The areas inhabited by man have always been an arena of conflict. The more developed regions attract new residents, who seek their place and work there. Excessive migration causes congestion, lack of space for new buildings and hence conflicts. The city is a specific area of conflict – over land, over access to infrastructure, over housing, over jobs. Excessive urban development, which exceeds the limits of efficient area management, contributes to the deterioration of living conditions – transport chaos, social segregation, inefficient public services, air pollution. Conflicts over water, over sustainable electricity, over resources, over access to education are also everyday topics in all parts of the world. We present our readers with a monograph devoted to some of the above-mentioned problems, which are common for Poland and for Latin American countries.

This publication is a continuation of the topics discussed in earlier monographs, which were the result of joint research of Polish and Latin American geographers within many projects dedicated to urban issues. Academics of the Faculty of Geography and Regional Studies of Warsaw University have been lecturers at doctoral studies in urban and regional sustainable development and post-doctoral studies in Earth and Environmental Science at the University of Manizales in Colombia (Doctorado en Desarrollo Sostenible y Posdoctorado en Ciencias de la Tierra y el Medio Ambiente). Doctoral students and lecturers from the University of Manizales have visited Poland many times in joint symposia and workshops. In 2017 a Polish-Colombian monograph in Spanish was published in Colombia and in 2018 two scientific monographs, both in Spanish and English, were brought out by the University of Warsaw Press. This volume is the first of the two published in 2021 and contains only English texts on sustainable development, risk and local development in Poland, Colombia and some other South American countries.
CONFLICTS OVER USE OF URBAN AND REGIONAL SPACES IN THE TIME OF CLIMATE CHANGES
GOOD MANAGEMENT AND PLANNING PRACTICES
CONFLICTS OVER USE OF URBAN AND REGIONAL SPACES IN THE TIME OF CLIMATE CHANGES
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EDITORS
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The scientific monograph entitled “Conflicts over Use of Urban and Regional Spaces in the Time of Climate Changes. Good Management and Planning Practices” intends to add new issues, taken mainly from the Polish and Colombian spaces, to the scientific discussion on urban-regional changes and the role of the government in these processes.

The authors invited to this work representatives of several scientific disciplines and several research topics. The common idea is to show the territorial processes through the prism of environmental, social and political conflicts.

The monograph is divided into three essential topics, important for this discourse:

– The city as an arena of conflicts and negotiations;
– The region as an arena of conflicts and negotiations;
– Society, education and possibilities in contestation spaces.

Cities have always formed a fascinating and intriguing space. Their unforeseen development, with surprising forms, unexpected directions and unpredictable effects have always brought crowds of people to cities, hungry to live in a different environment than rural – full of movement and interactions, lively, noisy, colorful and diverse in all senses.

The space of the city, due to the number of interests, aspirations and visions, must be conflictive. Thousands of texts have already been written about the apparent conflicts within the urban space and many more will probably follow. Here we mention just four topics within this problem that we find important and interesting for readers on both continents.

The first issue, which has not left the pages of newspapers for several years, is the question of the situation of cities and their place in space in the face of climate change. It is a very broad topic and causes several controversies about the forms of urbanization processes and the adaptation of urban space to these changes. Governance also plays an important role here. Jaime Mejía Gutiérrez talks about this aspect in his article and, being very critical of environmental policy in the southern department of Caldas in Colombia, blames local authorities for inadequate urbanization processes.

The article by Sylvia Dudek-Mańkowska and Mirosław Grochowski is also related to the theme of governance. This time they evaluate the efficiency of governance in the case of the city of Warsaw, Poland.
Green spaces and their social, integrating and recreational role within urban and semi-urban spaces are discussed in two texts on Warsaw. One by Dorota Mantey is dedicated to the usefulness and convenience issues of creating small recreational spaces in peri-urban areas. In the other article Miroslawa Czerny and Patricia Starzec talk about the real batch conflict in the central areas of the city. These are small gardens allocated in the communist era to the workers who used them for recreational purposes and to cultivate agricultural products that were missing in the formal market at that time. Today, these gardens located near the city center are a tasty snack for investors who are trying to change the use of these areas.

And finally, the article by Dominik Róžewicz who talks about the creation of the new space after the damage caused by the Second World War. But it turns out that the city built in a modernist style does not appeal to the inhabitants in the current era. A new urban space is being formed. But does this new urban form manage to integrate society around new signs and symbols?

The second part of the monograph is devoted to regional issues. The first text by Luis Alfredo Muñoz Velasco and Sylwia Kulczyk takes the theme of social construction of innovative and competitive territories in Colombia in a perspective of innovation and competitiveness. On the other hand, Tulia Elena Hernández, Burbano Javier Gonzaga and Valencia Hernandez write about the occupation of the territory by different cultures throughout the history of humanity, show the first steps towards planning as a fundamental axis in the determination of urbanism where there is risk and threat for the permanence of human settlements. This theme is partially developed by Hernando Gil Tovar and Sylwia Kulczyk when they bring us closer to the theme of governance, which has become a transcendental aspect for achieving social capital that supports the objectives of sustainable development.

Two other texts are devoted to water issues – fundamental resources for the development of contemporary and future societies. The first text by Roberto Saavedra Ardila and Jorge W. Arboleda Valencia brings us closer to the theme of sustainable water use planning. The second article by Christian Alejandra Vidal Sierra, Ciro Alfonso Serna Mendoza and Coral Jazvel Pacheco Figueroa returns to the theme of the importance of wetlands for the sustainable development of the planet. Ciro Alfonso Cerna Mendoza and Eutimio Mejia Soto are the authors of the other article dedicated to questions of water governance. We see that the issue of water use and management is currently one of the most important approaches in the discussion on sustainable development and its regional perspectives.

And finally, in the second part of the book we can enlist the article dedicated to the questions of the relationship between sustainable development and the efficiency of energy production.

The third part of the book is devoted to social issues and their impact on development. Within this theme there are also educational issues for development, social disparities and their consequences and social movements.
Katarzyna Dembicz presents a very important text on education for development and the mistaken western visions applied to the local Latin American world. Claudia Jurado Alvarán talks about the emigration of young people from the countryside and the very difficult situation in the countryside. Ciro Alfonso Serna Mendoza, Diana Sofía Serna Giraldo and Diego Hernández García speak to us about social movements and development, the role of society in participation in development acts.

In short, the spectrum of the topics presented allows us to open new directions for scientific discussion or to integrate with existing ideas. It seems that the geographical distance that separates the two countries mentioned at the beginning of the introduction does not constitute a barrier to conclude on apparently global issues located in the regional and local context. Hopefully the reader will find here some constructive and novel ideas.

Mirosława Czerny, Ciro Alfonso Serna Mendoza

Varsovia – Manizales, July 2020
I. THE CITY AS AN ARENA OF CONFLICTS AND NEGOTIATIONS
1. Introduction

The omnipresence of a certain point of view is not a sign of excellence or that the truth has been found but a failure of the reason to look for alternatives.

Paul Feyerabend, *Against the Method*, 1970

1.1. A territory with history. The determinants of experience in public policy oriented to land use with bases for altitudinal planning

This work is influenced by historical research on intelligence in the twentieth century done by the writer and historian Peter Watson, by reflections on the sciences of climate, land, territory and spiritual interpretation as a way out of the environmental damage. It was written by Mario Mejía Gutiérrez – a scientist of organic agriculture, a cultivator of harmonious relations with nature, a follower of the philosophy of non-consumerism to establish a dignified, productive life, without the shame of having lived it.

Engaging in territorial studies requires multiple disciplines and an effort of analysis in the history of culture, in economic evaluations, in the considerations of entrepreneurs of colonization and occupation of spaces to evolve in projects of urban and rural relations, in the international insertions, in the demand for institutional and government guidelines.

In a country so far from science and scientific knowledge, still subjected to great inequalities and hateful discrimination, getting involved in the sciences of the territory to explain the evolution of the territorial occupation is risky due to the dominance of discourses coming from an intellectual and political circles, which do deep damage to the search for pragmatic and useful solutions to the various problems of the current national situation. Academic experience obliges us to be loyal with the sincerity and frankness that the moment of
conducting the actions of the governments of the territorial entities that have been constitutionally created demands.

He says (Watson, 2014): “the engine of social evolution is science and it has two philosophical consequences in the twentieth century; the first is the technology that has given the individual greater freedom in many aspects of life, but it has also produced alienation and weariness. The second is the rapid change in concepts of science and the arts, which are cumulative areas that nest imagination, creativity, innovation, the world of the so called intuitive”.

Mario Mejia places us on the pathways of what pre-scientific is, that is, the indigenous ancestry that concerns us in the contexts of the diversity of ecosystems in the equatorial tropics, on the paths of what is scientific-experimental and on the outputs in front of the imprecision and uncertainty, in contexts of climate change, in the irreparable damage to mother earth, referring to the possibilities in the recovery of values of solidarity, spirituality, intellectuality and respect for nature by understanding this in peaceful coexistence with her, as a whole.

Earth sciences today start from the convergences of physics, biology, chemistry, architecture, mathematics, geology, archeology, paleontology, medicine and philosophical reflection on the ways of generating public policy and also pluralistic and inclusive government shaping. The earth sciences contain and derive the understanding of the knowledge applied to the explanation of the territorial ordering to allow human life in a peaceful and harmonious relationship with nature. Produce for a good lifestyle, eat healthy food to maintain a healthy and active life in all aspects and also educate yourselves to launch decent projects in housing, recreation and artistic creation. Access productivity away from consumerism that kills, poisons and enslaves us. Be competitive in civic cooperation institutionality with mutual advantages, in providing timely justice and equality plans before the norms.

Manizales and its surroundings, the municipalities that attempt a formula of regional association, are the result of an intersection of roads in the commerce of the late nineteenth century; it is the settlement that supplied colonies with coffee, in the exchanges between miners of Marmato and the food producers who, with hard effort, farmed the land where they could survive. Territories and forced sites in transit and deployment of the armies in civil wars, a Catholic population, emboldened by values of honesty, work, savings, family creation, capable of taking a place of residence away from the hillside. This is also to contemplate sunsets, to enjoy a “sunset factory”, as the poet Pablo Neruda called it when he visited it in the 1960s, at the International Theater Festival, when from the lookout of Chipre he observed the majestic paintings, in the mauve color, in the mountains of the western mountain range against the Tatamá hill. It is also a viewpoint of the snowy area of the central mountain range, the Ruiz, Santa Isabel, Paramillo de Santa Rosa. It is therefore a dimension of geography in the verticality of the territorial use that the indigenous people used for agriculture, subsistence, and the dimensions of religious beliefs.
The discussions into which the multifaceted criticism of the efficiency of the modern state has introduced us, have triggered in our Colombian nation constitutional modifications of a modern qualitative order such as pluralism, citizen participation, local activism to develop the regions with the popular election of leaders and the programmatic vote concretized in local and territorial development plans.

The colonizers, the founders, the occupants of the territory came from Antioquia, from the populations that embodied the spirit of rent seeking, based on productive items that combined mining, agriculture, commerce, and the exploitation of mines.

The myth of the entrepreneurial capacity of the paisa\(^1\) became a paradigm in the settlement of the hillside region, from Aguadas, full of water resources and filigree hat crafts, to Manizales and the borders of Valle del Cauca. From Samaná and Pennsylvania, occupying the limits of Tolima Grande, passing through Manzanares in the landscapes of the wild mountain range, of threatening deep gorges in abysses, in the steepness of the hills that culminate at Paramo de Letras. The sense for business of the residents of Aránzazu, the Colombian Phoenicians, as the lawyer and sociologist Antonio Mejía Gutiérrez quoted them, is proverbial. The aesthetic constructive capacity of the Salamineños, is considered a Colombian architectural heritage, the embryo of the coffee cultural landscape. Salamina, the city of light, also influenced the formation of Manizales, by poetic inspiration, the quality of its jurists, the exquisiteness of its writers, the wisdom of its doctors, the deep-rooted Catholic, Apostolic and Roman belief of enterprising priests, ships in the difficult tide of occupation.

This colonization and trade enclave is understood in the cycles of territorial occupation, first by indigenous people with well-developed political, social, religious, military structures in managing connections of varied altitudinal region, in diversified agriculture, in devotion to natural features of impressive topographical vigor and beauty amalgamated in lagoons, snows, streams, waterfalls, sulfur waters, forests of arboreal diversity, in ferns, in orchids, in thickets, in frailejones\(^2\) and the shelter of fauna of deer, agoutis, rabbits, armadillos, pigeons, birds and birds of beauty in plumage and song. The productive occupation of mestizos is mainly of coffee cultivation. The development of light industry is a phenomenon of notable innovative effort.

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\(^1\) Paisa is a region in the northwest of Colombia formed by the departments of Antioquia, Caldas, Risaralda and Quindío. Some regions of Valle del Cauca Department (north) and Tolima Department (west) culturally identify as paisas. The main cities of the Paisa region are Medellín, Pereira, Manizales and Armenia. A paisa or paisano is someone from this region too, especially from the part of the Andes in Colombia (editorial note).

\(^2\) Frailejones – *Espeletia* sp. is a genus of perennial subshrubs. Those plants grow at high altitude in páramo ecosystem in the Andes of Colombia, Ecuador, Peru and Venezuela. They are dominant and characteristic plants in páramo, endangered due to destruction for agricultural purposes (editorial note).
In the twentieth century Cundi-Boyacense colonized the cold land, from Aguadas and Salamina in San Félix and Marulanda started breeding cattle. Thus, the cold lands that were not occupied in the paisa spirit offered the possibility to Cundinamarqueses and Boyacenses to resume a productive inclusion work with the planting of potatoes and the management of Norman cattle. The beautiful flat slopes at an altitude above 2,600 meters above sea level, were used more to burn the native forest and turn it into lumber and charcoal for domestic use, than to find food and a route for endeavors of great territorial value.

It is not a territory free of social conflicts, especially those related to land tenure. “Colonists in southern Antioquia had frequent clashes with the owners of concessions, and one of the owners of the Aranzazu concession, Elías González, was shot to death in the 1840s”... the expulsion of colonists who occupied titled land used to occur in the whole country from the mid-nineteenth century, sometimes with burning of crops and houses by the owners, with the help of local authorities, such as those described in the novel Risaralda, by Bernardo Arias Trujillo (Melo, 2018, p. 157).

1.2. Environmental concern, climate change. Environments in the evolved occupation. The essentials of the phenomenon, from the ancestral mode to the technological innovation in the ways of life and territorial occupation

Knowledge of the annual course of atmospheric weather, which we call climate, is susceptible to approximately three ways of explaining Nature to us. The ancestral, pre-scientific mode knew and knows that the climate is cyclical. Western linear culture has a hard time being cyclical. Thus, at the latitude and orography of Manizales, two wet trends per year usually occur, interspersed with two dry trends. It is said that it is bimodal climate. Landslides in Manizales have occurred in every rainy season.

The scientific mode explains that climate is a global atmospheric-thermo-dynamic expression that is the effect of the distribution of solar heat on the terrestrial globe, which consists symmetrically of two hemispheres: northern and southern. From this symmetry the cyclicity of the climate originates. In each of Hadley’s cells the climate is typically expressed with recognizable physiognomy in macro terms. The post-scientific mode, with its principle of imprecision, helps us imagine a process that occurs in gaseous space; imprecise, chaotic3, where multiple variables intervene.

1.3. The phenomenon. Territorial planning and environmental governance in the south-central area of Caldas

But, in any case, it is a physical phenomenon, predictable with a certain degree of imprecision, but also with a certain degree of confidence. The rainy trend

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3 Bunyard’s data (2010).
of the first half of the year at latitudes and topographies similar to Manizales is known to come from the south, from the summer of the southern hemisphere. The rainy trend of the second half of the year comes from the north, from the summer of the northern hemisphere. “Anomalies” that occur after the middle of the year in Central America are indicative. Mountain ranges in the meridian direction, the Andes, cause equatorial, trade winds, called Colombian or Kenyan, bimodal in their annual trend. Mountain ranges in the sense of parallels, the Himalayas, cause monsoonal, monomodal climates in their annual trend. The ignorance of public administration officials disguises it as fatal, “natural” and unpredictable.

2. Methodology

The research question: How to interpret environmental governance in the inclusion of an organizational instrument that will determine the allocation of resources to deal especially with territorial change in climate change?

The action research is supported by community panels, experts and authorities on the political proposal of a metropolitan area, which involves territorial planning and organization in the face of climate change.

3. Theoretical framework

“The growth of cities and associated phenomena such as the conurbation and commutation of citizens seeking access to goods and services are constantly in tension with the aim of maintaining healthy ecosystems that are capable of maintaining the well-being of societies through the services they provide. At the local and regional scale, urbanization fragments, the habitat for species, degrades ecosystem processes, modifies the natural distribution regimes of species” (Liu and Wu, 2016), “facilitates habitats that are occupied by biological communities in which exotic species stand out” (McKinney, 2002), “degrades the quality of surface waters and exposes soils to further erosion” (Teixeira and Marques, 2014).

In the case of the Central-South region, thanks to its location on an extensive altitudinal gradient on the western slope of the central mountain range there is a great variety of ecosystems. Such ecosystems have been subject to a strong transformation regime that is evident in the large proportion that agro/ecosystems occupy in the region. Seventy percent of the Central-South

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4 The monsoon climate is a variable of the tropical climate that presents many complications in matters of detail but has as a fundamental and constant character that of a wind of land and another of sea succeeding regularly and forming like a gigantic breeze, which is known as winter monsoon (land) and summer monsoon (sea). Electronic document, www.titulaciongeografia-sevilla.es/ (access: 2.06.2020).
region is occupied by these ecosystems, mainly in spaces where previously the tropical dry forest and the Andean forests dominated. “On a national scale, the latter have been particularly affected in the dynamics of transformation of the landscape starting at 1800 meters above sea level, with approximately eight percent and forty percent of the original coverage remaining, respectively” (Etter and Possingham, 2008; and Etter, Garcia, Isaacs and Corzo, 2014).

Based on the dramatic reduction of forest cover at the national level, it is worth stopping to examine the dynamics of transformation of Andean and dry forests in the region, as well as the proposed strategies for their conservation. The Andean forests in the region are conserved in remnants inscribed within protected areas or in areas of difficult access, with steep slopes, where agriculture is difficult and loses profitability. In contrast to dry forests, Andean forests and mountain ecosystems such as moor or páramo and glaciers are highly represented in the Single Register of Protected Areas.

Regarding this last point, it is important to highlight that protected areas, despite their establishment, may be failing in their conservation objective so that they may not be sufficiently mitigating the pressures of the adjacent areas on their core areas. Furthermore, for protected areas to achieve their conservation objectives, it is essential that they are connected to each other, allowing genetic flow between populations and contributing to the maintenance of ecological processes that operate at a higher scale of landscape.

3.1. The nerve center in territorialization

If the loss of human lives in climatic events is an indicator of something, in the Colombian case the National Planning Department recognizes that 33% (a third) of the Colombian population is at risk, as of April 2017. The point it is not, then, natural fatality; it is that through the historical process of formation of Colombian society, at least a third of it has been exposed to the greatest risks; it is the result of a system of inequalities and administrative incompetence.

The way in which a city, a region, emerges is a matter of its territoriality associated with the economic, social, and cultural relations and of the adaptations of its government to the hierarchical arrangements of the political system. The word “region” comes from the ancient Indo-European meaning (reg) that evokes, according to Armando Martinez (2006:390), a peculiar universal action of human beings: to lead, to govern, to direct people. The public agenda today proposes the creation of the Central-South metropolitan area that would house the municipalities of Manizales, Villamaria, Palestina, Chinchiná and Neira. This is a promotional function of the state government in the search for mechanisms of environmental governance, in the development of efficient infrastructure to improve competitiveness and productivity, to connect the dimensions of urban and rural production in a fluid manner, facilitating technological connections, institutional synergies, business coordination in the spheres of action that the National Development Plan designates to the coffee axis.
This level of territorialization, that is, the incorporation of a region, or a city-territory within the framework of constitutionality and the law to provide organizational mechanisms for the exercise of metropolitan government, forces us to understand the framework and exercise of participatory democracy as an essential element in the public call for the proposed territorial organization.

3.2. The ancestral altitudinal

Ancestralities of Abya Yalá constituted societies that considered themselves Nature, according to time and space. What is meant by time is experience of the ancestors, the huacas, who devised the ways of life that made the present, which is the horizon of the future, possible. Space is living in the territoriality that would allow them to become life. Savannahs, forests, or Andean mountain ranges were places where some cultures of Abya Yalá, were moving towards horizons of reciprocity.

Cultures have been suggested for the Amazon rainforest that guided it for thousands of years towards a gigantic garden of food-bearing trees, from which they were inspired to design the multi-layered fruit orchard. At the same time, they created Chagra modalities for the intensive agriculture of plants of wisdom (yagé, coca, tobacco...) and food autonomy (cassava, pineapple, chili peppers, tomato, among others).

Savannah cultures, along with their roaming gatherer and hunter spirit, devised conuco food systems in diverse environments: conucos of savanna, morichal, mata de monte, vega, playa de río.

Mountain range cultures understood the simultaneous control of various altitude levels from sea level to rugged moors, creating agriculture of the highest food diversity that has occurred in the history of humanity: from hundreds of cereals to hundreds of root species and fruit trees.

Open space cultures lived their times; they were run over by cultures of accumulation, dispossession, closed spaces, cultures that live against time. Half a millennium was enough to go from cultures of life to cultures of money.

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5 Mature Land, Living Land or Blossoming Land, was the term used by the Kuna, native people living in Colombia and Panama, to designate the territory comprised by the American Continent.


7 The original farming system of Tainos. The natives utilized smaller plots of land that were called conucos, where they would simultaneously grow the principal staples of their daily diet, mainly root crops. Commonly used for lands of savanna which are dedicated to a single crop (editorial note).

8 Morichal is a palm tree forest characteristic of wetlands, wet savannas, and swaps of South America, dominated by moriche palm (Mauritia flexuosa L.); mata del monte and others are types of Colombian savanna’s ecosystems (editorial note).

In the beginning, in the ancestral, original, it was the itinerant experience along various altitude levels. Quimbayas\textsuperscript{10} ranged from the Cauca River to the top of the Central Mountain Range. The Pijao\textsuperscript{11}, from the Magdalena river to the top of the Central Mountain Range. The Yotocos, Calis, Jamundies, Guacaries, Bugas, from the Cauca River to the tops of the Central and Western Mountain Ranges. The Embera from the Pacific Ocean to the top of the Western Mountain Range. The Saliva from the foothills of the Cocuy to the foothills of the plains. The Panches from the Magdalena river to the Cundiboyacense plateau. At Sierra Nevada, de Santa Marta three Chagras communities were roamed: one of hot land, another of medium climate, and the third one of cold climate ... But the Spanish invasion implanted the idea of horizontality: extensive estates. The Jesuits made this idea possible by creating herds in the Eastern Plains and farms in other localities\textsuperscript{12}, with permanent residence. Instead of scattered provisional huts, villages. And, instead of a thousand languages, a common language.\textsuperscript{13}

3.3. Colonization and heritage

In his book The Return of Icarus (2002), Augusto Ángel Maya, a real Caldense, concerned with the environment, insists that environmental thought must not only be based on the historical elements of philosophy, but it must also be built from the advancement of the sciences. Thermodynamics, quantum physics, biology, chemistry, climatic sciences, paleontology, geology that energize the new sciences of territorial study are therefore part of this conception that we share as something valid, to understand how to construct or form an environmental public policy that is consistent with the sustainability of the use of land and environmental resources in comprehensive rural development.

Mario Mejía Gutiérrez (2017) says: “he embraces the cultural stereotype\textsuperscript{14} for

\textsuperscript{10} Quimbaya – Pre-Columbian culture of Colombia in the valley of the Cauca River and present living indigenous people of Colombia (editorial note).

\textsuperscript{11} Pijaos, Yocotos and other names of Colombian indigenous people (editorial note).


\textsuperscript{14} Enrique Dussel (1998), [in] etica de liberacion, departs from the conventional stereotype, posing Greek philosophy as inspired by Egyptian theologies, and insinuating the origin of philosophy in the Arab genius that rescues the rights of reason versus faith; 9\textsuperscript{th} and 10\textsuperscript{th} centuries.
which the world is, because there were once philosophers in ancient Greece”. Despite differences, we prefer to agree with Ángel Maya in his reasoning towards reunion with the Mother: Society and ecosystem are two different ways of being Nature (Ángel, 2002, p. 243).

Caldas in its municipalities of the mountain ecosystem, of the Andean mountain production mode, is traditionally a coffee state (department), imbued with the culture of an Antioquian colonization, which leaves an indelible mark of expression culturally molded in its rural and also popular urban landscape of towns, almost all of them linked to exporting grain as raw material for the coffee roasting industry. Manizales, Neira, Chinchiná, Palestine, Villamaría exist thanks to coffee planting and its commercialization. The parts of the mid-altitude hillside allowed for the adaptation of Arabian coffees in the region to boost the economy and make Colombia an international insert exporting raw material after the tobacco market crisis in the nineteenth century. Agua-das, Riosucio, Salamina, Samaná are municipal territorial entities of this type.

Despite all this, each one of them has differentiated characterizations due to the presence of indigenous people as in the case of Riosucio, with combinations of varied altitudinal floors in production, and climates such as Salamina and Agua-das with their cold zones of Cundinamarca-Boyaca colonization, producers of potatoes and Norman cattle, of sheep, horses and mules. After the Antioquia epic of the colonization of western Colombia, they became essentially coffee growers. Neira, Manizales, and Villamaría are in cold zones and moorlands, like the National Park of los Nevados, moorland patrimony, environmental essence of fundamental ecosystem in the territorial life and of connection with the mother earth or pacha mama. Samaná is a rich area of biodiversity, with beautiful rivers, splendid lagoons, and Andean forests, but also planted with coffee, inhabited by descendants of Paisas.

3.3.1. Environmental history and cultural heritage

This economic, environmental, social, territoriality history formed a society of small Catholic farmers, tireless workers, bearers of a culture of values of honesty, keeping the word in business. In the recent events of territorial positioning in contexts of globalization, UNESCO granted a certificate of Coffee Cultural Landscape to this form of productive expression established in municipalities with this characteristic. Coffee production is associated with other agricultural goods such as sugarcane, banana, some fruit trees such as orange, tangerine, lulo, passion fruit, papaya, tomato, granadillas; tubers like cassava; horticulture like the tomato, the ahuyamas. There are also agro-industrial enclaves such as sugar cane in the Risaralda river valley. This landscape is also associated with medium-sized and some extensive pasture-covered properties for livestock, of double use in the production of meat and dairy products. “It is clear that Society is culture and ecosystem is Nature. Culture is the capacity to transform Nature, and, at the same time, the result of that intervention.
The human species evolves, rides, even biologically, along with culture, intellectual and spiritual growth. Technological instrumentation, specific technique corresponds to each cultural stage” (Mejía, 2017).

The contexts of climate change, the vulnerability of the territorial space and the environmental goods that are necessary for integrated rural development, the provision of public services and productive resources, especially water, in the face of recurring weather phenomena such as El Niño (an annual weak warm ocean current that runs southwards along the coast of Peru and Ecuador at about Christmas time) and La Niña (a complex weather pattern that occurs every few years, as a result of variations in ocean temperatures in the equatorial band of the Pacific Ocean), require a cultural civilization that promotes the learning of quantum physics, biology, and chemistry as a triad of knowledge that is essential to the understanding of organic agriculture in harmony with nature, non-violent peace agriculture, and the creation of conditions for food security and sovereignty in territories that understand the present ecosystems.

Community organization, ties of solidarity and cooperation paired with social fabric that values work, good social behavior, legality, citizen oversight of development plans with a territorial approach, are essential conditions to face the challenge of making the city rural and urbanizing the countryside. Facing organized crime, illegal armed agents, extortion, the limitation of freedoms and rights is a function of the state in its real presence through the exercise of public administration as a whole. This sphere of action requires ideas, knowledge, and values from a perspective of public ethics that break down patronage, corruption and hateful exclusion categories before the priority of human rights, especially those of children.

The issues associated with public administration require these conditions for the elaboration and precision of public policy with a territorial approach to development and sustainability. Local development in the constitutional triad of competition, complementarity and subsidiarity prevails in the legality of territorial autonomy, with the necessary institutional coordination and levels of efficiency, efficacy and effectiveness in the field of public management. “In five hundred years it became a land of spoils, cannon fodder for crime, a space conducive to waste and corruption. The false ideas of western progress have us on the verge of extinction, on the precipice that anything goes for accumulation and abuse” (Mejía, 2016).

### 3.3.2. Resources, climate, and authentic competitiveness

The first essential element is the land, with its soil, use and tenure. Two main landscapes are recognized on the mountain slopes. The one with a dry tendency of the piedmont, normally up to 1,500 meters of altitude; the most humid tendency towards the upper zone of the central and western mountain ranges. In the case of Salamina and its township of San Félix at altitudes of
up to 2,800 meters above sea level, sandy and loamy soils are very useful for potato planting, which was the proverbial crop of the Cundiboyacense colonization of these cold regions, for rustic Norman cattle and sheep, for cultivating flowers and orchids, for recovering forests and protecting good watersheds. Each basin has its own altitude profile of rainfall, determined by the air circulation and the topography of it. This is the case of Aguadas, where the presence of micro-basins makes an unbeatable productive portal for the formation of landscapes for agricultural use. The steeper slopes can be cultivated with tree crops such as coffee or with forests with species of the ecosystem such as guadua, quiebrabarrigo, alder, guamos, native avocado, tree tomatoes, lulos, guava, soursop, papaya, cambuli, among many other species convenient and easy to grow and handle.

It is fundamental in the hillsides of the mountain range to tend by the wooded cover to the banks of the water currents, which generate corridors or bridges of transit for fauna and biological species or lines of arboreal vegetation that go from a hillside to a hillside and from a mountain range to a mountain range, crossing flood plains where the construction of houses is prohibited and the defense of grounds and prevention of landslides, floods and mass movements is assumed. This work is the one that must assume the municipal Umatas, in full collaboration of Corpocaldas as environmental authority, debureaucratizing its function and decentralizing their actions.

We must face the conflict that occurs between conservation and production in the mountain range zones, as is the case of the municipalities of the future metropolitan area, between cattle farming, agricultural crops based on agro-chemicals, such as coffee, avocado, citrus, tomato, potato, and speculation with land near urban areas that have become a source of capital gains and income for housing construction processes and associated public services, without affecting the payment of local taxes or property taxes in the distributive conception of rents in the use and exploitation of land.

Territorial planning schemes in the municipalities have delays in updating, despite the advice of the Spanish in the Modernos program. The basic plan of territorial ordering also has important deficiencies in the management of land, the protection or conservation of strategic spaces for environmental services and the clear definitions of reserve and rotation in community uses.

3.4. Agriculture\textsuperscript{15}

Culturally, in the spiritual relationship with the environment, the Andean cultures of the páramo constituted centers of creation and diffusion, particularly in the Quechua-Aymara highlands, towards 20 degrees south latitude,

\textsuperscript{15} See FAO – UNESCO – WMO (1975), de Freire, Rea, and Rijks, Estudio agro climatológico de la zona Andina, p. 375.
3,800 meters of altitude, where semi-deserted puna receives only four hundred millimeters of rain, between December and March.

Systems like the Waru Waru were designed for subsistence farming at high altitudes and desert climates. Quinoa up to 4,100 meters of altitude, goose and potato up to 4,000 meters, ulluco and tarwi up to 3,500 meters, corn and beans up to 3,900 meters, wheat up to 4,000 meters, barley up to 3,600 meters.

The agricultural condition of the Aymara plateau, the puna, is different from the Colombian condition, at lower latitude\(^{16}\) and higher humidity. That is, the intellectual, cultural, spiritual condition counts. If you think differently, you produce differently.

Paramo soils can be of volcanic origin, that is, paramagnetic, therefore of high productive potential. Thermal waters are used in agricultural practices (against potato drop, in baths and dosages to livestock), as it is known by farmers from Murillo-Tolima.

3.5. Water is not born in the highlands, it is the result of the hydrological cycle

In Colombia, in the first decades of the twenty-first century, simplism according to which water is born from the highlands was established as a dogma; it amounted to hysteria, even at the legislative level, with respect to important urban centers that believe that the intakes of their aqueducts are located in moors. In June 2018, the Colombian congress passed a law on the delimitation of paramos, creating limbo for the residents of paramuno\(^{17}\) in relationship to their subsistence activities, including agricultural activities. In fact, prohibitive provisions in the mining aspect would have been sufficient, especially in relation to the use of harmful substances such as cyanide or mercury, as well as some restrictions in agriculture: in fact, valid matters for the entire country.

3.5.1. Drinking water depends on the hydrological cycle, interfered with geological orographic conditions

Water is born and sprouts where the geological conditions determine it. Every spring, not just in the highlands, has to be protected. Colombian currents such as Magdalena, Cauca, Caquetá, Patía, Putumayo rivers ... originate in paramuno conditions. But the immensity of the Colombian aquatic flows do not receive a drop from the glaciers and subsoil of the moors: it is the case of rivers, even mighty ones, of the eastern plains, Amazonia and the Pacific. In the Amazon there are: Rio Negro, Vaupés, Cahuinarí, Apaporis, Apaporis,

\(^{16}\) Twenty degrees of latitude are equivalent, more or less, to a thousand meters of altitude, at the equatorial level (a condition similar to that of Colombia).

\(^{17}\) Paramuno – here, in that sense: upland, highlands in general (editorial note).
Mesay, Yarí, Cananarí, Papurí, Cotuhé, Caraparaná, Igaraparaná, Miritiparaná, Inírida, Guainía, Isana.

In the Plains, Tomo, Tuparro, Vichada, Manacacías, Vita. Even the Orinoco originates from systems of only about three thousand meters of altitude.

In the Pacific, Napipi, Truandó, Baudó, Cararica ... The Atrato only receives a river that comes from the Nudo de Paramillo ... The San Juan comes, like the Atrato, from a mountain range that is not clearly paramuna.

3.5.2. Altitude profile

The following elevation diagram can guide the Colombian altitudinal profile, which must be understood with variations of the order of one hundred to two hundred meters according to local atmospheric circulations.

**Table 1. Colombian Altitude Profile**

<table>
<thead>
<tr>
<th>Elevation Level</th>
<th>Height Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ecuatorial Floor</td>
<td>0–1,000 meters above sea level</td>
</tr>
<tr>
<td>Low Andes</td>
<td>1,000–1,500 meters above sea level</td>
</tr>
<tr>
<td>Medium Andes</td>
<td>1,500–2,000 meters above sea level</td>
</tr>
<tr>
<td>Andes Perse</td>
<td>2,000–3,000 meters above sea level</td>
</tr>
<tr>
<td>Andean Highlands</td>
<td>more than 3,000 meters above sea level</td>
</tr>
<tr>
<td>Sub Highland or Low Highland</td>
<td>3,000–3,500 meters above sea level</td>
</tr>
<tr>
<td>Highland</td>
<td>3,500–4,000 meters above sea level</td>
</tr>
<tr>
<td>Superhighland</td>
<td>4,000–4,750 meters above sea level</td>
</tr>
<tr>
<td>Glacier Level Floor</td>
<td>more than 4,750 meters above sea level</td>
</tr>
</tbody>
</table>

The altitudinal pluvial profile of each river is given by the particular Mountain Valley circulation, but the mountain range disposition manifests itself in general. In the flanks that are exposed to the great plains (Llanos, Amazon, Pacific) the pluvial precipitation is resolved around the first eight hundred meters of altitude.

In the Andean sectors themselves, the highest rainfall occurs between 2,000 and 3,000 meters of altitude, which is where the Andean rivers form a flow. No wasteland offers a rushing river. City intakes are generally not built on moors, but below 3,000 meters. Pollution, mining and consumption must be prevented in relationship with paramunsources, even at the cost of prohibiting mining, as it extends downstream. At the same time, it favors the infiltration of little rain.

The Colombian highlands are of a dry tendency (El Refugio station, El Ruiz moor, 800 to 900 millimeters per year, 4,200 meters above sea level). In the absence of rain gauges, the spontaneous vegetation of Paramuna is sprinkled, collecting water. The frailejón has a peculiar texture: the trunk is thick,
with **succulent hairy** leaves disposed in a dense spiral pattern, which is useful for storage of scarce water. The frailejón consumes the water it collects. The largest storage of water in paramo is the organic matter of the soil. Infiltration is favored, through agriculture to contour lines, infiltration trenches, lagoons ... Let the equation be:

\[
\text{Precipitation} = \text{runoff} + \text{infiltration} + \text{evapotranspiration}.
\]

If what you want is to increase runoff, then you have to think about waterproofing the land, paving it, roofing ... If what you want is to favor springs, then the key is to favor infiltration, because the **paramuno** relief is diverse (runoff), and natural vegetation more or less equals cultivated evapotranspiration.

If what you want is to establish intangible areas, then I suggest thinking in areas above four thousand meters, and in glaciers. Ultimately think about climate change. Livestock in páramo areas between 3,000 to 4,000 meters of altitude, should lead to controlled (stable) conditions in which the excreta receive microbial treatments and recycling. Also, activities should be of a certain specialty, such as beekeeping. The water that occurs in the moors comes from three sources: little rain, glaciers (they will no longer be in the twenty-first century), volcanic juvenile water (giving rise to lagoons, which may have been volcanic calderas, an aspect not yet dimensioned).

Instead of victimizing the **paramunos**\(^{18}\) and attributing the water that cities consume to the **paramos**, they are going to have to free themselves from the bureaucratic monopoly of municipal aqueducts and modify their concept of housing: each house has to be designed to store rainwater. Each city has to build reservoirs and make its wastewater drinkable.

### 4. Conclusions

In Colombia we are experts in peasant movements. We the Christians, are also experts in running over Christians and others who are not. In the name of environmentalism, we can generate conservationist fundamentalisms, exclusivisms. The cultures of Tibet, Titicaca, Alaska, Siberia, Iceland, Finland, Norway, Nariño, Boyacá ... are as respectable as others. The destruction of the paramun cultures has a name: ethnocide. Must one way of life die for another to survive? It is an ethical matter. The coexistence of all beings is possible in all environments: In the 1920s Taniguchi said, “If you are at peace with all beings in heaven and on earth, everything will be your friend, and nothing can harm you”.

Spirituality is the highest form of political consciousness (Iroquois declaration to the United Nations Organization 1977). The problem in the Colombian

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\(^{18}\) **Paramunos** – *here*: inhabitants of highlands (editorial note).
highlands goes beyond merely environmental considerations. Happiness for the *paramuno*, as for the peasant, is to live on their land; urban happiness is money. Why does one way of life have to disappear for another to survive? (in Davidson’s words).

Is it ethical to value an alternative world of life, a culture in money?

I appreciate all ancestral culture with the Hawaiian *Aloha aina*, which means love, reverence, care for the land. Was the land created for ecotourism, golf courses, hospitality?

The Central-South Caldas region encompasses a profuse altitudinal gradient that gives it great diversity at the ecosystem level. Its thirteen ecosystems provide different services to the inhabitants of the region and, likewise, they suffer diverse pressures that must be identified and managed comprehensively to achieve satisfactory cost-efficient results. Although this objective goes beyond the work carried out here, the present work allows us to identify the heterogeneity of challenges in terms of biodiversity conservation that each of the municipal administrative units and the Association of Municipalities of the southern center of Caldas has.

Thus, first, the reduced forest cover presented by the municipalities of Chinchiná and Palestine must be highlighted. These municipalities are located predominantly below 2,400 meters above sea level and their reduced forest cover is related to the high mountain conservation bias described above. For the recovery of sub-Andean ecosystems, an agreement is needed on the need to conserve values that such ecosystems provide to the population, including water regulation and nutrient cycling, which are key ecosystem processes for the maintenance of the economy based on agricultural production, especially coffee.

As conservation objects, it is worth reviewing the quality of the forests present in the municipality of Neira, especially those that are located over 2,400 meters above sea level. These forests are essential to consolidate an efficient Protected Areas System, which manages to amplify the positive effects that the Nevados National Park has on biodiversity and allow the transit of species of Andean ecosystems through the western slope of the Central mountain range. The results of such a review will shed light on how to manage the landscape in this part of the region and will bring benefits at the local and regional level in terms of increasing the quality and the quantity of the ecosystem services provided.

Finally, based on the description made and the discussion carried out, the hypothesis is suggested that conservation strategies in the study area have a bias towards the establishment of protected areas in high mountains. Also, they have overestimated the ability of agro-ecosystems to maintain biodiversity in sub-Andean areas, which is why effective landscape design measures have not been implemented to ensure the permanence of biological communities in the long term in both Andean and sub-Andean areas.
5. Bibliography


ABSTRACT

The territorial ordering in the metropolitan area of south-central Caldas in the context of climate change

This paper presents the initial preparations of a research that covers the municipalities of Manizales, Neira, Chinchiná, Palestine, Villamaría, in the perspective of strengthening organizational mechanisms that affect the territorial development, planning, management, emphasizing the context of climate change as an unavoidable phenomenon and affecting the common good. In order to meet the objectives of sustainability, the urgency of public policy for the prevention of disasters as a total promoter, defense and materialization of human rights, the state must seek policies for adaptation, mitigation, rehabilitation and reconstruction of public environmental goods, which support the viability and permanence of essential public services. The hypothesis: “It is not only that we do not know our environment, that we have been culturally, spiritually, intellectually alienated for centuries; it is that the model is untouchable, it is not negotiable, and the price is paid by those who are worst off with what they have been left: the lives of those who leave in the peripheries, in the suburbs. It seems to us that the model is a dangerous thing. With Nature we can live together, be part of it, behave like one of its many projects, understand it, learn the language of birds, read the messages of Mother Earth”.

The research question is: how to interpret environmental governance in the inclusion of an organizational instrument that will determine the allocation of resources to face, especially in territorial planning, climate change?

The action-research is supported by community panels of experts and authorities on the political proposal of a metropolitan area, which involves territorial planning and management in the face of climate change.

Keywords: land use planning, climate change, public policy, governance, altitudinal planning
Introduction

When analyzing public disputes about the past, a revision of the concept of collective memory is needed. It can be seen as an element of the political discourse; not a collective image of past events, but rather a claim to the dominant position of given image in society. The basis for collective memory is the dynamics of public memory and rivalry of the commemoration nature (Nowicka, 2014). Wulf Kansteiner proposed a model for analyzing the dynamic nature and persistence of collective memory. He understands collective memory as a result of constant discussions between memory producers and consumers, which is expressed through established rituals and traditions (Kansteiner, 2002). At the same time, people participating in the process of transferring collective memory do not have to experience it directly. This opens the possibility of expanding memory among larger groups and using it in the processes of building identification and identity (Pickering and Keightley, 2012). Such an increase in the number of memory participants and their diversity propels the memory dynamics.

Cities create their historical consciousness by selectively displaying past experiences and valuing them in a local and supralocal context, accurately historical or legendary. Although memories can be produced by all residents, it is the city authorities or other influence groups that decide to place them in the collective memory in the chosen form and desired function. The imbalance between memory-producing residents and memory-managing authorities is particularly evident at the local level, where history is highly individualized (Frijhoff, 2015). The locality of remembrance in the Netherlands is important because of the historical and far-reaching autonomy of cities and regions, lasting since the Middle Ages. Dutch cities compete with each other and retain strong identities to this day (Frijhoff, 2015).

Another introductory fact is that total damage caused by World War II was proportionately greater in the Netherlands than in most Western European
countries. Air raids, shelling, crashing planes and missiles killed some 10,000 civilians; more than half a million Dutch people lost their homes (Taverne, 2016). Destruction and robbery have severely affected the economy, infrastructure and agriculture. Dutch cities fell victim to both German and Allied air raids, which complicated the post-war evaluation and commemoration of recent events (Taverne, 2016).

On May 14, 1940, almost the entire city center of Rotterdam was destroyed as a result of German bombing raids. The bombing was intended to precipitate the surrender of the Dutch army during World War II. As a result, around 900 people died, and as many as 85,000 lost their homes (Go and Govers, 2011).

After the bombardment, the choice was not to reconstruct the city accurately, but to opt for a new, rigorously modern urban design for the center of Rotterdam. The breakaway with the old city center was radical. Already in 1940, the demolition of buildings spared by bombing and fires began. Only a few survived – including the city hall and post office, which matched the desired character of Rotterdam. The only building that has been rebuilt despite being largely damaged is the church of St. Lawrence. However, its reconstruction did not begin until the early 1950s. Until then, “the ideology of emptiness” was in force in Rotterdam (Van den Bent, 2010). The purification of the city center was to enable the implementation of ambitious plans to build a modern metropolis on the New Meuse. It was a realization of the ideal functional city, already discussed in Rotterdam before the war (Van den Bent, 2010).

For several decades after the war, the center of Rotterdam was loosely built-up. The dramatic contrast with the surrounding pre-war housing estates indicated milieu de mémoire, a real environment of the bombardment memory. The destruction of the old city has unintentionally been given extra emphasis – the old city was present as a negative of the new Rotterdam (Hogervorst and Van Ulzen, 2015). As the distinctive character of the new city center was blurring along with Rotterdam’s development and transformations, only lieux de mémoire, sites of memory, remained or had to be created.

The article analyzes the importance that was attached to commemorating the destruction and reconstruction of the city as a process of dynamic memory. From the end of World War II to the beginning of the 21st century, the destruction and reconstruction of Rotterdam constituted a dichotomy of competing elements in the consciousness and commemorative practices of residents. Collective memory is dynamic, thus the perception of the two elements was not constant. Raphaëla Held proposed a division into five remembrance phases occurring in Rotterdam since the end of World War II (2016). Each phase was characterized by a significant advantage of recollection of either destruction or reconstruction in the city’s commemorative practices. The article, however, suggests separating the next, sixth phase, covering the period from 2015 onwards. This would be the first phase in which both of these interrelated events simultaneously rank high in the awareness of the inhabitants of Rotterdam.
From 1945 to 1947

The first phase covers a post-war period until 1947, during which a short wave of local commemoration appeared. In the first days after the Dutch liberation of 5 May 1945, spontaneous celebrations were held throughout Rotterdam for several days, in which the memory of the recent past was also given a place (Held, 2016). In many places in the city simple wooden crosses and the laying of flower wreaths created spontaneous memorial sites for the victims of World War II (Nieuwenhuis-Verveen, 1972). The first official public commemoration in Rotterdam was held on 14 May, so on the fifth anniversary of the 1940 bombing. Despite the date, the commemoration was dedicated to all Dutch victims of the war, lacking explicit references to the destruction of the city itself (Hogervorst and Van Ulzen, 2015).

It is clear that the memory of the bombing was not a priority in this first phase of Rotterdam’s culture of remembrance. In the first years of the reconstruction, the youth could learn about the city’s destruction only at home and from their own experience. In public, the reminiscences of war were presented indirectly and only within a framework of expressing the desired values of freedom and strength. There was little or no interest in actual conveying the memory of the war. The first Dutch textbook dealing with World War II was created only in 1954 and mentioned the bombing of Rotterdam from the perspective of a political and military strategy (Hogervorst, 2015).

The municipality wanted the residents to have positive associations with rebuilding the city in a modernist fashion. For this, proper communication was needed. The Office for Information and Publicity (Bureau Voorlichting en Publiciteit) was created in 1946, a predecessor of modern marketing agencies. Their tasks included both external and internal city promotion as well as introducing plans to the residents (Paalman, 2015). The brochure The New Heart of Rotterdam (Het nieuwe hart van Rotterdam), published in 1946, elaborated on this fascination with a functional city of wide streets and tall buildings. Its authors encouraged the residents to realize that their fond memories of the lost city were in fact only shortcomings of a modern metropolis.

From 1947 to 1960

In the early decades following the war, hardly any attention was paid to the date of 14 May. Such sudden disappearance of the official bombing commemoration could have been caused by the emergence of national memorial days in 1946: Nationale Dodenherdenking (National Remembrance Day) on 4 May, dedicated to the Dutch victims of World War II, and Bevrijdingsdag (the Liberation Day) the following day. Amsterdam became the central site for national ceremonies, covered by radio and later television (Hogervorst, 2015). Due to the increasing popularity of the national Dodenherdenking on May 4, this day came to the
fore also in Rotterdam and replaced May 14 as a day of remembrance two years after the end of the war. The reconstruction of the destroyed city came into focus during this time. Public commemorations of the bombing were largely nonexistent, as the emphasis was shifted entirely towards the future of new Rotterdam. The only notable exception was the unveiling of the monument De Verwouste Stad (The Destroyed City) in 1953. It was, however, mostly a private initiative.

As the commemorations of 14 May were fading, the Opbouwdag (Construction Day) was established in 1947 and became an annual tradition. It was an occasion to celebrate the future of Rotterdam and hard work of its citizens. Opbouwdag played an important informative role. The main attraction of the first festival was the opening of an exhibition Rotterdam Straks (Rotterdam Soon) at Museum Boymas, showcasing plans for the modern city. Also, the reconstruction of the St. Lawrence Church in the city center was officially inaugurated.

Opbouwdag was celebrated on May 18th, marking seven years after Witteeveen, the city architect, started works on his initial plans for the new Rotterdam. Such close proximity between 14 and 18 May was a clear signal of a turn in the perception of the destruction of the city (Hogervorst, 2015). In 1947, Het Vrije Volk called it a “meaningful coincidence” and the Opbouwdag was presented as complement to the national celebrations on 4 and 5 May. Together they formed a triptych of commemorating the dead, celebrating the liberation and reflecting on the future. The popular newspaper was also preoccupied with conveying the superiority of the future Rotterdam over the pre-war crowded city:

“Rotterdam will be a beautiful city. Rotterdam will become spacious, it will have the allure of a world city: the fast traffic, the wide boulevards, the tall buildings will jointly create an atmosphere of activity, which is in line with contemporary life. It may not be pleasant, but we would rather see a row of shiny cars than a carriage with old ladies at the moment and feel more at home in a glass and mirror shop than in a stale grocery store, where the scent of cloves, soap and candy pleasantly tickles us. Rotterdam will be our city, the city of man from the twentieth century” (Het Vrije Volk, 1952).

The trauma caused by the destruction of the city was intentionally ignored by the authorities. It was seen as an obstacle on the way to progress. This is evidenced by the words of the author of Rotterdam’s final reconstruction plan, Cornelius Van Tra: “... the war victims we have had around us obstruct the prospect of the future: because of their homesickness for the past. And that is so human and so understandable and yet so very dangerous. It cannot be accepted that the urge for homesickness and the memory of a deprived generation would sacrifice the liberation of later generations” (Van den Bent, 2010). Ignoring the scale of the destruction of the city could be due to the fact that the historic center of Rotterdam did not have a symbolic status in the country. It was not widely considered attractive either. Shortly after the war, the 1940 bombing became an element of mostly local memory, and not a truly national concern (Frijhoff, 2015).
It should be noted that although the commemorations declined, the most prominent monument dedicated to the bombardment of Rotterdam was unveiled in the discussed phase. *The Destroyed City*, a sculpture by Ossip Zadkine, has become one of the symbols of the Rotterdam’s devastation. It was in fact offered to several cities and only purchased by Gerrit van der Wal, a director of Rotterdam’s Bijenkorf department store. The statue was later donated to the city (Pachner, 1994). *The Destroyed City* was unveiled in 1953 to much public consternation. Although a few monuments devoted to World War II had been erected in Rotterdam before, the work of Zadkine was distinguished by an expressive and emotional form, considerable size and central location. “A combination of Cubist faceting and Expressionist distortions contributes to the work’s impact of extreme horror. The supplicant gesture recalls a central element of Picasso’s *Guernica*. Zadkine’s figure itself is maimed by a carved-out void in its torso—a visual allegory of the razed city” (Pachner, 1994). This was an exception among other war memorials in Rotterdam, focused on the political and military aspect of the war rather than its impact on the civilian population.

**From 1960 to 1980**

*Opbouwdag* was celebrated annually on May 18 up to and including 1966 in a similar manner every year. Popular activities included laying of the cornerstones for the construction of various new buildings, such as for the shopping center in Hoogvliet in 1960; openings of completed buildings, such as the concert and congress building De Doelen in 1966; or screenings of films about developments in urban planning.

The participation of the Rotterdam residents in the *Opbouwdag* was steadily falling, despite the city’s efforts to make it attractive to the general public (Laar, 2000). One possible reason for the lack of interest in the events of May 18 could have been the growing criticism of the reconstruction – while the Rotterdam’s authorities announced the finalization of the reconstruction in 1966, critical voices regarding the cityscape increased among the residents (Held, 2016). From 1976, the city organized the *Binnenstaddag* (City Center Day), which, as the successor to *Opbouwdag*, was to be celebrated on the first Saturday after May 18. The aim of this celebration was to make both the residents and visitors aware of the possibilities and advantages of the new Rotterdam. It can be also clearly seen as the city’s response to the criticism of the reconstruction’s outcome (Hogervorst and Van Ulzen, 2015). The attention for this day remained low, which is evidenced by the lack of information in the relevant literature. However, the *Binnenstaddag* was held annually up to and including 2001.

In 1960s and 1970s, the anniversary of the bombardment on May 14 was not commemorated. However, significant changes in the perception of recent history came into being in the Dutch society. In the 1960s, dealing with World
War II in the Netherlands changed dramatically. The victims came into the picture and the story of military battle, heroism and resistance that had long dominated the public memory of the war faded into the background. Particular attention was paid to the victimization of the Jews (Hogervorst and Van Ulzen, 2015). The discourse was enriched by the growing awareness of the complexity and ambiguity of Dutch attitudes during World War II. This made it possible to draw attention to other victim groups. A tear in the myth of the national resistance movement led to the validation of civilian casualties, postponing the need to actively fight the occupier to deserve recognition (Piersma, 2005). Until then, they were not included in the commemorations because of the difficulty in utilizing their death to unite the nation in a spirit of reconstruction (de Haan, 1997).

**From 1980 to 2005**

The year 1980 marked a turning point in the culture of remembrance in Rotterdam. Along with the criticism of the reconstruction and the growing nostalgia for the prewar city, a return to the history of war and bombings appeared. It was decided to honor the 40th anniversary of the bombing of Rotterdam in compliance with its importance (Held, 2016). Around 1,000 residents directly affected by the 1940 bombing were invited to the official commemorative event in the prestigious De Doelen hall on May 14, 1980. There were chosen from several thousand more applications which were submitted just a few days after the call was published in local newspapers. Representatives of other cities destroyed during the war – Belgrade, Coventry, Dresden, Gdansk, Cologne, Leningrad and Warsaw – were also invited to the event. The former Queen of the Netherlands Juliana and the former German Chancellor Willy Brandt were present. After the commemoration in De Doelen, all participants took part in a vigil by the *De Verwoeste Stad* memorial. The statue became a symbolic center of the commemorations for the first time since its unveiling in 1953 (Ginkel, 2010). Having in mind its expressive form of pain, putting it in the center of the commemoration was a clear proof of the shift in the Dutch perception of non-combatant victims. Collective trauma echoing the city’s destruction was allowed to be manifested in public for the first time since the war. No previous anniversary of the destruction of Rotterdam was commemorated by an event of this importance. In fact, for the first time May 14 was officially and directly dedicated to the memory of the bombing and survivors’ stories. The commemoration of 1980 was successful and thus encouraged local authorities to repeat it every five years on 14 May (Hogervorst, 2015).

The event in De Doelen was the culmination of the 1980 commemorations, but various activities in the memory of the bombing, including exhibitions and educational programs, took place throughout the year. In 1980, the city authorities commissioned the creation of an educational program addressed
to primary and middle schools, regarding the bombardment and its repercussions. The program *Bombardement 14 mei 1940* was developed by schools, NGOs and municipal institutions. The effect of their cooperation was an educational package for over 30,000 students. It was first such educational campaign in the Netherlands since the end of the war (Hogervorst, 2015). In addition to military history, students had the opportunity to familiarize themselves with the emotional memories of survivors, and thus assimilate the human perspective of the event (Baardse, 1980). In the 1980s, individual memories were collected as well as efforts were made to convey these memories to the youngest generations. Hogervorst describes this process as “pedagogy of memory”. Within this term she refers to the transference of memories, as well as the values and warnings associated with them, which is to constitute and maintain identity (2015).

The program did not include the Nazi occupation of 1940–1945. After discussing the bombing, there was immediate transition to reconstruction (Baardse, 1980). The dichotomy of the destruction and reconstruction was rooted in local collective memory so deeply that the short period between them was simply ignored. Another reason for avoiding this topic might be the ambiguity and uncertainty of the occupation’s perception. It should be noted that Rotterdam also fell victim to Allied air raids during the war. Their goals were installations and industrial areas strategic for the Germans, but as a result of mistakes, mishits and fire-blowing winds, civilians became victims. The most tragic in consequences was by far the American air raid of March 31, 1943. This erroneous attack on the western districts of the city resulted in death of at least 350 people (Robben 2019). Such events remained taboo in post-war Holland. It was broken in Rotterdam only in the early 90s on the wave of interest in the history of the city. The appearance of the television program and articles covering the 1943 raid, including those in the *New York Times* (1993), led to the popularization of the topic, and thus to the creation of a memorial site dedicated to this event. The green area in the Tussendijken district was named Park 1943 in honour of the victims. A monument erected there was unveiled by Dutch Prime Minister Ruud Lubbers on March 31, 1993, on the fiftieth anniversary of the bombing.

In 1999, the Rotterdam city council requested an additional historical investigation covering the period of World War II. A large-scale historical study into seven centuries of Rotterdam had started earlier, commissioned by the municipality. However, the city council did not consider it sufficient in dealing with the period of 1940–1945. In 1999 it was stated that the war played a particularly important role in the history of Rotterdam and that the bombing of May 14, 1940 gave a dramatic turn to the development and shape of the city. Such statements demonstrated increased interest in World War II that has been present in Rotterdam since the 1980s. The study requested by the city council was presented in 2006 and provided an extensive political and military history of the period (Hogervorst and Van Ulzen, 2015).
Numerous publications referring to World War II in the 21st century not only constitute a subgenre of historiography, but must be seen in a much broader context of the greatly increased interest in past, heritage and memory that has been seen throughout the Western world since the 1990s. The cause for this increased interest is pointed to globalization and other radical changes in contemporary society, which cause people to long for recognizable anchor points in their local or national past (Hogervorst and Van Ulzen, 2015).

From 2005 to 2015

Along with the development and transformation of the city, the memory of its reconstruction seemed to fade away at the turn of the century. Simultaneously, an intensification of bombardment memory manifestations has been noticeable since 2005. It could be due to the release of higher financial resources by the city and state as a matter of the preparations for the 65th anniversary of the destruction of the city center (Ginkel, 2010; Held, 2016). The forms of commemorations have been expanded, diversified and commonized. In addition to the wreath laying, exhibitions and other traditional modes of commemoration, a cycle tour along the bombardment fire border was organized (Strupp, 2009).

The need for emphasizing the spatial extent of the 1940 destruction has appeared. A possible explanation is that, for the first decades after the war, the void and emptiness of the center of Rotterdam was a direct manifestation of its former annihilation. As the city was transforming, it became increasingly difficult to read the history of the bombing through the cityscape. In 2006, the city council decided to permanently mark the extent of the destruction caused by bombing with 400 small lamps embedded in pavements and roads. The project was named Brandgrens (limits of fire) and the twelve kilometers long course of lights was completed in 2010, upon the 70th anniversary of the bombing (Hogervorst, 2015). Earlier in 2007, the limits of fire were marked by way of an artistic project under which 127 spotlights were placed along the borders of destruction. Lit after dark, they were visible from afar and were supposed to evoke fire (Gemeente Rotterdam, 2008). Due to the positive response of the residents, the project was repeated again in 2008 (Hogervorst and Van Ulzen, 2015). May 14 has later remained the annual commemoration day in Rotterdam.

The bombardment of Rotterdam has never been so intensively commemorated as in the 21st century. Since 2007 there has been a full day and evening program on May 14 with many kinds of activities, ranging in character from traditionally solemn and religious to playful and informative. This shift in expressing memory is closely related to the change of value and function of commemoration in society (Hogervorst and Van Ulzen, 2015). The revival of the memory of the bombing has been associated with a nationwide discussion on the subject of multicultural society (Hogervorst, 2015). Rotterdam is one of the most ethnically diverse cities in the Netherlands. In 2019, 52% of its
residents were of immigrant origin (CBS 2019). At the same time, anti-immigrant sentiments expressed by the populist Leefbaar Rotterdam party are popular in the city. The party won the largest number of seats in local elections in 2002, 2014 and 2018, and took second place in 2006 and 2010. In the context of intensified political disputes, elements of national and local heritage began to serve as a means of identification more than before. Remembering history can play an important role in stimulating the community building (Hogervorst, 2015).

**From 2015**

As the commemoration of 14 May became annual in 2007 and was attracting great attention from the public, it is understandable that the seventy-fifth anniversary of the bombing was massively solemnized in 2015. Besides the main event, weeks prior to it, it was commemorated with exhibitions, books, articles and television programs. Also, in 2015 a branch of the Museum Rotterdam, focusing on the bombardment and Nazi occupation of the city, was established (Held, 2016). The small museum is divided into two zones. One is to reflect the experience of the bombing and Nazi occupation. The exhibits are to a large extent personal items, documents and other objects transmitting individual stories of victims and survivors. The second part is named Construction Site and is intended for children. It is not devoted to the reconstruction after World War II, but rather to the process of continuous transformation of modern Rotterdam. There, children learn how to build a “pretty city”. The emphasis is on the social aspect of the multicultural city – through games children are taught how important it is to be tolerant, respectful and recognize injustice.

Putting young people at the center of institutions dealing with the cultivation of collective memory shows a key feature of the contemporary culture of remembrance of World War II. Children are the target group, memory carrier and its active consumers and producers. As the eyewitness generations die, young people are gaining the central position in the process of preserving and transmitting memory (Hogervorst, 2015). It is to ensure the relevance and intelligibility of lieux de mémoire in the future. According to Nora (1989), the sense of loss is a key variable in the process of building connections between identities and memory sites. Lieux de mémoire are needed when people lose the ability to remember spontaneously – when real environments of memory cease to exist and thus to send stimuli. Creating memory sites is a tool of coping with loss, resulting from the mechanism by which the lost becomes desirable (Butler, 2003). As it was proven by the revival of the World War II commemorations at the turn of the 20th and 21st century, memory sites are created not only as a reaction to the already ensuing loss but also in preparation to its emergence. Witnesses started to pass away and the need for preserving their experiences appeared.

