The concept of sustainability of the urban realm and community as the key feature of the utopia

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Abstract. The aim of this paper is to demonstrate the topic of sustainability as a key basis for the formation of utopia on the example of the work of utopians (architects, politicians, etc.) in the historical context, and to compare their approaches to environmentalism with those prevalent and implemented today. The authors identify three conditional periods of utopia formation from the point of view of urban planning, which clearly demonstrate the shift in the approach to solving relevant problems, namely: spreading the idea of an ideal city (on the example of Franciscus Patricius, Ludovico Zuccolo); rejection of the city as a desirable model of human settlement and an attempt to return to nature (works by William Dean Howells, William Morris, Anatoile France); a period of active implementation of environmental technologies in projects since the early 20th century (the work by Ernest Callenbach).

1. Introduction

The concept of sustainability implies a change in people’s living standards, taking into account their current needs, and eliminating the negative impact on the future. A 1987 report by The United Nations General Assembly states that the concept includes two main ideas: taking into account the needs of the poorest sections of the population and limiting excess to the consumption and use of natural resources to conserve them [1].

In the historical context, the idea of transforming society by taking into account the needs of the poorest sections of the population is reflected in utopian ideas that depict an ideal society in which all residents are often equal. The concept of “utopia” is described as “an imagined place or state of things in which everything is perfect” [2]. The authors of utopias proposed verbal or visual authorial models of an improved society where peace and harmony prevail, and all citizens are happy and satisfied with the conditions of their lives. Utopia researcher K. Mannheim, describing different historical periods of utopias, notes that utopian ideas spread from the poorest and most oppressed centres. For example, the idea of the utopias of the orgastic chiliasm stems from the poorest part of the population - the peasants; liberal humanist utopias - from the middle classes, namely the bourgeoisie and the intelligentsia; the conservative idea - from the opposition segments of the population, etc. [3].

A common theme of sustainability was observed in the work of utopians, who believed that the ideal community could realize its potential only in a certain stable environment. Utopian ideas reflect the hyperbolized desire to improve the social order by changing the political model and
improving social conditions, establishing equality among the population, imposing significant restrictions on the use of resources and territories, and so on. It is worth noting that utopias are characterized by the idealization of human capabilities, for example, almost all authors of utopias note that the inhabitants of their cities are less sick or not sick at all. The theme of happiness in the utopian was global, but in fact, did not provide any possible alternatives. People who, according to utopians, will live in a state with the appropriate structure and conditions, must meet specific criteria: their behavior, thoughts and feelings are clearly regulated. “Utopia has never offered options” [4]. There is no unemployment or hunger in utopias, all basic human needs are met, there are no poor and needy, and so on. Utopias exaggerate the aspirations of the authors and idealize the possibilities of transformation, because they exist exclusively on paper. As a result, the study of the idea of sustainability through the analysis of utopias is quite significant in the historical context, as they are not burdened with issues of implementation, economic problems and quite clearly reflect the changing approaches to this issue over the centuries.

The concept of sustainability includes a significant number of different aspects. For example, the author of a significant number of books on sustainable development, John Elkington, identifies three main aspects of sustainability: social, economic and environmental [5]. Ignacy Sachs cites eight types of sustainability, social, economic, ecological, spatial, territorial, cultural, national and international policy [5]. Given that utopias contain an idealized socio-political system (all inhabitants have equal opportunities and living conditions) and mostly describe states and cities formed from scratch, it is worth emphasizing the spatial aspects of such models. For a clearer analysis of approaches to sustainability in the works of utopians, the authors of the article identified several specific components that were analyzed: the socio-political model; the choice of the territory where the state or city was formed; the approach to the formation of the urban environment; access and attempts to influence the population to natural resources.

