

ORIGINAL SCIENTIFIC PAPER

ANALYSIS OF THE ROLE OF FDI IN THE ECONOMIC GROWTH AND ENVIRONMENTAL PROTECTION WITH PARTICULAR REFERENCE TO CERTAIN ECONOMIC SECTORS IN SERBIA

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ABSTRACT

The aim of this research is to determine the extent to which foreign direct investment (FDI) inflows impact specific economic sectors in Serbia from the standpoint of environmental protection, in addition to economic growth. Foreign direct investments (FDI) are a key factor for economic growth and sustainable development, but they can have negative consequences for the environment. The study analyses FDI inflows in Serbia, focusing on their environmental impact, especially in light of global crises such as the COVID-19 pandemic and the war in Ukraine. The applied methods in this research include deduction and induction, synthesis, specialization, generalization, as well as the case study method. The findings reveal that FDI in industries with significant environmental burdens is increasing, while investments in environmental protection are declining, highlighting the need for an urgent regulatory response. The research suggests the necessity for a more detailed analysis of FDI in sectors such as agriculture, energy, and processing, where environmental and economic impacts are particularly significant. Future studies should focus on the development of environmental policies that balance investment attraction with sustainability.

Keywords: foreign direct investments, innovations, economic growth, environmental protection, global crisis

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INTRODUCTION

The question of environmental protection, along with its associated issues, is increasingly becoming a subject of analysis and research, both globally (e.g., [1] [2] [3] [4] [5] [6] [7] [8] [9] [10] [11] [12] [13][14] [15] [16] [17] [18] [19]). Deteriorating climate conditions, increased frequency of floods, fires, and other natural disasters, have undermined the environmental sensitivity of host countries and a growing number of people.

The increasing interest in preserving the planet, in environmental protection, is noticeable among individuals who are daily users of the environment, as well as among governmental and non-governmental entities seeking to steer legislation toward sustainable development. Namely, the government of each country should actively and devotedly engage in environmental protection. One of the main ways to achieve this is to strike a balance between environmentally unfriendly foreign direct investments (hereinafter referred to as FDIs) and economic growth, namely sustainable economic growth.

The ecological component of sustainable development encompasses natural resources such as water, land, air, forests, biodiversity, renewable energy sources, and ecosystems[41]. The priority is the protection and enhancement of the environment through the rational use of natural resources, while considering goals and prescribed measures. The economy depends on human society and the environment, while, on the other hand, for many people, society would not exist without the economy[42].

According to recent classifications, there are other components of sustainable development, such as institutional and culture components as an integral part of the sustainability concept. In this sense, it is considered necessary to modify the approach towards potential foreign investors, as well as existing ones, in accordance with respect for and implementation of government regulations related to environmental conservation, which is directly and indirectly affected by the production processes in various industries and economic sectors. This modification or change would have direct consequences on the market and investors, who would carefully direct their capital towards companies that are not only profitable in terms of financial gain but also sustainable in terms of the environment.

Therefore, the general aim of this study is to determine the extent to which the influx of foreign direct investment (FDI) affects specific economic sectors in Serbia from an environmental protection standpoint. More specifically, the objectives of this research are to identify the economic sector that has received the highest investment, i.e., the sector with the highest inflow of FDI, to determine the economic sectors where the inflow of environmentally oriented foreign capital is expected to be the highest, and to establish the relationship between FDI in specific economic sectors and economic growth in terms of environmental protection.

The research contributes to the theory of sustainable development and the economics of foreign direct investments by analysing specific sectors in Serbia, examining the extent to which FDI can influence environmentally sustainable development. The increase in FDI in Serbia directed towards sectors with certain environmental burdens calls for special attention, raising the question of how well these investments can align with the principles of sustainable development.

This paper is structured as follows. The next section describes the research methodology. The third section presents the regulatory framework closely related to environmental protection and FDI. The fourth section presents the results of the analysis of the role of FDI in the growth of the economy and environmental protection in Serbia. Finally, the research concludes with findings that aim to contribute to decision-makers in Serbia.

