SUSTAINABLE DEVELOPMENT
CROSSING BORDERS, BREAKING STEREOTYPES

EDITORS
MIROSŁAWA CZERNY
CIRO ALFONSO SERNA MENDOZA

WYDAWNICTWA UNIWERSYTETU WARSZAWSKIEGO
WUW

Reviewers
Wioletta Kałamucka
Rogelio Pineda Murillo

Commissioning Editor
Małgorzata Yamazaki

Content Editor
Wojciech Doroszewicz

English Text Editor
Bożena Lesiuk

Proofreading
Anna Wojciechowska

Production Editor
Maryla Broda

Cover design
Wojciech Markiewicz

Illustration on the Cover
Mirosława Czerny
Eje cafetero *(Coffee belt, Colombia) – houses that once belonged to coffee plantation owners are converted into guesthouses and hotels. This zone is often visited by foreign tourists.*

Typesetting
Marcin Szcześniak

This publication is part of the GEODESOLA project, which was financed by the National Agency for Academic Exchange NAWA under The Foreign Promotion Programme: PPI/PZA/2019/1/00064

ISBN 978-83-235-4878-2 (druk) 978-83-235-4886-7 (pdf online)
ISBN 978-83-235-4894-2 (epub) 978-83-235-4902-4 (mobi)

Mirosława Czerny 0000-0002-8216-9912
Uniwersytet Warszawski

Ciro Alfonso Serna Mendoza 0000-0003-9192-9771
University of Manizales, Colombia

Wydawnictwa Uniwersytetu Warszawskiego
00-838 Warszawa, ul. Prosta 69
e-mail: wuw@uw.edu.pl
Online bookstore: www.wuw.pl

First Edition, Warszawa 2021

V. Nature and conflicts over sustainable development

Integral diagnosis and conservation strategies for the Otomí Mexica Park of the State of Mexico. A systemic analysis on protected natural areas 281
Jesús Gastón Gutiérrez Cedillo, Luis Miguel Espinosa Rodríguez, Daniel Villegas Martínez

Objective six of sustainable development 2030: characterization in hydrosocial territory in the south of the State of Mexico 295
Alan Noe Jim Carrillo Arteaga, Jesús Castillo Nonato

Industrialization of the Amazon, a dialectical antagonism 309
Yuri Sandoval Montes, Gema Elvira Rios Araníbar

Heat sources in the Eastern region of Bolivia between 2000 to 2019 317
Guillermina Miranda Torrez

Trade trends in cyberspace before COVID-19. The case of online commerce in Mexico 336
Martha Cedillo Alonso, Francisco Monroy Gaytán, Rodrigo Huitrón Rodríguez

COVID-19 in Mexico. Space-time behavior from the socio-spatial constraints, February–October, 2020 349
Marcela Virginia Santana Juárez, Giovanna Santana Castañeda, Luis Ricardo Manzano Solís, Noel Bonfilio Pineda Jaimes, Rebeca Angélica Serrano Barquín

Facing sanitarian crisis: between sustainability and compatibility 361
Guillermo Torres Carral

Water management: environmental and social impacts of dam construction 368
Bruna Angela Branchi, Cibele Roberta Sugahara, Denise Helena Lombardo Ferreira

Economic valuation of flood control ecosystem service in natural wetlands. State of the art 376
Christian Alejandra Vidal Sierra, Ciro Alfonso Serna Mendoza, Coral Jazvel Pacheco Figueroa, Gloria Yaneth Flórez Yepes

VI. Education about and application of sustainable development

Earth science in education and its purpose in liquid modernity 389
Ciro Alfonso Serna Mendoza, Diana Sofía Serna Giraldo

"How were we supposed to know?" – the problem of embedding education for sustainable development in the learning process. Examples of New Zealand, France and Poland 400
Małgorzata Klein

Objective six of sustainable development 2030: characterization in hydrosocial territory in the south of the State of Mexico

Alan Noe Jim Carrillo Arteaga
ORCID 0000-0002-9045-7850
Facultad de Planeación Urbana y Regional. Universidad Autónoma del Estado de México

Jesús Castillo Nonato
ORCID 0000-0003-2086-356X
Facultad de Ciencias Agrícolas. Universidad Autónoma del Estado de México

Introduction

The 2030 Agenda was approved on 25 September 2015, by 193 Member States of the United Nations (UN). This is a planning tool that aims to move towards a model sustainable development, considering 17 objectives, focused on people, prosperity, planet and peace. With the fulfillment of these objectives, it seeks to reduce poverty, inequalities, protect human rights, build prosperous, just and peaceful societies, taking care of natural resources and the planet [United Nations System in Mexico, 2020 (Sistema de Naciones Unidas en México), 2020].