With the development of the city, the legacy of post-war reconstruction became less and less visible, and often destroyed by new investments. After
several decades of resentment, in the 21st century Rotterdammers began to value the architecture and history of this period. In 2015 and 2016, the 75th anniversary of commencing the city’s reconstruction was celebrated. Under the slogan Rotterdam Celebrates the City a number of initiatives were organized that told the story of the post-war reconstruction and contemporary transformation of the city. Some of the projects focused on individual stories of residents. One of them was Soul of Reconstruction (Ziel van de Wederopbouw), displayed in the public exhibition in Verhalehuis in 2016 and 2017. It is an audiovisual spectacle consisting of 101 personal stories, divided into four different performances (Post, 2016). It represents a contemporary individualistic approach to history.

Most notably, Opbouwdag returned to the Rotterdam calendar after 50 years on May 18, 2016 and has been held annually since then. It is organized by the Wederopbouw Platform, a cooperative of municipal units, cultural institutions and local NGOs. The Platform’s mission is to increase the awareness of the city’s inhabitants about the history of reconstruction. This is to become an inspiration for greater involvement in their social and urban environment. The Platform’s activity is based on tours, exhibitions, lectures, as well as various other activities organized as part of Opbouwdag. With the help of these tools, the stories of “the living museum of reconstruction – buildings and people” are to be told (Wederopbouw Platform 2018). Opbouwdag is used not only to preserve the history of reconstruction, but also to showcase and promote the current development of the city.

It is the return to the celebration of reconstruction that speaks for the recognition of the period starting in 2015 as a separate phase in the process of transformation of the Rotterdam culture of memory. Importantly, this is the first phase in which the destruction of the city is commemorated equally prominently as its reconstruction and everlasting transformation.

Summary

In 1948, Stronger by Struggle (Sterker door Strijd) became the official motto of Rotterdam. Self-understanding of the city has been closely related to the bombardment and reconstruction ever since (Frijhoff, 2015). Although the events constituted action and reaction, the narrative imposed by the city authorities long defined this dichotomy as a rivalry between the painful past and the modern future. The culture of remembrance in Rotterdam went through five phases, each focusing only on one part of the aforementioned dichotomy. It was only in 2016 that the anniversary of both the city destruction and the beginning of reconstruction were solemnly celebrated for the first time.

After the war, there was a general lack of discussion in the Netherlands about the damage and its commemoration. Instead of victims, heroes and the brave spirit of the nation were celebrated. This was to help unite the country in a difficult reconstruction. Rotterdam itself began to play an important role in
the process of the country’s revival, as the rapid launch of a modern and larger than ever port was a national priority. Optimistic years of the reconstruction left little space for mourning (Jager, 2016). In the sixties and seventies, the enthusiasm of reconstruction began to quickly disappear, it was replaced by criticism of the new city landscape. At the same time, the national historical discourse was turned towards civilian victims of World War II. This led to commemorating the fortieth anniversary of the bombing on an unprecedented scale. From that moment on, the interest in the history of World War II only grew. May 14 has been celebrated more intensively than ever before since the mid-2000s. The events became bigger and with the marking of the Brandgrens, the extent of the destruction was consciously brought back into the cityscape for the first time. It marked a turning point in the culture of remembrance, previously focused solely on the development and the city’s future.

The creation of social connection and profiling of a common identity play an important role in intensifying the memorial rituals around May 14 in Rotterdam. The bombardment can generate emotions and involvement with all Rotterdammers, including those originating from cultures different than Dutch. Although there are fewer and fewer living people with their own memories of the bombardment, and the direct emotion in that sense disappears from society, the emotion is reflected in the collective commemoration. The history of reconstruction can be even more attractive when choosing a binder connecting a diverse immigrant city. This is how one can explain the rather sudden reappearance of the Opbouwdag celebration after exactly fifty years. Unlike bombing, this is a positive and energized story of building the future. It can be easily transferred to today’s Rotterdam, which aspires to be a pioneering city in terms of innovative architecture and sustainable development.

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Abstract

Commemoration of destruction and celebration of reconstruction. The evolution of Rotterdam’s approach to the city’s history 1945–2019

In 1940, Rotterdam was attacked in an air raid, resulting in the death of 900 people and almost total destruction of the historic city center. The reconstruction lasting over 20 years transformed Rotterdam into a typically modernist city. The purpose of the article is to discuss and systematize the evolution of the dynamic memory of the war and its immediate consequences in Rotterdam. As a result, six phases of Rotterdam’s remembrance culture have been distinguished since 1945.

Keywords: commemoration, dynamic memory, reconstruction, urban history, urban sociology
RECREATIONAL PUBLIC SPACES IN THE CONTEXT OF SUBURBANIZATION. POLISH CASE STUDY

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Introduction

Nowadays, in both developed countries and those trying to catch up with them, city outskirts are growing faster than their cores. Suburbanization has become a global phenomenon (Phelps and Wu, 2011; Stanilov and Scheer, 2003) and suburbs are increasingly differentiated in social and functional terms (Vaughan et al., 2009; Harris, 2010; Watt and Smets, 2014). It is typical not only for the West, but also for Africa (Simon et al., 2004), Asia (Zhou and Logan, 2008), and South America (Heinrichs et al., 2011). The difference is that in the developing countries the suburbanization process is now occurring more quickly. The situation is similar in the post-socialist countries of Central and Eastern Europe (CEE), where during the transformation in the 1990s mass suburbanization was caused by the decentralization of the power, real estate privatization, conversion of agricultural land for construction purposes on a large scale, appearance of middle class as a new affluent social group, new commercial and spatial demands of rapidly developing capitalist society, activity of developers, culture of privatism etc. (Stanilov and Sýkora, 2014; Hirt, 2012). In Poland, the rapid and often spontaneous growth of residential areas was driven particularly by cheaper investment opportunities outside the city, the dominance of private property in the suburbs, and far less complicated regulations regarding construction. This resulted in the expansion of new housing, regardless of the provision of roads and other infrastructure, and therefore made suburban living environment unsustainable. One of the categories of space that unsustainable suburbs lacked was public space of recreational function. Recreational spaces emerged in the suburbs with a long delay after dispersed housing and revealed another problem, which is the discrepancy between their declared and real usage.

This chapter aims to characterize the vitality of suburban public spaces in the context of the conditions for their creation. The conditions are shaped mainly by suburbanization specific to post-socialist Europe, while vitality manifests the wider changes that occur in the sphere of needs and in the
daily functioning of contemporary suburbanites. This chapter presents general conclusions of the research project regarding the extent to which suburban public spaces fulfil their social function.

Suburbanization in post-socialist Europe

After the political transformation in 1989, municipalities as a local level of self-government restored in Poland in 1990, tried to adapt themselves to a new liberal reality, in which the market began to be perceived as the major agent of positive change, and decentralisation together with privatisation were the main drivers of transformation.

Decentralization of power, which was the shift in the formal control over space from the central to the local level, resulted in the “highly fragmented geography of local governments and the unwillingness of national and regional authorities to intervene in local affairs” (Stanilov and Sýkora, 2014, p. 13). Central and local government authorities rejected spatial planning as a relic of communist political system and centrally planned economy. In the 1990s most new development occurred on an *ad hoc* basis. It was called investor urbanism, in which the planners’ duties were limited to creating development opportunities instead of comprehensive development policy (Lorens, 2012) (Figure 1). This led to the extensive suburbanization that, initially, was quite chaotic, unplanned, and spontaneous (Zimnicka and Czernik 2007; Mantey, 2011; Solarek, 2013).

![Figure 1. New housing estates emerging spontaneously on previous fields in Józefosław (municipality of Piaseczno) in 2002](source: Google Maps)
Figure 2. Gencz housing estate – example of discontinuous development in Komorowice, near Wrocław

Source: Google Maps

The second main process, privatisation, resulted from the vigour of post-socialist privatism, defined by Hirt (2012) as a widespread disbelief in the public sphere and a widespread conviction that appropriation of the public is the best way to develop the private sphere. While privatization is an economic and political process of transferring material resources, privatism is a cultural condition which occurs in reaction to the perceived failure of the socialist public realm.

Decentralisation and rash privatisation resulted in many negative phenomena that have emerged since the beginning of the 1990s. One of them was disintegration of the suburban zone as a result of the lack of comprehensive planning for larger suburban structures, combined with poor control over spatial development (Zimnicka and Czernik, 2007), and the primacy of property rights over the common good. In Poland, there is no coherent system of spatial planning based, on the one hand, on a hierarchical system of plans, and on the other, on a similar importance assigned to different components of living environment in the process of spatial planning, in particular: social, ecological (natural) and economic (Kistowski, 2007, 2008). The lack of plans for the whole metropolitan area is another problem in Poland, while many European countries have already dealt with it (e.g. France, some metropolitan areas of Germany, Great Britain, the Netherlands). Privatisation, culture of privatism, decentralisation of power, and poor planning system have led to the formation of isolated building complexes and the lack of continuity of urban areas (Figure 2).

In Poland, apart from the universal causes for suburbanization, such as the increase in incomes of the population, the development of motorization and
road network (in Poland with a certain delay compared to the development of housing functions), as well as the growing nuisance of living in the city (Mantey, 2011), a significant role is also played by the competition between municipalities for the income generated by the inflow of new residents and investors (Topczewska and Maliszewski, 2014). New residents mean higher budget revenues from taxes, while new investors bring additional income and bear the costs of building the infrastructure. As a result, many new suburban neighbourhoods are located in random places, far from compact buildings, existing roads and technical infrastructure, with poor accessibility to basic services, social functions, and recreational spaces (Zimnicka and Czernik, 2007; Mantey, 2011; Solarek, 2013).

Diversity of Polish suburbs

The post-socialist suburbs in all Central and Eastern European countries are diversified and consist of a wide range of old and new residential areas: suburban areas with exclusive residences, housing parks, old and newly erected second residence communities, and private homes built with modest financial means (Brade et al., 2009). To understand this diversity, it is important to know the time when they were developed. Old suburbs, also called “the first”, are former settlement units, integrated with the central city, included in its transportation system, incorporated in the borders of the metropolis as a consequence of the spatial expansion of the whole agglomeration, often localized along main transport routes (Grochowski, 2004; Harris, 2015). The category of old suburbs contains also towns or villages located a bit further from the city, but well communicated with it, often by suburban train. Many of them originated as summer resorts or garden cities. New suburbs are, in turn, the result of the investments of developers operating on open, previously undeveloped areas (Grochowski, 2004). The age of the suburb translates into the urban fabric layout, the road network, availability of planned public spaces, visual aspects and the standard of buildings, backyards and gardens. The most mature suburbs were created before World War II. Some of them are fully planned garden cities, based on the railway transport, equipped with a dense network of streets and public spaces. The lowest standard of development is characteristic of post-war suburbs, which were erected before 1990, usually without a comprehensive local plan (Zębik, 2011). In socialist countries, aspiring urbanites could find a job in the city, but they were frequently not permitted to settle there because of registration restrictions, so they had to choose villages or small towns on the city outskirts. Although after World War II some small suburban housing estates were constructed by housing

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1 A detailed description of the types of post-socialist suburbs can be found in the paper: Mantey and Sudra (2018).
cooperatives$^2$ (Jakóbczyk-Gryszkiewicz, 1998), the vast majority of suburban detached houses at that time were built by individual investors. This is the reason why old suburbs were often underinvested, devoid of planned public spaces, inhabited by slightly poorer population (Hirt, 2012), and built up with houses of much lower overall standard than what is available today (Zębik, 2011). Another type of suburban building in the post-socialist part of Europe are modest part-time cottages with garden plots, which supplied their lower- and middle-class owners with fruit and vegetables. More affluent strata of socialist society used their cottages for recreational purposes only (Hirt, 2012). Many second homes were converted into permanent residences during the transformation processes.

The beginning of new suburbia falls on the 1990s as a result of the appearance of developers on the construction market, the intensive outflow of affluent people from cities to the suburbs, and the abandonment of agricultural activity by the farmers living on the outskirts of big cities. New urban structures erected by developers were usually monofunctional and spatially separated from existing settlement units (Dinić and Mitković, 2016).

After 1990, the process of modernization of some rural villages has also been observed. Many villages lost their rural character and underwent morphological, social and functional transformation (Mantey and Sudra, 2018). The current equipment of the houses reaches the average standard of new suburban development. Along with the buildings, also the lifestyle of the residents has been transformed.

In new Polish suburbs, we can find features typical of non-places described by Augé (2010): anonymity, considerable share of the space of flows, and superficiality of interpersonal relations. No genius loci can be felt there and no significant “magical” places are offered for the residents. Suburban public space is primarily comprised of access roads shared by cars and pedestrians, and forest lanes. Some research shows that despite the fact that suburbanites often complain about the lack of neighbourly relations and other relations characteristic of integrated communities, they usually choose activities that do not require establishing interpersonal relations, e.g. physical activity and contact with nature (Kępkowicz and Mantey, 2016), so anti-social living conditions are to some extent in line with their preferences.

**Suburban recreational public spaces**

Suburbs that arose in the previous political system, were generally not planned and therefore not provided with recreational areas, except school sports fields and school playgrounds, but those were of rather low quality. This trend was

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$^2$ Housing cooperatives, controlled by the state, were the dominant entities undertaking housing investments under the previous political system and centrally planned economy in Poland.
continued in the 1990s, when urbanites who decided to settle in the suburbs were driven exclusively by the desire to live in their own house with a garden, regardless of the availability of social services or leisure facilities (Mantey, 2011; Kajdanek, 2011a). Municipalities felt exempt from the obligation to provide recreational spaces as the residents did not demand them. The failure to reserve land for recreational purposes in local plans also resulted from Polish legal regulations, according to which municipalities have to pay market prices for the land purchased from private owners (Mierzejewska, 2011; Solarek, 2013; Mantey, 2017a). Since private land dominates on the outskirts of Polish cities, in the 1990s new suburbs were usually deprived of recreational spaces and social facilities, and the length of public roads was limited to a minimum. A similar strategy was adopted by developers whose activity was focused on maximizing profit, not on the design of pro-social housing estates.

With time, the rapid development of the suburbs started to be accompanied by greater attention to satisfying non-residential needs, especially after Polish accession to European Union in 2004. This opened new possibilities of financing investments, also those of recreational and social function. Thanks to this, many Polish suburbs gained new recreational spaces, and existing spaces were upgraded and pedestrianised (Mantey, 2019). Therefore, the statement that there is a lack of public spaces in contemporary Polish suburbs is a significant simplification. According to Kajdanek (2011b), there are rather two types of them: old and new suburban public spaces. The former include traditional meeting spaces: churches, cemeteries, bus stops, local stores, and the latter: green areas (parks, glades, forests), agrotourism farms (directing their offer mainly at wealthier urbanites), historic gardens and palace complexes, as well as large suburban shopping centres modelled on American shopping malls. There are also many new, well-equipped playgrounds, sports fields and recreation areas, some of which have been financed from the European Union common budget. However, the public character of all these spaces is determined more by their function than location. While the preferred location for public spaces are nodal points, suburban recreational areas are located chaotically (depending on where the municipality has its land), often without safe pedestrian access.

Old and new suburban public spaces reflect social division into old suburbanites and newcomers, which is typical of post-socialist countries (Kajdanek, 2011b). Attractive, well-equipped recreation spaces could be an important factor in improving social cohesion between these two groups. However, new suburbanites focus mainly on relations within the family or, especially in large housing estates, within groups of similar status, and reject the old social fabric of the village. The reluctance to integrate with other suburbanites is manifested in the phenomenon of gating. In many post-socialist countries, in the 1990s, wealthy families tended to wall off individually, whereas during the second decade of the transition, many began to search for gated housing estates where they could share space with people of a similar socioeconomic
status (Hirt, 2012). The specificity of the choices of suburbanites is as follows: they choose a habitat in the countryside (a house with a garden), but not the village as a social and spatial whole; similarly – they abandon the habitat in the city (an apartment that does not correspond with their aspirations), but they do not abandon the city as a functional whole – its opportunities, and spaces for gathering and social relations (Kajdanek, 2017).

The research project

The daily functioning of suburban recreational public spaces was the subject of the research project “Suburban Public Spaces”, financed by the National Science Centre in Poland, and carried out between 2017 and 2018. One of the aims of the research was to identify the most community-friendly recreational public spaces in Warsaw suburbs. The study area covered twelve suburbs (villages or big housing estates) diversified in terms of their location, history and type of investor. All the suburbs were conducive to the creation of public spaces due to their spatial scale (small suburbs were not considered for the research) and street layout. When selecting them, a typology by Mantey and Sudra (2018) was used. During the main stage of the research, thirty nine recreational spaces located in the suburbs studied were investigated – spaces that offer at least the possibility of passive leisure and establishing contacts with other people: eight sports fields (also those with playgrounds); eight separate playgrounds, outdoor gyms, or skate parks; seven multifunctional recreational areas; five squares with greenery and seating; four areas adjacent to churches or roadside shrines; three parks; two market squares with seating; one dog playground, and one recreational centre comprising publicly accessible space with seating as well as private recreational facilities with paid access.

The main concept of the research was the utility value of space, which is identified with the pro-social character of space. Assuming that the measurement of pro-social character of space should refer to the category of behaviour, we can measure the utility value of space by social behaviours. Social behaviour is the result of necessary or optional behaviour (Gehl, 1987). It includes all kinds of interpersonal contacts that take place if the time and place are appropriate: passive activities (observing people), greetings, spontaneous talks, children’s play, young people spending time together, and group activities planned to a lesser or greater degree, such as street events, parades, demonstrations (Gehl, 2013). The main method used in the study was behavioural mapping, which is observing and counting people, their behaviours and forms of interpersonal contact. This method is described in detail in the paper by Mantey (2020).

Utility value of space can be measured in three dimensions: Vitality, Integration, and Activity. Vitality of space refers to the number of people using the space across different times of the day and night, the uptake of facilities, the
number of cultural or other events over the year, and generally the presence of 
an active life in the space. Integration in space reflects the level of spontaneous 
interactions within and between groups, which can be illustrated by people 
meeting other diversified users with whom they have not come to a given 
space. Multi-person groups that do not consist exclusively of members of the 
same family and do not result from participation in organized activities are 
the most preferred for public space. Activity of space, in turn, is measured by 
counting types of behaviours and types of contacts between users, whether 
familiar or strangers (eye-contact, talking, listening). Verbal contacts between 
strangers and groups that mix with each other are preferred in public spaces 
of high utility value. It has been assumed after Gehl (1987) that from the 
perspective of a social function of public space, all three types of behaviour 
practiced simultaneously are desired: transit (passers-by), passive leisure (peo-
ple who observe others or relax), and physical activity.

Utility value of suburban recreational public spaces

The utility value of space shows how the space is really used. We can refer 
it to the Gibson’s (1977, 1979) theory of perception and a concept of afford-
dances – the perceived properties of the physical environment that support 
individual’s actions. For certain types of behaviour, we search for affordances, 
i.e. functional properties of environments offering certain possibilities to an 
individual user, hence some spaces become important and behaviourally useful 
for the user, while others not. The more affordances, the more vital the 
space. Unfortunately, on working days, suburban recreational public spaces 
are characterised by low social vitality measured by the number of users and 
passers-by. It is a consequence of the lifestyle of suburbanites and the necessity 
of commuting. Excessive mobility results in the lack of time and willingness to 
inegrate with other people living nearby. Private gardens, a distinctive feature 
of suburban built environment, also reduce the need of spending time in public 
space, since they function as a private space of recreation. A special group of 
suburbanites who rarely use public space are those who live in gated com-
munities provided with internal recreational spaces. These spaces successfully 
compete with those accessible for everyone. An insufficient number of users of 
many recreational spaces results from their poor and random location, often 
far away from nodal points and outside of the reasonable walking distance. 
Low economic vitality of the surroundings of the spaces is also problematic. 
The profitability of stores and other services in dispersed suburbs is often too 
low for such entities to stay in business. If there is no other reason to go to the 
public space than just sitting there, there is often no sense to go there at all. In 
Warsaw suburbs there are many examples of new, well equipped recreational 
spaces that seem to be “dead” during the day (Figures 3a, b). Low economic 
vitality of recreational spaces, their location away from traffic routes as well
as the lack of safe pedestrian infrastructure eliminates transit, which is one of a socially desirable kind of behaviour. Vital spaces attract other users, also passers-by, while empty space is hostile and discourages people from staying there (Whyte, 1988).

When it comes to the conditions for integration in groups, it should be emphasized that a good public space, open and welcoming to everyone, enables
people to mix, which contributes to building a society that draws on its class diversity, multicultural character, and heterogeneity (Carr et al., 1992). However, users of suburban public spaces, unlike urbanites, are relatively more homogeneous in terms of socio-economic status, age (a smaller proportion of senior citizens), and ethnicity. New suburbs are dominated by representatives of the middle class, especially young families with children. Ethnic minorities are rare in Polish suburban zones, although in Warsaw suburbs there are a few concentrations of Asians. The most numerous dispersed minority group in Poland, although visually difficult to be distinguished, are Ukrainians. Many of those who come to Poland for work, settled on the outskirts of big cities.

Suburbs are generally less diversified also in terms of residents’ age. A smaller proportion of senior citizens is another factor, alongside the socio-economic status that determines stronger homogeneity of users of suburban recreational spaces. In Poland it is often accompanied by a strong division into “old” and “new” residents, among which old residents are less likely to use new recreational spaces because they have different preferences for spending time together (Figure 4). It leads to the conclusion that what is desirable from the social perspective, can become undesirable for individual reasons. Among suburbanites, fear of otherness and diversity is more deeply rooted than it is in the case of urbanites (Sennett, 1990). That is why the best occasion to integrate in multi-person groups are special events or activities organized occasionally in public spaces, not the regular use of these spaces.

Figure 4. A common prayer of representatives of old residents by the roadside shrine in Zalesie Górne, municipality of Piaseczno.

Author: D. Mantey
The most preferred type of interactions between users of public space occur in multi-person groups that do not consist exclusively of members of the same family and do not result from participation in organized activities (interactions in organized groups are not spontaneous). They can be found mainly in spaces dedicated to physical activity: playgrounds, sports fields, and not in spaces offering passive leisure only. However, no matter how much the physical attributes of space are conducive to establishing interpersonal contacts, new suburban residents are generally less open to new acquaintances and building community in public space (Kim and Kaplan, 2004). Low density of interpersonal contacts is reinforced by low diversity of intended activities offered by such spaces and their poor location. Connecting with other people is more likely when there are all three types of behaviour: transit (passers-by), passive leisure (people who observe others or relax), and physical activity. The study of suburban recreational public spaces has led to the conclusion that instead of establishing new relations between groups of homogeneous users, intra-group contacts dominate. Most groups maintain longer-lasting eye contact with one another, but groups tend not to mix. The study also revealed that suburbanites prefer to move rather than stay in one place. They often choose cosy and secluded places as well as contact with nature. Therefore, recreational spaces located on the periphery of the suburb, but near a water reservoir or forest, are more frequented, provided that they are well equipped for users of various leisure preferences, safe and accessible to pedestrians and cyclists (Figure 5).
Conclusions

Spontaneous suburbanization initiated in the 1990s, manifested in the chaotic, often discontinuous development of Polish suburban areas, contributed to the spatial disintegration of many settlement units and the loss of their identity, or the creation of remarkably monofunctional suburbs devoid of public spaces other than space of flow. Many years of neglect in the field of spatial planning, shortage of municipal land and the primacy of private property, make it very difficult to start retrofitting of suburbs that are poorly planned or not planned at all. Improving the way of development of suburban space is a difficult and long-lasting process, but necessary in strengthening local communities.

The results of the research described in this chapter have shown, however, that attractive and well-equipped space is not enough to initiate social relations. In the suburbs, less contact with diversity is accompanied by greater indifference to the possibility of making new acquaintances. Theoretically, the potential for building local community based on bonding social capital should be greater in suburbs than in cities because smaller communities and less diversity in public space is compensated by greater proportion of contacts with “recognizable others”\(^3\). However, this potential is not easy to be activated. The reason is that less interest in public space in the role of space for integration is inscribed in the mentality of suburbanites. They seek vitality and diversity in cities and intensive interpersonal relations in the workplace or other social circles that are not necessarily related to the place of residence.

It has been proved that the attitude towards common use of local public spaces results not only from the space itself, but also from the lifestyle, needs, and aspirations of suburbanites. The research shows that in case of suburbs, the highest possible utility value for the most community-friendly public spaces is a kind of “wishful thinking”. It happens that new, well equipped recreational spaces are used with low intensity. This does not imply, however, that suburbs are deprived of social life. In modern societies public sphere moves from physical to virtual space, leaving mainly recreational function for physical space, especially if it is located near natural areas. On the other hand, the most community-friendly public spaces do not have to be fully public. Club spaces as well as private spaces occasionally used for picnics and local events are those categories of gathering space that gain popularity in the suburbs and their potential should be better used (Mantey, 2017b).

In the end, it is worth asking a final question that opens a discussion about the justification for investing public money in suburban recreational spaces. Should we first activate people around joint initiatives and then offer them public space for meeting and spending time together as a response to their real needs, or should we provide residents with a common space, hoping that

\(^3\) The concept of “recognizable other” has been introduced to Polish literature by Bierwiaczonek and Nawrocki (2012).
this will contribute to building a community in the future? The answer is not simple, because it needs further research. We should remember, however, that public space can function not only as a space of integration and social life, but also as an important factor that builds identity and a sense of pride in being a resident of a given locality (Mantey, 2017a).

Bibliography


Recreational public spaces in the context of suburbanization. Polish case study

In the post-socialist countries of Central and Eastern Europe, the 1990s were the beginning of mass suburbanization, which resulted in the emergence of new suburbs. They were deprived of basic infrastructure, recreational spaces, and social facilities. With time, especially after Polish accession to the European Union in 2004, many Polish suburbs gained new recreational spaces, and the existing spaces were upgraded and pedestrianized. This chapter aims to characterize the vitality of suburban public spaces. It has been proved that an attractive and well-equipped space is not enough to initiate social relations. Suburban recreational public spaces are characterized by low social vitality, which results not only from the space itself, but also from the lifestyle, needs, and aspirations of suburbanites.

Keywords: public space; suburbanization; suburbs; vitality of space; post-socialist countries
ALLOTMENTS IN URBAN SPACE – MODERN COMPONENTS OF CITY GREENERY OR COMMUNIST RELICS? AN ANALYSIS OF THE ISSUE AS EXEMPLIFIED BY WARSAW

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Introduction: the phenomenon that is the city allotment

Allotments form an ever-present element of the landscape in many European cities. It was in the 19th century that they appeared for the first time as a “non-urban” form of land use in urban areas. They were mainly assigned – allotted – to working-class families, who in this way met part of their needs for agricultural produce. The space managed in this way also provided opportunities for workers’ families to take some rest and recreation, primarily on the non-working “day of rest”, i.e. Sunday. It remained rare for workers to go on any form of holiday, and at best this would mainly mean time spent with family members back in the countryside – often in fact associated primarily with helping out in the fields. Thus, time on a city allotment offered some kind of a substitute for a holiday.

In the interwar period this form of land use in urban areas began to be regulated legally, and became subject to the activities of dedicated institutions, in this way carving out a more permanent place for itself in the spatial structure of cities throughout Europe (Pawlikowska-Piechotka, 2013). To the present day, they remain specific elements of the land-use structure, while at the same time serving agricultural and recreational functions – to the extent that they are seen by some as within-city enclaves somehow intermediating between the typically urban or typically rural landscapes. Today, areas in which allotments are present are considered by many researchers as possessing features that raise the quality of urban space, and as a landscape element helping with the achievement of sustainable development in cities (Barthel et al., 2015; Bellows, 2004; Farges, 2015; Larson, 2006; Sroka, 2014).
The analysis of the present role of allotments in cities’ functional and spatial structure makes it clear that a change in their key functions has taken place – from the purely utilitarian in the 19th century, when their use was of crucial importance to workers’ families supplying themselves with food; through to a recreational function whereby allotments represent elements of a system of urban “agro-culture”, and are not merely places designated for the cultivation of vegetables, fruit and flowers (often on a hobby basis), but also places open to city inhabitants, in which peace and rest away from a city’s “madding crowd” may be found. The change of function is exemplified by the way in which allotments now fall within the overall spatial policy of a metropolis, as in Berlin, London, Lisbon or Stockholm. In those cities, allotments are an integral element of urban structure, as well as sustainable development policy (Barthel et al., 2015; Bellows, 2004).

In the interwar period, but also after World War II, allotments represented a constant element of the landscape in Poland’s cities. Between 1945 and 1989 so called “workers’ or employees’ allotments” were set up. The state granted land in the suburbs (at that point still only urbanised to a limited extent) to the large enterprises, and these were given over to allotments for the workforce. Today, the land so-designated in the 1950s and 1960s often lies within highly-urbanised districts, and is sometimes even on the very edge of a city’s central business district, in which the prices of land designated for building are highest. Developers and other urban investors thus perceive allotments in this category as major impediments to the pursuit of their activity, and a source of conflicts over land. Basically, they view this kind of green space as applying a brake on new developments and the modernisation of infrastructure. In discussions involving politicians and planners, they resort to the argument that allotments are nothing more than a hangover from the communist era. For this reason, notwithstanding the status of “family allotments” as a cohesive, organised, institutionalised and legally-enforced system, they are still not always taken account of in cities’ physical development plans (Kosmala, 2013).

In this article, the authors analyse the way allotments function in Warsaw – the capital city of Poland, in which some 170 complexes of such allotments continue to exist. The sizes of the pieces of land involved vary quite markedly, but the locations are in every one of the districts into which Warsaw is divided administratively (Kosmala, 2013). The emphasis here is on the spatial functioning aspect, as well as on the key factors that have been shaping the allotments system within the city space of Warsaw.

The matters discussed here thus include the degree to which allotment gardening has been, is and may be deployed consciously in the process of planning for a city’s spatial development – as the functioning of this form of land use is exemplified by Warsaw space. Beyond that, a major objective of the work has been to determine the place of the allotment system in Warsaw’s spatial-organisation structure, and thus also to point to the most important linkages and inter-relationships with other functions of – and dimensions to
– urban space, most especially where the social and natural dimensions are concerned. The purpose of this work was also to indicate the nature of the key barriers to allotments being incorporated in a conscious process of urban spatial development. In seeking to achieve such goals, the authors must present a complicated evolutionary process by which allotments have gained (or have failed to gain) acceptance in urban space, with the attitudes involved ranging from enthusiasm through to negation by certain interest groups, as responded to by efforts at defending allotments mounted by those who make use of them.

Research concept and methods

As has been noted already, the main aims of the research include the presentation and assessment of changes in the way allotments in Warsaw have functioned over differing time intervals. It was believed that this kind of evaluation might prove to have its practical application as planning decisions are taken to regulate both the functioning of existing allotments in urbanised areas and the founding of the new ones. The work carried out was also to account for the degree to which the real functioning and significance of allotments (and the general concept of allotment cultivation) has changed over the study period, as this compares with perceptions of the role of allotments held by different groups capable of influencing the spatial development of cities, i.e. urban planners, the local and central authorities and allotment-users themselves. What was important in the selection of Warsaw as the study area, was the longstanding tradition of allotments within the area of the Polish capital. A key first thought in this context was that the distinct and manifold transformations of spatial structure typical for the city under study, and arising out of historical and political events taking place in Poland since the time of the first development of allotments, never led to the disappearance of this form of land use. That had to be viewed as a circumstance attesting to inhabitants’ considerable attachment to this form of organising space.

To determine changes in the functioning of Poland’s allotment system, both chronological and functional analysis was carried out. This allowed the specifics of this issue in urban space to be presented (Runge, 2006). Research also made use of the spatial analysis method, with the aim to supply procedures that could convert spatial data into results in the form of numbers, tables, figures and maps (Suchecka, 2014). The principal research tool used in the spatial analyses and visualisation of the results thereof is thus programming for Geographical Information Systems (GIS). Specifically, the work described here used ArcGIS 10.3 (from ESRI Inc.) in analysing changes over time in the distribution of allotments across Warsaw space, as well as defining the spatial relations pertaining between allotments and other functions present in urban space. Use was also made of statistical data presenting quantitative changes in the structure of areas with allotments and the individual plots into which
they are divided, in terms of number and size. Sources for these quantitative data include BDL GUS (the Local Data Bank of Statistics Poland), as well as Statistical Yearbooks for Warsaw (from the city’s Statistical Office) and the relevant subject literature. The main sources of data for spatial analysis were in turn:

1. the cartographic work produced in support of the 2001 Study of Conditioning and Directions to the Physical Development of the City of Warsaw (Studium Uwarunkowań i Kierunków Zagospodarowania Przestrzennego M.St. Warszawy), in raster form;
2. the 2015 Warsaw City Fotoplan (from the City’s Biuro Geodezji i Katastru);
3. qualitative data from Polski Związek Działkowców – the Polish Union of Allotment-Holders;
4. data deriving from the PRG (i.e. the state register of the boundaries and sizes of units of territorial division of Poland).

The analysis of the precision of data revealed that they represented the same level of semantic, temporal and positional precision – a matter of particular importance in the context of suitability for analysis of changes in distribution and size where allotments in Warsaw over the 2001–2015 were concerned. Following vectorisation of the raster data, all data were also characterised by appropriate topological and geometric precision.

Allotments and urban agro-culture

The onset of allotment gardening was associated with the period of dramatic development of cities as a consequence of industrialisation and the influx of large numbers of people from rural areas seeking to take up work in factories from the end of the 18th century onwards (Pawlikowska-Piechotka, 2013). The industrial towns and cities of that era were characterised by a lack of recreational land for the “lower orders”, in the absolute, quantitative sense, but also when it came to quality and accessibility (Pawlikowska-Piechotka, 2013; Bellows, 2010). In this connection, and with improving the lot of industrial workers and their families in mind, people started to designate small amounts of land for cultivation, assigning plots to the poorest working families. The not-altogether-selfless motivation here was that, by cultivating their own plot, workers might experience better nourishment. Beyond that, plots allotted might serve as space for rest and recreation in the fresh(er) air. Obviously, the fact that allotments might be made available was also a kind of propaganda tool deployed by rapidly-gentrifying factory-owners to convince country-dwellers to come and work for them in the city (Bellows, 2004; http://www.jardins-familiaux.org/office/eoffice.html).

The phenomenon described in the literature as urban farming, urban gardening, urban agriculture or food urbanism has as a whole been dubbed “urban agro-culture” (Sroka, 2014). A key part of this is the system of allotments,
and these have now become key elements in strategies serving sustainable development in towns and cities (COAG, 1996).

In line with differences in the form and scale of activity engaged in as part of urban agriculture, it is possible to distinguish between two main categories, i.e. farming activity first and foremost with a straightforward economic role, and urban garden management in which some crops may be grown (or even livestock raised), but with social and environmental functions prevailing (Sroka, 2014). The division helps separate out elements of the so-called urban “agro-culture” in relation to output targeted at the market or else seeking to be self-supplying; a recreational or professional approach to management; and the serving of functions that might be economic or social. Likewise, the category of agricultural activity serving economic goals can be commercially oriented, with, for example, denoting more-intensive cultivation of plants and rearing of livestock, with a location that is then typically on city’s peripheries. In turn, city gardening includes less-intensive agriculture steered towards the meeting of a person’s own needs, with the form even being as limited as cultivation on a balcony or roof, as well as typical house or flat gardens, and allotments sensu stricto (Sroka, 2014).

The dynamic development of the urban “agro-culture” idea took place in the 1980s, when the concept was presented as a global phenomenon for the first time, given development in a whole host of countries, and notwithstanding sometimes-major economic, cultural and climatic differences between them (Smit, 1996). It was also in this period that the first research emerged concerning the significance of urban “agro-culture” to food security policy overall. In turn, initiatives seeking to achieve the development of local systems of urban agriculture and horticulture began to gain the active support of both NGOs and groups uniting together local communities (Smit, 1996). In line with the definition devised by the UN-FAO (Danso, 2007; Veenhuizen, 2007), urban agriculture is understood as the cultivation of plants and raising of livestock to meet food needs (and for other purposes) in towns and cities, as well as suburban areas. The definition also extends to the auxiliary activity linked to production, sale and supply of produce to customers. This kind of definition thus applies to garden cultivation, but also to milk and meat production, aquaculture and forestry (COAG, 1996).

Today’s urban “agro-culture” represents a comprehensive system, elements of which include both the production of food and its distribution on local markets and such aspects as rest and recreation, the development of entrepreneurship, the raising of the aesthetic value of space, improvement in the quality of the natural environment and the strengthening of ties in local communities (Danso, 2007; Veenhuizen, 2007). On account of its multifunctional nature, urban “agro-culture” has its important role to play in strategies for spatial development founded upon the idea of sustainability (Danso, 2007; Sroka, 2014; Veenhuizen, 2007). Scientific work emphasises positive impact exerted as regards the economic, environmental and social aspects of the urban
system (Barthel et al., 2013; Genter et al., 2015; Perez-Vazquez et al., 2006, Speak et al., 2015; van der Berg et al., 2010). Many studies also address the healthful impact of different forms of urban “agro-culture” on those engaging in it, as associated with both physical and mental health, and in connection with activation – among the elderly in particular, with levels of stress also lowered and creative thinking encouraged, as people seek to shape their own small piece of space (van der Berg et al., 2010; Genter et al., 2015). In connection with all this, one of the current issues in urban planning underpinned by sustainable development is the shaping of cities’ spatial structure by way of the founding of systems of city farms and gardens on different scales, and with different degrees of advancement of the production process (Wowrzeczka, 2014).

A characterisation of the changes in function and significance associated with Poland’s system of allotments

The first development of the idea of allotment gardening in Poland has much to do with the country’s geopolitical situation in the 19th century (Lubawy, 1939). Poland as such did not exist then, with some of the Polish lands being under German (Prussian) rule, as they had been for more than a century following Poland’s partition by Russia, Austria and Prussia. It was in the voivodeships ruled by Prussia that the first allotments were established. Indeed, the urban-planners of these areas resembled those in Germany in taking account of Arbeitergärten for workers in the industrial towns beginning to develop in Upper Silesia from the early 19th century onwards. The role was then food production, with a view to the reduction of costs of the family’s upkeep (Łakomy, 2012). The allotments also represented a temporary form by which land could be managed, with factory-owners gaining further income in this way as they leased out the land (Łakomy, 2012). Such land was being put to productive use in this way, with a tangible impact on raising the overall availability of food (Kimic, 2012). Workers’ own cultivation of vegetables and fruit was to imbue a feeling of accomplishment, building in them a love for worthwhile work and a sense of respect for their own property and that of others (Kimic, 2012). The running of an allotment was also seen as a way by which workers might form a community, with neighbourly links forged on the basis of common interests. Family ties were also expected to benefit from time spent jointly out of doors.

It was in 1906 that Poland’s first allotments came into being in Poznań, followed by Gniezno, Bydgoszcz and Toruń, as well as Silesia and then Warsaw (Lubawy, 1939). At the outset, the allotments founded and operating during the period when Poland was still partitioned belonged most often to German citizens, with the primary function being recreational. Prior to the First World War there were about 11 areas with allotments in operation already in the western part of what became Poland (Lubawy, 1939). At that stage, allotment gardening was developing most intensively in Poznań and in Silesia.
In contrast, it was only developing slightly within what was known as the Congress Kingdom of Poland, as the Russian authorities had little time for any social initiatives whatever originating among the Poles. Thus, this partitioned part of Poland had just a single patch of allotments, which was set up in 1907.

The social and economic situation of the newly-independent Poland after the First World War was stimulus enough for the development of new allotments. In the interwar period, associations of allotment-holders pointed out the need for them to be taken account of in spatial development plans and included within the system of urban green space (Pawlikowska-Piechotka, 2013). Alongside an increase in numbers of pieces of land set aside for allotments, there was also an increase in the mean size of areas with allotments – from 3.68 ha in 1918 to 5 ha in 1939. By the latter year, there were some 606 such allotment complexes in Polish cities, covering a total of 6455 ha and with an overall number of individual plots reaching about 50,000 (Pawlikowska-Piechotka, 2013).

**Table 1.** A quantitative characterisation of allotments in Poland in the years 1928–1939. Source: Pawlikowska-Piechotka A., 2013, after Dziatkowiec Polski, No. 7/8 of 1947, p. 90.

<table>
<thead>
<tr>
<th>Criterion</th>
<th>1928</th>
<th>1932</th>
<th>1937</th>
<th>1939</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of individual allotments (plots) present within urban space</td>
<td>6,344</td>
<td>14,142</td>
<td>44,209</td>
<td>50,241</td>
</tr>
<tr>
<td>Number of allotment areas</td>
<td>51</td>
<td>135</td>
<td>461</td>
<td>606</td>
</tr>
<tr>
<td>Overall area of allotments in ha</td>
<td>239</td>
<td>699.5</td>
<td>2,704.6</td>
<td>6,455</td>
</tr>
</tbody>
</table>

The development of allotments in Poland after 1918 was mostly influenced by a process of institutionalisation of the movement, as well as regulations in line with the first instruments of law adopted at national level. Moreover, the development of allotment gardening started to become a matter of interest to institutions of national reach, as well as the central and local authorities in the state. It, in fact, became an element of state social policy, starting to encompass such groups as blue-collar workers, white-collar workers, the families of those employed and the inhabitants of both urban and rural areas (Grata, 2012). The Alliance of Allotment Societies gained the support of the Ministry of Social Welfare, the Labour Fund and city authorities. Assistance from the state mainly entailed co-financing of the process by which allotments were set up, with land being offered for their development, and grants for their upkeep made available from city budgets. It was most typical for cities to supply land on the basis of leasing agreements.

At first, the right to run an allotment was granted and renewed with each successive year, but the period was soon being extended to some 15–20 years (Lubawy, 1939). An Allotments Act was drawn up by a Special Commission of the State Social Welfare Council, and this introduced a definition of an
allotment as: “an area of land located where conditions are healthy, within or in the near vicinity of a town or city, suitable for cultivation, outfitted in the necessary agricultural and cultural infrastructure, designated for the purpose more permanently (for a period of at least ten years), fenced off, divided up and including within it some separate area suitable for joint cultural entertainments” (Pawlikowska-Piechotka, 2013, p. 18).

The Act also stated that a complex of allotments should comprise at least 20 separate plots, of areas in the 200–500 m² range. It also imposed an obligation that allotments be founded in gminas (local-authority areas) or industrial settlements in which the number of inhabitants exceeded 10,000, where at least 10% of these people were resident in multi-family housing. Beyond that, in their physical development plans, local authorities were obliged to designate land to serve as allotments, as connected with other land serving sporting and/or recreational functions (Pawlikowska-Piechotka, 2013). The Act furthermore imposed an obligation for allotments to be founded in urban gminas with more than 10,000 inhabitants, as well as in gminas whose areas of land included industrial centres (Lubawy, 1939).

After 1945, a further stage in the development of the system of allotments in Poland was reached, lasting through to 1989. Over the 1945–1989 (communist-era) period, the system of allotments became an element in a policy seeking to compensate – of course between the lines – for the many negative features of a state-run economy of low efficiency. A stated aim was in turn to improve the living conditions city-dwellers experienced (Bellows, 2004).

Bringing extensive areas of both urban and rural land under state ownership allowed for the quite-ready establishment of allotments in cities, and for the designation of areas for their development (Pawlikowska-Piechotka, 2013). The Decree on Allotments dated June 25th 1946 conferred upon these areas the status of institution of public utility worthy of the state’s protection and support, and also constituting an integral element of urban green space.

The first post-1945 instrument of law regulating the functioning of the allotment system in Poland was the Decree on this issue dating from 25th June 1946 (the Dziennik Ustaw Official Journal of Laws of 1946, No. 34, item 208). This drew a distinction between two categories of allotment, i.e. permanent and temporary (Art. 2). In accordance with the Decree, “a permanent allotment is an area of land enjoying a permanent designation, located on or close to a housing estate, fenced off and supplied with necessary gardening, sanitary and social infrastructure” (Art. 3, para. 1). An area of allotments was to comprise a minimum of 40 plots, each covering between 100 and 500 m². Then, by virtue of the Act of March 9th 1949, the organs of the state conferred a new significance upon allotments, terming them “workers’ allotments” (the Dziennik Ustaw Official Journal of Laws of 1949, No. 18, item 117). For the purposes of the 1949 Act, “an area of workers’ allotments is cultivated land divided up into plots, fenced off and supplied with the installations necessary for cultivation and for the meeting of social and sanitary needs” (Art. 1, para. 1).
In turn, in an article on who might enjoy the right to an allotment (Działkowiec No. 10, 1954, p. 2), it was said that the decision on the allocation of plots was a matter for an institution representing a place of work, i.e. a Works Council or trade union council, with priority assigned to “those who lead work, racjonalizatorzy (i.e. members of special teams of workers), activists and workers supporting large families”. As objects of public utility by virtue of the 1946 Decree, allotments became important elements of urban space.

A matter of fundamental importance to the operation of allotments was that they should be taken account of in physical development plans, so that they might be safeguarded against closure, with long-term functioning therefore assured. After 1945, spatial planning in Poland was regulated by virtue of the Decree of April 2nd 1946 on the planned spatial development of the country (the Dziennik Ustaw Official Journal of Laws of 1946, No. 16, item 109), with this providing for the inclusion within planning procedure of a stage at which applications from interested parties could be considered. In this connection, a requirement indicated was for there to be active involvement of allotment-users in the procedure by which local plans were enacted (Lenkiewicz, 1958).

Also to be regarded as crucial in terms of the inclusion of allotments among post-1945 considerations of spatial development was their classification and ascription to a defined type of land use, with a basic function in a city’s spatial structure being indicated. In practice, where spatial conceptualisation was concerned, allotments were most often defined as a special type of urban green space (Wydzga, 1952). And in the context of the spatial aspect to allotment functioning, a need was also indicated for them to be located in central districts, and even immediately adjacent to city centres. An argument speaking for this kind of solution was the disincentive that long travel to plots in suburban areas represented, notwithstanding the way this was a quite typical location for new plots awarded in compensation for the loss of previous ones (Donimirski, 1958).

The 1949 Act offered a more precise definition of who was to enjoy the right to use one of the workers’ allotments, stating that these would be “workers employed on the basis of a contract of employment or a service relationship; persons on these bases or another particular basis benefiting from social insurance, from State Treasury funds or from other public funds; and those receiving benefits” (Art. 1, para. 3). In line with this, the right to use a plot was enjoyed by those in a difficult financial or health situation, to the extent that they were in receipt of welfare payments; as well as those on old-age or other pensions. The obligation that allotments should be founded fell upon gminas (local authorities), while their locations were in housing-estate areas in which more than 20% of the population inhabited multi-family housing; or else in the vicinity of places of work employing 200 or more.

This approach was continued with in the 1949 Act (Art. 4, Art. 5, paras. 1 and 2). However, the latter Act imposed a further obligation on gminas and places of work, who were now to outfit permanent allotments with fencing,
a water supply and appropriate technical, sanitary and social infrastructure, as well as ensuring the maintenance of the latter in a state fit for use (Art. 5, para. 3). Under the 1949 Act, Funds assigned to the operation of allotments were to come also from the budgets of institutions made responsible for their establishment and maintenance (Art. 6, para. 1). In matters of planning, the 1949 Act upheld the right of gminas to resort to expropriation in acquiring land on which to develop workers’ allotments (Art. 7, para. 3).

The third most important legal instrument regulating the functioning of allotments in the 1945–1989 period was the Act of May 6th 1981 on workers’ allotments (the Dziennik Ustaw Official Journal of Laws of 1981, no. 12, item 58), which was passed 32 years after the first ground-breaking Act of the same title had entered into force (the Dziennik Ustaw Official Journal of Laws of 1949, no. 18, item 117).

The 1981 Act upheld the status of allotments as a privilege for workers. On the other hand, it was by virtue of it that a process of decentralisation of the allotment system was commenced with, as supervision was no longer in the hands of trade unions, but had rather become a matter for a new institution that was to coordinate the development and activity of allotments, i.e. Polski Związek Dzialekowców (the Polish Union of Allotment-Holders), which has continued to operate through to the present day.

Crucially, the 1981 Act introduced a provision under which workers’ allotments were deemed to represented a component of green space and the system of recreational areas (Art. 2, para. 1), while also enjoying the status of installation of public utility (Art. 2, para. 1). As in the 1949 Act, also in that from 1981, the right to obtain an allotment was enjoyed by “persons remaining in an employment relationship, as well as those running a craft or service enterprise, those engaging in home working on the basis of a contract and those in receipt of a pension or social welfare assistance.” (Art. 25, para. 2).

**Warsaw allotments after World War II**

A key factor influencing the development of allotment gardening in Warsaw in the 1945–1989 period entailed the living conditions experienced by the populace, which related almost entirely to multi-family blocks of flats, first and foremost blocks of a very large size. After 1945, private investors lost the right to pursue new housing developments in urban areas of Poland (Pawlowska-Piechotka, 2013). This was in particular true of the large cities, in which the construction of new housing was a matter for housing cooperatives ultimately under state control. Thus the only form of development of housing resources at this point was communal. Furthermore, the assignment of new flats to people was a matter entirely in the purview of the state authorities, which were theoretically to ensure access to new flats to all. In practice, factory workers with appropriate attitudes were first in line to obtain them.
The post-war re-establishment of the housing resource in Warsaw obviously had a particular influence on the cityscape here. Nevertheless, it was not until 1961 and beyond that new, monofunctional residential districts began to be laid out in the Polish capital (Gzell, 2006). There was rapid growth of population in Warsaw at the time, as in other Polish cities, and prefabrication was widely used to meet demand. The technology in question entailed the so-called “large-panel construction”, and it greatly reduced the amount of time needed to put up housing. Quality was another matter.

The estates that came into being in this way formed a monotonous cityscape of blocks of large-panel construction, while parsimonious urban-planning rules regarding flat size combined with the low quality of work and materials to reduce quality of life for city-dwellers markedly (Gzell, 2006). This left allotments as a key element of recreational space for inhabitants of Warsaw, meeting needs concerning rest, and contact with nature. As E. Kicińska (2000) makes clear, other countries were at that time attending to such needs by constructing single-family housing with gardens. In contrast, those residing in blocks of flats had just one option or form available, by which they might possess something private and exclusive to themselves and their families.

Warsaw spatial planning was thus broadly speaking under the control of the central authorities (Siemiński, 2006), with the location of allotments within the overall spatial structure of Warsaw also linking up with the dominant political system. This also left it reflecting the economic situation – mostly difficult, and above all difficult when it came to the populace being supplied with even basic foodstuffs. A Decree on the planned spatial management of the country was introduced in 1946, with the following year then bringing the Decree on the planned national economy. Together, these generated a hierarchical system of plans and programmes, most often running for 5 years each, with the aim to regulate cities’ spatial development in relation to the economic development of the country as a whole (Chmielewski, 2006). That also extended to the operation of allotments. Bearing in mind the fact that most industrial enterprises in Warsaw were located in the right-bank part, it may be noted that the key factor in the location of allotments was proximity to industry (as well as the availability of land not built on, obviously). Most new allotments thus came into being in the east of the capital city, across the Vistula. Overall, in the period 1966–1970 around 165 ha of land came into this category (Działkowiec, 1965, p. 165).

In the years 1970–1980 there was a plan to achieve a further increase in the area under allotments in the right-bank districts of Warsaw, i.e. North Praga (99 ha) and South Praga (8 ha), as well as in left-bank districts like Żoliborz (41 ha), Wola (70 ha), Mokotów (72 ha) and Ochota (27 ha) (Działkowiec, 1965: 165). On the other hand, it was stressed that the successful implementation of a further five-year plan for allotments would be hindered by the need to pursue an expropriation process that would raise setup costs (Działkowiec, 1965, p. 165).
In 1969, the overall area of allotments in Warsaw reached 829.75 ha, as divided up into 18,881 individual plots within the city limits (Działkowiec, 1970: 29). At the beginning of the 1970s, Warsaw and its voivodeship had 25,000 plots of this kind – as spread across an area of land in excess of 1100 ha (Mizera, 1973, p. 83). In the years 1971–1972, the area of allotments in Warsaw increased by 24 ha, though with just 8 ha in the area beyond the city within Warsaw province. In turn, as at the end of 1973, Warsaw and the province had over 26,000 workers’ families making use of around 1150 ha of allotments. The greater part of these were located within Warsaw itself (Jancz, 1974).

The importance of allotments for Warsaw in the 1945–1989 period was underlined even more strongly in the 1982 plan for the city’s physical development. This plan, combining spatial and socioeconomic planning, sought to improve living conditions for inhabitants by bringing many thousands of hectares of farmland within city limits (Gzell, 2006). The major increase in the area of land designated for agricultural purposes was linked with a rapid overall increase in the numbers of allotments and area covered. This reflected a deep economic and political crisis inter alia provoked by the introduction of Martial Law in Poland in 1981. An economy of shortage prevailed and was visible to all in a lack of goods in the shops, including unavailability of food. To ease this situation at least somewhat, the authorities promoted the growth of allotment-keeping in the city.

Taking place in the 1970s, the process of transforming Warsaw into an industrial centre of national importance had many and varied consequences for society, first and foremost linked with population increase, as well as modified population structure in terms of age (towards a prevalence of the young), gender and education. The city’s industrialisation also did much to shape living conditions. The need to ensure some kind of dwelling for all those factory-workers coming into the city from around the country – and most especially from rural areas in the east – made it necessary for multi-family housing to spill out rapidly on to what had previously been farmland. Notwithstanding the principle of equality in society when it came to the allocation of dwellings, the housing and material situation of workers in the industrial sector was more difficult than that facing white-collar workers. In line with the traditional model, workers’ families were larger than those of white-collar workers (Siemiński, 2006). In connection with this, allotments became “workers’ allotments” in the years 1945–1989, with their role in relations to most Warsaw inhabitants being in the supply of food, rather than merely recreational. Moreover, the industrial function led to the creation of a defined sub-culture among Warsaw inhabitants that was associated with Sundays and national holidays spent on the allotment. The great part of the industrial employees in Warsaw had moved there from farming villages and small towns in search of work, with the result that it is actually possible to speak of a “ruralisation” of city life in Warsaw after 1945 (Siemiński, 2006). Allotments in this period might thus serve as some link between holders and their places of origin.
The analysis of statistical data shows how the years 1945–1973 ushered in dynamic development of allotment-keeping in Warsaw. At the level of the individual plot, the number as compared with 1945 increased 6.8-fold, denoting an 85% increment. In turn, the area under allotments increased 6.7-fold between 1945 and 1973, denoting an 84% increment. It is thus possible to note that, in the later period, the area of individual plots was slightly lower than at the start of the 1945–1973 period, given a faster increase in number than in the overall area occupied. In the 1961–1965 period, Warsaw acquired 15 new areas of allotments, with four of the existing ones also increasing in size. The overall increase in area taking place in this period was of 220 ha. This in turn denoted the appearance by the end of 1965 of new plots for around 5,400 employees of different state institutions and industrial plants located in Warsaw (Działkowiec, 1965: 165). Moreover, in the period, the area of allotments per inhabitant of Warsaw as provided for officially was close to 6m² (Działkowiec, 1965, p. 165). As of 1965, areas to be earmarked for the founding of allotments were present in every district of the city except the centrally-located Śródmieście.

At the end of the 1970s, the number of allotment-users (including families) was an estimated 4 million (Mizera, 1979, p. 19). That assured allotments of a status as key elements of cities’ spatial structures, and at the same time as symbols of active recreation in a place making it possible for adults and children alike to make steady contact with nature. This was thus an era in which people started to refer to functions of allotments beyond the purely production-related (Mizera, 1979, p. 19). Indeed, over the years 1945–1989, allotments had managed to serve rather diversified functions. Nevertheless, as was noted above, the overriding role was initially to allow people to grow their own vegetables, fruit and flowers (Mizera, 1973, p. 83). On average, the allotments of Warsaw supplied 13,000 tonnes of crops, including 7,000 tonnes...
of vegetables (Jancz, 1974). However, at a time of breakneck industrialisation and urbanisation, many users of allotments treated their plots as places in which they might rest and recuperate (Mizera, 1973, p. 83). Beyond that, there was the way in which allotments could supply key functions of a cultural nature and in respect of the raising of families.

By 1973, 21 areas of allotments had gained their own work and play rooms for children, with most of these fitted out with televisions, musical instruments and libraries (Jancz, 1974). Allotments were also of social importance to the inhabitants of Warsaw. From 1968 on, an action was launched to allow less-affluent groups (especially those on old-age or other pensions) to spend time (often whole days) helping allotment-holders with their work. Around 1000 people took up the offer to do this in 1973, for example. A tradition also took hold for surplus produce from allotments to find its way to old people’s homes, children’s homes and institutions taking care of those with chronic diseases (Jancz, 1974) (see Fig. 1).

The post-1989 functioning of allotments. Is there room for allotments in today’s Warsaw?

Poland’s post-1989 systemic transformation kicked off a process of far-reaching change in the spatial structures of cities. This both reflected and encouraged ongoing socioeconomic and political change. In economic terms, a shift from the centrally-planned economy through to one based around the free market had its obvious influences on the mechanisms by which urban space was shaped (Lisze-wski, 2004). However, a further issue of primary significance was the reform of administration and the development of a system of local government, as well as attendant change in the legal bases underpinning spatial management (Górka, 2004). The decentralisation of the planning system, i.e. the way in which responsibility was taken on by local government, did much to influence ways in which allotments functioned. In this connection, it is possible to identify a successive (post-1989) stage to the development of the allotment-gardening system in Poland.

Transformation of the system of allotments began with the Act of 6th May 1981 on workers’ allotments (the Dziennik Ustaw Official Journal of Laws of 1981, no. 12, item 58). By virtue of that, a Polish Union of Allotment-Holders (Polski Związek Działkowców) was set up as a community organisation self-governing in character, whose aim was to promote the development of allotments. Once the PZD had been established, there was a very rapid increase in the area of Poland covered by allotments – from 27,124 ha in 1981 to 40,059 ha in 1985, in other words a 47% increase over 5 years. Over the whole 1945–1989 period, a similar (more than twofold) increase in the area of allotments had been noted in the years 1949–1956, during which the after-effects of the War and shortfalls in levels of provisioning available to the population encouraged supplementation by way of garden production.
Progressing urbanisation and spatial development in Poland’s cities (especially after 1990) took place in the circumstances of a decentralised system of spatial planning, and hence the assuming of planning independence on the part of local authorities (operating at the level of the gmina). As cities developed, allotments once located on the margins of the urbanised zone now found themselves in districts much closer to areas of city-centre development. It emerged rather rapidly that these plots made use of in gardening were now in very attractive locations, whose development – if only it were possible – would provide for continuity of built-up zones in cities (Banach, 2013).

This was a circumstance that obviously put the future of many allotments in some doubt. Furthermore, it was then but a short step to a portrayal of allotments as a hindrance to commercial investment that could bring local governments financial gain. The investment pressure imposed by a dynamically-developing economy of free-market competition thus set in train a process of closure involving allotments (Włodarska and Mruk-Wszałek, 2013). Indeed, of all the types of green space present in Warsaw at the beginning of the third millennium it is allotments that are (remain) by far the most threatened with elimination (Malinowska and Szumacher, 2008). Furthermore, allotments are seen to be disappearing, or diminishing in area, in the face of the wish to develop the transport and housing networks, as well as new buildings serving commercial and/or service-related functions (Biegański, 2014).

As of 2015, Poland retained 4695 areas of allotments, divided up into more than 90,000 individual plots, with a total area covered equal to 40,988.7 ha (Table 2). On this basis, it is further possible to note differences from region to region in numbers of allotment-areas present. It is Śląskie voivodeship (in Silesia) that has the most areas with allotments (662), followed by Lower Silesia – Dolnośląskie (with 528). This of course reflects the long and distinguished allotment-holding tradition in those (adjacent) regions, with plots irrevocably linked to the lives of workers living in districts associated with heavy industry.

After 1989, what had been a planned development of Warsaw (often burdened by wrong, politically-motivated decisions, but nevertheless taking some account of the public good) gave way to development mainly dependent on the matter of land rents and the income to be obtained from new investments in given parts of the city. Statistical data point clearly to downward trends for both allotment number and area. However, this does not add up to a consistent process of removal of allotments over the entire period from 1990. In fact, the situation faced was varied even at the end of the 1980s. The economic crisis that had hit the centrally-planned economy as Poland’s communist system began to pass into history unleashed dynamic, uncontrolled spatial processes manifested in the appearance of “rogue” allotments, which is to say the ones developing in an uncontrolled fashion (Słodczyk, 2014). Indeed, city-dwellers, fearing interruptions to the supply of food, sought to cultivate plots of land wherever they could.
Table 2. Poland’s situation as regards allotments, as of 2015

<table>
<thead>
<tr>
<th>Voivodship</th>
<th>Number of allotment gardens</th>
<th>Area of allotment gardens (ha)</th>
<th>Number of plots</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lodz</td>
<td>306.0</td>
<td>1,982.0</td>
<td>44,341</td>
</tr>
<tr>
<td>Masovian</td>
<td>467.0</td>
<td>3,568.5</td>
<td>79,960</td>
</tr>
<tr>
<td>Lesser Poland</td>
<td>251.0</td>
<td>1,296.0</td>
<td>29,318</td>
</tr>
<tr>
<td>Silesian</td>
<td>662.0</td>
<td>4,230.6</td>
<td>101,154</td>
</tr>
<tr>
<td>Lublin</td>
<td>170.0</td>
<td>1,312.4</td>
<td>30,536</td>
</tr>
<tr>
<td>Subcarpathian</td>
<td>169.0</td>
<td>1,325.8</td>
<td>29,667</td>
</tr>
<tr>
<td>Podlasie</td>
<td>99.0</td>
<td>953.9</td>
<td>20,935</td>
</tr>
<tr>
<td>Swietokrzyskie</td>
<td>79.0</td>
<td>813.7</td>
<td>18,709</td>
</tr>
<tr>
<td>Lubusz</td>
<td>191.0</td>
<td>2,105.5</td>
<td>44,986</td>
</tr>
<tr>
<td>Greater Poland</td>
<td>515.0</td>
<td>4,254.5</td>
<td>91,717</td>
</tr>
<tr>
<td>Western-Pomeranian</td>
<td>256.0</td>
<td>3,574.8</td>
<td>73,448</td>
</tr>
<tr>
<td>Lower Silesian</td>
<td>528.0</td>
<td>6,284.4</td>
<td>138,409</td>
</tr>
<tr>
<td>Opole</td>
<td>105.0</td>
<td>1,631.9</td>
<td>38,503</td>
</tr>
<tr>
<td>Kuyavian-Pomeranian</td>
<td>396.0</td>
<td>2,695.6</td>
<td>53,985</td>
</tr>
<tr>
<td>Pomeranian</td>
<td>257.0</td>
<td>2,717.1</td>
<td>62,546</td>
</tr>
<tr>
<td>Warmian-Masurian</td>
<td>244.0</td>
<td>2,241.8</td>
<td>48,673</td>
</tr>
<tr>
<td>Total</td>
<td>4695.0</td>
<td>40,988.5</td>
<td>906,887</td>
</tr>
</tbody>
</table>

Source: Ochrona środowiska. Bank Danych Lokalnych, Główny Urząd Statystyczny

Then, from January 1990 on, the role of the private sector in shaping Warsaw’s spatial structure began to grow. This stage in the city’s development was characterised by an abruptly increased significance for market mechanisms and questions of land rents, in connection with the activation of private business entities and the opening-up of the market to foreign capital (Słodczyk, 2014). Expanding investment, changes of designation of urban land and the development of new housing construction all put pressure on allotments. Investors demanded changes of the law from politicians in order that the former might be allowed to occupy new urban building land, especially where city-centre allotments were concerned. An argument surfacing at this point was that progressing urbanisation and growing environmental pollution (above all caused by skyrocketing city traffic) were sure to contaminate allotment produce with various chemical substances, with all the potential negative consequences for human health (Malinowska and Szumacher, 2008).
The first post-1989 legal instrument providing for new directions in the management of allotment areas was the 2001 Physical Development Plan for the Capital City, which served as the study of physical development conditioning and directions in Warsaw, through to 2006. The Study of the same kind currently in force for Warsaw has continued with the idea that allotments here should be turned into managed green space (effectively parkland). As the analysis makes it clear, 60 out of 141 allotment areas (43% of the total) are covered by local physical development plans. In the case of a further 34 areas (23%), such a local plan is in the process of being drawn up. This means that 33% of areas with allotments are not taken account of in local plans, with the effect that may be liquidated much more readily. Furthermore, and as can be noted, local physical development plans often fail to take account of allotments as an integral element in Warsaw’s spatial structure.

