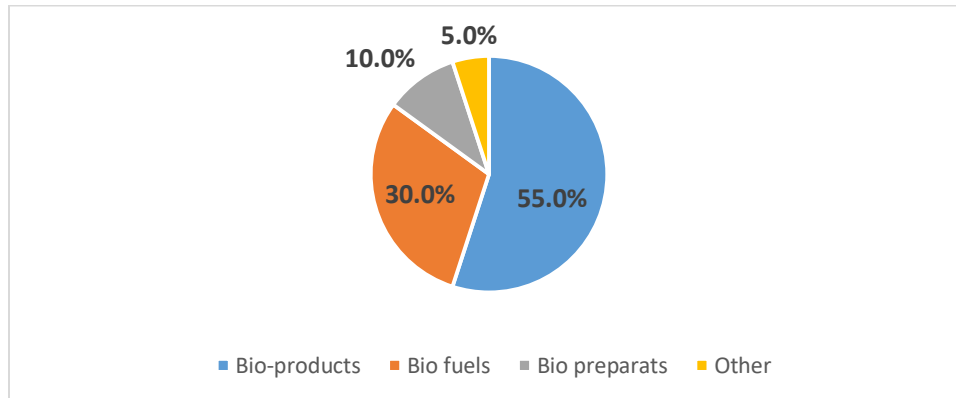


Figure 12. The most significant innovations that agriculture offers in Bulgaria. Source: AgriSPin Project, 2018.

**Effects of the innovation process within the CAP implementation.** The effects of the application of the CAP are measured both at the input of the "innovation process" system and at its output. The input of the system are the resources that are included in the innovation process in agriculture. In order to achieve efficiency of the innovation process, the use of these resources must lead to positive effects. Basically, the evaluation of these effects is performed based on the standard indicators used in the evaluation of economic efficiency.

**Effects on labor productivity.** One of the roles of innovation is to be the engine of higher productivity in the conditions of limiting production factors. Agriculture is one of the industries that operates in conditions of limitation both in terms of typical production resources and in terms of specific such as natural resources. Natural resources are non-renewable and their sparing use requires looking for alternatives when replacing them or looking for higher productivity when using resources in agriculture.

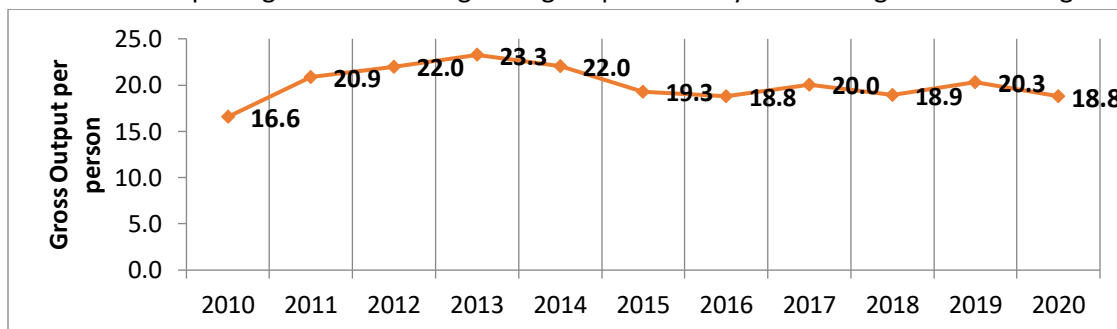


Figure 13. Dynamics of labor productivity in agriculture in Bulgaria, measured by the indicator gross output per employee. Source: Own calculations based on FAOSTAT and EUROSTAT data for the period 2010 - 2020.

Figure 13 shows the dynamics of the gross output of one employed in agriculture for a 10-year period. The dynamics of the studied indicator conditionally passes through 2 periods. Within the first - 2010 - 2014 there is a sharp rise in labor productivity, as the value of its measuring indicator reaches a peak value in 2013 - 23.3 units. The graph shows that the "first" phase of the CAP has a positive effect on labor productivity in agriculture. Promoting the use of innovation in the sector through the CAP mechanisms leads to an increase in labor productivity both in terms of the use of the human factor and in terms of the renewal of its technical armament. These two factors have a positive impact on labor productivity.

In view of which factors have had an impact on labor productivity in agriculture, the indicators of gross value added generated by one employee and one invested annual unit in agriculture are analyzed.

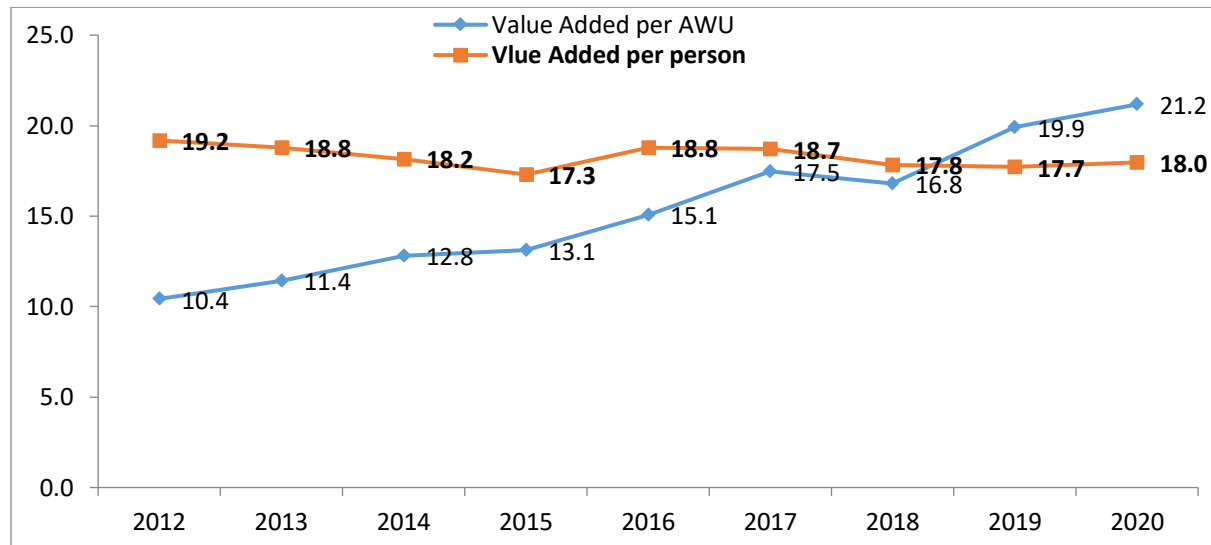


Figure 14. Dynamics of labor productivity in agriculture in Bulgaria, measured by the indicators gross value added per employee and per annual work unit (AWU). Source: Own calculations based on FAOSTAT and EUROSTAT data for the period 2010 - 2020.

In Figure 14 contains information about the dynamics of the mentioned indicators. It can be seen that the graphs of the studied indicators have the opposite trend. While the gross value added per employee decreases steadily over time, the dynamics of the gross value added of one AWU invested shows a positive trend. This proves that overall the number of people employed in agriculture is declining (by almost 8% in the last 10 years, according to EUROSTAT data), but labor productivity is still rising. This proves that the CAP influences labor productivity in agriculture by encouraging the use of innovations that allow the industry to intensify and its development is determined to the fullest extent by this factor.

Effects on emissions to air, soil and water. Another important aspect that innovation needs to have an impact on is the reduction of harmful emissions into the air. According to the FAO, agriculture is one of the main causes of greenhouse gases in the earth's atmosphere. The introduction of innovations encouraged by CAP instruments must lead to lower emissions. Agriculture generates significant amounts of emissions into the atmosphere from methane, carbon dioxide and nitrous oxide. One of the main points of the CAP is to reduce the carbon footprint of the agricultural sector.

Figure 15 shows a graph of the carbon dioxide emissions that agriculture has generated in the atmosphere over the last 10 years. In general, there is a tendency to reduce the carbon dioxide emitted by agriculture. During the study period, carbon dioxide emissions decreased by nearly 5.5%.

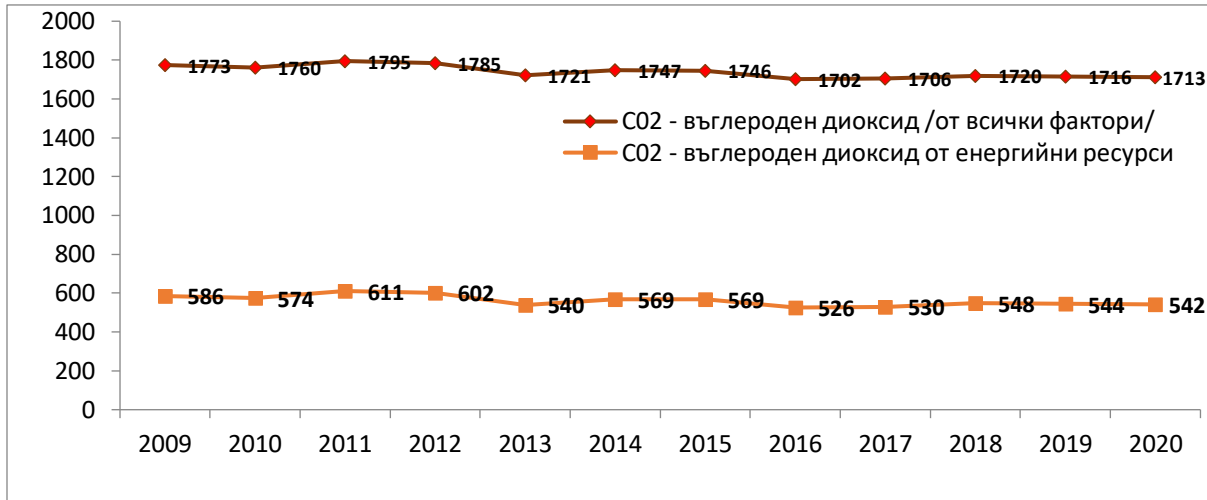


Figure 15. Emissions of carbon dioxide from a source in the agricultural sector of Bulgaria. Source: FAOSTAT data for the period 2009 - 2020 / kiloton /

The decrease can be seen as symbolic, but it should be noted that agricultural production has doubled during this period. The production expansion in the sector engages a huge amount of production resources, which are the main source of carbon dioxide (CO<sub>2</sub>) emissions. The CAP's "green mechanisms" in the sector encourage the use of innovations to reduce CO<sub>2</sub> emissions, and data show that this is the case. In 2009, agriculture generated 1,773 kilotons of CO<sub>2</sub> in the atmosphere, and in 2020 this amount will fall to the level of 1,713 kilotons of CO<sub>2</sub>.

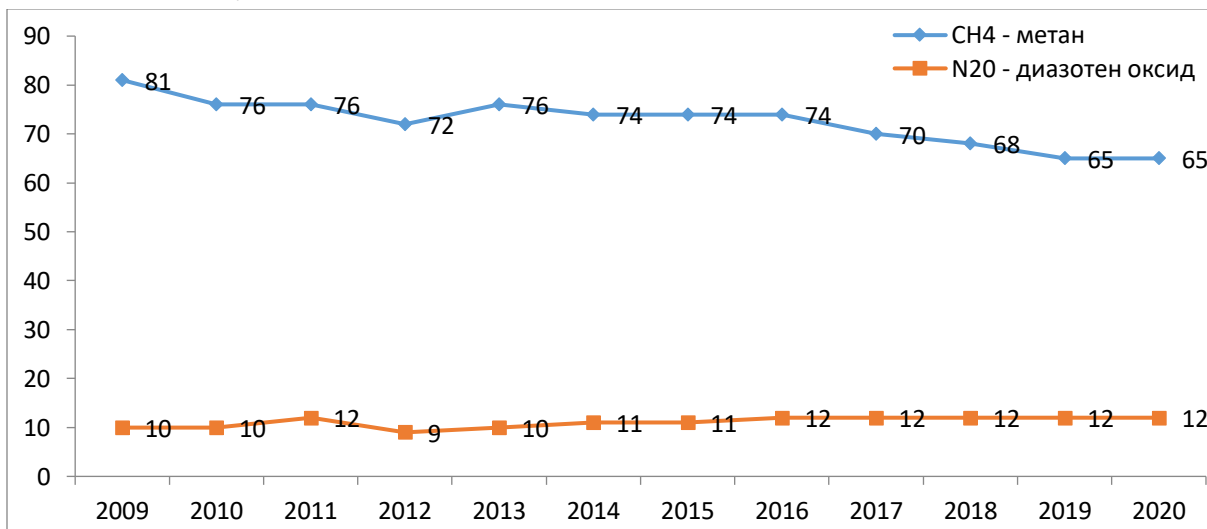


Figure 16. Emissions of CH<sub>4</sub> and N<sub>2</sub>O from a source in the agricultural sector of Bulgaria. Source: FAOSTAT data for the period 2009 - 2020 / kiloton /

The main reason for the reduction of carbon emissions is the use of resource-saving production technologies and improving the energy efficiency of agricultural holdings. This is evidenced by the data in Figure 25. According to these data, emissions from the use of energy resources on farms decreased from 586 kilotons in 2009 to 542 kilotons in 2020, a decrease of 8%. These data show that the CAP has a positive impact on innovations that reduce CO<sub>2</sub> emissions into the air both during the first phase of its implementation and during the current phase.

Other harmful atmospheric gases that agriculture generates are methane and nitrous oxide, which are defined as having a negative effect on the Earth's atmosphere.

Figure 16 shows the dynamics of CH<sub>4</sub> and N<sub>2</sub>O emissions from farms over the last 10 years. The data show that despite the intensification of agricultural production, harmful emissions are gradually declining. Although the reduction is not significant, it is a fact and the levels of CH<sub>4</sub> released into the air are reduced by 20%. N<sub>2</sub>O shows a slight increase, which is controlled at the level of 12 kilotons per year. It can be concluded that the application of the CAP in the management of CH<sub>4</sub> and N<sub>2</sub>O emissions generated by farms leads to positive effects. Encouraging the use of innovation in the fight against harmful gas emissions is evident, but the role of the CAP in this process needs to be reconsidered.

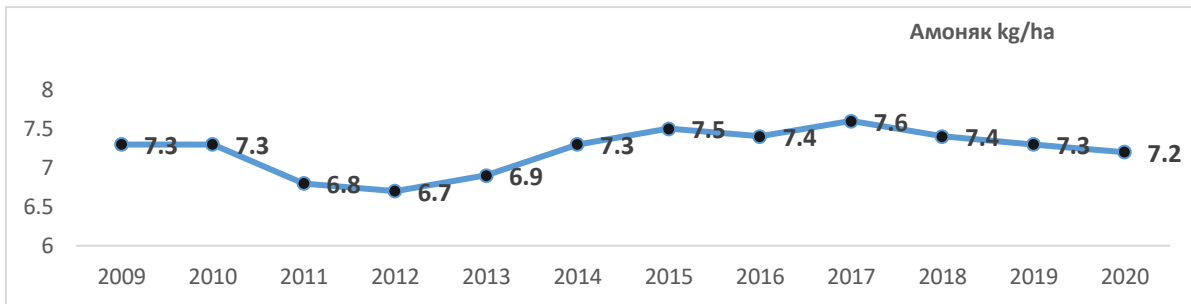


Figure 17. Ammonia emissions in the soil (kg / ha). Source: EUROSTAT data for the period 2009-2020.