RESEARCH METHODOLOGY

In order to establish the link between FDI and specific economic sectors from an environmental protection perspective, it is necessary to first analyse the level of FDI inflows in individual economic sectors and secondly, determine in which economic sectors the inflow of environmentally oriented investments is expected to be the highest. Given that, on one hand, investments can have detrimental effects on the environment ([18] [20]), while on the other hand, they contribute to GDP growth ([21] , regulations and policies exist to encourage environmentally friendly investments without hampering GDP growth ([22] [23]). Hence, it is considered essential to ascertain the extent to which environmentally oriented investments have been implemented in Serbia. The applied methods in this research include deduction and induction, synthesis, specialization, generalization, as well as the case study method.

To analyse changes in FDI inflows and their impact on economic growth and the environment, data from the National Bank of Serbia, as well as relevant international reports, were used. These methods provide a deeper understanding of how FDI can either support or undermine sustainable development in times of crisis.

The data used for analysis is secondary data on foreign direct investment by sector, obtained from the balance of payments of the National Bank of Serbia (NBS) (according to the original BPM6 methodology of the International Monetary Fund¹). Additionally, the annual World Investment Reports (WIRs) published by the United Nations Conference on Trade and Development (UNCTAD) are used. Prior to the global crisis caused by the COVID-19 pandemic, the global capital market experienced certain declines, and foreign investors were less active (investing less) in certain private sectors. This research aims to determine which sectors have experienced declines and which have seen growth in terms of FDI, as well as whether the investments that have seen growth are environmentally oriented investments. Specifically, the research aims to investigate whether the increase in FDI is associated with economic sectors that are expected to be highly environmentally oriented, such as water supply and wastewater, energy, mining, manufacturing, and innovative technologies.

REGULATIONS ON ENVIRONMENTAL PROTECTION

On the international level, discussions on environmental issues have been taking place since the 1970s. The World Commission on Environment and Development adopted the concept of sustainable development in 1987, which pertains to a process of change involving the exploitation of natural resources, establishment of new and different investments, and a shift towards technology-oriented development ([24] [25]).

However, it was only after the expansion of globalization and the end of the Cold War, in the 1990s, that widespread awareness emerged regarding the need for active measures to prevent further environmental degradation, such as averting irreversible consequences of climate change. During this period, various global conventions were established, such as the [26] *Rio Conventions*², [27] *Kyoto Protocol*³ and others.

Serbia adopted the Rio Conventions in 2001 through the Law on the Ratification of the Convention on Biological Diversity [28] while the Kyoto Protocol was adopted in our country only in 2007 through the Law on the Ratification of the Kyoto Protocol to the United Nations Framework Convention on Climate Change [29].

Over time, various strategies, programs, and projects have been developed at the global level with the aim of environmental protection, such as the Millennium Development Goals. In 2015, the Sustainable Development Goals (SDGs) and the 2030 Agenda ([30] were established, which Serbia adopted in 2016 [31].

The 2030 Agenda is a document that defines the goal of developing a set of guidelines for sustainable development. Although all 17 goals of the 2030 Agenda are fundamental to achieving global sustainability, the most important and perhaps most urgent of all are Goal 8, which pertains to "promoting sustained, inclusive, and sustainable economic growth, full and productive employment, and decent work for all," and Goal 13, which focuses on combating climate change. Essentially, the aim is to foster economic development that is not solely profit-oriented but ensures environmental and individual well-being.

For the first time, adaptation to changed climatic conditions is included in the new EU legislation, which went into effect in 2021 in compliance with the Paris Agreement. Regulation 2018/1999 requires the National Energy and Climate Plans (NECP) to include an effect study of altered climatic conditions on the security of the energy supply. This analysis focuses on the availability of biomass and water for energy producing facilities.

¹BPM6 - Balance of Payments and International Investment Position Manual (6th Edition) of International Monetary Fund (IMF).

²The Rio Conventions are three United Nations conventions on climate change, desertification, and biodiversity that were established in 1992 at the World Summit in Rio de Janeiro, Brazil. The conventions involve the participation of governments from 178 countries and are known as the United Nations Framework Convention on Climate Change (UNFCCC), the United Nations Convention to Combat Desertification (UNCCD), and the Convention on Biological Diversity (CBD) (UNFCCC, 1992).

³The Kyoto Protocol is an addition to the United Nations Framework Convention on Climate Change (UNFCCC) that was established in 1997 (UNFCCC, 1997).

