

XXVII INTERNATIONAL
ECO-CONFERENCE®
27th-29th SEPTEMBER 2023

ENVIRONMENTAL PROTECTION
OF URBAN AND SUBURBAN
SETTLEMENTS

PROCEEDINGS

ECO-CONFERENCE® 2023



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NOVI SAD, SERBIA

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of Novi Sad**



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THE ECOLOGICAL MOVEMENT OF THE CITY OF NOVI SAD:

AN IMPORTANT DECISION OF ITS PROGRAMME COUNCIL

Since 1995, the Ecological Movement of the City of Novi Sad organizes „EcoConference® on Environmental Protection of Urban and Suburban Areas”, with international participation. Twelve biennial conferences have been held so far (in 1995, 1997, 1999, 2001, 2003, 2005, 2007, 2009, 2011, 2013, 2015, 2017, 2019, and 2021.).

Their programs included the following environmental topics:

Session 1: Environmental spheres: a) air, b) water, c) soil, d) biosphere

Session 2: Technical and technological aspects of environmental protection

Session 3: Sociological, health, cultural, educational and recreational aspects of environmental protection

Session 4: Economic aspects of environmental protection

Session 5: Legal aspects of environmental protection

Session 6: Ecological system projecting (informatics and computer applications in the field of integrated protection)

Session 7: Sustainable development of urban and suburban settlements ecological aspects

Conference participants have commended the scientific and organizational levels of the conferences. Conference evaluations have indicated that some aspects are missing in the conference program. In addition, since a team of conference organizers was completed, each even year between the conferences started to be viewed as an unnecessary lag in activity.

Eco-Conference® on Safe Food

With the above deliberations in mind, a decision was made that the Ecological Movement of the City of Novi Sad should embark on another project – the organization of Eco-Conferences® on Safe Food. These Conferences were planned to take place in each even year. Preparations for the first Eco-Conferences® on safe food started after the successful completion of the Eco-Conference® '99. So far ten Eco-Conferences® have been held (in 2000, 2002, 2004, 2006, 2008, 2010, 2012, 2014, 2016, 2018, 2020, and 2022.) focusing this general theme.

Theme of the Eco-Conference®

By organizing the Eco-Conference® on Safe Food, the organizer wishes to cover all factors that affect the quality of human living. Exchange of opinions and practical experiences should help in identifying and resolving the various problems associated with the production of safe food. Since 2007 Eco-Conference® gained five times in a row, a sponsorship from UN and their sectorial organizations (UNESCO and UN-FAO) and became purely scientific Conference.

Objectives of the Eco-Conference®

- To acquaint participants with current problems in the production of safe food.
- To make realistic assessments of the causes of ecological imbalance in the conventional agricultural production and the impact of various pollution sources on the current agricultural production.
- Based on an exchange of opinions and available research data, to make long-term strategic programs of developing an industrialized, controlled, integral, alternative and sustainable agriculture capable of supplying sufficient quantities of quality food, free of negative side effects on human health and the environment.

Basic Topics of the Eco- Conference®

Basic topics should cover all relevant aspects of the production of safe food. When defining the basic topics, the intention was to itemize the segments of the production of safe food as well as the related factors that may affect or that already have already been identified as detrimental for food safety and quality. The topics include ecological factors of safe food production, correct choice of seed (genetic) material, status and preparation of soil as the basic substrate for the production of food and feed, use of fertilizers and pesticides in integrated plant protection, use of biologicals, food processing technology, economic aspects, marketing and packaging of safe food. To paraphrase, the envisaged topics cover the production of safe food on the whole, individual aspects of the production and their mutual relations, and impact on food quality and safety.

Sessions of the Eco- Conference®

1. Climate and production of safe food.
2. Soil and water as the basis of agricultural production.
3. Genetics, genetic resources, breeding and genetic engineering in the function of producing safe food.
4. Fertilizers and fertilization practice in the function of producing safe food.
5. Integrated pest management and use of biologicals.
6. Agricultural production in view of sustainable development
7. Production of field and vegetable crops.
8. Production of fruits and grapes.
9. Livestock husbandry from the aspect of safe food production.
10. Processing of agricultural products in the framework of safe food production.
11. Economic aspects and marketing as segments of the production of safe food.