One of the main sources of harmful emissions into the soil, and hence into the country's water resources are fertilizers and plant protection products used in agriculture. The main pollutant component is ammonia. Over the last 10 years, the accumulation of ammonia in the soil has ranged from 6.7 kg / ha to 7.3 kg / ha (see Figure 17). Despite the planned compensatory measures against this side effect, it remains tangible for the time being. It can be seen that in the period 2011 - 2013 the accumulation of ammonia in the soil is minimized, after which its accumulation begins to increase and reaches initial levels. Innovations in fertilizers and plant protection products cannot significantly reduce ammonia emissions in soil and hence in groundwater.

Another important non-renewable resource that agriculture uses is water. Although cereals predominate in Bulgarian agriculture, water consumption in the sector remains significant. In order to protect this natural resource, it is necessary for the innovation process in agriculture to achieve less pressure on the country's water resources. The data presented in Figure 18 show that agriculture is increasing its pressure on water resources, as in recent years the polluted water as a result of the activities of the industry reaches 5.6% of total water use. Despite the available measures and support schemes in the previous and current CAP, the negative effect of agricultural activity is increasing. In this context, we can conclude that innovation does not address the problem of water pollution. It is necessary to think in

the direction of purification of polluted water and reuse in irrigation of agricultural crops. This will limit the waste of this strategically important resource for the state.

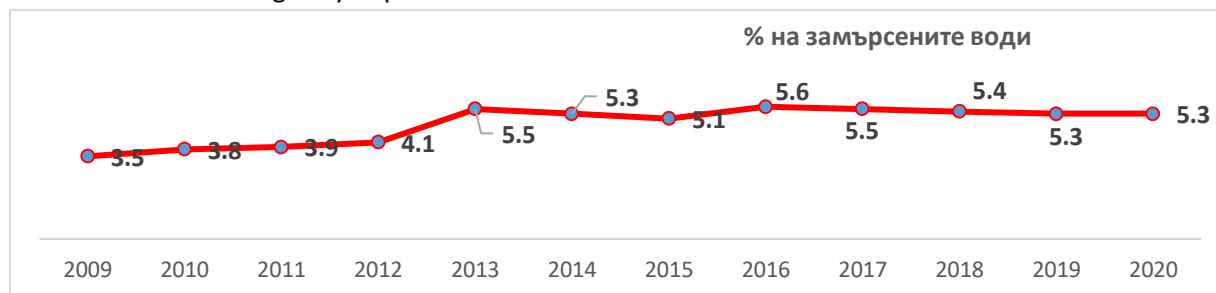


Figure 18. Share of polluted waters as a result of their use in agriculture. Source: Eurostat's own calculations.

The significant successes of the CAP in recent years in terms of reducing harmful emissions from agriculture are the following:

- Reducing the burned areas in agriculture as well as gradually eliminating the practice of burning stubble after growing cereals;
- The use of energy efficient resources in production as well as encouraging farmers to build their own renewable energy sources;
- Inclusion of a large part of the land resources in the NATURA-2000 network. This reduces the expansion of agriculture and encourages farmers to use innovations that increase their productivity without further including land in the economic turnover;
- Encourage the use of optimal crop rotations and through this practice to reduce the use of chemicals in agriculture.

*Effects on the social factor.* Another important aspect in assessing the effectiveness of the innovation process and innovation in agriculture is whether they lead to positive effects on the development of the social factor in rural areas. Innovation needs to create jobs, retain young people in the industry, attract new players to the industry and be a reason to increase the income of the rural population.

In Figure 19 contains information on the dynamics of employment in agriculture over the past 10 years. The data show that the number of employees in agriculture is decreasing, as in 2009 they were 230 thousand people, and in 2020 they will reach 205 thousand people. The trend shows a gradual decline, which proves that the outflow of workers from the agricultural sector to other economic sectors is insignificant, but there is. The main reasons for this trend are the following:

- Innovation leads to higher productivity of agricultural holdings using technologies that require less manual labor, which is reflected in less need for labor;
- Agricultural holdings are being consolidated, which leads to the standardization of production, and hence to the stabilization of the number of employees on the agricultural holding. In most cases for small farms (which predominate in the structure of agricultural holdings - data from the last census in the sector).

Along with the decrease in the number of employees, the share of the self-employed in the agriculture of Bulgaria is also decreasing. The data in Figure 19 show a sharp downward trend in the number of self-employed, with a decrease of almost 40% over the last 10 years. The main reasons for this trend are:

- In the conditions of economic recovery and efficiency in the absorption of financial assistance under the CAP, a large part of agricultural holdings have become market-oriented structures, with part of the farmer's family (who were self-employed) being replaced by specialists from separate functional areas. the business involved in the activity of the farm through a contract;
  - Some farmers are leaving the industry and looking for employment in other economic sectors.
- He can summarize that the innovation process fails to keep the migration processes in rural areas, as there is still an outflow of human capital in other economic sectors of the country.

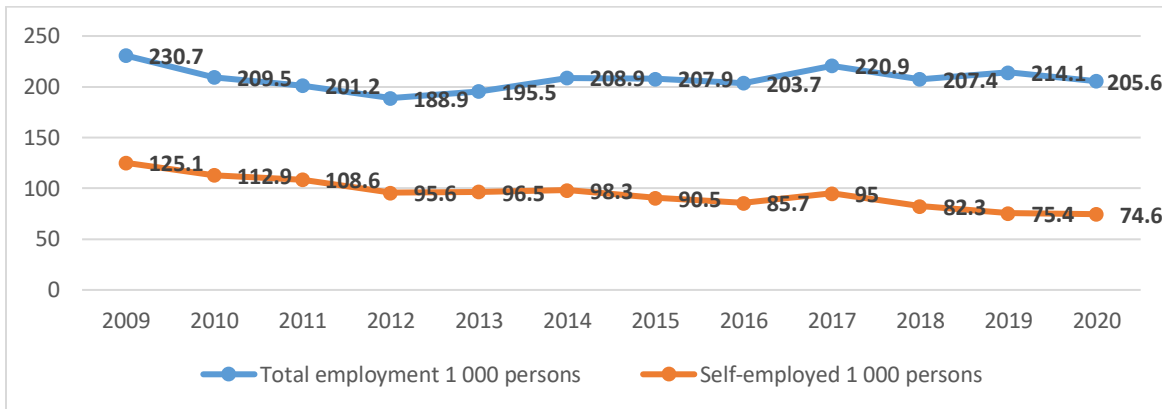


Figure 19. Dynamics of employment in the agricultural sector (thousand people). Source: Own calculations based on FAOSTAT database for the period 2009 - 2020.

Another important measure of the effects of the innovation process in agriculture is the level of profitability of employees in the industry. Income is one of the main economic drivers for the development of the social factor in rural areas of the country. According to the data in Figure 30, the disposable income of one employee in agriculture is growing significantly. The dynamics of this indicator conditionally passes through two stages - (1) stage, covering the period 2009 - 2014 and (2) stage, covering the period 2015 - 2020. The first stage shows a gradual increase in disposable income as in 2009. on average, one employee generates BGN 277.7 monthly income. By the end of 2014, the monthly income as a value doubled and reached a level of BGN 440.1. During the second stage, the monthly income began to increase rapidly and in 2020 reached BGN 987.7.

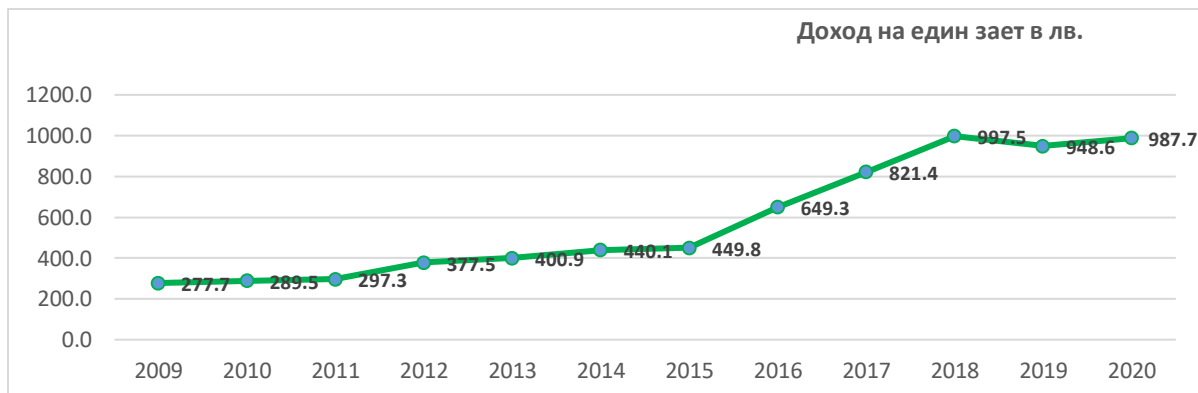


Figure 20. Income per employee in agriculture (monthly income in BGN) for the period 2009 - 2020. Source: Own calculations based on EUROSTAT data.

This proves that with the implementation of the CAP in the phase 2014-2020, the income of employees in the industry is growing significantly faster. According to the department "Agrostatistics at the Ministry of Agriculture, 83% of the income is formed by the financial support received from the state, which applies the CAP in the industry. Despite the sharp increase in income, agriculture lags behind other industries in terms of this indicator. Which explains the outflow of human capital to other economic sectors of the country, where profitability is higher with relatively lower risk. It should be noted that despite the lower levels of profitability, farmers have full freedom to diversify their activities and thus, through market innovation to increase their profits and hence income.

The increase in income in agriculture in the last 10 years is almost 5 times. However, the share of low-income employees in the sector remains significant. According to the data in Figure 21, the share of low-income employees was 18.9% in 2009. The following year, this share reached its highest value - 22.1%. In the following years, the share of low-income employees varied between 20.5% and 14.9%. There is a steady downward trend in the share of this group of farmers as in 2020, their share amounts to 16.1%. Under the CAP, the share of the poorest farmers remains significantly higher than at EU-27 level - 8.5%.

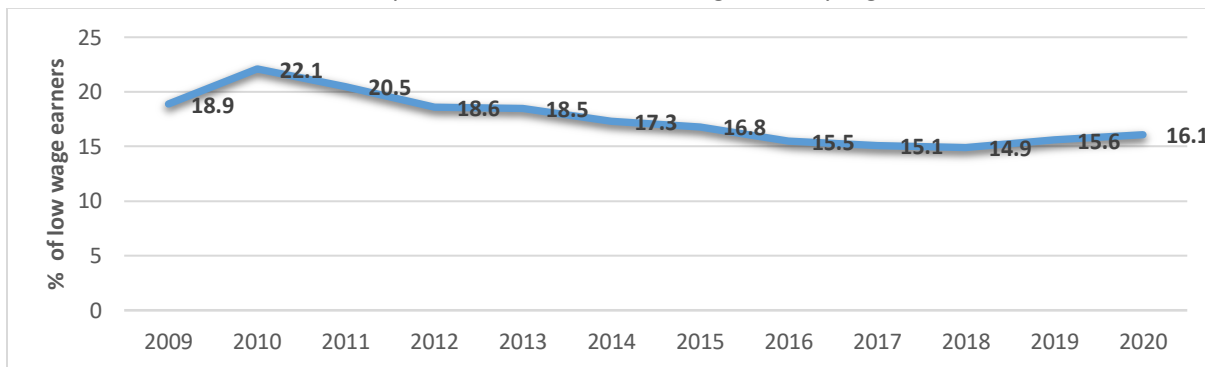


Figure 21. Share of low-income employees formed by their activity in agriculture. Source: Eurostat's own calculations.

Despite the generous financial support, the innovation process in agriculture cannot create conditions for higher profitability among the poorest farmers. This is due to the "sluggish investment spiral" effect, in which farms cannot set aside significant investments for innovations that have a higher market value and the ability to generate higher returns on business.

## CONCLUSIONS

### Conclusions regarding the impact of the CAP on the "entrance" of the innovation process in Bulgarian agriculture over the past 10 years:

- In the conditions of the CAP, Bulgaria has become an export-oriented country. In 2009, the export of agricultural goods from Bulgaria, presented as a percentage of total EU exports was 0.7%. Over the last 10 years, exports as a relative value have increased 1.4 times;
- Under the CAP, government spending on agricultural development has increased 3.3 times. It is clear that EU financial assistance is "pulling" up government spending on the sector;
- Apart from the state and foreign investors, the main role in the formation and development of the innovation process in agriculture is played by banking institutions, which are also the main provider of credit resources for the sustainable development of the industry over the years.



- The CAP 2014-2020, despite its "green" support schemes and measures, has failed to reduce the use of pesticides, and on the contrary, the amount of pesticides that farmers use in their activities is rapidly increasing. The CAP affects not only the uptake of pesticides, but also their 'greening'. The use of bio-plant protection products has increased almost 4 times in 10 years. This increase is due to an increase in the size of the areas occupied in organic production in our country.
- The CAP also affects the level of fertilizers used in agriculture. The analysis shows that the quantities of fertilizers applied in the industry are steadily increasing over time. In 2009 the imported fertilizers amounted to 160,981 tons, and in 2019 they reached 185,005 tons, which is an increase of nearly 1.1 times;
- Innovation in the application of fertilizers in agriculture is entering the sector intensively, encouraged by CAP support. The policy has positively influenced the share of bio-preparations to increase over the years. Innovations in fertilization are gradually entering domestic agriculture and by 2019 bio-fertilizers account for 10.9% of the total imported fertilizers on farms. The main factor for increasing the use of bio-fertilizers in agriculture is the gradual expansion of the areas occupied by agricultural crops grown in organic production conditions;
- The CAP has a positive impact on innovation in the use of machinery and equipment on the farm. In the last 10 years, the average value of newly purchased equipment on a farm has increased nearly 1.5 times. Mainly updated tractors and combines with the equipment attached to them;
- Within the two phases of the CAP, the widespread promotion of biotechnology as a successful technological innovation in the agricultural sector is being achieved. In the period 2013 - 2020 the share of organic farms has increased 1.2 times. However, the data show that the mass introduction of bio-technologies in agricultural holdings is not happening and the percentage of organic holdings remains below 5% of the total number of registered holdings.
- One of the important elements of the innovation process in the agricultural sector is the retention and development of staff in agricultural holdings. Under the CAP, the turnover of permanent staff on the farm decreases significantly. In the last 10 years, farmers have developed digital skills as well as human resource management skills, about 20% of respondents said that one of the two skills was important to them and have been trained to acquire it.

Conclusions regarding the influence of the CAP on the "outcome" of the innovation process in Bulgarian agriculture over the past 10 years:

- Innovative products for the end user are defined as bio-products and bio-preparations needed for the purposes of farmers developing organic production on their farms.

**Conclusions regarding the realized effects of the application of the CAP:**

- Within the framework of the applied CAP, there is an outflow of employees in the industry. Overall, the number of people employed in agriculture is declining (by almost 8% in the last 10 years, according to EUROSTAT), but labor productivity is still rising. This proves that the CAP influences labor productivity in agriculture by encouraging the use of innovations that allow the sector to intensify and its development is determined to the fullest extent by this factor;
- The CAP's "green mechanisms" in the sector encourage the use of innovations to reduce CO2 emissions, and data show that this is the case. The main reason for the reduction of carbon

emissions is the use of resource-saving production technologies and improving the energy efficiency of agricultural holdings;

- It can be concluded that the application of the CAP in the management of CH<sub>4</sub> and N<sub>2</sub>O emissions generated by farms leads to positive effects. Encouraging the use of innovation in the fight against harmful gas emissions is evident, but the role of the CAP in this process needs to be reconsidered;
- One of the main sources of harmful emissions into the soil, and hence into the country's water resources are fertilizers and plant protection products used in agriculture. The main pollutant component is ammonia. In the last 10 years, the accumulation of ammonia in the soil varies from 6.7 kg / ha to 7.3 kg / ha. Despite the planned compensatory measures against this side effect, it remains tangible for the time being. Innovations in fertilizers and plant protection products cannot significantly reduce ammonia emissions in soil and hence in groundwater.