The aim of this paper is to demonstrate the idea of sustainability as a key basis in the formation of utopia, which is realized through the representation of different approaches to site selection and urban strategy, through a specific understanding of “sustainable community”, through the relationship between sustainability and historical context. To achieve this goal, it is useful to compare the ecological approach present in the texts of utopians with today’s understanding of new technologies and their potential for environmental impact. This article for the first time analyzes the urban structure of the utopia of A. France and W. Dean Howells, clarifies the features of approaches to land selection and city formation in the context of forming a sustainable community in the works of F. Patricius, L. Zuccolo and W. Morris.

2. Research methodology
The authors of the article analyze six utopian works written from the 16th to the 20th century inclusively. The author went over not only classical examples of architectural utopias, but also works of fictions that are new to the study of utopias.

To present the results of the analysis, the authors propose three conditional periods of utopias, based on the change in the utopian approaches to the choice of territory and structure of populated cities, their attitude to technology and opportunities for environmental impact. It should be noted that this division is conditional, and focuses on the generalization of many different concepts.

The first period covers the period from the 16th to the 18th century and the concept of the ideal city, which presupposes: symmetrical planning and selection of sites that contain everything necessary from the beginning; landscaping through a clear functional division; use of simple technologies and means to change the natural environment. Within this period, the authors have analyzed the utopian works of Franciscus Patricius [6], Ludovico Zuccolo [7], as they most clearly describe the consideration of natural conditions in site selection to minimize
anthropogenic transformations.

The next period, which spans the late 18th and early 20th centuries and is characterized by the abandonment of the city as a desirable model of human settlement and an attempt to return to nature, is based on the desire to transform large settlements into more flexible and adaptable ones. Such utopias are often accompanied by an attempt to abandon the development of industry and a desire to return to traditional lifestyles. This is the result of people’s inability to provide all workers with proper living conditions in the real world. Features of approaches to the formation of the city are highlighted in the example of the utopias of William Dean Howells [8], William Morris [9], Anatole France [10].

The third period is the stage of active implementation of technologies in projects (since the beginning of the 20th century), which is characterized by more active development of technologies and attempts to use them to improve the environment and so on. For this period, Ernest Callenbach’s [11] utopia was chosen, which describes in detail the transformation of existing cities, taking into account the concept of green energy, the introduction of traffic jams and more.

The peculiarities of the urban planning approach to the organization of settlements were analyzed by the method of content analysis of textual and graphic works, and the methods of environmental friendliness and sustainability proposed by the utopians were singled out. The comparative method allowed us to compare the behavioural habits predicted for the inhabitants of the utopias with the described environment.

3. Literature review

The first two periods proposed by the authors of this article resonate with the research of Tessa Morrison, in which the architect, studying utopian urban projects until the early 20th century, divides them into two blocks - the ideal cities of the Renaissance and the cities of the Industrial Revolution [12]. Tessa Morrison’s works are devoted to the study of the utopian component of the concept of ideal cities, for example, the ideal cities by Filarete, Albrecht Dürer and other authors [13]. Helen Rosenau described the historical aspects of the formation of ideal cities from antiquity to the Enlightenment, analyzing the architectural features of Sforzinida by Filarete, Charles Fourier’s utopian colonies, the concepts of Ebenezer Howard’s garden city and other authors [14]. Political scientist Marius de Geus analyzed the practicality of the utopian approaches regarding the interaction with nature on the example of the analysis of works by such authors as E. Howard, E. Callenbach etc [15]. A detailed analysis of the peculiarities of the ecological utopia of E. Callenbach is described in the article by Fedak A., which also summarizes the vision of environmental society in the works of Plato, T. More, T. Campanella, Cyrano de Bergerac, Denis Vairasse, V. Odoyevsky [16].

4. Results and discussions

4.1. The model of cohesive community as a social basis for sustainable development in the concepts of Renaissance ideal cities

In Italy in the Middle Ages, city-states served as centers of cultural, social and political development. The spread of the concept of the ideal city, which was characterized by proportionality and correctness of the structure, became popular because it allowed to form a clear urban fabric, with predictable functional zoning. The concept provided not only an aesthetic solution to the image of the city, but also the transformation of the social order, which also had to be subject to the proposed scheme.