12. Food storage, transportation and packaging.
13. Nutritional food value and quality nutrition.
14. Legal aspects of protecting brand names of safe food.
15. Ecological models and software in production of safe food.

Attempts will be made to make the above conference program permanent. In this way will the conference become recognizable in form, topics and quality, which should help it find its place among similar conferences on organized elsewhere in the world.

By alternately organizing conferences on environmental protection of urban and suburban areas in odd years and conferences on safe food in even years, the Ecological Movement of the City of Novi Sad is completing its contribution to a higher quality of living of the population. Already in the 19th century, Novi Sad was a regional centre of social progress and broad-mindedness. Today, owing first of all to its being a university centre, Novi Sad is in the vanguard of ecological thought in this part of Europe.

It is our duty to work on the furtherance of the ecological programs of action and, by doing so, to make our contribution to the protection of the natural environment and spiritual heritage with the ultimate goal of helping the population attain a higher level of consciousness and a higher quality of living.

Director of the Ecological Movement of Novi Sad
Nikola Aleksic



ECO-CONFERENCE 2023

ECOLOGICAL MOVEMENT OF THE CITY OF NOVI SAD

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ECONOMICS OF THE FUTURE - GREEN ECONOMY AND SUSTAINABLE DEVELOPMENT

Abstract

The green economy is a sustainable economy of the 21st century that emits low carbon, efficiently utilizes limited natural resources, and reduces environmental risks. The fundamental premise of the green economy is environmentally responsible business practices that enable economic growth and development while simultaneously improving the quality of the environment. Therefore, an important dimension of the green economy is linked to social responsibility, namely social inclusion and the creation of employment opportunities and poverty reduction. Business, industry, and agriculture play a crucial role in providing economically sustainable products, processes, services, and solutions necessary for the transition to a green economy.

Keywords: *green economy, environmental protection, ecological responsibility, agriculture.*

INTRODUCTION

Conventional economics still maintains that the boundaries of economic growth have not yet been reached by modern society. However, it is becoming evident that we are dangerously approaching these limits, as natural resources are finite and the capacity of the environment is not inexhaustible or fully renewable. The realization of the limitations of natural capacities, significantly reduced by intensive production in pursuit of economies of scale, has resulted in an ecological crisis that has evolved into an economic and overall societal crisis by the end of the last century. These radical changes in the ecosystem were a clear signal of the need to change the existing economic paradigm and the emergence of a new business concept of sustainable development and a sustainable economy (Premović et al., 2013). Green economy signifies sustainable development and

represents a strategy for achieving prosperity primarily for people within the local community, but also on a broader scale within a country (Popović et al., 2015).

Increasingly stringent environmental regulations, growing pressure from the “green public,” demanding consumer expectations regarding environmentally friendly products, and a new approach of business management toward expanded corporate environmental responsibility have led to the fact that environmental care today means minimizing risks and harmful effects throughout the production cycle (Jovanović, 2017).

GREEN ECONOMY IN THE FIGHT FOR ENVIRONMENTAL PROTECTION

The green economy refers to the production, distribution, and utilization of goods and services that result in improved living conditions, a cleaner environment, and, in the long term, a positive impact on increasing the environmental awareness of future generations. Specifically, the environment should not be viewed solely as a source of natural resources but as a valuable resource itself (Jović Bogdanović and Janković, 2019). The green economy is based on the use of renewable energy sources and emphasizes the promotion of knowledge about energy efficiency. Circular economy is directly related to environmental preservation and, therefore, to the green economy.

