

# Defence of the environment

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## Abstract

Our historical continuity of existence is marked by a complex and ambiguous relationship between man and nature. The so-called progress has brought environmental pollution to both Serbia and the world to unprecedented proportions, which completely endangers the survival of most living beings on our planet, and many have disappeared permanently. At the same time, all the resources of the planet are endangered: air, water, land, mineral resources, and ore reserves. We have brought to perfection the destruction of the planet, our home. There is no end to our creativity in this process. On top of that, there is the climate change and its consequences, which are becoming frightening and require an urgent response from the global society, yet not rhetorical but operational and as efficient as possible. The future has become questionable. We have found ourselves at a crossroads that will determine our way and quality of life, and the answer to that question traces our future – with or without nature. In both cases there are solutions. Man is now able to shape the future. If we accept the fact that health has become the dominant obsession of modern man and society, then it is clear that the way he lives will have to change radically and therefore also his attitude towards the environment, which will produce huge social and economic changes of the planetary proportions. The choice is up to us, the conservation of resources and biodiversity, the application of a strategy of sustainable development and green (circular) economy, or going in the opposite direction, to a different future.

**Key words:** Serbia, the environment, sustainable development, green economy, laws, plans.

## 1. Introduction

From the historical aspect, it is believed that man has always been a part of nature. It is also believed that man's relationship with nature is full of respect and awe, but also that this relationship changes over time. It seems that over the centuries and millennia, that connection has weakened more and more, and that today we think about nature in the way and to the extent we treat it. We see it as a resource to be used, without thinking about the future. And that has been going on for centuries. It could be assumed that we have never paid attention to the damage we do to both the planet and ourselves. How egoistic and conscienceless!

Yet, for the most part, we can only speculate as to how life was unfolding in the past. There are numerous hypotheses about this. How did we live? Have we hunted and to which extent? Did we starve? Have we become greedy?

It could be said that with the start of growing crops and breeding animals, everything started to change. We became alienated from the forests and expanses that provided us with living space, lots of fruits, food. Probably, that way the long journey to the unknown began, without a return.

It is obvious that since the beginning of time, it has been implied that humankind takes from nature, deprived of awareness of the environment and our existing symbiosis with nature. And not only that, it seems as if we have never had an awareness of the limitations of the planet and nature, which naturally raises the question – how is that possible? The explanation lies in the small number of people of that time, in the small population in very isolated groups, in the existence of many fruit-bearing plants and animal species that successfully reproduce .... So, in modern language, biodiversity of a seemingly inexhaustible character, in every respect.

If we exclude some isolated parts of our population, numerous groups and collectives have always been unaware of the limitations, with only some rare individuals having that awareness, usually without any significant influence. Regardless of whether you are a creationist or an evolutionist, it is clear that all living beings have the right to life and that man has no right to take it away from them. Even religions fail to cope with the behaviour of civilization and the masses, they fail to curb the consumption and devastation of species and nature.

It could be said that for a long time, we have not had the feeling and awareness that we are a part of nature and biodiversity, and until recently that was not really true. So, we were part of nature and its diversity, whether we wanted that or not .... However, for some time now, man can no longer be considered as a part of biodiversity and nature, he separated from it, he began to create a new environment, new species, new beings. In that sense, he no longer depends on nature, he became a creator, since, thanks to genetic architecture, he is able to produce what he wants – from food, through landscapes, plants, animals and more.

Thus, new species, new beings, new people will emerge, and at the same time there will be “old” people. Also, a new, different community will emerge, and unpredictable and new social relations, but also a new environment and different landscapes that will shape the psyche of man and influence the formation of different behaviours. If the devastating onslaught on the planet, the mother Earth, does not stop, the beauties that surround us will disappear, that key factor of our survival so far will disappear. That beneficial influence of awareness of the existence of that beauty of diversity will disappear, love will disappear together with that beauty. Man’s love for nature, for other people. Man will stop loving himself. That’s tragic. With the cessation of love – happiness will also disappear. Forever and irreversibly, perhaps.