Spatial analysis of the functioning of allotments in Warsaw post-1989 was carried out to determine changes in the number, area and distribution of allotments in the 2001–2015 period. The analysis of the change made use of the method of photointerpretation in relation to the 2015 Warsaw Foto-plan, as accessible via the service of the Warsaw City Office at http://wms.um.warszawa.pl/serwis, as well as comparisons between the results of the photointerpretation and the map entitled “Green Areas in Warsaw – the existing situation” as appended to the Management Plan for the City of Warsaw (Resolution No. XXXVIII/492/2001 of Warsaw City Council dated July 9th 2001), which presents the structure of urban green space – including allotments – as of 2001.
The first stage of the analysis entailed the vectorising of data contained in the raster map entitled “Green Areas in Warsaw – the existing situation”, which was an annex to the Management Plan for Warsaw (Plan Zagospodarowania m.st. Warszawy). This purpose was served by applying the ArcMap 10.3 program (from ESRI Inc.), with the raster map registered by way of the “1992” coordinate system. A next stage was vectorisation by hand of the limits of areas that constituted allotments. A vector layer was then added with the limits of the different Warsaw districts – as originating from the state register of boundaries and areas of the units of territorial divisions into which Poland is divided (http://www.codgik.gov.pl).

The next stage to the analysis took in a comparison based around numbers, distribution and areas of allotments in Warsaw between 2001 on the one hand, and 2015, on the other. To this end, the vector layer with the distribution of allotments in Warsaw in 2001 was overlain on the 2015 Fotoplan of Warsaw obtained from the Warsaw City Office server and accessible at http://wms.um.warszawa.pl/serwis. Photointerpretation was thus used to determine the
current state of allotments. The effect was to update the map showing the distribution of allotments in Warsaw for 2015, with an indication given as to those areas of allotments that had undergone liquidation in the course of the 14-year period, along with a determination of the causes of these losses. A map of change in the system of allotments in Warsaw in the 2001–2015 period was therefore obtained (Map 2).

As of 2001, Warsaw had some 141 areas of allotments, covering a total of some 1,553 ha. This denoted that the number of such areas had declined by around 33% over 14 years, while the total area had shrunk by some 11%. This in turn meant that it had mainly been the smallest areas with allotments that had disappeared. Over the 2001–2015 period, the districts losing most such areas were Białoleka (–10), Targówek (–7) and Wola (–7). By no coincidence, these are also the areas in which new work on housing development has been and remains most intensive (Table 3).
### Table 3. Changes in the system of allotments in Warsaw over the years 2001–2015

<table>
<thead>
<tr>
<th>District</th>
<th>2001</th>
<th>Allotments liquidated</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Area in Ha</td>
<td>Number</td>
</tr>
<tr>
<td>Bielany</td>
<td>8</td>
<td>68</td>
<td>3</td>
</tr>
<tr>
<td>Bemowo</td>
<td>13</td>
<td>185</td>
<td>1</td>
</tr>
<tr>
<td>Ursus</td>
<td>3</td>
<td>19</td>
<td>1</td>
</tr>
<tr>
<td>Żolibórz</td>
<td>4</td>
<td>23</td>
<td>0</td>
</tr>
<tr>
<td>Wola</td>
<td>10</td>
<td>46</td>
<td>7</td>
</tr>
<tr>
<td>Śródmieście</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Mokotów</td>
<td>20</td>
<td>333</td>
<td>4</td>
</tr>
<tr>
<td>Ochota</td>
<td>5</td>
<td>54</td>
<td>1</td>
</tr>
<tr>
<td>Ursynów</td>
<td>4</td>
<td>22</td>
<td>2</td>
</tr>
<tr>
<td>Wilanów</td>
<td>5</td>
<td>73</td>
<td>3</td>
</tr>
<tr>
<td>Włochy</td>
<td>13</td>
<td>108</td>
<td>3</td>
</tr>
<tr>
<td>Białoleka</td>
<td>17</td>
<td>98</td>
<td>10</td>
</tr>
<tr>
<td>Wawer</td>
<td>8</td>
<td>91</td>
<td>2</td>
</tr>
<tr>
<td>Wesola</td>
<td>1</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Rembertów</td>
<td>4</td>
<td>31</td>
<td>0</td>
</tr>
<tr>
<td>Targówek</td>
<td>15</td>
<td>258</td>
<td>7</td>
</tr>
<tr>
<td>Praga Południe</td>
<td>8</td>
<td>125</td>
<td>1</td>
</tr>
<tr>
<td>Praga Północ</td>
<td>2</td>
<td>14</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>141</td>
<td>1,553</td>
<td>45</td>
</tr>
</tbody>
</table>

Source: Own elaboration

### Summary

Photographic documentation was prepared to meet the needs of the analysis, with this presenting elements of the 2015 *Fotoplan Warszawy* (server of the Warsaw City Office – http://wms.um.warszawa.pl/serwis) – as overlain with the boundaries of allotments existing in 2001 that had been eliminated by 2015. This made an analysis of the causes of the disappearance of allotments from Warsaw space after 2001 possible. It was in fact most typical for allotment areas to become land available for the development of housing and new infrastructure. This is especially visible in Białoleka district, i.e. the part of Warsaw subject to the most rapid development of single- and multi-family housing development in recent years (Plate 1).
A similar process is taking place in Wilanów district, where work continues on the Miasteczko Wilanów development (Plate 2).
Allotments have also turned into land assigned such infrastructural items as car parks or roads, though also areas serving sporting activity in Bemowo and Białołęka (Plates 3 and 4).

Only to a more limited extent is it possible to refer to allotment functions being lost in the direction of unmanaged green space of no clear function or significance, to Warsaw’s inhabitants. Where present – above all in Targówek
district – this process may be linked with the leading industrial function. As the firms that have taken on formerly state-owned industrial enterprises take no responsibility for either the founding or running of workers’ allotments, this function is not being continued with on land belonging to the plants in question (Plate 5).

![Plate 5](Source: Google maps)

The allotments in Warsaw have come under the strong influence of urbanisation processes, as well as changes in social conditions. On the one hand, the disappearance of allotments in favour of built-up areas has been under ongoing pressure from investors, and in the face of the lack of inclusion of allotments within the city’s spatial policy, as well as the issue of land reprivatisation. On the other hand, analysis of photographs presenting transformations of allotments over the 2001–2015 period makes it clear that some former allotment areas have no function at all at present, probably in connection with either an undetermined ownership situation, or a lack of interest in this form of utilisation of space among the inhabitants of the Polish capital. It can be considered that problems associated with the running of allotments in Warsaw post-1989 – such as the unregulated ownership situation, threats due to pressure on the part of developers and a lack of support from the City Office – may all have worked to discourage Warsaw’s inhabitants from investing in an allotment – on account of the lack of stable conditions of use. Ongoing (post-1989) declines in both the numbers of allotments and the area covered by them point to allotments not being taken account of when it comes to the city’s spatial development.

Bearing in mind the role, functioning and significance of allotments in Warsaw at all stages of its development, it is possible to note a close crossover between trends of national reach and those taking place at the city level. The most intensive development of the system of allotments took place before 1939, as well as in the 1945–1989 period. After 1989, it is possible to speak of a trend for allotments in Warsaw to disappear, with the main cause of this being ongoing urbanisation, with little or no account being taken of allotments in the overall vision for the capital city’s spatial development. In analysing
the significance of allotments to Warsaw’s spatial structure, it is possible to note major differences between three stages to the development of allotments within the city limits. In the first stage, there was strict linkage between allotments and the city’s spatial structure and system of green space. It was immediately during this period that planning solutions appeared by which Warsaw’s development was founded upon the idea of sustainable urban development, with the urbanisation process proceeding in closer harmony with the way in which the capital’s natural system functioned.

In the course of a further (communist-era) stage lasting from 1945 through to 1989, new conditioning emerged where the development of allotments in urban space was concerned. This included the availability of a very large amount of “free” land in the wake of the immense destruction taking place during World War II, followed by a process of the communalisation of land that made it easier to locate allotments within the Warsaw city limits. Beyond that, a considerable influence on the development of Warsaw was exerted by the state authorities, whose pursued social policy saw the allotment as an integral, and indeed key, element of urban space. The development of Warsaw as a national centre for industry ensured that allotments came to be located close to industrial plants in particular. This fact accounts for their presence in the cityscape of such Warsaw districts as Targówek or Bemowo. In this period, allotments were certainly included in plans and programmes of different kinds regulating the shaping of systems of urban green space that were to serve recreational functions. They were also the subjects of special standards designed to ensure that all citizens had access to public space of defined quality.

After 1989, allotments ceased to play any important function in Warsaw’s spatial development. As the historical analysis of the development of allotments in the capital makes clear, ongoing urbanisation has left these as a feature of the city’s central districts above all. Basing Warsaw’s post-1989 spatial policy around matters of land rents and the income to be gained from sales to developers has meant allotments coming under strong pressure from private investors. Beyond that, the problem of the return of land covered by the Decree on Communalisation ensures that now allotments do not represent a stable element within Warsaw’s spatial structure.

Bibliography


**ACTS**

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ABSTRACT

Allotments in urban space – modern components of city greenery or communist relics?
An analysis of the issue as exemplified by Warsaw

Allotments have always been an important part of social life in Central and Eastern Europe. Already at the beginning of the 20th century in several European countries, such as Germany, the Czech Republic, Poland and others, the authorities organized spaces on the margins of cities dedicated to family cultivation. They were intended for the working class.

Among the main objectives of this measure there were two: to make it easier for the working class to produce their own food products to supplement their daily diet and to use the allotments for recreational purposes. The workers could not afford to spend holidays away from the city and did not have many days off to go out. They had to spend these few days off in their gardens. This system became very widespread.

During the communist era the goals were the same. The communist authorities tried to provide a form of recreation for the workers. Numerous plot gardens were created. After the transformation, it turned out that, as a result of the expansion of urban development, these areas, located near the centre, were very well located. Developers and other investors began to take steps to take over the investments. The aim of the article is to show the conflict over these spaces within the city. Today, the lands that occupy these allotments are the target of many political and economic pressures.

Keywords: allotments, conflicts by the lands for new urbanizations, green spaces, Warsaw
Introduction

The process of forming and managing public spaces in modern cities is a research problem addressed by representatives of various academic disciplines, especially urban planning and architecture, geography and spatial management, economics, political and administrative sciences, sociology and psychology. Representatives of these disciplines apply different research approaches and emphasize different dimensions of the functioning of public spaces. This leads to terminological chaos, which also translates into different definition approaches and classifications of spaces among those responsible for managing them. Regardless of the disciplinary context, recurring characteristics of public spaces can be distinguished in the definitions. These are: the physical accessibility of public spaces to different user groups, the creation of opportunities for broad interactions and social relations, and the recognition of public spaces as a common asset.

The accessibility of space can be considered in various ways. Carr et al. (1992) writes about the physical aspect, understood as the absence of physical barriers related to the use of space, the visual aspect – associated with visibility and the possibility of separating this space from its surroundings, and the symbolic aspect – it is the accessibility associated with the presence of information on the possibility of using the space by specific user groups. The issue of unlimited accessibility of public spaces is constantly discussed. Many authors claim that public spaces are accessible and open to all, although in practice some groups of residents may be excluded or unwelcome (e.g. Orum, Neal, 2009).

Some researchers focus on the functions of these spaces: social, cultural, commercial or transport. The way public spaces are managed influences the
effectiveness of their functions. In the event of social functions, interactions taking place in public spaces most often assume the form of meetings. These are random meetings taking place in parks or playgrounds, as well as meetings planned and organised as part of cultural or sports events such as picnics, festivals, concerts (Dines et al., 2006). For these interactions to take place, the public space should have certain characteristics. The organisation Project for Public Spaces (2000), after surveying more than one thousand public spaces worldwide, has identified four key features of adequately organised public spaces that are attractive to users. These are:

- **Accessibility** - a specific space is easily accessible, visible, different parts and nooks and crannies can be used, it is located in the vicinity of a public transport stop,

- **Comfort and image** - spaces are perceived positively if users feel safe in them, the spaces are clean and have places to sit, rest and encourage them to pause,

- **Functions and activities** - activities constitute space and place, define possibilities of spending time in public space and are the main factor determining its choice, they attract users. Attractive public spaces should, among others, be unique and vibrant,

- **Social value** - public spaces should foster the establishment and maintenance of social relations, both with neighbours and strangers. This will make people feel more strongly about the character of the place or the bond with their community.

However, many public spaces do not attract people. This is due to the way they are developed and how these spaces are created and managed. Bauman (2006) distinguishes four categories of urban spaces that are not conducive to people’s encounters, perceived as inhospitable and unfriendly. These are: spaces dominated by modern architecture, spaces in which inhabitants are treated as ordinary consumers, pseudo-places which by their dysfunctionality repel users and discourage them from staying there for longer, and empty spaces.

In the aforementioned Project for Public Spaces Guide (2000), the causes of dysfunctionality of public spaces are divided into those connected with their development and those associated with their management. In the former case the weaknesses in space design are pointed out, e.g. lack of comfortable seats, lack of assembly places, dark and narrow entrances and visually inaccessible parts, non-functional amenities, paths leading nowhere. As far as management issues are concerned, the issues of lack of an entity responsible for the maintenance and functioning of the space are raised, as well as ineffective management, which leads to the degradation of the space in material and functional terms (undeveloped parts of the space, incorrectly located public transport stops, lack of programmes and activities inside the space).

The causes of dysfunctionality of public spaces are of universal nature. They occur in many cities and are a challenge to the local authorities, which are responsible for the socio-economic and spatial development of cities and
providing their inhabitants with good living conditions, including high quality public spaces.

This chapter is dedicated to the shaping, management and functioning of public spaces in Warsaw, a city which over the last 30 years has undergone a profound functional and spatial transformation. The change of the political system that took place in Poland in 1990 led, among others, to the creation of new rules governing urban development. The establishment of local government together with the empowerment of society has led to a new situation in which the local government community, i.e. the city authorities and the inhabitants of the city, decide together on the paths of development of the city and the ways and forms of developing its space. The needs and expectations of the inhabitants, the socialisation of development programming and spatial planning processes and the introduction of new instruments of city management have contributed to the growth of interest in public spaces and the initiation of actions aimed at their systematic development by the city authorities.

The chapter briefly presents the evolution of the approach to public spaces resulting from changes in the conditions of city development. The functional and spatial structure of Warsaw is characterized with attention paid to the issue of public spaces. It also assesses the steps taken by the city authorities to bring order to the approach to public spaces and to formulate policies for their development. The chapter utilizes the results of a study commissioned by the Architecture and Spatial Planning Department of the Warsaw City Hall. The survey was part of the preparatory works for the public space development programme to be implemented under the Warsaw development strategy known as #Warszawa2030.

**Public space in a socialist and post-socialist city**

Leaving aside all ideological issues and applying a neutral, purely urbanistic approach to the spatial development of the city, we define public space as a common asset, available to the public, shaped and used according to socially accepted principles and values. However, public spaces function in a specific political and social context. This context stems from the political system of a given country and the ways of organising public life, including the development management model, the degree of decentralisation of public administration and the level of development of civil society. The political system influences both the forms and organisation of public spaces and their functions. In oppressive political regimes, access to public spaces may be limited and their functions or symbols imposed from above. In democratic systems public spaces are an emanation of community life, an open and co-created environment, an important element of urban space in its material and social dimension.

In Warsaw, as in other CEE cities, there is a large variety of public spaces with different morphogenesis. In these cities we have historical, pre-war public
spaces, socialist public spaces and modern, post-socialist public spaces. The division into “historical”, “socialist”, “modern” and “post-socialist” spaces is a simplification of reality. Parysek (2017) proposes to distinguish three periods in his reflections on the development of Polish cities: the first period is the years 1950–1989, i.e. the time of formation of the so-called “socialist city”, the second period covers the years 1990–2004 – this is the time of transformation and the third period after 2004 – the time of formation of the city of the 21st century.

The socialist city concept refers to cities that were created or developed in a socio-political system called real socialism in Poland. A post-socialist city is a city that, after the fall of real socialism, develops under the laws that govern the economic, social and spatial development typical of a market economy. With regard to urban concepts, socialist ideology tried to reflect the social content of this system, whose main watchwords were: classlessness of society, equality of citizens and social ownership of the means of production.

Socialist cities in Poland developed in conditions of planned economy. It was based on the centralization of production and distribution of goods, the liquidation of the market and private trade, full control of economic activity, a general obligation to work, food rationing and ideological assumptions of social development limiting the self-organization of society. The basis for the economy was the industry, primarily mining, energy, metallurgy, armaments and means of production. Since the 1970s, the importance of services began to grow, which was reflected, among others, in the functional structure of cities (Parysek, 1992; Chojnicki et al., 1999). However, it was industry that was the main driver of urban development and the reason for building large housing estates for the working class. These housing estates were built first of all in areas destroyed during World War II. Owing to this, they were incorporated into the existing urban development. They were then built in the peripheral zone as districts of the “socialist city” (Parysek, 2006). These estates were provided with public spaces, usually interconnected, often located in the central part of the estate. These were mainly parks, squares and playgrounds. In the central parts of socialist cities, large spaces, ceremonial squares or wide boulevards were created, performing ideological functions. They were used for celebrations of national holidays, marches and parades or rallies in support of political authorities.

Stanilov (2007) identifies three main differences concerning public spaces in socialist and capitalist cities. These differences are: the share of public spaces in the city’s surface area, the distribution of these spaces throughout the city, and their development and facilities. In CEE cities, public land also includes parks, recreational areas and streets, thus increasing the share of public land to approximately ¾ of the city area. In Western European cities, the total share of public land constituted 1/3 of the city area. It should be remembered, however, that only a part of these areas in socialist cities could be described as public spaces. Moreover, in these cities, most of the spaces
were only “public by default” because the state nationalised most of the urban land and property and controlled all social activities.

Stanilov also draws attention to a completely different distribution of public spaces in the functional-spatial structure of socialist and capitalist cities. In a capitalist city, public spaces are concentrated in and around the city centre, with the exception of large public parks located in peripheral districts. In a socialist city, the number of public spaces does not decrease with the distance from the centre, due to, among others, the different location of industrial or residential areas in the city.

Spaces in socialist cities also differ from those in capitalist ones in their functions, which is obviously linked to their development and facilities. Public spaces were created on a large scale while their functionality was low. Wide passageways and squares created mainly for party celebrations were rarely used by the residents, who were overwhelmed by both the scale and form of these spaces.

For many socialist cities, including Warsaw, the time of transformation was a period of spontaneous spatial development. It became quite common to deny the rationale of spatial planning. The “Invisible Hand of the Market” was to be the main regulator of phenomena and processes taking place in the city. In Warsaw’s space, bazaars, allotment gardens, and temporary commercial structures often appeared in the least expected places. The space was appropriated by vibrant entrepreneurs. Squares were subject to commercialization and lost the qualities of public spaces. No investments were made in parts of the city due to unresolved ownership issues. Deterioration of living conditions in the central part of the city and low land and property prices in the municipalities surrounding Warsaw stimulated the process of equally spontaneous suburbanization. The post-industrial areas were gradually degraded. Public space in housing estates also deteriorated. Developers dominated the residential construction market and became key players in shaping urban spaces, including public ones.

Only the period of development of the city in the 21st century brought attempts to control the spatial chaos and return to planned measures. The issue of shaping public spaces as a goal of the spatial policy appeared in this activity. In Warsaw, the issue of public spaces was included in the new city development strategy entitled #Warszawa2030. This strategy was adopted by the City Council in 2018. Urban movements representing the interests of the residents had already initiated or forced the city authorities to take actions that would lead to harmony in the organisation of space. There is a growing awareness of the importance of the quality of space for city life among both residents and representatives of the authorities. Warsaw residents are actively involved in various initiatives that concern not only their place of residence and the immediate vicinity but also other parts of the city.

Today, Warsaw is facing the challenge of how to design and manage public spaces. Carmona (2010a, 2010b) points out that, on the one hand, those
responsible for the design, development and management of public spaces are criticised for insufficiently effective management of spaces, leading to their neglect or exclusion of certain users. On the other hand, these individuals are equally often criticised for introducing too many regulations concerning the functioning of certain types of spaces. The result of this “top-down overregulation” may be the privatisation of spaces, the domination of activities carried out in spaces by those aimed at consumption, the creation of “imaginary” spaces that do not take into account the needs of residents. This criticism results from the growing awareness of the economic, social and natural value of public spaces.

Public spaces in the functional and spatial structure of Warsaw

The urban structure of Warsaw is divided into the central area, residential districts and industrial districts. For the last several years, the latter have been transformed into service complexes. There is an imbalance in spatial development between the left and right-bank part of the city. A large part of the city’s area is occupied by urban wastelands with temporary buildings, degraded areas located in industrial zones and railway tracks. Over 10% of the city’s area is occupied by agricultural land, with over half of it not used for agricultural purposes.

Warsaw has numerous valuable urban and landscape environments. However, the quality of historical public spaces is low. Also, the quality of the arrangement and development of city streets and squares, as well as the city entrance routes, is low. With respect to the shaping of Warsaw’s spatial structure and landscape, in accordance with the planning documents, efforts are focused on the urban quality and protection of the cultural and natural environment and are subordinated to such changes in the urban landscape that emphasize and highlight the elements shaping the individual image of the city and determining the quality of urban space.

Public spaces are concentrated mainly in the central districts of the city. They are located along the streets running in a north-south direction. A separate element of the spatial structure are the historical lines connecting historical city squares of various geometric forms. Warsaw’s public spaces are generally characterized by low development intensity and poorly supplied with public services, while at the same time they are not adapted to the needs of the disabled. In many cases they are dominated by transport functions. Outside the inner city area, public spaces are poorly developed or neglected. They have no continuity and there are no links to public spaces in the centre. Critical appraisal of public spaces is also influenced by the presence of aggressive advertising in their area or in the immediate vicinity, poor quality and technical condition of street furniture, pavements and other urban facilities.

Public spaces in Warsaw require strong interventions to become an important element of the functional and spatial structure of the city. Their low
quality affects the attractiveness of themselves and the entire city. In the Warszaw development strategy entitled #Warszawa2030 the issue of public spaces appears in various contexts. It is present, among others, in the Comfortable Locality and Functional Space strategic objectives.

In the spatial policy of the city authorities, the creation and development of public spaces is connected with the creation and functioning of district and local centres. Such a policy is intended to foster the strengthening of Warsaw’s polycentric development. The very idea of creating district and local centres results from the specificity of contemporary urban development trends. Warsaw is a part of these trends. At present, the development is mainly done by improving the internal structure of cities. One of the problems Warsaw faces is the lack of well-developed district and local centres in large areas of the city. For this reason, the #Warszawa2030 strategy contains provisions concerning this important component of the functional and spatial structure of the city.

Public spaces in the spatial development policy of Warsaw:
Quality of Public Spaces Index

As mentioned earlier, the change in the city’s policy on public spaces was reflected in the provisions of the Warsaw Development Strategy #Warszawa 2030. The document states that “Warsaw is a city where everyone feels at home – free and safe. The abundance of space resulting from the skilful mix of tradition and modernity, urban and natural environment, local character and the features of a capital city offers a comfortable everyday life and favourable conditions for engaging in various activities”.

Future public spaces in Warsaw are to encourage the integration of local communities, establish social and neighbourly relations and be a space for spending free time together. They should implement programmes ensuring their multifunctionality, which is one of the conditions of their attractiveness for various groups of inhabitants.

Improvement of the quality of public spaces has been included as one of the operational objectives of the #Warszawa 2030 Strategy (Operational objective 3.1 – We use attractive public spaces). The achievement of the objective requires improving the usability and aesthetics of public spaces in the city and connecting them into a coherent and attractive network. It is planned that public spaces will create a hierarchical arrangement covering the city centre, district and sub-district centres and other important components of space, which are the Vistula river embankments, historical urban developments and main transport routes. This will involve the transformation of existing spaces as well as the creation of new ones. Ensuring the usability of the space for people staying in it will require the preparation of an extensive offer of services, high quality street furniture, green infrastructure and a clear information system. In addition, their safety should be guaranteed and architectural and spatial barriers to free movement should be eliminated. The importance and attractiveness
of public spaces can also be increased by improving their aesthetics, using them as a place of cultural activities and displaying the resources of cultural and natural heritage and landscape features.

The attainment of this objective requires the Warsaw Town Hall to apply systemic solutions including:

- taking into account in spatial planning the quality requirements of public spaces and the application of universal design principles,
- increasing the effectiveness of protection of cultural heritage in its material and non-material dimension,
- subordinating the management of municipal real estate to the city’s spatial policy,
- coordinating activities of different nature in key areas forming public space, e.g. in the so-called Vistula District or city centre.

The Architecture and City Planning Department in the City Hall has been tasked with developing an indicator of the degree of achievement of objective 3.1. The employees of the Architecture and City Planning Department in the City Hall have proposed a Public Space Quality Index to measure changes in the quality of public spaces. The Index is an indicator presenting the current level of quality of public spaces expressed as a percentage (percentage of points obtained by the surveyed locations from the total number of points that may be awarded). The presentation of the Index in percentage terms makes it possible to monitor changes in the quality of public spaces and allows to expand the set of examined spaces. It is assumed that in 2030 the index will reach 80%.

The first pilot edition of the public spaces quality survey was conducted in 2017 by the Architecture and City Planning Department. It examined 189 locations, divided into three categories: street, square, green area. They were selected from over 300 spaces which, according to the authors of the Index, meet the requirements for attractive public spaces. The highest rated public spaces are located in the city centre. These are:

- ul. Krakowskie Przedmieście (89,7%) – a prestigious street in Śródmieście, constituting the northern section of the Royal Route, leading to Plac Zamkowy (Castle Square); there are historic tenement houses and monuments, the University of Warsaw and the Academy of Fine Arts; the street underwent a major renovation in 2008 and is listed in the register of historical monuments as an urban development,
- Bulwar Jana Karskiego (89,7%) – a modernized fragment of the Vistula promenade; it serves as a promenade and bicycle path, is provided with planted plants and street architecture,
- Plac Grzybowski (87,3%) – a downtown square, the history of which dates back to the seventeenth century; in the years 2009–2011 the reconstruction of Plac Grzybowski was carried out, in the middle of which a garden with a pond was arranged; in the years 2011–2013 two tenement houses were renovated, a 160-metre high Cosmopolitan
skyscraper designed by Helmut Jahn was built in the neighbourhood. The square is lavishly equipped with street architecture and greenery, which is conducive to relaxation.

The lowest marks went to public spaces in the outlying districts:

- ul. Pratulińska in Targówek (2.6%) – the low mark given to this space was due to the construction of the second line of Warsaw’s metro during which the street was partly closed to users,
- Wiśniewo Park in Białołęka (11.4%) – difficult access and neglected greenery area,
- Aleja Komandosów in Rembertów (15.4%) – a street in a peripheral part of the city, one of the key thoroughfares in the district.

The survey showed that despite many critical assessments, the quality of Warsaw’s public spaces is quite good, with an average quality index of 61.7%. However, during the survey in the Office of Architecture and Spatial Planning doubts arose concerning both its methodology and the course of the survey itself. Therefore it was decided to involve experts in the process of developing the final version of the public spaces quality index.

In 2018, a team from the Urban Laboratory at the University of Warsaw carried out a second edition of the survey. The survey included verification of: a) the results of the first survey conducted by the Office of Architecture and Spatial Planning in the Warsaw City Hall, b) the approach and research instrument used during the survey. As a result, recommendations were developed for: a) modification of the methodology of the Public Spaces Quality Index survey, b) creation of a classification of public spaces for the purposes of the Index survey.

The 2018 survey covered the public spaces assessed in 2017. Repeating the survey in an unchanged formula was intended to verify the quality of the survey methodology and to initiate regular monitoring of changes taking place in the quality of public spaces in Warsaw. The valorisation of public spaces with the use of the previously developed questionnaire was supplemented by the participatory observation of researchers and free interviews. Conducting qualitative field research allowed for a better understanding of the functioning and specificity of the surveyed spaces and a better evaluation of the research tool developed in the Town Hall.

Undoubtedly, the success of the Office of Architecture and Spatial Planning was to make an initial inventory of public spaces and their simple categorization (street, square, green area). On the basis of the survey it became possible to prepare a “sheet” of every public space in the city, containing information about its location, area, facilities, functions, aesthetics and accessibility. Thus, extremely rich material on public spaces in Warsaw was collected. The key criteria for evaluating public spaces included the following issues:

- greenery (trees, shrubs, lawns),
- pedestrian zone (width of pavements, type of surface and its condition),
- adaptation to the needs of people with various disabilities,
• equipping with bicycle infrastructure,
• equipping with street architecture, playgrounds, outdoor gyms, veturilo stations, bicycle racks, leisure facilities,
• lighting,
• access to public transport,
• parking,
• presence of café gardens, catering facilities,
• composition, visual qualities,
• compliance with the standards of pedestrian infrastructure for designated zones (Ordinance of the Mayor of the Capital City of Warsaw No. 1682/2017) and the draft landscape resolution.

The Public Spaces Quality Index obtained in the 2018 survey was higher than in the preceding year and reached 64.35% (up by 3.24 p.p.). The highest ranked public space in 2018 was Bulwar Jana Karskiego in Śródmieście, which scored almost the maximum number of points – 94.6%, the worst public space turned out to be once again Wiśniewo Park in Białołęka – 21.6%.

A survey carried out by a team of experts revealed various weaknesses in the City Hall’s survey methodology. These included three issues: a) the selection of the spaces to be assessed, b) the classification of these spaces and c) the assessment criteria.

Firstly, it was stated that when selecting spaces for the survey of their quality as public spaces, one should first verify whether they fulfill the functions of public spaces. The lack of the initial attributes of a public space, as defined in the introduction, resulted in the inclusion in the survey of many streets, squares and parks, which are difficult to describe as public spaces (thoroughfares, green areas with no entry to the public, squares performing mainly transport functions, etc.).

Secondly, the selected spaces were assigned to three categories within which they were assessed (streets, squares, green areas). In the structure of the surveyed sites there is an over-representation of streets, as they constitute 63.5% of the total surveyed spaces. The remaining locations are squares – 20.1% and green areas – 16.4%. For the purposes of diagnosis and formulation of recommendations for public space development policy such overrepresentation should not have occurred.

The criteria used for the selection of space for the survey influenced the results obtained. The analysis covered public spaces, including those serving as district and local centres as well as planned local centres. The detailed analyses show that a joint assessment of developed spaces and spaces with potential is not justified.

It is therefore difficult to consider the results obtained as representative for public spaces in Warsaw. However, the value of the Index itself can be interpreted as an effect, despite various deficiencies, of the rather high attractiveness of district and local centres. Assuming that only this type of public space in Warsaw (i.e. district and local centres) is to be covered by the survey,
an initial categorisation and distinction of the following categories should be considered: a) district centres, b) local centres, c) centres aspiring to the function of public space, i.e. planned local centres.

The distribution of public spaces in Warsaw is obviously uneven. However, such large differences in the number of places surveyed from particular districts of Warsaw should not have occurred. A significant part of the surveyed spaces is located in Śródmieście (34.4%). The fewest public spaces were assessed in the peripheral districts: Rembertów and Wesoła (2 each) and Ursynów and Białoleka (3 each), although some of them have large housing estate complexes. The assumptions adopted for the selection of locations do not reflect the specific nature of the districts and their offer, or the size of the market of potential users.

The selection of spaces to be surveyed should also take into account their number in different districts. The selection criteria should be clearly defined in such a way that on the basis of the analyses it is possible to draw conclusions not only about the situation of individual spaces but also about the situation in different districts in the sense of their saturation with public spaces of specific virtues and quality.

When considering issues related to the number of assessed public spaces and their attributes, attention should be paid to problems associated with their categorisation. The group of the surveyed spaces is very diverse and internally complex, and it was too simplistic to distinguish only streets, squares and green areas among public spaces. Distinguishing only three categories of public spaces and qualifying selected places to them made not only the research process difficult but also affected the results obtained. The categories of streets included both thoroughfares as well as distributor roads and local streets. Some streets were evaluated along their entire length, in other cases the measurement was sectional (even in this situation there were differences in functions and development). It is difficult to assess a section of a residential street, a prestigious street, a bridge, or an important thoroughfare using the same criteria. The assessment took into account, among others, the presence of cultural facilities, the possibility of using the street development to educate children, the uniqueness of the development and composition on the district scale, and the state of vegetation.

The squares category also turned out to be extremely diverse. The evaluation was carried out on squares of the old town complex, squares from the interwar period, squares from the times of real socialism, district squares and roundabouts. Among other things, the evaluation included street architecture, the presence of pedestrian, bicycle, and road traffic, the location of catering facilities, the connection of public space with the environment, the presence and quality of a water reservoir and the state of vegetation.

The third category consisted of green areas. These included city-wide, district and local parks and small gardens. The criteria assessed included, among others, the presence of pedestrian, bicycle and roller coaster traffic,
the location of catering facilities, the presence of an amphitheatre/bandshell, the presence of an open-air gym and a playground, the quality of the lawn.

Therefore, it can be noted that some of the surveyed spaces could not be assessed positively due to their specificity and because of their inclusion in a particular category. Some of the assessment criteria were inadequate.

During the survey, the boundaries of the assessed space and complete omission of the neighbourhood effect also proved to be a problem. In Falenica (Wawer district), the assessed public spaces are located in close proximity to each other, so they are difficult to assess as separate places – they start to form a microsystem. In other cases, on the other hand, the examined space does not perform certain functions (e.g. there was a lack of street architecture, a playground, an outdoor gym, bicycle racks), but there were attractive and well-equipped places to spend free time in their vicinity.

The application of the assessment criteria assigned to the category of public spaces also proved to be a problem. It was only verified whether the examined space meets the specified criteria or not – the assessment took place on a 0/1 scale. Such an approach obviously has advantages, e.g. it accelerates the research process, limits the subjective evaluation of the researcher, increases the credibility of the results obtained, but makes it difficult to grasp the essence of public space quality.

One of the key conclusions of the expert study was that the attractiveness of these spaces was not included in the Index and quality does not automatically translate into attractiveness.

**Discussion and conclusions**

The character of public space is affected by its location, form of development, range of influence as well as its original function (Nicol and Blake, 2000). Every socio-political formation lasting for a sufficiently long time leaves traces in the city space. They are visible both in the organisation of the urban fabric as well as in the social space of the city, which is a reflection of social relations characteristic of a particular political formation. This regularity also applies to cities which were created or developed during the period of real socialism. Public spaces in Warsaw have different origins, these include historical spaces, partly reconstructed after the war (e.g. Plac Grzybowski, Ogród Saski), public spaces from the times of real socialism (e.g. Plac Konstytucji, Plac Hallera), contemporary spaces, created after 1999 (e.g. Bulwar J. Karskiego, Frenkel’s playground). These spaces are evolving – some of them underwent renovation or refurbishment, which in turn translated into their attractiveness and functionality, the inhabitants of the area and their users changed, which also affected their functioning. Public spaces are a very diverse form, not easy to define and categorise, which makes it difficult to study them. The authorities of Warsaw having attempted to determine the quality of public spaces, have carried out their initial inventory and categorisation.
The results of the expert study have formed the basis for the formulation of several general conclusions and recommendations for research on public spaces in Warsaw, which should be conducted as part of the monitoring of changes in the city’s spatial development. The results of the monitoring should form the basis for formulating a policy for the development of public spaces and premises for the ways of developing and managing these spaces.

In order to carry out a systematic assessment of the quality of public spaces, it is necessary to define city’s policy, what public space is and how the definition of this space is rendered operational in Warsaw. The provisions regulating the issues of public spaces can be found in the *Spatial Planning and Development Act*. The experience from the survey clearly shows that universal approaches and general definitions are not applicable in Warsaw. It is necessary to take into account the local specificity of the creation and functioning of public spaces, and to operationalise the concept of “public space” taking into account local conditions.

Public space is assigned the following meanings: utilitarian, interactive, civic and political, axiological, symbolic and identity-related. Assessment of the quality of public space should take these meanings into account. Therefore the definition of public space and a set of criteria which it should meet should be developed jointly by the appropriate departments (competences, tasks, experience, information resources) of the City Hall. The developed features of public spaces should relate to their accessibility, functionality, attractiveness and pro-community nature.

There is also a need to systematise the terminology connected with public spaces and planned district and local centres. The term “public space” appears in too many meanings and contexts. From the perspective of planned interventions (implementation of projects supporting the creation of local and district centres and the creation of public spaces) clear and precise definitions should be worked out, which will be applied consistently in all documents of the City Hall and interpreted in the same way when conducting study and programme works by organisational units of the City Hall.

An element of terminology systematisation should be the development of a more comprehensive set of public space categories. A greater number of well-defined categories will help to organize and structure the set of information about public spaces. It will also facilitate the research process. Analysing the experience of cities from different countries, three basic, universal criteria used in the classification of spaces can be indicated:

- the significance of a given space (e.g. metropolitan scale, local scale) / catchment hierarchy / catchment area,
- function,
- environmental character / landscape.

Using these criteria, their categories can be distinguished within the types of public spaces. The method of categorisation is an arbitrary choice, most often depending on the city’s spatial policy and its objectives, which translate
into actions in the sphere of public spaces. The issue of public spaces may be perceived and treated differently by the authorities of the whole city, district authorities or smaller auxiliary units. A consensus is needed to understand what public spaces of different categories are, what they can offer and how they function.

The process of space classification may have a different structure. This set may be adjusted after the survey or as a result of other assumptions concerning the classification of spaces. However, it will have its internal logic, allowing spaces to be grouped according to specific criteria.

The objectives of the survey leading to the determination of the public spaces quality index should be formulated as follows: assessment of the condition of development and facilities of public spaces, assessment of the programme offered/implemented by public spaces and assessment of the level of satisfaction of users taking advantage of public spaces. The implementation of the above survey objectives will allow to create an objective index of public spaces quality. The survey should be repeated at different times of the year. The image of a space from the summer period differs from the image we obtain during the winter period.

As the results of the survey showed, the principles of delimitation of public spaces are important from the point of view of the policy of creating and managing public spaces. The immediate environment of a space is often important for its functioning. It may be a location of the infrastructure used by users of the space. It should be assumed that depending on the category and nature of a public space, its boundaries will be determined individually, for each space. The practice of delimiting public spaces varies. The use of subdivision survey dispels all doubts as to the course of the boundaries. However, it does not always reflect reality in the sense of functioning of this space. The criteria for delimitation depend on its purpose. A public space can constitute a whole with its simultaneous internal diversification. Functional connections may indicate boundaries other than physiognomy. The issue of land ownership can be important in delimitation where it is designed to identify those responsible for maintenance and the functioning of the space.

In general, there is no single benchmark for the examination of public spaces to determine their quality. Different countries and cities have different approaches and methods. It is worth noting, however, that often typologies, classifications or categorizations, resulting from research in geography, anthropology, sociology of the city or the economics of city functioning, are recorded in official city documents. The general “public space” category is not used. The categories that are distinguished make it possible to monitor changes on the local scale, in the districts, whole cities or metropolitan systems. Such a solution should be applied in Warsaw.

The changes suggested in research methodology should be accompanied by the development of research instruments. A valuable addition to this would be, among others, behavioural mapping. The “Atlas of Public Spaces”, containing
a set of periodically updated information about individual spaces could be an
effect of monitoring changes in the quality of public spaces in Warsaw. Such
an atlas may be used for various purposes, including the promotion or building
the image of districts or the entire city.

The case of Warsaw clearly shows how the change of the political system,
the emergence of local government and the empowerment of local communi-
ties affect the approach to public spaces, both by residents and city authorities.
Due to the new systemic conditions, the issue of public spaces in the city lies
within the competence of the local government, which is responsible for the
formulation and character of urban policy. Introducing the issues of public
spaces to the urban policy broadens the scope of this policy and creates oppor-
tunities to improve the quality of the functional and spatial structure. Warsaw
local authorities are on the way to transform public spaces. The first steps in
inventorying and assessing public spaces were an important experience. The
correction of the research approach and development of the research instru-
ments enable a better diagnosis of the situation of public spaces. This will
make the interventions implemented under the urban policy more effective.

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**Abstract**

**Public spaces in urban policy: evolution of approaches on the example of a post-socialist city**

The chapter deals with the issues of shaping, management and functioning of public spaces in the city that has experienced changes of systemic conditions for its development. The case study is Warsaw – the capital of Poland, which has undergone a profound functional and spatial transformation, resulting from the change of the political system in Poland in 1990. The change of the political system led to the emergence of new rules governing the development of cities. The re-birth of territorial self-government and the empowerment of society resulted in a new situation in which the local community – i.e. the city authorities and its inhabitants – not the central government or the communist party, decides about the city’s development paths and the ways and forms of developing its space, including public spaces. Residents have the opportunity to articulate their needs and interests. The city government is responsible for coordinating development programming and spatial planning. One of the goals of the city’s social and spatial policy is to provide residents with the high quality public spaces. These spaces have played different roles in Warsaw over the years and have had different meanings for the inhabitants. The chapter presents the evolution of the approach to public spaces presented by the city authorities and residents. Its causes and effects are discussed. The chapter also includes an assessment of the activities of the city authorities that lead to the formulation of a policy for the development of public spaces. The text uses the results of the study conducted by the authors of the chapter for the purposes of implementing the Warsaw development strategy #Warszawa2030.

**Keywords:** public space, post-socialist city, Warsaw
Introduction

Over the last two hundred years, the area around us has been undergoing very dynamic changes. The beginning of industrial age in the cities, which resulted in abrupt development of urban centres, contributed to the dynamics of those changes. Therefore, the industrial heritage shows us the peculiar history of a given place and its cultural, economic and social value. It happens due to the fact that (post)industrial areas become an element of the genetic code of the city (Loures, 2008) and merge into unity with its other functions.

Of course, at the beginning of the 19th century, industrial areas differed significantly from those that can be observed nowadays. It is associated with changes connected with technological advancement and the industrialisation level of a given city, but also with the type of industry. The development of industry is one of the most important elements of the shaping of modern structures of cities in the scope of their politics, economics and social, environmental or landscape aspects (Zigmunde, Katlapa, 2017). Industrial architecture complexes are characterised by exceptional form and visible arrangements of organisation of given surface. Industrial architecture shows the complexity of various kinds of technologies; it is also characterised by the use of prefabricated building materials, the presence of extensive glazing surfaces (sometimes there are walls made entirely of glass) and visible steel constructions (Ibanez, 2014).

The most important period of changes that occurred in the industrial landscape of Polish cities was the political transformation in the 1990s (Turek, 2013), where, similarly to other agglomerations in Europe and the United States, the industry fell and lost its significance. The process of deindustrialisation resulted from the restructuring and liquidation of many industrial
plants (Wojtoń, 2010). This process occurred significantly earlier in Western Europe, i.e. in the 1960s (Kaczmarska, Przybyłka, 2010). Eventually, it led to a situation where in 60% of Polish cities nowadays there are areas of post-industrial nature (abandoned, degraded and unused) – the total area of which is 8,000 km², including a high degradation level area of 1,400 km² (Gasidło, 2008). It also applies to urban landscapes (Kazimierczak, 2012). And so, the privatisation of industrial sector negatively affected the management of those areas, which was often influenced by external capital (Zigmunde, Katlapa, 2017).

The aim of this paper is to analyse the preserved post-industrial heritage of Warsaw in 2018 on the basis of its two districts, Praga-North and Wola. Historically, both districts were a place of industrial advancement in Warsaw. Nowadays, they are the areas of the biggest urban transformations in the city, which causes a total transformation of their nature. The paper puts forward a method of industrial heritage use assessment.

1. Idea of post-industrial heritage preservation

The policy of liquidation of industrial areas and replacing their original functions with new ones caused irrecoverable damage to many valuable architectural facilities that underlined the former nature of a given place. Currently, the policy towards post-industrial heritage in Poland is changing: it started to be perceived as the preservation of a certain type of past (Zigmunde, Katlapa, 2017). This change in rhetoric towards the specific role of post-industrial areas occurred along with Poland’s accession to the European Union in 2004 (Wojtoń, 2010).

The idea of industrial heritage protection in other European countries started to be visible much earlier – e.g. already since the mid-20th century in Great Britain. It was a period of the so-called Great Depression, when a great number of industrial establishments was closed and physically liquidated (Zigmunde, Katlapa, 2017). In 1949 a document (Statute of the Council of Europe) was adopted in London, which stated that the protection of cultural heritage would contribute to the economic and social advancement of European countries as well as become a significant element of integration of nations in the European community. Therefore, the document reveals that the cultural heritage of post-industrial areas should be considered a common good expressed in its diversity and cultural community, and thus protected and preserved for future generations – which is compliant with the assumptions of the Venice Charter of 1964 as it is an element of identification of a specific social group (Loures, 2008). An important document for the discussed topic will be the Industrial Heritage Charter of 2003, adopted by the International Committee for the Conservation of the Industrial Heritage TICCIH (Trifa 2015) (the so-called Nizhny Tagil Charter), according to which industrial buildings as well as artefacts associated with industrial heritage are valuable elements (Loures,
The charter also states that it is a multidimensional heritage, so it does not concern only post-industrial buildings (architecture or technological solutions (Loures, 2008), but also historical and social values (Trifa, 2015), as post-industrial areas show the identity of a given society (Pozo, Gonzalez, 2012). It concerns all types of activities of industrial nature, both tangible or intangible residues (Loures, Burley, 2012). Legal protection concerning industrial buildings was approved by, *inter alia*, ICOMOS – the International Council on Monuments and Sites – and UNESCO – the United Nations Educational, Scientific and Cultural Organization (Loures, Burley, 2012).

Therefore, what is a cultural value is the industrial landscape, skilled rehabilitation of which can lead to proper organisation of the city and its reconstruction. It can be performed with tools associated with revitalisation as a result of which new functions for given buildings are found, which makes them preserved and properly protected. It is the so-called city development sustainable management with multidimensional benefit for residents. Measures are to be taken to make the policy of repeated healing of a given area compliant with protection of those valuable buildings (Trifa, 2015). Demolition or, in the case of Poland, waiting for spontaneous damage of buildings leads to the loss of valuable cultural resources.

Of course, there are many people who appreciate the qualities of such an area. However, the society frequently does not perceive industrial areas as valuable elements that require protection (Trifa, 2015): it is associated with the experiences of a given population (the collapse of industry contributes to social impoverishment, depopulation of areas settled by working class society (Pawlikowska-Piechotka) and its improper education. Another important fact is that such areas are encumbered with many deficits associated with, for instance, spatial aspects resulting from what is located in a given area, as well as social aspects (Summerby-Murray, 2015) due to the fact that a sense of threat arises out of such abandoned post-industrial areas (Loures, Burley, 2012). Frequently, these are negative experiences not only for the population, but also for the authorities. The establishment of post-industrial cultural identity in various places is, thus, very difficult (Summerby-Murray, 2015). On the basis of experience gathered so far, the adaptation of post-industrial areas can lead to improvement in city image at the social, economic, environmental or aesthetic level (Loures, Burley, 2012).

### 2. Potential of post-industrial areas

Post-industrial areas are free from various types of negative burdens that affect the manner in which they will be transformed. It is associated with, for instance, the level of their degradation, level and type of pollution and lack of determined legal status. The costs associated with adjustment of industrial buildings to new functions are also significant, which frequently entails great
The above factors contribute to the lack of interest of the city authorities and investors in buildings and waiting for their slow degradation. This results from the fact that it is the very ground, often located in central areas of a given city, that is valuable for investors. Industrial aesthetics in the whole world is becoming more and more appreciated and fashionable (Ibanez, 2014) and has even become an aspect of prestige. Upon terminating a given business activity, post-industrial areas are adapted to new functions – which can be called some kind of a sustainable city policy (Turek, 2013). For example, they can perform environmental and recreational functions, such as Park am Gleisdreieck-Flaschenhals in Berlin, commercial functions, such as the Manufaktura shopping mall in Łódź or Koneser in Warsaw (Google Campus registered office), or cultural-social functions, e.g. Bethlehem SteelStacks Arts + Cultural Campus.

Frequently, as examples from all over the world show, the industrial heritage is not properly used. At this point it is crucial to return to the definition of industrial heritage areas as protection of technological complex, thought or line (e.g. Ecomuseum in Starachowice) and state that very frequently in the cities only single elements, not industrial complexes are protected. This results from irregularities associated with reconstruction, revitalisation or adaptation of those areas and lack of consideration for the context of the place – the value of industrial landscape (Loures, 2008).

Leaving single elements in former post-industrial areas, such as chimneys, single buildings, technical structure frame or crane (Ibanez, 2014) makes that area unreal. To some extent, it is some kind of theatrical scenography. The renovation of such areas should not concern single buildings only. It should involve building complexes or preservation of technological elements that can be used as educational forms for future generations (Kaczmarska, Przybyłka, 2010). The revitalisation and restoration process should be properly initiated and implemented. First of all, the designers themselves should know why it is vital to protect given areas and transform them properly (Loures, 2008).

The result of the improper approach to the transformation of industrial areas is their adaptation to functions associated with entertainment, spending free time or consumption (Ibanez, 2014). Therefore, an embellished and fictional image of place is created, where people frequently worked in very hard conditions (Summerby-Murray, 2015). Such an approach to transformation of post-industrial areas leads to the fact that they are accessible only for one determined social group belonging to the middle class or a higher one (Pozo, Gonzalez, 2012). Less affluent people, who are associated with given areas more deeply due to their history, have limited access to them – unfortunately, such a paradox is occurring more and more frequently. And the aim should be to maintain the specific character of a given place and return it to its local population with application of proper designing and zoning tools (this is possible only with multidisciplinary project teams). The recycling of degraded and unwanted area is an element of sustainable city development (Loures,
Burley, 2012) and positively influences its expansion (Turek, 2013). Transformation of this type of area allows for changes that can cover a greater area and for achieving a proper capital for its maintenance and development (Sztaba, 2013). The preservation of this specific heritage is as important as care for the population that lives and functions nearby these areas (Sztaba, 2013). Additionally, the maintenance of industrial identity of the place increases the sense of community (enhancement of ties with the local community) (Loures, Burley, 2012).

Of course, the aspect of visual values of a given area is significant, but it cannot dominate the history of a given building, which is often not used (Zigmunde, Katlapa, 2017). A beautifully restored body of the building and its interior prepared with utmost care do not allow even for a moment of reflection on how that building influenced people and the city. Such activities should be oriented towards the restoration of the truth (authenticity) of a given area, not towards creating fiction (Summerby-Murray, 2015). This can be achieved by involving the local population in designing activities (Loures, Burley, 2012).

3. Industrial advancement in Warsaw

The city of Warsaw was established “in cruda radice” by merchants from Toruń and localised at the intersection of two important trade routes: north-south and east-west, near the river on which commodities were transported by water – the first mention of it comes from 1313. From the beginning of its creation, the described urban centre was associated with trade and exchange of commodities. The original space of the city, the so-called Old Warsaw, ceased to be sufficient for dynamically developed agglomeration very quickly. As a result, the so-called Nowa Warszawa was raised concurrently behind the outskirts of Old Warsaw. Jurydyki, private cities established by the wealthy gentry, were located around those urban units (Drozdowski, Soltan, Zahorski, 2017). Faster development of industry occurred after the transfer of the royal court and the most important state institutions to Warsaw in 1596. Textile, clothing, footwear, food and metal industries were developed then. The development of manufacturing industry started in the 18th century. The industry contributed to fast development of the city, specifically from the demographic point of view. Between 1655 and 1754, the population in Warsaw increased by approximately 30% (Misztal, 1998).

Political events were important aspects that influenced the extension of the city: the first period of economic downturn was the third partition of Poland in 1795. The country was divided between Austria, Prussia and Russia. Warsaw was under control of Prussia and lost its social functions. The next industry heyday occurred after 1815 along with the establishment of the Kingdom of Poland, with its capital city Warsaw. Textile, food and metal industries were the most important industry branches developed in this period in Warsaw.
The greatest concentration of industrial plants was visible in Powiśle (the central part of the city located by the Vistula). The location was compliant with Weber’s theory, according to which the most important location factor are transport costs. 50% of Warsaw industry employees were employed in Powiśle (Misztal1998).

Another slowdown of industry development in the city occurred after 1831. However, in 1870 Warsaw entered the stage of industrial revolution. Between 1870–1913 the number of the employed in the industry increased over 8 times. Further industrialisation process changed the character of buildings in the urban and sub-urban areas (including Wola and Praga-North, analysed in the paper) (Drozdowski, Soltan, Zahorski, 2017). An important element of further development of capital city’s plants was the construction of railway lines: the first one, connecting Warsaw and Vienna, was constructed on the left bank of the Vistula between 1845–1848 – it transported coal from Upper Silesia and Dąbrowa Basin. In turn, in Praga (right side of the Vistula), the railway line to Saint Petersburg was established in 1862 and to Terespol in 1867. Products were transported to Russia by these railway lines (Misztal, 1998). The next railway, the so-called Vistula River Railroad line, was opened later (1874). It should be stated that in Warsaw, on the right bank of the Vistula, the railway track had wide spacing, such as in Russia, whereas the railway tracks on the left side of the city had European spacing. As a result, the next railway line, the so-called ring railway line, which connected the lines from Praga with the Warsaw-Vienna connection, was established on the other side of the Vistula. Numerous railway sidings along which industrial plants started to be established were constructed. A significant undertaking (mainly for development of the industry in Praga) was the construction of a steel plant in 1877, where the rails for development of railroads were produced (Morawski, 2006).

The railway contributed to the development of industry in Wola. Due to the above, the old industrial districts started to lose importance (Morawski, 2006). After 1870, the most important function of the city was the industrial function (Misztal, 1998). The industry located in the suburbs formed the so-called industrial region (fig.1).

Up to World War I, the Warsaw Industrial Region was the second region in Kingdom of Poland in terms of employment. Contrary to the industry of Łódź, it was multi-disciplinary. The reasons for the fast industrialisation of Warsaw were social and economic conditions, in particular the abolition of the feudal system, migration of people to cities, technical revolution, industry protection by tsarist authorities and development of rail transport (Fig. 1). The role of industry in the city decreased after 1918, when Poland regained its independence, which caused the loss of Russian outlets. Therefore, the production focused on the local market only. Despite these difficulties, the industry in Warsaw became modernised significantly, the steam engine was replaced with the electric motor. The possibility of construction outside the city allowed for the development of industry in Wola and Kamionek (Misztal, 1998).
Figure 1. Industrial areas in 1926 (areas in pink colour) and post-industrial areas in 2018 (areas in grey colours). On the basis of map “1938 – Map of capital city of Warsaw and environs, industry distribution in 1926 by J. Kwiatkowski”
The modernised and modern Warsaw industry was almost completely destroyed during World War II. Many modern technological lines were stolen and transferred to Germany. War losses that affected the industry reached as much as 90% (Misztal, 1998). Until World War II broke out, the metal, machine and electrical engineering, food, tanning and chemical industry dominated in Warsaw (Kazimierski, 1978). After World War II, between 1945 and 1989, the so-called socialist industrialisation of the country occurred. Many plants destroyed by warfare were not rebuilt. The plants that could continue their operations started production again (in the area of Praga, the plants were not destroyed to a large extent) (Misztal, 1998). Warsaw after war became an important industrial hub. In 1985, industrial plants in Warsaw covered the area of 2,300 ha and ca. 100 industrial buildings coming from the 19th century and the first half of the 20th century and 50 post-war buildings. A part of them did not survive until now and were totally demolished (Derek, 2012).

1989 marked the beginning of the decline of Warsaw industry. The so-called market economy developed then and there was a 6-year period of industry restructuring. The peak of recession occurred in 1992, when the industrial production value declined to 44% in comparison to 1988. The Kasprzak Radio Products and “Polam” Electric Lamp Production Plants (previously Phillips) in Wola started to be liquidated at the time. There was a necessity of finding new functions for big areas in central districts of the city. It should be mentioned that the industrial areas in Warsaw were not reasonably planned and covered areas bigger than necessary. After stopping production, post-factory buildings were used by small entrepreneurs (Misztal, 1998) (Fig. 1).

4. Research methods

This paper precisely analysed the industrial heritage in Warsaw. Taking the current number of buildings into account, the analysis covered the industrial buildings located in two districts that were of most significance for the industrial development of the city – Wola and Praga-North. Every building was characterised precisely. Four criteria were used to characterise buildings: technical condition, architectural attractiveness, use level and use manner. Architectural attractiveness means the presence of valuable structural elements and architectural details or the application of interesting building solutions. The highest architectural attractiveness is associated with granting the monument status. The value of a post-industrial building for the current city functioning can also be evaluated through the use of the entire building or its part. The ideal situation is the possibility to use the entire building for new functions. Due to the occurrence of buildings used only in part, such a characteristic was used in the study. The use manner assessment is similarly significant. The highest and the most desirable state is the accessibility of buildings for everybody and fulfilment of the cultural role. A lower score is granted to those buildings that
are used privately and are virtually not available to the residents. The precise manner of assessment of industrial buildings and their importance for today's city is presented in Table 1.

**Table 1.** Elements of industrial building assessment (own study)

<table>
<thead>
<tr>
<th>Technical condition</th>
<th>Architectural attractiveness</th>
<th>Use level</th>
<th>Accessibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 – no buildings</td>
<td>1 – unattractive</td>
<td>1 – building not used</td>
<td>1 – use prohibited</td>
</tr>
<tr>
<td>2 – ruin, devastation</td>
<td>2 – little potential</td>
<td>2 – spontaneously/informally used</td>
<td>2 – restricted (apartments, private property)</td>
</tr>
<tr>
<td>3 – bad condition</td>
<td>3 – average potential</td>
<td>3 – used to a little extent</td>
<td>3 – averagely restricted (offices)</td>
</tr>
<tr>
<td>4 – average condition</td>
<td>4 – very attractive</td>
<td>4 – partly used</td>
<td>4 – restricted to a little extent (common services)</td>
</tr>
<tr>
<td>5 – good condition</td>
<td>5 – monument</td>
<td>5 – fully used</td>
<td>5 – unrestricted (culture, art, public)</td>
</tr>
</tbody>
</table>

The hierarchical data analysis was used for assessment of the condition of post-industrial buildings in Warsaw. On the basis of this analysis, 5 groups of buildings of various level of intensity of particular features were created.

There were 56 buildings in total in the area under examination (Wola and Praga-North) that fulfilled industrial functions. As mentioned before, Warsaw industry had a multi-disciplinary nature. Due to this fact the type of run industrial operations was taken into account in the analysis – the food, chemical or metal industry and other light operations. Buildings of metal industry predominate in Wola and Praga-North. Praga-North is better represented by the former food industry (Table 2).

**Table 2.** Number of post-industrial buildings according to business sectors in Wola and Praga-North (own study)

<table>
<thead>
<tr>
<th>Industry type</th>
<th>District</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Wola</td>
</tr>
<tr>
<td>Food</td>
<td>4</td>
</tr>
<tr>
<td>Metal</td>
<td>15</td>
</tr>
<tr>
<td>Chemical</td>
<td>4</td>
</tr>
<tr>
<td>other–light</td>
<td>5</td>
</tr>
<tr>
<td>TOTAL</td>
<td>28</td>
</tr>
</tbody>
</table>

In the following part of the paper, the results of analyses will be presented as well as the most interesting examples of use of post-industrial buildings will be described. Statistical analyses were performed in the IBM SPSS 24 software.
5. Research results

Almost a half of all 56 analysed buildings are metal industry buildings. Among the four assessed building features, the highest score has been granted to architectural attractiveness (average of 4.04) and technical condition (average of 3.71). The statistically significant difference between those values was not identified. Therefore, it should be recognised as equal (paired Student’s t-test: \( t = -1.588, p = 0.158 \)). The technical condition of buildings (3.71) is significantly higher than their accessibility (2.52)\(^1\) and the use level (3.36)\(^2\). The architectural attractiveness of buildings (4.04) is also higher than their use level (3.36)\(^3\) and accessibility (2.52)\(^4\). The building use level is higher than their accessibility\(^5\).

Table 3. Elements of assessment of post-industrial buildings in Wola and Praga-North (own study)

<table>
<thead>
<tr>
<th></th>
<th>Technical condition</th>
<th>Architectural attractiveness</th>
<th>Use level</th>
<th>Accessibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wola</td>
<td>3.93</td>
<td>4.11</td>
<td>3.86</td>
<td>2.64</td>
</tr>
<tr>
<td>Praga-North</td>
<td>3.50</td>
<td>3.96</td>
<td>2.86</td>
<td>2.39</td>
</tr>
<tr>
<td>Total</td>
<td>3.71</td>
<td>4.04</td>
<td>3.36</td>
<td>2.52</td>
</tr>
</tbody>
</table>

The post-industrial buildings of Wola and Praga-North are similar in terms of technical condition, architectural attractiveness and accessibility for residents (no significant differences). They differ in terms of use level. In Wola it is higher (3.86) than in Praga-North (2.86)\(^6\).