One of the five pillars of the Green Agenda for the Western Balkans is climate action, which involves decarbonization and adaptation to changing climate circumstances. This agenda, which is based on the Sofia Declaration on the Green Agenda for the Western Balkans, has received complete support and adoption from the Western Balkan countries, as has the regional action plan for putting it into practice.

As an implementing agency of the Green Climate Fund (GCF), the United Nations Development Programme (UNDP) assists the Government of Serbia in carrying out the "Enhancing Medium- and Long-Term Planning for Adaptation to Altered Climatic Conditions in the Republic of Serbia (NAP Project)." Using the best available climatic and socioeconomic data, evidence-based decision-making is necessary to integrate climate change adaptation into medium- and long-term planning. Within the NAP project, a digital platform called the Digital Climate Atlas of Serbia has been built specifically for this purpose.

The following types of climate data are available online: regional climate model projections for the entire nation, as well as at the sub-national and city/local levels; historical observations (or data derived from observations, such as "gridded" climatology or reanalysis); and online visual representations, such as maps and charts, for various seasonal and annual analyses and data. All of the meteorological information included in the Digital Climate Atlas of Serbia is openly accessible to the public and can be utilized by a range of stakeholders for risk and vulnerability assessments, as well as for the identification of sectoral, subnational, and national adaptation options, including those for priority areas/sectors (transport, energy, infrastructure, agriculture and water management, and so on).

In addition to these two goals, fundamental to sustainable development and environmental protection is Goal 12, which relates to sustainable patterns of production and consumption. These patterns imply sustainable, green investments. In other words, it involves promoting the transition from a linear economy to a circular economy.

The linear economic model leads to unnecessary waste or loss of resources in several ways:

- Waste generation in the production chain (during the manufacturing process),
- Waste generation at the end of the product's life cycle,
- Untapped energy from reuse,
- Degradation of ecosystem services' quality.

In contrast to the linear model, the circular model envisions products designed to enhance their durability, usability, upgradeability, and repairability, while removing chemicals from products and increasing energy and resource efficiency.

The fundamental principles underlying the circular economy are as follows:

- Creating products that do not end up as waste,
- Distinguishing between consumable and durable components of products,
- Relying on renewable energy sources,
- Considering waste as an input or raw material,
- Emphasizing cascading or sequential reuse,
- Shifting from consumers to users (sharing economy),
- These principles serve as the foundation for the transition to a circular economy, promoting sustainability and environmental conservation [32].

The primary goal should be the transition towards a circular economy. When considering the EU, the need for such a transition is even more pronounced. Currently, the EU and its citizens consume twice as many resources as the EU's ecosystems can renew. Furthermore, the EU's share of global resources is unjust, as it utilizes nearly 20% of the Earth's biocapacity while representing only 7% of the world's population. If everyone were to consume natural resources at the rate of an average European citizen, we would require 2.8 planets to meet the total demand. This is significantly higher than the aforementioned global average of 1.7 planets. The movement of the ecological footprint and biocapacity within the EU is depicted in Figure 1.