The target six, so-called "water and sanitation", seeks to ensure availability, sustainable management and sanitation of water resources for all, as it is considered a human right. At the end of the second decade of the 21st century there are still people who do not have access to water-related services, such as drinking water. On the other hand, they do not have effective treatment plants that guarantee the potability of the resource before being discharged into a river, lake and the ocean.

It should also be mentioned that the UN contemplates ten notable points which in some way synthesize the problems related to "water and sanitation" at a global level: "Data highlights

1. Three out of ten people lack access to safe drinking water services and six out of ten lack access to safely managed sanitation facilities.
2. 892 million people continue to practice open defecation.
3. Women and girls are in charge of collecting water in 80% of households without access to running water.
4. Between 1990 and 2015, the proportion of the world's population using an improved source of drinking water increased from 76% to 90%.

5. Water scarcity affects more than 40% of the world's population and this percentage is expected to increase. More than 1.7 billion people currently live in river basins where water consumption exceeds recharge.
6. Four billion people lack access to basic sanitation services, such as toilets or latrines.
7. Over 80% of wastewater resulting from human activities is discharged into rivers or the sea without any treatment, causing pollution.
8. Every day, about 1,000 children die from diarrheal diseases associated with poor hygiene.
9. Approximately 70% of all water extracted from rivers, lakes and aquifers is used for irrigation.
10. Floods and other water-related disasters account for 70% of all deaths related to natural disasters." (United Nations System in México, 2020).

It must also be said that in order to face these remarkable data that establish the problems and relevant aspects related to goal six, the UN also established six goals and two sub-goals to be met by 2030 and these are: "The targeted six goals for sustainable development, 2030.

1. Universal and equitable access to drinking water at an affordable price for all.
2. Access to adequate and equitable hygiene and sanitation services for all and end open defecation, paying special attention to the needs of women, girls and people invulnerable situations.
3. Improve water quality by reducing pollution, eliminating dumping and minimizing the emission of chemicals and hazardous materials, reducing the percentage of untreated wastewater by half and significantly increasing recycling and safe reuse worldwide.
4. Significantly increase the efficient use of water resources in all sectors and ensure the sustainability of freshwater extraction and supply to address water shortages and significantly reduce the number of people suffering from water shortages.
5. Implement integrated management of water resources at all levels, including through cross-border cooperation, as appropriate.
6. Protect and restore water-related ecosystems, including forests, mountains, wetlands, rivers, aquifers, and lakes.
   6a. Expand international cooperation and support to developing countries for capacity building in activities and programs related to water and sanitation, such as water harvesting, desalination, efficient use of water resources, wastewater treatment, recycling and reuse technologies.
   6b. Support and strengthen the participation of local communities in improving water and sanitation management." (United Nations System in Mexico, 2020).

Let us now consider the relationship of objective six with the characterization of a hydrosocial territory in the south of the State of Mexico. In the

first place, it is necessary to mention that the territory to which we refer in this work is the municipality of Coatepec Harinas, which is a non-urbanized territory. The characterization and the concept of hydrosocial territory refers to the study of the relationships that keep three elements: water, territory and society based on the water resource to which they have access through infrastructure at different levels of services, as well as technology and quality, in most cases linked to the type of activity and social organization that manages, builds, administers, controls and, at the same time, configures a territoriality based on its meaning, relevance, relationship and the construction of agreements.

With regard to understanding the meaning of the word "territory" it is advisable to make a series of clarifications of its roots and with this we refer to the origins of the word, In this sense in etymological terms it is a word that comes from the Latin *territorium* which means "politically divided land extension". The lexical components are: terra (land), plus the suffix orio (belonging, place). Capel (2016) mentions that this word was found in Spanish as well as in French as early as the 13th century.

The Dictionary of the Royal Spanish Academy (2019) defines the territory in this way:

"from Latin – Territorium with four meanings:

1. m. Portion of the earth's surface belonging to a nation, region, province, etc.
2. m. Land; field or sphere of action.
3. m. Circuit or thermal that includes a jurisdiction, an official role or other analogous function.
4. m. Specific land or place, such as a cave, a tree or an anthill, where a certain animal lives, or a group of animals related by family ties, and which is defended against the invasion of other congeners".