Buildings in Wola are more homogeneous and have similar technical condition, architectural attractiveness and use level (Table 3, Fig. 2). Only the building use level can be recognised as higher than building accessibility\(^7\), which is in keeping with the general tendency. Post-industrial buildings in Praga-North are more varied. They have similar technical condition and architectural attractiveness. At the same time, the technical condition exceeds the use level\(^8\). A similar situation was observed in terms of architectural attractiveness and the use level\(^9\). The use level as well exceeds the accessibility of buildings\(^10\).

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\(^1\) Paired Student’s t-test: \( t = 7.780, p < 0.0001 \).
\(^2\) Paired Student’s t-test: \( t = 2.204, p < 0.032 \).
\(^3\) Paired Student’s t-test: \( t = 2.258, p = 0.028 \).
\(^4\) Paired Student’s t-test: \( t = 6.244, p < 0.0001 \).
\(^5\) Paired Student’s t-test: \( t = 4.716, p < 0.0001 \).
\(^6\) Paired Student’s t-test: \( t = -2.033, p = 0.047 \).
\(^7\) Paired Student’s t-test: \( t = -2.489, p = 0.019 \).
\(^8\) Paired Student’s t-test: \( t = 2.851, p = 0.008 \).
\(^9\) Paired Student’s t-test: \( t = 2.604, p = 0.015 \).
\(^10\) Paired Student’s t-test: \( t = -4.916, p < 0.0001 \).
The technical condition of post-industrial buildings is worse than in Praga-North (Fig. 3). 3 buildings in this district have no development elements, whereas 4 buildings are in ruin. Buildings in average technical condition dominate in Wola. There are 18 buildings in good condition. It is less than a half of the buildings analysed in this paper. The architectural attractiveness of post-industrial buildings is recognised as high – 16 buildings in Praga-North and 19 buildings in Wola have the status of monument (Fig. 4). The remaining buildings in Wola have at least average potential.
10 buildings in Praga-South and 7 in Wola are used only in an informal manner. It means that homeless people and people who temporarily use unguarded areas appear in the devastated buildings (Fig. 5). Wola, has a higher use of buildings, with its 17 buildings being used fully. The consequence of the building use level is also the manner in which buildings are arranged. It is prohibited to use 12 buildings in Praga-North. They are closed. One of the forms of using post-industrial buildings is to dedicate them to residential or office purposes. This purpose does not equal full accessibility for all residents. These are private areas. 12 residential buildings, 8 out of which are located in Wola, and 11 office buildings were identified in total. Unfortunately, only 7 out of those are public areas or fulfil cultural functions (Fig. 6).
6. Discussion

On the basis of hierarchical data analysis, all post-industrial buildings were divided into 5 following groups:

1. **NEED FOR ACTION** – 13 buildings of almost the highest architectural attractiveness, but of below-average technical condition and very low use level and accessibility (mainly informal using),

2. **NO CHANCES FOR RENOVATION** – 7 buildings with low scores in all four parameters, used informally and offering restricted accessibility,

3. **ANIMATED BUILDINGS** – 12 buildings in very good technical condition and with a high use level, but of average accessibility and low architectural attractiveness,

4. **EXCEPTION** – 1 building that has different parameters than other buildings (Warsaw Mechanical Bakery). Monumental building of low use level, intended for different services,

5. **THE BEST EXAMPLES** – 23 buildings in very good technical condition, with maximum architectural attractiveness, high use level and average accessibility.

Effectiveness of actions regarding industrial buildings that aim to preserve industrial heritage can be assessed by means of two parameters – the status of monument as well as cultural and public functions. Among all buildings – 35 were entered in register of monuments, including 19 buildings in Wola and 16 in Praga-North. Only 6 buildings (4 in Praga-North) fulfil cultural or public functions. Another desirable transformation of post-industrial buildings entails their conversion into buildings offering generally available services (contrary to company offices and registered offices), e.g. catering services or commerce. There are 9 such buildings in total. The highest level of building accessibility is represented by 15 out of 56 post-industrial buildings in Wola and Praga-North.
The residential function of industrial buildings can be an interesting way for preserving buildings, but in terms of Warsaw such actions are merely superficial. Using only one wall of a formerly industrial building and adding other elements is a good example as well, such as in terms of investment in Waliców Street. The new building is associated with the past of the city only to a limited extent and does not reflect the industrial nature of the place.

The buildings that are prohibited to be used form a large group as well. Usually, such buildings are closed (18 buildings). Due to the above, those buildings are used in an informal manner, usually by homeless people. Lack of decision regarding the future of such buildings results in their further devastation and loss of value. It should be observed that among the 18 unused buildings, 11 were entered in the register of monuments, which confirms their high architectural attractiveness. It should be stated that it is a pathological situation to a large extent. On the one hand, the significance of buildings for industrial heritage of the city was underlined by entering the buildings in the register of monuments. On the other, there are no ideas on how to use those buildings. There is a threat of total devastation of those buildings that would paradoxically “solve” the problem of restoring the buildings and granting them new functions. Two out of 11 not used monumental buildings are in ruin. The other are in poor technical condition.

Warsaw nowadays is one of the most dynamically developing European cities. The location of the city in Central Europe acts for its advantage. Due to this fact more and more international companies are establishing their offices there. The conducted studies expressly underline that the transformations that occurred in Warsaw lately lead to slow blurring of industrial nature of the analysed districts, slow destruction of post-industrial buildings and to their demolition so as to establish new buildings that do not refer to the context of place, which is not compliant with the assumptions of the Industrial Heritage International Charter of 2003, the so-called Nizhny Tagil Charter.

In Wola, near the streets: Towarowa, Okopowa and Żelazna, 34 skyscrapers 120 to 180 meters high are to be built (the city centre is moving...). It was adopted in spatial development plans [which will grant Wola a status of one of the highest districts in Europe (The highest district in Europe...)] and has a downtown nature (dynamic development of Wola...). The sole district is to be transformed into a business area of Warsaw (the city centre is moving...). The office area of 1.2 million m² is planned to be built there by 2020 (The highest district in Europe...). Post-industrial elements are systematically transformed into office buildings between which housing developments started to be erected. Unfortunately, there is no educational or cultural infrastructure either. It is observed that a part of the investment started to be transferred to post-railway areas – these are residential investments mainly (Bartoszewicz, 2016).

Transformations in Praga-North will have a different nature. In this case, the city authorities tried to establish the image of area that is friendly to
artists, creative people or creative undertakings (therefore, the Polish registered office of Google and many start-ups are located in the area of Praga-North) and improve the life quality of its residents. Such a policy and the so-called “taming” of Praga, which for many years was regarded as a dangerous district, seems to advantageously influence the development of property real estate market [“use” of artists by developers allowed for increasing the value of parcels (Derek)]. Exclusive apartment blocks and entire housing estates started to be built in Praga. Due to this we are now observing the gentrification of this area. The significance of small trade and craft workshops started to decrease. In their place, new designer shops, various cafes and restaurants of high standard started to occur. Currently, a part of Praga was involved in a revitalisation programme (Integrated Revitalisation Programme for the capital city of Warsaw to 2022). It can be observed that, similarly to other countries, where post-industrial areas are transformed into other functions, post-industrial buildings adopt commercial functions. Therefore, they are accessible only to a selected group of residents (mainly visitors) and inaccessible to locals. The phenomenon of gentrification is happening as a result, which can be observed in both Praga and Wola.

On the basis of the conducted analyses, it can be stated that the transformations of post-industrial areas occurring lately on the territory of Warsaw can be divided into three groups (Table 4).

### Table 4. Diagrams transformations of industrial buildings in Warsaw (own study)

<table>
<thead>
<tr>
<th>Building functioning stages</th>
<th>Diagram no. 1</th>
<th>Diagram no. 2</th>
<th>Diagram no. 3</th>
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<tbody>
<tr>
<td>Stage 1 Industry as main function</td>
<td>Industry as main function</td>
<td>Industry as main function</td>
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<tr>
<td>Stage 2 Collapse of industry</td>
<td>Collapse of industry</td>
<td>Collapse of industry</td>
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<tr>
<td>Stage 3 Shaping of negative image of place</td>
<td>Granting the status of monument to industrial buildings</td>
<td>Valuable land</td>
<td>Demolition of industrial buildings</td>
</tr>
<tr>
<td>Stage 4 Occurrence of artists and creative entities</td>
<td>Deterioration of technical condition of buildings</td>
<td>Implementation of mono-functional office buildings</td>
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<tr>
<td>Stage 5 Improvement in place image</td>
<td>Waiting for total spontaneous devastation of buildings</td>
<td>A new image of place with no relations to industrial past</td>
<td></td>
</tr>
<tr>
<td>Stage 6 Buyout of areas by developers</td>
<td>Erection of development on valuable plots of lands</td>
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</table>
As it was mentioned earlier, the post-industrial buildings are an element of cultural heritage specific to given society and should be properly protected due to their historical, aesthetic and social values. The measures should be taken to protect all post-industrial complexes or technological lines, not only solitary elements. Otherwise, the whole area loses its context.

In order to preserve the last places that reflect Warsaw’s industrial nature of the past, all actions should be undertaken, including administrative ones, which are based on renovation and adaptation to new (social) functions of currently deteriorating buildings that are valuable in terms of architecture. If not, Warsaw’s industry (a link between industrial and modern city) will be forgotten along with an important element of identity of this unusual and important city for the entire country.

Bibliography


### Appendix 1 – list of industrial buildings


<table>
<thead>
<tr>
<th>Industrial buildings in Praga-North in Warsaw</th>
<th>Industrial buildings in Wola in Warsaw</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Address</td>
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<tr>
<td>Anczewska’s Sugar Factory</td>
<td>Lilpop Rau and Loewenstein’s Establishment</td>
</tr>
<tr>
<td>Brage’s Rubber Products Factory</td>
<td>S. Landau’s Warsaw Lace Factory – Joint Stock Company</td>
</tr>
<tr>
<td>Krzysztof Brun and Son’s Steel Product Trade House and Warehouse, House and Warehouse of Joint Stock Company</td>
<td>Białostocka 22</td>
</tr>
<tr>
<td>Alfons Mann and Company’s Factory of Surgical, Veterinary Instruments and Sharp Steel Products</td>
<td>Białostocka 42</td>
</tr>
<tr>
<td>Władysław Adamczewski and Company’s Establishment</td>
<td>Grodzińska 21/29</td>
</tr>
<tr>
<td>Bakery, carpentry workshop</td>
<td>Grodzińska 26</td>
</tr>
<tr>
<td>Sport Soap Establishment</td>
<td>Grodzińska 47</td>
</tr>
</tbody>
</table>

<p>| Forma Metal Products Factory                   | Michal Kulak’s Duvet, Mattress and Underwear Factory | Chłodna 29 |
| Michal Kulak’s Duvet, Mattress and Underwear Factory |
| Z. Szczerbiński’s Warsaw Stylish Furniture Factory |
| L. Klamer’s Carpentry Workshop                 | Sigma Mechanical Plants | Dzielna 72 |
| Sigma Mechanical Plants | Dzielna 72 | Zalmed | Dzielna 72 |
| Storehouses of A. Wróblewski and Company’s Joint-stock Association of Warehousing and Transporting Furniture and Products | Inżynierska 3 | Haberbusch and Schiele’s Brewery | Grzybowska 58–70 |
| Adolf Pypke’s Lace and Embroidery Factory, Fittings Factory, Karol Jung’s Sheet-Metal Product Factory | Inżynierska 5 | Stanislaw Kubiak’s Roller Chain Production Plant | Hrubieszowska 9 |
| Pigment Printing Ink Factory, Joint-stock Company | Kawęcynska 9 | Magister Klawe’s Joint-stock Company Chemical and Pharmaceutical Industry Association | Karolkowa 22/24 |
| Mill Machine Factory | Klopotowskiego 11 (formerly Szeroka) | Philips SA Polish Plants | Karolkowa 30/44 |
| H. Zielen’s Factory of Steel Products, Structures and Ornaments | Konopacka 17 | Gasworks in Wola | Kasprzaka 25 |
| Unruh and Liebig’s Mechanical Crane Construction Establishment / Sport Equipment Production Plant | Konopacka 19 | Ambroziewicz’s Steel and Metal Foundry | Kolejowa 56 |
| Belgian Joint-stock Company of Warsaw Wire, Panel Pins and Nails Factory, the so-called Wire Company/Warsaw Galvanizing Establishment | Objazdowa 1 | Waclaw Czajkowski and Company’s Metal Product Factory | Młynarska 33 |
| Ogórkiwicz and Zagórny’s Locksmith Factory | Okrzei 12 | Klein and Company’s Chemical Factory | Okopowa 55 |
| Praga Steam Mill | Okrzei 23 Klopotowskiego 22 | Temler and Szwede’s Tanning Factory | Okopowa 78 |</p>
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<th>Name</th>
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<tr>
<td>PePeGe Polish Rubber Industry Factory</td>
<td>Otwocka 14</td>
<td>Emil Kowalski’s Tanning Establishment</td>
<td>Płocka 9/11</td>
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<td>Cane Establishment</td>
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<td>Emil Kowalski’s Tanning Establishment</td>
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<td>Płocka 9/11</td>
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<td>Targówek Glass-works</td>
<td>Radzymińska 116</td>
<td>W. and M. Dmowscy’s Coppersmithing and Mechanical</td>
<td>Płocka 20</td>
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<td>Establishment</td>
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<td>Warsaw Mechanical Bakery</td>
<td>Stolarska 2/4</td>
<td>Power Plant Establishment and City Tram Repair Establishment</td>
<td>Przyokopowa 28</td>
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<td>Gustaw Pulst’s Mechanical Product Establishment /</td>
<td>Strzelecka 30/32</td>
<td>Jakor Gauze Pad and Cardboard Factory</td>
<td>Przyokopowa 43</td>
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<tr>
<td>Stanisław Zwierzchowski and Sons’ Concrete Strongbox Factory</td>
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<td>Warsaw Steelworks</td>
<td>Szewdzka 2</td>
<td>Metal Fancy Goods Die-cutting Establishment</td>
<td>Przyokopowa 45</td>
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<td>Bruner Brothers, Hugo Schneider and R. Dietmar – Lamp Establishment,</td>
<td>Szewdzka 20</td>
<td>Henryk Dąbrowski and Company’s Chemical Plant</td>
<td>Rogalińska 15</td>
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<td>Joint-stock Association</td>
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<td>Schicht–Lever Fat Industry / Pollena Beauty</td>
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<td>Muzykiewicz I. – Leather Products</td>
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<td>Franbola’s Sugar and Chocolate Factory</td>
<td>Śnieżna ¾</td>
<td>Warsaw Tiles Factory</td>
<td>Srebrna 7</td>
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<td>Środkowa 20</td>
<td>Borman Szwede and Company’s Joint-stock</td>
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<td>Ząbkowska</td>
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<td>Herman Jung’s Brewery</td>
<td>Waliców 9 and 11</td>
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<td>Józef Franaszek’s Covering and Colour</td>
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<td>Nałęcz Pasta Establishment</td>
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<td>Warsaw Metal Rolling Mill</td>
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<td>Duschik and Szołce’s Steel Product</td>
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Abstract

System transformation and what happens next? Post-industrial heritage in Warsaw – an assessment attempt

Warsaw is a city where we are observing dynamic spatial transformation. It is particularly visible in the area formerly occupied by industry. This paper attempts to assess changes that have lately occurred in the so-called industrial districts of Warsaw, i.e. in Praga and Wola. It was revealed that those changes are driven by different assumptions and their objective is to include degenerated post-industrial areas in the city structure and to attribute new functions to them, which leads to changes in broader spatial structures. And so Wola is transforming into office and residential centre, whereas Praga-North – into artistic space, space of creative industries and residential space. The implemented changes contribute to the blurring and disappearance of the former character of those districts as well as the unique and legally protected post-industrial heritage. It was also observed that the potential of those areas commences to be accessible only for a selected social group, characterised by higher capital.

Keywords: post-industrial areas, revitalisation, Warsaw, Wola, Praga-North
II. THE REGION AS AN ARENA OF CONFLICTS AND NEGOTIATIONS
Social construction of innovative and competitive territories in Colombia

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Introduction

The definition of competitive territories (departments) is connected to the productivity level of their economy and this, in return, depends on the existing human capital in that geographic portion under analysis; that explains the degree of differentiation of social and economic gaps which are partly described by endowment as potentiality and partly by the effective presence or absence of intervention policies to improve the competitiveness and innovation conditions of the territories in a context of transformation and consolidation of productive structures.

In this projected scenario, this document seeks, based on the conceptual approach to territorial development, to expose productivity conditions of the departments and the country in a comparative analysis that is able to explain the level of productivity of an economy. To do this, it does not only rely on the global competitiveness index (GCI-WEF) and the Departmental Competitiveness Index (IDC-CPC-Universidad del Rosario), but also on the beta and sigma convergence methodology (Salas-i-Martin, 1990; Silva-Lira, 2005), with base information on Gross Domestic Product (GDP), population and Gross Domestic Product per capita GDP pc, in a multi-time period between 1980 and 2018, for the 32 departments registered in Colombia at this time.

1. Materials and methods

The purpose of this work is to achieve a conceptual approach to the Social Construction of Innovative and Competitive Territories: in Colombia (South America) we started from the documentary review of existing literature in search engines, that permits not only to know their status, but to show the conceptual bases for update and argument grounded on that universal and
necessary objective of the societies (as is the search for innovative, competitive territories with levels of economic performance) in order to close the existing gaps in the formation of human capital among regions.

Its construction departs from analyzing the methodological processes adopted in different investigations related to those aforementioned topics, which have been presented as articles in scientific journals or as research reports in different scenarios and as well, supported by information from synthetic indexes constructed by the WEF and the Private Competitiveness Council – Rosario University, and the use of methodologies for the analysis of convergence and territorial disparities with a National Department of Statistics (DANE) source.

2. Development and discussion

2.1. Territorial development

Addressing knowledge of an approach to territorial development, as an expression of the locality, requires a conceptual reference of the integrating elements that give it content. This implies recognizing the conditioned presence of the territory, place – space and habitat, where relationships not only of topography and territoriality are created and shaped, but also those of collective construction of the territory.

Then, the space lived and occupied, in its interactive dimension with other beings of nature, causes feelings of recognition and interdependence, marking and defining it in a connotation of feeling that one is and belongs to a certain place (Yory, 1999). This creates an identity with the physical space, its landscape and with the place itself. There, one is recognized and in that dialogue of construction, others are also recognized as actors of change and of filial affinity with the place. They are builders of socio-economic, political-cultural, and environmental realities, in a game of powers for individuals to build and de-build their own underlying world.

Then, feeling somewhere where space inhabited and filled not only gives shape to the imagined and created reality, becomes vital for the person of the individual and of this one with their surroundings but, as stated by Spíndola in citing Heidegger regarding Dasein as being/there/in/the/world (Heidegger, 2001, 2012), refers to a dialogue of the creature with its environment that creates and recreates as a life experience while solving conflicts that are its own “as a collective space” (Escobar, 2013). A universe in permanent dialogue, where the space delimited by the local, is valued in discovering the relational truth with the globalized world, (Moncayo-Jiménez, 2001). It means immersion in the glocal from the economic geography (Boisier, 2005), in an explanatory reference to the construction of conditions for sustainable endogenous development.
In this context, the meaning referring to territory is holistically integrated, frequently to a definition of region as an expression of nation, mainly focused under the concept of territory-region (Escobar, 2013). Consequently, it is pertinent to affirm from this perspective that this has its own identity and it is not only because of the exuberant natural landscape inherent in the territory but also because of the permanent interaction of social groups in the solution and generation of conflicts in the historical space-time framework, which is, in turn, conditioned and modified. Therefore, it must be interpreted as the space where interacting social events occur, linked to external relations of dependency and domination and internal to modes of production, nature-population, in a certain historical setting.

However, the territory should not only be conceived in a spatial functionality. Rather, it is a dynamic and systemic networked construction that defines and characterizes it as a social and historical product with initial legacies of resources and ways of solving the economic problem under organizational figures and institutions that reduce chaos and anarchy, in a constant and dynamic social cohesion and integrating elements (PNUD, 2011), which explain the good-living and well-being.

These resources integrate a concept of development in an allusion to taking advantage of endogenous and exogenous resources that heighten local possibilities.

Therefore, it is categorical to affirm that the territory has a collective identity and, as Cammarata (2006) points out, it contains “values and norms” (p. 357), which define power relations not only in the resolution of conflicts within the space bounded by the local, but they rather support the conditions for the creation of value and wealth chains. That is, the territorial configuration in its categories of occupation, use and valorization of the natural and built endowment, in an active dynamic of its actions as a subject of change determines new categories and forms of valorization of potentialities.

Consider living space and environment as a system of relationships that contains visible and invisible elements (Vida rt, 1997), which represent typologies and social forces that explain and determine the complex of relations following one another in the interpretation and worldview of the environment as a system or as an environment affecting living beings, particularly humans (Psathakis et al., 2010).

In this context, for CEPAL (2015), territorial development is a social process where individual and collective forces of the parties settled in a territory and their interactions with the initial endowment, build and create the conditions to promote social, economic, political and environmental conditions of bounded and lived space. Therefore, it is understood as a stable relationship of exchanges and social construction of space, starting from conceiving it as the outline and object where interacting events take place between coordinated or uncoordinated actions of man-state-nature, but consciously or unconsciously it must encourage a culture of survival and maintenance of the
endowment, within a framework of sustainable development that is based – as much as possible – on appropriate management of the socio-environment (Flores, 2007). In other words, the dynamic construction in a synergistic and organic relationship of well-being and good-living from the existing endowment.

In the words of the World Bank (2009) it means that the valuation of natural resources, as an initial endowment, should be regarded as special economic assets, which imply an important source of economic resources and income to lever up sustainable development. A *sine qua non* condition is that they be professionally managed in a context of political institutions and inclusive markets.

This materializes a motivation to understand the territorial ordering to which the nation-states are subject, which far exceeds the conformation of regions that respond to the traditional administrative political division comprising the purpose of allocating resources, decentralizing and deconcentrating of power. Thus, yielding new regions administratively created with the purpose of boosting endogenous growth from the use of the existing endowment or, boosting it from exogenous growth that offers a better distribution of endowed wealth or the attraction of foreign investment. An intervention in a specific geographic space equipped with natural wealth ceding territorial sovereignty and sometimes establishing a source of social conflicts and inequities.

In Colombia, for instance, the legal improvements that invoke the need to increase wealth in territories based on the monetization of non-renewable natural resources, considered the need for compensation for their exploitation to be used for the financing of programs and projects that can support economic growth, job creation, and actions aimed at overcoming poverty, intergenerational equity, social and regional equity. This policy guides the construction of a new map of regions, which seeks to reach the territories affected by the armed conflict with resources, and transform them into a new reality of ongoing development, towards more prosperous territories for everyone and including all regions of the national geography.

### 2.2. Social capital

Recognizing natural resources as special economic goods that generate benefits, produce changes in local territories by the use of comparative advantages and the existing endowment in a man-nature-state dialectic, is closely linked to the development of human capacities and the liberties of choice of the population for the construction of alternatives that make them viable.

But it is no less true that these changes in the territories must not only take place from the endowments, but also that they can and must be accompanied by “social advances” (Sen, 1998, p. 89), in education, health, gender equity, social inclusion and income, among others, as conditioning factors for the expansion of human freedoms and as part of “development”. Its existence enhances human capacities and the freedom to choose, and with it, a stimulus to productivity, economic growth, and therefore, to stages of well-being and good-living.
It is then necessary to assess the contexts where populations settle, create and recreate their lives. But then, who are the called to look towards the territories and review those necessary contexts and conditions so that there is a real stimulus that contributes to productivity or economic growth?

Apparently the answer is not only in the concern of wellness and wealth theorists, but that it is the responsibility of the leaders of the nation states and involves multilateral organizations especially, the United Nations, who have found common ground in considering that it is necessary to generate integration in favor of creating conditions for development; they are represented by the need to reverse existing liabilities in the community towards the construction of intangible assets, basis for social capital represented in access to basic rights, protection and guarantees for the solution of basic human needs to allow individuals to choose the life they want to live.

In this sense, the initiatives in the community of nations have a benchmark of more than 15 years from the year 2000. With the inventory of liabilities that affected and that still affect most of the world’s low and middle income people, sanctioning the structuring of what was known as Millennium Development Goals (MDGs) which sought, among others, to eliminate hunger and extreme poverty, to strive for education by the states, quality education, dynamic and decent employment, good health and housing (PNUD COLOMBIA, 2015). These objectives imply vertical and categorical equity and return some social justice to associates, in a world characterized by inequity and disparity.

According to the evaluation of results by UNICEF (2015), 700 million people left poverty, 48 million children under the age of 5 and 5.9 million children over 5 years escaped from diseases such as malaria. In Colombia, these achievements are evidenced in the reduction of poverty from 49.7% and extreme poverty from 17.7% in the total population in 2001, to 30.6% (that is, 6.7 million Colombians left poverty) and 9.1% (that is, 3.5 million Colombians classified as extremely poor who abandoned that situation) in 2013. In addition to that, the percentage of children at ages for basic schooling and who were not in school, was met before the target year. However, 25% of individuals in extreme poverty at the age to access secondary education fail to do so because of the vicious circle of poverty (PNUD COLOMBIA 2015).

The previous achievements and the experience acquired by the member states allowed, with a focal date of 2030, the structuring and definition of 17 Sustainable Development Goals (SDGs) that recognize the importance of incorporating equity, sustainability, and decent employment into public policies, among others, as categorical imperatives for wellness and well-being (UNICEF 2015).

Yet, it should be noted that present inequities mainly in the middle- and low-income economies affecting human development, represent a crucial obstacle to making the 2030 Agenda for Sustainable Development (UNDP) a reality. Thus, if measured in terms of the Human Development Index (HDI), it yields a world total value of 0.731 among 189 countries and adjusted for
inequality (D) the value is located at 0.584. Colombia ranks 79 worldwide with an HDI equal to 0.761 and HDI-D equal to 0.585, slightly above the world’s average, placing Colombia amongst the group of High Human Development countries, below Chile, Brazil and above Peru, Ecuador, Venezuela and Bolivia.

In addition, the Human Capital Index (HCI), built by the World Bank for 157 countries, provides information on the productivity of the next generation of workers compared with full reference point in terms of health and education. In other words, it measures the amount of human capital of a child born nowadays who is able to reach the age of 18. This index is made up of five indicators: 1) the probability of survival until the age of five, 2) the expected schooling years of a child, 3) the harmonized scores as a measure of learning quality, 4) the survival rate of adults – fraction of 15 years that will survive to 60, and 5) the proportion of children without stunted growth (The World Bank 2018).

According to the calculations of the World Bank (2018), the state of human capital in Colombia indicates that a child born today will be 59% more productive at adulthood unless they have complete access to education and health. It means that their income will only reach 60% compared to another child who exceeds the conditions established by this indicator.

For this indicator and according to World Bank calculations, Colombia along with Peru, show the same performance with an HCI equal to 0.59, lower than that of Chile (0.67), Argentina (0.61) and, Ecuador (0.60) yet above Brazil (0.56), forcing Colombians to contemplate and intervene in social public policies, to guarantee richer and more productive citizens in the immediate future.

Parodying Coleman (1988), though the creation of physical capital occurs through changes in the materials that serve to produce goods that help produce other goods, human capital is created by operating changes in people which encourage new behaviors based on new skills and capacities.

This occurs in a clear sense of a networked society as an associated factor that preserves and increases value added and derived from the subject’s intangible assets, the construction and formation of human capital. This requires changing relationships between people, based on the action of their abilities and capacities which help them reduce the prevailing social and economic gaps.

Then, the proposal to apply an inequality reduction approach and the search and implementation of decent employment policies plus guarantees of access to opportunities in education and health for a good life, lead to the conclusion that human capital should be integrated by capabilities, knowledge and health status that human beings would acquire in their lives to become productive in society (World Bank 2019), in a connotation that transcends and involves an explicit reference to human capacities as a factor for social construction of territories, enjoyment of their potentialities, freedom to choose the lifestyle people want to live; in this sense, the territories ought to be marked and differentiated in typologies, for which it is important to highlight that the categories of wealth and their strategies of production and appropriation
consider forms as individuals materialize the way of life they want, wish and live (Restrepo, 2005). Here emerges a connotation of development as a stage of good living and well-being.

2.3. Innovative territories and competitiveness

The abovementioned shows that economic theory supports its thesis of economic growth in the long term through a constant increase in productivity. Colombia, in the South American region, is one of the most dynamic economies that has thrived on external shocks and experienced a real economy growth of 2.7% and 3.3% in 2018 and 2019. Still, despite this behavior, the total productivity shows low performances that placed Colombia during those same years, at 0.29 and 0.21 according to DANE (2019). Then in line with the HCI, it explains the low purchasing power of an average Colombian.

Considering that competitiveness is defined as the set of institutions, policies and factors that determine the level of productivity of an economy, the 2019 global competitiveness report for 141 economies indicated that Colombia, on a scale from 0 to 100 in this index, obtained 62.7; improving 3 positions compared to 2018, and occupies 57th place in 2019, 27 places lower than Chile. In the region, the third and fourth best economies in the ranking are Peru (61.7) and Brazil (60.9) in positions 65 and 71 correspondingly; while Argentina ranks 83, Ecuador is ranked 90, Bolivia 107, and Venezuela 133; not only they are on the lowest scale, but they have lost ranking positions compared to 2018 (World Economic Forum 2019).

Back to the national level now, Colombia’s Departmental Competitiveness Index IDC\(^1\) prepared by the Private Competitiveness Council from Universidad del Rosario (2019), considered a scale from 0–10 for the departments of Colombia and grouped eight regions\(^2\), following the proposed associative methodology defined as Administrative Planning Regions (RAPE\(^3\)) and enclosed in the National Development Plan for the 2018–2022 period. Let us to point out that in 2019, Bogotá DC, Antioquia, Santander, Atlántico and Valle del Cauca were located in the first five positions of the Departmental Competitiveness Index (IDC).

In the departmental ranking, the last 5 positions were occupied by Amazonas (29), Chocó (30), Guainía (31), Vichada (32) and Vaupés (33). According

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\(^1\) IDC for Spanish: Índice Departamental de Competitividad; English: Departmental Competitiveness Index.

\(^2\) Regions used in the 2019 IDC: Seaflower Region: San Andrés Archipelago; Coffee Region: Antioquia, Caldas, Quindío, Risaralda; Pacific Region: Cauca, Chocó, Nariño and Valle del Cauca; Amazon Region: Amazonas, Caquetá, Guainía, Guaviare, Putumayo, Vaupés; Caribbean Region: Atlántico, Bolivar, Cesar, Córdoba, La Guajira, Magdalena, Sucre; Santander Region: Norte de Santander, Santander; Central Region: Bogotá, D.C., Boyacá, Cundinamarca, Huila, Tolima; Planes-Orinoco Region: Arauca, Casanare, Meta, Vichada.

\(^3\) Spanish: Regiones Administrativas de Planificación (RAPE).
to the indicated report, the departments that upgraded positions compared to the same methodology and ranking in 2018 were: Caquetá (2), Putumayo (2), Casanare (1), Chocó (1), Huila (1), Meta (1), Nariño (1), Norte de Santander (1), Tolima (1) and Vichada (1).

At the regional level, the Private Council of Competitiveness report and the University of Rosario made it possible to generate a territorial situational diagnosis in terms of each of the defining IDC factors and pillars, describing the degree of regional competitiveness to offer an overview in the identification of strengths and weaknesses for formulators of the policy of territorial promotion and development. For example, it shows that, although the Amazon region presents widespread challenges in all the pillars of the IDC, its main weaknesses are concentrated in ICT adoption, higher education and job training, the financial system and business innovation and dynamics, scoring an average below 2 points. Therefore, the analysis of the state of each of the grouped territories allows not only to prioritize public policy action, but also to make efficient allocation of spending on investments at strategic level in the key variables related to productive progress and competitiveness of the territories (Private Competitiveness Council – Universidad del Rosario, 2019), as can be perceived in Figure 1.

But alike Amazonas, with its weaknesses and strengths, we find the Coffee Region, with satisfactory results in all factors, except for the environmental and financial systems, which are below 5; slightly above average ratio is the market size, infrastructure, innovation and business dynamics, and finally higher education and job training. It has been witnessed that this last factor is transversal and quite worrying in all regions of the country, with the extenuating factor that within all the regions, a predominant characteristic in the labor market is informality, which exceeds a rate of 47%; that is to say, 5.6 million informal workers (DANE, 2019).

Meanwhile, the Central Region and the rest of the regions have the worst result in the innovation and business dynamics factor, accompanied by the adoption of ICT.

In addition to the quantitative analysis offered by the Global Competitiveness Index (GCI) –WEF – and the Departmental Competitiveness Index (IDC) – CPC-UROSARIO, the concern is and continues to be, the need to raise the level of productivity of territories in order for them to become more competitive; and that is what many agree on. In this context and for the Colombian case, despite the fact that some departments improved positions in the world and local ranking within the country (compared to the same period in 2018), a CONPES document (2016) briefly explains the causes for low productivity in three scenarios. In this institutional framework, the first responds to the presence of market or government failures, which limit the productivity of producers and therefore the aggregate productivity of the economy. The second cause that explains low productivity in the Colombian economy focuses on the reduction of economic activities and products in which the country is
<table>
<thead>
<tr>
<th>Region/Pillar</th>
<th>Institutions</th>
<th>Infrastructure</th>
<th>ICT Adoption</th>
<th>Environmental Sustainability</th>
<th>Health</th>
<th>Basic and medium education</th>
<th>Higher education and work training</th>
<th>Environment for business</th>
<th>Working market</th>
<th>Finance system</th>
<th>Market size</th>
<th>Sophistication and diversification</th>
<th>Investment and business dynamics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amazons</td>
<td>4.31</td>
<td>2.71</td>
<td>1.55</td>
<td>5.25</td>
<td>5.37</td>
<td>3.35</td>
<td>1.24</td>
<td>6.53</td>
<td>5.85</td>
<td>1.46</td>
<td>2.10</td>
<td>2.06</td>
<td>0.60</td>
</tr>
<tr>
<td>Caribbean</td>
<td>4.95</td>
<td>4.97</td>
<td>4.11</td>
<td>4.17</td>
<td>5.95</td>
<td>5.63</td>
<td>3.20</td>
<td>6.81</td>
<td>5.17</td>
<td>2.05</td>
<td>6.31</td>
<td>5.30</td>
<td>1.81</td>
</tr>
<tr>
<td>Central</td>
<td>6.13</td>
<td>5.54</td>
<td>5.60</td>
<td>5.31</td>
<td>6.05</td>
<td>7.50</td>
<td>4.07</td>
<td>6.86</td>
<td>6.03</td>
<td>4.83</td>
<td>6.27</td>
<td>6.77</td>
<td>3.33</td>
</tr>
<tr>
<td>Coffee region &amp; Antioquia</td>
<td>7.12</td>
<td>5.54</td>
<td>6.39</td>
<td>4.76</td>
<td>6.11</td>
<td>6.35</td>
<td>5.81</td>
<td>7.11</td>
<td>6.12</td>
<td>4.79</td>
<td>5.93</td>
<td>7.14</td>
<td>5.26</td>
</tr>
<tr>
<td>Planes-Orinoco</td>
<td>4.48</td>
<td>3.59</td>
<td>3.59</td>
<td>5.00</td>
<td>4.69</td>
<td>5.57</td>
<td>2.18</td>
<td>6.71</td>
<td>6.07</td>
<td>2.58</td>
<td>4.08</td>
<td>2.20</td>
<td>0.95</td>
</tr>
<tr>
<td>Pacific</td>
<td>4.46</td>
<td>3.59</td>
<td>3.59</td>
<td>4.35</td>
<td>5.40</td>
<td>5.20</td>
<td>2.47</td>
<td>6.62</td>
<td>4.69</td>
<td>2.36</td>
<td>5.38</td>
<td>6.50</td>
<td>1.65</td>
</tr>
<tr>
<td>Santanderes</td>
<td>5.77</td>
<td>4.74</td>
<td>6.84</td>
<td>5.02</td>
<td>5.94</td>
<td>7.92</td>
<td>4.88</td>
<td>6.84</td>
<td>5.41</td>
<td>4.21</td>
<td>5.84</td>
<td>6.82</td>
<td>3.33</td>
</tr>
<tr>
<td>Seaflower region</td>
<td>4.36</td>
<td>4.39</td>
<td>2.55</td>
<td>5.37</td>
<td>5.38</td>
<td>5.80</td>
<td>5.43</td>
<td>6.83</td>
<td>7.03</td>
<td>3.61</td>
<td>3.02</td>
<td>6.31</td>
<td>2.23</td>
</tr>
</tbody>
</table>

**Figure 1.** Regional performance by pillar at IDC 2019

Source: Private Council of Competitiveness, 2019, p. 54.
competitive, with a particular characteristic defined by the low sophistication and value added in the production of goods and services that constitute the exportable offer. Finally, the third cause referred to in the document is the existence of articulation failures between the national and regional governments, so as between the public and private sectors and between different entities of the national order.

In other words, in these scenarios, it is necessary to introduce substantial changes in the territories and in the consolidation of territorial governance and governability in order to achieve local economic development in the global context, for a better well-being of the population. This is possible by recognizing government authorities at all levels accountable for providing health services, education, financing and quality controllers, as a guarantee for reducing inequalities, offering access conditions of opportunities and inclusion such as fundamental elements to improve human capital, which is a complement to physical capital, and a factor in economic growth and productivity improvement.

Considering all these ideas, the essential question is: how to reverse the causes of low productivity in the Colombian economy, which explain differential territorial development? Experts responsible for the national policy of productive development think that it is necessary to improve the innovation and entrepreneurship capacities of the production units in such a way that technology is absorbed and transferred (CONPES, 2016). For this, policies must be accompanied by efficient access to the financing of production and the closing of gaps in human capital in the fields of quality of education and relevance of training in relation to present and future work.

For the time being, in order to solve what has been proposed in the absence of diversification and sophistication, it is necessary to list the territories for the transformation and diversification of the productive apparatus based on an efficient policy of productive bets and a vigorous effort to regional and business competitiveness (CONPES, 2016), accompanied by improvement in the communications and technological infrastructure.

To correct the articulation failures between the different actors, the government authorities demand to create favorable and reliable scenarios for the institutional environment (CONPES, 2016), which guarantee the sustainability and consolidation of the Society-State-Company triad, which may raise the conditions of competitiveness in territories, such as the promotion of science, technology and innovation; with these conditions the improvement of human capital is a quota to physical capital in the production process and this, in turn, constitutes a relevant source for innovation in technology and future growth (World Bank 2019).

2.4. Evidence from the analysis of convergence and territorial disparities

32 departments currently registered in the country, which will be the subject of the analysis. Nevertheless, considering that 9 of them make up the New Departments, together there are 25 observations, dispersed in 24 departments in Colombia and the new departments.

Variables X and Y were identified for the analysis of performance and departmental economic convergence in Colombia used in the classification of the departments, units in which they are expressed and their national trend. In this way, based on the data provided by secondary sources such as DANE, the information on the departmental Gross Domestic Product per capita for the historical 1980–2018 was compiled. But, since the series was available in different base years, it was necessary to carry out merging processes according to retropolation methods used by DANE (interpolation method) in order to locate the series at constant 2005 prices, which is the interest of the researcher, given the convenience at finding a large amount of necessary data more straightforwardly, located in this base year.

The average growth rates of GDP per capita in the period of analysis were calculated on the basis of the information processed and mentioned above, specified by the variable (Y). With the average departmental GDP per capita for the period, expressed in units of natural logarithm $, the variable (X) was estimated. Once this process was completed, the performance of the departmental GDP pc, the absolute beta and sigma convergence were estimated; they were useful tools to define the typology of economic evolution of regional territories (departments) compared to growth averages and GDP pc. These explain how the growth of poor regions performed against rich regions, whereas real per capita income explains the regional dispersion.

2.4.1. Analysis of growth, convergence, and territorial disparities

The investigative technique here is supported by beta convergence and sigma convergence. In the case of the first acceptance, it refers to the fact that poor economies grow more than wealthy ones. In the second, it is associated with the tendency to reduce the dispersion of real income per capita between groups of economies (Silva-Lira, 2005).

According to this process, the performance of the 24 traditionally known departments and the old national territories (grouped into new departments for a total of 25 territorial units), is analyzed in order to prove whether in the period 1980–2018 a territorial convergence process was observed, which allows to indicate if the regions (departments) have or have not experienced growth and if they have reduced disparities.

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4 Made up by: Guainía, Vaupés, Arauca, Casanare, Guaviare, Vichada, Putumayo, Amazonas, San Andrés y Providencia.

5 Through the Geometric Growth Rate formula \( r = \left( \left( \frac{P_t}{P_0} \right)^{1/n} - 1 \right) \), where n is the number of years.
In estimating both beta convergence (β) and sigma convergence (σ), per capita gross domestic product is used at constant 2005 prices, in an attempt to explain the main determinants involved in both the economic lag and development of the regions or sub regions, where economic convergence constitutes an important topic that offers ground to understanding these aspects, based on different theoretical approaches to growth (León, 2013).

In the same sense, for the performance analysis, the typologies of economic evolution of the departmental territories will be used in comparison with growth averages and GDP per capita – GDP pc (Silva-Lira, 2005), in which the horizontal line on the axis of the abscissa denotes the average rate of GDP growth at the national level during 1980–2018, and then, those departments that were above this axis will be those that have grown above the national average and will be classified as dynamic. Thus, they will be located in quadrants 1 and 2. Correspondingly, the vertical line on the ordinate axis refers to the average GDP per capita at the national level; therefore, if a department is located to the right of it, it indicates that it has a GDP per capita above the national average and is located in quadrants 1 and 4. In turn, the departments that are located in quadrant 2 and 3, that is, on the left, will be those that have grown below the national average and that have a GDP per capita below the national average and consequently are stagnant and potentially falling behind with the risk of increasing their distance from the most successful departments (see Table 1).

Table 1. Territorial typologies – Departmental Economic Performance Quadrant Analysis – PIB pc

<table>
<thead>
<tr>
<th>Quadrant analysis of Departmental economic performance</th>
<th>Quadrant II: Dynamic Territories with Low GDP Per Capita: potentially winners (ongoing)</th>
<th>Quadrant I: Dynamic Territories with High Per Capita GDP: potentially winners</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average annual growth rate (%)</td>
<td>The regions in which the total GDP has grown above the national means and that have a GDP per capita lower than the national means are in this quadrant. They are poorer or more backward regions compared to others, but with a good growth rate.</td>
<td>Regions where total GDP has grown above the national mean and which have a GDP per capita well above the national average, and therefore are considered successful.</td>
</tr>
<tr>
<td>GDP per capita national average ($)</td>
<td>This is exactly the opposite quadrant to quadrant I. These territories have grown below the national mean and have a GDP per capita well below the national average.</td>
<td>Regions or territories that have grown below the national average and that have GDP per capita above the national average are in this quadrant.</td>
</tr>
</tbody>
</table>

Source: Based on Silva-Lira, 2005
2.4.2. Growth, convergence, and territorial disparities

In relation to the reasoning that has been carried out, and taking the findings and theoretical positions of authors such as Moncayo-Jiménez and Enríquez-Sierra (2009), Acevedo (2003), Bonet-Morón (1999), Bonet-Morón and Meisel-Roca (1999), Cárdenas-Gutiérrez (1993), Carreño-Montoya and Portilla-Muñoz (2011), Betancourt-Pabón and Sarmiento-Montes (2014), among others, as a reference, we will seek their works on the analysis of growth, convergence and territorial disparities and especially, on the Colombian case, to approximate the result on the issue.

Referring to only some of the studies referenced above, it can be affirmed that in the work of Cárdenas-Gutiérrez (1993) a process of convergence for Colombia is evidenced; while the results of the work from Bonet-Morón and Meisel-Roca (1999) show that Colombia has undergone a clear process of convergence between departments, in the period 1926–1960 (both beta and sigma). The researchers have found it evident that recently (1960–1995) the situation was different given the increasing polarization of per capita income by department.

Meanwhile, Acevedo (2003) found that in the 1980s the gaps between rich and poor departments narrowed. That notwithstanding, in the 1990s there were differences in wealth again. Thus, they state that their results are not conclusive in terms of convergence between departments. As a consequence, in this context, from the analysis of performance quadrants and departmental convergence in the period 1980–2018 with the measures of static and dynamic departmental economic disparities, it is analyzed which territories have grown and converged towards the rich departments, with reduction of disparities.

2.4.3. Analysis of performance quadrants and departmental convergence

For purposes of performance analysis, use of the typology of territories based on quadrants is made and explained in the methodology of this work, in which the annual average growth rate and the national average GDP pc are taken as a reference (see Figure 2). For this purpose in the study period of a total of 25 observed territorial units, the department of Cundinamarca is located in quadrant 1, and classified as dynamic department with a high GDP per capita that makes it a potential winner, which means its population has been able to take advantage of the comparative benefits, associated with activities of agglomeration of industries and industrial density in adjacent areas of the capital city, without disregarding the high weight that agricultural and livestock activities represent in the national GDP.

Meanwhile, 56% of the departments are in quadrant 2; that is, potentially winners and in progress, characterized by having dynamic territories that grew above the national average and have per capita products (GDP pc) lower than the national average. These regions, measured in terms of GDP pc, experience
relatively greater poverty than the other regions, but as they are still growing, they are therefore close to convergence with the most dynamic territories.

In the non-dynamic and low GDP per capita territories, so-called “potentially losers”, stagnant, corresponding to quadrant three (3), according to this work, 4 departments are located, including the Department of Huila, Caquetá, Norte de Santander, and Bolívar. It is noteworthy that it is coincidental with the study of Silva-Lira (2005), so as in the works of Carreño-Montoya and Portilla-Muñoz (2011); while the work of Betancourt-Pabón and Sarmiento-Montes (2014) places Huila in non-dynamic territory and high GDP per capita; that is, in quadrant four, according to the typology of territories.

The territories in this quadrant are called stagnant, due to the fact that they have low economic dynamism and their situation in relative terms tends to worsen; they therefore categorically define themselves as “potentially losing” regions or territories, thus demanding directed actions of public policy to flee the situation where they have been prostrated.

In this context, those departments that have grown below the national average and that have products above the national average per capita, are in quadrant four (IV) and are called non-dynamic territories with high GDP per capita. In this quadrant are Antioquia, Bogotá, Quindío, Valle del Cauca, Atlántico, along with the new departments. These territories are characterized by the fact that in the past they have performed well reaching high levels of GDP per capita, but they have lost dynamism or experienced economic contraction associated with primary activities; this is the case of Antioquia and the manufacturing industry, complemented by a significant increase in the national average of the population, as is the case of Bogotá. In the case of the new departments, it is low industrial dynamism, the depletion of some natural resources and low competitiveness. In this case, it also coincides with Silva-Liras’s study (2005), which locates the department of Antioquia and Bogotá in this quadrant.

Meanwhile, beta convergence (which refers to the speed of convergence, understood as the time it would take for poorer departments to reach richer ones; for which it is assumed that there is beta convergence between departments when there is an inverse relationship between the growth rate of GDP per capita and the initial level of GDP) seeks to show whether at a given moment, a condition considered to be a relative lag tends to decrease over time. That is, if convergence occurs, it constitutes an explanation in which the relatively poorer departments tend to grow faster than the richer ones.

In addition to the above, a useful tool to understand beta convergence is the analysis of performance quadrants and in this case quadrant two (II), known as convergent territories; a total of 14 departments that show growth above the national average and a low initial GDP per capita as per (1980) are located in this quadrant, but given the observed growth dynamism, they advance and seek to reach the richer regions of the national territory.

As can be seen in Figure 3, the Department of Huila, along with Caquetá, Bolívar and Norte de Santander, maintains the trend observed in its economic
performance and is located in quadrant 3, among the potentially stagnant departments, with a level of GDP pc initially low for 1980 with respect to the others; during the 38 years they managed to grow below the national average, with a sustained lag, since they have not been able to reconvert their economic base and generate industrial linkages; it is though necessary to highlight that these departments have had long periods of armed conflict with the presence of irregular armed groups that to a certain extent affected economic progress and social welfare.

When analyzing the Gamma Indicator\(^6\), identifying and selecting the maximum and minimum GDP pc values, the dominant pattern observed in the period 1980–2018 is Bogotá, while the minimum values at the observation points in the 1980, 1990, 2000, 2010 and 2018 were defined by the departments of La Guajira, Caquetá and Chocó, the last two being the ones that alternated between decades with the minimum GDP pc. The indicator shows an average of 5.2, which shows the magnitude of the gap between departments, in 1980 equal to 7 i.e. the maximum value of the GDP pc is seven times greater than the GDP pc of La Guajira and in 2018, it is 4.6 times larger than the GDP pc of Chocó.

\[ Y = \frac{\text{MaxGDPpc}}{\text{MinGDPpc}} \]
On the other hand, the Alpha Indicator\(^7\) shows a proportion of the distance between the maximum and minimum values of the GDP pc in relation to the national average; in the study period this result is on average 1.9 significant of an income disparity and a greater distance from the national average; such behavior is irregular, since in the first years it is high and varied, located at the end of the period with a maximum value slightly above 2 and a minimum value slightly above 1.5 and below 2, as can be seen in the years-reference points such as 1980 (2.07), 1990 (2.26), 2000 (2.08), 2010 (1.58) and 2018 (1.65).

The Herfindahl-Hirschman Concentration Index\(^8\), which measures territorial imbalances in the spatial dimension and indicates the degree of participation of a territory in production with reference scale between 0 and 10,000, where a maximum value is maximum concentration and a zero (0) value means that there is no contribution to value formation by that territory. The analysis of the data shows that throughout the period the region that contributes the most to national gross domestic product formation is Bogotá, with the departments of Chocó, Guajira, Caquetá and Huila contributing the least.

\[\alpha = \frac{\text{PIBpc(max)} - \text{PIBpc(min)}}{\text{PIBpc(prom)}}\]

\[\text{IHH} = \sum \left(\frac{Y_i}{Y} \cdot 100\right)^2\]
As for the Sigma Convergence ($\sigma$), defined by the coefficient of variation (CV)$^9$, it is a statistical measure of the central tendency or dispersion of a data set. In this case and during the period between 1980–2018 it was observed that the standard deviation maintained an increasing trend, while the variation coefficient shows a fluctuating behavior between 0.38 as a minimum value and a maximum close to 0.54, for an average 0.47; during the years 2001 and 2012, the dispersed behavior places them below the trend line, whereas for the time period 1980 to 2000, the coefficient is increasingly placed by above the trend and presents a slight tendency to converge in the years 2016 to 2018. Then it is concluded that the regions are dispersed, and that there is no sigma convergence, although their better performance is distinguished. See Figure 4.

![Figure 4. Sigma Convergence (CV) – Departmental GDP pc (1980–2018)](image)

Source: Own elaboration and calculations

Conclusions

The data analysis registered here shows that Colombia overall presents a good indicator regarding behavior of the global competitiveness index in relation to other economies of the South American region; and in turn, has a human capital index that reflects the progress that the country has had in epidemiological and demographic terms. This projects better health and a growth in access to education, allowing for a higher life expectancy at birth in conditions of a better life; prospecting that productivity in the future of a child born nowadays, will be significantly higher when compared to their regional peers. Yet in their adult life it represents roughly 40% less remunerated income, when compared to other people who would have a better environment and

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$^9$ CV = $\frac{S}{X}$; where S is the standard deviation of the departmental GDP pc. X is the average of that one variable.
improved opportunities, since Colombia still depicts a low level of productivity that distresses with its competitiveness.

The social construction of innovative and competitive territories in Colombia that allow reduction of the existing gaps both in economic performance and in the concentration of economic activity and participation in the national product (where the poorest economies grow at a greater speed) requires the implementation of a national public policy of productive development that includes diversification and sophistication, prioritization of bets and productive chains that resolve market, government and articulation failures. They should be based on the improvement of productive capacities: incorporate innovation, entrepreneurship and appropriation of technology as a “conviction”. All these should be followed by closing the gaps and financing in human capital among regions with the integration of quality education into the model, pertinence and application to present-day and future work aimed at a greater dynamic of regional and business competitiveness, accompanied by betterment in communications and technological infrastructure.

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**Abstract**

**Social construction of innovative and competitive territories in Colombia**

The paper analyzes the territorial performance of Colombia taking innovation and competitiveness as guiding tools for development of the social capital. The review of literature and the analysis of statistical reports and data allowed to define the conditions for the social construction of innovative and competitive territories. The transformation and diversification of the productive apparatuses are necessary. They should focus on an improvement in the capacities of the units of production. It is crucial to incorporate innovation and entrepreneurship into this process. The role of technology is defined as the capacity for appropriation and adaptation. The developed policies must be accompanied by efficient access to the financing of production and the closing of gaps in human capital.

**Keywords:** territory, human capital, competitiveness, territorial performance
1. Background

Extreme climatic phenomena between high and low temperatures, associated with increased rainfall and drought, as well as events that are more frequently repeated in nature, taking high human costs, have called for the community of nations to unite to develop strategies for knowledge and risk reduction and attention to disasters through an international bloc of governments that have signed internal organization commitments, as well as solidarity assistance in the face of its occurrence.

A territory is resilient to the extent that it anticipates the damage that may be caused by the occurrence of disasters. This is achieved through the accumulation of knowledge of hazards and vulnerabilities, followed by the appropriation of mechanisms necessary for their prevention through planning in the occupation and definition of appropriate uses.

It is difficult to fully identify a pattern that summarizes the criteria that guided ancient cultures in the selection of sites to end nomadism. But neither can it be said that there is a complete absence of rudimentary planning to occupy the territory. Urbanism and its evolution in ancient Mesopotamia flourished between the Tigris and Euphrates rivers, indicating that the water supply determined the choice of the site.

The abundance of water favored the economy and floods benefited irrigation for agriculture, which allows us to infer that these cultures knew the natural cycles, as well as the risks derived from their location and, accordingly, defined the terraces as suitable places to build their buildings (Sandoval & Williner, 2017).

Analyzed from the perspective of the alterations of the territory and what today would be understood as “disasters”, the city states in Mesopotamia practiced a model of occupation that attended to the natural cycles of the rivers, since their agricultural activity depended on it.
“Prehistoric data show that the initial concern was for the proximity to water sources and food supply, while in later stages human groups were guided by the criteria of connectivity” (Pallarés, 2010) and “defense against invasions and looting by barbarian tribes” (Azzara, 2004).

Specifically, “in the primitive history of urban planning processes, there is an absence of references that allude to disasters as determining events in the occupation and use of land, except to mitigate the risk of war or slavery by invading peoples, which determined fortified cities or settlements surrounded by walls” (Morris, 1979).

1.1. Territorial planning for sustainable development

For today’s civilization, the occupation of territory must arise from the application of a planning policy for sustainable development and conceived as sustainable, which rules out all improvisation; decisions are taken in advance on the appropriate establishment of activities and uses, taking into account the history of calamitous events that have forced or threatened to give rise to displacement and significant losses.

The design and construction of territories based on a planned order for their occupation, aimed at sustainable security in the face of disasters, faces various weaknesses, in which three aspects are significant: the impact generated by migrant populations, the temporariness of governments and the persistence of private interest.

Today’s cities allow for the protection of their inhabitants, with a powerful cybernetic structure elaborated from a legal human rights framework that rules out all forms of violence, dispossession or discrimination, and outlaws slavery or reduction to prison for debt.

In this way, current human sites have come to be differentiated from ancient cities; while human dignity is elevated, science, technique and technology are at the service of the security of the territories where they contribute to the reduction or mitigation of disaster risk.

Urban planning in the era of sustainable development is based on the recognition of the individual as a significant actor in decision-making by government bodies and institutions founded in democracy.

The guarantee for cities to project themselves to future generations is concentrated in the effective exercise of authority focused on the control of the activities developed by those populations that are based in the territory; in the continuity of government development plans and in the subjection of private interest to the general interest.

1.2. Disasters in territorial planning

Analyzed from the theory of constructivism, “disasters are socially constructed” (Araya and Andonegui, 2007), and this happens because the inhabitants of
a territory develop actions that omit the definition of land use, disregard the criteria for occupation and deviate from the guidelines for developing the buildings. In short, it is the same human groups who, by action or omission, construct their own displacement.

The awareness and acceptance of the limitations regarding the role that the communities play in the territorial ordering when it is incorporated and prevents the occurrence of accidents, is proportional to the level of participation that the citizens develop in the construction of the instruments for the planning and projection of their territory. Public policy in disaster risk management should be a collective construction of a safe and sustainable territory.

In matters of disasters, the public administration fulfills a normative duty to formulate a policy that impacts four areas that contribute to development: sustainability, territorial security, collective rights and interests, and improvement of the quality of life.

![Figure 1. Development policy based on disaster risk management](source: Own elaboration)

Meeting these dimensions requires controlling three factors that weaken participatory planning: migration, government temporariness and private interest.

1.2.1. First factor: Migration and disaster risk in the occupation of territory

The social dimension is a fundamental part of the construction and implementation of development instruments. To assess the situation of rights and duties in the relationship between man and territory, seen from the resilience and adaptation associated with climate change, it is crucial to identify those situations of social vulnerability such as poverty, social inequality, illiteracy, corruption and the structure of government.
The environment where factors that determine the sudden mobility of human groups are combined, contains more elements such as “displacement under fortuitous cause” and uncertainty, than the decision to migrate counting on assisted and planned information of the definitive or temporary departure, nor of the opportunities or threats that can be expected in a strange territory, in case the circumstances lead to a permanent stay.

One type of migration, for the International Migration Organization (2007, p. 12) is the “forced migrant for climatic reasons”, concerning those persons or population groups that “because of unavoidable, sudden or progressive environmental changes, which negatively affect their lives or living conditions, (they) are forced to leave their usual homes, or decide to do so voluntarily. The displacement may be temporary or permanent, within their country or abroad”.

In any case, this definition implies the fact that environmental changes are “unavoidable”, which attributes a “naturalized” character to environmental changes, when it is already scientifically known that many of these changes, for example, climate change, are phenomena clearly produced by anthropogenic action and that, in the same way, they can be mitigated and even reversed.

Droughts, infertile lands, disasters, violence, tyrannical governments among other reasons, explain the history of a planet inhabited by human groups in permanent mobility. Transient and in need of a place that offers them the necessary conditions to build a home and provide their food, the displaced people act in a clear-cut manner, far from the recognition of minimum rules of duties and rights for other groups that share their situation. Solidarity among victims is relativized, particularly when they face conflicts that involve their progress in overcoming the crisis.

Already in the 2009, United Nations High Commissioner For Refugees reported that climate-related aspects may constitute not only the most common triggers but also those directly responsible for many migration conflicts, and therefore, it is expected that the demand of the state to provide protection and assistance to the affected population will grow, under the framework of what is today known as “environmental refugees”, “environmental migrants” or “environmentally displaced persons”. The United Nations High Commissioner For Refugees has already warned that, since this issue is not only growing, but also touches on humanitarian and global development aspects, any intervention must be framed within a rights approach, since the catastrophe experienced in the 2004 Indian Ocean tsunami, Hurricane Katrina and other more recent disasters have confirmed that these events generate threats to the human rights of the affected populations.

Migration brings with it pressures on the territory, starting with demands for vital goods and services such as water, air, rest and food, followed by the need for a place to settle. This is a whole that adds to the burden already borne by the receiving ecosystem, where competition for these provisions opens up in direct relation to the extent to which the territorial entity has planning
that refers to its capacity to supply new inhabitants, while these in turn find
the best option in the informality that leads to the construction of conditions
conducive to the occurrence of disasters.

In the case of migration, it should be borne in mind that migrants,
whether considered individually or collectively, are highly vulnerable to the
territory (Rodriguez, 2018), that being alien to the level at which mobility
occurs, outsiders are afraid of controls and have difficulty getting involved
in the decision-making of the public administration of the place where they
are established. Their motivation is guided by particular interest, usually the
satisfaction of basic human needs, which puts disaster risk in the background.

The number of people who have matured the idea of going to live in
another country has increased notably since 2015 in Latin America, a trend
that is shared by Colombia, where the rate of nationals who migrated for
the purpose of staying between the years 2016 and 2017 varied positively by
13 percent.

However, the region must remain prepared for massive migrations of peo-
ple from various countries, especially Venezuela, who seek to settle in the
territory, overcome shortages and protect themselves from violence. “The vast
majority of these migrants show high economic vulnerability, without social
security, unemployed or prepared for unskilled jobs” (Corporación Latino-
barómetro, 2019).

The case of migrants who seek permanence registers a particular con-

1.2.2. Second factor: Government temporality and disaster risk

As a public policy associated with development, disaster risk management is
the responsibility of all levels of government, from the national level to the
territorial level in charge of the respective governors and executors of the public function, whose constitutional characteristic is the temporality of the mandates for those positions provided by popular election.

“In that context, the territorial management plans are also proposed to be attended with the criterion of temporality, obeying the mandate of the programmatic vote” (Congress of the Republic of Colombia, 1994). In this way, every candidate to be a governor or mayor, presents for the consideration of the elector citizens a government program that finally is transcribed in the respective development plan to be attended during the constitutional period.

The constitutional periods of the president, governors and mayors are four years, and their execution coincides with the time that other territorial management instruments are in force, such as the territory ordering plan, within which watershed planning and disaster risk management plans are understood to be incorporated, the execution of which depends on the dynamics for the collection, appropriation and execution of public resources defined in the Budget for Income and Expenditure.

The Development Plan of the respective mandate must articulate, in its goals and indicators, the guiding principles, uses and occupation model defined in the territorial ordering under environmental determinants which, once agreed upon with the environmental authority, limit or regulate the development of particular interests and which are defined in the ordering of the river basins or in the Disaster Management Plan.

The temporality of development plans can result in islands that are disjointed from the backbone of the land use model, which occurs when planners abandon phases initiated during previous governments. When this happens, the continuity of development processes already initiated is discarded, while depriving public administrators of maintaining meaningful information that keeps the timeline on the goals towards which the territorial entity is leading, and provides a state of the art accompanied by the identification of actors who appropriate and live the daily life of the territory.

From these reflections it can be inferred that the temporality of the rulers and their government proposals have a greater or lesser impact on the continuity of local policy to the extent that it has continuity strategies for citizen participation; planning instruments for the development of the territory are articulated and include disaster risk management components.