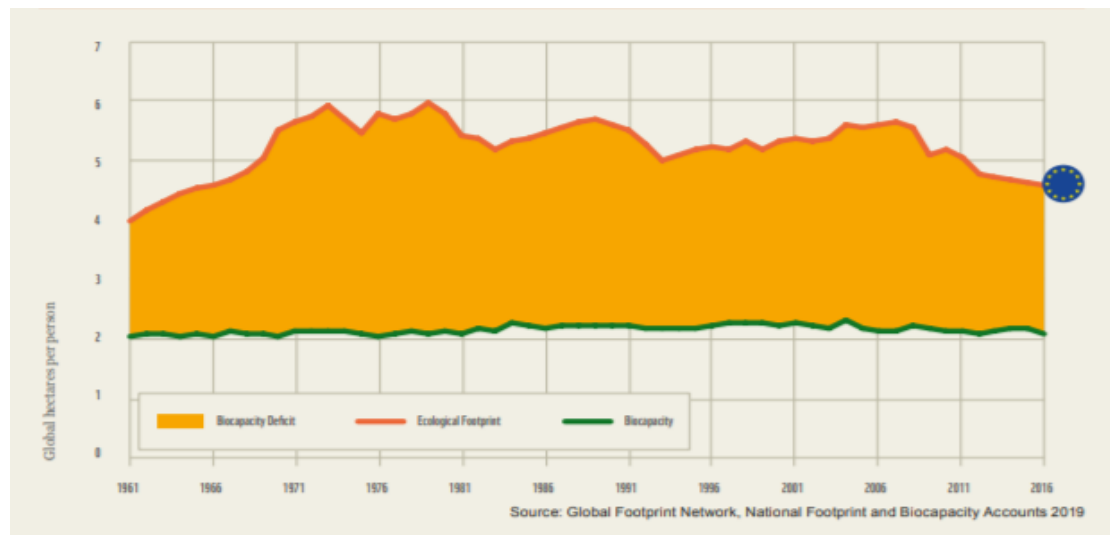


Figure 1: Movement of the ecological footprint and biocapacity in the EU, 1961-2016.

Source: [33]

The continuation of a linear economy implies a long-term need for unlimited resources in terms of raw materials and energy. In such a system, products are assumed to become waste at the end of their life cycle, resulting in various problems, with waste management being a significant issue. On the other hand, adopting a circular economic system, based on product recovery and reuse, would prevent products from becoming waste at the end of their life cycle. Moreover, several problems could be addressed simultaneously. On one hand, the demand for raw materials and energy would decrease, while on the other hand, the waste disposal issue would be resolved. Additionally, the implementation of a circular model would reduce pollution resulting from the production process, leading to a significant decrease in negative environmental impacts. This model is not only beneficial for the environment but also for companies, which can recycle instead of purchasing raw materials, and investors, who can gain higher credibility and improve their competitive advantage. Therefore, it is crucial for governments to enact and enforce laws that create incentives for environmentally oriented companies and penalties for non-compliant companies.

In line with the 2030 Agenda, the United Nations has mandated reporting on the Principles of Responsible Investment (PRI), which major investment funds and rating agencies are required to follow. Essentially, PRI promotes the incorporation of environmental, social, and corporate governance (ESG) factors into investment decision-making, encouraging investors to take greater responsibility for their investments. Essentially, ESG can be viewed as an analytical framework for measuring and quantifying the sustainability level of companies. This shift encourages investors to seek new ways to allocate their money and capital. ESG funds are among the new investment formulas being introduced to meet the growing demand for sustainable investments.

RESULTS AND DISCUSSION

FDI inflows have been identified as the largest source of global financing ([34]. Globally, FDI flows reached \$1.58 trillion in 2021, representing a 64% increase compared to the levels during the first year of the COVID-19 pandemic. Developing countries experienced a growth in FDI flows by 30%, while Europe recorded a remarkable increase of 171% (Figure 2) [34].

This surge in FDI inflows can be attributed to the expansion of mergers and acquisitions (M&A) activities and the growth of international project financing. However, the consequences of the conflict in Ukraine have significantly altered FDI flows in 2022, particularly due to sanctions, crises in the food, fuel, and finance sectors, as well as the escalation of general debt and inflation levels. These factors have contributed to the rise in prices of essential goods and energy resources, thereby negatively impacting sustainable development goals and the environment [34]. Notably, greenfield projects have experienced a decline during 2021-2022, and a further decline is expected [34]. While greenfield investment projects decline, multinational companies continue to witness increased profitability. These companies have experienced the highest growth in 2021, following a trend that began in 2010 [34].