Traditional economics identifies four fundamental functions of the environment: it serves as a source of resources for the production of economic goods intended for individual or industrial production and consumption; it provides certain natural (ecological) goods for independent use or through consumer services, such as air, water, arable land, the aesthetic value of landscapes, and the recreational function of the natural environment (including various forms of ecotourism - spas, mountains, seas, lakes, rivers, etc.). The characteristics of these goods and services provided by the environment are that they can be simultaneously utilized by multiple individuals without competition for their use, and their use cannot be denied to any individual; the environment absorbs residues from production and consumption, including pollutants that disrupt its functioning as a healthy and environmentally clean system; it also serves as a space for locating national economic systems (economy) - the utilization of land and other areas for the functioning of the economy (Riznić et al., 2017).

From an economic perspective, the ecological crisis manifests in the following ways:

- Environmental degradation due to increasing production (economic growth) based on the depletion of energy sources and raw materials, which makes future production more uncertain and costly.
- Pollution of water, food, and air, resulting in higher healthcare expenses.
- Shortened life expectancy, decreased work capacity, and deterioration of basic conditions and parameters for quality of life.

- Threats to natural environmental conditions, such as the ozone layer depletion, greenhouse effect due to excessive CO₂ emissions, energy and social entropy, with the possibility of “heat death” of the planet Earth.
- Destruction of fundamental elements of human existence, including natural habitat and ecological balance, morphological characteristics of settlements, and more.
- Climate change, with alarming consequences in various areas, including droughts, floods, tsunamis, typhoons, and wildfires (Pejanović, 2015).

The consequences of these changes are manifested in increasing environmental pollution and the alienation of humans from nature. The environment has been considered a free good (a gift from nature) in previous development practices, and as a result, it has been ruthlessly exploited, leaving multiple negative consequences. As a result of long-term reliance on a linear economy, Serbia produces 150,000 tons of hazardous waste annually, and there are 3,500 illegal dumpsites. The Republic of Serbia invests up to 50 million euros to control 150 non-sanitary landfills, and a staggering 95% of waste needs to be recyclable in order to improve the environmental situation in Serbia (Radoičić and Arsić, 2020).

The realization of the limited capacity of natural resources, significantly depleted by intensive production in the pursuit of economies of scale, has resulted in an ecological crisis that, by the end of the previous century, evolved into an economic and general societal crisis. These drastic changes in the ecosystem served as a clear signal of the need to change the existing economic paradigm and gave rise to a new business concept of sustainable development and a sustainable economy.

During the production process, business models of the circular economy do not generate “waste” as traditionally understood. Instead, they perceive any byproducts as “raw materials” that can be reintroduced into the production cycle through circular design and cleaner technological processes. The goal of the circular economy is to restore natural resources, maintain the use of materials, and prolong the lifespan of products by employing appropriate design strategies that prevent products from becoming waste and contributing to pollution (Ministry of Environmental Protection of the Republic of Serbia, 2020).

As a result of long-standing reliance on a linear economy, Serbia generates 150,000 tons of hazardous waste annually, with 3,500 illegal dumpsites present. The Republic of Serbia invests as much as 50 million euros in controlling 150 unsanitary landfills, and a significant 95% of waste needs to be made usable through recycling processes in order to improve the environmental situation in Serbia.

Recycling, as one form of circular economy, is the process of extracting materials from waste and reintroducing them into production and use for the same or similar purposes. The process involves collection, separation, processing, and manufacturing of new products from used and worn-out items and materials. It is important to sort waste by type, as many waste materials can be reused if

collected separately. Anything that can be reused represents recycling. The following goals are achieved through recycling:

- Conservation of raw materials: Recycling helps conserve natural resources as all materials are of natural origin and can be found in limited quantities in nature.
- Energy savings: Recycling eliminates the need for energy-intensive primary processes and transportation associated with those processes. Additionally, energy can be generated through the combustion of non-recyclable materials.
- Environmental protection: Waste materials can degrade the natural environment, while recycling helps protect the environment by reducing waste and pollution.
- Creation of green jobs: Recycling processes and eco-design of products require knowledge and labor, leading to the creation of new job opportunities.