Ancient Roman engineer and architect Vitruvius in his treatise “Ten Books on Architecture” describes recommendations for choosing a city site, designing public and residential buildings, selection of materials and more. Vitruvius notes that when building a city, it is important to design the streets taking into account the direction of the winds, as people living in unfavorable locations are more likely to get sick and need appropriate treatment. The treatise mentions eight
winds, which are named according to the direction from which they blow, which corresponds to the wind rose (for example, northeast wind). Vitruvius proposes to orient the city around the world and design 8 main radial streets, the first of which deviates by 22.5 degrees from the north, and each subsequent deviates from the previous one by 45 degrees. Thus, the city has an octagonal shape, and all streets are designed to be protected from the main winds [17].

Vitruvius’ ideas for regulating the city’s space have been popular since the 15th century, when architects and statesmen tried to settle the chaotic city of the Middle Ages after the plague pandemic. The anti-epidemiological measures that are gaining popularity include: control of clean air through the disposal and processing of sewage, including waste and residues from the food industry, regular cleaning of sewage systems, etc.; organization of cemeteries outside the city; increasing the network of medical colleges, which provided professional training for physicians and persons who could provide medical care; construction of special infirmaries, hospitals (a special type of building with porches) on the outskirts or outside cities; introduction of quarantine for ships that had to stand on the roadstead (anchor stop) for a certain number of days before entering the harbor [18]. All these attempts to regulate the fabric of the city in order to improve the quality of life of people influenced architects and politicians, who tried to regulate the activities of city-states, to improve them. The architectural designs of the ideal city were designed by Italian architects Filarete and Francesco di Giorgio Martini, described in the treatise by Leon Battista Alberti. They also gained popularity in the works of utopian philosophers who used the right urban structure to form ideal states.

In the Renaissance, the idea of forming a friendly community of the city was more than just a desire to reach an agreement among the inhabitants. The inability to travel long distances and the lack of means of rapid transmission of information limited people and the circle of their constant communication to a certain area, community. Utopian projects of the Renaissance were aimed at organizing relations within such communities, providing a favorable environment for the formation of a sustainable community.

The English writer Sir Thomas More in his socio-political satire “Utopia” (1516) and the Italian philosopher Tommaso Campanella in his treatise “The City of the Sun” (1623) offer special containers for collecting rainwater that can then be used. The French writer Denis Vairasse in his utopia “History of Sevarambes” (1675) describes a system of land irrigation, which will allow the use of a significant number of territories that were previously considered infertile [16]. The correct shape of the city (a circle in T. Campanella, a square in T. More and D. Vairasse) and a fictional location with favorable natural conditions, allowed the authors to visualize the ideal city, which would be provided with everything necessary. The inhabitants of such a city were also portrayed as endowed with idealistic traits of character, and the relationship between them was clearly regulated and did not go beyond what was permissible. This approach was too abstract from the real conditions, as the authors of these utopias did not give recommendations on the choice of site or ways to interact with the environment.

The Italian philosopher Franciscus Patricius in his treatise “The happy city” in 1551 when choosing a site for a new city recommends avoiding: wetlands and forest areas with evergreen trees such as ivy, cypress, spruce, etc.; locations where there are often east or south winds. Part of the city should be located on an elevated, for better ventilation, otherwise part on the plain. Given the need to protect the city from external enemies, Patricius also proposes to build a defensive wall and moat around the city. The city should be divided into a “happy” part (focused on soldiers, magistrates, priests) and “unhappy” (inhabited by farmers, artisans and merchants). All city residents must meet certain standards, including external attractiveness. The buildings are designed to protect against excessively scorching sun and low temperatures; shaded areas under the loggias can be used as terraces; the rooms on the first floor will also serve as a salvation from the sun [6]. All residents should have some property near the outer border of the city and in its central part - this will encourage them to defend the city borders
in case of attack [6]. There is no detailed information about the architectural or engineering features of the city organization, which distinguishes this utopia from the works of T. More or T. Campanella, but the functional division of the city, which affects the formation of the community is described quite clearly (figure 1).