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CONDITION, DEVELOPMENT AND MEASURES FOR IMPROVEMENT OF THE ECOLOGICAL INFRASTRUCTURE  
IN PERNIK DISTRICT

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**ABSTRACT**

The sustainable development of the European Union and the Bulgarian regions is becoming a major goal to be achieved. In order to implement policies for improving the quality of life and regional development, it is necessary to invest purposefully in building technical infrastructure in the field of ecology and environmental protection. Therefore, the author sets as his main research goal to analyze the state and guidelines for improving the environmental infrastructure in Pernik district. Achieving the goal formulated in this way, the author uses a territorial and systematic approach, which is complemented by systematic, analytical, descriptive, chorological methods, as well as conducting sociological research to prove the theses articulated by the author. The researcher indisputably proves his findings on the basis of analyzes that the ecological infrastructure in the district is in poor condition and the waste treatment system is not functioning effectively. That is why investment in environmental infrastructure must be increased. Analyzes show that funding for this type of technical infrastructure is insufficient.

**KEY WORDS:** education, staff with higher education, human capital, business, development

**ABSTRAKT**

Die nachhaltige Entwicklung der Europäischen Union und der bulgarischen Regionen wird zu einem der wichtigsten Ziele, die es zu erreichen gilt. Um eine Politik zur Verbesserung der Lebensqualität und der regionalen Entwicklung umzusetzen, ist es notwendig, gezielt in den Aufbau einer technischen Infrastruktur im Bereich Ökologie und Umweltschutz zu investieren. Daher setzt sich der Autor als Hauptforschungsziel, den Zustand und die Richtlinien zur Verbesserung der Umweltinfrastruktur im Bezirk Pernik zu analysieren. Um das so formulierte Ziel zu erreichen, verwendet der Autor einen territorialen und systematischen Ansatz, der durch systematische, analytische, deskriptive und chorologische Methoden sowie durch soziologische Forschung ergänzt wird, um die vom Autor aufgestellten Thesen zu belegen. Der Forscher weist anhand von Analysen unbestreitbar nach, dass die ökologische Infrastruktur im Bezirk in einem schlechten Zustand ist und das Abfallbehandlungssystem nicht effektiv funktioniert. Deshalb müssen die Investitionen in die Umweltinfrastruktur erhöht werden. Die Analysen zeigen, dass die Mittel für diese Art von technischer Infrastruktur nicht ausreichen.

**STICHWORTE:** Bildung, Personal mit Hochschulabschluss, Humankapital, Unternehmen, Entwicklung

**RÉSUMÉ**

Le développement durable de l'Union européenne et des régions bulgares devient un objectif majeur à atteindre. Afin de mettre en œuvre des politiques visant à améliorer la qualité de vie et le développement régional, il est nécessaire d'investir de manière ciblée dans la construction d'infrastructures techniques dans le domaine de l'écologie et de la protection de l'environnement. Par conséquent, l'auteur se fixe comme objectif principal de recherche d'analyser l'état et les lignes directrices

pour l'amélioration de l'infrastructure environnementale dans le district de Pernik. Pour atteindre l'objectif ainsi formulé, l'auteur utilise une approche territoriale et systématique, qui est complétée par des méthodes systématiques, analytiques, descriptives, chorologiques, ainsi que la conduite d'une recherche sociologique pour prouver les thèses articulées par l'auteur. Le chercheur prouve indiscutablement ses conclusions sur la base d'analyses selon lesquelles l'infrastructure écologique du district est en mauvais état et le système de traitement des déchets ne fonctionne pas efficacement. C'est pourquoi il faut augmenter les investissements dans les infrastructures écologiques. Les analyses montrent que le financement de ce type d'infrastructure technique est insuffisant.

**MOTS CLÉS:** éducation, personnel avec une éducation supérieure, capital humain, affaires, développement

### INTRODUCTION

Ecological and environmental issues are on the agenda of all Eastern and Central European countries. This theme is seen as one of the key indicators for the integration of these countries into the Union's internal market. In this sense, the Community's approach to environmental protection plays a key role in the accession process of the countries of this part of Europe. In this sense, it is important for the countries to assess the effectiveness of national environmental legislation. In this context, the funds allocated for the environment and water are progressively increasing, including in Bulgaria. In the Bulgarian state the need for planning and implementation of ecological infrastructure is of particular importance in the context of the outdated water supply and sewerage network, outdated technologies for environmental protection and water and maintaining low levels of harmful particles in the air. The data show that by 2020 only 2% of the water sector network has been replaced, which requires BGN 20 billion. In the capital alone, the funds needed for the rehabilitation and construction of a sewerage and water supply network amount to BGN 2 billion. In recent years, drinking, water and sanitation problems have become common at national, regional and local levels. That is why the topic of investment design of environmental infrastructure is of paramount importance for the country. The focus of our research is on the Pernik region. In practice, however, the city of Pernik as a regional center needs mostly measures and implementation of policies to improve the water transmission system. Recently, the municipality of Pernik is burdened with unfavorable climate change and there is a need to build and effectively manage the regional environmental infrastructure. This article will discuss the state of the ecological infrastructure in the region of Pernik and the possibilities for its improvement.

**Methodology.** The survey was conducted on the principle of direct individual survey, using questionnaires sent electronically. The study covers the period from 10.01.2022. until March 10, 2022. The questionnaire consists of 13 questions, formulated in order to obtain a clear and objective assessment based on the most common answers and the prevailing opinion of consumers about the state of environmental infrastructure in Pernik. The survey can claim to be representative because it includes the answers of 109 respondents, which is a representative percentage of employees in the district. The target group are civil servants and experts who are part of the administration of Pernik district and are directly or indirectly related to the management of environmental infrastructure. Unlike the mass survey, which aims to establish opinions, values and attitudes, the expert survey provides information about the events and phenomena themselves, which are reflected in the opinions of experts who are better acquainted

with the research. The overall goal of the present study is to establish the opinion and assessment of experts on the state of the ecological infrastructure in Pernik district. Based on the received information, conclusions and recommendations will be made regarding measures for the improvement of the ecological infrastructure. The research methodology includes factual and evaluative questions, including 12 closed-ended and one open-ended questions, using both the Likert format (five-seven-point scale) and the two-point scale, forced scale, as well as questions with one possible answer.

**Theoretical framework.** Regional development and regional policy are directly related to the construction of environmental infrastructure. The main regulatory mechanisms used for the implementation of regional policy are regulated by national laws developed in accordance with the legislation of the European Union. In this context, regional development is seen as a process of permanent social change that contributes to the sustainable and sustainable development of the community in a particular region. It presupposes a multisectoral and complex process related to certain goals: economic growth, sustainable development, social integration, meeting basic needs, quality of life, regional autonomy, environmental protection. The author assumes that the regional policy is based on a system of normatively regulated documents, the implementation of which needs to be financially secured and aimed at achieving the goals of regional development in the administrative-territorial communities (Petrov, 2020). The objectives are related to the achievement of regional and sustainable development, which implies the creation of favorable living conditions. Therefore, the construction of environmental and water infrastructure is the basis for improving the socio-economic conditions in the regions. There is an objective connection between the state and development of the water supply and sewerage network in the regions and their sustainable development as a result of the implemented policies for regional development (Tsonkov, 2021).

The technical infrastructure has an important role in terms of servicing the production process and the needs of the population in territorial terms. In its composition it has an engineering and technical purpose, and in its functions it has an important socio-economic purpose. Technical infrastructure creates the functional connection between all branches and types of infrastructure and the functioning of human life, territorial and production structures is impossible without it. The increase of the economic and social functions of the territorial units and the settlement formations is largely determined by the condition, development and improvement of the infrastructure and mainly of the technical one, which includes the following subsystems: energy production and transmission systems; transport system, transport construction and transport network; water supply and sewerage system; information and telecommunication system. This composition of the technical infrastructure forms the territorial economy and its social and economic relations (Hristoskov, 1992).

Increasingly, the literature refers to a broader category of infrastructure, such as "green infrastructure". Given its role and importance, it is perceived as a basis without which human development would be impossible, or a framework for the development and course of socio-economic processes at all levels - global, national, regional, local. In this direction, there is a tendency to study the progress in the development of green economy in Bulgarian municipalities. Respectively, we could point out the research in this area of Tsonkov and Petrov, related to the improvement of living conditions in some Bulgarian municipalities as a result of the implementation of green policies for regional and sustainable development (Tsonkov, 2021). Some authors point to green infrastructure as a strategic

approach to the protection of open areas, which is crucial for the success of smart growth initiatives and defend the view that just as growing communities need to improve and expand their built infrastructure (roads, sanitation, utilities) services) (Benedict and McMahon, 2001). They also need to renew and expand their green infrastructure - the network of open space, forests, wildlife habitats, parks and other natural areas that maintain clean air, water, natural resources and enrich our quality of life. Thus, green infrastructure is defined as an interconnected network of green areas that preserve the values and functions of natural ecosystems and provide certain benefits to humans. In addition, it presents itself as the environmental framework necessary for environmental, social and economic sustainability (Benedict and McMahon, 2001).

Given the principles of green infrastructure planning outlined by the authors, it is a "critical public investment", which means that the functions, values and benefits of green infrastructure are accessible to the whole society. And as green infrastructure provides benefits for all, the conservation of key natural resources - soil, air, water and related ecosystems - is gaining public importance. In this way, green infrastructure is presented as the sum of all natural resources and their perception as "green infrastructure", it is a way to recognize that they have value for people (Benedict and McMahon, 2001). Thus, green infrastructure can be presented as a network of natural areas and zones with specific functions in terms of environmental protection. Another important role for the sustainable development of society is the ecological infrastructure. A distinction must be made between environmental and green infrastructure. In general, environmental infrastructure is infrastructure that provides water supply, waste disposal and pollution control services. This includes extensive networks of engineering sites and installations, such as: water distribution pipes, sewer pipes and pumping stations; treatment systems such as sedimentation tanks and aeration tanks, filters, septic tanks, desalination plants and incinerators and waste disposal facilities, such as sanitary landfills and secure enclosures for hazardous waste storage. The construction of these infrastructure sites and facilities has two important goals: to protect human health and ensure the quality of the environment. Ecological infrastructure can be classified as technical infrastructure, as it is in practice engineering and technical facilities and facilities serving both production processes and the population. Its main functional characteristic is that through it the connection between human activity and the environment is realized. Ecological infrastructure is designed to mitigate the negative effects of human on the natural environment. As well as the technical, the ecological infrastructure has a territorial character. The sites and facilities of the technical infrastructure are also built on a territorial principle, but their importance goes beyond the boundaries of the region, ie. they are essential to reduce the harmful effects on the overall state of the environment. Ecological infrastructure can be considered as part of the communal economy (Kalinkov, 2007).

There is no definite definition of the term ecological infrastructure in the scientific literature. For the purposes of this study, the author proposes a working definition: ecological infrastructure is part of the technical infrastructure and is territorially located sites and facilities with ecological purpose, helping the normal course of the production process, providing appropriate living and working conditions and reducing harmful environmental impacts of these activities.

From all that has been said so far, it can be argued that environmental infrastructure has a key role and importance in achieving sustainability in social development.

## **RESULTS AND DISCUSSION**

In the analysis of the answers to the first question it becomes clear that a large part of the respondents determine the quality of the ecological infrastructure in the district in the negative part of the table, as for 38.86% it is obviously bad and for 45.87% it is satisfactory a positive assessment should be good. What are the reasons for this negative assessment should be analyzed through the other parameters of the survey, but especially through the answers to the question with emphasis on the shortcomings of environmental infrastructure in the area.

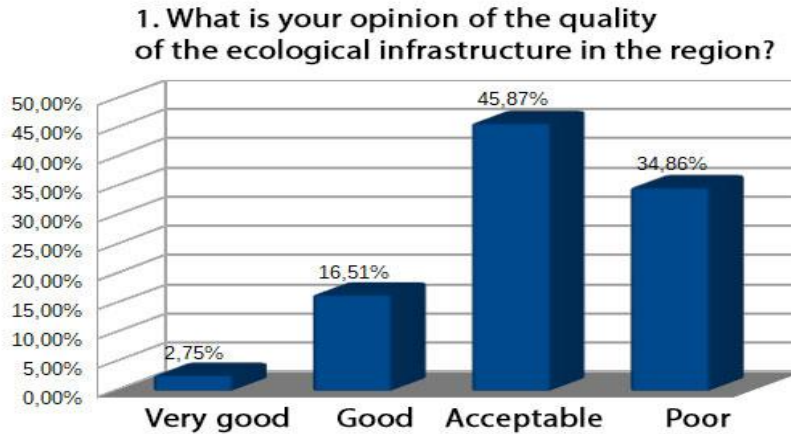


Figure 1. What is your assessment of the quality of environmental infrastructure in the area?. Own survey, 2021

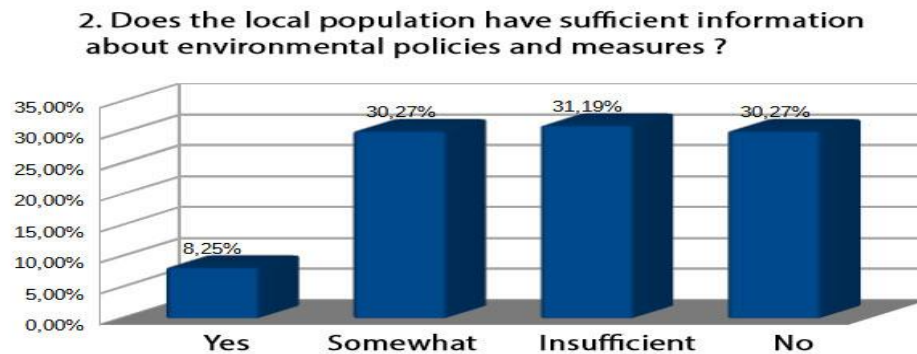


Figure 2. Does the local population have sufficient information on environmental policies and measures? Own survey, 2021

An analysis of the answers to this question in the survey shows that the majority of respondents indicate that the population is not informed or is insufficiently informed about environmental policies and measures. These results overlap with the answers to the open-ended questions in Figure 1, where the lack of information is specifically noted. It should be noted that in addition to the lack of information, the lack of interest in information also appears here as a reason.

**3. Rate from 1 to 6 how waste is managed in the area (highest score is 6)?**

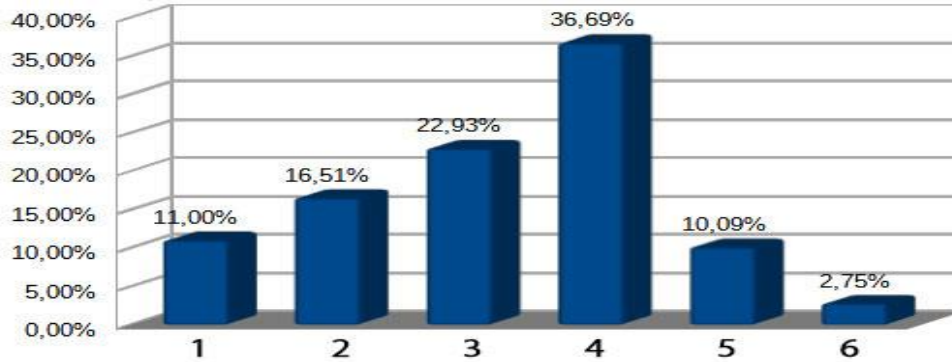


Figure 3. Evaluate from 1 to 6 how waste is managed in the area? Own survey, 2021

The highest percentage of respondents give an average assessment of waste management in Pernik district. The share of respondents who tend to give a poor or bad grade compared to the average is higher and the share of those who give a high or excellent grade is smaller. As all respondents are experts or municipal employees who directly or indirectly work in the management of infrastructure in Pernik district, it should be noted that the respondents confirm the functional suitability of waste management in the district, but are critical and consider it necessary improving administrative capacity. This analysis is confirmed by comparison with the answers illustrated in FIG. 1, where the largest percentage of respondents point to the main weakness of the environmental infrastructure in the region: poor governance, poor competence, lack of staff and unscrupulous performance by municipal workers. In this sense, it is appropriate to implement a program to increase administrative capacity and to develop control mechanisms.