Capel (2016) explains that there are specialized dictionaries in urban geography, urban planning and spatial planning that define the territory as "a geographic space in the broad sense attributed to an individual being or a collective entity" (Grupo Aduar, 2000). The Dictionary of Human Geography defines it as: "the portion of space occupied by a person, group or state; in its most social geographical use, the territory refers to the limited social space, occupied by different social groups as a consequence of the implementation of their territoriality or the field of power over a space exercised by the dominant institutions. From this perspective, the territory can be used as an equivalent of the spatial concepts of place and region" (Johnston, Gregory y Smith, 2000; citados en Capel, 2016, p. 3).

It should also be mentioned that talking about territory is not only naming or ordering objects within a space, it also has other purposes, such as approaching the concept as a strategy related to the communication of different meanings, especially classificatory in order to establish forms of identity and difference, thereby managing to control what is inside, limiting access

or excluding others; in this way it works as a control mechanism to promote order, security and peace in a more clear and simple way, contributing to the progress of a social group (Hernández, 2018; interpreted by Delaney, 2005).

In this sense, territories present a dynamic for their formation and construction based on societies, and specifically based on the interactions between the different social actors. However, as it requires other aspects to stimulate this process. Duarte et al. (2015), Rodríguez and Boelens (2016) comment that interactions with technology and nature are essential.

On the other hand if the territory is analyzed with the greatest number of possible interconnections can find another term partner that adds to the breadth of understanding and conceptualization of the first, this concept is territoriality, this broad understanding of the territory and involving different forms of thinking, acting and being in the world, the ways of building based on beliefs, desires, cultures and circumstances, one can say the material and metaphysical phenomena, which are structured by the collective and individual conscience of a certain social group (Delaney, 2005; Hernández, 2018).

We can now explain the concept of hydrosocial territory: it assumes relationships, meanings, symbols, beliefs, culture and agreements, development, organization, establishing and defining social actors in relation to water resources in a given territory.

Let us consider some theoretical aspects of hydrosocial territory, starting with the contribution of Boelens et al. (2016; quoted by Hernández, 2018), who mentions the elements that make up the term in the following way: "A rebellious imaginary and socio-environmental materialization of a spatially united multiscale network, in which human beings, water flows, ecological relationships, hydraulic infrastructure, financial means, administrative-legal arrangements, cultural institutions and practices are defined, aligned and mobilized interactively through epistemological belief systems, political hierarchies and naturalizing discourses" (Boelens et al., 2016, p. 2; quoted by Hernández, 2018).

So the definitions of other authors as cited Hernández (2018), we speak of "hydrosocial configuration" and in this term we can find concepts such as: "hydro-social cycle" (Swyngedouw, 2009), "sociometabolic profiles" (Zanuccoli et al., 2011), "water flows and power flows" (Meerganz von Medeazza, 2006), "hydric landscapes" (Budds, 2010), view: Rodríguez (2017), cited in Hernández (2018).

Methodology

The methodology used was of a multi-method type based on the use of qualitative methods and techniques that allowed to achieve the characterization of the hydrosocial territory considering the priority of objective six "guarantee the availability, sustainable management of water and sanitation for all", exposing

the situation of access, control and the relationships between the different social actors.

The multi-method consisted of three stages. The first was the documentary investigation to obtain sources of information: articles, books, statistics, geostatistics, Public Registry of Water Rights (REPDA) for its acronym in spanish and specialized bibliography, as well as cartography, aerial photographs and satellite images.

The second stage consisted in the selection of adequate information, with this a structured matrix was made based on two questionnaires, one of them referring to the ten notable points. The second questionnaire was based on the six goals and two subgoals established by the UN to deal with the relevant problems and aspects, considering that these goals must be met by 2030, and in this sense it assessed the context of the hydrosocial territory and its relation to goal six.

In addition to structuring the questionnaires, a strategic plan was developed to carry out field work, through tours and key participatory interviews, in order to obtain reliable information on the characterization of the hydrosocial territory and its relationship with objective six. This plan was based on the anthropological method, identifying the social actors and the infrastructure to give way to prolonged stays (two to three months in the rainy season) and semi-permanent stays (the dry season) in which semi-structured interviews were applied to the Irrigation Unit, producers and authorities. It was possible to know the form of social organization for the development of agricultural and floricultural activities making use of the water resource and with it the way in which they had built a territoriality and the configuration of the territory.

The third stage consisted of the qualitative and quantitative analysis of the information obtainedduring research, compared to the field work. The results obtained characterized the water sources, the social actors, the territoriality and the configuration of the hydrosocial territory, considering the three actors: water, territory and society, as well as the technologies used by each of the social actors for access, agreements, administration and control of water.