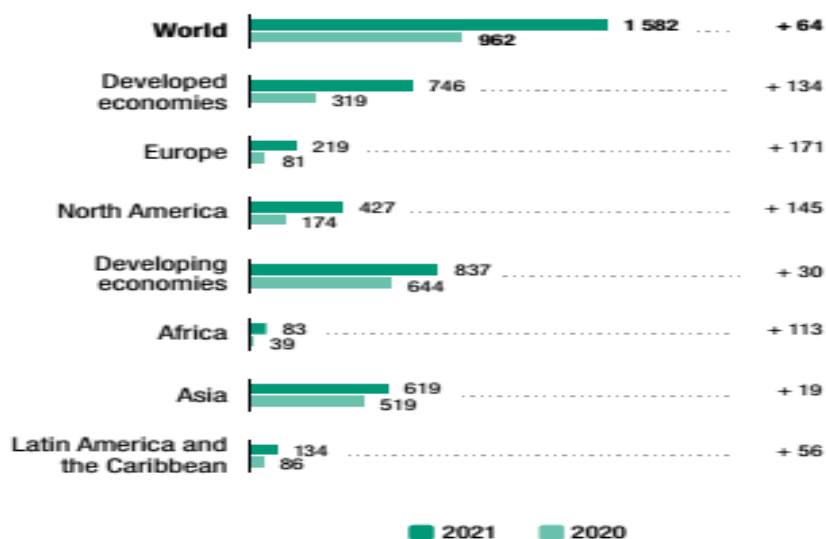


Figure 2. FDI Inflows by Regions, in Billions of Dollars and Percentage Change, for the Period 2020-2021

Source: [34]

Comparing the findings of this research with existing literature, notable similarities emerge with the conclusions of UNCTAD's 2022([34] report and studies such as those by ([35]. In both cases, it was concluded that FDI experiences a significant decline during times of crisis, particularly in sectors requiring long-term investments, such as sustainable development and environmental protection. However, unlike global trends, FDI inflows to Serbia during the crisis period recorded certain growth, a result of structural reforms and incentivizing policies.

These results indicate that while FDI can have a positive effect on economic growth, they often do not contribute sufficiently to sustainable development, especially when investments are directed towards industries with high environmental burdens. In line with previous research ([36], our findings confirm the necessity of establishing clearer environmental standards to ensure long-term environmental protection.

Regarding FDI flows in Serbia, the total inflow of FDI amounted to €3,885.99 million in 2021, representing a 21.8% increase compared to 2020 (€3,038.88 million). The year 2022 recorded the highest level of FDI inflows in Serbia since 2007, reaching €4,415.93 million, which is a 12.01% increase compared to 2021 (Figure 3).

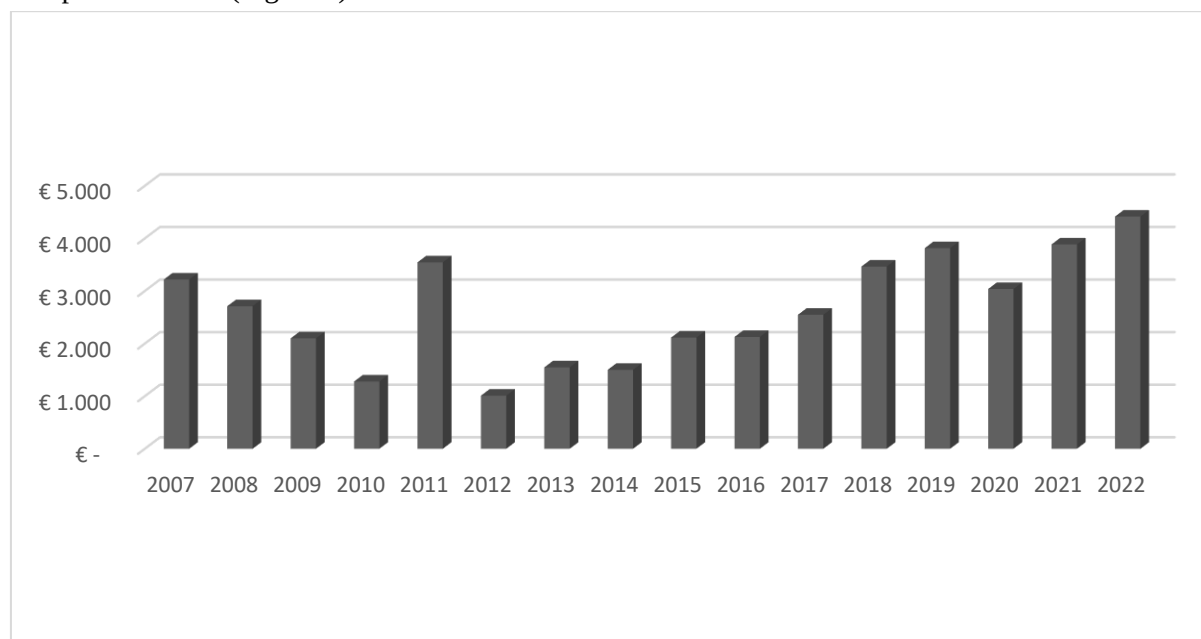


Figure 3. FDI Inflows in Serbia, in Millions of Euros, for the Period 2007-2022

Source: Author's presentation based on data from the [37] National Bank of Serbia (2023a).