Sustainable agriculture is the future. The use of sustainable agricultural practices, as well as sustainable technologies, will allow us to continue the tradition of agriculture without causing harm to the planet. According to the United Nations, green agriculture incorporates ideas and guidelines from various conceptual areas, including fair trade, ecological agriculture, organic or biodynamic agriculture. The concept of sustainable development emerged as a pathway to address the ecological crisis caused by industrial exploitation of environmental resources and the ongoing deterioration of its quality, but it has gradually encompassed primarily economic and social dimensions. Sustainable business practices, implemented in a continuous sequence, are essential for creating long-term value and profitability for companies, while also ensuring the protection of the environment and the balance of economic and social aspects. Sustainable development cannot be simplistically viewed solely as a battle against climate change or the reduction of greenhouse gas effects. Investing in the green economy, which is also aimed at solving environmental problems, opens up market opportunities for farmers, promotes organic agricultural production, and encourages a healthier way of life. The existence of a green economy signifies our collective desire to preserve biodiversity and safeguard the environment in which we live. (Vujović et al., 2020).

The European Green Deal is a new strategy of the European Union in response to the increasing global challenges and threats to the environment in the late 2010s. With its adoption by the European Commission in December 2019, the EU continues its activism and commitment as a global leader in environmental protection, placing a healthy environment, climate change mitigation, and clean energy use at the center of all economic activities of member states. The “Farm to Fork” strategy, which aims to establish an environmentally sustainable food sector, is another element of the Green Deal that is intended to contribute to the comprehensive integration of agricultural production and food production with environmental protection. Food production contributes to air, water, and soil pollution, loss of biodiversity, and climate change due to excessive use of natural resources. Measures are proposed to

reduce the environmental impact of the food processing and retail sectors by adopting a more proactive approach and regulation in areas such as transportation, storage, packaging, and food waste, which will require changes and accelerated economic transformation. (Vasilkov et al., 2021).

The green supply chain, as a contemporary development paradigm arising from the rapid scientific and technological progress, aligns perfectly with the concept of the green economy by minimizing the environmental impact of products throughout their lifecycle, from material selection to recycling or reuse processes. Green supply chains connect all stakeholders involved in green business operations, aiming to implement sustainable development policies, including green production, green storage, green distribution, green transportation, green materials, green design/packaging, and green purchasing. (websites)

FOOD SAFETY AND ECOLOGICAL PRODUCTS AS SUPPORT FOR SUSTAINABLE AND GREEN DEVELOPMENT

The World Health Organization (WHO) defines a food safety approach as a shared responsibility of governments, the food industry, consumers, and science. Harmonized international legal regulations enable the establishment of common standards for international food trade, ensuring safety and trust in the food available on the market, regardless of its production origin. Legislation on food is also important. In the European Union, the food industry is the third most heavily regulated sector after the automotive and chemical industries. Initially, the regulation of the food sector originated from the need to regulate the internal market effectively, and later continued due to the necessity of consumer health protection. To protect consumer health, in addition to the mentioned regulations, appropriate “tools” are necessary to prevent the presence of various substances in food. The “tools” that constitute and ensure a comprehensive and long-term food safety concept are Good Manufacturing Practice (GMP), Good Agricultural Practice (GAP), Good Distribution Practice (GDP), Good Hygienic Practice (GHP), Hazard Analysis and Critical Control Points (HACCP), and risk analysis. These are also strategies for controlling hazards that operate at the operational level, while risk analysis represents a higher-level management approach (Pejanović, 2015).

An eco-product can be defined as a product that is free from genetically modified organisms, herbicides, pesticides, and mineral fertilizers that are widely used in conventional production. For an eco-product, it is crucial that 95% of its ingredients are organic, while up to 5% of possible pollution from sources such as acid rain or wind, over which humans have no control, is permitted. Green products have a lesser impact on the environment and are less harmful to human health compared to their conventional counterparts available on the market. They are frequently made from recycled materials and are often produced in ways that conserve energy or are packaged with minimal materials. In other words, efforts

are made to treat nature well throughout the production, storage, and other stages of the product's manufacturing process (Marić, 2021).