1.2.3. Third factor: Private interest and disaster risk

The plurality of public agencies that attend to the demands of services for the inhabitants of a territory, which are offered in a diversity of hierarchies and autonomies, involving actors and social groups, introduce new edges and variables to the conflict for the territory and its benefits.
The Risk Management strategy was adopted as public policy in Colombia through Law 1523 issued in 2012. “Risk management is an indispensable development policy to ensure sustainability, territorial security, collective rights and interests, and to improve the quality of life of populations and communities at risk, and is therefore intrinsically associated with safe development planning, sustainable territorial environmental management at all levels of government and effective participation of the population” (Ley 1523, 2012).

For the businessman who provides public services, it is a priority that the conditions are in place to give continuity to his business; for the workers and suppliers, the permanence of a dynamic market is relevant. For the users, the importance of the territory is hierarchical with respect to the living conditions to which they have access, so that the value of access to these public services offered in the cities contributes to giving quality of life to its inhabitants, without factors of pressure or burden on the goods and services provided by the ecosystems or the exhaustion of public space having an impact on the decision to use this portfolio. Their importance will only arise when access to them is restricted or extinguished.

The tendency of individuals towards the development and use of the territory for their own particular purposes cannot be intervened by the authority of the State, whose agents prefer to move according to the production of “plans” rather than in the exercise of government authority. In this way, there remains a recognition of the *ius abutendi* that has been extinct since the 1991 Constitution, which defines property as a “social function that implies obligations. As such it has an inherent ecological function” (Constituent Primary Colombia, 1991). Thus it remains in the shade, a lack of government in the responsible and sustainable use of the territory, with communities detached from its management.

### 1.3. Territories built with citizen participation

As a public policy, physical disaster risk management is intrinsically associated with planning where two extremes interact: government authorities and the population. Urban planning is a public function materialized in urban development actions (Republic Congress, 1997) that includes among its purposes the improvement of the security of human settlements in the face of natural risks (Vargas, 2002), with which the prevention of the catastrophic effects of disasters has gone from being a humanitarian problem to becoming a matter of the model of territorial occupation.

The challenge of planning sustainable cities is a highly complex matter because government plans must articulate a plurality of public agencies that seek to satisfy demands for goods and services for the community that are provided at various levels of hierarchy and autonomy to which the aspirations of actors and social groups are added. All of them act in scenarios of competition...
and tension according to individual interests that must lead to the satisfaction of the general interest within a governance framework.

The mission of weaving this diversity of tendencies towards an integral goal must be consolidated in a territory ordered in a way that is convenient to the general interest, whose main challenge is the construction of a “dynamic planning” (UNCHS, 1994), which understands the dynamic as a “negotiating or negotiated planning” that seeks joint solutions at various scales with scope at the level of regions. This is possible through the practice of participatory mechanisms that bring authorities into contact with the communities concerned and through a pedagogy that stimulates a sense of solidarity and proactivity, without this participation leading to the formation of social movements that are different from citizen organizations (CNUAH, 1994).

The possibility of co-constructing the future of a territory is the ultimate expression of citizen participation where the social dimension is committed to sustainable development, making democracy real beyond the level of protest.

2. Conclusions

Planning is a fundamental tool for the management of the state, a structural fiction where the relationship of the public administration with its affiliates within a territory must be supplied in numerous instances of government using its own tools, which can be woven in a systemic manner so that they function in an interdependent and simultaneous manner, like a machine programmed almost perfectly to achieve certain aims.

Therefore, planning must be understood as a systemic, orderly and coordinated process that fulfills three basic functions: “prospective, implementation and evaluation”, which operate “in all sectors, institutions and levels of government, in a variety of time frames” (UN, 2017), and within this framework it must be recognized as playing a fundamental role in the construction of sustainable development.

The people express themselves in a higher normative order, that is, in the Political Constitutions; the construction of other tools that complement the constitutional portfolio must bet on a multiscale planning and contemplate the citizen participation as a fundamental instance in the planning process.

With this, what should be sought in matters of disaster risk, beyond the incorporation of the planner’s subjective perceptions, is the exploration as an act of collective and anticipated recognition of hazards seen from their correlation with the vulnerability of exposed populations, the fundamental piece for building safe territories, in whose favour the private interest must yield.

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1 Governance is that “state of dynamic equilibrium between the level of societal demands and the capacity of the political system (State/Government) to respond to them legitimately and effectively”.
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**ABSTRACT**

**Disaster-safe territories from land management**

The occupation of the territory by different cultures throughout the history of humanity, shows the first steps towards planning as a fundamental axis in the determination of urbanism where the land had organized use. This was not enough to avoid or reduce the damage caused by disasters that could have been prevented if people had had the means to assess the risks they were exposed to in the places they chose to stay. The learning accumulated over more than ten thousand years of living on the planet says that sustainable development requires anticipating disaster losses through the appropriation and knowledge of risks.

**Keywords:** planning, risk, disasters, sustainable development, citizen participation, territory
1. Introduction

From the time of the middle of 1990s, copious scientific information has been produced around the concept of social capital. There is a multiplicity of viewpoints focused in this notion: from the means that an individual can gather as a consequence of having its place in a group, interchange, unanimity or reliance between the associates of a group, going through established characters and even cultural features of a society (Urteaga, 2013). Social capital is a suitable perspective for sustainability, since a sustainable resource management base is a good starting point for the revitalization of it. This means that it is from communal resources that you can raise the issue of sustainability with greater possibilities of increasing social capital.

Social capital is an additional wider practice that triggers the crusade of trust over time. Now, trust is not an indicator of how the public perceives political leaders but a consequence of public engagement in civic life and the associated feelings of trust and reciprocity which are developed in a civic activity. If inhabitants untie from civic life and do not believe in social reciprocity, they do not trust the establishments governing political life (Keele, 2007).

According to the previous concept, the trust concerning the social sciences is of two types: the interpersonal or social and the institutional or political. The latter is the one that interests the present work. Political trust in an institution implies the belief that it will not act in an arbitrary or discriminatory way that is harmful to our interests or those of the country, but will treat us, and other citizens, in an equal, fair and correct way. There are four characteristics that make up this type of trust, which are important to keep in mind when reading this analysis: 1) the relationship with the future, when the citizen assumes that what he expects will happen; 2) being at a middle point between knowing and ignoring, that is, the individual has incomplete information and lacks the possibility of completing it; 3) depending on an authority or a representative to assert the options and satisfy the citizen’s needs; and 4) updating the
relation trustee – trusted based on the actions of the trustee, in the case of the legislative body (Landau, 2009).

As for the methodology used for contrasting the conduct of people against the decision of the Colombian population regarding the representative political culture in social capital as a basic component in the procedure of sustainable construction of the Colombian territory, a Probit model is suggested, presenting an explained variable that takes the values of 0 and 1; where 0 indicates individuals who do not trust the Congress of the Republic, while 1 captures all the people who trust or trust a lot in the bicameral legislature of the Republic of Colombia. The main source is the Survey of Political Culture ECP-DANE1 (2019), characterizing features of participation in community sceneries, trust based on the perceptions and practices of citizens in their political and social environment. For this, the populace considered is the one that is equal to or over 18 years old.

The results suggest that the higher the education, the less likely it is to trust the congress. Regarding the stratum, an individual in a low stratum presents a probability of trusting in the congress and the probability decreases as the individual increases his socio-economic stratum. In relation to age, young people are less likely to trust the electoral system, while the population which is matured is more likely to trust Congress to a greater degree.

2. Theoretical background

2.1. Trust in Congress

Democracy is not a form of government that occurs once and for all. It needs to be reproduced on a daily basis. In this reproduction of the democratic form of government, Congress plays a fundamental role. Not only because it is the organ of political representation par excellence of modern representative democracies, but also because a large part of the institutional and legal architecture of a country originates from legislative precincts (Bartolini et al., 1988). They are also legitimate sounding boards for political and ideological differences held by various groups existing in a system; they are also the privileged space to deliberate and ventilate the problems of the public agenda. They also fulfil an important function of auditing public powers and balancing powers in a system of representative and republican democracy (Escamilla, 2002). In this sense, responsible and effective strong (representative) parliaments contribute enormously to the task of maintaining and reproducing the stable democratic order. Conversely, weak parliaments (unrepresentative, ineffective, and irresponsible) pave the way for democratic breakdown (Flórez, 2001).

The Political Culture of a country would be defined as the set of attitudes, behaviours, feelings, and political orientations that are related to each other.

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1 DANE: National Administrative Department of Statistics in Colombia.
This includes the set of knowledge, attitudes, beliefs and evaluations of citizens about the political system (Almond and Verba, 1980; DANE, 2019). Meanwhile, trust is a state of mind present in a relationship between two entities: the trustee or truster and the trustee of that trust or trusted. It is assumed, with a certain firmness, that the second acts and will act as the first expects it, thanks to the values, knowledge, and prejudices that he possesses. This relationship implies gambling, maintaining expectations, having hope that the references used are true, that is, that they really respond to the characteristics of the depositary. If the expectations on which trust is based are not verified, the truster is disappointed (Ponce, 1999).

The malfunction of democracy, even its lack of consolidation, could be based on distrust of political institutions. Accrediting them involves various facilities. For example, tax, legal and participatory are favoured in those democracies where citizens rely more on their institutions. This means that, in these cases, there is a greater probability of paying taxes voluntarily, in respect and adherence to the rules, and in the exercise of the political voice (Arizti et al., 2010). In this way, the citizens who trust will assume that the government will use their money and apply the rules with good intentions, so they will tend to participate and organize more easily and thus have more adherence to the established system (Cleary and Stokes 2006).

Trust is essential for political leadership. Without trust, leaders are impotent to achieve citizen compliance without oppression, make lasting decisions, or commit resources needed for collective action (Barber, 1983; Braithwaite and Levi, 1998). Trust, in short, creates the environment that political leaders need to succeed (Hetherington, 1998). Trust and government performance are grounded in basic concepts of democratic representation and accountability. I assume that each citizen grants decision-making power to an elected politician under an implicit contract that the representatives will accomplish goals of good policy, peace, and sound economic stewardship.

A voter will trust his or her representative if he or she has evidence that the politician has the integrity and capacity to meet the voter’s expectations. Therefore, to earn the voter’s trust, a politician must demonstrate that he or she has the capability to fulfil the goals he or she was elected to accomplish. Citizens who are not engaged in civic activity are likely to feel a lack of political influence, which causes feelings of powerlessness that fuel cynicism and distrust toward political and social leaders, the institutions of government, and the regime as a whole (Putnam, 2000). Therefore, citizens who have withdrawn from civic life harbour a hostile orientation toward government leaders and institutions. Trust in government will influence civic activity, since it may require some level of trust in government to participate in activities that engage political institutions (Miller, 1974).

Citizens have a tendency to oversimplify recent government actions to form valuations. Individuals supervise the performance of the president, Congress, and the economy, adjusting their trust of the government up and down.
accordingly (Citrin, 1974). Here, trust is not an expression of how the public views political leaders but a product of how much the public participates in civic life and how the attendant attitudes of trust and reciprocity develop in civic activity. When citizens disengage from civic life and its experiences of social reciprocity, they are incapable of trusting the institutions that rule political life (Keele, 2005). Government reliability which lacks democratic support seems to be shrinking; even in established democracies that disengagement and disinterest towards democracy is the overture to processes of democratic regimes weakening, even if they seem firmly established (Foa and Mounk, 2017).

Research shows that trust in the institutions that govern social functioning declines over time (de la Vega et al., 2010). This generates a fundamental problem, as Luhmann (2005) states, since trust is a necessary condition for the formation of institutions and its absence promotes social conflict, since these institutions have the function of reducing the degree of uncertainty generated by social complexity and grant citizens clear guidelines that provide predictability for social interactions.

Trust in government institutions is a measure of diffuse support for the system (Easton, 2006). High levels of trust would mean greater voluntary compliance with the law, payment of taxes and a reinforcement of the legitimacy and values of the democratic system. That attachment to the system or that legitimation not only lubricate social relationships and increase well-being, but also reduce the costs of law enforcement, and strengthen the rule of law and the culture of legality (Offe, 1999).

Institutional trust strengthens the capacity of governments to effectively design and implement legislation and public policies. By facilitating the transfer of information and knowledge and increasing the likelihood of coordinating complex, expensive, or long-term activities, trust enhances and qualifies state capacities. This in turn affects better design and greater effectiveness of public policies (Brewer et al., 2006).

Trust favours greater activism or involvement in forms of political participation (membership in parties, trade unions and business associations) and civic (participation in conventional voluntary associations), which reinforces citizen responsibilities and leads to greater participation and involvement in public and in demanding accountability tasks (Norris, 2002).

Trust in the government and its institutions favours the adoption of reforms, especially structural ones, the benefits of which will only be seen in the long term. It is essential in critical situations, such as natural disasters and economic or political crises (Naser et al., 2017).

The trust in social sciences is of two types: the interpersonal or social and the institutional or political. Political trust in an institution denotes the acceptance that it will not act in an arbitrary or discriminatory way that is harmful to our interests or those of the country, but will treat us, and other citizens, in an equivalent, non-discriminatory and appropriate way (Lewis and Weigert, 1985).
Trust in institutions has been approached from different angles. It has been identified as a fundamental component in the proper functioning of democracy. Trust reduces costs in every sense: when there is no trust in democracy, it is necessary to invest more resources so that it becomes present and helps to legitimize the system. A low level of confidence in political institutions questions the basis of legitimacy and the prospects of the democratic regime (Palazuelos Covarrubias, 2014).

Institutional trust has been approached from two perspectives that are differentiated by the type of support that underlies them: diffuse and specific. Diffuse institutional support is conceptualized as the support that is maintained over time, by attitudes and values shared with the system or the institution in general, which makes it possible for people to trust public institutions when faced with circumstantial disagreements. Specific institutional support is more transitory and is directly related to the effective fulfillment of institutional demands (Price and Romantan, 2004).

In relation to this last approach, various studies show that institutional trust is more closely related to the good performance perceived by institutions, that is, with the ability they have to satisfy the demands of citizens (Baker, 2008; de la Vega et al., 2010; Hiskey and Seligson, 2003; Morales Quiroga, 2008, Price and Romantan, 2004). For example, it has been observed that low institutional confidence is associated with ineffectiveness and waste of public money (Baker, 2008) and with corruption, which is also generally linked to institutional mismanagement and poor performance (de la Vega et al., 2010).

2.2. Sustainable development

There are several definitions of sustainable development. One of them defines it as “development that meets current needs without compromising the ability of future generations to meet their own needs”2. Other authors offer the definition in terms of the improvement of the quality of life within the limits of ecosystems or one that offers basic environmental, social and economic services to all members of a community without jeopardizing the viability of the systems (Voisey and O’Riordan, 1997).

Sustainability is not the same as immobility. All living systems are changing and it is fundamental not to eliminate the changes but avoid destroying the sources of renovation, from which the system can recover after the inevitable stresses and disturbances to which it is exposed due to its open system condition (Holling, 1997). Ecologically based approaches to sustainable development emphasize the importance of focusing on society’s ability to resist or recover from disruption, stress, and shock rather than its ability to produce goods. For their part, approaches from an economic point of view postulate

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that economic development is sustainable when a certain crucial variable can be *sustained* in the sense that it does not have to decrease in the future as a consequence of the growth itself. In the literature on the subject, approaches to sustainable development can be classified into three groups, depending on whether the crucial variable or objective function to be maximized is welfare (or utility), consumption, or capital (manufactured or natural) (Vercelli, 1998).

### 2.3. The sustainable development goals

The Sustainable Development Goals (SDG), also known as the Global Goals (MDGs), were adopted by all Member States in 2015 as a universal call to end poverty, protect the planet, and ensure that all people will enjoy peace and prosperity by 2030. The 17 SDGs are integrated, as they recognize that interventions in one area will affect the results of others and that development must balance environmental, economic, and social sustainability. In keeping with the promise of leaving no one behind, countries have pledged to accelerate progress for the most backward. Therefore, the SDGs have been designed to bring several life-changing *zeros* to the world, including zero poverty, zero hunger, zero AIDS and zero discrimination against women and girls. It is necessary for every state to achieve these ambitious goals. Creativity, knowledge, technology, and financial resources of the entire society are needed to achieve the SDGs in every context (Griggs et al., 2013).

The 17 SDG which are the basis for this new agenda, represent a common vision of the future and make clear commitments to face those pending challenges. They recognize, for the first time, the importance of peace, justice, and the critical role that governments and strong democratic institutions play in achieving development. In addition, they trace the route to achieve a balance between economic and environmental variables, incorporating issues that were not included in the MDGs, such as climate change and sustainable consumption (Herrero, 2018).

The legacy and achievements of the MDGs have provided us with valuable lessons and experiences to start working towards the new Goals. However, for millions of people around the world, the work is not over. We must make one last effort to end hunger, achieve full gender equality, improve health services, and ensure that all children continue to learn after primary school. The SDGs are also an urgent call for the world to transition to a more sustainable path.

The SDGs are a bold commitment to finish what we have started and to tackle the most urgent problems facing the world today. The 17 Goals are interrelated, meaning that the success of one of them affects that of the others. Responding to the threat of climate change impacts how we manage our fragile natural resources. Achieving gender equality or improving health helps eradicate poverty; and promoting peace and inclusive societies will reduce inequalities and help economies prosper. In short, it is an unequalled opportunity for the benefit of the lives of future generations.
The SDGs coincided with another landmark agreement concluded in 2015, the Paris Agreement approved at the Conference on Climate Change (COP21). Together with the Sendai Framework for Disaster Risk Reduction, signed in Japan in March 2015, these agreements provide a set of common standards and feasible goals to reduce carbon emissions, manage the risks of climate change and natural disasters and rebuild after a crisis. The SDGs are special in that they cover issues that affect us all. They reaffirm our international commitment to end poverty permanently and everywhere. They are ambitious, as their goal is that no one is left behind. Most importantly, they invite us all to create a more sustainable, secure, and prosperous planet for humanity (Sachs, 2012).

2.4. The sustainable development goals in Colombia

Colombia has even more reasons to ensure the implementation of this agenda. It was one of the forerunners in its design since the Rio + 20 Conference in 2012 and has been a pioneer in including the Agenda in its planning instruments, such as development plans and CONPES on the SDGs. Furthermore, this is a historic opportunity, in which, with the end of the armed conflict, the country can move decisively towards closing development gaps (Herrero, 2018).

The Multidimensional Poverty Index (MPI) is an indicator that analyses the quality of life of households based on the deficiencies in five dimensions associated with their well-being: educational conditions, conditions of childhood and youth, health, work and housing conditions and public services. From a comprehensive reading of the MPI, and the deprivations of households in each indicator and dimension, the rulers can focus and channel investment resources to resolve regional disparities.

The measurement of the MPI at the municipal and departmental level can be a true instrument of public policy, monitoring and following up social achievements. In this sense, it is suggested to take advantage of the information reported in the DANE’s Large Integrated Household Survey (LIHS), and with this, focus according to household, domain, and region conditions.

2.5. Trust and sustainable development

The MDGs are a call to leave behind an agenda in the paternalistic fund, through which developing countries are the ones that have to act, to move to an agenda of shared responsibilities, in which everyone has to act (Chavarro et al., 2017). Thus, this time the impetus came from the countries that had not been more traditionally involved (Peru and Saudi Arabia, for example, were the first countries to support the Colombian initiative). The MDGs did not succeed in mobilizing action, but they did help to change the more traditional political mindset a little. Others are more critical and think that the MDGs expressed good intentions but were not well thought out. Finally, there are those who
think that the MDGs did not attack the central problems of development but rather distracted by focusing on superficial issues (Hulme, 2009).

The SDGs, explicitly or implicitly, are in the formulation of the country’s public policy, although in some regions they are more present than in others. However, the government still has several challenges: advance in the formalization of the country’s goals to 2030, a guarantee of the participation of civil society and the private sector in defining them, building an action plan and a public timetable for the High Level Inter-institutional Commission, providing incentives for citizen oversight and implementing a monitoring and control system that requires having statistical capabilities and reliable data (Castañeda et al., 2018; Hulme, 2009).

3. Study area and methods

3.1. Study area

In this research the study object is the trust in congress and the sustainable development of Colombian territory (Voisey and O’Riordan, 1997). The information about trust in congress comes from The Political Culture Survey, which allows to know what kind of collective and solidarity activities Colombians do, what opinion they have of the forms of people’s participation and what considerations they have about participation. In addition, it allows to know the behaviour of people in the elections and their perception of the population participation in different positions of popular election; it also shows the valuation of the citizenship regarding the democratic system of the country, access to services provided by the Public entities and the relationships of support and trust established between people and the institutions, which allow for contributing the determinants of evolution towards a modern society with institutional effectiveness and peaceful coexistence.

The general objective of this survey is to generate strategic statistical information that allows characterizing aspects of the Colombian political culture, accumulation of social capital, participation in community settings and trust, based on the perceptions and practices of citizens in their political and social environment, such as input to design public policies aimed at strengthening Colombian democracy and peaceful coexistence (DANE, 2019).

Now the goals for sustainable development in Colombia (SDGs) are presented, giving a look at the agenda 2030. This agenda is a new ethical and programmatic agreement between nations and people to face the challenges of contemporary society. Global concerns are still focused on slow economic growth, social inequalities, environmental concerns, and the longing for peace in all its dimensions. For this reason, a review of the so-called Millennium Development Goals (MDGs) was necessary to advance in the construction of solutions that would allow universal well-being.
After presenting the perspective of trust in congress and the sustainable development goals, it is necessary to bring about the relations between them. The organizations oversee promoting, regulating, and guaranteeing the coordinated social action among citizens. For decades, the institutional trust has been declining. This creates a major problem because institutional trust is necessary for the institution’s progress. The fact that low institutional trust is correlated with low general social trust is among the adverse effects that it brings. Because of that, citizens do not feel confident in their interactions with others and have negative feelings about the trustworthiness of strangers, which affects societal interconnection, collaboration, collective relationship and acceptance between citizens, among other things (Beramendi et al., 2016). So, in order to achieve the sustainable development goals, trust in institutions, especially in congress, must be reinforced.

This is important since congresses are irreplaceable venues for deliberation, design and approval of legal instruments that enable not only social coexistence but the implementation of public policies (Flores Andrade, 2013). Trust is a subjective dimension of politics (Lechner, 1998); it is considered a variable that can positively or negatively influence democratic functioning (Morales Quiroga, 2008). It has even been considered a variable to explain the functioning of democracy and economic performance (Luna and Velasco, 2005). It enables social cooperation and coordination to generate positive social results. In this sense, trust yields predictability, while its opposite (mistrust) carries uncertainty (Luhmann, 2005). Hence, exploring the level of trust that citizens place in leaders, institutions, organizations, and parliaments, contributes significantly to determining the degree of predictability of political systems.

3.2. Methods

A Probit model is proposed that presents an explained variable that takes the values of 0 and 1; where 0 captures individuals who do not trust the Congress of the Republic, while 1 captures all the people who trust or trust a lot in the bicameral legislature of the Republic of Colombia. The Probit model is a non-linear econometric model that is used when the dependent variable is binary or Dummy, that is, it can only take two values.

This model has been selected because it is a way to perform regression for binary outcome variables. Binary outcome variables are dependent variables with two possibilities, like yes/no, positive test result/negative test result or single/not single. The word Probit is a combination of the words: probability and unit; the Probit model estimates the probability a value will fall into one of the two possible binary outcomes3.

3 Probit Model (Probit Regression), Definition, https://www.statisticshowto.com/probit-model/.
The Probit model arises from the need to solve the problems of the linear probability model, such as the obtained probabilities which can be less than zero or greater than one, and that the partial effect always remains constant. The Probit model solves both problems: the values (which represent probabilities) will always be between [0,1] and the partial effect will change depending on the parameters. They can handle random preference variation, allow any substitution pattern, and are applicable to panel data with temporarily correlated errors. Thus, for example, the probability that a person is involved in a formal job will be different if they are a recent graduate or if they have 15 years of experience. The only limitation of Probit models is that they require normal distributions for all unobserved utility components.

It is useful for situations where a dichotomous response is available that is thought to be influenced or caused by levels of one or more independent variables and it is particularly suitable for experimental data. This procedure will allow estimating the intensity necessary for a stimulus to induce a certain proportion of responses, such as the effective dose for the median. Social scientists are often interested in assessing the extent to which an association between two variables is mediated by a third variable. For example, stratification researchers may be interested in whether racial differences in income are attributable to the uneven distribution of educational attainments across races (Breen et al., 2013).

This model has been used for similar studies in measuring poverty levels in a Colombian city (Narváez et al., 2015). Likewise, the ordered Probit model has been used in other similar researches among which we present some examples. The original title of this one is translated from Spanish to English: What influences trust in institutions? This study takes data from the 2014 LAPOP survey to explore the factors that explain institutional confidence in Chile (Riffo et al., 2019). Other study called Trust and social capital: evidence for Mexico from an economic perspective and using Probit, concludes that trust among members of a society is associated with the efficient functioning of markets, contract reinforcement and in general with the capacity to generate development and welfare (Martínez-Cárdenas et al., 2015). Among other similar studies, Congressional Polarization and Political Trust which also uses the Probit model, shows how Americans have become less trusting of their federal government since the late 1950s (Uslaner, 2015).

The variables defined as explanatory for the model are presented in Table 1. The specification of the model has the form:

\[ P(Y = 1 \mid x) = F(\beta_0 + \beta_1 x_1 + \beta_2 x_2 + \ldots + \beta_n x_n) \]

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4 It is the main academic institution that conducts public opinion polls in the Americas, with more than 30 years of experience. See Web page: https://www.vanderbilt.edu/lapop/.
Where $F$ is a function that assumes values that are strictly between zero and one for all real numbers $z$, $0 < F(z) < 1$. The vectors of the variables $(X_n)$ are those defined in Table 1.

**Table 1. Explanatory Variables**

<table>
<thead>
<tr>
<th>General characteristics</th>
<th>Variable type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education</td>
<td>Continuous, measured in years.</td>
</tr>
<tr>
<td>Rural</td>
<td>Binary, (1) lives populated and/or dispersed rural centre</td>
</tr>
<tr>
<td>Stratum</td>
<td>Continuous, from 01 to 06.</td>
</tr>
<tr>
<td>Man</td>
<td>Binary, (1) is a man</td>
</tr>
<tr>
<td>Age</td>
<td>Binary, (1) in years.</td>
</tr>
<tr>
<td>Trust in Justice</td>
<td>Binary, (1) If the person considered the most serious cases of corruption in the public sector.</td>
</tr>
<tr>
<td>Vote</td>
<td>Binary, (1) If the person voted in the presidential elections of 2018.</td>
</tr>
<tr>
<td>Central</td>
<td>Binary, (1) if the person lives in the central region</td>
</tr>
</tbody>
</table>

This survey is a part of the annual Political Culture survey ECP-DANE (2019) which seeks to generate strategic statistical information that shows characteristic aspects of Colombian political culture, accumulation of social capital, participation in community settings and trust, based on citizens’ perceptions and practices of their political and social environment, as input to design public policies aimed at strengthening Colombian democracy and peaceful coexistence. The thematic design of the Political Culture Survey considers aspects such as the information needs of users, the objectives of the operation, the theoretical and conceptual framework, the indicators that will be obtained and the design of the form.

The Political Culture Survey arises from the need expressed in the National Plan for Basic Official Information (PLANIB) 4. 2006–2010 to build enough series and statistical indicators to measure social and economic phenomena and those sectors in which they presented notorious information gaps, including justice. Among the nine missionary programs that were developed in PLANIB, the eighth corresponded to Political and Cultural statistics. This included conducting research on citizen participation, governance and relations with the State and the construction of statistical series on the evolution of preferences and electoral participation. Considering the above, the need arises to develop a statistical operation, particularly focused on observing citizen perceptions against elements related to national politics (DANE, 2019).

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The Political Culture Survey is a statistical tool whose normative support is Resolution 416 of June 2006, by which the National Basic Information Plan is adopted, which seeks to provide the country with an information system capable of generating essential knowledge on the national reality and its trends. Among the specific programs determined by it, is the so-called Cultural and Political Statistics whose development must consider elements such as: Citizen Participation; Governance and Relations with the State; Participation and Electoral Preferences.

The main international analysis references that were taken for the development and adaptation of the Political Culture Survey are: National Survey of Democracy and Political Culture – Nicaragua, carried out between 1999 and 2000; Second National Study on Democracy and Democratic Values – Bolivia. The first was carried out in 1999, published in 2001 under the name of Democracy and Political Culture in Bolivia and subsequently carried out in 2004; National Survey of Political Culture and Democracy (DEMOS 2004) – Dominican Republic, was distributed in the years 1994, 1997, 2001 and the last one was carried out in 2004; National Survey on Political Culture and Citizen Practices (ENCUP) of the Ministry of the Interior – Mexico, led by the General Directorate of Democratic Culture and Civic Development of Mexico; Political Culture and Democratic Governance 2006 – Paraguay, was carried out in November 2006 (DANE, 2019).

The following thematic and geographic disaggregations are used in the processing of the survey output tables:
- Sex,
- Age ranges: comprise the ranges of 18 to 25, 26 to 40, 41 to 64, 65 and more,
- Colombian regions. For DANE, the regions are organized as follows:
  - Bogotá: only Bogotá is included (as a region),
  - Caribbean: Atlántico, Bolivar, Cesar, Córdoba, La Guajira, Magdalena and Sucre (7 departments),
  - Oriental: Boyacá, Cundinamarca, Meta, Norte de Santander and Santander (5 departments, excluding Bogotá),
  - Central: Antioquia, Caldas, Caquetá, Huila, Quindío, Risaralda and Tolima (7 departments),
  - Pacific: Cauca, Chocó, Nariño, and Valle del Cauca (4 departments).

The master sample for household surveys was designed in accordance with the requirements and objectives established by DANE to carry out not only the labour market survey but all those with a social theme whose sources of information are private households. This scheme was implemented in 1996 and was updated from 2008 with information from the 2005 General Census. The Political Culture Survey is a subsample of the Master sample for Household Surveys; therefore, it acquires the same characteristics as the Master Sample, with the particularities of the research.

The calculations were made with formulas corresponding to the type of sample design. The effect of clusters on design (Deff), is determined as a
relationship for each domain, between the real variance of this cluster design and that which would be obtained with a simple random element design (MAS). The basic parameters to estimate are proportions of 10%, with a relative standard error not more than 5% in the county towns and 8% in populated centres and scattered rural areas.

Sample size:

\[ n = \frac{\text{Deff} \cdot T \cdot N \cdot z^2 \cdot P \cdot Q}{N \cdot e^2 + P \cdot Q \cdot z^2} \]

Where:
- \( n \) = Sample size,
- \( N \) = Size of the Universe,
- \( P \) = Probability of occurrence of the studied phenomenon,
- \( Q = 1 - P \),
- \( e \) = Margin of error,
- \( z \) = Statistic that defines the desired confidence level based on the standard normal distribution. In this case it is 1.96,
- \( T \) = Adjustment for non-response,
- \( \text{Deff} \) = Design effect.

As a result, the following distribution of the sample is obtained in segments according to the geographic breakdown domain.

**Table 2. Trust in Colombian Congress**

<table>
<thead>
<tr>
<th>Region</th>
<th>County Town</th>
<th>Dispersed town and rural center</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caribbean</td>
<td>259</td>
<td>106</td>
<td>365</td>
</tr>
<tr>
<td>Bogotá</td>
<td>252</td>
<td></td>
<td>252</td>
</tr>
<tr>
<td>Cauca</td>
<td>120</td>
<td>154</td>
<td>274</td>
</tr>
<tr>
<td>Central</td>
<td>253</td>
<td>119</td>
<td>372</td>
</tr>
<tr>
<td>Oriental</td>
<td>255</td>
<td>120</td>
<td>375</td>
</tr>
<tr>
<td>Pacific</td>
<td>237</td>
<td>55</td>
<td>292</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1376</strong></td>
<td><strong>554</strong></td>
<td><strong>1930</strong></td>
</tr>
</tbody>
</table>

**4. Results**

The results of the estimation of the model, on the probability that a person trust the Congress of the Republic of Colombia, are presented in Table 2. This shows, at a general level, that the chosen variables are significant except for the gender variable. However, if a person is chosen randomly, there is a 15.26%
probability that they trust the congress, when the explanatory variables are in their means.

In 2018, the probability that Colombians trust the Congress of the Republic is 24.56% and 75.44% doubts the institutionality represented there.

Table 3. Trust

<table>
<thead>
<tr>
<th>General characteristics</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Education</td>
<td>-0.00104**</td>
<td>(-0.0004)</td>
</tr>
<tr>
<td>Rural</td>
<td>0.01265***</td>
<td>(0.00469)</td>
</tr>
<tr>
<td>People Home</td>
<td>0.00652***</td>
<td>0.00160</td>
</tr>
<tr>
<td>Stratum</td>
<td>-0.00232 (0.00197)</td>
<td></td>
</tr>
<tr>
<td>Man</td>
<td>0.00364 (0.00368)</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>0.00116***</td>
<td>(0.00011)</td>
</tr>
<tr>
<td>Trust in Justice</td>
<td>-0.02249***</td>
<td>(0.00417)</td>
</tr>
<tr>
<td>Vote</td>
<td>0.01628***</td>
<td>(0.00426)</td>
</tr>
<tr>
<td>Central</td>
<td>0.02898***</td>
<td>(0.00496)</td>
</tr>
</tbody>
</table>

Note: *** Significant at 1%, ** Significant at 5%, * Significant at 10%.

On the other hand, as it is evidenced here, in one of the constituent elements of human capital such as education, there is an inverse relationship between it and the confidence of the voter and, in particular, in the Congress of the Republic, in such a way that an improvement in the possession of human capital represented in an increase in the educational level reduces confidence in institutions. In other words, if an individual increases his education in one year, the probability of trusting Congress will be reduced in 0.104%, allowing us to infer that an improvement in training not only makes the individual freer but it develops his human capacities, and in the exercise of that freedom it allows him to be more critical and perhaps more selective in the process of choosing.

In contrast, the model predicts that there is a direct relationship between the population settled in populated centres or in rural and dispersed rural areas with confidence in the Congress of the Republic, with a greater probability compared to those who lived in the urban area. Regarding the number
of people that make up and inhabit a home, it turns out to be significant and positive, indicating that the greater the number of people that make up the home, the greater the probability of trusting Congress. While the social stratum, synonymous of economic power and generator of gaps between rich and poor individuals, is not significant when it comes to explaining trust in the Congress of the Republic, although it is important to note that the probability decreases as an individual increases in socio-economic status, that is, he rises on the scale at the stratum level.

In the case of gender, men are more likely to trust Congress, compared to women, although this variable is not statistically significant. Women are more likely (0.36% more likely) to trust the congress. On the other hand, those who trust justice have a 2.25% chance of trusting the congress, compared to those who do not have much confidence.

Now, the results show that the more mature and older the person is, the more he trusts the institutionality. That is, if a person increases his age by one year, keeping the other variables in his means, the probability of trusting in Congress increases.

Comparatively, the ratios indicate that individuals who voted in the 2018 presidential elections compared to the same process in 2019, have greater confidence in Congress, while those who trust in justice are less likely to trust.

When doing a comparative analysis regarding trust in institutionality between regions and the central region, an individual who lives in the central one and in particular in one of the departments of Antioquia, Caldas, Caquetá, Huila, Quindío, Risaralda and Tolima, has a probability of less than 2.89% to trust the Congress of the Republic, or what is the same, in the other regions of the country there is a better perception of the population with respect to Congress, as it can be seen in Table 3, which includes the calculation of the marginal effects of each of the variables chosen for the model.

Table 4. The probability of trusting Congress

<table>
<thead>
<tr>
<th>Variables</th>
<th>Categories</th>
<th>Probability</th>
<th>Variables</th>
<th>Categories</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural</td>
<td>Rural</td>
<td>0.1513865</td>
<td>Rural</td>
<td>Rural</td>
<td>0.1513865</td>
</tr>
<tr>
<td></td>
<td>Urban</td>
<td>0.1640400</td>
<td>Urban</td>
<td>Urban</td>
<td>0.1640400</td>
</tr>
<tr>
<td>Man</td>
<td>Man</td>
<td>0.1526805</td>
<td>Vote</td>
<td>Vote</td>
<td>0.1418606</td>
</tr>
<tr>
<td></td>
<td>Woman</td>
<td>0.1563247</td>
<td>No Vote</td>
<td>No Vote</td>
<td>0.1581500</td>
</tr>
<tr>
<td>Trust in Justice</td>
<td>Trust</td>
<td>0.159701</td>
<td>Central</td>
<td>Central Region</td>
<td>0.1490397</td>
</tr>
<tr>
<td></td>
<td>No Trust</td>
<td>0.1372004</td>
<td>Other Regions</td>
<td>Other Regions</td>
<td>0.1780222</td>
</tr>
</tbody>
</table>

Table 4 presents the results regarding the probability of trusting Congress according to the general characteristics measured in terms of education, experience, and age. The results suggest that the higher the education, the less
likely it is to trust the congress. A person with 15 years of formal education, when the explanatory variables are in their means, presents a probability of trusting the congress in 14.32%, this probability decreases as the individual has a greater number of years of education.

Regarding the stratum, an individual who is in stratum 2, when the other variables that explain the variations of the dependent variable are expressed in their means, presents a probability of trusting in the congress at 15.25%, and the probability decreases as the individual increases his socio-economic stratum or conscience, as explained above in the footer. In relation to age, and if the parameter defined by the Friz index is followed, it results that young people are less likely to trust the electoral system, while the population matures and (30 to 49 years), has a probability to trust Congress at 13.71% while if the population is old and for example is in the range over 60 years of age, the probability increases by 3.52%.

Most Latin American congresses suffer from the same problem. According to the available information, consolidated democracies and those already in the process of consolidation, as well as highly developed or underdeveloped countries, all share the same problem: congresses are among the institutions with lower confidence indices (Catterberg and Moreno, 2006).

5. Discussion

At the social level, trust in institutions plays a fundamental role since it conditions the social trust of citizens. When institutions promote a framework of legality, social equity, and justice policies (property rights, judicial independence, compliance with contracts, the development of the welfare state, among others), individuals feel safe in their exchanges with others. These institutional policies generate the perception that institutional actors are capable of minimizing opportunism and foster the belief and expectation that other anonymous are trustworthy. On the other hand, when institutional incentives are absent, pessimistic expectations are generated about the reliability of strangers (Robbins, 2012). For this reason, it was found that in countries where there is greater institutional trust there is greater trust in people in general as well as a greater development of civic culture (Baker, 2008; Knack and Putnam, 2000).

What we could call a confidence crisis seems to be going through the region as a whole. Latin America and the Caribbean face enormous challenges in political coexistence, such as the level of per capita income, inequalities in the distribution of wealth, poverty and the exclusion of large majorities due to their ethnic descent, gender condition, age, or sexual preference, among

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6 The Friz index is a graphical representation of demographic data. It represents the percentage of the population under the age of 20 (between 0 and 19 years), with respect to the population group between the ages of 30 and 49.
others. To these challenges is added, or added precisely because of them, very low confidence in the institutions of democracy, which is perceived, on the one hand, by inability to meet and respond to the expectations they generated and, on the other, to the perception that one has of them due to the lack of transparency in public administration, since they have repeatedly been peppered with accusations of corruption (León and Aravena, 2013).

Although there is no evidence that the distrust towards institutions prevailing in many nations is associated with the same variables (de la Vega et al., 2010), there is a variety of elements that affect trust or mistrust in Congress, among which these factors can be mentioned: 1) performance, 2) social capital, 3) social values, 4) ambiguity of political culture, 5) socioeconomic factors, 6) demographic, 7) the country’s political history, 8) the image of ineffectiveness and corruption, 9) generational factor, 10) the nature of legislative work, etc (Flores Andrade, 2013).

According to Democracy Observatory of the University of Los Andes (2018) only a quarter of Colombians trust the Congress of the Republic. Poor management, links with cases of corruption and little interest in the concerns of citizens are some of the factors that reaffirm the lack of confidence in the legislative. In Colombia, historically, the image of the Congress of the Republic has not been praised and, on the contrary, public discourse about it has always tended to be negative. In recent decades it seemed that the 8,000 process, which featured the government of the then President Ernesto Samper and that left 26 congressmen condemned, was the lowest point in public image that this institution would have. However, in the middle of the following decade (2007), the confidence of Colombians in Congress did not exceed 37%, largely explained by the great loss of prestige left by the parapolitics scandal that left almost 50 congressmen condemned for their links with paramilitary groups.

And although between 2008 and 2012, according to the data from the Americas Barometer (LAPOP), supplied by the Democracy Observatory of the Universidad de los Andes, the confidence in Congress did not fall and even in some years it recovered, reaching the proportion of 4 out of 10 Colombians who trusted this institution, in 2013 the drop was more than 10 percentage points, and in 2016 only a quarter of citizens trusted Congress, without showing signs of recovering in the short term.

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7 It was the judicial process initiated against the then President of Colombia, Ernesto Samper, under the accusation of receiving financing from drug trafficking for his presidential campaign. Its origin was the discovery of a file with that number in the Cali Prosecutor’s Office, which corresponded to a search of the offices of a Chilean national accountant, Guillermo Pallomari, linked to the Cali Drug Cartel.

8 Name with which the political scandal unleashed in Colombia since 2006 is known for the revelation of the ties of politicians with paramilitaries, after the demobilization process carried out by several of the groups that formed the United Self-Defence Forces of Colombia. In Colombia, illegal armed groups of the extreme right that call themselves self-defences and are generally linked to drug trafficking are called paramilitaries.
The current low level of confidence of Colombians in Congress is confirmed by making a comparison with data from other countries in the region. In both 2014 and 2016, Colombia ranks among the countries with the lowest level of confidence in its Congress, along with countries such as the United States, Brazil, Haiti, and Peru, where corruption scandals involving several of its members and the little legislative management has been the predominant note at least in recent years.

Politics serves as a driving belt between society and the state. But now people are not clear who they vote for and the electoral system does not allow whoever they choose to call accounts individually. The specialized magazine *Dinero*, in the month of February 2019, published a figure regarding trust in the government, from the polling firm ACDI-VOCA⁹, according to which 10.6% of the surveyed population in Colombia trusted the local government, while 89.4% did not. It explains how the relationship between society and the state was broken. The society is becoming increasingly atomized, it is more opportunistic and, moreover, in that period of polarization, due to the peace process, it was divided. The most dramatic thing is that political mistrust failed to get ahead in one of its natural settings: the October election day. The most important cities punished the extremes and the centre managed to colonize much of that spectrum. But the local elections did not lower the fuel for the political conflict and, on the contrary, they ratified it (*Dinero*, 2020).

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⁹ As a leading market systems practitioner, ACDI/VOCA addresses issues of food security, economic prosperity, and social inclusion through locally driven market solutions. See: https://www.acdivoca.org/about/at-a-glance/.
Trust in the national government, according to the same source, is as follows: 9.1% of the Colombian population trusts and 90.9% do not. According to the aforementioned study, what perpetuates the vicious circle of corruption and mistrust in Colombia is the existence of a political class that refuses to correct the rules that would allow citizens to take them into account, in addition to the populist discourse that promises a university education with universal and free coverage, without taking into account the limitation of resources.

Regarding the limitations of the study, the data depends on a single official survey and there is no other source for its confrontation. The political culture survey used has the following disadvantages: the estimates of the study universe can be improved if the population totals obtained from the expanded sample are compared at the geographic breakdowns level with the population census totals projected to the survey date. That improvement is based on the premise that the structure by geographic breakdowns, projected from a recent population census, is more precise than the one estimated from the sample.

The regression estimators are applied using the auxiliary information corresponding to the Population Projections of the 2005 Census. In this case, the auxiliary information by age group and sex has been used. This process is carried out through Calibration Methods, which are procedures that use auxiliary
information related to the study variables in order to improve precision and reduce biases in estimates.

According to results above-mentioned, it can be concluded that with these levels of mistrust in Congress, the local and national government sustainable development goals remain stagnant or declining, with a pessimistic outlook given by the low probability of achieving them. Thus, it is mandatory to accept the challenge of modernizing itself in order to respond to the increasingly high citizen demands so that its representation work is carried out effectively. Such reforms must also be designed and implemented; however, it is not an easy task (Fung, 2015). Congresses are complex institutions that operate at different levels and in which many actors legitimately influence their management: congressmen, boards of directors, political parties, commissions, secretaries, administrative personnel, support teams, advisers, among others. All these actors contribute, from their space, to shaping and permeating parliamentary management (Romzek and Utter, 1997).

Political parties must be transformed so that they become true spokespersons for citizens. Likewise, the opinion of the citizenry on democracy as a form of government should be strengthened in comparison with other political systems; issues such as corruption and crime should be eradicated outright. It is imperative to strengthen the degree of association of citizens and the socio-demographic characteristics of the population, in this case mainly education and age. These groups of variables, particularly the first two, have empirically offered elements to strengthen their role as determinants of confidence in the legislative branch (Gómez Vilchis, 2018).

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ABSTRACT

Trust in congress and the sustainable development of Colombian territory

Trust in representativeness in congress and government has become a transcendental aspect for achieving social capital that supports the objectives of sustainable development. As a result, it is necessary to analyse the representative political culture in social capital for the sustainable development on the Colombian territory. Based on a methodology originating from the Survey of Political Culture ECP-DANE (2019) and using a Probit model, this study establishes a relation between social-demographic variables and congress trust. The results show what influence gender, age, and educational level have on trust in the congress as an important aspect for the achievement of the welfare goals of the national community. This is an essential feature of political leadership.

Keywords: trust in congress, sustainable development, Colombia
1. Introduction

Energy is defined in the present document as the body’s ability to perform an activity, move, or change properties which, at the time of generation and emission is not lost, but rather transformed (Real Academia Española de la Lengua RAE, 2018). As such, it may be affirmed that energy moves the world and drives the intensity of national economic growth. Energy permits productive systems to perform transformation processes that give rise to both tangible and intangible goods, which satisfy all sorts of needs. Similarly, its access directly provides individuals with the means necessary to meet their light, heat, and refrigeration needs, as well as access to other services that disclose their level of well-being or quality of life.

In accordance with the above, the way in which energy is generated and saved in a given economy determines the degree of the impact of human activity on natural environment conditions. An energy efficiency analysis constitutes an interest in a strategic alternative that would make sustainable development viable nationally. The fundamental purpose of this document is to analyze the way in which energy efficiency constitutes a feasible means of climate change mitigation and poverty reduction.

In order to achieve the said objective, a review of the concepts related to alternative energies, energy efficiency, climate change, and poverty was performed. Next, a reflection on the way in which humanity generates the energy necessary to meet its needs and a review of successful energy efficiency cases was carried out. Finally, those elements that establish these as efficient and effective means to achieve sustainable development were identified.
2. Materials and method

In order to obtain those elements which position energy efficiency as a strategic national interest for the achievement of sustainable development, an exploratory methodological approach was employed, specifically through a content analysis, which permitted in-depth learning about unknown contexts and the identification of the various categories reflected in the present document.

The results of this study were obtained from the implementation of three phases: the first consisted of an exploration of the literature. Therein, qualitative data were identified that permitted documentation on energy efficiency, climate change, poverty, and sustainable development, by way of scientific articles and other bibliographic sources contained in recognized databases in the international academic environment (Science Direct, Schimago, Redalyc, Dialnet, Proquest, Scielo and Google Scholar). The second phase was related to the characterization of the way in which contemporary society generates and consumes energy, as well as the review and documentation of successful cases of energy efficiency. These cases included situations of energy savings, on the one hand, and the improvement of individuals’ quality of life, through greater electric energy service coverage, on the other. In the third and final phase, energy efficiency elements were identified that converted and enhanced this as a sustainable development strategy that poor countries may implement in order to obtain improved results in their fight to eradicate poverty and improve populational quality of life, while maintaining equilibrium with the natural environment.

3. Reference framework

In function of that which this document seeks to present, the concept of energy and the typologies of energy that currently exist should be briefly described. The world ‘energy’ comes from the old Latin term energia, and this from the Greek ἐνέργεια (energeia). It refers to the ability of bodies or groups of bodies to perform a task or activity. This means that energy permits bodies to move or change properties.

There are two important typologies: energy from renewable sources, and energy from non-renewable sources. Renewable energy is that “whose sources occur in nature in a continuous and practically inexhaustible manner”. This category encompasses hydraulic, solar, marine (tidal energy), geothermic, eolic, and biomass energies. Additionally, in nature, there are non-renewable energy sources, those which, in their process of transformation and exploitation, are completely consumed. The most often-used types of non-renewable energy are petroleum and its derivatives, coal and gas, energy sources most widely known as fossil fuels (Real Academia Española de la Lengua RAE, 2018). Several advantages and disadvantages of these types of energy are summarized in Table 1.
Table 1. Advantages and disadvantages by energy type

<table>
<thead>
<tr>
<th>Energy type</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Renewable energy</td>
<td>• Once the technology is available, this has the lowest cost of energy production of the fossil fuel&lt;br&gt;• They are natural, inexhaustible, infinite, sustainable energy sources, and are available globally&lt;br&gt;• Clean energy, practically free of CO₂ emissions</td>
<td>• Significant economic investment in the initial phase, given technological and infrastructure requirements&lt;br&gt;• Technology installation and energy generation processes can cause problems and environmental imbalances&lt;br&gt;• Efficient technology for renewable energy storage has yet to be developed</td>
</tr>
<tr>
<td>Non-renewable energy</td>
<td>• Energy infrastructure and economic system designed for fossil fuel implementation&lt;br&gt;• Greater efficiency levels as generators of energy, as compared to biofuels&lt;br&gt;• Ease of transport and storage</td>
<td>• High CO₂ and other greenhouse gas emissions that accelerate global warming&lt;br&gt;• Fossil fuel reserves are limited, and with their use, are progressively depleted&lt;br&gt;• Particulate emissions generate harmful health effects, promoting respiratory and cardiovascular illness</td>
</tr>
</tbody>
</table>

Source: Author’s elaboration, based on bibliographic references

Document review on the central concepts that characterize the objective and scope of the present investigation highlight the following aspects: energy efficiency, climate change, sustainable development, and poverty, specifically energy poverty.

**Energy efficiency**

Energy efficiency is understood here as the group of activities and actions that, whether individually or collectively, privately or publicly, may be undertaken and adopted to diminish energy consumption, without affecting quality of life. In other words, it implies better energy use. This choice or decision, whether assumed individually or societally, translates to economic benefits, which include lower costs and expenditures for fuel and energy, and additionally boast the environmental benefits of mitigating the greenhouse gas emissions responsible for global warming. The installed capacity made available with energy consumption savings, as a result of energy-efficient action, makes it possible to enable access to produced energy to more individuals, companies, or industries, without the need to expand existing infrastructure (Gil, 2014).

Energy efficiency may be improved in two ways: the first is via technological change, using new technological processes and equipment, and the
second, via energy management, which implies the administration of the energy consumed, as well as a cultural change in energy use, which would reduce consumption, and simultaneously increase production capacity through the use of the same initial energy. If action that integrates new technologies and energy management is achieved, the energy consumption savings results are much more significant. As such, energy efficiency, through the adoption of actions from technology, energy management, or a combination of the two, constitutes the most concrete way to achieve sustainability in the design and construction of buildings, industrial processes, means of transport, and all kinds of human activities (González, Castrillon, Quispe, 2012).

In Colombia, energy efficiency is regulated by Law 697 of 2001, and Regulatory Decree 3683 of 2003, the norms which disclose the rational and efficient use of energy, as well as the use of unconventional energy sources, or those which are environmentally sustainable, as a matter of social, public, and national coexistence interest, so as to guarantee full and opportune energy supply, economic system competitiveness, and consumer protection. In the said regulation, energy efficiency is understood as the relationship between the amount of energy exploited versus the total amount of energy used in the energy chain process. Efficient energy use is defined as the use of energy, in such a way that the greatest energy efficiency is obtained (Congreso de la República de Colombia, 2001; Presidencia de la República de Colombia, 2003).

### Climate change

The United Nations Framework Convention on Climate Change (UNFCCC) defines climate change as “a climate change attributed directly or indirectly to human activity that alters the composition of the global atmosphere and is added to natural climate variability observed during comparable time periods” (Naciones Unidas, 1992). On the level of Colombian legislation, in the National Climate Change Adaptation Plan (PNACC), climate change is defined as “important statistical variation in the average state of the climate or in its variability, which persists during a prolonged time period (normally decades or even more). Climate change may be due to natural internal processes or changes from external forces, or even from persistent anthropogenic changes in the composition of the atmosphere or in land use” (Ministerio del Ambiente y Desarrollo Sostenible de la República de Colombia, 2011).

Scientists from all over the world, in the Intergovernmental Panel on Climate Change (IPCC), a United Nations organism that evaluates the science related to climate change, as a result of “periodic evaluations of the scientific bases for climate change, its impacts and future risks, and options for adaptation and mitigation”, have contributed technical and scientific information regarding the acceleration in the rhythm of the planet’s climate changes, as well as evidence regarding the way in which activities related to production, extraction, settlement, and resource consumption constitute the principal
cause of this acceleration in climate change (Intergovernmental Panel on Climate Change of United Nations, 2019).

Human activities, specifically those related to the direct exploitation of natural resources, cause changes in land use or vocation, as do deforestation processes, which cause significant environmental impacts, as they alter “the characteristics of ecosystems, reduce biodiversity, and promote soil degradation”. All of these adverse climatic conditions augment the vulnerability of environmental and social systems to its impacts and effects (Magrin, 2015).

Climate change is represented in the greater frequency, intensity, and magnitude of climatic events worldwide. Changes in temperature and in precipitation levels, conditions which explain the reason why drought is accentuated and prolonged in dry regions, and now why humid regions are more likely to suffer from flooding, given the increased intensity and frequency of rain, may be explained thereby. Although climate alterations manifest with global warming, society is not entirely prepared. It is necessary to make decisions related to the adaptation to and mitigation of the effects of climate change, as well as those societal actions which are aligned with its viewpoint of sustainable development (Instituto de Hidrología, Meteorología y Estudios Ambientales, 2014).

It is thus inferred that the effects of climate change affect not only the natural, but also the social environment. As such, global warming affects both natural and human systems globally. Specifically referencing its effects on the social context, warnings such as the following have been issued: “climate change is projected to increase threats to human health, particularly in low-income populations, and predominantly in tropical and sub-tropical countries” (IPCC, 2019). They further manifest that the social conditions and individual quality of life will be affected imminently, as a consequence of global warming. Based on the premise that elevated and persistent poverty and inequality levels reduce capacities for adaptation and mitigation of the effects of climate change, poor countries are more vulnerable. They are thus those which will experience the most severe effects of the environmental crisis (Intergovernmental Panel on Climate Change, 2001; Sánchez, Ortiz, Mussali, 2017; Belay, Recha, Woldemmanuel, Morton, 2017; Magrin, 2015).

**Sustainable development**

At a UN summit in Stockholm, Sweden, in 1972, interest in environmental questions was first posed on the international scene. Several years thereafter, the sustainability condition was attributed to development, a category that completely modified the way in which national economic growth had been conceived. Many studies and investigations have sought to comprehend the situation and characteristics of each of the spheres of sustainable development (society, environment, and economy), as well as the relationship between them (Naciones Unida, 2010).
Sustainable development encompasses, at the least, relationships between the economic, social, and environmental dimensions. Considering this from a systemic perspective, it also incorporates political and cultural dimensions. The integration of these five dimensions enables the implementation of real changes to reduce the environmental cost of development, and consequently, the sustainability of social, economic, and natural systems concurrently (Ramírez, 2014).

In the same way, Ramírez and Izaguirre (2018) propose sustainable development as a critical topic for the planet’s future, for which reason the development of a rationality oriented toward the transformation of interactions between humans and nature, such that the effects on the ecological system are lessened, is necessary.

**Poverty**

On the concept of poverty, there is no consensus whatsoever, within the social sciences. It may be defined in at least twelve different ways, and said definitions include notions based on material conditions, which consider the limitation of resources, needs, and hardship standards, economic conditions that consider quality of life, inequality, and economic position, and social conditions that frame the absence of ownership, lack of basic security, exclusion, dependency, and social class, although the foundation of all of these definitions of poverty consider a value judgement or important moral burden for society that refers to an unacceptable hardship that requires action (Spicker, 2009).

The different conceptual and methodological approximations utilized to measure poverty have focused, above all, on the economic dimension, by way of measurements of monetary poverty, emphasizing the income levels of individuals or groups of people (homes). However, considering the impossibility of capturing the complexity of this phenomenon using only these measurement types, other methodologies have been designed, which incorporate several aspects from the social dimension, in reference to access or provision of physical assets (land, homes, etc.), and human assets (health, education, labor ability, etc.), measures which permit an approximation of populational well-being, through time, in function of its economic hardship (Millán, 2004).

Within poverty measurements, the Poverty Line (PL), Unmet Basic Needs Index (NBI), Human Development Index (IDH), and Multidimensional Poverty Index (IPM) should be mentioned, among other measurements that reveal different dimensions of poverty. These are complementary, but not exclusionary in addressing the said social matter (Feres, Mancero, 2001). However, the analysis of poverty from the viewpoints of any of these methodologies makes it impossible to link the definition and measure of poverty, as the relationship between the three basic dimensions to which sustainable development refers, since these indicators leave out the relationships and implications of the environmental dimension as determinants of individuals’ poverty.
In Colombia, as of 2011, the National Planning Department (DNP) and National Administrative Statistics Department (DANE), began to employ the Multidimensional Poverty Index (IPM) in order to define, understand, and measure poverty. The IPM, an indicator developed by the Oxford Poverty & Human Development Initiative (OPHI) in 2010, reflects the degree of hardship for individuals in five dimensions: educational conditions at home, childhood and youth, health, and work conditions, and access to utility services and home conditions. These aspects relate to the level of hardship and income necessary in the home to cover a series of expenditures for a group of basic goods. Poverty levels have been calculated in this manner up to the present day. The IPM is employed by a significant number of Latin American countries as an indicator of poverty levels in their populations (Departamento Administrativo Nacional de Estadísticas, 2017).

Within the meanings of poverty that have been developed, in hopes of defining indicators that most precisely reflect the hardships and quality of life conditions of those living in poverty, and for the effects of the interests of the present document, energy poverty, or fuel poverty should be underscored. This emerges as a line of research when families’ economic inability to pay for the fuel necessary to heat their homes is discovered. In other words, it represents their inability to satisfy their energy use-related needs (García, 2013).

4. Discussion and results

In terms of results, below, successful cases of energy efficiency in the industrial, commercial and residential sectors of Colombia are presented, as is quantitative information regarding national energy sources and uses. These are data that may be a starting point for future research, in which, with econometric analysis, the strength of the relationship between energy efficiency, savings, coverage, and sustainable development, may be established. In the present document, these results are the bases upon which the elements that make energy efficiency a viable and effective strategy for the attainment of sustainable development, specifically in poor countries, is inferred.

Successful energy efficiency cases in Colombia

The Colombian company Enertotal S.A. E.S.P, a company specialized in efficient lighting in Colombia, lends its sustainable electrical energy, technological, innovative, and socially responsible services to nearly 19,000 clients in the industrial, commercial, and residential sectors, in 117 municipalities. Its services are focused on improving competitiveness and client quality of life. As such, in addition to other programs and projects, they design and implement energy efficiency actions, from which the following successful results emerge, in terms of energy savings, increase in electrical charges, and energy supply reliability...
ENERGY EFFICIENCY AS A SUSTAINABLE DEVELOPMENT STRATEGY

for clients. Below, information regarding several successful energy efficiency cases is provided, most of which is related to the implementation of technological changes, noted on the company’s website (Enertotal S.A. E.S.P, 2015).

• The Cooperativa Financiera Cotrafa, “Cooperate, transform, and facilitate”, implemented an integral project for technological change, specifically in their Bogota offices, which consisted of the installation of equipment with greater electric capacity, controlled by an automatic, electrical protection system, which was furnished with a fuel-supply system free of environmental risk. The integration of these changes generated greater energy provision reliability to all related infrastructure, especially its DATACENTER. The DATACENTER has a contingency system for its most important charges, both in terms of supply and electrical protection, as well as high-security plants, all of which are certifiable.

• The new cargo terminal at the El Dorado Airport implemented technological change represented by the installation of electronic energy meters with load profiles, memory for data storage, backup battery, unit for remote data transmission, and electronic direct connection meters with metric cycle registry. This technology permits it to register the facility’s historic energy consumption, facilitates the implementation of measures to optimize said resource, guarantees its rational and efficient use, and reaps yields that provide energy fee savings.

• The Santa Mónica building in Cali, in order to decrease energy consumption in common areas and guarantee efficient electricity use, implemented a technological change, and replaced traditional lighting in the common areas with LED technology. This resulted in significant consumption savings results. In October of 2014, 28,624 kilowatts of energy were consumed, in September of 2016, this totaled just 22,219 kilowatts, an average savings of 6,405 kilowatts per month.

• ICOLTRANS S.A.S., a member of the logistics and ground merchandise transport industry and works in the entire national territory, performed a technological renovation of its lighting systems with highly-efficient lights. T8 illumination technology with electronic ballast was used. Said lights decrease energy consumption by approximately 20%, and simultaneously increase lighting levels both at workstations and generally, in company facilities. They also made infrastructure modifications, when they installed transparent roofing, and changed the paint color on both roofing and walls, which would allow for maximum exploitation of natural light in their warehouses. ICOLTRANS’ Administrative and Financial Manager observed that these changes represent an annual savings of approximately twenty thousand American dollars.

• WM Impresores, a company in Cali (Colombia), provides marking and packaging solutions for a variety of products. They implemented an efficient lighting project with LED technology, which permitted an average energy consumption decrease of 3,136 kilowatts.
There are a great many more successful cases reported by other Colombian companies that consult and implement energy efficiency projects. These include: Garper Energy Solutions Colombia, a company that promotes the implementation of efficient practices, such as substituting or updating electrical equipment and systems to eliminate energy loss and create significant electricity consumption savings.

Garper presents the following results obtained from five recognized Colombian companies as success stories (Garper Energy Solutions Colombia, 2017):

- Richmond Suites replaced their lighting, pumping, air conditioning, and electric motor systems with highly-efficient systems, and attained a 48% reduction in energy consumption and an 80% reduction in maintenance costs.
- Farmatodo (a company from the pharmaceutical sector), based on a lighting system evaluation, determined efficiency measures to be implemented. They installed equipment, controls and led trainings that permitted a 30% reduction in the lighting load, implementation of automatization systems and savings in replacement and operational costs, among other benefits.
- Avianca (a commercial aviation company), modified its lighting, hangar control and Bogota office systems and achieved energy bill savings averaging 100 billion American dollars annually, reduced their electricity consumption by one million kilowatt hours annually, and observed annual reduction in greenhouse gas emissions.
- Colpatria, with the installation of LED systems in 40% of office space lighting, reduced their consumption by 20% and improved lighting.
- Centro Comercial Unicentro, in Bogota, with the replacement of compact, fluorescent lamps with LED lights that consume three times less energy, among other efficiency measures implemented, was able to save 875,000 kilowatt hours per year, and saved on replacement and operational costs, among other positive effects.