Figure 1. Schematic representation of city planning. 1 A town square; 2 “Happy” part of city (focused on housing of soldiers, magistrates, priests); 3 “Unhappy” part of city (focused on housing of farmers, artisans and merchants); 4 Every resident should have property near the city limits (this will encourage them to defend the city in the event of an attack); 5 Large enough area for agricultural purposes [drawn by author according to the description in “The happy city” by Franciscus Patricius].

The Italian theorist Ludovico Zuccolo in his work “Aromatario, or the Republic of Utopia” (1625) criticizes the work of T. More ”Utopia”. The author singles out insufficient detail of T. More’s work on various aspects of the organization of public life, the idealization of people and their behavior; notes impossibility to implement the proposed model. Zuccolo believes that it is not necessary to decide whether the country will be mainland or island - it is much more important to take into account climatic and natural resources. The site should be located in an area with good climate conditions and clean (“healthy”) air; the way of life should correspond to the terrain. The described political ideology has the features of democracy - individual freedoms; election of power; no communal property [7].

4.2. The first pre-ecological utopias of the Industrial Revolution: concept of abandoning of cities and returning to nature

Since the end of the 18th century, aesthetic utopias have been spreading, which preserve the humanistic ideal and the desire to rebuild the Golden Age [19]. During this period, urban planning is becoming an increasingly organized process, subject to certain general rules and laws. Cities that were formed in the previous period are subject to reconstruction (for example, the reconstruction of Paris by Baron Haussmann between 1853 and 1870). The development of industrialization and the active development of cities contributed to the deteriorating living conditions of residents who came to certain industrial centers in search of work and, as a result, lived in inadequate conditions. Characteristic of many authors of utopian works of the late 19th century are images of countries that do not have large cities, and residents prefer to live in rural areas planted with trees. The inhabitants of such utopias mostly have equal living and working conditions, living in harmony with their neighbors and the environment.

For example, the American writer William Dean Howells in his utopian novel “A Traveler from Altruria” (1894) describes the fictional island nation of Altruria, whose inhabitant is in the United States and marvels at the social restrictions on the rights and freedoms of some citizens. The territory of the country is divided into districts, each of which has a capital, and cities and villages in the usual sense are absent. Cities, some of which were quite large (some could hold up
to a million people), were considered economically unviable: they did not provide citizens with the necessary resources, but used those produced in villages and provinces as a result, negatively affecting the economy; all cities were completely destroyed. The author describes anthropogenic climate change: to improve conditions, the country’s inhabitants separated from the island a peninsula (20 miles wide and 93 miles long), located in the southeast of the country. It is proposed to use natural energy sources: wind and water power; the inhabitants of the country completely abandoned the use of classical energy sources; power lines cover the entire territory of the country, connecting villages and capitals [8]. It is noted that the country’s residents do not play sports as such, as all are involved in agricultural work and other types of physical labor for at least 3 hours a day. Thus, the counterurbanization of the territory contributed to changes not only in the characteristics of buildings, but also in the daily habits of citizens.

Another example of counterurbanization is the utopian work of the English writer and art theorist William Morris, who in his novel “News from Nowhere (or An Epoch of Rest)” (1890) describes a society of the future in which cities that served as industrial centers disappeared. The main administrative unit is a community or district, which is formed by villages. The author proposes a change in the functional purpose of outstanding buildings. For example, Windsor Castle has been preserved, but now it performs a different function: most of the rooms have become living rooms where anyone can live; a part of the premises serves as a museum. Phalanstery by Charles Fourier is mentioned in the work as one of the steps in the organization of an ideal society, which is still considered obsolete and imperfect. In the described future, the area of forests and various plantations increases and the population of birds of prey increases. The political ideology described by W. Morris has signs of communism: there is no private property in the state; no money and no payment for work, all goods are received free of charge; all residents live in separate buildings, but the doors of their apartments are always open [9].