If today we start believing that nothing is more beautiful than nature and its fairy-tale diversity, maybe there is a hope .... However, it is quite clear that today’s man and society do not feel any guilt, judging by the acts and not the words and “high moral” declarations. That’s right. It’s a matter of choice.

The choice actually was the so-called progress: agriculture, wheel, electricity ..., in fact, the imitation of nature. The choice was the technological progress and the technocratic society in which we live today, deprived of everything that would make us happier than we are. Profit has become the ideal and master of the world, and it is in fact the main culprit for the destruction of the environment.

## **2. State of the Environment**

### **2.1. The situation in the world**

There is no doubt that ruthless destruction of the environment is the most important planetary issue. In recent years, the consequences of global warming have become increasingly obvious, so citizens around the world are increasingly concerned about their own health and lives. A huge number of people have become aware of the threat endangering us, demanding a solution.

As a reminder, we must say that this year we will mark the 50<sup>th</sup> anniversary of the Stockholm Conference, when we began, on a global level, to actively deal with the problems of the environment and its protection. It turns out to be unsuccessful, since the goals set during this

period have not been achieved! To be precise, none of the goals have been achieved or have been only partially achieved .... What a failure!!!

Let us remember Machiavelli's words: "If we recognize from afar the evolving evil (what only a wise man can do), it can be cured quickly. But, if we didn't recognize it well and allow it to take such a swing that already everyone can recognize it, there is no cure anymore." [1]

In order to essentially understand the reason for that, it is necessary to answer where the system error is and what we have not understood or done well all this time. It is possible that the goals were unrealistic, it is possible that we had neither good nor real goals, but it is rather something completely different. I believe that we can find a solution only if we answer the question: who rules – the state or corporations?

"Sustainable development does not include only – as is often heard – all levels from global to local, sustainable development also concerns the individual level: without the effort and diligence of each individual, there can be no change in terms of sustainable development." [2]

We are facing a large increase in industrial activities and activities that pollute the environment in general, and the number of inhabitants on the planet is growing dramatically, and thus increasing the pressure on cities where more than half of the world's population already lives today. This is important, because, in fact, cities are the key black spots of pollution of our planet and the point of depletion of all resources to the extreme.

## **2.2. State of nature in Serbia**

According to *the Constitution of the Republic of Serbia* (Article 74), it is defined that everyone has the right to a healthy environment and full information about the state of the environment, that everyone, especially the Republic of Serbia and the Autonomous Provinces are responsible for environmental protection, as well as that everyone has a duty to protect and improve the environment [3].

Serbia and this part of the Balkans are among the areas richest in biodiversity in the world and in Europe. We are one of 153 biodiversity centres in the world, and one of 6 in Europe. So, it is clear that we have been living in the most diverse and beautiful gift of nature for centuries, and that it is a true privilege to enjoy such beauty and wealth. The question is, of course, do we have the awareness about it, and accordingly – how do we treat nature?

About 44,200 species and subspecies have been identified on the territory of Serbia so far, and it is estimated that there are about 60,000 of them! In percentages, Serbia makes up 0.82% of Europe, and our participation in Europe's biodiversity looks like this:

- 44,4% of bryophyte species (moss and others);
- 18,6% of vascular flora species;
- 12% of invertebrate species;
- 16,25% of fish species;
- 15,46% of amphibian and reptile species;
- 66% of bird species;
- 43,4% of terrestrial mammal species.

There are 1,783 strictly protected species and 860 protected species. There are 471 protected areas in Serbia (of which 5 are the National Parks), which covers 7.66% of the surface of Serbia. There are 700–800 phytocenoses, plant communities, and the afforestation is about 30%, including about 250 native species [4].

We have rich geologically inherited various types of land, which is often very fertile. The relief of Serbia is very diverse. The highest point in Serbia is the mountain peak Đeravica (2,656 m) on Prokletije, and the lowest point is at 28 m above sea level – the confluence of the Veliki Timok and the Danube rivers.

The largest rivers are not autochthonous, but flow through Serbia – the Danube and the Sava. Here, we should especially emphasize the fact that of all the countries in our region, Serbia has the LEAST surface autochthonous waters. This fact deserves high attention, as new circumstances and climate change will bring a great need to preserve and use with extreme care this planet's most important resource [4].