**Characterization of energy generation and use**

Within the Colombian Energy Balance (BECO), which the Ministry of Mines and Energy presented for 2016, it was established that Colombia’s potential to improve energy efficiency was quite significant, considering that, for 2015, over 50% of the energy generated was registered as lost in the national energy matrix, and just 48% was considered useful energy (Ministerio de Minas y Energía República de Colombia, 2016).

BECO results are shown in charts one and two. As related to energy consumption, they show that those sectors that consume the most energy nationally, are transport (40.90%), industrial (29.36%), and residential (16.72%). These same three sectors contribute most to losses in the energy matrix, with the transport sector in the lead. This data indicates Colombia’s need to
Figure 1. BECO 2015 energy consumption


Figure 2. Final energy consumption distribution. Colombia – 2015

improve energy consumption efficiency, based on the idea that energy is fundamental for the normal development of commercial and industrial activities, the promotion of productivity and competitiveness in the economic system, and the improvement the well-being of individuals, all of which are elements central to national development.

In order to continue with the national energy characterization, based on BECO’s 2016 results, certain particularities related to consumption and energy sources, used widely by each productive sector, are presented below.

The transport sector, as reviewed, both consumes and loses the most energy. Of the aerial, maritime, fluvial, rail, and road industries, road transport consumes 88% of final energy. The main source of ground transport energy is fossil fuel. For the transport of freight and the public transport of passengers, ACPM is used more widely, and private passenger transport uses gasoline.

The industrial manufacturing sector’s consumption, which corresponds to nearly 30% of Colombia’s final energy, is important for heating uses that create power, such as mineral coal, natural gas, bagasse and coke, which represent 83% of the total energy consumed by this sector: direct heat generation (61%) and indirect heat generation (39%). Only 17% of the energy consumed comes from electric energy, and this is used mostly for motor power. Based on this data, it is inferred that the industrial sector is another economic sector dependent on fossil fuels for energy generation.

Tertiary sector activities only consume 7% of Colombia’s final energy, showing that commercial and service activities, in general, have low energy intensities. The main sources of energy employed in this sector are: electricity (66.24%), natural gas (28.91%), and propane gas (4.84%). The main uses for electricity are as follows: light (31%), air conditioning (22.8%), refrigeration (13.9%), and motor power (12.4%). In terms of lighting technology, BECO indicates a tendency toward the modernization of lighting systems, using T5 and LED lights, although tubular fluorescent T8 and T12s persist. T8 technology is especially stable, which increases consumption in accordance with the size of the establishment that employs these.

Despite relatively low consumption, it is important to underscore that those companies linked to the sector have implemented important energy efficiency measures. These include public administration institutions, educational establishments, and hotels, among others, which are strategic for the visualization of energy efficiency benefits, in hopes of generating “replication effects” (Ministerio de Minas y Energía República de Colombia, 2016, p. 21). For this same reason, a series of legal guidelines have been emitted, for example Resolution 549 of 2015, through which the guide for water and energy savings was issued, considering the design and construction of sustainable buildings, where the potential for reductions in energy consumption may range from 10% to 45%.

In the residential sector, energy consumption mainly stems from refrigeration, lighting, and cooking. These use electricity (55%), natural gas (35%), and
a small amount of propane (10%) in urban areas, while in rural areas, firewood continues to be the most commonly used energy source (77%), followed by propane (14%), and electricity (9%). In accordance with BECO reports, the preponderance in the use of inefficient equipment and appliances by 85% of the population explains the levels of consumption and energy loss in the residential sector. However, despite the fact that individuals from socioeconomic strata 1, 2, and 3 have income limitations and receive energy consumption subsidies, during recent years, equipment has been replaced. However, that does not necessarily imply the acquisition of high-performance energy equipment. Technological change actions effective for home energy consumption savings relate to the replacement of high-performance energy appliances, illumination of parts of the home using energy-saving light bulbs and/or LED technology bulbs, and energy management actions, such as disconnecting apparatuses or placing them in a plug that effectively suspends electricity.

Finally, to bring this energy sector characterization part to a close, energy intensity is an indicator that is calculated considering the number of energy units required to produce or obtain a unit of wealth. It is used to measure energy use efficiency. Colombian energy efficiency improvement between 2000–2014 has been nearly imperceptible, in accordance with the results of the study conducted by Enersinc for the Departamento Nacional de Planeación (DNP), with the help of the World Bank and the Korean Green Growth Trust Fund (Departamento Nacional de Planeación, 2017).

Notes on the benefits of energy efficiency

Based on the idea that energy consumption is among the most important determinants of economic and productive activity, and as such, of the societal social well-being, the industrialization and urbanization processes that have occurred in recent decades, on different scales and intensities around the world, have caused ever-greater energy demands. These greater energy needs have been met principally by fossil fuels, which, when burned, emit large quantities of carbon dioxide CO₂ into the atmosphere. As the IPCC has scientifically proven, excessive CO₂ and other greenhouse gas emissions are accelerating climate change, one of the most dramatic environmental problems that society currently faces (Banco Mundial, 2012).

The world economic system’s dependence on fossil fuel for energy generation, and thus for development – practically all activities performed by humans to meet their needs – represents a challenge for society. In order to mitigate the effects of the environmental crisis, the economy must be decarbonized, insofar as energy generation, industrial and transformation processes, means of transport, and generally, the development of all economic activities themselves. Land use changes must be promoted as well, such that this resource ceases to be an important carbon sinkhole (Programa de las Naciones Unidas para el Medio Ambiente; UNEP DTU Partnership, 2016).
In the decarbonization of human activity, considering the processes used today to generate the energy that promotes economic growth, as well as the way in which this is used in various sectors of society, they are the greatest contributors to global warming. Technological developments have gained momentum, in terms of renewable energy. All clean energy, free of CO₂ and other greenhouse gas emissions, the general implementation of which would alleviate the environmental crisis in which we are currently immerse and would enable the operationalization of the sustainable development notion, since, as affirmed by UN environmental in its official page, “sustainable energy presents an opportunity to transform lives and economies while we safeguard the planet” (United Nation Environment Programme, 2019).

The International Energy Agency (IEA), in its 2014 report, entitled Capturing the Multiple Benefits of Energy Efficiency, presents the benefits that economic and social systems reap on implementation of the notion of energy efficiency in their production and energy use processes. They all constitute potential positive impacts for sustainable development, as they would provide greater wealth and well-being for society in general, in equilibrium with the natural environment. However, it is relevant to highlight the following: energy efficiency reduces the dependence on other countries generated in the procurement of energy sources. It saves monetary resources, represented by lower payments, given the restriction or slowing of consumption, decreases pollution (soil, air, and water contamination), improves human health as a result of improved physical environment conditions, reduces the pressure on natural resources to produce energy, and as such contributes directly to the mitigations of greenhouse gas emissions. With fewer threats to the environment as a consequence of climate change, the synergy between consumption reduction and technological development that occurs in energy management may generate new ventures that create new and more jobs, and promote sustainable development. As a central point of interest for the present document, it reduces poverty, provides access to clean energy to those in this condition with the existing infrastructure. In other words, energy efficiency “increases accessibility to energy services for the poorest families, by reducing the unitary cost of lighting, heat, refrigeration, and other services” (International Energy Agency, 2014, p. 23; Campos, Prías, Vidal, Lora, 2008).

As shown in diverse studies, individuals and communities in impoverished conditions are more vulnerable, owing to their low adaptive abilities and limited resilience, such that the poor are those who suffer the consequences of climate change and adverse conditions in the physical environment most acutely (Magrin, 2015). One strategy to improve their capacities for adaptation and resilience is oriented toward “exploring synergies between adaptation to climate change and mitigation, particularly in sectors such as energy”, considering that better and more equitable access to clean energy sources, in addition to contributing to reductions in vulnerability and improved resilience, may
constitute a principle for the reduction of inequality gaps and the matter of poverty (Sánchez, Ortiz, Mussali, 2017).

Within the energy efficiency elements that should be considered and which provide guidelines for the way in which poor countries may adopt this as a strategy to achieve sustainable development, are the following.

Firstly, in the decarbonization process of the economic system, the adoption of clean technologies for energy generation permits societies to reduce the harmful effects of highly contaminant energy, and thus mitigates the effects of climate change that worsen day to day, with ever-greater greenhouse gas emissions (Banco Mundial, 2017). This would create favorable conditions in the natural environment that guarantee well-being and quality of life for communities.

Secondly, energy efficiency is a mechanism to ensure the energy supply, given that, via the adoption of new technologies and good consumption habits, one may optimize the management and use of available energy resources. In this sense, it constitutes a means to accelerate and increase national productivity and competitiveness, and is among the principal strategies for the mitigation of environmental impacts produced in each phase of the energy chain (Ministerio de Minas y Energía República de Colombia, 2016).

Thirdly, considering that economic growth necessarily involves greater energy consumption, the implementation of new technologies is required. Moreover, clean, renewable energy must be the main source that moves economies to achieve the expected levels of sustainable development, not only for poor regions, but for all regions of the world. In other words, “clean, accessible energy services to improve quality of life and reduce poverty in the population” is necessary (García, 2013, p. 7).

Fourthly, access to energy facilitates poverty eradication, and to achieve this, “measures related to efficient energy use, renewable energy sources, energy source diversification, research and development of technologies that efficiently use energy, and policies that reduce distortions in the energy market” must be designed and incorporated. All of these alternatives to combat poverty were proposed many years ago, specifically beginning in 2002, in the World Sustainable Development Summit in Johannesburg. Although they have not yet materialized, these are key clues to design integral strategies to combat the social matter of poverty (Presidencia de la República de Colombia, 2003).

Fifthly, the reduction of losses and increase in energy savings that would occur with utilization of technology developed for energy management guarantees that the impacts of human activity on the natural environment would be ever lesser. As such, it is justified to implement energy efficiency actions permanently and thus simultaneously improve individual well-being and the conditions of the natural environment, which would continue over time. In order to ensure, then, efficient energy use, it becomes necessary that all public and private organizations, whether multinational or local, large or small, etc., have an energy management system that would permit the efficient and
sustainable administration of the energy it consumes, so as to produce the best results (González, Castrillon, Quispe, 2012).

The individuals, organizations, institutions, and in general, economic systems which are able to adopt energy efficiency as their form of action would obtain economic, social, and environmental benefits, including poverty reduction. With the authentic implementation of energy efficiency in a society, positive rebound effects are obtained, represented in the achievement of benefits for health, alleviation of poverty, or improvement in productivity. All of these may be results of energy savings (International Energy Agency, 2014). All of the above positive effects that redound to the sustainability of national development, would improve the quality of life of inhabitants and that of the natural environment.

“The cleanest and cheapest energy is that which goes unused”. It is based on energy efficiency that when one ceases to consume and demand energy, these savings permit energy resource preservation, and make it possible for the least favored sectors of society, who, owing to income conditions, were unable to access this previously, and now are able to access energy benefits to meet their needs, thus improving the quality of life in society in general (Gil, 2014).

5. Final notes

Dependence on fossil fuels for the development of all kinds of economic activities that occur today is significant, despite the negative effects that their use has for the environment and individuals’ lifestyles, effects which are ever more evident in their severity, intensity, and the frequency of extreme events and temperature changes.

In developing countries that are rich in natural resources, such as Colombia, in which the dynamics of productive systems and economic growth are tied to the use of fossil fuels, it is more and more urgent to take on the challenge of decarbonizing the economy, with energy efficiency being the strategy employed to attain this, as it permits the rational consumption of the energy generated. This option of energy savings via the use of less contaminating technologies, driven by clean energies, must be adopted on all levels of society, and permeate all productive activities, as it is the only way to mitigate CO₂ emissions and those of other greenhouse gas emissions, so that conditions of quantity and quality of natural resources may be guaranteed, and the threats to the environment as a consequence of climate change may be lowered. These elements become even more relevant considering that the presence and diversity of natural resources in Colombia is its main source of competitive advantage in international markets.

Energy efficiency, by way of the adoption of high-performance energy technologies and good consumption habits that translate to energy savings constitutes a mechanism to optimize the management and use of available energy resources, ensuring energy supply, reducing poverty through access to
clean energy, and mitigating the environmental impacts of economic activity. For all of these reasons, and many more, energy efficiency is the strategy that will permit national economic systems to accelerate and increase productivity and competitiveness internationally. Likewise, it is one of the main strategies that is effective for mitigation of the environmental impacts that result from human activities in each of the phases of the energy chain.

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ABSTRACT

Energy efficiency as a sustainable development strategy

The aim of this document is to identify the way in which energy efficiency contributes to sustainable development, especially in countries with high poverty rates. To this end, a qualitative investigation was performed, which made use of content analysis. Therein, based on a bibliographic review of energy efficiency in the international setting, it was possible to identify several elements which permit determination of the way in which energy efficiency is a viable sustainable development alternative. This is so because it permits the mitigation of the effects of climate change and reduces poverty, thus providing a possible solution to the environmental, social, and economic crisis faced today by communities and territories worldwide.

Keywords: energy efficiency, climate change, poverty, sustainable development
1. Introduction

The allocation of ecosystem resources for a continuously growing society has generated a constant concern since it is known that we have a limited stock of resources to satisfy needs. Faced with this problem, mankind has implemented technology as a solution to substitute products obtained from nature that continuously allow their production. However, there are functions that technology has not been able to replace, functions which the very existence of ecosystems and consequently human well-being depend on.

Based on this premise, in the 1980s the concept of ecosystem services defined as “the benefits that man receives from ecosystems [MEA, 2005: v]”\(^1\) was launched for the first time to maintain its social, economic, and environmental well-being. These ecosystem services are classified into four types: 1) provisioning, 2) regulation, 3) support and 4) cultural. Provisioning refers to essential products for human well-being since they provide food, freshwater, fuels, fibers, biochemicals, and genetic material, impacting on the family economy. Regulation and support maintain the ecological function of ecosystems, creating a world where it is biophysically possible to live, performing climate regulation, hydrological flows, water purification, waste treatment, control of the erosion, regulation of natural disasters, and pollination; support services perform soil formation and nutrient cycles. Cultural services are intangible

and encompass aesthetic, educational, cultural, and spiritual benefits, as well as opportunities for the development of tourist and recreational activities that ecosystems provide (MEA, 2005; Pasupalati, 2017). It is pertinent to clarify that not all wetlands offer the full range of regulatory services. This varies according to their type, extent, and location.

It has been shown that the social perception of the ecosystem services of wetlands indicates that they are more relevant to the subsistence of communities, giving greater importance to provisioning services, therefore, regulatory services are undervalued and often not visible for the communities. Paradoxically, the importance of regulatory ecosystem services is related to ecological processes that maintain the natural conditions necessary to guarantee the existence of wetlands and generate the necessary productivity as life support for people.

This problem is accentuated because the regulation services are part of indirect uses of wetlands that have not been studied in-depth, which results in the lack of environmental education, the lack of dissemination of its importance and impact and the lack of awareness in communities, decision-makers and wetland planners. An underlying reason for this problem is that the processes that maintain ecosystem’s functions are not visible or tangible to humans, but it is people who receive the effects of changes in the quality or quantity of these ecosystem services, causing loss or harm to communities.

A powerful tool to measure the impact of the degradation of regulatory ecosystem services on human well-being is done through economic valuation with various methods, which makes it possible to grant a monetary quantification that serves as an indicator to establish comparisons with other components of human well-being and supports decision-making for the management and use of wetlands.

In this context, the objective of this work aims to highlight the importance of the economic valuation of the ecosystem services for the regulation of wetlands, for which two fundamental questions were asked: 1) Why are ecosystem services for the regulation of wetlands important in terms of their ecological function and what is their impact on sustainability? and 2) What ecosystem services for regulating wetlands have been valued in the world and what is their monetary value?

2. Method

For the construction of this document, the qualitative methods of bibliographic review and bibliometrics were used. First, a bibliographic review of documents was carried out, containing reports and information sheets published by the Ramsar Convention, recognized as the highest authority in the matter. Within these documents, the information of the wetland regulation services related to the main aspects that determine the importance of the functions of these
ecosystems and their impact on sustainability was identified. Subsequently, in order to obtain scientific information (articles, reviews, conference proceedings, etc.) on the investigations and case studies of economic valuation of the ecosystem services of regulation in wetlands, a bibliometric review was performed in the specialized database. Scopus®, for which four advanced research equations were constructed from key research descriptors (wetlands, wetland ecosystems, regulation services, and economic valuation), using only English terms. Subsequently, the search equation was selected [TITLE (“wet land” or “wetland ecosystems”) AND TITLE-ABS-KEY (“economic value” or “economic valuation” or “economic cost”) AND TITLE-ABS-KEY (“climate” or “water” or “erosion” or “natural hazard” or “regulating services”), which obtained the highest results for a period of twenty years. Finally, the results were delimited to those that contained information about their monetary value, extracting and ordering the information in an Excel® database for analysis, sorting the data on the author, year, country, name of the study site, type of wetland, scale, ecosystem regulation service, valuation method, and monetary value.

3. Importance of ecosystem services for the regulation of wetlands

The ecosystem services for regulating wetlands are important due to the functions they perform. Wetland functions refer to ecological processes that maintain the balance of the biophysical conditions that interact and allow their existence (Secretaría de la Convención de Ramsar, 2006). Therefore, it is important to highlight that changes (favorable or unfavorable) in the regulation of wetlands will have an impact on the sustainability (social, economic, and environmental) of the communities.

The importance of natural wetlands for sustainability is represented by its great economic prosperity calculated for coastal wetlands at USD 193.845/ha/year for Continental at USD 25.682/ha/year (de Groot et al., 2012). In addition, around 200 million people around the world live in them, they are sources of employment, and they help produce a significant amount of food, contributing to the livelihood of more than a billion people around the world. This would not be possible without the proper functioning of regulatory ecosystem services.

Wetlands are ecosystems recognized for their ability to regulate the climate, becoming an essential solution to the global problem of climate change that causes global warming, rising sea level, increases the intensity of the rainfall and increases droughts, acting as a catalyst for natural disasters such as floods, hurricanes, tsunamis, and storms. This has a significant socio-economic impact on the territory and affects the quality of life of people. Viewed in this way, coastal wetlands such as mangroves, coral reefs, and marshes are considered as natural protection against the coastline, reducing the effect of storms, since they reduce wind speed, soften the impact of the high energy
waves, and slow coastal erosion. Thus, it has also been shown that seagrasses can control salinity as an effect of rising sea levels, avoiding the destabilization of the system.

Wetlands are natural ecosystems responsible for regulating hydrological flows. They charge and discharge underground water systems and store water for agricultural and industrial use. This function is related to the permeability of the soils that make up the wetlands that allow the passage and retention of water. These services are mostly provided by continental wetlands such as rivers, streams, lakes, and swamps including flood plains.

Additionally, wetlands play a fundamental role in regulating natural disasters related to water. In the last decades, it has been identified that the main climatic imbalances combined with extreme events related to water have caused 90% of the natural disasters in the world. In particular, floods are generated by intense precipitations in short periods and by the saturation of the soil, decreasing its rate of infiltration of water into the subsoil. Flood plains, lakes, and swamps have the ability to absorb and store water from heavy rainfall and avenues of water, which prevents floods.

Furthermore, natural wetlands have been recognized as primary ecosystems in the mitigation and adaptation of climate change, so that in 2019 the Paris Agreement recognized the role of wetlands by limiting the amount of atmospheric carbon. In this sense, peatlands contain around 550 gigatons of carbon, which is why they are considered the most effective carbon sinks that exist by storing three times more carbon than forests. Contrary to its large storage capacity, peatlands are scarce ecosystems that occupy about 3% of the earth’s surface and are highly threatened by anthropogenic activities accelerating their loss and degradation. From the total peatland worldwide, Malaysia has the 56% of these wetlands, but the pressure produced by the intense desiccation for the development of agricultural activities, mainly from oil palm, releases large amounts of carbon dioxide into the atmosphere, threatening its conservation and restoration as elements of climate change mitigation (Evers, Yule, Padfield, O’Reilly, Varkkey, 2017). Also, mangroves, saline marshes, and seagrass beds store twice as much carbon as terrestrial forests, and limit at least 35% of the total terrestrial organic carbon stored in their soils in the long term, playing an essential role in limiting the main greenhouse gas in the atmosphere.

In natural wetlands, the relationship between plants and soil types is significant for water purification and waste treatment processes. Through this function, they eliminate high concentrations of nutrients such as nitrogen and phosphorous in water as surpluses from the agricultural industry, avoiding eutrophication in the bodies of water. Some studies show that certain types of vegetation typical of wetlands such as *Eichhornia crassipes* (water hyacinth), and some species of *Typha* and *Phragmites* have both the ability to absorb and stabilize toxic compounds present in water in their tissues, among which stand out heavy metals, such as cadmium, zinc, mercury, nickel, copper, and
vanadium, and remove pharmaceuticals. As a matter of fact, this same function is copied by the technology of wastewater treatment plants called artificial wetlands. However, the conservation of continental wetlands such as lakes, rivers, streams, and swamps contribute to lower investment costs in the installation of wastewater treatment plants and does not generate operation and maintenance costs. This represents its main advantage over constructed wastewater treatment systems.

Natural wetland systems provide the pollination service since they constitute the habitat of a variety of pollinating species that guarantee communities’ food supply. This regulatory ecosystem service has been scarcely addressed in the documents of the Ramsar Convention, however, it is extremely important for the sustainability of communities in terms of nourishment.

4. Economic valuation of wetland regulation services

Based on the results of the bibliometric analysis in the specialized database Scopus®, 153 documents related to the regulatory ecosystem services in wetlands were found; nevertheless, the search was delimited using the *economic valuation* descriptor, with which 26 documents were obtained (84.6% articles and 15.4% reviews). In the end, nine documents (articles) that had the necessary elements to carry out this analysis were reviewed and integrated into an Excel® database.

Graph 1 shows that the ecosystem services of flood regulation are the most frequently studied, representing 23% of the total number of investigations; followed by water purification and chemical oxygen demand (18%); in the third place there is carbon storage, sequestration, and fixation (17%); in the fourth position the storm and coastal protection (12%); and at long last, erosion control, groundwater charging, nutrients recycling, water and supply regulation with a 6%. The dominant continent in research on the economic valuation of regulatory ecosystem services is Asia, as China has produced at least a third of the studies analyzed in this chapter. However, North America, Europe, and Oceania also have case studies regarding these services provided by wetlands.

Services of regulation, control, and flood mitigation have been studied in countries such as Bangladesh, China, the United States and the Federated States of Micronesia, as well as in Europe, Africa, and South Asia. These studies have been conducted more frequently in mangrove wetlands, rivers, swamps, flood plains, river systems, and in some cases have included artificial wetlands. The widest scale of study used to determine the value of these services is the regional scale and one global study. Climate change, the damage, and the meta-analyses have been used as study approaches to the economic valuation of these services. Economic valuation methods have included simulating scenarios of climate change and damage through histograms, replacement costs using reservoir construction costs as the basis of economic analysis.
The data has been collected through techniques with Geographic Information Systems (GIS) and national information databases (survey data from wetlands in China). Due to the differences in the techniques and objectives of each study, no homogeneous results were found in terms of units and monetary values. The main findings showed that, in the coastal zone of Bangladesh, a flood induced by the relative rise in sea level would generate losses in the total value of ecosystem services, such as the provision of raw materials and food, which range from USD 0–1 million to USD 16.5–20 million (Mehvar, Filatova, Sarker, Dastgheib, Ranasinghe, 2019). In the case of Beijing, the flood regulation service was estimated at RMB 15.89 billion in 2014, with an average of RMB 0.31 million/ha (Zhang, Shi, Liu, Xu, 2017). In Otter Creek wetlands in Middlebury, Vermont, United States, flood mitigation services ranged between USD 126,000–450,000 (Watson, Ricketts, Galford, Polasky, O’Niel-Dunne, 2016). At last, in a meta-analysis that included wetlands from the continents of North America, Europe, Africa, Asia, and Oceania, it showed that the value of flood control was on average USD 6,923/ha/year, while the median was USD 427/ha/year (Brander et al., 2013).

Coastal wetlands, rivers, swamps, river systems, and artificial wetlands have been studied for the assessment of ecosystem services for water purification,
including the purification of chemical oxygen demand (COD) as a parameter of water contamination. Most of the scale of study has been developed at a regional level and has been studied at a local level, the Total Economic Valuation (VET) approach was utilized, using cost-elimination methods for the COD pollutant, market price, the shadow price, and pollution prevention costs. Data collection techniques include GIS and wetland survey data. For this ecosystem service, it is China which is leading, valuing the purification of water in coastal wetlands in Zhejiang Province in CNY 7,698 × 10^8 /year (Wang et al., 2012) and coastal wetlands Sanchahe in RMB 38.14 × 10^4 (Chen et al., 2007). In contrast, the purification of COD valued in Beijing’s rivers, swamps, river systems, and wetlands was estimated at RMB 169 million in 2014 (Zhang, Shi, Liu, Xu, 2017).

On the other hand, storage, sequestration, carbon fixation, and oxygen release services have been quantified in coastal wetlands, swamps, salt and freshwater marshes, and rivers in countries such as China and Canada. The VET approach has considered this type of ecosystem services, studied to a great extent at regional and local levels, grouping economic valuation methods the social cost of carbon calculated, using the Integrated Dynamic Climate and Economy model, market prices, the cost of reforestation, shadow prices, the cost of pollution prevention and ecological value. For this, data on net carbon sequestration rates and data from wetland surveys, among others, have been collected. Like the regulation of floods, the units and currencies in which the results of these investigations were presented are heterogeneous. For example, in the case of the storage provided by marsh and marsh wetlands in Nova Scotia Canada, they were estimated in the range of USD 124 and 373 ha⁻¹ year⁻¹, ranging from USD 5,105–39,795 ha⁻¹ (Gallant, Withey, Risk, van Kooten, Spafford, 2020). In China, the carbon sequestration and oxygen release provided by the wetlands of Zhejiang Province were valued at RMB 11,867 × 10^8 /year (Wang et al., 2012); while in the Sanchahe wetland in the region of Huaihang carbon fixation obtained RMB 314.30 × 10^4 (Chen et al., 2007).

Coastal wetlands and mangroves provide a service of storm protection and coastal protection decreasing wind speed and holding back the surge. This service has been valued in Sundarbans wetlands in Bangladesh and Zhejiang Province in China using a regional scale of study. Contingent valuation along with market price methods, reforestation costs, shadow price, and ecological value have been used to estimate the monetary value of this service. Also, one of the most used data to value this function is the replacement cost using the dike construction price. In the case of Bangladesh, the amount of storm protection was estimated at USD 13 /ha (Rahman, Jiang, & Irvine 2018) and in the case of China coastal protection amounted to CNY 37,944 × 10^8 /year (Wang et al., 2012).

The value of control erosion was estimated in the case of the mangroves of Sundarbans in Bangladesh. This function was estimated through the contingent valuation method applied on a regional scale, appraising it at USD 2/ha (Rahman et al., 2018).
In another perspective, groundwater recharge service in the seasonally flooded saline wetlands in Botswana was estimated under the approach of VET with a regional scope, using static and dynamic cost-benefit models, bibliographical review, and interviews with interested parties. Its value was calculated between BWP 9–10 million, for total water consumption of between 3.12 and 3.73 Mm³ (Setlhogile, Arntzen, Mabiza, Mano, 2011).

Likewise, in the study of the Sanchahe riparian wetlands, the ecosystem service for water regulation was also assessed, under the VET approach at the local level, quantified in the amount of RMB $562.80 \times 10^4$ (Chen et al., 2007).

The economic value of ecosystem services for nutrient recycling and water supply was estimated as part of a meta-analysis on a global scale that selected freshwater, brackish and saline marshes; non-vegetated sediments; estuarine, marine, riparian, marsh, lake wetlands, and wetlands constructed in the regions of North America and Europe, Africa, South Asia and the Federated States of Micronesia. The average value calculated from 38 valuation studies concluded that nutrient recycling is worth an average of USD $5,788 /ha/year$ (median USD 243/ha/year), and the water supply was estimated at an average value of USD $3,389/ha/year$ (median USD 57 /ha/year) (Brander et al., 2013).

Finally, based on the advanced search strategy used, no economic evaluation results were found for the pollination service. The absence of results for Latin America and the Caribbean is also highlighted.

5. Conclusions

The benefits that humans receive from wetlands are often the result of regulatory ecosystem services. These important ecosystems work thanks to the balance between the interactions of biophysical conditions, which are altered mainly by the development of anthropogenic activities, among which the global problem of climate change stands out due to the impacts it causes locally in terms of sustainability. However, its resilience capacity helps shape sustainable communities and cities.

From this perspective, it is important to mention that 78% of the results show that the investigations consider the scope at the regional level as part of their studies, which is recognized as a success because it is considered to be the context that influences decision-making on the territories that have an impact on the sustainability and conservation of wetlands.

It should be noted that the results obtained through the search strategy used did not show studies referring to the economic valuation of the pollination ecosystem service despite its great importance for achieving food security, as well as the impact it currently receives due to the effects of climate change and the loss and degradation of wetlands as habitat for pollinating species.

Another important finding is that the research did not yield results of monetary valuation investigations of the regulatory ecosystem services in wetlands
for the Latin America and Caribbean region, coinciding with what was found in the meta-analysis prepared by Brander et al. (2013). This result stands out in the framework of regulatory services because Latin America and the Caribbean are regions most affected by natural disasters, particularly floods, leaving a total of 53 million people affected and economic losses of USD 1 billion in the last twenty years (ONU 2020). These facts show that research into the economic valuation of regulatory services in this region should be encouraged to serve as a supporting tool in decision-making and community awareness.

Bibliography


A LOOK AT THE IMPORTANCE OF THE ECONOMIC VALUATION OF THE REGULATION SERVICES OF NATURAL WETLANDS

Wetland regulatory services provide a variety of benefits to humans. This work aims to highlight the importance of economic valuation of regulatory services in wetlands, based on the main aspects of the ecological functions that they perform and their impact on sustainability, and through the exploration of research and case studies of economic valuation of these services worldwide. The qualitative methods of bibliographic review from documents (reports and fact sheets) published by the Ramsar Convention and bibliometrics in the specialized database Scopus® were used. The main results show that regulatory services are paramount to maintain productivity and sustainability of communities and the economic value of the services of flood regulation; water purification, carbon storage, sequestration and fixation have been most frequently studied. Coastal wetlands are the most thoroughly explored from this approach. Based on the criteria and research strategy used, it was not possible to obtain results that would visualize studies assessing ecosystem services of pollination in wetlands and so generally no studies were found for Latin America.

Keywords: wetland, ecosystem services, monetary valuation, indirect uses
Introduction

The water on the planet has remained unchanged over time in terms of quantity, “what has changed is the proportion of its different states, i.e. solid, liquid and gas, and the proportion of salt and fresh water present in the different geological eras” (Rodriguez, 2019, p. 127), in addition to the conditions of quality and location of this water on the earth. A good part of these changes are caused by human action, which interferes with water stocks and flows. According to the principle of “entity” (Mattessich, 2002, p. 36), the users (states, organizations, individuals etc.) must report the capture, circulation and return of water resources that they have appropriated for the fulfillment of their corporate purpose, following the modification of the condition of the resource, either by depletion, degradation, location and/or improvement of the resource.

“In the operation of the cycle, the oceans are the largest water reservoir, the most part of the planet’s water is salty and only a small part is fresh. The water of the oceans represents 97.5% of the total water of the Earth, while the fresh water, which is found in the continents and islands, only represents 2.5%. But of the total of fresh water, 69% is captured in glaciers and 30% in the subsoil” (Rodriguez, 2019, p. 129). Water is a vital good, as it has been understood by the different international institutions, which have determined instruments and mechanisms for its protection; in the accounting field, procedures have been developed for its assessment and reporting by organizations such as the United Nations UN, the Global Reporting Initiative GRI, the System of Environmental Economic Accounting SEEA and the International Integrated Reporting Council IIRC.

The condition of the water resource and the importance it has for life, demands the promotion of water governance systems that allow for its sustainability. Integral and sector based inclusive management requires multiple instruments and tools that allow for a socio-environmentally responsible
administration exercise that, from the frameworks of social and institutional convergence, allow for an environmental management as well as water management of the territories. Water governance implies the development and use of multi-criteria measurements of a broad nature that interrelate the greatest number of variables associated with water resources. In addition, it is necessary to develop instruments that allow for the assessment and permanent control of management, based on the fulfillment of internal goals and compliance with external provisions, established in the context of a moral commitment based on global sustainability.

The term governance has a polysemic character, is defined from different approaches, is understood as a process that allows organizations to jointly promote and implement actions agreed between communities spatially and temporally determined to solve common problems, or draw up joint plans. Some authors circumscribe it to actions promoted from institutionality guaranteeing authority, legitimacy and recognition through public policy, as a mechanism that generates state-individual trust. It can also be understood as the set of macro agreements that a society, even from private initiative, conceives of public goods and the way to protect them jointly. Consequently, water governance can be thought of as the coordinated, planned and agreed relationship between public regulation, institutional policies, organizational actions and social actions, focused on the protection, safeguarding and sustainability of a good that is socially conceived as vital.

Governance invokes collective action, the individual reaches his/her fullness according to the general interest, which recognizes him/her as necessary in the process, but sufficiency is achieved jointly, the result is achieved when there is a synchronous action by all social actors. Overcoming contradictions and converging on points associated with the common good is one of the benefits of governance, which contributes to the transparency, participation and legitimacy of the social system. Social convergence is tied to shared values and public trust among the actors in the system, where there is agreement on the recognition of the importance of water and the need for its protection and safeguarding; in addition to trust between the different social actors, and that each actor will strive to achieve this socially validated objective (Arias and Vargas, 2010, p. 294; González, Boza and De León, 2018, p. 149; CILEA, 2013, p. 16).

An accounting system based on sustainability is a significant contribution to good governance and the achievement of its objectives. Bio-accounting is a discipline that promotes the knowledge of funds and the circulation of natural wealth and the evaluation of the management of organizations with respect to this wealth (Mejía and Serna, 2018, p. 95). A governance system based on sustainability requires a theoretical, conceptual and procedural accounting reporting system aligned with a vision committed to the protection and conservation of natural wealth. Water asset accounting based on sustainability must recognize all the factors, focused on a sustainable society, such as the
SDG Sustainable Development Goals, the Global Compact principles and the frameworks for water governance issued by the Organization for Economic Cooperation and Development (OECD); but above all, it must develop instruments of assessment and representation, associated with the existence of the resource more than with the benefits that it represents for man, in what has been called extrinsic assessment-versus intrinsic assessment associated with the dichotomy sustainable development versus sustainability, weak sustainability versus strong sustainability or environmental economy versus ecological economy Mejía (and Serna, 2015, p. 113; Mejía, 2019, p. 101).

The quality, location and trajectory of water changes for its own autonomy, but is also a result of anthropogenic activities affecting the different life forms on the planet. In this sense, accounting has the big challenge of giving an account and a reason for the existence and circulation of water wealth, contributing to integrated water management systems as an essential factor for its optimal conservation in conditions of quality, location and disposition on the planet. The big challenge of accounting is in contributing to clarify the management that the organization has with respect to water stocks and flows and their effects on life in all forms. As mentioned above, there are several types of water accounting, including accrual accounting, management accounting and special use qualitative-explanatory reports.

Fresh water is renewed through a continuous cycle of evaporation, precipitation and runoff – commonly known as the water cycle – which determines its distribution and availability in time and space; with respect to these processes, the statements and accounting reports should describe, explain and prescribe these behaviors. The accounting information system is complex and multidimensional and therefore, must use a plural assessment (Correa, 2018, p. 121) because the faithful representation of reality requires the recognition of the multiple interactions and existing flows; the faithful representation is not achieved with homogeneity, but with the inclusion of the most representative heterogeneity of reality.

“An accounting information system (AIS) is the organized set of interacting and interrelated elements and subsystems, which, integrating a unitary and complex whole, are intended to satisfy the needs of users in the study, description and projection in monetary and/or non-monetary terms, of the state of objects, facts and/or persons, attributable to a social entity, with the aim of managing. That is to say, every accounting system has an objective to fulfill, that of producing useful information that the recipient can manage; and it is in this intelligence that the information communicated must be of relevance” (García Casella, Fronti de García, Chiquiar, 2018, p. 19). By understanding that in society there are stakeholders who struggle for different interests, it is possible for different environmental accounting systems to coexist, which allows different interests to be satisfied. For example, the representation of water resources is not the same if it is done by a stockman, a farmer, a hydroelectric plant manager, an environmentalist or a government entity.
This document presents a proposal of the basic criteria for the development of a water accounting system under the guidelines of bio-accounting, compared to the existing accounting models that allow the recognition of water as an asset and the reasons why such recognition, measurement, presentation and disclosure processes are not adequate, partial or incomplete in the face of the need for a theory, model and system of water accounting based on sustainability. It is argued that a water accounting model should be bio-centric (not anthropocentric), use intrinsic assessment (recognizes but exceeds extrinsic assessment), be holistic (not reductionist), complex (not deterministic) and support responsible use of the resource (not unsustainable).

**Water as a vital resource**

“Water is an essential element for the existence of the planetary ecosystem and the living beings that inhabit it” (Vallejo, 2011, p. 39). Water fulfills multiple environmental functions that are vital for the existence of ecosystems and the conservation of life in all its manifestations, such as atmospheric regulation, climate regulation and water availability, soil formation, nutrient regulation, biological control, food, quasi-universal solvent, among others (Gomez-Baggethun, de Groot, 2007, p. 7–9; Vallejo, 2011, p. 39). Human actions can alter these functions and potentialities of the water resource, bringing significant consequences for the dynamic preservation of life on the planet. The following institutional data reaffirm the vital importance of water:

1. “Water covers about 70% of the earth’s surface and makes up about 72% of the living tissue of animals, plants and humans” (Vallejo, 2011, p. 39).

2. “Accessible, high-quality fresh water is a limited resource with high variability. OECD projections indicate that 40% of the world’s population lives in river basins under water restraints and that water demand will increase by 55% by 2050 (OECD, 2012a cited in OECD, 2015, p. 1).

3. “Approximately 884 million people lack access to safe drinking water and over 2.6 billion people do not have access to basic sanitation, and it is alarming that each year approximately 1.5 million children under 5 die and 443 million school days are lost as a result of water and sanitation-related diseases” (UN, 2010, 2).

4. “By 2050, 240 million people are projected to be without access to safe drinking water and 1.4 billion without basic sanitation” (OECD, 2012 cited in OECD, 2015, p. 1).

5. “A considerable investment, estimated at US $ 6.7 trillion until 2050, is required to renew and modernize water supply and sanitation infrastructure. If a wider range of water-related infrastructure is included, the bill could triple by 2030” (OECD, 2015c, as cited by OECD, 2015, p. 1).
6. “Water use has been increasing worldwide by approximately 1% per year since the 1980s. Agriculture (including irrigation, livestock and aquaculture) is by far the largest water consumer, accounting for 69% of annual global water withdrawals. Industry (including power generation) accounts for 19% and households 12%” (UN, 2019, p. 14).

7. “Global water demand is expected to continue increasing at a similar rate until 2050, up to an increase of 20 to 30% above the current level of water use. Although specific projections may vary somewhat, current analysis suggests that much of this growth will be attributed to increases in demand from the industrial and domestic sectors” (UN, 2019, p. 14).

8. “More than two billion people live in countries experiencing high physical water restraints. Although average global water restraints is only 11%, 31 countries experience water restraints between 25% (defined as the minimum threshold of restraints) and 70%, and 22 countries are above 70%, and therefore are under severe water restraints” (UN, 2019, p. 15).

Water governance

Despite the importance of water as a resource for life, it was only in 1992, under the Dublin Declaration (Ireland) that a document, that would make central reference to fresh water, was published. This document establishes the principles that should rule optimum governance of the water resource and set out the actions to be taken and verification measures to be implemented, all of which were framed in terms of the conservation of adequate conditions for the conservation of water as a guarantor and support for life.

The International Conference on Water and the Environment (ICWE, 1992) in the Dublin declaration established four principles for the protection of water resources:

1. “Fresh water is a finite and vulnerable resource, essential for sustaining life, development and the environment”. The need for integrated, effective and inclusive management to achieve responsible use of water resources is recognized.

2. “Water development and management should be based on a participatory approach involving users, planners and policy-makers at all levels”. In accordance with the approaches of post-normal science, the diagnosis, search for solutions and decision making with regard to social problems must count on the real participation of all the actors involved, understanding their intervention as valid partners and real decision makers (Funtowicz, Ravetz, 2000, p. 51).

3. “Women play a fundamental role in the supply, management and safeguarding of water”. The role of women is recognized as the main
actor in social dynamics, as essential decision makers and as leaders in the social awareness of protection and safeguarding of natural wealth (Martínez Alier, 2011, p. 80).

4. “Water has an economic value in all its various and competing uses and should be recognized as an economic good”. This is a point that has generated various discussions, since in different jurisdictions the consideration of water as an economic good has been rejected, and in other cases, the allocation of an economic cost/price is associated as a protection mechanism and not as a commercialization means.

The publication of the document “Caring for the Earth: A Strategy for the Future of Life” recognized the importance of the water cycle for the sustainability of life and ecological processes on the planet, and then addressed the main aspects of its problem, the scarcity caused by the diversion, retention and abuse of water for agriculture, the growth of salinization processes, water degradation, as a result of pollution and discharges, among others. Different social actors agree that to maintain the water benefits and overcome its present problems, its care and protection are required, which translates into an adequate governance of the water resource.

Vallejo (2011, p. 25–26) notes that conservation is understood as “the management of human use of organisms and ecosystems, to guarantee the sustainability of such use. Apart from sustainable use, conservation includes protection, maintenance, rehabilitation, restoration and improvement of populations and ecosystems”. Guaranteeing the conservation of the quality, availability and temporary location of water resources requires responsible management by different social actors: government, businesses and households, driven by an environmental ethics committed to present and future generations (Gurria, 2007, p. 143; Ríos, 2009, p. 78–85; Francisco, 2015, p. 8).

The organizations’ social responsibility is an important support in the integral management of resources and in the call for actions by the entities based on the common interest and, therefore, on water sustainability (Raufflet et al., 2012, p. 118; Sánchez, Grau, 2016, p. 38).

Achieving water resource safeguarding implies actions that national and international entities have promoted. The Organization for Economic Cooperation and Development OECD (2015, p. 4) has promoted a water governance agenda based on three basic principles: first, effectiveness, clear roles and responsibilities, appropriate scales within basin systems, policy and training coherence; second, efficiency, data and information, financing, regulatory frameworks, innovative governance and trust; and third, participation, monitoring and evaluation, arbitration between users, urban and rural areas and generations, stakeholder involvement, integrity and transparency. A governance roadmap has been set out by the OECD (2015, p. 5) with the following steps: policy and strategy formulation, implementation, and monitoring and evaluation.

The OECD (2015, p. 9–12) formulated twelve general water principles grouped into the three following categories: improving the effectiveness of
water governance, improving the efficiency of water governance and improving trust and participation in water governance. The principles highlight the importance of allocating responsibilities, management at appropriate scales, cross-cutting coordination, adaptation to the level of authorities’ capacity, information sharing, efficient resource allocation, effective application of regulatory frameworks, implementation of innovative practices, stakeholder participation, integrity and transparency practices, managing arbitration between users, promoting regular monitoring and evaluation of water governance and policies.

**Environmental-financial and non-financial organizational reports**

The United Nations System of Environmental and Economic Accounting (SEEA) and the annexed SEEA-Water system (SEEA-Water) constitute the macro format that allows for the reporting of the existence and circulation of water resources at the national level. The SEEA Central Framework is the first international standard of the United Nations Statistical Commission in terms of environmental and economic accounting. It was approved in 2012 as a result of the revision and improvement of previous versions of the “National Accounting Manual: Integrated Environmental and Economic Accounting IEEA” (1993–2003).

“The Central Framework SEEA provides a methodology for assessing the natural resources (renewable and non-renewable) and land, consistent with the 2008 System of National Accounts (SNA) asset boundary, which represents the full assessment of natural resource and land assets and related flows” (UN et al., 2016, p. 6). The central framework has the merit of using physical and monetary units to represent natural wealth, which influences the stock and flows of environmental resources. The SEEA reports on a variety of assets, including energy, air emissions, water emissions, solid waste, mineral resources, energy resources, land, forest and ecosystem accounts, soil resources, timber, water, natural and biological and water resources asset accounts, which is the main focus of this research-publication.

The SEEA-Water was issued in 2013 based on SEEA central framework and a satellite system of the System of National Accounts SNA 2008 of the United Nations UN. The system addresses water flow accounts within and outside the market, from and to nature, as well as between businesses, government and households; it addresses the asset account, the classification of economic activities and products associated with water use, the asset study under spatial and temporal conditions, exposes water use, supply, degradation and pollution accounts, as well as procedures for their physical measurement and monetary valuation.

Five accounting categories are covered by the SEEA-Water: supply tables, physical use and emissions accounts; hybrid and economic accounts, asset
accounts, quality accounts, water resources assessment. Based on the system of accounts, the (UN Naciones Unidas 2013, 1.15) prescribes reporting on water resources funds and flows from and to the environment, pressures generated by the economy, supply and use by sources and uses, reuse, costs generated, financing, payments established, resource available, investments and infrastructure installed and in process of installation in relation to the water resource.

Integrated water resources management is based on the concept of water as an integral part of the ecosystem, as a natural resource, and as a social asset, whose quantity and quality determine the nature of its use. The SEEA-Water (2013, 1.24) can help policy makers to make informed macro decisions regarding efficient resource allocation, understanding the impacts of water management, improving investment and performance matching resource supply and demand, standardizing information systems, and achieving higher participation of all stakeholders.

The SEEA is presented at the macro level; at the micro level, i.e. from the organizations, it interacts with the stakeholders through different means, with financial and non-financial reports and statements, which are the most recognized mechanisms. The International Financial Reporting Standards IFRS (IASB, 2019) is the globally accepted model for organizational financial reporting. There is a consensus among theorists and regulators regarding the need to complement IFRS organizational reports through non-financial reports that can represent the environmental, social and cultural wealth managed, used, improved and/or destroyed by organizations (Mejía and Serna, 2018, p. 151). Most of the emerging reporting models are voluntary and there are several methodologies that can be implemented by the entities.

The proposed organizational reporting methodologies have allowed organizations to gradually expand the supply of non-financial information through sustainability reports, integrated reports, social and environmental balance sheets, among others. In the United States, the Sustainability Accounting Standards Board (SASB) was created in 2011 and Europe has recently issued regulations regarding the presentation of non-financial information (EU, 2017), including climate information (EU, 2019). These developments are important, but they do not replace bio-accounting statements and reports, which due to their structure and aggregation are less likely than discretionary organizational reports to diffuse, hide and cover up transcendental information on the impact that environmental, social, economic, cultural and institutional wealth has been generated. Knowing the organizational reality is necessary for adequate decision making by the different stakeholders.

Traditional accounting has provided for the financial information of organizations. Accounting research has developed new disciplines aimed at describing and accounting for natural and social wealth. Bio-accounting is an accounting discipline that studies the qualitative and quantitative assessment of the existence and circulation of environmental wealth controlled
by the organization, which through intrinsic and extrinsic methods evaluates the organization management in the wealth control, to contribute to the optimal accumulation, generation, distribution and sustainability of such wealth. The bio-accounting statements propose the following asset-liability accounts: 1. Hydrological, 2. Atmospheric, 3. Fauna, 4. Flora, 5. Soil, 6. Subsoil and 7. Mining-energy. These bio-accounting states would be invaluable for good governance of natural resources.

The new accounting for sustainability must recognize that systems are complex, that the economy is a subsystem of the biosphere system, for which it will have to rely on theories such as green economics, bio-economics, bio-ethics, social metabolism and political ecology; it will use generic tools such as Multi-Scale Integrated Analysis of the Societal and Ecosystem Metabolism (MUSIASEM), multi-criteria assessment and three-dimensional accounting

<table>
<thead>
<tr>
<th>Model or system</th>
<th>Issuing entity</th>
<th>Current version</th>
</tr>
</thead>
<tbody>
<tr>
<td>System of control accounts and environmental balance, SCCOBAMB</td>
<td>Eduardo Mantilla Pinilla</td>
<td>2006</td>
</tr>
<tr>
<td>Disclosure of climate information</td>
<td>Climate Disclosure Standards Board</td>
<td>2007</td>
</tr>
<tr>
<td>OECD guidelines for multinational enterprises</td>
<td>Organization for Economic Cooperation and Development OECD</td>
<td>2011</td>
</tr>
<tr>
<td>Integrated Report</td>
<td>International Integrated Reporting Council (IIRC)</td>
<td>2014</td>
</tr>
<tr>
<td>Social and environmental balance model for SMEs</td>
<td>Committee for Latin Integration Europe-America CILEA</td>
<td>2015</td>
</tr>
<tr>
<td>Report on contribution to the Objectives of Sustainable Development</td>
<td>United Nations UN</td>
<td>2015</td>
</tr>
<tr>
<td>System of Environmental and Economic Accounting SEEA</td>
<td>United Nations UN</td>
<td>2016</td>
</tr>
<tr>
<td>Sustainability reports</td>
<td>Global Reporting Initiative GRI</td>
<td>2016–2018</td>
</tr>
<tr>
<td>Accounting standards for sustainability</td>
<td>Sustainability Accounting Standards Board SASB</td>
<td>2017</td>
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</tbody>
</table>

Source: Drafted by authors
theory. Water accounting, in addition to traditional tools, will be based on Integrated Water Resources Management (IWRM) approaches, recognition of the multidimensionality of water resources, incorporating the multilevel accounting matrix of water flows, the Water Metabolic Rate (WR), impact models and measurement of the ecosystem value and social flows, the implications of classifying water as an eco-social asset, among other legal, social, institutional, political, physical, chemical, biological and geological approaches to water (Velázquez, 2007, p. 252).

The above components must be included in the design of a specific water accounting system, for which a logical deductive route proper to accounting must be followed as established by the Three-Dimensional Theory of Accounting in its philosophical, contextual, conceptual, procedural and assessable components. The procedural component can be developed in accordance with what is indicated by the Research Institute on Administration, Accounting and Quantitative Methods for Management of the University of Buenos Aires, which presents five points that an accounting information system must have. These elements are appropriate for a bio-accounting system and specifically for the quantitative and qualitative reporting of water assets. The elements are the following (García García Casella, Fronti de García, Chiquiar, 2018, p. 21–22): inputs, processing, output, control and feedback.

Conclusions

1. Water is a vital resource for life and the health of species and ecosystems on planet earth. Water protection, conservation and sustainability requires good governance to ensure adequate integral management of the resource, for which purpose it must be supported by various sciences, disciplines, technologies and techniques in all fields of knowledge. Bio-accounting as a field of knowledge focused on the study of the qualitative and quantitative assessment of natural wealth (including water), is an important theoretical, conceptual and procedural complement to achieve the common goal of safeguarding water as an essential good for present and future life on the planet.

2. The degradation and depletion of drinking water and the general deterioration of the water resource is the result of an absence of water management or weak management systems, which indicates that water uses and their administration have focused on institutional, business or household consumption, without paying sufficient attention to the water cycle and the real capacity of the water supply to support the growing demand.

3. Integrated water resource management corresponds to a model that coordinates and plans the joint actions of the State, businesses and households; all stakeholders must be committed to the conservation of
optimal spatial-temporal water quality and quantity conditions, where actions obey a systemic, holistic and articulated plan.

4. The sustainability of water resources requires the consolidation of a knowledge dialogue (post-normal science), which brings together scientists and non-scientists to diagnose and present alternative solutions to water-related problems, where all stakeholders converge in the form of valid interlocutors.

5. Ecological economics establishes the importance of making bio-geo-physical assessments of water resources to determine their true value, power and importance for all the species and ecosystems’ life. Economic assessment can only be subsidiary, recognizing that it will always be fragmentary, incomplete, one-dimensional, but it can be useful to set sanctions, taxes, fees and contributions for its use and impact, but it cannot replace an integral assessment of the water resource.

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ABSTRACT

Water governance and bio-accounting

Contrary to what the conventional economy says, natural resources are not scarce, they are sufficient, but they require adequate governance. The problem of depletion and degradation of natural resources, and especially of water resources, is the result of the insufficiency or absence of an integrated management focused on the active preservation of resources and ecosystems; in conclusion, water problems are a matter of water governance. Sustainable environmental management requires transparent, holistic and integrated organizational information systems that contribute to the correct representation of reality and good decision-making. In this sense, bio-accounting is mainly a complement to achieve the sustainable purposes of governance, which require accounting information that leads to the presentation of qualitative and quantitative non-monetary information of natural wealth (including water), as a mechanism for evaluating the organizational management and implementation of corrective actions and continuous improvement. This proposal establishes the relevance and importance, which a system of socially committed environmental accounting represents for water governance.

Keywords: water, bio-accounting, governance, nature
Introduction

The world is migrating towards the adoption of new models for agriculture, livestock production, clean production, and renewable energies. These new models are motivated partly by the aim to reduce poverty and by the increase in global food and energy demand, as well as by conflicts regarding the use of natural resources. Therefore, with the purpose of generating well-being for its citizens and considering the realities of each country and the availability of natural or technological resources, nations worldwide are exploring how to incorporate sustainable development practically in their development plans, thus meeting the great challenges of demographic explosion, climate change, loss of natural resources, food security and availability of water.

Increasing production in a territory on the basis of its natural resources entails a continuous process of adaptation to the carrying capacities of ecosystems and the design of productive processes in line with conservation and availability of resources such as water, soil, and energy. This article explores whether a region of a developing country that is rich in natural resources, extension of soils, and water availability should encourage the development of that territory toward greener growth, or maintain a laissez faire policy without focusing and directing its growth (Sales, 2018). In addition, it develops the elements for green growth policy and availability of water applied to the region known as Orinoquía in the Republic of Colombia.

According to Rodríguez et al. (2009), the development style for the Orinoquía should be adaptive and prudent, given the uncertainty/lack of knowledge
regarding the functioning of ecosystems and the impacts of productive transformations on their functionality. The Orinoquía is a set of ecosystems, and interventions should ensure that each landscape group of the Orinoquía be resilient to them.

The authors suggest avoiding irreversible changes and defining locally feasible rules in order to ensure access to water and guarantee land ownership rights. In general, some progress has been made by state research centers and universities as to monitoring systems on the use of soil, water dynamics, wetlands, and the dynamics of species and ecosystems, intended to make useful information available to interest groups for planning and valuation thus helping to define critical thresholds, and to support decision-making on policies of use, change of use, and definitions for optimal balance between use and conservation (Rodríguez et al., 2009).

Environmental sustainability depends on the incentives for the use of the soil and water. The strategies for massive intervention of the use of soil or water in the Orinoquía must pass through careful institutional analyses carried out by specialized state institutions that should propose access regimes to resources and incentives for conservation and comprehensive cost-benefit for all inhabitants of the region. The regulations should make farmers or agricultural producers avoid using the floor in a predatory manner due to the lack of property rights over the land, the instability of policies, or the lack of access to financial markets, which encourages them to take advantage of opportunity periods while they last (e.g., subsidies, high prices), thus overloading the environmental services (Benavides, 2010).

It is proposed that the state establishes a reference frame to ensure environmental sustainability associated with the excessive productive transformation facing the Orinoquía, which could generate irreversible social and environmental damage.

Benavides (2010) highlights: “The internalization of environmental management to build possibilities from arrangements that mutually reinforce the production and conservation. The perception of finiteness of resources corresponds to a Malthusian vision of the world. Innovation can convert restrictions into abundance”.

Therefore, taking into account the limitation on the availability of water in the territory, development of a region or territory can be guided either by the traditional market approach or by focusing on green growth, considering the availability of natural resources, water, and energy in order to grow with a sustainable approach; not to continue as producers and exporters of basic natural and agricultural resources, which does not generate enough added value to the territory’s economy.

Due to the quality of soils, existing ecosystems, and the poor road infrastructure, agricultural and livestock production would only provide added value significantly if large plantations with technological support for soil improvement, optimization of water availability and use, and technological
management of crops and animals were to be established. However, is it necessary to investigate and determine how much production can increase so as not to affect the ecosystems on the plains irreversibly.

**Description of the Orinoquía**

Colombia is a geographically and climatically multi-diverse country located in the tropics and with coasts on both the Pacific and the Atlantic oceans. According to the conditions of the terrain (i.e., mountainous or flat), distance to the ocean, rain average, and natural vegetation, six geographic regions can be identified in Colombia: Amazonía, Andes, Caribbean, Pacific, insular territories, and the Orinoquía (IGAC, 2005).

The Orinoquía has been identified as the Colombian territory that can be developed sustainably thanks to its large amount of available soil, its low population density, its availability of natural resources, the low cost of lands, and the availability of environmental information developed by the Colombian state to plan its near and far future. It has a gross domestic product dominated by the production of hydrocarbons. Agricultural production, though highly visible, is modest vis-à-vis the regional area and tends to monoculture in large areas, with a tendency to enclaves.

Major investments in agriculture are highly subsidized by tax exemptions and are not competitive. Manufacturing production, financial intermediation, and exports have little weight in the region’s gross domestic product. The population of the Orinoquía is approximately 1,700,000 inhabitants, representing 3.28% of the total population of the country. The region contributes 5.5% of the Colombian GDP (2007). By majority, the population lives in cities on the mountain slopes (piedmont), and the majority of the new investors in agricultural projects live outside the region or abroad (Benavides, 2010).

Following is a summary of the characteristics of the Orinoquía.

The Orinoquía comprises the departments of Arauca, Casanare, Meta, and Vichada, and extends over an area of 25.3 million ha. According to the Instituto Geográfico Agustín Codazzi, 9.4 million ha have floors suitable for any type of production (37.1% of the Orinoquía), and 15.9% corresponds to soils and lands dedicated to livestock raising (Benavides, 2010).

The Colombian Orinoquía is a geographical region recognized by the homogeneity of some natural elements, from which its apparent flat geomorphology, a big number of wetlands, and a relative continuity of grass-covered lands stand out. According to Molano (1998): “Such regional characterization accompanied by the homogeneity of the natural environment has made it possible to construct a concept that is partly obvious and in part wrong; because los Llanos (i.e., the Plains) or the savannas, as a significant portion of the Orinoquía is called, was considered through centuries as a territory void of human beings and natural resources of importance”.
It is a unified geographic region around the basin of the Orinoco river, abandoned by the country’s development over the centuries. It was populated by migrations of settlers who violently displaced the native tribes, pushing the agricultural and livestock production borders further.

Molano (1998) draws attention to this by highlighting that the Llanos Orientales (i.e., the Eastern plains) have been reduced to a physiographic
Figure 2. Biome Orinoquía colombiana

Source: IGAC (2005)
interpretation that homogenizes a flat area, and that this has prevented the significant variability of the geomorphological landscapes and the unequal distribution and behavior of climate, edaphic, hydric, vegetal, and animal elements, not including the complex intervention and management processes of this territory by human action. During the last decade, the massive arrival of foreign capitals that sought to generate productive areas of technified crops took place, producing significant changes in the ecosystems.

Regarding water availability, the block to the west of the Meta river maintains an active subsidence, which is why its landscapes are characterized by the overflowing and flooding of large areas in the territories of Arauca, Casanare, and Meta; where they retain considerable volumes of water that cause a high continental production of water of unique ecological, economic, and cultural value. The swamping and flooding plains are a considerable extension of savannas and tropical forests located mostly on the left bank of the Meta river. In all, the Arauca, Casanare, Meta, and Vichada rivers possess a swampy surface of 97,870 ha together with 16,600 ha of wetlands (Molano, 1998).

The part of the Orinoquía to the south of the Meta river, known as “a well-drained area”, includes the alluvial terraces and altillamuras (i.e., high plains) both flat and with slight slopes. These areas absorb water quickly, which is why they are not subject to flooding. The region of the altillamura extends between the rivers Meta and Vichada, with low fertility soils at altitudes between 150 and 250 meters above sea level (Molano, 1998).

The departments with the highest percentage of their departmental area made up of land suitable for livestock are Casanare and Arauca with more than 50% of their extension. The livestock capacity in Meta between 2001 and 2008 was 1.8 heads/ha; in 2008, the capacity in Casanare was 1.7 heads/ha, and in Vichada it was 0.10 heads/ha. These differences are mainly due to the availability of water and pastures, the type of technology used for raising cattle, and the contribution of complementary foods (Benavides, 2010).

The second productive use in the region is agricultural, with 11.3% of the total of the Orinoquía (2.8 million ha); Vichada and Meta are the ones that contribute the most to the amount of land for cultivation. Other uses that could be developed in the Orinoquía are forestry, with 5.07% (1.2 million ha) and agro-forestry, with 4.6% (1.1 million ha), for a total of 20.9% of the region with capacity for agricultural, forestry or agro-forestry development. Although the lands in this region are suitable for any type of production (37.1%), the Orinoquía also has 34.4% of the region (8.7 million ha) in strategic ecosystems that must be conserved and protected, since they are of the utmost environmental importance, such as wetlands, marshes, swamps, lagoons, lakes, and rivers listed as areas for conservation and protection (IGAC, 2016).

The departments of Meta and Vichada have the greatest number of hectares for conservation, with 3.8 and 2.6 million ha respectively. The remaining 28% of the Orinoquía is comprised of legal or restricted areas such as natural national parks, environmental reserves, or indigenous reservations (IGAC, 2016).
The Orinoquía contains 32.4% of the fresh water in Colombia, 36% from the rivers with flow rate greater than 10 m³/sec, and 38.7% of the micro-watersheds. It has a single rainy season (between April and October), followed by drought in the remaining time. The more humid zone is the piedmont (i.e., mountainside), with annual rainfall between 3,000 and 7,000 mm. The driest area is in Arauca (between 1,000 and 2,000 mm annually). The vast majority of the Orinoquía has a precipitation between 2,000 and 3,000 mm annually (Benavides, 2010). Table 1 presents the volume of the basins of the main rivers of the Orinoquía, obtained for each of the watersheds through the method of long-term hydrological balance (Domínguez, 1998).