The aim of the research was to identify factors important for achieving competitiveness

of industrial and agroindustrial products of a national organization and to discover the differences in the ratings of the factors important for increasing the level of competitiveness of products of organizations of different sizes and activities in relation

to both domestic and foreign industrial and agroindustrial products.

The results of the research show that the most important factor for the competitiveness

of an organization's products is competitive price, followed by good functionality,

effective marketing, functional design and finally fast service. The importance of price for the competitiveness of products was rated with a mean value of 4.34, i.e. almost half of the organizations rated the price with a score of 5, so it is concluded that organizations consider the price to be extremely important for the competitiveness of products (Ćurčić and Miletić, 2020).

THE USE OF RENEWABLE ENERGY SOURCES

The future of development and progress is reflected in the green economy, as it ensures a more equitable distribution of resources and wealth, reduces poverty, and addresses societal inequalities. Furthermore, the energy potential of biomass is of great importance, as it is constantly present regardless of weather conditions or adversities. Alongside biomass and biogas, renewable energy sources encompass wind energy, solar energy, hydropower, tidal energy, and geothermal energy. The European Union has set a target for renewable energy sources to account for 20% of total energy consumption by 2020, thus providing a strong incentive for increased biomass utilization, a renewable source with significant potential.

When considering the Republic of Serbia, biomass represents the largest share (approximately 49%) in terms of renewable energy sources. Its potential primarily stems from agricultural waste and woody biomass. The potential use of agricultural biomass as an energy source takes into account long-term sustainability, which considers competitiveness effects in food production, impact on biodiversity, and carbon dioxide emissions during combustion. Biogas can be obtained from liquid and solid manure, energy crops (i.e., residues from agricultural production), as well as other types of biomass. Biogas is produced through anaerobic digestion of biomass. Currently, there is significant interest in biofarms on agricultural holdings. These are facilities that produce biogas through anaerobic co-digestion of manure. For example, in the Republic of Serbia, the National Action Plan for Renewable Energy envisages the construction of 30 biogas plants by 2020, and thus far, 12 have been built, representing a notable progress (<https://www.agromedia.com>).

CONCLUSION

Green economy signifies sustainable development and represents a strategy for achieving prosperity primarily for people within local communities, as well as at the national level. The existing implementation of the circular economy model undeniably proves that it is possible to reduce the exploitation of natural resources and minimize negative impacts on the environment. Sustainable development is directly linked to the new concept of the economy, as it is based on the utilization of materials already used in the previous production process. This concept leads to significant cost savings and socio-economic benefits. The fact that a number of major global companies are inclined towards this concept is already indicative of the prospects for further promotion. Entrepreneurship is increasingly turning to processes that enable greater competitiveness and cleaner production. One of the weaknesses of this concept is the lack of universality in its application. Unlike the linear economy, which is a universal model, the circular economy has not yet developed a dimension of universality, meaning it is not yet possible as a universally applied model.

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EKONOMIJA BUDUĆNOSTI-ZELENA EKONOMIJA I ODRŽIVI RAZVOJ

Abstrakt

Zelena ekonomija je održiva ekonomija XXI veka koja emituje malo ugljenika, efikasno koristi ograničene prirodne resurse i smanjuje rizike za životnu sredinu. Osnovna pretpostavka zelene ekonomije je ekološki odgovorno

poslovanje koje treba da omogući ostvarivanje ekonomskog rasta i razvoja uz istovremeno povećanje kvaliteta životne sredine. Zbog toga je važna dimenzija zelene ekonomije vezana za socijalnu odgovornost, odnosno, socijalnu inkluziju i stvaranje mogućnosti za zapošljavanje i smanjenje siromaštva. Biznis, industrija i poljoprivreda imaju ključnu ulogu u pružanju ekonomski održivih proizvoda, procesa, usluga i rešenja koji su potrebni za prelazak na zelenu ekonomiju.

Ključne reči: *zelena ekonomija, zaštita životne sredine, ekološka odgovornost, poljoprivreda*

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