**4. Should new environmental taxes be introduced to improve living conditions?**

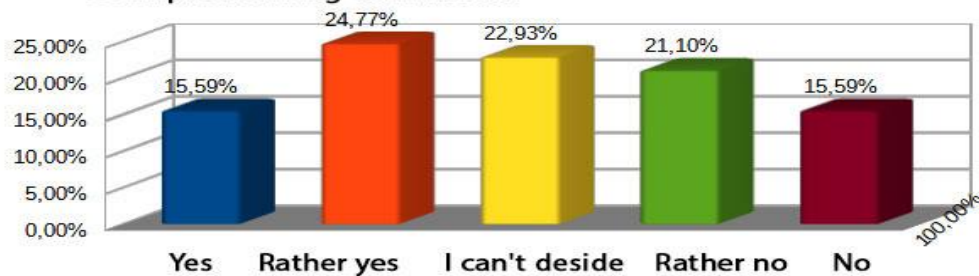


Figure 4. Should new environmental taxes be introduced to improve living conditions?. Own survey, 2021

In the analysis of this question there is obviously a big hesitation among the respondents. Affirmative and negative answers have an equal percentage, as well as the percentage of both positive and negative



answers and respondents who indicated that they could not judge. If we compare this parameter with the parameter in Figure 5, where 90% of respondents indicate that not enough funds are available for investment in the environment, it becomes clear that environmental taxes do not seem to respondents to be a source of funds for building environmental infrastructure. The reasons for this are different. Compared to the answers to question 9, the lack of transparency, poor management of funding, lack of decentralization of funding, poor control, and the perception of corruption at central and local level are the main factors in the context of the environment, which determine the hesitation among respondents as to whether new environmental taxes should be introduced. To this must be added the low standard of living as well as the high local taxes.

**5. Do you think that there are sufficient investments for the environment?**



Figure 5. In your opinion, is the investment sufficient for the environment? Own survey, 2021

It is obvious that almost all (89.90%) of the surveyed experts and employees indicate that their funds are insufficient. This result overlaps with the responses in Figure 1, where the lack of funding is particularly highlighted. However, there are various reasons for the lack of funds, including the lack of sufficient public, European and private funding, as well as the presence of corruption, lack of sufficient administrative capacity, as well as insufficient decentralization. Among these factors is the factor of awareness and interest of the population, which due to the many sectors that need funding neglects the importance of environmental. These parameters will be clarified in the conclusions of the publication.

6. Is the health and quality of life of the population guaranteed?  
(Rate on a scale from 1 to 6, where 1 is the lowest and 6 is the highest)

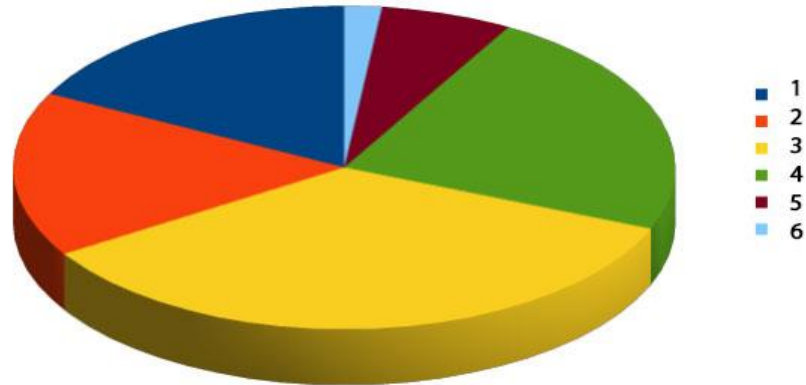


Figure 6. Is the health and quality of life of citizens guaranteed? (Rate on a scale of 1 to 6 in ascending order). Own survey, 2021

The analysis of the respondents' answers to this question shows that the average assessment of the quality of life and the guarantee of health in the district prevails. However, of the rest of the distribution of responses, negative assessments predominate and are twice as significant as positive ones. As can be seen from fig. 1 this negative attitude is described by the presence of high air pollution, lack of a well-organized waste collection system, as well as a system of separate waste collection. Existence of many new factors for pollution and at the same time cumbersome procedures for building environmental infrastructure.

7. In your opinion, what changes have occurred after the construction of a landfill in Pernik?

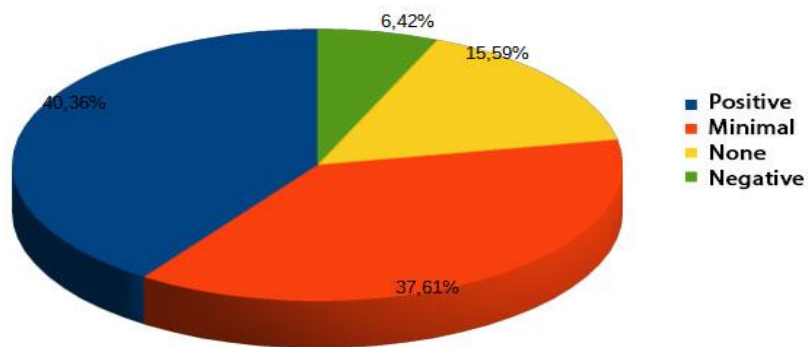


Figure 7. In your opinion, what changes have occurred after the construction of a landfill in Pernik? Own survey, 2021.

The answers to this question show - although there is a positive answer and the majority of respondents answer with "positive" and "minimal" - that there is a positive attitude towards the construction of the landfill, but the negative feeling and suspicion of irregularities is not ruled out. . What nature they would be can be deduced from the answers in Figure 1.

### 8. In your opinion, what should be the sources of funding for environmental projects?

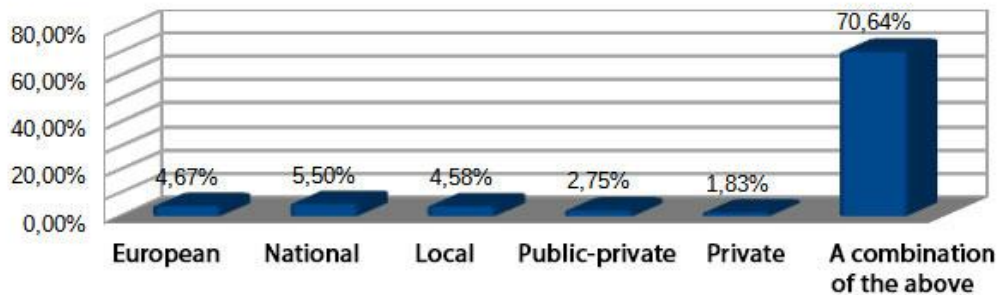


Figure 8. In your opinion, what should be the sources of funding for environmental protection projects?  
Own survey, 2021

The analysis of the answers to this question of the survey is dominated by the opinion that a combination of all available sources of funding should be used. The reason for this is the position, as it is clear from the survey, that there is a lack of funding for environmental infrastructure in the district. At the same time, however, there is a lack of confidence in funding from national and European projects due to suspicions of corruption and a lack of transparency. On the other hand, the private sector is not interested in the construction and maintenance of sites and facilities of environmental infrastructure, as far as their public property is concerned, such as landfills, sewage treatment plants, incinerators and others. At the same time, public-private partnership (PPP) is, as a world practice, one of the successful financial mechanisms for providing investment funds in public infrastructure, when the country and municipalities do not operate with the supposed financial resources, while wanting to ensure better value of the public funds used for this purpose. (Hristov and Daskalova, 2011). Again, due to suspicions of corruption and the fact that "the regulatory framework is in favor of companies that do not in any way meet the requirements related to the protection of the eco-structure", as stated in one of the answers to the open question of public-private partnership looks with disbelief. In addition, the lack of sufficiently successful decentralization can be noted. However, respondents are of the opinion that all available funding opportunities should be used. The answers in Figure 1 confirm, summarize and develop the other questions from the survey. Before analyzing the data from them, it should be noted that a relatively large percentage of answers are without a definite opinion - 18.34% or 20 respondents. The content answers can be grouped into several common groups. The largest percentage of respondents (28 respondents or 25.68%) indicate as the main weakness of the management of environmental structure in the region: poor governance, poor competence, lack of well-trained staff and poor logistics, as well as careless performance of municipal workers. This group of answers pays attention to the training of the employees and workers who are engaged in this activity. It is pointed out that the administration has insufficient optimal spending of the provided funds and public non-involvement. It is also stated that all the

innovations are extremely slow and cumbersome. workers, as well as the companies with which a contract has been concluded.

The second large part of the respondents pay attention to the weak funding. This confirms the results of question 5 where 98 respondents or 89.90% report a lack of funds. In the open questions in question 9, the main weakness of the management of the environmental structure in the region is the lack of funds from 14 respondents or 12.84%. Problems with funding include: lack of transparency and poor management of funding, lack of decentralization of funding, poor control of funds. The next most important group of answers to the open question draws attention to: corruption, mafiaization and lack of transparency. 16 people or 14.67% of the respondents paid attention to this.

Another important group of answers draws attention to people's behavior and their lack of ecological culture. This was pointed out by 13 respondents or 11.92% of the number. They do not comply with the imposed environmental measures. There is little concern and awareness of citizens.

The low awareness of the citizens was pointed out by some of the respondents as a major weakness. The factor "weak control" is specifically and independently mentioned both in terms of the activities of employees and in terms of funding, as well as for specific events, part of the environmental infrastructure. Dirty air is specifically mentioned as a problem for the area and the weak control over this parameter. Another important self-stated parameter is bureaucratization and outstanding projects. On the one hand, this can be reduced to the first group of assessments, which describe as a weakness the administrative management of the environmental structure in the region. However, the specific parameter provides information on the lack of funding parameter. As the lack of funding is accompanied by poor absorption. Other responses draw attention to the overall poor state of infrastructure, with particular emphasis on waste collection.. Many of the villages and some towns in the Pernik district do not have an organized system for household waste collection, and many of the existing waste treatment facilities do not comply with European norms and standards. The infrastructure for hazardous waste disposal has not been built at the national level. There are not enough places for waste disposal, and even the places where there are enough are not cleaned regularly by the services. There are more and more pollutants in the environment, and positive actions are happening at a slow pace and at the same time are accompanied by poor quality construction. There is also a lack of a mechanism for separate waste collection. There are containers for separate collection in the municipality of Radomir, but they are disposed of in the Pernik landfill, instead of being transported to recycling plants / enterprises. There is a lack of public confidence in the administrations regarding the management of environmental infrastructure. There is not enough effective wastewater treatment and sewerage in all settlements of the municipality. Gingerbread. There are not enough containers for separate waste collection. The summary of the answers to the open-ended questions is fully consistent with the answers to the other questions in the survey.

10. In your opinion, is there enough information about the financing for the construction of ecological infrastructure in the region?

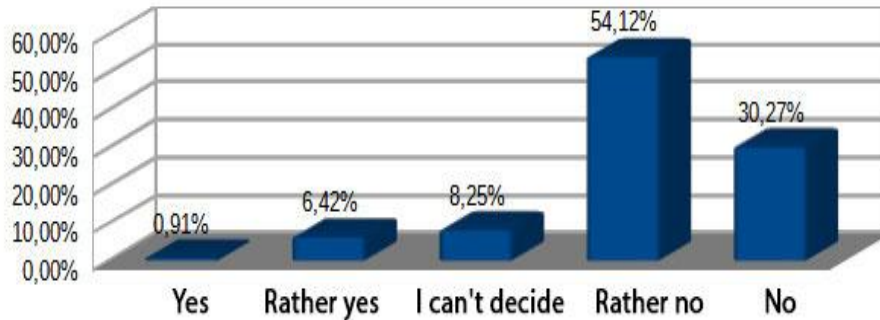


Figure 9. Do you think there is enough information about the financing for the construction of environmental infrastructure in the area? Own survey, 2021

When analyzing the respondents' answers to this question, it became clear that the negative answer dominated, with the majority of respondents answering either "no" or "rather no". This result is analogous to the answers to the open-ended questions, where it was found that the lack of information, as well as the lack of interest, were identified as major weaknesses in the management of environmental infrastructure. Also, the answers here are analogous to the answers in Figure 3, where the population's awareness of the state of the ecological infrastructure as a whole was analyzed. Awareness of funding is even more negative, as suspicions of corruption and lack of transparency increase the negative outcome.

11. Do you think that citizens should be able to participate more directly in making decisions about the environmental situation in the area?

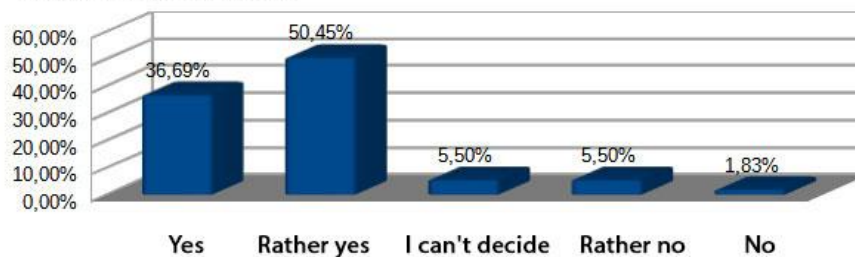


Figure 10. Do you think citizens should be able to participate more directly in decisions about the environmental situation in the area? Own survey, 2021.

In the analysis of the answers from the surveys it becomes clear that the positive answer dominates. Almost all respondents answered "yes" or "rather yes". On the one hand, this response has to do with criticism of centralization and the feeling that greater participation of citizens in local government is

needed. On the other hand, the lack of trust and the feeling of weak administrative capacity and lack of control lead to an increase in this result.

**12. Are the citizens sufficiently informed about the non-governmental organizations operating in the region and their influence and participation in the decision-making of the local government?**

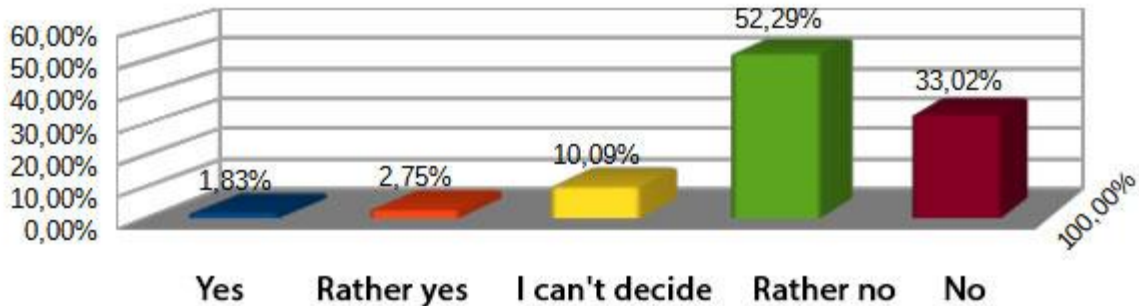


Figure 11. Are citizens sufficiently informed about the NGOs operating in the region and their influence and participation in local government decision-making? Own survey, 2021

An analysis of the answers to this question shows that the negative answer dominates. Almost all respondents answered "no" or "rather no". On the one hand, this response confirms the lack of awareness of the state of environmental infrastructure in general, but emphasizes that there is a general lack of awareness of the operation of structures that can increase civic participation in local government, including environmental issues. In addition to the lack of information, the factor of lack of interest should be noted.