Table 1. Average Flows of the River Basins in the Orinoquía

<table>
<thead>
<tr>
<th>Basin</th>
<th>Rainfall (mm)</th>
<th>Evapotranspiration (mm)</th>
<th>Area (m²)</th>
<th>Average flow (m³/s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arauca</td>
<td>1.918</td>
<td>1.292</td>
<td>39.072</td>
<td>776.2</td>
</tr>
<tr>
<td>Guaviare</td>
<td>2.870</td>
<td>1.519</td>
<td>75.956</td>
<td>3.254,5</td>
</tr>
<tr>
<td>Inirida</td>
<td>2.884</td>
<td>1.629</td>
<td>58.598</td>
<td>2.330,2</td>
</tr>
<tr>
<td>Meta</td>
<td>2.479</td>
<td>1.416</td>
<td>114.791</td>
<td>3.868,9</td>
</tr>
<tr>
<td>Tomo</td>
<td>2.375</td>
<td>1.573</td>
<td>20.857</td>
<td>530,7</td>
</tr>
<tr>
<td>Vichada</td>
<td>2.548</td>
<td>1.591</td>
<td>33.174</td>
<td>1.006,7</td>
</tr>
</tbody>
</table>

Source: Universidad Nacional de Colombia. 2004. Graduate Degree in Hydraulic Resources

The Meta river, natural axis of the Orinoquía, is 804 km long (of which 785 km are navigable), and is less sinuous than the majority of the rivers in the Orinoquía, which are more meandering. The Meta river is the only means of transport in its area of influence during the rainy season, as the roadways are flooded. The Arauca river is 700 km long (296 of them in Colombia). The Casanare river has a length of 400 km, with only 112 km navigable by small boats. The Vichada river is 580 km long. The Guaviare river is 947 km and is navigable in 775 km. The Ariari river is 290 km long and is navigable in 79 km.

It is important to note that the Orinoquía already has general studies of its soils developed by the IGAC, which may be consulted by the authorities and communities to develop land, productive and environmental management. The soils of the Orinoquía are, in general, of low fertility, acid, and with toxic levels of aluminum and iron, and are prone to erosion and structural degradation (IGAC, 2014).

The temperature of the eastern plains does not fluctuate significantly (23°–35°C), as it is usual in the equatorial isothermal areas. Therefore, we can say that the seasonality in this stretch of the planet on the low latitudes is based on rainfall throughout the year, and is daily in terms of its maximum thermal variability (Waldrón et al., 2016).
It should be noted that there are references that suggest irreversible damage to the ecosystem caused by incorporating agricultural intensive growth not considering the capabilities of the ecosystem and the availability of water. The aggravation of the surfaces affected has much to do with man’s relationship with the environment due to the predominance of immediatist and predatory behavior over social and ecological awareness. In Brazil, the case of the northeast region is noteworthy due to its ongoing and increasingly severe droughts. In Colombia, improper management of water and livestock production in the area of the swamps of the Caribbean plains is significant (Zarate-Villarreal, 1977), as are the large open pit coal extraction sites with respect to water bodies.

**Development and Green Growth**

In low- and middle-income countries, but with availability of natural resources, the transition to a green economy (also known as green growth or green transformation) could become a strategy for achieving greater productivity, higher income, and value creation through structural change, while reducing the overexploitation of natural resources and environmental degradation (Altenbourg, Rodrik, 2017). However, there are considerable challenges for developing countries in implementing green growth due to the existence of an informal economy, high levels of poverty and inequity, low capacity and insufficient resources for innovation, and inadequate investment and governance (Barbier, 2016).

The developing countries assessed may be concerned about implementation of green growth being the best option for them, and that this strategy could undermine their economic growth and development in the short term (OECD, 2013). However, it is known that countries can generate positive disruptions if they leverage in creating added value from the natural resources available to them, because if they decide to generate competitiveness in other technologies far from their natural resources, they will be required to significantly strengthen innovation, education, and service exports skills, which requires long-term projects.

This concern is based in historical evidence. On the one hand, there is convincing evidence that economic growth, on average, reduces poverty in developing countries when it is accompanied by policies of wealth redistribution and increase of well-being (Molano, 1998). In comparison, the evidence that green growth is compatible with the alleviation of poverty is more varied, as there are many cases in developing countries where the introduction of environmentally friendly policies and investment can also adversely affect income, the means of subsistence, and the employment of the poor (Barbier, 2016). This is where the state can play a dynamic and protective role to promote policies and development plans for the population, added to environmental and market regulation. Innovation and sustainable production practices may
only be implemented by consolidating the rule of law and building institutions (Benavides, 2010).

The green growth strategy is an approach to economic, social, and environmental growth to which Colombia adhered in the OECD’s Declaration on Green Growth in 2012. Currently, 42 countries are signatories to this statement. Green growth was established as a cross-cutting and enveloping strategy of the National Development Plan for 2014–2018. This strategy became state policy by Law 1753 of 2015, which established in its Article 170: “The DNP, in coordination with the Ministry of Environment and Sustainable Development, will formulate a Green Growth Long-Term Policy to define the objectives and goals for sustainable economic growth” (Colombia-DNP, 2018b). It should be noted that, with the increase of environmental concerns, 70% of OECD countries have green growth recommendations since 2011 (Colombia-DNP, 2018a).

The majority of developing economies and the majority of their inhabitants depend directly on the land and on natural resources. For many of these economies, exports of primary products represent the vast majority of their export earnings, and one or two primary products constitute the greater part of their exports (Barbier, Hochard, 2019).

When the conditions of dependency on subsistence agriculture are maintained, people increasingly require more land. This generally comes with a substantial change in the use of land by turning forests, wetlands, and other natural habitats into agricultural land and other resources for primary planting activities, responding to a large extent to the extension of the agricultural frontiers of our countries. This practice is increased in remote lands in less favored regions, which are susceptible to low productivity and high degradation due to the fact that their agricultural potential is limited biophysically by the relief, inadequate soil quality, availability of rainfall, and, additionally, limited access to infrastructure and markets. This is proof of the lack of adequate planning strategies that allow for the characterization of productive areas, in order to implement efficient systems through a rational use of all the biotic and abiotic elements that compose them.

The expansion of lands in remote areas is carried out by relatively poor rural households. This expansion of the land border has stood for a long time as a channel of employment of the last resort for unskilled and underemployed workforce. On the other hand, the Colombian Llanos Orientales were colonized by peasants who fled the violence that was taking place in other geographical regions of the country. The activities that are typically performed in remote

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1 The National Planning Department of Colombia (DNP – Departamento Nacional de Planeación de Colombia), is the leader for the Colombian national and sectoral planning, and their articulation at different levels of government. For this reason, it has led long-term structural discussions through “missions”, whose purpose is to study public policy issues in various areas and to invite experts to address the socio-economic and environmental challenges of the country in an innovative way.
areas include plantation agriculture, cattle-ranching, forestry, exploitation of fossil fuels, and mining activities. However, such activities do not integrate neither forward nor backward with the rest of the economy, and do not provide significant added value to primary activities (Barbier, Hochard, 2019).

As a territory in transformation, the eastern plains meet the environmental, social, and political conditions that can leave them anchored in poverty. Barbier (2019) indicates that there are three implications in the pattern of use of natural resources and poverty in developing countries: a) for the poorest economies, primary products continue to dominate the export earnings, and it is difficult for them to diversify from primary production as the dominant economic sector; b) many economies have a substantial part of its rural population located in less-favored agricultural lands and in remote areas, creating geographical poverty traps; c) economic development – as well as greenhouse gas emissions – continues to be associated with the change in the use of land. These changes regarding the use of the soil are also significant generators of greenhouse gas (GHG); Bowen and Fankhauser (2011) state: “[…] a certain distance, until the demand for energy increases, the change in the use of land and forestry remains as the most important source of greenhouse gas emissions in low-income countries. On the whole, it represents 50% of the emissions of low-income countries”.

It is important to note that developing countries are expected to require between 0.9 and 1.35 million square kilometers of new lands to be cultivated until 2030, and that they will need new lands to cultivate biofuels, grasslands, and industrial forestry, and also to replace the lands lost by the degradation (UN, 2017).

The Orinoquia is a territory with the capacity to grow in crop and livestock production, but up to a limit that does not affect the natural ecosystems. The best proposals for green growth policy in Colombia are being sought in order to find a proper way to address the key structural characteristics regarding the use of natural resources in the eastern plains and reduce poverty.

Barbier (2019) concludes in his literature review of policies and investments in developing countries for green growth that it is necessary to intervene in four critical areas in support of the rural green transformation:

a) to create the conditions for a successful long-term diversification of economies that are rich in natural resources;

b) to create the conditions for rural transformation, significantly reducing the dependence of the peasants in sustenance agriculture, while reducing the overexploitation of natural resources and land;

c) to control the use and the expansion of the land for commercial activities of primary production in regions with abundant land;

d) to reduce poverty and promote diversified strategies for well-being among the small rural farmers in remote and marginal agricultural areas, promoting the installation of renewable energy and energy efficiency to improve the conditions of habitation and work in poor rural households.
Another objective of the rural green transformation is to establish strong policies to disengage the socio-economic benefits achieved through primary agricultural production and the advance of land tenure obtained through the continued expansion of the agricultural frontier and deforestation. This decoupling is strengthened by the formulation of policies on the use of land that promote its efficient use given that it has already been cleared (intensification of use for agriculture and livestock) and by discouraging or restricting deforestation.

In many flat rural areas in Colombia, livestock remains extensive (one cow head per hectare), exhibiting low productivity and generating low local employment rates and causing social conflicts and violence. This adds to the expansion of pasture, which still generates a substantial deforestation without rendering significant socio-economic gains (Cardoso da Silva et al., 2017).

**Green Growth Policy in Colombia**

The Macro-project for Green Growth in Colombia is the strategy to align the country’s economic growth for the decade 2020–2030. The concept of green growth is booming around the world because it brings together two key points for the development of a country: the increase in productivity and economic competitiveness, ensuring sustainable use and conservation of natural resources, promoting the transition towards a low-carbon economy and a more sustainable development (Colombia-DNP, 2018b).

The National Planning Department of Colombia (DNP) convened in 2016 to a Mission for Green Growth in order to prepare and discuss the technical inputs and public policy for the formulation of a Green Growth policy to guide the economic development towards a more sustainable model – green growth in 2030 – that promotes economic competitiveness, protects and ensures the sustainable use of natural capital, and ensures well-being and social inclusion, as expressed in Article 170 of Law 1753 of 2015, which issued the National Development Plan for 2014–2018, *Todos por un nuevo país* (2018a).

The Mission for Green Growth was proposed with the purpose of discussing policy options focusing on green growth in the planning of the country’s development with civil society, the public and private sectors, academia, the media, and the general public. In addition, as transversal axes, the Mission gave priority to analyzing the feasibility of developing new economic environmental instruments or to reforming existing instruments in order to send market signals to the economic agents to stimulate the transition towards green growth; as well as to promoting science, technology and innovation as a determining factor for the development of new sustainable products, processes, and services low in carbon dioxide. Forty OECD countries have implemented actions to discourage the use of coal and fuels. Colombia established the carbon tax in 2016, at a price of COP $16,000/ton of CO$_2$. 
The Mission for Green Growth developed the different aspects associated to be intervened through policies and green growth projects in the country through specialized consultants. The importance of the thorough analysis carried out by the consultants by means of consulting technical databases that allowed to define the baselines for the status of production using natural resources is noteworthy.

The information analyzed shows that sustainability is not just a problem of resilience of the productive sector and of environmental conservation. This is also noted in the low competitiveness of the country’s economy, as reflected by many international indexes that measure it. One of the dimensions of this unsatisfactory competitiveness demonstrates inefficient use of natural resources and materials in productive processes. In general, Colombian indicators of usage of materials and energy are far below those of developed countries. The Mission established the following challenges for the Macro-project for Green Growth, intended to be developed in different regions of the country (Colombia-DNP, 2018a).

- Water use productivity, efficiency in wastewater treatment, and water reuse.
- Land use productivity.
- To foster intensity in the use of materials and circular economy.
- To develop Bio-economy.
- To take advantage of forest resources.
- To promote unconventional renewable sources of energy.
- Business formalization and green growth.
- Labor productivity and human capital for green growth.
- To promote sustainable mobility.
- Green Growth and strategies for science, technology, and innovation (STI).
- Economic instruments to boost green growth.

For each of the above-mentioned challenges, the Mission conducted a detailed diagnosis (useful biological resources and materials, strategic capacity of enterprises, markets, etc.), and produced some policy recommendations and the corresponding targets and indicators. However, the scope of the Mission did not establish applied or technological guidelines to close the gap of backwardness detected in economic sectors. It should be noted that the Mission proposed individuals to become responsible for developing growth projects with state support, but it did not explore the community and social participation of the inhabitants of the territory where the projects were to take place as significant stakeholders to decide upon and protect natural resources.

The Mission identified resources such as economic instruments and financial incentives to promote green growth and international financing sources for climate change in Colombia. However, the development of these instruments has been delayed and there has been no leverage to undertake green projects. Likewise, minimal progress has been made regarding the harmonization of
economic instruments for green growth such as exemptions on the import of goods for green growth projects and reductions in the value-added tax. A milestone in policy was the application of the carbon tax, although due to its low price per ton of CO₂, it has not been significant yet for project decisions.

Another important aspect is that developing green growth projects will require professionals with a new approach to sustainability, starting with the economic, social, and environmental concepts. This will require that universities also incorporate the green growth target and train their professionals to be promoters of this purpose. Development in the countryside requires professionals with a comprehensive formation in the knowledge of ecosystems, economics, and technological resources to generate value and with adequate control of environmental impacts (Cano, 2015). A growth policy in line with the objectives of sustainable development must include education as a fundamental strategy that allows not only to train the population for the change, but also to ensure the presence of human capital to adequately interpret the needs regarding the mission and vision statements for green growth.

Additionally, another essential factor for the sector’s growth is the continuation of the science, technology, and innovation processes. These are useful to generate the knowledge that must be applied for productive development. However, this requires a greater investment as a percentage of GDP and an effective articulation between the state, academia, and the industry. The National Policy for Science and Innovation for Sustainable Development of Colombia (Colombia-Colciencias, 2018) represents a useful tool to develop green growth projects in the Orinoquía, since it requires employers and entrepreneurs to: “(i) explore new business opportunities to contribute to the solutions regarding the objectives of sustainable development through the development of innovations that meet the criteria of sustainability and that represent opportunities for diversification of the productive apparatus; (ii) develop new sustainable business models; (iii) incorporate green technologies to improve business productivity within the criteria for sustainability as well as responsible and sustainable business practices, not only in environmental terms, but also social and economic, (iv) make part of the construction of alternative and sustainable ways to provide goods or services, for example through interaction with various agents (users, scientists, policy makers) to develop technical designs, identify the needs for infrastructure or regulation, redefining cultural meanings, among others”.

**Special Areas in the Orinoquía**

The department of Casanare spreads over an area of 4.4 million ha. Of these, 54.2% are lands dedicated to livestock. According to the general survey of soils and land zoning for Casanare, livestock production systems with intensive grazing in warm weather could be established in the majority of these grounds.
However, due to its high vocation for livestock production, other activities are somewhat unnoticed: 8.7% is dedicated to agriculture (388 thousand ha); 2.8% to agroforestry (126 thousand ha); and 1.9% to forestry (83 thousand ha). The conservation and protection areas cover 28.4% of Casanare, for a total of 1.2 million ha (Benavides, 2010).

The most adequate transient crops in Casanare are rainfed rice, corn, beans, pepper, tomato, melon, watermelon, passion fruit, squash, hot pepper, coriander, and yucca, as well as permanent crops such as orange, lemon, avocado, plantain, mango, mamón, papaya, African palm and oil, tobacco, and pineapple (Molano, 1998).

In the Department of Meta, studies of the IGAC indicate that the department’s production should focus on 15.7% of its area, i.e., 1.3 million ha, which host suitable soils for agriculture, livestock, forest, and agroforestry. The predominant production in Meta is agriculture, which extends to 12.6% of the department (1.07 million ha), followed by forestry with 2.09% (178 thousand ha) and agro-forestry with 0.58% (50 thousand ha). The lands for environmental conservation correspond to 45.2% of the department, with territories that could promote ecotourism developments and scientific research. Finally, 39% of the department corresponds to protected areas of national parks, by law, such as the Sierra de La Macarena (IGAC, 2016).

The department of Arauca accounts for 2.3 million ha, of which 1.2 million ha are soils with capacity for livestock farming. Arauca is the second territory with greater capacity for livestock production because 29.9% of all these soils in the Orinoquía are in Arauca. In a smaller amount, there are areas used for agroforestry (10.1%), forestry areas (0.8%), and areas with agricultural vocation (0.4%). Thirty-seven point sixty-one percent of Arauca has strategic environmental reserves and ecosystems based on water and biodiversity (Benavides, 2010).

In the department of Vichada, with an extension of more than 10 million ha, 14% are lands dedicated to agricultural production (1.4 million), 10.1% to forestry (1.007 million), 8% to agro-forestry (800 thousand ha), and only 3.9% to livestock (391 thousand ha). The areas identified for environmental conservation correspond to 26.89% of the department (2.6 million ha). The Tuparro National Natural Park is located there, with an extension of 548,000 ha (Molano, 1998).

The ecosystems of the Orinoquía have strategic importance for maintaining life cycles of species, including humans. Wetlands, gallery forests, and natural savannas contain large biotic wealth and the potential to provide a myriad of services for the maintenance of the natural dynamics of the territory in general. Permanent residents have learned to live with the pulses of rains and summers that transform the flooded savannas, and – have been known to benefit to a greater or lesser extent from the gifts of nature – ecosystemics services – offered by the Orinoquía.

The importance of water in the Orinoquía is decisive. Molano (1998) reconfirms its role for life in the plains: “Swamps and extensive areas of overflows are
true refuges for continental and aquatic life. Instead of draining the marshes, supported by the moral criterion of them poorly drained, we must recognize, with a broader and fuller vision of life, that we possess a wealth of invaluable amphibious and aquatic species in the wetlands. It is not about destroying these biogeographic aquatic shelters, but taking advantage of the natural production of the waters while preserving their ecosystems and making their use and management sustainable. Desiccation has been an unfortunate practice of agricultural planners, who, with a wrong interpretation of our equatorial environment, have tried to make us resemble other countries without water and forests”.

The Colombian Orinoquía is a region with 7 to 8 months of rains and with high clouds that pour large volumes of water. In addition, it holds an infinite network of creeks, streams, and rivers that flow through the savannas through irregular, curved and twisted channels that extend over plains and beaches, permanently overflowing and flooding areas of influence or to enrich estuaries, swamps, and mangroves. “Desiccating the Orinoquía is making the same mistakes in that we have made in the Caribbean, Cauca, Magdalena or in the Andean highlands.” (Molano, 1998).

Current Situation of the Ecosystem as a Basis for Production

The settlers’ practice for the intervention of the Orinoquía was to reduce the ecosystems to pastures by the reducing action of fire. This is one of the perennial environmental problems that harass and harm the biomes and landscapes of the Colombian Orinoquía, and of the Orinoquía in general (Molano, 1998). The spread of livestock raising in the Orinoquía as a productive system and practice has been seen as the only project to “take advantage of the land”. For these cattle to graze, it is necessary to burn the savanna, thus favoring the emergence of tender shoots for cattle, to the detriment of the food supply for all the millennial food chains that bind together forests, savannas, wetlands, high plains, and mountains (Molano, 1998).

Socio-economic risk in the Orinoquía has significant expressions such as the practice of productive systems that have resulted in losing the food self-sufficiency of their inhabitants and indigenous populations. The extraction of natural resources from the vegetation and fauna, with which biodiversity is lost; exploitation of the subsoil, mainly for hydrocarbons, which generate unknown and deteriorating social, economic, environmental, political, and cultural situations; the confrontation of the actors of the conflict, which creates conditions for depopulating regions by deaths, threats, and internal displacement of persons, thus losing the human resources necessary for production and socio-economic development. In addition, state actions that have not contributed to economic, social, environmental, and political development processes and whose involvement is required to develop the sustainable bases for an equitable and harmonious society with its physical and biotic nature (Molano, 1998).
Water Availability and Agricultural, Livestock and Population Growth

The development of the productive capacity of the Orinoquía will be carried out in the short- and mid-term due to the advantages offered by the territory and the demands of the market, and so the uncontrolled production of crops and livestock could be extended. It should be noted that the institutional framework is weak in the Orinoquía, and that the state does not have enough institutional presence to establish agreements with the interest groups. However, it is necessary to promote social dialog on the present and future of the Orinoquía. The Universidad de Los Andes expresses thus: “The degree of uncertainty about the result of this transformation process is very broad, as a result of insufficient information and knowledge regarding the functioning of its ecological and social systems in scenarios of global change, in the light of the institutional weakness and the lack of a social agreement about what should be the future of the region.” (Rodríguez et al., 2009).

Benavides (2010) summarizes the environmental variability of the Orinoquía as follows: “The Orinoquía houses 156 types of ecosystems, 94 of which are natural (Romero 1998). There are 32 types of savannas that are grouped into two broad categories: well-drained high land savanna to the east of the Meta river; and floodable savanna (wet season), which covers the majority of Arauca and Casanare. From a geomorphologic standpoint, Mejía (1998) describes to the basin of the Orinoquía (including Boyacá, Cundinamarca, and Guaviare) as a region with five large landscapes: Piedmont, recent alluvium, poorly-drained Orinoquía, well-drained Orinoquía, and the ‘Andén Orinocense’”.

Soil Resources

The richness and potential of resources in the eastern plains evidence the importance of creating strategic alliances between various interest groups in order to generate joint strategies for integrated management of biodiversity and ecosystem services. Some oil companies have conducted socio-environmental studies, for which they sought local allies through cooperative agreements in which capacity building was established as the aim of the two-way process (Waldrón et al., 2016).

Governance

It is essential to generate strong institutionality as a region, increasing the capacity for governance by the autonomous environmental authority and the presence of the authority of the National Natural Parks System. The job of coordinating the Region needs to be supported by a monitoring system of the
economic situation and of the occupation of the territory, its resources and ecosystems, and the availability of water. The Autonomous Environmental Corporation (Corporación Ambiental Autónoma – Corporinoquia) and a network of universities in the country could promote, implement, and maintain a system for assessment, consultation, and sustainable decision-making (Rodríguez et al., 2009).

**Perspectives on the use of the Water Resource**

The Orinoquía has a limited and unknown capacity to make water available for ecosystem services and to be used in agricultural, livestock and industrial production as well as human consumption. This premise implies that water consumption will reach a limit beyond which ecosystems and services will be deteriorated. It should be reminded that this territory has numerous areas for protection of ecosystems and natural national parks, requiring the retention of their water tributaries and rainfall regimes (Molano, 1998).

Crops require water, CO$_2$, energy, and nutrients to form their biological mass, and the amount of water is characteristic of each crop. The hydric footprint (HF) of a crop indicates the amount of evaporated/transpired water for a given crop production, distinguishing between the water from precipitations (green) and the water extracted from rivers, lakes, and aquifers applied through irrigation (blue). (Alvarezo et al., 2016).

The global average water footprint for beef is of 15,400 liters/Kg of meat, with 94% of the hydric footprint coming from green water (rainwater stored in the soil). It is important to note that depending on whether the production is industrial, grazing, or mixed, the water footprint greatly varies, being much higher if production is industrial.

The Institute de Hidrología, Meteorología y Estudios Ambientales – IDEAM has conducted studies to monitor, assess, and model water to learn about the surface and underground water supply for several territories of the country. It is important that these studies be conducted for the Orinoquía in order to quantify the availability of water and that it is geo-referenced to detail the areas where intensive production processes could be developed (Colombia-IDEAM, 2018).

It is important to note that the agricultural, livestock, industrial, and population developments will be limited by the availability of water in each of the zones of the Orinoquía. The alleged abundance of water in ecosystems could lead to believe that the areas can resist any amount of exploitation, and then promote the accelerated growth of production. It is essential to establish strategies for the use of water such as: a) governance as a function of water and biodiversity; b) the preservation of ecosystems and their ecosystemics services; c) production limited to water availability; d) development of the bio-economy to take advantage and protect water quality.
Governance in function of water and biodiversity involving all the interest groups in the region, should be promoted by all state institutions so that it is present in all plans and decisions regarding development in the region. The state should ensure that information regarding water be public, up-to-date, geo-referenced, and that its costs be internalized in productive processes.

The preservation of ecosystems and their ecosystemic services implies that any decision on intervention expressly assesses, qualitatively and quantitatively, its environmental impact on ecosystem services locally and in the region. No development shall include or affect protected areas, national natural parks, or biodiversity. It is important to determine the impacts of productive systems in ecosystems and biodiversity during periods of drought in the region, and establish storage controls for water in the dry season.

The information on the availability of water requires knowing in detail the natural cycles of rains in the piedmont of the plains and in the region of the Orinoquía, and natural consumption for the ecosystemics services existing in each area. At the same time, this requires identifying water consumption for agricultural, livestock, and industrial production, as well as for the population, that would be needed depending on the amount to be produced (Sales, 2018).

The biomass generated in the Orinoquía should be exploited to return its nutrients and energy to soils in the region, for which it is necessary to develop bio-economy in order to generate added value to the production as well as sources of employment and export products.

Conclusions

The Orinoquía is a multivariate territory, of great environmental importance that needs to be developed with a sustainable development approach, and whose implementation can be aligned with the green growth policy and the policy on innovation in science and technology.

This territory has water available for ecosystemic services and may facilitate the development of agricultural and livestock farming production. However, it requires to determine the availability of water that could be exploited in each of the areas without damaging ecosystems and protected areas.

Research on the availability of water should be cross-referenced with the vocations for the use of soil and the quantities and types of production (agricultural or livestock production, industry) in order to establish the limits of water consumption as well as the strategies to strengthen the availability of water throughout the year.

The country has the technology to perform the geo-referenced analysis of water availability so that its environmental research institutions and universities can carry out detailed studies with which to support the inhabitants of the region regarding the interrelation between water availability and productivity.
The rivers in the Orinoquía define local characteristics of their basins and are fundamental in the provision of water to the other water bodies. For this reason, they need to be protected, and their contributions to the logistics in the region must be explored. The Meta River could become the articulator of a multi-modal transport system and of trade in the region.

The agricultural sector can sustainably increase the area used and its productivity based on research and development on genetics and on the optimization of environmental services by deepening its knowledge of water availability and biodiversity.

Bibliography


ABSTRACT

Future perspectives of sustainable development: an innovative planning approach to water in the eastern Colombian region

To increase production, agricultural growth of the territory in a country such as Colombia is taking place rapidly without proper coordination by the state and by the interest groups. This situation can cause irreversible losses to the ecosystems and water bodies, which are key factors to support the biodiversity of the region. This document analyzes
the elements that should be taken into account as the recommended strategy to implement in a vast region of Colombia known as the Orinoquía, which is a territory with abundant natural resources, environmentally sensitive ecosystems, and a big number of natural reserves and national parks, focusing on green growth. In addition, it enumerates the characteristics of the Orinoquía, exploring the impact of water availability as a significant factor for the definition of the amount of production that should be planned and allowed for each area or ecosystem in the region as a response to strategic planning. Finally, it concludes by highlighting the importance of strengthening the institutions in the region, promoting water governance, and performing geo-referenced research of water availability in order to promote proper decision-making regarding productivity and sustainable conservation while improving the well-being of its inhabitants.

**Keywords:** water governance, availability of water, green growth, Orinoquía, wetlands, expansion of lands
III. SOCIETY, EDUCATION AND POSSIBILITIES IN CONTESTATION SPACES
Proposal

Today, the topic of social development is gaining momentum. What factors contributed to it?

This surge may be a consequence of the fact that our leaders are beginning to consider the enormous need to permit access to meet the basic needs to broad sectors of the population, living on the margins of the society.

As such, today, social development is a proposal that consolidates objectives including: placing Colombian society in an international economic and political context, and generating democratic, participative processes in communities.

Insofar as these achieve a consolidation of participative spaces, oriented toward the reinforcement of national democracy, creating employment opportunities and satisfaction of basic needs, one may consider it a true vision of Latin American economic development.

The said vision must consider social development a way to continue providing opportunities to all sectors which, day in and day out, require it, as well as to all social movements that require mass social reforms in different territorial spaces in their search for sustainability.

1. Regarding social development: interpretative points

One must begin by establishing the difference between developmental concepts such as developmentalism and economic growth.
The concept of economic development seeks, as a fundamental strategy, to stimulate economic potentialities in a micro and macroeconomic environment. However, said potentialities must stem from populational well-being.

On the other hand, economic growth is linked to increases in national merchandise production (referred to as Gross Domestic Product, or GDP).

In some cases, when all of a nation’s potentiality reinforces merchandise production, it remains in just the developmental environment, which seeks to consider indicators such as per capita income, or the entire population’s total over the number of goods produced. Per capita income does not reflect the real distribution of wealth in a country, as goods and services do not always extend to the population.

Economic development must include populational economic well-being, together with economic growth. It is said that growth may exist without economic development, from the developmental point of view.

Economic development must seek the true satisfaction of populational needs. Said needs may be met by way of a productive process, framed within the sphere of production-distribution-consumption. For this reason, in the developmental environment, only the accelerated merchandise production phase is present, without the distribution and consumption phases, those which permit populational well-being.

Thus, the quality of life depends on the opportunities that individuals have to meet their fundamental human needs. According to Max-Neef, fundamental human needs must be understood as a system in which these interrelate and interact, and are based on two criteria: existential and axiological. The first includes the following needs: subsistence, protection, affection, understanding, participation, leisure, recreation, identity, and freedom.

As such, insofar as we satisfy all populational needs, social development may be discussed. In general terms, the social front has, among other objectives: placing Latin America in international economic and political contexts, systematizing and deepening knowledge of Latin American society within a historical perspective, establishing the relationship between reality, theory, change models, development plans, and the actions of different social agents in terms of their real contexts, conducting an analysis of the Latin American juncture on political and institutional levels, as well as a critical evaluation of its regional impact on participation and organization processes, analyzing the decentralization and municipal reform process taking place in Latin America, and the impact such development projects have on social life, positioning the problem of social development in an educational environment, as a means of change in Latin America.

Notably, within the social development perspective, education and development are considered to be parallel, and it is posited, as a basic principle, that education be conceived from the point of view that development is the only effective means to elevate quality of life and achieve regional development, which brings with it a new world view to individuals, and the respective processes.
1.1. International and national views of social development

It must be stated that today, the world is facing important changes in economic, social, political, and cultural terms, in which many of the ideas of the past, and their paradigms, are being reconsidered to make room for new conceptualizations. For example, in terms of the topic of development there is a new view. Development is discussed on a human scale, on which human beings are considered developed beings in all potentialities (in previous times, man was considered in terms of production machines). Today, continued development is discussed, in which the generations of the present day may respond to future generations about the richness of the environment that has been bequeathed to them.

Since the great crisis and depression of the 1930s, humanity has sustained changes to their world view. For example, prior to the said period, economic activity was considered on the premise of the classical school, led by A. Smith, D. Ricardo, T.R. Malthus, J.B. Say, J.S. Mill, etc. For Adam Smith, human conduct is naturally moved by six aspects: selfishness, commiseration, the desire to be free, sense of property, work habit, and tendency to exchange, trade, and change one thing for another. Given these conducts, each individual, naturally, is the best judge of their own interests, and as such, must be at liberty to meet them as they see fit. If one is left free, one will not only work for their own advantage, but also promote the common good. The belief in the natural equilibrium of motivations led Adam Smith to assert that, by seeking one’s “own advantage, each individual is led by an invisible hand to promote a goal that is not their own purpose”.

However, the classical conception in economics falls apart when John Maynard Keynes’ suggests state interventionism as a way to approach the proposals of the classical school. Among other things, he advocated for the free market and the laissez faire, laissez passe economy.

With Keynes, a new economic reality appeared, which was supported by state intervention, and entailed the planning and creation of central banks, superintendencies, state enterprises, etc. The decisive factor in this to move forward was the Second World War. In the said war, the magnitude of the resources employed, their extension, the violence of the battles, etc., obliged all countries to design new forms of state intervention to guarantee production and the mobilization of necessary resources for victory.

This reality necessitated the emergence of new policies and institutions, which served as bases so that, on finalization of the content, an international institutional system would be created to influence the ability of states to intervene in the economy, and naturally, reflect new economic and political realities. In these historic moments, in the North American population of Bretton Woods, the International Monetary Fund was created. Its principal objective was to prevent the phenomena that led to the 1930 crash. There, it was agreed that the dollar would become the patron of the economy in place
of gold, and mechanisms were created so that countries would not lose their ability to pay. The BIRF, today the World Bank, was also created, in hopes of channeling worldwide liquidity toward the reconstruction effort for new relationships. Later, the UN was created to overcome the limitations of the old and ineffective League of Nations. It was equipped with a complex institutional system that permitted intervention in all aspects of social life. Thus emerged the WHO for health, UNIDO for industry, UNDP for development, UNESCO for culture, the FAO for agriculture, UNICEF for children, etc.

Simultaneously, a familiar network was constituted in Latin America, including the Organization of American States, the Interamerican Development Bank, ECLAC, OPS, etc.

These networks, more than reflecting new international realities, meant the universalization of state intervention and planning, and were the basis for a situation that, for Colombia, was consolidated with the presence of the Currie Mission in 1950, the first BIRF mission to begin its work in a third-world country, once the fundamentals of the reconstruction process had been achieved in Europe and Japan.

With the creation of the aforementioned institutional network, as well as the generalization of state intervention, criteria, patterns, and plans were designed internationally, and theoretical conceptions were formulated regarding the causes of underdevelopment and its possible solutions. These were presented to the Third World Countries as guides for the definition of internal policies. This resulted in development models for change in Latin America.

Thus, as Latin America appears to be a model formulated by the United Nations, named the development decade, known specifically by ECLAC as inward growth for the substitution of importations.

The manager of this project, Raúl Prebisch, proposed that Latin America should tend toward a growing industrialization process, based on the elimination of certain importations that prevented development.

The ECLAC structuralist model held theories that criticized its fundamental premises and advocated for an outward developmental model, via the liberation of importations, reduction of state intervention, and exportation stimuli.

Parallel to these development analyses were other schools that criticized the scopes of ECLAC structuralism, in the sense that, through the search for substantive change, it forgot less necessary sectors. It was raised, for example, that ECLAC structuralists disregarded the fact that no development policy was possible without first resolving the basic needs of human resources. It was argued that the societal structural changes would fail if members of society did not have their survival guaranteed in minimal quality conditions. To solve this, another

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1 BIRF – El Banco Internacional de Reconstrucción y Fomento (International Bank for Reconstruction and Development).
2 ECLAC – Economic Commission for Latin America and the Caribbean
3 OPS – Organización Panamericana de la Salud
paradigm, that of basic needs, was proposed. Therein, the World bank launched its “Assault on Poverty”, at the beginning of the 1960s, which would spur integrated rural development programs, integrated rural development, and nutrition.

It must be noted, however, that the industrialized world passed through a phase of expansion between 1950–1960, but later entered into a phase of deceleration, beginning in the 1970s. The present economic crisis is reflected in both recession and inflation. During this period, the debt crisis in Latin American countries intensified.

This panorama caused theoretical models that were in vogue, oriented toward the consolidation of development, to enter into a crisis, given that they could not aid the solution of the sizeable problems in Latin America.

In regards to the breaking of these theoretical schemes, it may be proposed that the development discussion has focused on reshaping the theoretical models and frameworks that permit the support of adjustment policies, as occurs with the neoliberal or neostructuralist approaches.

Adjustment policies, characteristic of recent decades have the following fundamental aspects:

- Public spending reductions, which logically, proportionally affect social spending,
- Investment reductions, which affect the growth rate,
- Importation reduction,
- Elimination of exportation stimuli,
- Liberation of legislation for foreign investment,
- Devaluation,
- Fiscal reforms to increase state income,
- Reduction of official spending and public sector wages.

These measures seek to increase state income and decrease its expenditures. With this, in the short term, the state can increase its payment capacity, but at the cost of economic growth, and severely diminishing populational quality of life. This situation has generated a growing rejection for adjustment policies. International organisms have since recomposed a new model for change that acceptably formulates adjustment policies for indebted countries, or those in crisis, and which seems to be based on the following points:

- Decreasing state intervention in the economy, unplanning, and deregulating,
- Privatizing and destabilizing economic sectors with state participation,
- Using the informal sector as the basis for recuperation and growth,
- Stimulating decentralization processes,
- Stimulating democratization processes,
- Stimulating foreign investment to obtain the remaining capital,
- Economic aperture as a strategy for economy modernization,
- Promoting community participation and organization as the central thread of new policy,
- Restructuring legislation and institutions.
1.2. Social development in Colombia

In accordance with studies performed on indicators for social development, it has been shown that relative progress has been made, especially in the satisfaction of basic needs and income distribution. However, if the composition and channeling of the achieved benefits of economic development are analyzed, it is evident that they are concentrated on certain economic activities and social groups.

It is suggested that a high percentage of the current national population is marginalized, and lack resources for the satisfaction of their minimal, essential needs. Jesús Antonio Bejarano, in Colombia Hoy, 1991, specified that 45% of Colombians did not have the income necessary to satisfy their most basic needs, and 18% could not meet their minimal nutritional needs with their income.

On the other hand, nearly 60% of the rural population, and approximately 30% of the urban population is in a situation of extreme poverty, a further 76% of the inhabitants of municipalities with fewer than 100,000 inhabitants do not have their needs met.

Additionally, the deterioration in development is clear, when only 60% of Colombians have access to potable water systems, and just 40% have access to sewer and waste water systems. However, the situation is more difficult, given that 35% of the population is not affiliated with health services, and over two million individuals are illiterate.

When the macroeconomic study is only found in the technical aspect, and is disconnected from the social aspect, the words of distinguished economist Manfred Max-Neef become relevant. Following careful reflections as an economic researcher, he concluded that: “After many years of working as an economist in diverse international entities, my enthusiasm and optimism in different times began to recede, and was replaced with growing unease. To continue being a witness and direct participant in efforts to diagnose poverty, measure it, and design indicators that would permit the establishment of the highest statistical or conceptual threshold from which the methodologies behind the findings are defined (My God!), to critique the methodologies behind the findings, express profound concern (occasionally with a cocktail) for that which said findings finally indicate, emitting recommendations to solicit additional funds destined to continue with investigations and discuss them in meetings, all this seemed like an obscure ritual in which I was happily participating” (Max-Neef, 1986).

To what aspects do the above reflections of Manfred Max-Neef correspond? This author believes that it is a result of the shift that economic science and macroeconomic analysis have taken. They have focused on ideological problems, and as such, the materialization of the said ideologizing process is clearly established in the representation of stochastic economic models, which reduce society to educational systems.
In his *The New Hundred Years* article, Stephen J. Turnovsky indicates, that, for many years, economists, and in particular, macroeconomists, have been divided by ideology (Turnovsky, 1991). This indicates that at some times, the economy of a given country adapts to an ideological bias, developing the political economy in function of this aspect, as occurs in the present day with the stochastic neoliberal model, which has infiltrated every country in the world, seeking those who would tame it. Macroeconomics must walk a more social path in order to be able to promote socioeconomic development in accordance with populational needs. “The economy must be at the service of a larger social good. In the coming years, I hope that economic conclusions will be less servile to the needs of policies and their convenience. Economists should not accommodate themselves to political conveniences and should not be indifferent to the political context, or its social and economic restrictions”.

With the above expressions, Galbraith (1991) visualizes the next century’s economy. From this point of view, his statement must respond to the achievements that social movements must work toward in modern life: those that result in improved well-being.

**Conclusions**

From the previous work, the following may be concluded:

The view of social development has been associated with the search for economic development, but the notion of development is confused with economic growth, and in certain cases, with developmental stances, which obscure the ability for social development.

**Bibliography**


ABSTRACT

Social development and social movements

Today the theme of social development is gaining strength. For this reason, it is currently sought that social development is a proposal that consolidates objectives such as: placing Colombian society in the international economic and political context, and generating democratic and participatory processes within the communities.

Keywords: social development, Colombian society, CEPAL school, neostructuralism
1. Introduction

Migrants are the main “human waste” of globalization.

Zygmunt Bauman

1.1. Migration and sustainable development

The great challenges currently facing humanity which is moving towards a sustainable planet, and which demands and desires the eradication of poverty and hunger, seeks universal and inclusive education and gender equity, attempts to reduce the loss of biodiversity and other environmental resources, all call for priority attention to rural development (Vilches, Gil, Toscano and Macías, 2014). The stress is on the sustainability and the priority is the rural youth, because of their capacity for action for sustainable living, in the search for alternatives to address the serious problems of the rural environment and the high demands of the urban world.

According to Trivelli and Berdegué (2019, p. 5), “There is no sustainable development without rural development”. This statement is especially significant when it is known that in 2007 more than half of the planet’s population moved to live in cities, which implies a higher food demand against a lower supply, so that famines caused by an unprecedented increase in food prices are predicted. Despite this worrying reality, some governments think that the countryside and rural societies can be dispensable for the quality of life of urban dwellers, because they do not participate in technological progress or in the market dominance of products handled by ICTs. This idea is now a fallacy, when the “2020 pandemic” has revealed that although you can stop industries, airports, hotels, big stores, move educational services to homes, you

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1 This is the pandemic caused by COVID-19 which, according to Giselly Nieves (2020) should be understood as something beyond a simple viral disease with medical and hospital management.
cannot stop health services and food supplies provided by the countryside. This revelation of the global quarantine points to the weaknesses of the neoliberal and free market model, and points to the capacity of institutions and societies to respond to the new reality and the agri-food and environmental demand provided by the rural world, which is seen today with hope, as the solution to the new needs, the demanding urban challenges and expands the growing opportunities in this rural context.

The effects of climate change, the growing demand for natural goods and the need to promote economic growth through investment are economic pressures typical of the neoliberal model promoted in Latin America with greater force since the 1990s. The economic tensions of this model are the cause of the deterioration of the natural heritage, the provocation of socio-environmental conflicts, the deterioration of agricultural production conditions and food security. Rural areas are experiencing this impact, which is related to the deterioration of the quality of life of their inhabitants, since these conditions lead to an increase in rural poverty, the migration of rural inhabitants to the cities and the disintegration of families. However, with the global quarantine caused by the COVID-19 pandemic, this model is beginning to be questioned by authors such as Arturo Escobar, Boaventura de Sousa Santos, Ignacio Leff, among others, who have been criticizing the neoliberal model for its impact on natural systems and the cultural diversity that has been built up by ancestral, peasant and rural communities and by native peoples. However, among the migrant populations, the main and most copious are the young people, who seek opportunities to improve their living conditions in a market for which they are not prepared.

This current situation calls for a study of the conditions of the rural population that produces food and that requires urgent solutions for rural development (Trivelli, 2019), as a contributor to sustainable development. In this regard, the United Nations Population Fund (UNFPA) (2018), has conducted a study that provides timely and quality information to study urban and rural socio-demographic trends, to understand population dynamics and inequalities in the cities and the countryside. The purpose of UNFPA is to make a design of public policies in the framework of the Sustainable Development Goals available in order to overcome rural poverty and make the human rights of this population effective.

This chapter recognizes the role of rural youth in sustainable development and is consistent with the state and international organizations that have expressed their interest in ensuring that young people in rural areas are

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2 In an inter-institutional exercise led by the National Planning Department (DNP), other Colombian entities such as the Ministry of Health and Social Protection (MSPS), the Ministry of Foreign Affairs, the National Administrative Department of Statistics (DANE), and the United Nations Population Fund (UNFPA) analyzed the population situation in Colombia in 2018.
productive, globally connected and able to shape their own future. Hence, the interest and demand to think about the situations in which young people seek to progress, the constraints and barriers they face, and the dynamics of transformation of the world that create challenges and opportunities for them. IFAD (2019), in its report *Creating Opportunities for Rural Youth*, maintains that only by understanding the difficult conditions of rural youth’s livelihoods, especially those of Latin America, is it possible to understand the tensions, possibilities and spaces in the new times of global change. Only then, is it possible to offer an image close to these young people that will enable decision makers, policy makers and implementers manage more effective investments to promote this rural context. Governments and international organizations such as FAO and IICA are called upon to promote food security and to encourage and support the efforts of states to develop sustainable agriculture for the well-being of rural populations.

2. Methodology

This is a documentary research, carried out through a descriptive-analytical analysis, based on sources from 2010 onwards, available in official reports from national and international organizations, and in academic and scientific databases, as inputs for analysis, with emphasis on a review of the phenomenon of rural youth migration in Latin America. Some studies carried out in this region, both qualitative and quantitative, are taken as a reference framework, since both allow for an in-depth analysis of migration from the main points of the text. The quantitative works, as well as the related research, were the basis for describing the general context of rural youth in Latin America. The qualitative studies were assumed as inputs for analyzing trends in research on rural youth migration in Latin America and were checked against the needs of sustainable development for the year 2030 and especially the needs of the rural environment. Data are collected according to the publications in

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3 The International Fund for Agricultural Development (IFAD) is a specialized agency of the United Nations whose objective is to provide funds and mobilize additional resources to promote the economic advancement of the rural poor, mainly by improving agricultural productivity: https://es.wikipedia.org/wiki/Fondo_Internacional_de_Desarrollo_Agr%C3%ADcola (access: 10.03.2020).

4 FAO is the United Nations agency leading the international effort to end hunger. Its goal is to achieve food security for all, while at the same time ensuring regular access to sufficient and good quality food for an active and healthy life. Electronic document, http://www.fao.org/home/es (access: 10.03.2020).

5 The Inter-American Institute for Cooperation on Agriculture (IICA) is a specialized agency of the Inter-American System, which belongs to the Organization of American States (OAS). Its purposes are to stimulate, promote and support the efforts of its Member States to achieve sustainable development of agriculture and the well-being of rural populations. Electronic document, https://iica.int/es (access: 10.03.2020).
scientific journals and official reports, and the trends found in the approach to the subject.

The works that guided the reflection come from a state of the art (Valdés, Fernández and Pereira, 2005), “bibliographic review” or “state of knowledge” (Romanowski and Ens, 2006) and are considered in the following way:

a) the literature consulted that addresses issues related to transformations in the field and social problems related to the young population, such as work and schooling;

b) the literature whose objective is to identify the academic contribution around a particular topic in the form of a review of the topic. It provides a complete description of previous research and contributions, contributing to future research and proposing additional studies. It demonstrates the academic relevance of a researcher’s work.

3. Theoretical framework

3.1. Youth, rural territories and sustainable development

The overall picture of young people in Latin America reveals that they can be seen as a driving force and activators of change. They are also a key population group for the rural development and sustainability of the country. Their abilities to relate, cooperate, communicate and act are enormous and the challenges they face are also crucial. Young people approach climate change with criteria, they are victims of unemployment, they suffer from lack of educational opportunities, they are victims of inequity and exclusion, particularly those who belong to vulnerable or marginalized groups such as rural youth.

3.2. Towards an understanding of rural youth according to sustainable rural development

3.2.1. Sustainable development and its human vision

In principle, it is worth addressing the notion of sustainable development, which has gone through several phases since its introduction, especially with the Brundtland report (1987), which links environmental aspects to a predatory economy, in which the market and capital prevail over the well-being of society and the conservation of the planet. Previously, in the Cocoyoc Conference (CEPAL-ILPES, 1974), there was not yet a declaration on the causes of environmental deterioration, nor was it considered that poverty was related to environmental problems or to economic growth as it was developing. It is difficult to find convergence in the origin of this notion, but most sources place it at the beginning of the seventies or at the end of the sixties, with multiple and varied
meanings. Authors such as (Daly, 1991) already announced how this notion could be a notion that in itself would contain contradictory or opposed meanings, and it was common to identify its relation with some meanings of the line of sustainable progress, increase and improvement at the beginning of the nineties.

According to Klarin (2018), “sustainable development must provide a solution to satisfy human basic needs, integrate environmental development and protection to achieve equality, guarantee social self-determination and cultural diversity and environmental conservation”. Therefore, governments must offer viable conditions in terms of sustainable development. The sustainable development approach has valued transformations through the flows of ecosystems, human capital and financial capital. According to Czerny and Serna (2018), “a complex model of sustainability must incorporate factors such as historical conditioning, psychological and emotional characteristics and cultural conditioning”. Sustainable development, then, refers to an assessment of the economic development of a nation, region or community, which cannot be divorced from environmental responsibility, the human dimension and ethical commitment of a society. For this reason, the value of rural youth to sustainable development needs to be put into context.

3.2.2. Rural development and sustainability

The relationship between sustainability and the development of rural life, of the countryside, of its productive livelihoods, of the cultural heritage of rural inhabitants is becoming increasingly strong. In this sense, Trivelli and Berdegué (2019, p. 5) maintain, “The sustainable and sustainable development of the inhabitants of this planet – and of the planet itself – is interdependent on the development of the rural world, of its people and societies, of its livelihoods and economy, and, undoubtedly, of the ecosystems and natural resources present there”.

The authors, point out that of the one hundred and sixty-nine targets established to achieve the Sustainable Development Goals -SDGs- (UNDP, 2020), one hundred and thirty-two (78%) have as their scenario, at least partially, the rural world, and one of every five targets is exclusively or mainly rural. From this perspective, to envision a future for an urban world, where issues such as sustainable cities, sustainable consumption, clean air are dealt with makes it necessary to address them in interconnection with the rural world.

Rural development, with respect to the SDG (UNDP, 2020), requires the conviction that rural areas and their populations play a substantial role in their achievement. However, the question of how rural areas should be measured for the purposes of the analysis and the design of programs and policies that take into account the rural territory is being reconsidered, since the ODS refer to socioeconomic and environmental indicators, and rural territories usually occupy more than 90% of the surface area of Latin American countries.
Three conditions of rural development need to be addressed to make a sustainable future possible:

a) Improving the education and welfare of the billions of people living in this environment (nearly half of the world’s population) by eradicating poverty.

b) Achieving sustainable agricultural production to ensure that all human beings have access to the food they need.

c) Protecting and conserving the capacity of the natural resource base to continue to nurture production, the environment and culture (Vilches, Gil, Toscano y Macías, 2014).

d) The potential of rural youth, who are a key population for sustainable rural development, should be recognized. Therefore, they should be considered as key and determining actors to consolidate agri-food and environmental systems that make sustainable food security possible in rural and urban contexts.

3.2.3. Towards a model of sustainable rural development

A perspective of rural sustainability that seeks to energize the economy in rural areas, which contributes to the management of environmental problems and adapts to the trends inherent to rurality, has among its principal objectives: guiding rural development towards sustainability through harmony between conservation, the supply of environmental services, the diversification of agricultural production, the increase in competitiveness and the improvement of the quality of life of rural inhabitants, and finally, establishing functional systems for equitable access to the support infrastructure of the rural territory.

3.2.4. Rural youth and sustainability in rural/urban linkages

The rural world of Latin America is changing rapidly, so that the worn-out preconceptions about its development, work dynamics, and the place assigned to agriculture are no longer adequate (Pardo, 2017). It is necessary to understand the links between the countryside and the city and to understand that when it comes to caring for life, it is the rural world that has the conditions to produce food security, supply water to the cities, preserve and conserve the natural wealth that is home to the plant and animal life, which is the eco-systemic guarantee of clean air.

Territories can become a potential activator of promising conditions for society, and studies have shown that young people who are capable of building community life projects, which expand employment options, educational opportunities, social relations, cultural dynamics and connectivity in rural contexts, enhance their development and demonstrate that rural youth do not need to look to cities for work opportunities and cultural novelties.
This articulation requires actors capable of making alliances with urban institutions and with management skills, so that this population is recognized and accepted for its contribution to the “demographic bonus”\(^6\), which refers to equitable participation and the search for development (Saad, Miller, Martínez, Holz, 2012)\(^7\).

### 3.2.5. Approaches to the general context of rural youth in Latin America

Rural youth in Latin America and the Caribbean are heterogeneous, with rich environmental relationships, their own difficult histories, different political perspectives, social conditions of scarcity, degraded cultural relations and multiple geospatial locations. According to Guiskin (2019), they face crucial disadvantages and have higher levels of poverty than rural adults and urban youth, which makes them a particularly vulnerable group, and which is further aggravated if they are women, indigenous people or people of African descent.

Latin America’s rural areas have undergone crucial changes in the last two decades, with significant variations in the production structure, different territorial dynamics, different views of the environment and critical political positions, despite some forms of development, and the economic and social inequalities that are profound features of Latin America (ECLAC, 2010). These features are related to poverty, exclusion and inequity in rural territories. As a whole these conditions affect the limitations of rural youth to achieve human development and an acceptable level of quality of life.

The study of rural youth migration is a reference for understanding the dynamics of this population and the inequities in the rural environment in Latin America. According to UNFPA (2018) “the interest of these analyses should be to offer information to guide the design of public policies in the framework of the Sustainable Development Goals”.

The current census definitions in Latin America and the Caribbean consider that everything that is not “urban” is “rural”, in a dichotomous way, without further subdivisions. According to Dirven (2019), “the rural population of the twenty countries of Latin America would reach some 120.6 million people, 18.5 percent of the total population. For the twenty-six countries of the English-speaking Caribbean, the rural population is 3.8 million people, 31.4 percent of the total population”.

In Latin America and the Caribbean\(^8\), of a total of one hundred and fifty-six million young people between the ages of 15 and 29,39% live in poverty.

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\(^6\) It occurs when the dependency ratio between the population of productive age (young people and adults) and that of dependent age (children and older persons) changes favourably, with the former having a greater relative weight than the latter, UNITED NATIONS, ECLAC.

\(^7\) International Youth Organization.

\(^8\) Only some countries (such as Costa Rica and Brazil) introduce concepts such as “dispersed rural”, “concentrated rural” and “urban periphery” or similar.
Youth unemployment reaches approximately 17%, while 20% of young people between the ages of 15 and 24 do not study or work (Faieta, 2017). These dimensions of unemployment indicate a hopeful scenario, when it is observed, that the Latin American and Caribbean countries have a young population structure and still enjoy the “demographic bonus” that must be enhanced.

According to FAO (2017), nearly 30 million young people between the ages of 15 and 29 in Latin America and the Caribbean live in rural areas, representing 25.3% of the rural population and 19.6% of all young people. According to Dirven (2016), some 9.6 million work in the agricultural sector and 8.2 million in non-agricultural activities. In addition, about 2.8 million “urban” youths also work in the agricultural sector. In addition, there are about 11.9 million rural young people who do not work.

All this indicates that rural youth are increasingly caught up in a rural world with few opportunities. Dirven (2016) notes that the inactive population is large, and for young people unemployment is in the second place.

In the last three decades, almost 20 million rural inhabitants of Latin America have migrated to urban areas, so that this is one sixth of the rural population, with a high preponderance of young people (ECLAC/CELADE, 2010). This is related to ECLAC’s projection (2019) for Latin America and the Caribbean for 2020 that 18.8% of the population will be rural. According to ECLAC (2008), only 22% of the total population is rural, and from 2008 to 2020 this population decreased by 3%.

Although Latin American countries have been making efforts to develop programs aimed at rural youth, challenges remain regarding factors that prevent young people from realizing their potential for decent and productive employment. The rates of justice and equity of access to education, health and recreation remain a concern. In education, although the gap between urban and rural areas has tended to close, it still persists and worse indicators of educational completion, attendance and access to tertiary education are observed (Guiskin, 2019).

According to ECLAC (2016), this scenario indicates that Latin America is the most disparate region in the world, since social inequality is also a structural feature because of its historical persistence in Latin American and Caribbean societies, as it has been maintained and reproduced even during periods of economic growth and prosperity. Inequality is an obstacle to the eradication of rural poverty, sustainable development and the guarantee of human rights. The region has followed a heterogeneous production model, in which monocultures, inefficiency and inequity prevail, with a landowning model and a high concentration of land in cattle-raising regions and smallholdings in agricultural regions, with the exception of some crops such as palm.

10 These people no longer appear in rural statistics.
sorghum, rice, sugarcane, and some cereals, which makes the urban prevail over the rural.

Young Latin Americans have the capacity to enrich their environment when they acquire the ability to firmly state their expectations for the future and their possibility of influencing public agendas. According to the Agenda 2030 for Sustainable Development (UN, 2015), “young people decisively demand quality education, decent work, honest and transparent governments and greater and more meaningful participation in decision-making” (Faieta, 2017).

3.2.6. Review of significant international studies on rural youth migration

The main findings in the scientific literature on rural youth in Latin America and the Caribbean according to the condition of migration from the countryside to the city are listed below, highlighting emerging and meeting points in the collected works.

In this list of studies focused on rural youth migration, the research interest is to understand the forms of migration that contribute to the construction of youth identities and their life projects in order to identify their motivations to change their living space (Jurado, Tobasura, 2012). During the twentieth and twenty-first centuries, according to Piñeros and Thomaz (2016), research was interested in rural youth, salaried workers, peasants, indigenous people, “quilombolas”¹¹, among others, in places where the capital-labor contradiction is alive and in the agrarian complexity in Latin America. On the other hand, Méndez (2016) identifies four main factors related to young people’s lack of interest in staying in the countryside:

a) Job opportunities.

b) Access to productive assets.

c) Particularities of the family socioeconomic environment.

d) Education and professionalization.

In addition, another factor is highlighted in studies on rural youth migration, especially in Colombia. Denov and Marchan (2014) note the need to address the relationship between forced rural youth migration and demobilization in the country and the urgency of challenging prevailing stereotypes. Despite the challenges after leaving an armed group, young people found themselves adrift in a terrain of swindling and undirected crime. Many other participants, however, committed themselves to programmes designed to improve their lives through education and employment.

¹¹ *Quilombolas* is a term used in Brazil to designate slaves who have taken refuge in quilombos, or descendants of black slaves whose ancestors in the period of slavery fled from the sugar cane mills, farms and small properties where they worked and formed small villages called quilombos. Electronic document, https://educalingo.com/es/dic-pt/quilombola (access: 05.04.2020).
Table 1. Main articles directly related to the migration of rural youth in Ibero-America published in scientific journal

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<td>Dilema de la juventud en territorios rurales de Colombia: ¿campo o ciudad?</td>
<td>Jurado, Claudia &amp; Tobasura, Isaías</td>
<td>2012</td>
<td>Artículo</td>
<td>SCIELO</td>
<td>Colombia</td>
<td>Revista Latinoamericana de Ciencias Sociales, Niñez y Juventud, 10(1), p. 63–77</td>
<td>It seeks to understand how demographic, migratory and productive transitions contribute to the construction of youth identities and their life projects in rural environments of the Eje Cafetero and to identify the motivations of young people, some of the reasons for leaving the countryside</td>
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<td>Juventude rural e mobilidade territorial do trabalho no século XXI</td>
<td>Robinzon Piñeros Lizarazo Antonio Thomaz Junior</td>
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<td>Intervention-amstelveen</td>
<td>Colombia</td>
<td>Intervention-amstelveen-, 12(1), 331–343</td>
<td>Forced migration of children demobilized from guerrilla forces</td>
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<td>Migração rural-urbana, juventude e ensino superior</td>
<td>Octavio Spíndola Zago</td>
<td>2016</td>
<td>Artículo</td>
<td>Redalyc</td>
<td>Brasil</td>
<td>Revista brasileira de educação, 21(64)</td>
<td>Rural and urban migration</td>
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<td>Boundaries within: Nation, Kinship and Identity among Migrants and Minorities: Green Economy and Green Growth</td>
<td>Decimo Francesca &amp; Gribaldo, Alessandra</td>
<td>2017</td>
<td>Libro</td>
<td>Base de datos Universidad de Manizales</td>
<td>Estados Unidos</td>
<td><a href="https://biblioproxy.umanizales.edu.co:2266/book/10.1007/978-3-319-53331-5">https://biblioproxy.umanizales.edu.co:2266/book/10.1007/978-3-319-53331-5</a></td>
<td>Internal boundaries by minorities and migrants</td>
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Source: Author's elaboration
Zago (2016), supported by his own quantitative and qualitative information, summarizes his results as follows:

a) From literature that talks about transformations in the field and social problems related to the young population, such as work and schooling.

b) Field research carried out in universities on the social and economic characteristics of the family of origin and issues related to professional occupation, migration and expansion of school capital.

c) The effects of global factors in agricultural policies and social transformations in the rural world that influence the prospects of young people in the context of family farming.

In these studies, research carried out on rural youth migration in the last eight years has demonstrated how demographic, migratory and productive transitions contribute to building identities and life projects of young people. Some of it identifies young people’s motivations for leaving the countryside. Some studies in Colombia address issues such as forced migration in populations demobilized from guerrilla forces and socio-cultural perspectives on migration in relation to education. From these studies it can be concluded that rural youth migration refers to the connectivity between their generation, globalization and geo-bio-politics.

The category geo-bio-policy was introduced by Do Nascimento and Hilling (2018), in their study on rural youth and their participation in local development. With this category, the authors seek to contribute to the debate on rural youth actors in their communities, and analyze their role as political agents of change and their impact on local development. They observe that the role of rural youth actors in their communities is key because they are political agents of change in local development, in a context with geographical and biological conditions that influence the constitution of rural youth as political subjects.

The last international reference that stands out is the book published by the National Youth Secretariat – SNJ (2018), which served as a support for the formulation of public policies for this population in Brazil. These are policies that guide strategies and programs to improve the quality of life in the countryside. One contribution of this work is its interest in promoting the autonomy and emancipation of agriculture in traditional rural towns and communities, which are aspects often overlooked in other work on the problems of rural communities. Another contribution of this work is its interest in offering elements to strengthen the conditions of permanence in the rural environment, supported by agro-ecological and sustainable principles, which are in line with the Objectives of Sustainable Development (2015–2030) (UNDP, 2018).

4. General conclusions

There is a gap in literature and in the public policy approach that deepens the conditions faced by rural youth, particularly in the Eje Cafetero area which,
due to its agricultural transformations and the new destinations of rural spaces such as rural tourism, have also generated new geo-spatial and bio-political conditions.

The labor future of Latin America’s youth is one of their biggest problems that they cannot solve. Byer (2017) raises the issue of full and decent employment for young people as a critical issue facing the Latin American and Caribbean region. Young people yearn for greater social inclusion and want to participate in decision-making, alongside policymakers.

Despite the scarcity of data and the risk of error with which the demographic phenomena of the rural population in Latin America and the Caribbean are addressed, it can be argued that rural youth migration occurs due to the lack of policies, programmes and actions that can lead them to improve their job opportunities, their limitations in decent access to public infrastructure and quality rural public services. It is also related to a pressing need to improve technological resources and strengthen citizen participation in this population. At the municipal level, there is an urgent need to improve social services in education, health and protection, care and strengthening of the environment, and promotion of training and employment in agricultural activities. In addition, there is a lack of technological access combined with a lack of opportunities to exchange knowledge with the world.