### **2.3. State of the environment in Serbia**

If we take into account that in Serbia more than 50% of the population lives in the cities, it is clear that we must first observe the quality of the environment in these areas. So, all the elements of the environment in cities are poor or endangered. This refers to air, water, land, forests, flora, and fauna. The factors and activities that affect the quality of the individual elements of the environment certainly include: traffic, energy capacities, heating, industry, agriculture, urbanism, noise, different types of radiation, ....

In rural areas, Serbia is less polluted, but we may not ignore the importance and consequences of pollution there, especially in relation to the construction of small hydropower plants.

#### **2.3.1. Air quality in Serbia**

Air pollution can be classified as the most severe degradation of the environment. “The occurrence and frequency of increased concentrations of pollutants in the atmosphere depend on the size of the distribution of emission sources, local topography, and climatic conditions, and then on the type of pollutants, exposure, and other effects associated with exposure” [5].

The World Health Organization (WHO) definition of air pollution reads as follows: “Air can be considered polluted when it contains one or more harmful substances in such a concentration and for so long that it adversely affects people, animals, plants, and material goods or contributes to their damage and disturbance of the general condition” [6]. According to *the Law on Environmental Protection of the Republic of Serbia*: “Immission is the concentration of gases, vapours, aerosols, and other pollutants in the air at a certain place at a certain time which expresses air quality” [7].

According to the official data from the *Report on the state of the environment in the Republic of Serbia for 2018* [8], the assessment of air quality for zones, agglomerations, and cities for 2018 shows: “The air quality on the territory of the Republic of Serbia in 2018, as in previous years, was predominantly determined by the concentrations of suspended particles.” In the zone of Serbia and the zone of Vojvodina during 2018, the air was clean or slightly polluted, except in the cities: Valjevo, Kragujevac, Kraljevo, Sremska Mitrovica, and Subotica, where it was

excessively polluted, *i.e.*, of the third category. In the agglomerations of Belgrade, Pančevo, Smederevo, Kosjerić, and Užice in 2018, the air was excessively polluted. In the agglomerations of Bor, Niš, and Novi Sad, the air was of the first category (with the remark that there was not a sufficient percentage of measurements of PM<sub>10</sub>).

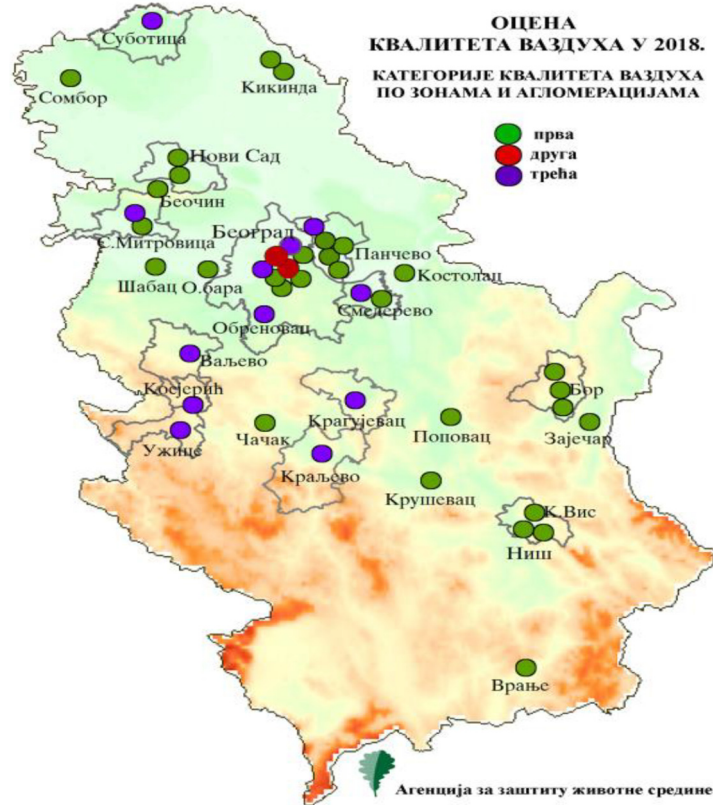


Figure 1. Air quality categories in Serbia 2018 [8].