**13. Do you think there are loopholes for double interpretation of the legislation and is there a need to revise some provisions directly related to the daily lives of citizens and businesses in the region?**

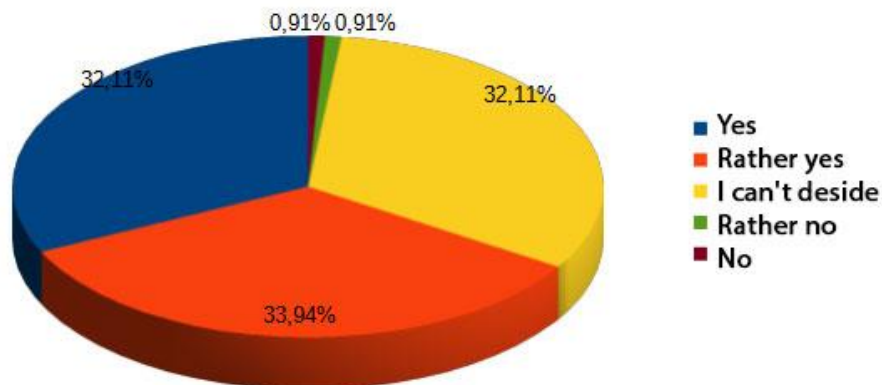


Figure 12. Do you think there are loopholes for double interpretation of the legislation and is there a need to revise some provisions directly related to the daily lives of citizens and businesses in the region?  
Own survey, 2021

An analysis of the answers to this question shows that the positive answer dominates. Most of the respondents answered "yes" or "rather yes". A significant part are also the respondents who answered with "I can't judge". On the one hand, this response reaffirms the aforementioned repeated sense of corruption and lack of transparency in governance. It also highlights the uncertainty at the national level about how regional development in the field of environmental infrastructure will take place.

### **CONCLUSION**

Respondents describe the quality of environmental infrastructure as poor. They point out that waste management is working, but improvements are needed, which should be in line with increasing administrative capacity, as well as implementation control, transparency of funding and public awareness. The population is insufficiently informed about the policies and measures for environmental protection as the reasons are both the lack of information campaign and the lack of interest, which is explained by the fact that ecology is secondary to the population. Environmental taxes do not seem to be a source of funding for respondents to build environmental infrastructure, due to mistrust and a sense of corruption at the central and local levels. Respondents are convinced that the funds for financing an environmental structure are insufficient and believe that it is necessary to use all possible sources of funding. At the same time, there is again great mistrust regarding the allocation and management of funds. The largest percentage of respondents believe that the main weaknesses in the management of environmental structure in the region are: poor competence and lack of well-trained staff; lack of transparency and poor funding; lack of ecological culture among the population. Greater role of civic participation in local government is needed in order to increase control, but at the same time there is a lack of awareness of the state of environmental infrastructure in general, sources of funding and the operation of structures that can increase civic participation in local government self-government. Discussing the results of the survey through the prism of scientific analysis related to the development of environmental infrastructure, it should be said that in order to achieve sustainable regional development it is necessary to adopt a state policy focusing on rational and equitable allocation of resources (especially financial). It is also essential to strengthen the decentralization process, which will give regional and local authorities a greater opportunity to make management decisions concerning the solution of problems of this nature. This will help solve a number of problems, especially those related to directing investments in infrastructure sites and facilities of national, regional and local importance, taking into account the needs of regional and local communities. There are more and more environmental pollutants, and positive actions are slow. Increasing investment in environmental infrastructure, as well as enhancing technological innovation and innovation, not only by private organizations but also by public ones, is particularly important in reducing environmental impact. The practical implementation of Bulgaria's sustainable development is a matter not only of gaps in national legislation or the lack of a fully regulated approach to sustainable development processes, but also of delayed processes of decentralization of functions and rights from central government to local authorities, and hence and the opportunities for

municipalities to be one of the main participants in the process of sustainable development (Nedyalkova, 2002). Funding is among the main problems for improving environmental infrastructure. The state of the economy in Bulgaria necessitates the allocation of significant financial resources for the implementation of environmental infrastructure projects, both by private companies and by national and local authorities. In this way, the aim is to adopt a new approach to investing - sustainable investment. The concept of sustainable investment is seen as an approach of modern investment theory and practice to overcome a complex of different crises of development, has the distinctive features of conventional understandings of investment, according to which the main feature of any investment is wealth or other positive results for a long time, the main distinguishing features are: innovation, integrity, cohesion and synergy. The notion of sustainable investment is that it requires in-depth consideration of social and environmental impacts, assessing and measuring whether business practices can maintain social equality and environmental balance while maintaining profitability. (Boy, 2008). This raises the issue of socially responsible investment, which focuses on sustainable practices and strategies that maximize economic, social and environmental performance, while maintaining and preferably renewing communities and ecosystems. The aim is to promote business with goals related to economic, environmental and social indicators, and to achieve high returns (Larson, 2018).

According to the European Sustainable Investment Forum, responsible investing is "any investment process that combines an investor's financial goals with his or her attitude towards the environment, society and governance" (Environment / Society / Governance, ESG) (European Sustainable Investment Forum, [www.eurosif.org](http://www.eurosif.org)). Thus, municipalities as an investor must focus on investing in infrastructure projects in relation to social development and the environment. The sustainable development of territorial communities depends to a large extent on their institutional capacity, which should be considered as one of the forms of capital. The institutional capabilities of the municipalities determine the ways of planning and managing the other forms of capital and achieving such development of the municipalities, which to the greatest extent will provide the needs of the present and future generations.

The construction of various infrastructure projects in various sectors such as transport, industrial production, etc. because problems related to pollution and degradation of the environment and a number of negative impacts on human health. This is especially typical for Pernik district. Ecological infrastructure is part of the technical infrastructure and is territorially located sites and facilities with ecological purpose, helping the normal course of the production process, providing appropriate living and working conditions for the population and reducing the harmful effects on the environment from these activities.

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## COMPETITIVENESS OF AGRICULTURAL ENTERPRISES – THEORIES AND DETERMINANTS

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### ABSTRACT

The purpose of the article is to determine the factors, main determinates shaping and influencing the level of competitiveness of agricultural enterprise. Competitiveness of the enterprise is the result of many factors, which have a complex influence on him. Competitiveness exist as a state of agricultural enterprise only in market conditions. Market is characterized by its three forces - demand, supply and competition. Depending on the manifestation and the dominance of these three forces, the market is defined as a monopoly with perfect competition or monopolistic competition. In this context, it appears that competition is an engine of development and a reason to explore, study and manage the competitiveness of the market players It has become clear that the competitiveness is a complicated and complex economic category. This determines the difficulty in determining the performance assessment. In the literature there is no uniform opinion on the number and composition of indicators to assess the competitiveness of enterprise. This stems mainly from differences in the opinions of the authors of the nature of the economic category "competitiveness". On the one hand there is a desire for maximum characterize the competitiveness of the company. This leads to excessive expansion in the number of proposed indicators to assess, which in turn hinders their practical use. On the other hand there is a desire to develop a separate indicator, which easily and quickly measures the aggregate competitiveness of the company.

**KEY WORDS:** competitiveness, market share, adaptability, production costs, innovations, comparative ability

### ABSTRAKT

Ziel des Artikels ist es, die Faktoren und Hauptdeterminanten zu bestimmen, die das Niveau der Wettbewerbsfähigkeit eines landwirtschaftlichen Unternehmens bestimmen und beeinflussen. Die Wettbewerbsfähigkeit eines Unternehmens ist das Ergebnis vieler Faktoren, die einen komplexen Einfluss auf das Unternehmen haben. Die Wettbewerbsfähigkeit als Zustand eines landwirtschaftlichen Unternehmens existiert nur unter Marktbedingungen. Der Markt ist durch seine drei Kräfte - Nachfrage, Angebot und Wettbewerb - gekennzeichnet. Je nach Ausprägung und Dominanz dieser drei Kräfte wird der Markt als Monopol mit vollkommenem Wettbewerb oder als monopolistischer Wettbewerb definiert. In diesem Zusammenhang zeigt sich, dass der Wettbewerb ein Motor der Entwicklung und ein Grund ist, die Wettbewerbsfähigkeit der Marktteilnehmer zu erforschen, zu untersuchen und zu steuern. Es ist deutlich geworden, dass die Wettbewerbsfähigkeit eine komplizierte und komplexe wirtschaftliche Kategorie ist. Daraus ergibt sich die Schwierigkeit bei der Bestimmung der Leistungsbewertung. In der Literatur gibt es keine einheitliche Meinung über die Anzahl und Zusammensetzung von Indikatoren zur Bewertung der Wettbewerbsfähigkeit von Unternehmen. Dies ist vor allem auf die unterschiedlichen

Auffassungen der Autoren über die Art der wirtschaftlichen Kategorie "Wettbewerbsfähigkeit" zurückzuführen. Auf der einen Seite besteht der Wunsch nach einer maximalen Charakterisierung der Wettbewerbsfähigkeit des Unternehmens. Dies führt zu einer übermäßigen Ausweitung der Zahl der vorgeschlagenen Indikatoren, was wiederum ihre praktische Anwendung behindert. Andererseits besteht der Wunsch, einen separaten Indikator zu entwickeln, der einfach und schnell die gesamte Wettbewerbsfähigkeit des Unternehmens misst.

**STICHWORTE:** Wettbewerbsfähigkeit, Marktanteil, Anpassungsfähigkeit, Produktionskosten, Innovationen, komparative Fähigkeit

## RÉSUMÉ

L'objectif de l'article est de déterminer les facteurs, les principaux déterminants qui façonnent et influencent le niveau de compétitivité de l'entreprise agricole. La compétitivité de l'entreprise est le résultat de nombreux facteurs, qui ont une influence complexe sur elle. La compétitivité n'existe en tant qu'état de l'entreprise agricole que dans les conditions du marché. Le marché est caractérisé par ses trois forces - la demande, l'offre et la concurrence. Selon la manifestation et la dominance de ces trois forces, le marché est défini comme un monopole avec une concurrence parfaite ou une concurrence monopolistique. Dans ce contexte, il apparaît que la concurrence est un moteur de développement et une raison d'explorer, d'étudier et de gérer la compétitivité des acteurs du marché. Il est devenu clair que la compétitivité est une catégorie économique compliquée et complexe. Cela détermine la difficulté de déterminer l'évaluation de la performance. Dans la littérature, il n'y a pas d'opinion uniforme sur le nombre et la composition des indicateurs pour évaluer la compétitivité des entreprises. Cela découle principalement des différences d'opinion des auteurs sur la nature de la catégorie économique "compétitivité". D'une part, il existe un désir de caractériser au maximum la compétitivité de l'entreprise. Cela conduit à une expansion excessive du nombre d'indicateurs proposés pour l'évaluation, ce qui à son tour entrave leur utilisation pratique. D'autre part, il existe un désir de développer un indicateur distinct, qui mesure facilement et rapidement la compétitivité globale de l'entreprise.

**MOTS CLÉS:** compétitivité, part de marché, adaptabilité, coûts de production, innovations, capacité comparative

## INTRODUCTION

Competitiveness of the enterprise is the result of many factors, which have a complex influence on him. Competitiveness exist as a state of agricultural enterprise only in market conditions.

Market is characterized by its three forces - demand, supply and competition. Depending on the manifestation and the dominance of these three forces, the market is defined as a monopoly with perfect competition or monopolistic competition (Mirkovic, 2000). In this context, it appears that competition is an engine of development and a reason to explore, study and manage the competitiveness of the market players.

According to (Stoyanov D, 1995), (Ribov, 1997), (Chobanyaneva, 1998), (Marinov 1998) competition in its essence is a rivalry between people, companies, regions, countries to achieve certain goals. (Ribov, 1997); (Drucker, 2000) identify "Theory of competition as the highest form of knowledge.

A. Smith explains the competition as a permanent mechanism for removing the inadequate and maladjusted from market. It is an engine of social development. To exist such a phenomenon, there should be the following conditions: be a person behavior justified self-interest; clearly defined property rights; sovereignty of the individual economic entity manifesting itself in complete freedom in deciding to change his behavior.

The purpose of the article is to determine the factors, main determinates shaping and influencing the level of competitiveness of agricultural enterprise.

## RESULTS AND DISCUSSION

In an inductive approach, there are two types of relations between economic entities: a **alternativeness and solidarity**. According to (Trifonov, 2003) The first type of relationships are those in which the realization of the objective of a subject preclude the realization of a similar order of another entity. This is regarding alternativeness. The second type of relationships are those in which the realization of the purpose of an entity is a condition for the realization of similar purpose to another. This is an attitude of solidarity. Of this total production resulting rivalry relations and coordination of the actions of the subjects in any economic system. A basic condition for the emergence of a relationship of rivalry is designated entity to be located in an area of interest to another entity - in the situation of alternativeness (or he, or other entity). Between economic players there is always a relation of rivalry (competition) at some point of their market relationship caused by the scarcity of production factors and the unlimited needs of individuals. In satisfying their needs individuals exhibit two types of behavior: rivalry or solidarity, depending on their personal interest.

Competition phenomenon exists only in the free market. The market is one that provides an assessment of how to allocate scarce factors of production and how to meet unlimited needs of society and individuals. Competition in a market economy following several functions as: matching - competition is a versatile tool for comparing the effectiveness of different economic players for the detection and stimulation of economically most able-bodied; election - competition is a "natural selection" in a market economy. As a result, increases the overall level of production efficiency; encouraging - competition encourages creativity and entrepreneurship of economic players. Thereby achieving efficient use of scarce production factors and stimulating innovation activity; disciplining function - competition creates a situation of alternativeness. This is the reason every economic player carries out its activities no worse than others.

Given the immanent characteristic of market power called competitive ability - can put basic understanding of what constitutes economic and managerial category "competitiveness". Various are the opinions of the nature of the category "competitiveness" of the enterprise. Some authors – (Ribov, 1997); (Chobanyaneva, 1998); (Danailov, 1998); (Marinov, 1998); (Minyko, 2004); (Krichevskiy, 2004); (Ivancevich, 1994) and (Lifits, 2001) connect "competitiveness" of the enterpris with the **notions of products manufactured by him**. According to The Report Aldington – “products are competitive when they are produced in higher quality at minimum production costs compared with those of competitors”.

Another part of the authors like (Drucker, 2000); (Petkov, 1994); (Sergeev, 2003); (Avila, 1997); (Porter, 1998) define "competitiveness" of the enterprise as a result **of effective management of production, expressed with high productivity of factors of production**. According to this group of authors,

competitiveness is the result of effective management of production. If managers effectively manage production resources put into production, the enterprise will have a good competitiveness and can be developed into specific market conditions.

Others authors like (Pettigrew, 1987); (Galbraith, 1990); (Rumelt, 1992); (Lockshin, 2000); (Twomey, 2002); (Barinov, 2000); (Rezear, Borisov, Radev and Osmani (2019); (Borisov & Popova, 2021) related "competitiveness" with ***the degree of adaptability to the changing environment***. According to this group of researchers of the problem, if the enterprise is adaptive to market changes and not only to survive but also to develop its marketing abilities should be considered with good competitiveness.