Sustainability for rural youth requires generating greater opportunities for employment and participation to increase production in rural areas as a guarantee for global food security, since a progressively aging rural population cannot meet the demands of the labor market and sustainable development.

The “global public evil 2020”, similar to climate change, requires building a sustainable human future, which requires valuing rural life and its inhabitants as highly vulnerable populations, who must be protected. It especially concerns young people because of their educational, computer and occupational vulnerability. They can be the protagonists in creating networks of agri-food systems, they can diversify traditional local marketing systems, and they can energize external markets if they approach the final markets for their products and relocate strategic regional agro-productive and technological processes.

Latin America’s rural youth face the enormous challenge of overcoming their inclination to migrate to the cities, rather than enhancing their capacity to influence sustainable rural development. To this end, programmes and policies aimed at this population are needed to help reduce poverty and socio-economic inequality between urban and rural areas, which threatens the stability of the population, coexistence and food security. There is a need to promote economic growth based on long-term sustainable and competitive foundations in the global context, and to improve the quality of life in the countries of the region.

This work aims to contribute to the theoretical and reflective status of rural youth in Latin America, because of its possible contribution to improving the quality of strategies, policies and investments aimed at this population.
and to advance processes of sustainable economic, environmental, social and political inclusion in the rural world of Latin America. There is a need to overcome worn-out preconceptions about their development styles, lifestyles, work dynamics and the place of agriculture, natural wealth and historical-cultural traditions that are being energized towards sustainability.

Therefore, the following questions should be raised: How can the new global context shape a new sustainable order that generates greater conditions of inclusion for Latin American rural youth? Can we talk about rural youth in the territory and their contribution to a “sustainable demographic bonus”?

The migration of rural youth to the cities requires going beyond the urban/rural dichotomy and understanding the links and relations between the countryside and the city, since “without the countryside there is no city”.

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RURAL YOUTH MIGRATION FROM A SUSTAINABLE PERSPECTIVE


ABSTRACT

Rural youth migration from a sustainable perspective

This chapter presents an approach to the theoretical status of research on rural youth in Latin America, through the analysis of scientific reports, official texts of public entities and international organizations between 2010–2020. The purpose of this work is to reflect on the role of rural youth in a sustainable context. The conclusions of the investigations and the official reports of the international organizations are related as analytical inputs, carrying out an analysis of the research trends in Latin America on the migration of rural youth to the cities, to contrast them with the demands of sustainable development for 2030. Data is collected from publications in scientific journals and in official study reports from national and international organizations. The lines and trends of approach to the subject are analyzed. The results show that research tends to address the field of rural youth migration in Latin America in a limited and incomplete way. It is found that the migration of rural youth requires a revision of some structural changes, the traces and socioeconomic gaps that, from these changes, have persisted in the rural world during the last decades, with emphasis on demographic issues related to rural youth and to sustainable development. This is, therefore, the subject of analysis in this document.

Keywords: rural youth, migration, sustainability
1. New Paradigms: Route to Sustainability

In the face of today’s challenges of humanity and to ensure the welfare of life of inhabitants of the planet Earth, countries saw the obligation to join efforts beyond the ideological differences on the basis of a comprehensive economical model that enables the efficient use of the ecological and social patrimony of territories from a holistic and differential vision, establishing that the reinterpretation and systemic understanding of the territory is vital for a true comprehensive development. The United Nations (UN) has promoted different spaces for discussion where the importance, threat and the risk of the ecological-social heritage is emphasized. It evidences the need for guidelines of preservation, conservation and efficient use of them to guarantee the sustainable development (SD) of the planet earth, understanding the SD as a third generation mega human right that links the right to development, established in 1986 and the right to a healthy and ecologically balanced environment, originated in 1972. Over time, SD has become the world agenda since 1968 in the Club of Rome, 1972 Stockholm Conference, 1982 World Charter for Nature, 1986 Right to Development, 1987 Brundtland Report (where SD concept was born), 1992 Rio Earth Summit, 1993 Vienna World Conference on Human Rights, 1994 Cairo Conference on Population and Development, 1995 World Summit for Social Development Copenhagen and Fourth World Conference on Women, Beijing, 1996, The World Food Summit, Rome, 1997 The Kyoto Climate Change Conference, 2002 Johannesburg Earth Summit, 2000 The United Nations Millennium Development Goals, 2009 Kyoto Protocol, 2012 United Nations Conference on Sustainable Development (Rio+20) and 2015 Paris Agreement, where the approval of the 2030 Agenda for Sustainable Development Goals was made. Despite efforts, there are still alarming numbers; the report of the Intergovernmental Panel on Climate Change (IPCC, 2019) estimates that anthropocentric activities have generated 1.0°C in relation to pre-industrial activities with a tendency to 1.5°C between 2030 and 2052 if the
current human activities continue increasing, which would produce significant impacts on biodiversity and ecosystems with repercussions on the social and economic dimensions. This inspires to make changes in the management of organizations for the efficient use of factors of production, including natural wealth and the ecosystem services coming from the territories.

Within the transformations to face the current and future challenges of humanity from the organizations, an information system is required that breaks half-truths paradigms based on the neoclassical economy that minimizes the realities and only recognizes the economic capital, ignoring the ecological and social wealth of the respective territories. Due to the neoclassical economy, it does not implement valuation methods of qualitative and quantitative character that make possible the recognition, measurement, revelation, control and evaluation of the non-marketable factors of production that intervene in the different processes of the organizations.

In this sense, it is necessary to refute the laws of the traditional economy that influence the logic of current markets at the global level and that make it impossible to change the development models and accounting systems to generate reasonable, relevant and timely information. The treatment given to ecological wealth by traditional economics and accounting discipline is one of the many discussions that must take place to find the route to sustainability. Parkin et al. (2007) mentions that the law of supply in a perfect market is when the factors remain constant and generate a directly proportional relationship between the price of the good and the quantity offered; that is, the higher the price of a good, the greater the quantity offered, and the lower the price of a good, the less it will be offered. Logic is not applicable to a possible law on the supply of natural resources and derived ecosystem services, which requires a different treatment; a treatment that moves away from the anthropocentric notions of growth and market that deepens the problem of natural wealth.

![Law of Supply](image1.png)  ![Ecosystem Services Offer](image2.png)

**Figure 1.** Difference between the supply of the traditional economy and the supply of the bioeconomy

Source: Own elaboration, 2020
As it can be observed, the law of supply under the vision of the traditional or neoclassical economy is directly proportional due to the fact that factors of production are conceived as if they were infinite, whereas the reality is that the supply of natural resources and derived ecosystem services has a different dynamics that transcends initially through the discovery of the resource and designation of price, and later, for the exploitation and marketing, causing the deterioration and overcoming of the load capacity. Dynamics that in the current generation of information for decision making are not taken into account since the accounting system that starts from the micro and feeds the macroeconomic indicators is based on the generation of financial information required by the neoclassical economy. This reaffirms the relationship of accounting with the economy, forcing the accounting to discuss natural wealth as the ecological economy does.

![Figure 2. Differences between grown and development under the sustainably approach](image)

Source: Own elaboration, 2020

The route to sustainability from decision making is clarified when bio-accounting finds different ways in the economics ecology to address ecosystem potentialities, focusing its efforts on recognizing that the factors of production land, capital, labor, natural resources, ecosystem services, and technology and innovation must be managed from their carrying capacity and resilience to ensure proportional dynamics, and thus achieve sustainable development due to the characteristics of the territories, avoiding what is called the law of diminishing returns. It refers to the disproportionate dynamics of the factors of production that end with economic decline. In other words, the notion of growth is limited to an information system for decision making that does not recognize and guarantee the adequate use of natural wealth, while the notion of development challenges the information system by involving economic growth and socio-ecological well-being that allows it to achieve sustainability, in accounting terms to achieve the maintenance of heritage.

According to Aguilera (2006), the very existence and the functions that nature performs in life sustaining are the most significant value referring to the process of production and the transformation of culture. Based on these
aspects, the interaction of the different scientific disciplines becomes necessary to find and consolidate a theory of value that makes possible the accounting processes from the ecological dimension that indisputably includes not only economic variables, but also the ecological and social ones. Mejia and Martin (2012) points out that the accounting field has not been alien to the reality that the environment suffers from degradation, exploitation and consumption of natural resources. This discipline must present all information that shows the existence of energy and supplies flows, through reports or wealth states that allow to know clearly the accountability directed to sustainable development that reveals the management of organizations and allows to receive differential visions of social actors on the territory.

From the countless number of problems that arise due to the imbalance based on the exhaustive degradation of nature that the human being has generated, the need emerges that disciplines such as accounting start to recognize the need to relate to different fields of knowledge to generate joint constructions. It can be deduced that the socio-ecological problems need to be addressed in an inter and transdisciplinary way, and in that way to face in a homogeneous way the challenges that these generate. The emergence of new paradigms entails that accounting generates new proposals more in line with realities, overcoming the traditional and capitalist approach. In accordance with these situations, a model emerges that is specifically aimed at the bio-accounting area, as indicated by Parra et al. (2016). Bio-accounting as a focus of the Three-dimensional Accounting Theory (3-DAT) is a discipline that studies the quantitative and qualitative valuation of existing resources and the circulation of ecological wealth controlled by the organization, due to the use of diverse methods that allow to evaluate the organization management of this wealth in the interest of sustainability.

Groot (2007) adds that the good health of the economy and human well-being are, in the long term, dependent on maintaining the integrity and resilience of the ecosystems that comprise them. The fact that standard economic theory has ignored it, has been identified as a fundamental cause of the current ecological crisis. In this sense, with the aim of incorporating the externalities of economic systems and the services generated directly by ecosystems, economics has developed methods of environmental valuation based on market dynamics permeated by a high level of subjectivity that under accounting principles makes it difficult to recognize, measure and disclose the circulation of wealth.

The ecological economy (EE) is a new paradigm that has allowed to open borders to the search of solutions to the ecological problems of the 21st century, where it is intended to index the responsibility of guaranteeing sustainable development to economy, whereas the traditional economy has the value (monetary measurement) as a principle of all products and services under a consumption model that society can make use of to satisfy its basic needs and capital accumulation. Consequently, the integration of ecology within the economy has been postulated with the purpose of contributing
to the management in the adequate handling of the energetic and ecological degradation. In short, the economic activity is integrated into the respectful interaction that the human being has with the natural, cultural, social, cosmological and biophysical resources of the respective territories (Leff, 2002). Likewise, Achkar et al. (2005), mentions that bio-economy, unlike the neoclassical economics, has a physical-biological dimension, which is aligned with the aspects related to the preservation, the power of diversity and the complexity of the ecosystem, aimed at productivity, the natural cycle and biodiversity. This allows the ecological economy or bio-economy to make an important contribution to bio-accounting to reflect the existence and absolute circulation of wealth, which it incorporates into its theoretical foundation the idea of recognizing, measuring and revealing in units of value for ecological, social and economic purposes, and not only in monetary prices. Without a doubt, bio-accounting is substantially linked to sustainability, which is understood as the optimal present condition of natural resources at the time of production and the interaction between them, achieving guidelines that lead to a balance and the minimization of processes of environmental degradation and their conservation.

Figure 3. Transversality of Bio-accounting
Source: Own elaboration, 2020

Bio-accounting inspired by the ecological economy includes wealth in all its dimensions and gives rise to a transversal branch of accounting that complements management accounting, public accounting, financial accounting, cost accounting, fiscal accounting, forensic accounting among others, in decision making and continuous feedback from information users. Thus, it moves away from the tax perspectives of economic growth and impregnating morality to life.
Bio-accounting assumes an integrative perspective, the new accounting thought must be eclectic, holistic and systemic that demand multidimensional, epistemic-dynamic and inclusive to allow the adoption of valid theories, concepts, methodologies and procedures for the development of a knowledge that theoretically and empirically is at the service of sustainability (Mejita and Serna, 2019, p. 19).

In this sense, it is fundamental that accounting science continues discussing the adaptation of the principles and methods of ecological economics with the objective of consolidating the bio-accounting dimension as a new route that makes it possible to act in organizations through decision-making on natural resources and ecosystem services. Likewise, it allows to transcend from an accounting rooted in anthropocentrism to eco-centric bio-accounting.

2. Bio-accounting as an information system

There are theories that seek to explain the disclosure of information that responds to corporate social responsibility (CSR); they include the legitimacy theory and stakeholders theory. Firstly, the legitimacy theory proposes that the publication of social and ecological information by companies that has largely provided the economic, social and ecological crisis make the dimensions of their background public and that such disclosure focus on legitimizing the actions of the company to users of information (Deegan, 2002). For the sake of the positioning of organizations in the markets and the change to a more sustainable consumption it is required that companies develop indicators that allow them to measure their activities and performance in the social-ecological dimensions, which are regulated in a micro or macro way with the objective of communicating to the community the compliance with such standards. Legitimization is achieved when the organization’s performance minimally complies with existing social standards (Long, Driscoll, 2008). Stakeholders theory determines the participation of different users of information, other than owners and investors that have high expectations of decision making for the respective organizations, and therefore, there is an ethical obligation to provide information on the performance of these organizations in the use and circulation of wealth. This theory defines that organizations are not only accountable to owners and investors, but also to any user who affects or may be affected directly or indirectly in the fulfillment of an organization’s corporate purpose (Fleege, Adrian, 2004).

Accounting as an information system for decision making is based on generally accepted principles, which according to Article 6 of Law 43 of 1990 sets them out as the set of concepts and rules that must be taken into account when making records and providing accounting information on the affairs and activities of organizations. This makes accounting an essential source of information for management to plan, develop, evaluate and improve the functioning
of organizations, guaranteeing the sustainability of them in view of the current challenges of humanity, which requires accounting to generate comprehensive information including non-financial information in view of the social and ecological dimensions.

In the face of knowing the state of ecological wealth from an eco-centric approach, it is necessary to generate non-financial information that allows planning and management of organizations. Accounting as an information system has undertaken a struggle to find an objective language in the methods of valuation of ecosystem potentialities for the solution of problems of intense degradation of nature that does not lie in betting on other methods of anthropocentric and monetary measures; on the contrary, the bet is on the study and rigorous adaptation of methods that bring together the specific elements of the biophysical approaches of the ecological economy that offer the possibility of being outside the monetary counts, and thus aim at the maintenance, prevention, conservation and adaptability of the ecological wealth without negative repercussions to the socio-cultural and economic wealth of the territory where the social object of the respective organizations is developed.

Lozano et al. (2017) mentions that companies worldwide have started the process of reporting on corporate social responsibility (CSR) covering a wide and diverse range of aspects, including practices related to internal and external users and using this information to generate business value through the legitimization of actions or the assumption of responsibilities to stakeholders. Cheng and Courtenay (2006) add that the information about organizations that is generated and published can alleviate concerns about financial and reputational risk associated with social and ecological issues, since this information, by addressing not only financial aspects allows the formulation and implementation of timely measures for the efficient use and circulation of wealth.

In response to the different calls, initiatives are being taken that seek to provide a comprehensive information system for decision making and the fulfillment of the objectives of sustainable development. In this sense, in the European Union (EU), Directive 2014/95 on the disclosure of non-financial information comes into force with different levels of requirements for certain companies or organizations. Spain adopts these provisions in Royal Decree Law 18 of 2017 and modifies it with Law 11 of 2018, positioning it as a European reference in the presentation of non-financial information and diversity. This facilitates the comparison of information using international standards such as the Global Reporting Initiative (GRI), United Nations Global Compact, Integrated Reporting Framework (IR) and the Sustainable Development Goals (SDGs) (Menéndez, 2018). The United Nations has also proposed the System of Environmental-Economic Accounting as an experimental ecosystem accounting tool (SEEA EEA), where five areas are prioritized to feed into the system: spatial areas, ecosystem conditions, ecosystem service and valuation, initiatives that show progress in the publication of non-financial accounting information, but evidence a long way to go for the reasonable and objective homogenization of information. In this sense,
it is necessary to evacuate the biophysical valuation methods of the ecological economy (EE) or bio-economy that support the bio-accounting processes or the ecological accounting in an objective way in the conservation of the ecological bases as a non-financial, non-marketable, non-substitute and indispensable production factor for the sustainability of the organization and life. Although according to Cortés: The EE is not yet an instrument to overcome the difficulties of converting values into prices, although it theoretically raises concerns about the weaknesses of the mainstream. However, although the general method of the EE is not yet unified, there are already important advances in the alternatives for valuing natural resources (2007).

From the approach of the economy for sustainability, it is chosen to link the challenges faced by natural wealth with an information system that allows organizations to make decisions in an objective way and that recognizes the multifunctionality of the wealth controlled and influenced by the productive activity carried out in a certain territory. Decision-making in organizations is based on the availability and quality of information that they possess. In this sense, they have based their decisions on financial information provided by accounting, which makes the impacts generated by the control of wealth invisible and which has led to economic growth; but not an integral development of the context of which the organization is part, which ethically and in the face of the challenges of this century is obliged to present accounting information that integrates the ecological, economic and social dimension with internal and external users. According to Mejía et al. (2013): The organization that reports on accounting is the natural or fictitious person(s), legally or informally constituted, who individually or jointly have some type of control over some type of wealth that in a potential or real way impacts the existence and circulation of it, a fact that generates the obligation to present accounting information that allows the evaluation of the organization’s management in the control of environmental, social or economic wealth (p. 191).

Therefore, in view of the current remains of the ecological-social situation of the land, the dimensions of sustainable development for the reasonability and pertinence of the information of the organization for the integral decision making with the territory must be incorporated in the processes of recognition, measurement, control, monitoring and evaluation of the organizations. In the face of the need of the users of the information, the accounting sciences formulate theoretical alternatives for recognition, subsequent measurement and disclosure such as bio-accounting, social accounting, environmental accounting, ecological accounting, emerging accounting and three-dimensional accounting. These are still far from being implemented and included in the current economic valuation methods and accounting systems due to the high level of subjectivity provided by the econometric valuation methods implemented. Based on Gómez et al. (2010) such as preference approaches focused on market analysis, hedonic pricing, contingent value, avoided and replacement costs and social value, all anthropocentric.
All this requires that the accounting information system evolves from anthropocentrism to ecocentrism. The first is based on market-focused environmental economics that gives rise to sustainable development, sustainability and environmental accounting. The second is based on the ecocentrism of the ecological economy with a biophysical focus that sediments sustainability and ecological accounting or bio-accounting. Groot (2007) adds that within trans-disciplinary approaches as the ecological economy, the multidimensional nature of value, or the existence of plural values (monetary, ecological, cultural) that can be immeasurable among them is raised, which means that they cannot necessarily be reduced to a single unit of common measurement. In this way, we debate the bases and axioms on which neoclassical economics is based and work on new reasonable conceptual and methodological frameworks for the valuation and non-valuation of wealth (ecological, social and economic dimensions).

That is why it is necessary to have an accounting information system for decision making that integrates wealth and guarantees the sustainability of the context where the organization is part of, either from the public and/or private approach according to the degree of ownership of the factors of production respectively of the economic sector where the organization develops its social purpose. A reasonable accounting system with objective methods of valuation that makes viable the foundations and principles of the accounting process towards sustainability, is proposed by Cañibano (1997), of an accounting that is supported in the assumptions of measurement, periods, structure, aggregation, accounting object, accounting subject, organization, accounting phenomena, objectives of the accounting systems, classifications and materiality. Similarly, three-dimensional accounting (3-DAT) which is understood according to Mejía (2014) as: The applied social science that studies the qualitative and quantitative evaluation of the existence and circulation of environmental, social and economic wealth controlled by organizations, using diverse methods that allow it to evaluate the management that the organization exercises on the mentioned wealth, with the purpose of contributing to the accumulation, generation, distribution and integral sustainability of the same one (p. 204).

From where the bio-accounting derives, and for its applicability, the foundation in the ecological economy is proposed by the ecocentric vision that depends on the level of relation with nature, because of that systemic vision that demands that the process recognition and measurement for the revelation of the objective accounting information is given because of the biophysical approaches based on the methods of valuation entropic/physical cost and value of insurance or resilience; in this case the method of the emergent synthesis could allow to advance the accounting science from the ecological economy and to surpass the environmental economy. It can be noted that bio-accounting is more than an approach; bio-accounting is a paradigm shift of life of present generations to ensure the life of future generations.

The times when organizations only publish financial information have ended. Humanity demands to know in an objective and reasonable way the actions of
economic entities, which according to Mejía (2014), forces accounting to break paradigms by assuming the challenge of generating integral information corresponding to ecological and social wealth, and tangible or intangible economy that voluntarily or not generate impact by the use or potential use in a direct or indirect way. Accounting should address valuation methods from a biophysical approach to transcend in practice from financial accounting to bio-accounting, from environmental economics to bio-economics and from sustainability (anthropocentric) to sustainability (ecocentric).

3. Bio-accounting and energy

Few studies link applicable energy analysis to accounting, economic and administrative sciences. According to Chaverra (2018), 50% of the scientific production related to energy is linked to the area of physics and astronomy, engineering and materials science. It can be added that when analyzing the scientific production from 2016 to 2020 that links the variables of bio-accounting and energy with their respective thesauri, it is found that 43% of the scientific production is in the area of engineering and energy, 19% in environmental sciences, 8% in computer science, and in areas such as social sciences, administration, business, accounting, economics and finance between 3% and 4%. Scientific production led by China, the United States, and Italy, which shows a challenge for accounting sciences and, in case of overcoming it, would be an achievement for bio-accounting by generating information that would allow the recognition, measurement and disclosure of natural wealth in an objective and universal language.

Some studies highlight the interest of reincorporating the role of natural resources and derived services in political, administrative and economic decision making; closing the gap between growth and development even more they allow to observe the link and the perspective of energy, information system, sustainable development and decision making that under the focus of the 3-DAT can be classified as approaches in the bio-accounting dimension, which are raised by Eisenkraft et al. (2014), who defines energy as that which is transferred between the boundaries of a system that flows with losses in the transfer processes and which needs to be measured. Likewise, Dauer et al. (2014) mentions that energy is an analysis tool that is conserved through changes. Additionally, Duit (2014) defines energy as a key in any system and dimension since it has the capacity to perform work and generate changes in them. On the other hand, Rodríguez et al. (2015) links the emergy synthesis designed by Odum as an energy evaluation method destined for the calculation of ecological performance and sustainability indicators. At the same time, Fu et al. (2017) suggests a calculation method based on standard emergencies as a tool for agro-ecological compensation in territories with certain characteristics. In relation to this, Mayorga et al. (2017) presents
an alternative known as energy analysis in the face of the theoretical and methodological limitations of environmental accounting, which is part of the methods designed within the so-called ecological economy. It should also be mentioned that Liu et al. (2018) independently from financial economics, evaluates the impacts of anthropocentric activities on the social and ecological systems from biophysical accounting.

In addition, Bravo et al. (2018) describes energy as one of the methods that allows to account and interpret the effects of material and energy flows in an integrated way, in systems where humans and nature interact at all scales. Villalobos and Salcedo (2018) also address energy analysis as a tool for measuring and monitoring ecological systems for timely and relevant environmental management. Finally, Mejía et al. (2019) links the System of National Accounts (SNA) with the double-entry method to observe and account for energy exchanges between the state, public-private companies and households.

Beyond the reconceptualization and epistemological advances of the elements of the method and the accounting system for the pragmatics of the bio-accounting dimension, it is necessary to address objective valuation approaches for the accounting process in organizations that recognize non-marketable inputs coming from the use of ecosystem services. For this the entropic costs in organizations that specifically integrate valorization through the method of energy analysis are proposed.

**Figure 4.** Scientific production by areas of knowledge

Source: Authors’ elaboration based on Scopus results, 2020
Without a doubt, the advances that have sought to link the elements of energy efficiency and the method of emergy synthesis for the generation of sustainability indicators in accordance with contributing to the bio-accounting processes in the generation of financial and non-financial information for decision making have been based on what has been developed by Odum, who, by reducing the complexity of the ecosystem to the dynamics of energy, has achieved unprecedented progress in leaping from the anthropocentrism of environmental economics to the ecocentrism of ecological economics. This is the moment from which tools are offered to accounting to achieve the reasonability of information and to include the dynamics of controlled production factors in accounting processes. It was not recognized at the time by accounting science, which continued under the approaches of neoclassical economics.

The valuation based on the emergy evidences the link between development and the territory and the need to recognize the impacts caused by the organizations in an accounting information system for decision making, thus allowing the implementation of the theoretical postulates of the T3C. Chaverra (2018) states that: The processes and flows of energy in the territory make possible to identify potentials for the use and exploitation of energy in all its dimensions, both free resources (renewable and non-renewable) and resource flows, finding that efficiency, based on greater use of free resources,
rational use of non-renewable resources and optimal and efficient management of subsidized resources makes it possible to maximize production, increase the long-term sustainability index of the territories and reduce the negative environmental effects associated with production practices in the territory (p. 116).

This requires the publication of financial and non-financial information for decision making without losing the nature of accounting, and makes it a great challenge for the accounting discipline by requiring it to study how to recognize, measure and disclose the management, use, potential use and direct and indirect circulation of ecological, socio-cultural and economic wealth by organizations. In today’s world, the corporate image of the largest companies is closely linked to their performance in the field of corporate social responsibility, and the disclosure of information on that subject, specifically on climate change (Prado-Lorenzo, Garcia-Sanchez, 2010).

Since energy is available in everything that is recognisable (including information), energy based on measures of energy can be used to evaluate real wealth on a common basis. Emergy recognizes and measures the universal energy hierarchy, which is a measure of real wealth which adds up the available energy of a previously required type directly and indirectly, through input pathways to make a product or service (Odum, 2000a).

Moving forward under this reasoning, the accounting must give answers to the demand of information that adjust to the natural resources and allow to see the way of maximizing and taking advantage of the potentialities in a sustainable way, to which Odum gives solution by mentioning:

Emergy accounting uses the thermodynamic basis of all forms of energy, resources and human services, and converts them into equivalents of one form of energy, usually solar energy. To evaluate a system from the point of view of emergy, a flow chart is first drawn to organize the evaluation and take into account all the inputs and outputs of the system. From the diagram, a table is constructed with the real flows of resources, work and energy, which are later put in emergy terms. The final step of an emergy evaluation involves interpreting the quantitative results. In some cases, the evaluation is done to establish how a certain economic proposal fits with the environment. In other cases, different alternatives are compared, or the aim is to find the way in which a certain resource can be used in order to maximize the economic viability of that use (p. 3).

Taking into account the interest of today’s society that demands financial and non-financial information in the face of the impacts and actions resulting from direct and indirect relationships with natural resources and the ecosystem services derived from them, the emergy synthesis can be considered as the missing link that was found to face the challenges and ethical debt that accounting sciences have at present. Being able to determine the real ecological wealth by means of emergy joules or emergy weights in the first place provides a reasonable method to carry out the bio-accounting processes
of recognition, measurement, and disclosure of information for decision making; in addition to the evaluation and control by means of indicators of energy sustainability.

Finally, the importance of the bio-accounting approach must be highlighted, since it determines objective valuation methods that allow to carry out accounting processes in organizations without the objective of substituting financial information. On the contrary, it provides integral accounting information for decision-making in top management that guarantees the reduction of risks derived from the depletion and deterioration of natural production factors. To this end, it is necessary to base it on the elements of ecological economics in the exploration of biophysical valuation approaches and the presentation of non-financial information. It also represents an opportunity for the construction of accounting knowledge in an interdisciplinary manner, taking into account that the relationship between the accounting discipline and the generation of non-financial information is an area that has been explored but that requires greater contributions, where Colombia has a great debt against the generation of non-financial information, knowing that we are the second most biodiverse country in the world.

Under the above, it is required to continue analyzing the bio-accounting recognition in the light of the energy through the emergy synthesis method for the generation of information and to make bio-accounting a viable alternative for the ecocentric development of the organizations from a public and/or private approach. Besides it makes bio-accounting a holistic vision (micro-accounting and macro-accounting) of the reality of the entity as a whole for the prospective planning of the social object with knowledge of the load capacity and resilience of the ecological production factors (ecological wealth). In order for accounting science to continue strengthening the bio-accounting approach, there is a call to continue exploring methods of analysis of energy, emergy, exergy, material flow, coverage flow, regime change analysis, adaptive cycles and panarchy.

Bibliography


ABSTRACT

Bio-accounting: an alternative to the challenges of the accounting science

In the face of the demand for non-financial information by different users for decision making, the paper aims to evince the need to link the ecological economics postulates to the discussion of accounting sciences to support the implementation of bio-accounting. Similarly, it shows the emergy synthesis method based on biophysical valuation approaches as a possibility for the realization of bio-accounting processes from the perspective of sustainability.

Keywords: bio-accounting, ecological economics, emergy synthesis, sustainability, decision making
1. A word of introduction

The following paper is based on the deliberations and research dedicated to the perception of development in Central America carried out as part of the “Discourses and development dilemmas in Central American local communities”. The project, led by me, has been implemented since last year and is funded by the National Science Centre. While I was collecting materials documenting the discourse on development in Costa Rican press and at the level of local authorities, I came across a series of manuals for trainers who were to impart cultural mediation workshops for indigenous people. The manuals are aimed at providing task-related support for the trainers in handling relations with adult participants of the training sessions, in order to increase the participation of local communities in sustainable development, forest conservation, and counteracting climate change.

The initiative was inspired by REDD+ (Reducing Emissions from Deforestation and Forest Degradation) programme – often referred to as a mechanism – created by the United Nations. Its goal is to reduce carbon dioxide emissions caused by deforestation and forest degradation in the so-called developing countries (FAO, 2020). As with any programme, it has both its enthusiasts and sceptics. The enthusiast argue that the programme contributes to the creation of a transparent, intersectoral and international agreement that secures both horizontal and vertical flow of information, and decentralises the decision-making process through linking the actions for the reduction of CO₂ with policies and commitment of particular states. Simultaneously, the programme engages local communities in the activities aimed at preservation of forest biodiversity and regeneration of deforested or degraded areas. On the other hand, the sceptics and critics point out that REDD+ does nothing to alter the status quo of the neoliberal, fossil fuel-based economy, while allowing
for balancing the global CO₂ production through emission rights trading, which, in fact, perpetuates the hegemony of industrialised and highly-developed states and compensating the Global South countries for the shortcomings with various subsidies and additional financing for a variety of development programmes from international financial institutions, such as the World Bank, or the Inter-American Development Bank (Carbon Trade Watch, 2013).

“The companies and the governments of the Global North sponsor projects implemented under REDD+ programme and other similar funds, using either public resources or funding from emission trading to show their «contribution» towards stopping the deforestation. However, as this does not address the reasons underpinning the deforestation, it only aggravates the problem. Since REDD+ programme represents the logic in which destruction of environment in one place can be «compensated for» with corrective actions in another, it strengthens the factors that lead to deforestation and climate change” (Carbon Trade Watch, 2013, p. 4).

Regardless of these opinions, without a doubt, this programme aimed at curbing emissions caused by deforestation and forest degradation is a part of the global notion of socio-economic development shaped by international institutions. In other words, it is a top-down proposal that, in line with the transformation of the visions of the future and alternative development paradigms, takes into account the prominent role played by local communities in the processes of change. Thus, one can conclude that REDD+ “comes close” to the group of development proposals that build upon the paradigm of transmodernism. I have purposefully used quotation marks for the words “comes close”, as the local community and its recognition as a subject in the decision-making process when proposing changes to the surrounding reality and creating new paths towards the future is, indeed, a common element. Nevertheless, the fundamental difference lies in the fact that REDD+ was conceived by the Western World, while transmodernism, described by Enrique Dussel (1999) and Yamandu Acosta (2018), builds upon the reflection on Latin American identity and takes into consideration all the theories and concepts created by the so-called Third World that demand proper recognition in the face of Western modernity, and whose key element is the notion of a post-colonial entity.

I grew to believe that in the light of the above mentioned reflections, as well as the content of the series of manuals on cultural mediation among indigenous peoples of Costa Rica, a review of these manuals was called for. The starting point was the idea that their message to the trainers reflected the traditional – among Western civilisation – notion of Latin American native peoples, thus further deepening the negative stereotypes about them. Such phrasing of the thesis implies the following research question: what is the purpose of using such image in an educational discourse?

To answer it, I shall use several research methods and maintain an interdisciplinary approach. On the one hand, in terms of qualitative analysis, I shall review the content of the manuals series in regards to the image of
the Indigenous population that was the subject of the training. I shall analyse this image comparatively in the context of social history, and afterwards I shall attempt to thoroughly answer the question presented above, using the knowledge from the field of pedagogics. It should be stressed that the content of the manuals corresponds to the scope of socio-economic geography.

2. Origins of the Manuals

During the Paris COP21 meeting in 2015, i.e. the 21st Conference of the Parties of the United Nations Framework Convention on Climate Change – UNFCCC, the planned objective was reached, and an international agreement on joint global actions on climate change was signed. The signatories have taken upon themselves to keep the level of global warming below 2°C, versus the pre-industrial era, and to strive to maintain it at the 1.5°C level. The Paris Agreement has served as a framework for actions aimed at bolstering the capacity of states to handle the impact of climate change and providing them with international support (UN, 2015). In regards to the implementation of the plan, the states have taken the obligation to strengthen the capacity of their societies to overcome the results of climate change. A conclusion was reached that in order to pursue these goals, it was necessary to raise social awareness regarding the climate change, to create appropriate conditions for education in this regard, to facilitate access to information on the issue, and to stimulate the growth of social activism in the fields by engaging civil society organisations (Milano, 2019).

Latin America is one of regions of strategic importance to the Agreement. It has the lowest indicators in terms of global greenhouse gases production while having vast forest areas that offset the CO₂ circulation in the environment. Still, the region is plagued by strong social and economic inequalities, high social vulnerability, and exposed to a high risk of releasing CO₂ to atmosphere due to irresponsible forest management, such as deforestation and degradation of forest areas. Woodlands are managed by multiple actors: from the state and international organisations, to private enterprises, cooperatives, individual farmers and indigenous communities. The REDD+ programme actions address all the listed stakeholders, with particular interest dedicated to native populations.

Costa Rica promotes multilateral cooperation within the framework of REDD+ (Reducing Emissions from Deforestation and Forest Degradation) – an agreement negotiated in 2005 under the UNFCCC. Since that time Costa Rica has taken steps to implement its mechanisms, such as those related to information, consultations, and dialogue with local communities that inhabit and carry out activities in the areas that are rich in forest resources. This issue has been additionally narrowed down by the so-called Cancún Agreement at COP16 in 2010 in the context of the decision on the social protection and environmental safeguards, as well as stages of national-level implementation of the REDD+ programme (Wallbot & Florian-Rivero, 2018).
“When undertaking the activities referred to in paragraph 70 of this decision, the following safeguards should be promoted and supported:

1. That actions complement or are consistent with the objectives of national forest programmes and relevant international conventions and agreements;
2. Transparent and effective national forest governance structures, taking into account national legislation and sovereignty;
3. Respect for the knowledge and rights of indigenous peoples and members of local communities, by taking into account relevant international obligations, national circumstances and laws, and noting that the United Nations General Assembly has adopted the United Nations Declaration on the Rights of Indigenous Peoples;
4. The full and effective participation of relevant stakeholders, in particular indigenous peoples and local communities, in the actions referred to in paragraphs 70 and 72 of this decision;
5. That actions are consistent with the conservation of natural forests and biological diversity, ensuring that the actions referred to in paragraph 70 of this decision are not used for the conversion of natural forests, but are instead used to incentivize the protection and conservation of natural forests and their ecosystem services, and to enhance other social and environmental benefits;
6. Actions to address the risks of reversals;
7. Actions to reduce displacement of emissions” (UN, 2010).

The process of preparing Costa Rica for the implementation of REDD+ started in 2008 with the appointment of FONAFIFO (Fondo Nacional de Financiamiento Forestal) as the responsible authority. The 2012 national-level meeting, in a form of a workshop, was a prominent event in this respect. It was then that the potential stakeholders of the REDD+ programme were tasked

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2 Paragraph 70 of the Cancun agreements: “Encourages developing country Parties to contribute to mitigation actions in the forest sector by undertaking the following activities, as deemed appropriate by each Party and in accordance with their respective capabilities and national circumstances:

1. Reducing emissions from deforestation;
2. Reducing emissions from forest degradation;
3. Conservation of forest carbon stocks;
4. Sustainable management of forests;

3 Paragraph 72 of the Cancun Agreements: “Also requests developing country Parties, when developing and implementing their national strategies or action plans, to address, inter alia, the drivers of deforestation and forest degradation, land tenure issues, forest governance issues, gender considerations and the safeguards identified in paragraph 2 of appendix I to this decision, ensuring the full and effective participation of relevant stakeholders, inter alia indigenous peoples and local communities” (REDD+ Web Platform, The Cancun Agreements).
with social and environmental assessment of the entire proposal to introduce the project. Among them were the representatives of 24 indigenous territories. It should be noted that the Costa Rican Native community of slightly less than 70,000, constitutes less than 2% of the general population and holds 7% of the territory of the country (out of which 70% is covered by forests) (MINAE, 2016).

At this point it is necessary to mention two factors that shape the relations between the native peoples and the surrounding world – including the Costa Rican state. From the historical perspective it is these groups that have suffered uncertainty and underdevelopment caused by discrimination and law violations prevalent in the country. For several decades the Costa Rican state ignored the existence of ethnic diversity in its territory – both in regards to Indigenous peoples as well as to communities of African origins. It was only in 1977 that the so-called “Indigenous Law” (Ley indígena) was adopted, settling the basic principles of the autonomy and the rights of these groups, such as land ownership. On the other hand, in spite of the existing legislation, these groups continued to be, and still are, exposed to illegal expropriation of community-owned lands by the remaining actors interested in carrying out business activities in forest areas, including small farmers, cattle farmers, and multinational corporations that want to have their mega-projects located in these areas (Wallbott & Florian-Rivero, 2018, p. 504).

In 2014 Costa Rica has formally become a partner within the UN-REDD, and FONAFIFO the governmental body responsible for the execution of the provisions of the programme.

The troubled past and the uncertain future, combined with supra-local interests in Costa Rica, call for a peaceful dialogue between the state and the indigenous communities, who formally have the right to forest areas that are necessary for the actions against climate change. One of the means of initiating interactions is the “cultural mediation” – as it is called in Costa Rica – i.e. a creation of a platform for intercultural dialogue. One of its elements a curriculum whose part are the workshops and manuals that will be discussed further in this article.

3. “Manual para la mediación cultural”: Objectives, Tasks, Content

The “Manual para la mediación cultural” series of cultural mediation manuals, as stated in the included description, has been conceived as a means to promote knowledge on the international REDD+ programme and the methods of its implementation among Costa Rican indigenous population. Since the initiative focuses on forest areas, which in the case of Costa Rica are partially in the hands of indigenous communities, the Costa Rican state has expressed particular

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4 There are 8 indigenous peoples living in Costa Rica: Cabécar, Bribri, Brunca (Boruca), Guaymí (Ngābe), Huetar, Guatuso (Malecu), Térraba (Teribe), and Chorotega.
interest in carrying out consultations and establishing a dialogue with these communities, regarding the issue of counteracting the climate change under the REDD+ programme. Wide dispersal of Native American communities across the territory of the country – an obstacle at an early stage of the task – was dealt with rather swiftly. To overcome the problem the 24 autonomous territories of Costa Rica were divided into 4 blocks: the central one in the cantons\(^5\) of Buenos Aires and Pérez Zeledón; the northern one with its centres on the Nicoya Peninsula; Ngäbe with centres in the south and RIBCA (Red Indígena Bribri-Cabécar de la Región Atlántica de Costa Rica) comprising Talamanca canton in the Limón Province (Florian Rivero, Sucre & Díaz Briones, 2014a, p. 81). This has facilitated the flow of information between the institutions involved in the REDD+ and the indigenous population inhabiting given areas.

To my knowledge, six manuals have been published. They constitute the basis for instructing future trainers of cultural mediation. Their aim is to enable the trainers to efficiently draw up scenarios and workshops for indigenous communities on the issues of climate change, REDD+ programme, and the methods of using it. Ultimately, the mediators should originate from these communities. Their tasks include working with the Natives and supporting them throughout the consultation process under the national REDD+ strategy (Florian Rivero, Sucre & Díaz Briones, 2014a, p. 93). Knowledge of local issues and trust among fellow members were listed as the reason for recruiting mediators from the members of indigenous communities.

The manuals were published by CATIE (Centro Agronómico Tropical de Investigación y Enseñanza)\(^6\). Five of them were issued in 2014, edited by Elena M. Florian Rivero, Levi Sucre and Angela Díaz Briones, and one, edited by Elena M. Florian Rivero, Raffaele Vignola and Angela Díaz-Briones in 2012. The manuals were created under the patronage and with financial support from the National Forestry Financing Fund – FONAFIFO, the Costa Rican REDD+ programme and the German GIZ – Deutsche Gesellschaft für Internationale Zusammenarbeit. Each of the publications is dedicated to a particular ethnic group. Although the contents of the earliest edition focus on the case of the Talamanca people, it is of a more general nature, as denoted by its title “Cambio climático y bosques: promoviendo la participación indígena en Costa Rica” (Climate Change and Forests: Promoting Indigenous Participation in Costa Rica). The remaining five 2014 issues address climate change, forest management, and the REDD+ programme in the context of the experiences of the Chorotega (issue no. 1), Malecu (no. 2), Huetar (no. 3), Ngäbe (no. 4), Bribri, and Cabecar people (no. 5). Apart from the main title of the series, “Manual para la mediación cultural” that reflects the spirit of the initiative, all the publications use same

\(^5\) Costa Rica has a three-tier administrative structure: a district is the smallest unit, canton is mid-sized, and province is the biggest body.

\(^6\) Tropical Agriculture Center of Research and Teaching – an international organisation with its seat in Costa Rica, active in Central America, Andean Countries, and the Caribbean.
particular titles and slightly different subtitles, i.e. each issue is titled “Cambio climático y bosques” (Climate Change and Forests), and has a subtitle starting with the words “Promoviendo la participación...” (Promoting the Participation...) that is modified depending on the community it is dedicated to. And so, for instance, the manual for the Chorotega people is called “Cambio climático y bosques: promoviendo la participación del pueblo Chorotega” (Climate Change and Forests: Promoting the Participation of the Chorotega People).

All manuals share a similar structure, except for the one dedicated to the Talamanca community, published in 2012. Their content is divided into thematic modules, each ending with a set of tips for the trainers on how to carry out the workshops on the issues addressed in a given module. The first module is dedicated to the Weltanschauung of the indigenous peoples (Cosmovisión indígena...) and its content varies, depending on whether the publication was meant for the Chorotega, Malecu, Huetar, Ngäbe, Bribri, or the Cabecar community. Subsequent modules address the issues of climate and climate change (El clima y el cambio climático), methods of appraisal of forests (Formas de valorar los bosques), the role of forests in combatting climate change (El papel de los bosques para combatir el cambio climático), Costa Rican national REDD+ strategy (La estrategia nacional REDD+ de Costa Rica) as well as the basic elements of workshops implementation in the community (Elementos básicos para implementar talleres en la comunidad).

Due to the fact that “Discourses and Development dilemmas of Central American local communities” scientific project, which I lead, focuses on researching areas inhabited by the Chorotega people (north-western part of Costa Rica), in my analysis I shall primarily use the cases published in the issue dedicated to this particular community. Since the thesis and the research questions were formulated based on the content analysis of the manuals published in 2014, I shall mainly focus on these editions. As for the 2012 manual for the Talamanca community, I shall refer to it at the final stage of the analysis, as a certain point of reference for my observations.

The name of the series – “Manual para la mediación cultural” – implies the use of culture and cultural differences as building blocks for dialogue and understanding between various social actors in a specific thematic dimension which, in our case, is the REDD+ programme. The definition presented in the manuals seems to confirm this view. The authors of the publication perceive cultural mediation as a search for communication, relationship, and integration of different individuals and groups that represent different cultural values and means of communication, who remain (located) in the same territory (Florian Rivero, Sucre & Díaz Briones, 2014b, p. 92). I have used this definition as a starting point for the evaluation of the entire series. After a preliminary read of the book it became apparent that:

- in spite of heavily emphasising the phrase “cultural mediation” (mentioned no less than 39 times in the publication) its definition was put at the end of the manual rather than at the beginning; while
– the interpretation of the process was, in fact, boiled down to the dialogue between the indigenous population and scientists/experts on the information concerning climate change and the forms of forest management, including financial gains generated by such activities, as can be seen in the graphics below.

Figure 1. Cover of the publication
Retrieved from: http://repositorio.bibliotecaorton.catie.ac.cr/handle/11554/8535

Figure 2. Visualization of the dialogue
Retrieved from: http://repositorio.bibliotecaorton.catie.ac.cr/handle/11554/8535
The visual aspect, which plays an important role in shaping readers’ imagination, has caught my particular attention, and became a reason for me to analyse this publication in regards to presented visions of indigenous communities and development.

4. The Perception of the Native Americans

Zygmunt Bauman argues that each of us builds “our own world map” based on the relations between one’s own group and the foreign one. Often, such identification is rooted in the existing antagonisms, which grow along with the social distance and the fading intensity of social interaction between individuals and groups (Bauman, 1996, p. 45–47). The relationship with others, which is the basis for all other differentiations that take the shape of our behaviour, is primarily affected by the distinction between “us” and “them”. “The pronouns «us» and «them» reflect not merely the classification of people into two groups, but rather the two highly divergent attitudes: sentimental relation and dislike, self-assurance and fear, readiness for collaboration and hostility” (Bauman, 1996, p. 47). The image of “others” that we build is based on facts, accounts, and impressions, rendering it, as Bauman puts it, fragmented and vague (1996). The impossibility of predicting the behaviour of “others” inspires fear, suspicion, distance, and leads to a preconception that the other group feels the same about us.

Such was the way in which the image of the New World was created in the European imaginary. First, based on fragmented information and accounts by travellers and conquistadores, and later using the relation of dominance. These notion of the New World and its inhabitants, as well as its relationship with Europe, varied. From idyllic representations with naive and friendly inhabitants to bloody descriptions of barbaric customs, describing acts of cannibalism as an everyday American reality, as can be seen in the engravings that accompanied Willem Piso’s "Historia Naturalis Brasiliae" (Piso, 1648), the accounts “Of the Island of Cuba and its Inhabitants” by Bartolomé de las Casas or the reports of Amerigo Vespucci in his letters to Lorenzo de Medici written in the year 1500.

A fragment of “Of the Island of Cuba” by Bartolomé de las Casas: “This infinite multitude of people was so created by God, as that they were without fraud, without subtlety or malice, to their natural Governors most faithful and obedient. Toward the Spaniards whom they serve, patient, meek and peaceful, and who laying all contentious and tumultuous thoughts aside, live without any hatred or desire of revenge”.

A fragment of a letter by Amerigo Vespucci to Lorenzo de Medici: “Since we have directed our ships northwards, the first inhabited land that we have encountered was an island some ten degrees away from the equator. Once we were by its shore we saw there a great multitude of inhabitants (...). We have learnt that these people, same as the inhabitants of the island that we have mentioned, were cannibals and feasted on human flesh”.

A fragment of "Of the Island of Cuba" by Bartolomé de las Casas: “This
Unfortunately such notion of Native Americans prevails in the contemporary mental representations, also in the form of stereotypes, as reflected in the political discourses of the Bolivian or Brazilian leaders (such as Jeanine Añez and Jair Bolsonaro respectively).

These notions are the product of difficult intercultural relations, both historical and contemporary that cost blood and lives of millions of original inhabitants of the Americas. In his “Clash of Civilisations” Samuel Huntington describes these relations as conflicts, and accurately captures their essence in the sentence “The West won the world not by the superiority of its ideas or values or religion (to which few members of other civilizations were converted) but rather by its superiority in applying organized violence. Westerners often forget this fact; non-Westerners never do” (Huntington, 1997, p. 59–60).

Therefore, it is justified to resort to dialogue and mediation as tools of communication, reaching agreements and settling disputes. Especially in Latin America, where the rights of Native peoples are threatened and violated. Such is the case of forest areas and the conflicts around their ownership rights. The authors of the analysed manuals address use specific examples to address the Central American tensions and conflicts in this regard. They argue that
mediation could facilitate: “communication between individuals and groups of different cultural backgrounds and lead to better mutual recognition and identification of cultural elements. Such elements, in turn, may be useful for promoting a more efficient and adjusted communication, higher degree of understanding of a given issue, as well as limiting the risk of conflicts stemming from misconceptions about the values of the other group or person. The aim of cultural mediation is to reduce the impact of stereotypes and prejudice that form the principal barrier for cultural integration, as well as to foster openness and social engagement among different social groups” (Florian Rivero, Sucre & Díaz Briones 2014a, p. 92)7.

Therefore, the aim of the manuals is not limited exclusively to initiating a dialogue and stimulating openness to new cultures but, first and foremost, it is to convince the Indigenous peoples of Costa Rica of the validity of the REDD+ programme ideas and presenting arguments that will encourage active participation in the programme. For that purpose the mediators are equipped with tools that allow them present arguments and ideas in favour of REDD+ in the best possible manner and quell potential conflicts. “Manual…” also serve as an introduction to knowledge on the traditions and beliefs of the people with whom the mediator will work.

Regrettably, in spite of lofty goals and objectivity the authors of the monographs fail to evade the prevalent stereotypes concerning the Indigenous peoples, which is reflected in the illustrations included in the manuals. In general, their function is to explain and complement the text content (Wincencjusz-Patyna, 2013). In this particular case, their aim is also to better resonate with the imagination of the trainers and workshop participants as they are used by the mediators during the sessions.

In the introduction of the books, in the part titled “¿Qué es un pueblo indígena?” that describes the material and spiritual world of the Native peoples of Costa Rica, the reader will find an illustration representing three persons: a woman, a man, and a child (see Figure 4). One may assume that it is a family. Its model (2+1), however, is rarely encountered among the Natives but corresponds more closely to the nuclear family typical of the Western culture. If the text was purely historical, such representation would be surprising. However, the illustration is a part of the definition of native population and information on the current status of Indigenous peoples of Costa Rica, their number, structure, and distribution.

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7 Own translation of the original content: “La mediación cultural nos puede ayudar a facilitar la comunicación entre personas y grupos culturalmente diferentes y a incrementar el conocimiento mutuo de los elementos culturales. Estos elementos pueden ser útiles para promover la comunicación más eficiente y adaptada, e incrementar el grado de comprensión sobre un tema en particular y limitar la posibilidad de que surjan conflictos debido a malentendidos por falta de conocimiento de los valores del otro. La mediación cultural busca reducir el peso de estereotipos y prejuicios que constituyen una de las principales barreras para el acercamiento cultural y favorece actitudes de apertura y compromiso social entre diferentes grupos sociales”. 

Hence, it may be misleading in regards to their situation and the traditional outfits of Costa Rican Tribes.

Although subsequent pages contain drawings that adequately depict the daily life of the communities (see Figure 5), the image of naked Natives appears on several other occasions, also in confrontation with the urban life and motor vehicles (see Figure 6).

It is as if the authors wished to highlight the healthy and bucolic way of life that is typical of native communities and the areas they inhabit, which brings to mind the chronicles of early explorers, in which the idyllic visions often overshadowed the actual situation. This impression is deepened by the drawings dedicated to beliefs and legends that seem to be aimed at strengthening the paradise-like image of the indigenous space, filled with air of carefreeness, and whose inhabitants may be defenceless.

These sensations are further enhanced by observations regarding the type of illustrations: their style seems better suited for a children’s book than an adult viewer, such as the trainer and their interlocutors who participate in the workshops.

I shall correlate the attempt to answer the question on the purpose of using such way of artistic interpretation with the explanation regarding the development model promoted by the REDD+.
Figure 5. The image of the Costa Rican native peoples in the “Manual para la mediación cultural”

Retrieved from: http://repositorio.bibliotecaorton.catie.ac.cr/handle/11554/8535

Figure 6. The image of the Costa Rican native peoples in the “Manual para la mediación cultural”

Retrieved from: http://repositorio.bibliotecaorton.catie.ac.cr/handle/11554/8535
5. The Perception of Development

Scientific dilemmas of the 1980s and 1990s regarding development have led to the creation of new notions of development. They clearly point to the need of rejecting the existing models and policies, not only because of their ineffectiveness, top-down orientation and origins, but first and foremost because they represent an Eurocentric approach, which disregards local (predominantly developing countries’) perception of development, prosperous life, happiness, and satisfying the needs of individuals and communities. Therefore, alternative concepts of development, which came to life already in the 20th century, started to take into account the difficult to estimate, qualitative factors. Many of these visions were created by Latin American intellectuals and scholars, and are sometimes deemed as excessively utopian.

One of the most utopian definitions of development, the Human Scale Development, relies on these qualitative characteristics and defines development in the following manner: “Such development is focused and based on the satisfaction of fundamental human needs, on the generation of growing levels of self-reliance, and on the construction of organic articulations of people with nature and technology, of global processes with local activity, of the personal with the social, of planning with autonomy and of civil society with the State”. Its authors, Manfred Max-Neef, Antonio Elizalde and Martín Hopenhayn (1991), based on the experience of Latin American countries, very specifically indicate that development cannot take place through top-down actions and decisions. In their opinion, only the self-determination of their own needs by local communities in the context of the growing influences of global phenomena is a prerequisite for the development process to occur: “Human needs, self-reliance and organic articulations are the pillars which supports Human Scale Development. However, these pillars must be sustained on a solid foundation which is the creation of those conditions where people are the protagonists in their future. If people are to be the main actors in Human Scale Development, both the diversity as well as the autonomy of the spaces in which they act must be respected. Attaining the transformation of an object-person into a subject-person in the process of development is, among other things, a problem of scale. There is no possibility for the active participation of people in gigantic systems which are hierarchically organized and where decisions flow from the top down to the bottom” (Max-Neef & Elizalde, Hopenhayn, 1991).

Simultaneously with Max-Neef, a Chilean economist, a Colombian scholar, Arturo Escobar (2018), was developing his own concepts. He gathered his reflections on possible and alternative development of Latin America in the book titled “Otro posible es posible” [“Another Possible is Possible”]. He set his work not only around the deconstruction of Eurocentric and neo-colonial notion of development in the contemporary world, but rather on the values of Indigenous peoples and contemporary ecological experiences, as well as the
ability to approach these issues from a universal perspective. Escobar’s starts with the idea that humans are part of the Earth and they belong to it (and not vice-versa, as in the Western culture that promotes modernity) and calls for tuning into the rhythm of its life, listening to voices of local communities of the Global South, and building upon the experiences of matriarchal cultures, where dialogue and consensus take the upper hand. His ideas belong to what Boaventura de Souza Santos describes as the epistemologies of the South [Epistemologías del Sur].

Such elements of alternative proposals for development – albeit only as scattered fragments, rather than a coherent whole – can be found also in the “Manual para la mediación cultural. Cambio climático y bosques: promoviendo la participación del pueblo...”. And thus the consideration indigenous peoples opinion in the REDD+ strategy has led to the creation of the manuals and became a goal of its own. The section dedicated to their lives stresses the importance of the Earth to the Natives and their mutual bond: “We are the Earth, we live off the Earth, and there is a link between spirituality, Earth, environment, and nature. It is the greatest value that we must preserve” (Florian Rivero, Sucre & Díaz Briones, 2014a, p. 17).8

The trainers, who are to be the final users of these manuals are also sensitised to the role of women in the community and the inequalities that arise from gender differences. In general, much attention is devoted to this matter, and it is recommended to dedicate one full meeting to the issue as part of the planned workshops.

Of course, global warming, its impact, and the international capacities to counteract the phenomenon are broadly discussed as well.

However, what in my opinion is the pivotal matter, i.e. the development, its definition, and its perception by local society, is completely overlooked. Although the term appears repeatedly across the text, along with such phrases as “human development”, “social development”, “economic development”, “developed countries”, or “developing countries”. The text also mentions the implementation of development goals, generating money, as well as high technologies and securing access to water and food as elements of development.

Such an approach does not encourage the participants or the trainers to reflect upon how they perceive their own future. Instead, the manuals direct the attention to the issue of possible gains from participating in the REDD+ programme, and offer classes (within the workshops) whose aim is to indicate the impact of climate change along the benefits that forest management can bring. This last issue is crucial for proving that what we see is (in this particular case) a traditional approach to development and natural resources. The general message conveyed by the “Manual para la mediación cultural...” is

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8 Original text: “Nosotros somos de la Tierra, vivimos de la Tierra, nacimos y hay un entorno entre espiritualidad, Tierra, entorno y naturaleza. Es el valor más grande que debemos conservar”.
that managing natural resources is a part of development and that Indigenous communities have the right to co-decide on how these resources are used. The vision presented in the manuals sets this management under a mercantilist paradigm, in which the good, i.e. the forest and its resources, as well as the economic and industrial underdevelopment of areas rich in forest resources, may be appraised and treated as elements of trade in goods and services (see Figures 7 and 8).

**Figure 7. The Benefits of REDD+**


Such an approach contradicts the attitudes of Indigenous peoples, whose opinions emphasising the pricelessness of the Earth, are quoted in the book: “The Earth is everything to us. If we sell out the Earth, we sell out our mother. A non-native sees the Earth as a mean to make money” (Florian Rivero Elena M., Sucre Levi & Díaz Briones Angela, 2014a, p. 18)⁹.

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⁹ Original text: “La Tierra es todo para nosotros. Si nosotros vendemos La Tierra, vendemos nuestra Madre. Para el no-indígena, la Tierra es un negocio para hacer plata”. 
The notion of development imposed by international organisations may, in a short term, improve the financial situation of the communities through funding provided by international funds. Still, the economic activity of these communities seems to be consistently curtailed in the areas where REDD+ is implemented – especially in regards to traditional activities that entail seasonal burning of forests for cultivation of traditional alimentary plants, cattle farming, or obtaining wood for trade, etc. Most certainly it will also affect the cultural identity of the communities.

Unfortunately, in the global scale, this proposal does in fact strengthen the system of dominance and economic dependency, founded upon the flow of funds from the rich countries to the poor ones on the condition of keeping the level of CO$_2$ emissions low and preventing deforestation and forest degradation. This dependency is well-illustrated by drawings, such as the one below, as well as the use of the classical international relations division into developed and developing countries.

![Figure 8. The Benefits of REDD+](http://repositorio.bibliotecaorton.catie.ac.cr/handle/11554/8535)

Thus we are arriving at a conclusion that the model of development that the Indigenous population is offered as part of the REDD+ strategy fits the traditional, mid-20th century notions in which natural resources have an easily determined value, and can be subjected to trade exchange in order to obtain tangible gains.

6. As a Conclusion

As shown in the analysis, the message of the series, exemplified by the “Manual para la mediación cultural. Cambio climático y bosques: promoviendo la participación del pueblo Chorotega”, reflects Western civilisation’s traditional notion of Native Latin American peoples, thus strengthening the prevalent negative stereotypes concerning indigenous populations. This image is accompanied by the invariable recipe for methods of pursuing development that has been pushed for years by such international institutions as the World Bank or the United Nations. This “well-known” image certainly makes the trainers task easier, as they stay within the clichés describing the relationship between the man and the environment or the traditional cultures and the development; concepts imparted in school and promoted for years by governments and international institutions. This simplistic image of Indigenous peoples of America that the trainers receive may lead them to believe that task they are to face will be effortless, and that the Indigenous population, and their “opponent” – undemanding. I am using the term “opponent” deliberately, since it is the style of the books’ narrative, set not in the consensus at which the mediation should be aimed, but rather in the existing divisions and differences between the indigenous culture and the West.

What is troubling is that the manuals where consulted with the representatives of Costa Rican Indigenous peoples, and still their contents remains controversial. Land disputes, conflicts over economic influence, and over decision-making processes exists also among the native communities, and it is likely that this was the element that affected the final form of the manuals, whose goal is to raise awareness on climate change among Indigenous peoples under the paradigm of profit and loss account. Yet, the “Manual para el mediador cultural. Cambio climático y bosques: promoviendo la participación indígena en Costa Rica”, published in 2012, is an exception. In spite of being part of the same series, its content is different than that of the remaining publications. It lacks the controversial depictions of naked Natives, and its layout reflects the essence of the issue that need to be resolved, i.e. the global warming and the rational use of forests.

I can state with full responsibility that the contents of the presented publications does not reflect the new, transmodern approach to development and the matters relating to global warming. Thus, it serves as yet another argument in favour of the alternative ideas for role reversal and assuming a grass-root, i.e. local, perspective on these issues.
Bibliography


Abstract


The article is a part of research within the framework of the “Discourses and development dilemmas in Central American local communities” project, funded by the National Science Centre (project no. 2018/29/B/ HS6/00187). The paper analyses the content of a series of 2014 publications titled “Manual para la mediación cultural. Cambio climático y bosques: promoviendo la participación del pueblo...” whose objective was to raise awareness and commitment of Costa Rican indigenous people in regards to combating climate change. Our interest focuses on the notions of indigenous peoples and development as key elements of the development paradigm that shapes the world of contemporary institutions and international relations.

Keywords: Costa Rica, REDD+, education, development, indigenous peoples
The areas inhabited by man have always been an arena of conflict. The more developed regions attract new residents, who seek their place and work there. Excessive migration causes congestion, lack of space for new buildings and hence conflicts. The city is a specific area of conflict – over land, over access to infrastructure, over housing, over jobs. Excessive urban development, which exceeds the limits of efficient area management, contributes to the deterioration of living conditions – transport chaos, social segregation, inefficient public services, air pollution. Conflicts over water, over sustainable electricity, over resources, over access to education are also everyday topics in all parts of the world. We present our readers with a monograph devoted to some of the above-mentioned problems, which are common for Poland and for Latin American countries.

This publication is a continuation of the topics discussed in earlier monographs, which were the result of joint research of Polish and Latin American geographers within many projects dedicated to urban issues. Academics of the Faculty of Geography and Regional Studies of Warsaw University have been lecturers at doctoral studies in urban and regional sustainable development and post-doctoral studies in Earth and Environmental Science at the University of Manizales in Colombia (Doctorado en Desarrollo Sostenible y Posdoctorado en Ciencias de la Tierra y el Medio Ambiente). Doctoral students and lecturers from the University of Manizales have visited Poland many times in joint symposia and workshops. In 2017 a Polish-Colombian monograph in Spanish was published in Colombia and in 2018 two scientific monographs, both in Spanish and English, were brought out by the University of Warsaw Press. This volume is the first of the two published in 2021 and contains only English texts on sustainable development, risk and local development in Poland, Colombia and some other South American countries.