Therefore, without a doubt, the air is of poor quality, especially in the urban areas, and according to the WHO, the number of deceased citizens of Serbia due to the consequences of poor air quality is around 6,600 per year!

### 2.3.2. Water quality in Serbia

Serbian Water Quality Index (SWQI) in the period 2008–2017 has a growing trend, *i.e.*, the water quality is improving [8]. According to the indicator that monitors the biological oxygen demand (BOD-5), in the period 2008–2017, the water quality was without significant changes. The concentrations are low, within the limits of good ecological status. The persistent organic pollutants (POPs chemicals) have not exceeded the permitted concentrations [8].

The percentage of polluted (untreated) wastewater in 2017 was 87.9%, which means that in 2017, 12.1% was treated. The quantities of total wastewater in the period 2008–2017 show a favourable (declining) trend. The average amount of treated wastewater in the same period was 10.8% of the total wastewater. The largest quantities of untreated wastewater (95–100%) were present in the regions of Nišava, Belgrade, Zlatibor, Bor, Rasina, Pirot, Braničevo, and Srem.

The lowest quantities were present in the regions of Podunavlje (22.1%), Šumadija (30.8%), North Banat (33.8%) North Bačka (37.7%), and Kolubara (45.9%). See Figure 2.

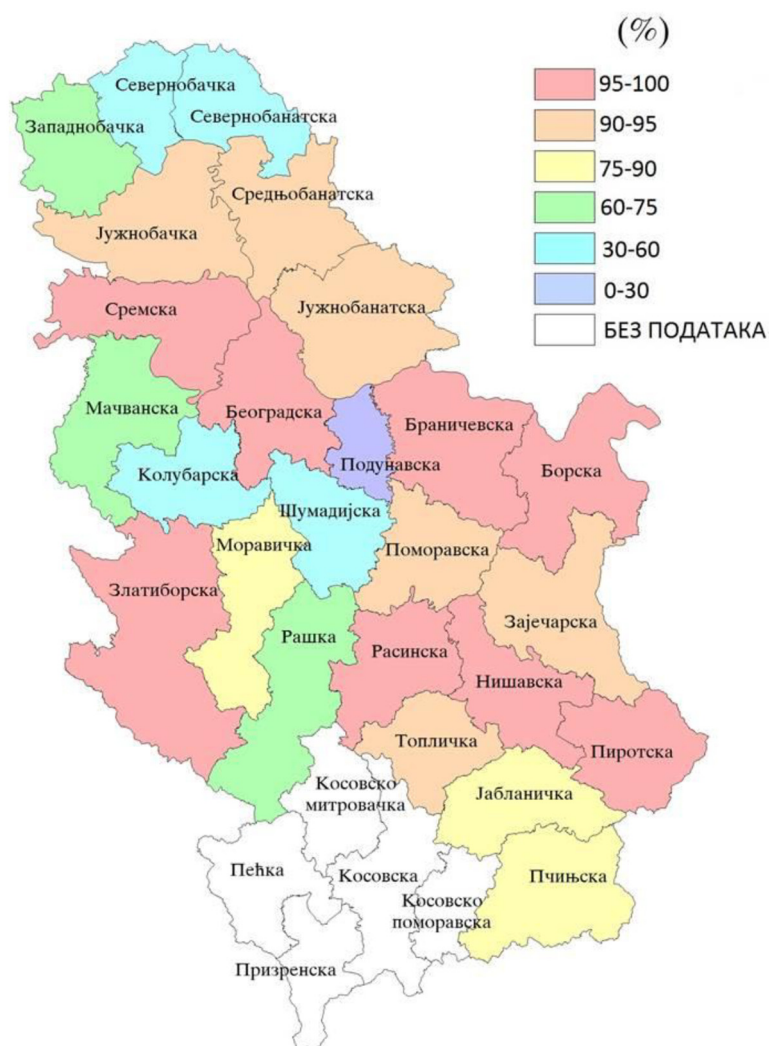


Figure 2. Untreated wastewater by areas (2017) [8].