(Buckley, 1998; (Pride, 1989); (Paounov, 2000); (Osmani, Kolaj, Borisov & Arabska, 2021). related competitiveness with ***the ability of enterprise to generate profit (value)*** from its participation in the market. According to them, if it happens that means enterprise has a good competitiveness, also its maintained that profit must increased.

(Lipsej, 1987); (Kirpalani, 1987) and (Van Duren, 1991); (Armstrong and Collopy, 1996); (Borisov and Garabedian, 2020) related "competitiveness" with the ***size of the market share*** of the products. According to them, the greater is the amount of reclaimed market share of enterprise products, the better competitiveness has it. According to (Tirole, 1998); (Bloodgood and Katz, 2004) there is a correlation between ***market share and production capacity of the enterprise***. With large production capacity enterprise has the potential to gain an greater market share, taking advantage of all the benefits of large-scale production. Therefore, the competitiveness of the enterprise, expressed by achieving a growing market share as ability of management to build large-scale production (with large production capacity), whose products quickly realize the market.

According to (Zikmund, 1995); (Kleiman, 1997); (Emilova, 2005); (Gorynia, 2004); (Zhdanin, 2000); (Borisov and Radev, 2020) "competitiveness" of the enterprise is determined by two factors: ***cost leadership and product differentiation***.

Price leadership is the ability of an enterprise to produce at lower cost its product compared to its competitors. Main reason for this, according to (Owen, 1983); (Paounov, 1995) is the ability of the enterprise to achieve economies of scale. This factor at enterprise make him to be able to minimize production costs and to sell manufactured products at lower prices than its competitors.

Product differentiation is a marketing based approach of management, based on the idea that clients are vital and if enterprise make strong connection with them will have better competitiveness. The marketing managers should convince clients that consuming the products they receives an additional benefit that is missing in the consumption of competing products. Product differentiation is the ability of the enterprise to build a loyal demand for products manufactured by him.

Others authors like (Terptsra, 1994); (Chankova, 2001) "competitiveness" of the enterprise is determined by the ***availability of innovation***. (Liao, 2005) points out that the lack of innovation in the enterprise will degrade its competitiveness. According to (Ikherd and Jansen, 2002) introduction of new production technologies is key to improve the competitiveness of companies. The purpose of the introduction of new production technology has lead to higher productivity of factors of production and also minimize the production costs.

According to representatives of the institutional approach on the competitiveness of the agricultural enterprise affected asymmetry of market information, a major component of the

imperfection of the institutional environment and the specifics of agricultural enterprise as a production system. In clarifying the nature of "competitiveness" of the enterprise and its evaluation is necessary to examine the **effectiveness of management in the enterprise**. Management efficiency is one of the most important indicators of good competitiveness of the company. High performance of management, now permanently established mutually beneficial relationships with market counterparties with which minimizes market risk and improve its market position and power.

Synthesizing the expressed opinions of different groups of authors on "competitiveness" of the enterprise shows that enterprise must have the following characteristics to be in a good competitiveness: **productivity of factors of production used in production; increasing return on assets; permanent and/or increasing market share; to produce high quality products at minimal production costs; high adaptability to changes in the environment; to develop innovation; to be able to realize economies of scale; to create loyal demand for its products and to implement effective management.**

Different starting points in defining the "competitiveness" make of the different opinions of the authors of who is the crucial factor for market success. The market introduction of agricultural enterprise depends on: the effects of resource management, the effects of the management of the acquired knowledge and experience in the enterprise as well as the effects in the management of the adaptability of the enterprise to market conditions. These effects should contribute in a situation of market dominance on over its competitors.

According to (Rajaram and Fitzgerald, 2000) competitiveness of enterprise is expressed in that it has the **ability to create defensible market niches**. (Barney, 1999) indicating the presence of unique resources as a source of competitiveness. The author defines as unique those resources that have the following characteristics: scarcity value, unique and indispensability.

According to (Ling, 2000); (Gorynia, 2004) choice of **organizational form of the enterprise** determines its potential for competitiveness. This critical factor determines the ability to accumulate capital required to build a successful business model on opportunities to increase productivity of factors of production in the enterprise, the possibility of specialization, concentration and intensification of production process. Conquest of market share, to develop innovation and the degree of adaptability of the enterprise to changes in the environment.

Acquisition and storage of each factor of production generates two groups of expenditure: acquisition costs of production factors and costs for use of production factors.

The owners of production factors make these costs in order to obtain benefits, wealth, income, resulting from the operation of production factors in the production process that benefits wealth and income of enterprise and will meet its specific needs.

Referring to the hypothesis for reconciled advantage of every factor of production can be supplied for use in various industries, enterprises and regions and can have different uses. The owners of production factors in the choice of organizational form for their use in the manufacture is governed by the rules to maximize the useful effect (E).

Owners compare the benefits of the productive use of a factor in a variety of organizational forms of management, and choose the best from their point of view.

The choice of organizational form in its essence is a choice of mode of use of owned limited factors of production in one of many possible organizational forms.

Every entrepreneur is guided by two criteria in choosing the organizational form of realization - monetary (money) and non-monetary.

**Monetary criterion-** This is the income that brings the production factor involved in the production process in the organizational form of the enterprise. The owner chooses this form of organization for the realization of it owned by the production factor that brings him the greatest income. Under the highest income is understood that exceed earnings, which are obtained from alternative organizational forms.

**Non monetary criterion** -These are all other non monetary determinants that determine the choice of organizational form for the realization of owned production factor. These determinants are associated with the psychology of the individual, having a production factor. Adopted this criterion solutions are defined as irrational from the standpoint of economic efficiency of use of production factors. Only after equalization of income that brings him the individual alternative, the owner of the production factor in the choice of organizational form are not resorting to monetary criterion.

**Factors determining the competitiveness of private / family and sole / agricultural enterprises.** According to (Handler, 1989); (Dyer, 1986) family enterprise is "an organization where decisions of owners and managers take account of family ties." The reason for the emergence and spread of single-family businesses is the need to seek the realization of holdings of family factors of production in order to obtain income necessary to meet their needs. The purpose of a family enterprise is to maximize the received income from a source of the needs of family members. The main competitive advantages of the family enterprise are based on property and labor of the family. A central role in it played the family, and it is the fundamental unit of society, where members' interests coincide; extremely important socio-economic characteristics of a family enterprise is that it in an individual combines the functions of three characters - owner, developer and contractor (worker). This achieves unity between ownership and management; Detached enable enterprises to overlap the objectives of the owner, the contractor and the worker, which is vital to the motivational process. According (Lutsovand Petkov, 1993); (Doichinova, 2003) this kind of organizational forms predetermine strong to motivation for entrepreneurial process and a strong motivation to work with the contractor. In single enterprise has freedom of entrepreneurship, the choice of goals and ways to achieve them, the procurement of necessary resources, the choice for distribution of the income received by the enterprise; as private producer is guided by personal economic interest, it appears highly material incentive, carefully manage production resources occurs frugality in their spending, strive to minimize production costs, achieve lower cost of production and thus higher competitiveness; ownership of land property and other productive resources concentrated in a very strong level interests. Only the owner of the factors of production in manufacturing is the utmost interest to use them the most complete because it makes for itself. The literature found allegations that the joining of the owner, the contractor and the worker in one person is a decisive factor for the successful development of agricultural enterprise production in Western Europe and North America; contractor responsible for performance not only with capital, but with all his possessions; in single enterprise moving motive is income. He is dependent on social and market conditions. So the one-family enterprise is an effective form agricultural production only under normal market and socio-economic conditions that can ensure cost recovery and profit. The above factors determine these vital characteristics of single-family enterprises: a high degree of adaptability to changes in the environment, striving for innovation, striving

for higher productivity of factors of production. Detached enterprises have limited opportunity for socialization of production and can not benefit from economies of scale. Inadequacy of management, mostly due to insufficient professional knowledge and experience and to comply with the dynamic changes in the environment compromise on the competitiveness of these companies. Another factor limiting competitiveness sole organizational forms is the inability to share the risk in the implementation of entrepreneurial process.

***Factors determining the competitiveness of cooperative agricultural enterprises.*** According to (Stankov, 1999) cooperative as an agricultural enterprise is a system that is oriented to receive income and profit from production and sale of plant and animal products from their processing products or services rendered.

In these organizational forms relies achieve the goals is through solidarity, cooperation, collectivity. The personal interest of cooperative members gave way to self-help and mutual assistance. The motivation for the work of the members of the cooperative is defined in better management of their property by joint labor. (Ivanov, 1994) certain economic cooperation category as "joint action or behavior by operators of cooperation aimed to achieve mutually beneficial common goal." For the emergence of behavior na cooperation between the various economic operators should have the same economic interests / goals /. History has proven that cooperation is successful form of organization only if it is achieved through voluntary consent of the agricultural enterpriseers. Raiffeisen F., who was the ideologist of the comprehensive agricultural cooperative movement in Germany, formulated the basic principle of the cooperative, namely free and equal access to it. According to (Treneva, 1994) and (Lutsov, 19993). The building is built on the following principles: self - means the members of the cooperative to rely on their own strength in achieving the goals, but not necessarily seeking assistance. The building relies on the principle: the individual can not achieve as much as the team through united labor. Self-help means and autonomy, striving for economic self-sufficiency and independence; Relief - every individual in need of help, realizing their interests is a potential member of the cooperative; democracy: one member - one vote regardless of the size of the property which is involved in cooperative agricultural enterpriseer cooperative. All involved in the process of deciding on the activities of the cooperative ie Self is realized. Democracy: each member has one vote regardless of the size of the property with which he participated in the cooperative. In these circumstance allows and irrelevance and landless members have the opportunity to participate in the activities and management of the cooperative. Typical of these structures is that the number of their members is unlimited, anyone who has the desire can participate in cooperative; collectivity: in these organizational forms collectivism resist individualism. The objectives of individuals are subordinated to the objectives of the team. So individual initiative runs in total joint efforts to achieve a common goal; Freedom: The member cooperative can choose what activities to engage; personality development. Typical of these structures is that the number of their members is unlimited, anyone who has the desire can participate in cooperative; collectivity: in these organizational forms collectivism resist individualism. The objectives of individuals are subordinated to the objectives of the team. So individual initiative runs in total joint efforts to achieve a common goal; Freedom: The member cooperative can choose what activities to engage; personality development. Typical of these structures is that the number of their members is unlimited, anyone who has the desire can participate in cooperative; collectivity: in these organizational forms collectivism resist individualism. The objectives of individuals



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Summing up the review of the opinions of the authors (Treneva and Trendafilov, 1999); (Stankov, Lutsov., Zinda, 1994) and (Alexandrov, 1992) – “the nature of the cooperation established that this is a business enterprise that aims to increase the income of its members and to develop their economy. The cooperative has set specific business objectives to the benefit of member cooperative. The cooperative operates through joint performance of the activity. Income distribution in this enterprise has democratic character.

Specific relationships between member - the agricultural enterpriseers who are owners, managers and workers in the production building set within the competitiveness of the cooperative. The production building has the following sources of competitive advantages: socialization of production factors owned by the members of the cooperative determines economies of scale, which is distributed fairly between them and increases their motivation to work; high degree of adaptability to changes in the environment, driven by the possibility of diversification of production; It creates an opportunity for the introduction of innovative products into production; create conditions for increasing specialization and qualification; creates conditions for increasing the concentration and intensification of production;

Despite the many advantages, the competitiveness of cooperatives is limited by: the type (model) of the cooperative in wrong made model, the cooperative could prove uncompetitive; democracy (one member - one vote regardless of the size of the equity contribution) in the management of these structures creates conditions for low motivation for entrepreneurship and labor compared to other organizational forms and delays making management decisions; slower development of innovation compared to other organizational forms; greater social focus of the cooperative, to satisfy the needs of cooperative member, cause under adverse economic conditions to worsen its economic efficiency, reducing its competitiveness; creates opportunity for corruption among its management,

***Factors determining the competitiveness of agricultural enterprises – Companies Ltd.*** In modern conditions in the majority of these organizational forms there is a division between ownership and management ie these organizational forms clearly distinguish these characters - owners of the enterprise managers and workers who follow their own purposes.

Specific relationships between three characters (owners, managers and workers) in joint stock companies formed the competitive advantages of these structures but also set limits to their competitiveness. These organizational forms allow for the accumulation of substantial financial capital through the issuance and sale of shares, which is a prerequisite for building large-sized production facilities, enabling the realization of economies of scale. Major financial capital is used to build barriers to new competitors in the sector, thus maintaining and increasing market share; Krupp financial capital makes it possible to build cost leadership and product differentiation of our products; the possibility of higher income workers which ceteris paribus increases their motivation to work; a large number of shareholders (owners now) to promote risk sharing by the enterprise on a substantial number of persons,

which determines the choice of high-risk industries where profitability is higher; it is possible to implement a system of total quality production; Krupp capital of public limited companies allows management to create competitive advantages through lobbying of government and other organizations. Despite the large number of advantages, joint stock companies have the following disadvantages: due to the high specialization, intensification and concentration of production, caused by the large amount of financial capital, they have high adaptability to changes in the environment, as other forms of organization; their large size complicates their management. High specialization and concentration of capital in these forms in elasticity limit of the production. As is known, the elasticity of production is greater as higher share of variable costs of total production costs, which are protruding optimization costs and consequently, the smaller the share of fixed costs. With the increasing intensification of production in the enterprise occurs displacement ratio of variable to fixed costs as higher saturation capital is associated with a high level of fixed costs, and greater specialization - lower-level variables costs.

***Effectiveness of management of competitiveness of the agricultural enterprise.*** There are many criteria for evaluating the effectiveness of management of the competitiveness of the agricultural enterprise. We believe that when assessing the effectiveness of management is imperative to use the criteria to minimize market risk. This is necessary in view of the increasing competition in the market as a result of which increased market asymmetry among market agents.

The management of agricultural enterprise seeks to use a system of contracts for the provision of production inputs and sale of finished products in order to minimize market risk. To achieve this, made transaction costs. These expenses are presented as "economic line of friction in physics", ie they take into account the asymmetry of market information (varying degrees of awareness of market participants in the exchange) and the impact of institutional environment on the exchange of goods on the market. (Coase, 1937) defines transaction costs as costs of carrying out transactions through exchange open market. According to (Barzel, 1997); (Douglas, 2000) transaction costs associated with the transfer and establishment of the protection of ownership of the factors of production and goods.

(Arrow, 1997) defines transaction costs as expenses necessary for the operation of the economic system enterprise. (McEachern, 1989) and (Eggertsson, 1990) define them as the price of time and information necessary for the implementation of trade on. According to (Tapscott and Tico, 2001) transaction costs consist of three types of costs: Cost of study - the reason for their existence is information asymmetry in the market, which is expressed in the fact that not all market participants are equally informed. Costs of negotiation - these are the costs of negotiating the deal between the company and its contractors. Coordination costs - these are the costs of coordinating the resources and processes required to implement the agreed deal. According to (Matthews, 1986) production costs are being made for the actual implementation of a contract, and include transaction costs for its conclusion. In this connection (Todorova, 2004) notes that the production and transaction costs coexist in the economic activity of the enterprise and together form the full economic costs. The latter shall be subject to optimization in order to maximize the profits of the enterprise. Hence the essence of effective management of the enterprise is to optimize the size of the transaction costs that are part of the full economic cost. While production costs can be optimized when their size is minimized in the applied technology, it does not apply to transaction costs. Transaction costs actually reflect a price management of the enterprise pays to minimize risks when negotiating deals. The optimization of these costs is

achieved by minimizing the size. Therefore, the optimal size of transaction costs is one in which minimize market risk by agreeing to the terms of exchange of goods and resources. Hence the optimal size of transaction costs is one that achieves durable mutually beneficial market behavior between the enterprise and its partners.