The French writer Anatole France describes the events of the future in his 1905 novel “The White Stone”. The author describes the Great Union of Several European States - “European Federation”. Cities that have been formed are historically degrading; most settlements are villages. The city’s population decreased as most people began to live in villages [10]. Settlements of any shape, most buildings are located along roads (figure 2).

Figure 2. Schematic representation of city planning. 1 Round area- a town square; 2 Public buildings; 3 Residential buildings; 4 Arbitrary network of streets; motorways, streets and roads focused on motor vehicles and trams [drawn by author according to the description in “The White Stone” by Anatole France].

Despite the rejection of the urban way of life, France describes a variety of industrial plants and factories in which all processes are automated. The author does not pay much attention to natural resources, and the described political ideology has signs of collectivism: lack of private
property); lack of money: employees receive vouchers for a certain number of hours worked; these vouchers are exchanged for food, clothing, etc. [10].

The architectural utopias of reurbanization include the idea of the garden city by Sir Ebenezer Howard [20]. This is the concept of a self-sufficient city, which is formed by low-rise buildings surrounded by a lot of greenery. A city of 32,000 inhabitants was proposed, and in the event of an increase in population, another city would have to be formed for new residents. E. Howard founded in 1899 the Town and Country Planning Association, which operates to this day and is engaged in improving urban planning and environmental policy.

4.3. Introduction of eco-technologies in utopian projects
Since the beginning of the 20th century, active urbanization, the proliferation of motor vehicles and the increase in the number of plants and factories have contributed to increasing problems, both in the organization of urban spaces and in the field of environmental protection. These negative transformations have contributed to the emergence of new urban planning practices, such as New Urbanism and Sustainable Architecture, which are focused on the introduction of means to protect the environment and improve the living conditions of residents. Utopians, who previously proposed the formation of new cities on conditional islands, now go beyond the planet Earth, describing ideal societies on Mars or the Moon. Some authors describe utopian societies in today’s cities, offering a significant number of changes in the urban fabric, the approach to nature conservation and behavioral habits of residents.

For example, the American writer Ernest Callenbach in his novel “Ecotopia: The Notebooks and Reports of William Weston” describes in detail the community living in an ecological environment: there are waste recycling stations, renewable energy sources are used, and so on [11]. Callenbach’s work is characterized not only by an attempt to introduce an ecological economy, but also to restore damaged rivers and the spaces around them (figure 3).

![Figure 3. Schematic representation of city planning. 1 Restored river, which was previously turned into a sewer; 2 Embankment with public areas; 3 Buildings; 4 Roads are focused on electric vehicles, cyclists, pedestrians; 5 Territories of schools; 6 Factories and power stations [drawn by author according to the description in “Ecotopia: The Notebooks and Reports of William Weston” by E. Callenbach].](image)

Callenbach depicts the country Ecotopia, formed not on a conditional territory, but on the site of existing cities in the United States, which are subject to some reconstruction. Preserved historic cities have a typical US street network, planned according to the grid street plan. At the same time, new cities are formed by a network of winding streets that have different names, not numbers. This work depicts a state where the laws of sustainable development have been implemented, which has had a positive impact on clean air and the region’s ecology. Residents,
although they have to follow certain rules (sort garbage, wear only clothes made of natural materials) are still not subject to such clear restrictions as it was provided by the utopias of previous centuries [11].

4.4. The result of the analysis of the selected utopias of the three periods
Summary of the analysis of the selected utopias is given in the table 1, where the leading characteristics of all three periods are singled out according to the choice of the territory on which the state or city was formed; approach to the formation of the urban environment; access and attempts to influence natural resources.