In 2017, the water potability was satisfactory in both the physico-chemical and microbiological terms in 56.3% of the public water supply systems in urban settlements [8]. The percentage of residents connected to the public water supply and public sewerage was constantly growing in the period of 2000–2017.

### 2.3.3. Soil quality in Serbia

The land in Serbia is endangered and to a large extent polluted by the activities in agriculture, energy, mining, traffic, and transport, but also in construction and urbanism. It is also increasingly endangered by the consequences of climate change (torrents and droughts) and erosion processes.

In 2018, the degree of endangerment of the soil from chemical pollution was monitored. The most frequent exceedings of the limit values was recorded for Zn, Cu, Ni, Co, Cd, PCB, and DDE/DDD/DDT [8].

### 3. Adverse impacts on the environment in Serbia

**Wastewater.** It is evident that about 90% of the wastewater in Serbia is not treated, and that it is one of the most important factors of environmental pollution. Regardless of whether it is domestic, industrial, agricultural, or other wastewater, its impact on the quality of the recipients is huge, but at the same time on the surrounding land and groundwater.

**Energy and heating.** They have a devastating impact on the environment, especially due to the use of fossil fuels. In 2018, the primary energy consumption amounted to 16.65 Mtoe, and the structure of consumption is dominated by fossil fuels with 87.9%, while the share of renewable energy sources is 12.15%. Households have the largest share in the final energy consumption with 32.5%, industry with 28.6%, and traffic with 25.6% [8].

**Traffic.** Having in mind the large number of vehicles we use as well as the types of fuel, the traffic significantly affects the environment, especially in terms of air quality and noise. We use very old vehicles with very poor combustion, and even when they fall out of use, they become the hazardous waste. Every year, we import to Serbia over 100,000 used vehicles, often the worst, over 10 years old. Most of them end up in Belgrade and other cities.

**Agriculture.** It is one of the largest polluters on the planet, especially in relation to soil and air. By cultivating the soil, its quality decreases, erosion processes intensify, and hydrology changes. A particularly polluting factor is the excessive use of chemical agents, which, in addition to soil, also significantly endangers groundwater. If we add deforestation as a condition for establishing the agricultural land, it is clear what we are doing to ourselves and the planet through agriculture.

**Waste.** It is mostly generated by thermal energy facilities, but also by different types of industry. In 2018, about 92,000 t of hazardous waste were registered, and a total of about 11.6 million t of all types of waste. What is dramatic here is that Serbia still does not have the proper facilities for disposal of hazardous waste, neither does it have the adequate possibilities for disposal of other types of waste.

**Noise.** By monitoring the noise intensity in 2018, it can be concluded that the highest percentage of the total noise indicators,  $L_{den}$ , falls within the range of 60–64 dB while the highest percentage of the night noise indicators,  $L_{night}$ , falls within the range of 56–60 dB; the percentage of those exceeding 70 dB is negligible if we observe the urban areas on the territory of the Republic of Serbia where the monitoring was performed [8].

**Non-ionizing radiation.** It has become a significant environmental factor. There are 11,269 radio base stations on the territory of Serbia with a tendency of increase, and, therefore, this activity will increasingly attract the attention of experts and disturb citizens due to the risk to the health and life of people and the living world, especially in urban agglomerations.

#### **4. Serbia – measures and plans for the solutions**

It is quite clear that the development of Serbia, in terms of economy and technology, has followed the world trends, and that by using technology, Serbia has fundamentally damaged the quality of all parts of the environment – water, land, air, ..., especially in the urban agglomerations. This process has lasted intensively for a long time, and it is present today.

Regardless of the fact that we founded the Institute for Nature Conservation back in 1948, essentially, we have not seriously dealt with the environmental protection. It was only in 1971 that the world began to deal with this topic in a more organized way, and Serbia is at least 20 years behind the developed world.