Out of the total inflow of FDI in our country, the highest level of FDI in 2022 was recorded in the manufacturing industry (1,571.36 million euros) and construction sector (1,501.36 million euros) (Table 1).

Table 1. FDI Inflows in Serbia, by sectors, for the period 2020-2022, in million euros.

	2020	2021	2022
Agriculture, forestry, and fishing	49,372	42,603	9,637
Mining	212,677	118,747	147,690
Manufacturing industry	850,827	1,488,852	1,571,362
Supply of electricity, gas, steam, and air conditioning	35,394	45,597	2,333
Water supply, wastewater management, waste treatment and similar activities	125,950	99,402	52,296
Construction	385,004	863,386	1,501,325
Wholesale and retail trade; repair of motor vehicles and motorcycles	196,157	128,139	360,738
Transportation and storage	450,939	499,573	149,195
Accommodation and food services	15,087	1,336	23,415
Information and communication	28,237	108,122	114,392
Financial activities and insurance	512,103	95,713	-217,653

Source: adapted from [38]

The highest growth in FDI in 2022 compared to 2020 in our country was observed in the information and communication sector (over 300%), construction sector (290%), followed by the manufacturing industry (84.7%), and wholesale and retail trade (83.9%) (Table 2). In the mining industry, FDI inflows increased by 24.4% in 2022 compared to 2021, while FDI in this sector decreased by 30.6% compared to 2020, indicating a decline in FDI in mining in 2021 by €93.93 million compared to 2020. In 2022, there was a rebound in FDI in mining, reaching €147.69 million (Table 1).

FDI in the sector of water supply, wastewater management, waste treatment, and similar activities has experienced a drastic decline in the past three years. Specifically, there was a decline in FDI in this sector by as much as 58.5% in 2022 compared to 2020. An even larger decline in FDI was recorded in the sector of electricity, gas, steam, and air conditioning supply, with a decrease of 93.4% in 2022 compared to 2020 (Table 2), mostly due to the global crisis and the conflict in Ukraine.

Table 2. Growth of FDI inflows in Serbia, by sectors, for the period 2020-2022, in %

	Δ 2022 vs 2021	Δ 2021 vs 2020	Δ 2022 vs 2020
Agriculture, Forestry, and Fishing	-0.774	-0.137	-0.805
Mining	0.244	-0.442	-0.306
Manufacturing	0.055	0.750	0.847
Electricity, Gas, Steam, and Air Conditioning Supply	-0.949	0.288	-0.934
Water Supply; Sewerage, Waste Management, and Remediation Activities	-0.474	-0.211	-0.585
Construction	0.739	1.243	2.900
Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles	1.815	-0.347	0.839
Transportation and Storage	-0.701	0.108	-0.669
Accommodation and Food Service Activities	16.523	-0.911	0.552
Information and Communication	0.058	2.829	3.051
Financial and Insurance Activities	-3.274	-0.813	-1.425

Source: Calculations by the author based on [38]

In the agricultural, forestry, and fishing sector, a drastic decline in FDI was also recorded, amounting to 80.5% in 2022 compared to 2020, and 77.4% compared to 2021 (Table 2). Both globally [34] and in Serbia (Table 2), a decline in investment projects in the primary sector has been observed, attributed to the lack of FDI in agriculture and the shift from greenfield projects to international project financing, which spreads the investment risk among multiple actors. With the growing importance of foreign direct investments and international trade in agriculture, the significance of production standardization and environmental protection has also increased. Generally, without transitioning to agricultural methods that utilize resources more efficiently and reduce pollution, it will be challenging in the future to meet the growing food demand without the environmental burden caused by intensive farming.

An imbalance in nature will have a significant impact on the sustainability of natural resource management in agriculture, with serious implications for all countries. Developing countries, and particularly the least developed ones, are expected to be the most vulnerable to the effects of climate change, despite contributing the least to the problem. Public investments in agriculture can boost productivity, attract private investments, and help reduce the risk of food shortages. While the amount of food that needs to be produced continues to grow, the rural labour force, particularly farmers, is shrinking as a result of urbanization.