### CONCLUSION

It has become clear that the competitiveness is a complicated and complex economic category. This determines the difficulty in determining the performance assessment. In the literature there is no uniform opinion on the number and composition of indicators to assess the competitiveness of enterprise. This stems mainly from differences in the opinions of the authors of the nature of the economic category "competitiveness". On the one hand there is a desire for maximum characterize the competitiveness of the company. This leads to excessive expansion in the number of proposed indicators to assess, which in turn hinders their practical use. On the other hand there is a desire to develop a separate indicator, which easily and quickly measures the aggregate competitiveness of the company.

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## THE ROLE OF BIO ECONOMY IN REGIONAL DEVELOPMENT OF BULGARIA

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### ABSTRACT

Europe faces challenges of sufficiency, competitiveness and social and environmental sustainability. Global challenges like climate change, land and ecosystem degradation, coupled with a growing population force us to seek new ways of producing and consuming that respect the ecological boundaries of our planet. At the same time, the need to achieve sustainability constitutes a strong incentive to modernise our industries and to reinforce Europe's position in a highly competitive global economy, thus ensuring the prosperity of its citizens. To tackle these challenges, we must improve and innovate the way we produce and consume food, products and materials within healthy ecosystems through a sustainable Bio economy. The aim of the current article is to tackle the role of Bio economy in regional development of EU member states.

**KEY WORDS:** bio economy, circle economy, regional development, strategy, sustainable development

### ABSTRAKT

Europa steht vor Herausforderungen in Bezug auf Suffizienz, Wettbewerbsfähigkeit sowie soziale und ökologische Nachhaltigkeit. Globale Herausforderungen wie der Klimawandel, die Verschlechterung der Böden und der Ökosysteme in Verbindung mit einer wachsenden Bevölkerung zwingen uns, nach neuen Produktions- und Verbrauchsmethoden zu suchen, die die ökologischen Grenzen unseres Planeten respektieren. Gleichzeitig stellt die Notwendigkeit, Nachhaltigkeit zu erreichen, einen starken Anreiz dar, unsere Industrien zu modernisieren und die Position Europas in einer äußerst wettbewerbsfähigen globalen Wirtschaft zu stärken und so den Wohlstand seiner Bürger zu sichern. Um diese Herausforderungen zu bewältigen, müssen wir die Art und Weise, wie wir Lebensmittel, Produkte und Materialien innerhalb gesunder Ökosysteme produzieren und verbrauchen, durch eine nachhaltige Biowirtschaft verbessern und innovieren. Ziel des vorliegenden Artikels ist es, die Rolle der Bioökonomie in der regionalen Entwicklung der EU-Mitgliedstaaten zu untersuchen.

**STICHWORTE:** Bioökonomie, Kreislaufwirtschaft, regionale Entwicklung, Strategie, nachhaltige Entwicklung

### RÉSUMÉ

L'Europe est confrontée aux défis de la suffisance, de la compétitivité et de la durabilité sociale et environnementale. Les défis mondiaux tels que le changement climatique, la dégradation des sols et des écosystèmes, associés à une population croissante, nous obligent à rechercher de nouveaux modes de production et de consommation qui respectent les limites écologiques de notre planète. En même temps, la nécessité de parvenir à la durabilité constitue une forte incitation à moderniser nos industries et à renforcer la position de l'Europe dans une économie mondiale hautement compétitive, assurant ainsi la prospérité de ses citoyens. Pour relever ces défis, nous devons améliorer et innover la manière dont nous

produisons et consommons les aliments, les produits et les matériaux au sein d'écosystèmes sains grâce à une bioéconomie durable. L'objectif de cet article est d'aborder le rôle de la bioéconomie dans le développement régional des États membres de l'UE.

**MOTS CLÉS:** bioéconomie, économie circulaire, développement régional, stratégie, développement soutenable

## INTRODUCTION

The Updated European Bio Economy Strategy (European Commission, 2018) argues the need for addressing more effectively the existing societal challenges such as climate change, land and ecosystem degradation, growing population and decreasing food nutrition and safety by improving and modernising the way we produce and consume food, products and materials within healthy ecosystems through a sustainable Bio economy.

The Bio economy (BE) covers all sectors and systems that rely on biological resources (animals, plants, micro-organisms and derived biomass, including organic waste), their functions and principles (McCormick and Kautto, 2013). It includes and interlinks: land and marine ecosystems and the services they provide; all primary production sectors that use and produce biological resources (agriculture, forestry, fisheries and aquaculture) (Nikolov, Borisov, Radev, and Boevski, 2020); and all economic and industrial sectors that use biological resources and processes to produce food, feed, bio-based products, energy and services (Antikainen, 2017). Targeted policies in the field of Bio economy will help addressing the three major challenges faced by the building-blocks sectors of the Bio economy today: ensuring viable food production in response to their growing global demand; ensuring sustainable management of natural resources and climate action and balanced development of rural areas and their communities (Bennich, Belyazid, Kopainsky and Diemer, 2018).

However, the analysis shows that many regions in Europe (35.7%) have a **low level of Bio economy maturity**, i.e. they cannot fully exploit the potential (i.e. jobs, growth, resource efficiency, rural development) of the Bio economy on their own. Therefore, a further development is needed e.g. in a coordinated support from the EU level to cities and regions in strategic planning and communication within a streamlined and integrated EU strategy and policy framework for Bio economy. Also the knowledge exchange between Member States and regions should be supported/encouraged (Spatial Foresight, 2017).

The **European Strategy for Bio economy** (European Commission, 2018) takes into account the national and regional specific factors that contribute to the adoption and adaptation of the Strategy in national legislations. The diversity of aspects of the Bio economy chosen as a focus by the different Member States most often follows the 'smart specialization' approach, which is in line with EU policies. The EC analysis shows that there is no unique "Bio economy plan" to be followed, but rather a variety of "bio economies" that are being developed at national and regional level. Their development depends on national and regional conditions, including not only the type and form of available biomass (e.g. wood, agricultural products, marine products, waste, etc.) but also infrastructures, markets, know-how and investment capacity, etc. For instance, low Bio economy added value in the Central and Eastern European countries is at odds with their high, and, compared to other European regions, yet underutilised biomass potential.



The systemic and cross-cutting nature of new and emerging Bio economy approaches and new value chains will need **new education and skills** (Reime, Almasi and Coenen, 2016.); (Borisov, Nikolov, Radev and Boevski, 2020). These must be adapted to different needs across Bio economy sectors (e.g. at the interface of agrology, bio refining, ecology and other disciplines), to be capable of responding quickly and flexibly to the emerging and ever-growing needs of the Bio economy. The piloting of vocational and higher education curricula, the involvement of social partners and the development of entrepreneurship programmes will contribute to this action.

The aim of the current article is to tackle the role of Bio economy in regional development of EU member states.

## **RESULTS AND DISCUSSION**

Europe faces challenges of sufficiency, competitiveness and social and environmental sustainability (Rezezar, Borisov, Radev and Osmani, 2019). Global challenges like climate change, land and ecosystem degradation, coupled with a growing population force us to seek new ways of producing and consuming that respect the ecological boundaries of our planet. At the same time, the need to achieve sustainability constitutes a strong incentive to modernise our industries and to reinforce Europe's position in a highly competitive global economy, thus ensuring the prosperity of its citizens. To tackle these challenges, we must improve and innovate the way we produce and consume food, products and materials within healthy ecosystems through a sustainable Bio economy (European Commission, 2018). In parallel, there is a growing need for establishment of coherent research and innovation (R&I) programs in response to recent international political drivers, such as the UN SDGs and the COP 21 climate commitments. Future research agenda will continue to prioritize strategies for sustainable and inclusive economic development including patterns of consumption and production by mobilizing scientific and innovation capacity, taking into account the implementation of the ten-year framework of Sustainable Consumption and Production Models (Resolution of the UN General Assembly, 2015), the Energy Union Package adopted in 2015, the outcome of the 2015 Paris climate conference, the EU's 2030 climate framework, the Circular Economy Package and the CAP.

Agriculture, forestry, fisheries and aquaculture are an integral part of the European (bio)economy and society (Ramcilovic-Suominen and Pülzl, 2018). These sectors produce and process biological resources under conditions of limited natural resources to meet consumer demand and a wide range of food industries, feed, bioenergy and organic products. While increasing food security in Europe as regards the availability, access, use and stability of products and food and providing jobs and business opportunities that are essential for rural, coastal and maritime regions, these sectors face significant challenges that require solutions based on research and innovation. They also cover healthy nutrition and quality of life, the impact of global climate change, the loss of biodiversity, the depletion of natural resources of major importance for agriculture and the new ethical requirements for food producers (Nikolov, Borisov, and Radev, 2014). These challenges call for the creation of new, adapted green farming technologies and innovations for the modernization and efficiency of the agrarian sector and food chains (D'Amato, 2017).

Bringing these industries into line with key national, regional and international processes is crucial, as the means to overcome malnutrition and address societal challenges in this respect depend on a wide range of conditions. Nutrition systems are no longer limited to the production and supply of enough food for everyone, and include the provision of a safe and healthy diet for urban and rural consumers. Scientific

research until 2030 and beyond (e.g. FOOD 2030 Research and Innovation Agenda, 2016) will play a key role in enhancing the sustainability, ethics and diversity of nutrition systems and the inclusion of civil society in them, solutions to food waste (1.3 billion tons per year) and global biodiversity loss (nearly 60%).

**The role of the Bioeconomy concept.** The Bioeconomy (BE) covers all sectors and systems that rely on biological resources (animals, plants, micro-organisms and derived biomass, including organic waste), their functions and principles (El-Chichakli, Braun, Lang, Barben and Philp, 2016.). It includes and interlinks: land and marine ecosystems and the services they provide; all primary production sectors that use and produce biological resources (agriculture, forestry, fisheries and aquaculture); and all economic and industrial sectors that use biological resources and processes to produce food, feed, bio-based products, energy and services. To be successful, the European Bio economy needs to have sustainability and circularity at its heart (Figure 1). This will drive the renewal of our industries, the modernisation of our primary production systems, the protection of the environment and will enhance biodiversity (European Commission, 2018).

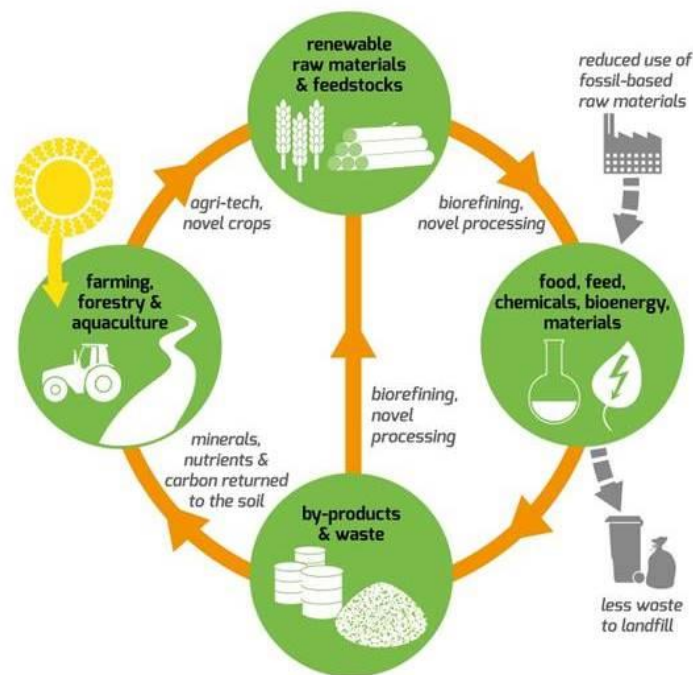


Figure 1. The Bio economy concept (source: BioVale, 2018)

Bio economy is a key to Europe as it represents an annual turnover of around € 2 trillion and provides employment for some 22 million people, a large number of which are located in rural and coastal areas. Agriculture and forestry play an important role in the bio-economy in the context of the EU's ambitious climate and energy goals by 2030 and rural development (Commission Communication on the Future of Food and Agriculture, 2018). The Bio economy goes beyond traditional uses of resources and includes new and innovative bio-based products, such as biochemical, bioplastics or biopolymers, green chemistry. New bio-based technologies can also help to make better use of waste and the recovery of resources, such as nutrients, thereby contributing to resource efficiency and circularity.

The development of Pan-European and national bio-economies has been a focus of the Commission over the last two years (EU Bio-Economy Roadmap, 2017, the EU Communication on the Future of Food and Farming (2017), the EU Biodiversity Strategy Mid-Term Review (2015).

The review of the EU Bio economy strategy was made in 2018 ([http://ec.europa.eu/research/Bioeconomy/pdf/review\\_of\\_2012\\_eu\\_bes.pdf#view=fit&pagemode=none](http://ec.europa.eu/research/Bioeconomy/pdf/review_of_2012_eu_bes.pdf#view=fit&pagemode=none)), which provides:

- mechanisms and instruments to strengthen the inclusion of primary producers (farmers and foresters) in new Bio economy value-chains in rural areas to reduce depopulation by creating jobs and business opportunities based on modern digital technologies and innovative business practices.
- future policy framework of the Bio economy to all Member states (MS) to realize potential of EU farmers, foresters and rural areas.
- guidelines to national governments, especially in the MS-13 countries, of possible actions to support the uptake of the Bio economy in rural areas and to assure larger adoption in the national economies.

Targeted policies in the field of Bio economy will help addressing the three major challenges faced by the building-blocks sectors of the Bio economy today: ensuring viable food production in response to their growing global demand; ensuring sustainable management of natural resources and climate action and balanced development of rural areas and their communities.

Four priority areas should be addressed:

- **Productivity: Sustainable increase of biomass production**, by becoming competitive and leading high-quality food and feed producers worldwide;
- **Sustainability: Developing biodiversity and biosecurity**, by maintaining and strengthening natural values and defending the rest of Europe from the transboundary plant and animal diseases;
- **Resource efficiency: Circular and value-added use of the available biomass**, by becoming key players in the development of new bio-based value chains;
- **Rural development: Increasing viability and attractiveness of rural areas and society**, by developing an innovative, inclusive, climate-ready and sustainable Bio economy growth model by 2030.

**The regional character of Bio economy.** The European Commission and the national government recognises the necessity to improve the synergies between the EU and the Member States on the development of the core Bioeconomy sectors such as agri-food chains, forestry and fishery chains, and the functionality of mechanisms and instruments for more effective uptake of innovation technologies, e.g. through:

- **Inclusiveness:** Macro-regional, National and Regional / local levels of involvement targets all relevant players and stakeholders such as national ministries, regional authorities, international organisations and initiatives, research organisations, academia, universities, the private sector, non-governmental organizations and the general public.