However, over the past years, a number of laws, strategies, and plans have been adopted, which completely keep pace with the world trends and standards. But, of course, that is not enough. From their adoption to the implementation – we have a very long way to go. The measures are not consistently implemented, and the economy still has a significant advantage over the environment. It is not so in the Western Europe. Since Serbia aspires to join the EU, which is the world's flagship in this area, the pressure on Serbia will increase dramatically in the direction of urgent implementation of the strict regulations in this area. Having adopted a negotiating position for Chapter 27 (Environment, forests, and waters), Serbia is ready for the negotiations and an ecological path that will last several decades. However, we do not need any negotiations to understand for ourselves that we must immediately start serious protection, but also “repair” of the environment, which has in fact been devastated. The basic motive for that is obvious – the health and life of every citizen.

How to get there, and which are the prerequisites? In the first place, it is a question of decision and priority, both of the state and the economy and other activities. Actually, the key question is awareness, but whose? The awareness of a citizen, an employee, or someone else. There is no doubt, the awareness of politicians is the key. They are the decision makers, they make strategies and set priorities. At this point, it should be said that their awareness of the environmental protection is still in a rudimentary state, and that a lot still has to be done. One of the ways to do that is certainly the pressure of public opinion, which means that it is necessary to work in parallel on raising the awareness of citizens. In this sense, considering the awareness and public opinion as the first part of the solution, non-governmental organizations, media, and experts have a key role to play in this process.

Another prerequisite for the solution is – knowledge. Serbia does not lack knowledge. We have great universities, faculties, institutes, experts, and scientists. There is no doubt that they are able to keep pace with the world's achievements and contribute to their country with innovations.

Laws must be clear and enforceable, with achievable goals, updated and amended every 2–3 years. In all fields and departments, ecology must take precedence over anything else. That is the only way we can succeed in this most important task. Each minister, regardless of the ministry he or she leads, must be an ecologist at the same time. Only by incorporating the environmental rules into all activities a progress can be made. It is not possible for this process to be managed by a single ministry. The EU has implemented this model long time ago.



And one more thing, very important. Without increasing the capacity and capability of the local self-governments, this process will never succeed. This implies a significant increase in the number of environmental officers, their competence, and constant training and development. Especially in the ecological-inspection. At the same time, the government urgently needs to increase the number of employees in the Ministry of Environmental Protection to around 600, strengthen and reform the Institute for Nature Conservation, significantly increase the competencies of the Environmental Protection Agency, and relieve the Ministry from the operational and technical tasks. It is understood that their budgets must be significantly increased.

Therefore, it must be established that funds represent one of the key factors in the protection and defence of the environment. Namely, first of all, it should be noted that according to the effective law, the money that is collected based on eco-fees and taxes does not go to the budget of the environmental authorities, but of the financial ones (the secretariat and ministry). Therefore, it is obvious that even these small funds do not end up with purpose. It is estimated that, due to the misuse of funds, we have lost billions of euros initially intended for the environment. So, changes are necessary. Secondly, it is estimated that more than 13 billion euros will need to be appropriated for the needs of environmental protection in the coming period! These are huge funds for the construction of ecological infrastructure, which will directly affect the increase of GDP, which was not understood upon forming of the Ministry of Environmental Protection. This fact was confirmed by the Fiscal Council. A clear commitment of the EU to the so-called *Green Deal* shows that the environmental protection and the fight against the consequences of climate change are the first priority of Europe, and that the promotion of the so-called green (circular) economy is the main direction of the world economy.

If we ask whether Serbia can provide such a large amount of money, the answer is affirmative. Firstly, there is the necessary increase of our own investments, and then it is certain that the EU funds but also other funds present a very realistic source. However, it should not be forgotten that this is a very lucrative business and that some countries and many companies in the world are very interested in investing their money in these ventures that bring significant profits.

Assuming that all this is applied, still the inspections represent a very significant segment, *i.e.*, the precaution and supervision in every aspect and at every level. No compromise and no exceptions.

In addition, there is no way to a better environment without the construction of the ecological infrastructure, and the construction requires the preparation of the technical design documentation. So, the operational and practical starting point is the technical design documentation, and just that! At this stage of our society, this must be the one and only priority! Everything else is secondary!