Table 1. Summary table of approach features for all three periods.

| Period | The concept of the ideal city as a model of a close-knit community | Utopias of abandonment of cities and return to nature | Introduction of eco-technologies in utopian projects |
|--------|---------------------------------------------------------------|---------------------------------------------------|--------------------------------------------------|
| Timeline | By the 18th century | End of the 18th - beginning of the 20th century | From the first half of the 20th-century |
| Analyzed works | F. Patricius “The happy city” (1551); L. Zuccolo “Aromatario, or the Republic of Utopia” (1625) | W. Morris “News from Nowhere (or An Epoch of Rest)” (1890); W. D. Howells “A Traveler from Altruria” (1894); A. France “The White Stone” (1905) | E. Callenbach “Ecotopia: The Notebooks and Reports of William Weston” (1975) |
| Choice of territory | Conditional location | Conditional reconstruction of existing cities | Reconstruction of existing cities (Northern California, Oregon and Washington, USA) |
| Approach to building the territory | Urbanization | Deurbanization of the territory | Deurbanization of the territory |
| The urban structure | City | Small towns, villages | Small towns, villages |
| Anthropogenic impact on the environment | Minimization of environmental impact; taking into account climatic conditions and clean air; the way of life must correspond to the terrain | Minimization of environmental impact; approach to nature - active gardening and spread of agriculture; attempts to use natural energy sources | Use of natural energy sources; garbage processing stations are operating; implementation of the principles of sustainable development; use of the latest technologies for cleaning the river, etc |
5. Conclusions
Analysis of the works of utopian writers of the 16th-20th centuries demonstrated that the idea of sustainable development in the context of the environmental approach has become the basis for the formation of utopias. Utopian concepts stated that the cleanliness of the city and the ability to improve the physical characteristics of space are important aspects of comfortable living that shape the behavioral habits of residents.

Until the 18th century, the authors of utopias operated with the concept of an ideal city, striving to organize the territories of cities that were formed chaotically. They suggested using physical means to increase the level of involvement of residents in the public life of the city and reduce the incidence. For example, a responsible approach to choosing a site for the construction of a new city, which would create a healthy comfortable environment, due to the required strength and direction of winds, which improves the health of citizens ("The happy city" by Franciscus Patricius, "Aromatario, or the Republic of Utopia" by Ludovico Zuccolo). The city-states they describe are self-sufficient and orderly, their structure is clear and the population is evenly distributed throughout the territory. At the same time, the main means of anthropogenic ascent to nature are attempts to irrigate the land and collect rainwater. In these concepts, the model of a cohesive community that works for the common good to improve living conditions is central.

The industrial revolution of the second half of the 18th century led to the development of industrialization and active urban development. This contributed to the migration of the working class, who gathered in cities that were industrial centers, and the uncontrolled increase in population density, a significant deterioration in their living conditions. As a result, in the 19th century a number of projects emerged to reurbanize territories by destroying large cities and forming a network of settlements with a good-neighborly community of people (garden cities; concepts of rural utopias). Such projects aimed to restore the well-being of neighboring communities and strengthen people’s connections with nature, improve the level of the environment, which has deteriorated significantly as a result of the growing number of plants and factories. The main means offered were a return to the rural way of life, a reduction in the percentage of mechanized production, and so on. Such utopias were pre-ecological in nature.

Since the 20th century, the topic of finiteness of natural resources, the state of the environment and the decline of social interaction between people has been more actively raised. These problems are reflected in the work of utopians who try to visualize cities with alternative energy sources, or offer models of communities that abandon non-organic products in favor of natural products.

Thus, the analysis of utopias in the works of selected writers of 16-20 centuries demonstrates that the idea of sustainable development is one of the leading in the formation of utopia. Writers, statesmen and architects, using fictional societies or images of cities of the future, offer their vision of solving many problems. The ideas of solving the problems of social equality and ensuring social justice are most acutely reflected in their works. However, the formation of such an ideal society is impossible without a healthy environment. The ecological component occupies a leading place in utopias. It is provided by various measures at different times: cohesive, consolidated action of residents to ensure the cleanliness of the environment, escape from the city and merge with nature, the use of the latest technologies.

Thus, the desire to shape the sustainability of the environment, as a guarantee of sustainability of the community, is one of the leading signs of utopias.

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