- **Scale:** Different types of action to be taken at different levels, as regards to geographical coverage, critical mass of Bio economy experts and workers, joint funding, coordination of national/regional efforts or the use of EU /national instruments.
- **Alignment:** Boosting the participation in already existing joint programming initiatives in the Bio economy (through the ERANETs, JPIs, EJPs, or bi-lateral programmes, etc.) or launch new actions (if necessary) based on the needs of the MS-15 and MS-13 countries, e.g. know-how transfer, capacity building, education and training, etc.).
- **Investing:** In the Bio economy, including new food value-chains for e.g. digitalized primary production, circular and resource-efficient technologies, environmentally-friendly and consumer-friendly end-products and foods, technologies for sustainable supply of cities, tools for better risk management, etc.
- **Liaising:** by easing the collaborative networks between sectors such as Agriculture/Food, Transport, Environment, Regional Development, Education and Research and Innovation, e.g. consortiums between MS-15 and MS-13 countries.
- **Capacity building:** by a know-how transfer within the EU on standards and regulations for setting up and functioning of an innovative EU system for (secondary, tertiary, administration) education in Bio economy, especially focused on regional specialization realms such as Food Systems.
- **Enabling:** by setting up targeted EU and nationally-specific Information and Communication Campaign for larger society, i.e. consumers and consumer groups, business and industry, regional administration, etc.

Diverse **needs and bottlenecks** on their way to further deploy the Bioeconomy have been identified by the regions and countries analysed (Spatial Foresight, 2017):

- Needs related to strategic planning and governance,
- Needs related to value chain/cycle development, in particular SME engagement,
- Needs related R&I on technologies, knowledge transfer, education and new Bioeconomy skills,
- Needs related coordinated funding and synergies between instruments,
- Needs related to public awareness and acceptance,
- Bottlenecks related to external factors.

The analysis shows that many regions in Europe (35.7%) have a **low level of Bioeconomy maturity**, i.e. they cannot fully exploit the potential (i.e. jobs, growth, resource efficiency, rural development) of the Bioeconomy on their own. Therefore, a further development is needed e.g. in a coordinated support from the EU level to cities and regions in strategic planning and communication within a streamlined and integrated EU strategy and policy framework for Bioeconomy. Also the knowledge exchange between Member States and regions should be supported/encouraged (Spatial Foresight, 2017).

**The EU and Bulgarian political agenda.** In the autumn of 2018, The European Commission updated the European Bio Economy Strategy (European Commission, 2018<sup>2</sup>). in order to respond to the current policy priority needs. In line with the new EU policies, the evolved objectives of the updated European Bio Economy Strategy are the following:

1. **Ensuring food security.** Food and farming systems are a fundamental part of the Bio economy, but they urgently need to be transformed to become more sustainable, nutrition-sensitive, resilient

and inclusive in view of a growing world population, climate change and other environmental challenges, including water scarcity and loss of biodiversity and of productive land.

**2. Managing natural resources sustainably**, as central for a Bio economy whose parts are increasingly interlinked. More than ever, a circular Bio economy depends on an efficient and sustainable use of biological resources, against the backdrop of an increasing demand for biomass. The European Bio Economy Strategy aims to restore and enhance ecosystems, for instance addressing the root causes of the declining health of global oceans and the collapse of biodiversity.

**3. Reducing dependence on non-renewable resources**, including replacing fossil fuels. Today, bioenergy is the EU's largest renewable energy source, and it is expected to remain a key component of the energy mix in 2030. Moreover, a scaled-up and strengthened bio-based sector can do more than non-renewable substitution: it can support the renewal of the EU industrial base; it can contribute to the greening of industrial products; and it can help to systematically turn bio-waste and discards into value, thus achieving circularity.

**4. Mitigating and adapting to climate change**, by combining enhanced ecosystems services with a renewed bio-based industrial base reducing energy demand and lowering emissions, and with the provision of a more resource efficient, sustainable primary production on land and sea. A sustainable Bio economy has a pivotal role in reducing pressures on major ecosystems such as oceans, forests and soils to a level

respecting all planetary boundaries, and support their pivotal role for balanced nutrient cycles and as carbon sinks.

**5. Creating jobs and maintaining European competitiveness.**

Deploying a sustainable Bio economy will support competitiveness by capitalising on advances in life sciences and biotechnologies, as well as innovations merging the physical, digital and biological worlds, in some of the EU's most significant sectors and industries. A more proportionate sharing of the benefits of a competitive and sustainable Bio economy among primary producers could benefit job creation at a local level.

**The EU Budget for the Future 2021-27 foresees that EUR 10 billion is invested for research and innovation in food, agriculture, rural development and the Bio economy** (European Commission, 2018<sup>2</sup>), as compared to the current EUR 3.85 billion in Horizon 2020 Societal Challenge 2 (Food, sustainable agriculture and forestry, marine, maritime and inland waters research, and the Bioeconomy). This unprecedented level of commitment needs an equivalent level of responsibility in ensuring that these investments deliver a sustainable Bio economy across the EU. These EU investments will be closely coordinated with and ideally complemented by the European Regional Development Fund and similar efforts at national and regional level, as well as with the public and private sectors. Importantly, the Action Plan will promote the involvement of stakeholders across the entire value chain in Research and Innovation to ensure that research and innovation are co-designed with the future users of its results.

The European Strategy for Bio economy (European Commission, 2018) takes into account the national and regional specific factors that contribute to the adoption and adaptation of the Strategy in national legislations. The diversity of aspects of the bio-economy chosen as a focus by the different Member States most often follows the 'smart specialization' approach, which is in line with EU policies (see also **Annex 1**, EU policies relevant for the Bio economy)

The EU analysis shows that there is no unique "Bio economy plan" to be followed, but rather a variety of "bio-economies" that are being developed at national and regional level. Their development depends on national and regional conditions, including not only the type and form of available biomass (eg wood, agricultural products, marine products, waste, etc.) but also infrastructures, markets, know-how and investment capacity, etc.

In the territorial agenda that focuses on the territorial dimension of **European Cohesion Policy and the Europe 2020 Strategy**, the following challenges and threats to the regions are highlighted:

- Growing globalization: the structural changes following the global economic crisis;
- Changes in the integration of the European Union and the growing internal dependencies between the regions;
- Demographic situation in different territories. social challenges and the isolation of vulnerable groups;
- Climate change and environmental risks: impacts in individual geographic areas;
- The energy challenges that are intensifying and threaten regional competitiveness;
  - Loss of biodiversity, endangered species, risks to the landscape and cultural heritage.

The relative contribution of primary sectors to the EU Bio economy is significantly lower in terms of value added (33%) than in terms of the number of persons employed (55%) (European Commission, 2018<sup>2</sup>). This is clearly reflected at national level too, where several EU countries have a high share of jobs in the Bio economy, however with a comparatively low resulting added value, mainly due to a predominance of employment in the less productive sectors. Figure 1 reveals a rather heterogeneous geographical contribution to the EU Bio economy at Member State level. In particular, low Bio economy added value in the Central and Eastern European countries is at odds with their high, and, compared to other European regions, yet underutilised biomass potential.

In the **"Actions leading the way towards a sustainable, circular Bio economy"** (European Commission, 2018), the Commission states that in order to support the five objectives in the context of evolved policy priorities, this updated strategy proposes three main action areas:

- strengthen and scale-up the bio-based sectors, unlock investments and markets
- deploy local bio economies rapidly across Europe;
- understand the ecological boundaries of the Bio economy.

In regards to these actions, the Commission foresees:

1. Active support and promotion of all types of innovations and practices for sustainable food and farming systems, forestry and bio-based production through a systemic and cross-cutting approach linking actors, territories and value chains. According to the Strategic Deployment Agenda, the systemic approach will address, amongst others, the following areas:

- **Future proofing food and farming systems** (terrestrial and aquatic) by addressing e.g. food waste, losses and by-products (including nutrient recycling), resilience, the need for nutrition-sensitive food production, more food from the sustainable use of seas and oceans with increased share of EU aquaculture production and market uptake.
- **Bio-based innovations** including in farming, to develop new chemicals, products, processes and value chains for bio-based-markets in rural and coastal areas, with involvement and increased benefits for primary producers.

- **New opportunities arising for the forestry sector** in view of replacing non-sustainable raw materials in construction, packaging with bio-based materials and for providing more sustainable innovations in sectors such as forestry-based textiles, furniture and chemicals, and new business models based on the valuation of forestry ecosystem services.
  - **Specific interventions will be developed under the Common Agricultural Policy (CAP)** to support inclusive bio economies in rural areas. The aim is to better link national Bio economy strategies and national strategic plans under the CAP (including via dissemination of best practices among actors).
  - **The Urban bio economies pilot** will enable 10 European cities to turn organic waste from a societal problem into a valuable resource for the production of bio-based products. Furthermore, the rehabilitation of brownfields and application of Circular-Bio economy processes and technologies within urban areas should be further developed to diversify the sustainable sourcing of biomass and to create new business opportunities.
  - **"Living labs"** will be set-up to develop and test place-based innovations based on ecological approaches and circularity in primary production and food systems. This will allow adapting innovations to site-specific needs, involving the relevant stakeholders and facilitating their further adoption and deployment.
2. The systemic and cross-cutting nature of new and emerging Bio economy approaches and new value chains will need **new education and skills**. These must be adapted to different needs across Bio economy sectors (e.g. at the interface of agronomy, bio refining, ecology and other disciplines), to be capable of responding quickly and flexibly to the emerging and ever-growing needs of the Bio economy. The piloting of vocational and higher education curricula, the involvement of social partners and the development of entrepreneurship programmes will contribute to this action.
  3. Understand the ecological boundaries of the Bio economy.

Enhancing the knowledge base and understanding of specific Bio economy areas, in attempt to address the pressures on the environment, enhance values and protect biodiversity and enhance the full range of ecosystem services, more in-depth knowledge of the sustainable biomass supply limits at the local, regional and global level. The process will include forward looking, cross-sectoral assessments, modelling and scenarios. Progress in the Bio economy will be systematically monitored for a responsible and inclusive governance and coherent policy-making. The status of biodiversity, ecosystem, degraded land areas and land at risk of climate change impacts, such as desertification will also be monitored, to restore land based and marine ecosystems. Knowledge gained will be used to provide voluntary guidance for operating the Bio economy within safe ecological limits (Action 3.3). The benefits from biodiversity-rich ecosystems will be better integrated in primary production through a specific support to agro-ecology, the development of microbiome-based solutions, new tools to integrate pollinators in value chains and specific support for agro-ecology (Action 3.4). The data and information generated in these actions will be made publicly available through **the Knowledge Centre for Bio economy**.

In addition, in order to ensure regionally-adapted sustainable **Food and Nutritional Systems (FNS)** in the long term, it requires adopting a **food systems approach** underpinned by sustainability, linking land and sea, and encompassing the entire '**food value chain**' (Fabri K., 2018).

Such an approach should include:

- the sustainable use of land, soil, inland and marine waters, and biodiversity as providers of ecosystem services upon which food production relies;
- primary production practices of agriculture, aquaculture and fisheries providing food and animal feed, including production-specific inputs of nutrients, energy, seeds, plant protection issues, and equipment, harvesting, and storage;
- food processing of primary and value-added food and feed products, including packaging, distribution and logistics;
- food preparation and consumption, as well as;
- the handling of food and related non-food waste streams.

However, a number of issues need attention at national and regional level level in Bulgaria in relation to Bio economy and FNS, such as:

- Food and Nutritional Systems (FNS) are still not taken from a system point of view (e.g. at different scales such as national, regional, urban or rural)
- Absence of a national strategy on Bio economy and the FNS and as an integral and important part of the wider Bio economy context
- Insufficient financing of research and innovation sector, e.g. University (young) scientists have low motivation to research and innovate in the field of Bio economy, which is coupled with R&I capacities lagging behind the leading EU, with business discouragement to invest and grow, “brain-wash” and migration, etc.
- Food and nutritional policies, which are the core of the Bio economy, are led by different Ministries, which often produce incoherent framework and lack tangible targets.
- Nutrition and health of consumers are not systematically linked to bio-based resources, food processing and packaging, recycling, etc.
- FNSs are not perceived as a common denominator in the Rural Development Programme (RDP).

**The Innovation Strategy for Intelligent Specialization (ISIS) of Bulgaria.** Based on business proposals, established and declared interest in international projects, including Horizon 2020, on the basis of an assessment of international trends and market potential, four thematic areas, specifying specific product and technology niches, services and industries are defined:

- Information and communication technologies,
- Mechatronics and clean technologies,
- Healthy life and biotechnology industries,
- New technologies in creative (creative) and recreational industries.

Strategic goal: By 2020, Bulgaria should move from the "incomplete" group 3 to the group of "moderate innovators".

In practice, this change in indicators will be achieved through an effective policy to promote:

- innovation, research and human capital development,
- investing in high-tech areas, where Bulgaria has traditions, created specialists and successfully competed on the international market,
- Emerging export-oriented industries.



The strategic goal will be realized with the achievement of operational objectives: Objective 1: Focusing investments to develop innovation potential in the identified thematic areas (to create and develop new technologies leading to competitive advantages and increasing the added value of national products and services).

The National Concept for Spatial Development by 2025 takes these challenges into consideration and emphasizes the role of **urban centers** as a key factor for sustainable economic growth. Integrated Urban Recovery and Development Plans have been developed in targeted areas with potential for economic development. The idea is for these areas to become attractive centers in the future, both for external investors in industrial development, for clusters and for innovation cooperation. Some of these cities have the potential to become "smart cities", including the European Innovation Partnership on Smart Cities and Communities (EIP-SCC).

## CONCLUSION

Taking into account the above-described trends in the regional aspects of the Bio economy, it is imperative to seek synergy with Regional Innovation Development Strategies as part of the overall Regional Development Strategies because they aim to attract public and private resources for research and innovation embedded in industrial systems with platforms in economic zones, taking into account continuous progress. The regional innovation developments are geared towards addressing the underlying causes of the country's untapped potential in the field of innovation - low public and private investment in research and development, "brain drain", inadequate interdependence of scientific excellence and industry needs, structuring the funding of research from institutional to project and program funding, the need for clear vision and priorities addressing regional needs and opportunities, e.g.:

- Established and emerging clusters

Potential as well as existing clusters at different stages of their life cycle will require support in a variety of areas, including raising management and entrepreneurial skills, as well as investment support. Otherwise, most of them may never reach the level of development, efficiency and innovation of the EU-15 clusters.

The total number of existing clusters currently in Bulgaria is 190 (according to European commission). Business clusters can be used as regional intelligent specialization locomotives in Bulgaria because they include the real elements of the innovation infrastructure in the regions. Moreover, the development and creation of new clusters are prerequisites for developing the links between education, training and business. Clusters can contribute to establishing the competency standards required by different professions.

The location of vocational schools and relevant universities with their research and education programs play an important role in cluster development.

Potential for development and future support can be found in clusters with typical "Bulgarian characteristics", for example in the food industry such as the cluster "Bulgarian yoghurt" involving export of technologies, equipment and services for production of yogurt, or the cluster "Bulgarian rose oil" involving development of cosmetic- perfumery industry on the basis of efficient production of Bulgarian

rose oil, or the cluster "Production of electricity from biomass" involving development of technologies and production of equipment for generating electricity from different biomass.

The low-tech group covers economic activities related to the production of food, beverages, tobacco, textiles, clothing, leather goods, wood, furniture and services such as commercial, land transport, hotel services, restaurants, real estate, tour operator activities, reservations, repairs of computer equipment, etc. The group employs about 1.5 million people, including about 350,000 souls in production, and just over 1 million in services. This is the group of economic activities and services that generates maximum employment and is characterized by a relatively good regional specialization in the food, wood, furniture, textiles and clothing industries. Most of these activities are fundamental to the national Bio economy or are dependent on it. The presence of regional specialization and the density of enterprises is the basis for the implementation of cluster policy in the respective economic activities.

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