And it is especially important to point out the key priorities of the environmental protection in Serbia:

1. the construction of all the wastewater treatment systems, including the sludge lines,
2. the construction of the regional waste management centres, with the accompanying infrastructure,
3. the air protection, and,
4. the afforestation, *etc.*

At the moment, about 40 sets of design documentation have been prepared, and several more are under way, while several facilities are currently under construction.

And finally, if we agree that the environmental protection is a priority, then a social consensus and consent of all segments of the society – politics, economy, science, civil society, and citizens – must be reached. This is possible, since this topic has become extremely important in the last three years, according to some research. Citizens have become very susceptible to the topic of environmental conditions, and the media have greatly increased the space dedicated to this neuralgic and significant topic. In addition, Serbia has included the above-mentioned priorities in its plans of significant investments, and the investment into Vinča – the Waste Management Centre in Belgrade, amounting to approximately 330 million euros, is in the final phase.

Therefore, the measures and procedures for the solutions include:

- the strategies and plans,
- the raising of awareness of the importance of environmental protection and defence,
- the political will,
- the implementation of knowledge and science,
- the increase of the capacity of institutions,
- the relevant laws,
- the funding,
- the technical design documentation,
- the priorities, and
- the social consensus.

## **5. Conclusion**

We can say with certainty that all scientific evidence and predictions indicate that we are a generation the future depends on, whatever that means. We will either preserve this environment or proceed in the completely opposite direction. The outcome is uncertain in both cases. There is a room for optimism, we just need to make our decision as soon as possible, aware that this is a conflict between man and nature. It is clear that a dramatic change in the philosophy of life is needed, and that it is necessary to give up materialism. It is obvious that modern society needs a new, different ideology for both environmental and economic reasons. We also need a fundamental change of lifestyle. Urban planners and architects, spatial planners, landscape architects, and sociologists must devise, design, and enable a new, better, and more humane way of life in modern circumstances. We need a different organization of work, different places to live in, different traffic ....

The corona virus crisis has taught us that such a change at an instant is possible, it only requires an adequate motive and a manner how to make it. So, it is a matter of decision and not of “impossibility” or compulsion. Again, it is a matter of choice! If we understand, as we do at this point, that the health of man and the planet has become the most important thing for both the individual and the collective, then everything else shall be easy. Of course, it is clear that in such a case nothing can be the same anymore, that changing dirty technologies will require all other changes and a lot of money, but here again the question arises which is more important – man, nature, or money?

An obvious and possible solution is here. It is the green economy. It actually offers everyone a chance. Without exception. It offers better than anything a path that leads to a better and healthier life, and there seems to be no better alternative at the moment. It also offers the environmental protection and economic survival, in that very order. After all, the protection (defence) of the environment is becoming the most important planetary issue. The health of people and nature is the basic motive for that. It could be said that the health and the attitude towards it have already become a kind of new and leading “religion” in the world.

Our obsession with health is a fact that is changing modern society and determining the direction of development. The serious countries have long had the awareness and strategies about it, and in that context, they have long been dealing with the environmental security, environmental and climate diplomacy, *etc.*

The world is changing. Social, economic, political, and all other relations are changing. Analysts around the world have that in mind. However, they seem to be missing a significant opportunity – that social movements inspired by the health and environmental protection will change the world.

It is clear that Serbia must keep pace with the world, to the full extent, which in terms of ecology means to keep pace with its own interests. Abundant in biodiversity, rich in heritage, it must rapidly change technologies, invest in ecological infrastructure, and work on raising the awareness of its citizens. That is the only way. There is no other. The fact that Serbia is small is not a disadvantage but an advantage in this particular case. If we understand that this is the right opportunity for us, it will be easier for us to overcome the difficulties, and enable a happier and healthier life for the generations to come.

From a historical point of view, Serbia has always been progressive and on the positive side of the world. We have always treated ourselves and others in a civilized way, and this new age undoubtedly shows that the measure of a society’s civilization is its relationship to the environment.

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