According to UNCTAD [34], greenfield and green investments significantly declined in 2020 but started to moderately increase in 2021. Moreover, there are significant announcements for new greenfield and green projects.

Investments in sustainable development sectors are, therefore, very low. In lower-developed countries, these investments are at a very low level. The number of foreign investment projects, both greenfield and international project financing, has declined in important sectors of sustainable development, such as renewable energy sources, energy, food industry, agriculture, and healthcare. On the other hand, on average, these projects are growing in sectors such as transport, education, and water, sanitation, and hygiene [34], which is not the case in Serbia (Table 1).

It is recommended that policymakers and decision-makers reassess the long-term negative consequences of FDI on Serbia's environment. Taking into account previous research and the results of this analysis, it can be concluded that there is a potential ecological threat due to the lack of environmentally oriented investments, which calls for greater control over FDI to protect the environment and sustain Serbia's economic growth.

CONCLUSION

Most existing research focuses on the economic aspects of FDI, while the analysis of their environmental impact, particularly during crisis periods such as the COVID-19 pandemic and the war in Ukraine, is significantly less represented in the literature. This study fills that gap by combining the economic and environmental aspects of FDI, which is crucial for understanding their long-term impact on sustainable development.

The aim of this study was to determine the extent to which FDI inflows affect specific economic sectors in Serbia from an environmental protection perspective, through the analysis of relevant official sources. The results of this analysis have indicated that the influx of non-green FDI remains high, while the influx of green FDI is very low, despite numerous announced greenfield projects, for example. There are currently significant ecological difficulties for the world economy posed by a 1.5°C increase in global warming. An increase in the frequency and intensity of extreme weather events is indicative of a breakdown of the socio-ecological system, which can be brought about by a rise in temperature. Heat waves, hurricanes, floods, and droughts are just a few of the natural disasters brought on by the ongoing use of fossil fuels and unsustainable land and energy use [39]. The rise in global temperature, caused by both natural factors and irresponsible human behaviour, is more and more often triggering extreme heatwaves, which in turn disrupt public health and cause droughts, floods, and climate change [40]. In certain economic sectors such as water supply, wastewater management, waste disposal, and similar activities, FDI in Serbia has experienced a drastic decline in recent years.

The theoretical contribution of this paper lies in expanding the theoretical framework on FDI during times of crisis. While previous research [34] primarily analyzed the economic consequences of FDI, this

study introduces a new perspective by examining how crises affect both the economic and environmental aspects of these investments in Serbia. The paper contributes to theories of sustainable development and economic crises, highlighting the importance of integrating economic and environmental factors in the analysis of foreign investments.

One of the main shortcomings of the existing literature is the lack of sector-specific analysis when assessing the effects of foreign direct investments. In most cases, entire economies or broadly defined sectors (such as manufacturing, trade, and services) are analysed collectively, even though these sectors often exhibit diametrically opposed FDI effects, leading to aggregation bias and inaccurate empirical results and conclusions. One way to overcome this issue is by focusing on individual sectors.

Given the significant findings of this article, it is recommended that future research focus on a more detailed analysis of the economic and environmental impacts of FDI in specific sectors, such as energy and agriculture. Additionally, long-term effects of reforms in Serbia, which contributed to FDI growth during the crisis, should be analysed to determine which measures were most effective in attracting sustainable investments. Further research could also include comparative studies with other countries in the region to identify best practices in regulating FDI during crisis periods.

The necessity of this research arises from the growing importance of environmental protection and the need to balance economic growth with environmental standards. In the current global context, particularly after the pandemic and ongoing geopolitical conflicts, the question arises as to how to attract FDI that will not jeopardize natural resources but instead contribute to sustainable development. The significance of this research is reflected in its practical implications for policymakers in Serbia. Foreign direct investments can have both positive and negative environmental impacts. If accompanied by the adoption and implementation of international standards, particularly in the areas of environmental regulation and protection, FDI can be expected to contribute to the improvement of a host country's environmental performance. Investments in sectors such as agriculture, with a particular focus on environmentally sustainable products, can boost exports and strengthen Serbia's position as a reliable economic partner on the global stage. In this context, the results of this analysis have numerous implications for academics, investors, and policymakers interested in understanding and improving environmental protection practices and responsible investment through the application of green and sustainable investments.

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