Results

Regarding the characterization of the hydrosocial territory, let us consider that important water sources circulate through the municipality from runoff from the Xinantécatl Volcano, better known as the Nevado de Toluca, a hydrological source of vital importance for the Toluca and Tenango Valley.

Based on the Public Registry of Water Rights (REPDA), the municipality has 60 titles that protect agricultural use with a total volume of 55'072,348.80 m^3 per year, extracted from 32 springs, 15 rivers, 8 streams, 4 wells and a riverbank. As shown in Table 1, the volume of water consumption by title ranges from 2,250 m^3 per year to 15,768,000 m^3 per year.

Table 1. Titles with agricultural use

Number	Volume (m^3/year)	Use covered by the Title	Source
1	25 228,00	Agricultural	Water springs CLARA 1, 2 Y 3
2	13 478,00	Agricultural	Springs LOS SAUCES I Y II
3	20 736,00	Agricultural	Spring LA MESA o LA TRINIDAD
4	6 143 040,00	Agricultural	River LAJA o River LAS FLORES
5	787 968,00	Agricultural	Stream LA TORTUGA
6	165 888,00	Agricultural	Stream CANOITAS
7	60 000,00	Agricultural	Spring LAS TINAS
8	36 495,00	Agricultural	Spring AGUA ZARCA
9	126 144,00	Agricultural	Spring AGUA ZARCA
10	50 572,80	Agricultural	1504 – TENANCINGO
11	18 000,00	Agricultural	Stream CALICANTO
12	20 736,00	Agricultural	Spring OJO DE AGUA
13	115 550,00	Agricultural	River LAS FLORES
14	378 432,00	Agricultural	Streams EL MOLINO Y TIERRAS BLANCAS 1 Y 2
15	60 000,00	Agricultural	Spring RINCON DE LAS HADAS
16	518 400,00	Agricultural	River EL SALTO
17	18 255,00	Agricultural	BORDO ESPINOZA I
18	275 121,00	Agricultural	Spring LOMA DE ENMEDIO
19	63 072,00	Agricultural	Stream LA CRUZ
20	2 460,00	Agricultural	Spring EL FRESNO
21	16 912,00	Agricultural	Spring LA JOYA
22	12 614,00	Agroindustrial	Spring LA CIENEGA
23	68 947,00	Agricultural	River LAS FLORES
24	51 840,00	Agricultural	Spring JOYAS DE DON ABEL
25	11 795,00	Agricultural	Spring EL POCITO
26	17 400,00	Agricultural	Spring EL MANZAN0
27	2 250,00	Agricultural	Spring LOS ENCINOS
28	2 250,00	Agricultural	Spring LA ROSA
29	9 960,00	Agricultural	Spring LA ROSA
30	21 000,00	Agricultural	Spring LOS AILES
31	48 000,00	Agricultural	1504 – TENANCINGO
32	40 000,00	Agricultural	1504 – TENANCINGO

Number	Volume (m^3/year)	Use covered by the Title	Source
33	49 766,00	Agricultural	Stream LA FRAGUA
34	24 261,00	Agricultural	Spring LA TRINIDAD Ó LA MESA
35	6 000,00	Agricultural	Spring EL MANZANO
36	39 823,00	Agricultural	Spring AGUA ZARCA
37	24 000,00	Agricultural	Spring LOS CARRIZOS
38	539 136,00	Agricultural	Springs OJO DE AGUA, A. LOS AMARGOS 1 Y 2, LOS JARROS, LOS CAPULINES, LA HILAR, LA CIENEGA Y TE
39	894 000,00	Agricultural	Spring LA TOMA
40	589 680,00	Agricultural	River EL SALTO
41	199 895,00	Agricultural	River CHILTEPEC
42	6 894 823,00	Agricultural	River LAS BURRAS
43	2 310 295,00	Agricultural	River CHIQUIHUITERO
44	331 776,00	Agricultural	0 – COATEPEC HARINAS
45	37 340,00	Agricultural	Spring LA JOYA
46	37 340,00	Agricultural	Spring LA CIENEGA I
47	37 340,00	Agricultural	Spring LA CIENEGA II
48	30 850,00	Agricultural	Spring EL FRAYLE
49	37 340,00	Agricultural	Spring PUENTE DE TIERRA I
50	37 340,00	Agricultural	Spring PUENTE DE TIERRA II
51	2 633 472,00	Agricultural	River PACHUCA
52	435 456,00	Agricultural	Stream CAPULIN
53	933 120,00	Agricultural	River LAS PITAYAS
54	199 584,00	Agricultural	Springs LA CAÑADA Y OJO DE AGUA
55	9 123 840,00	Agricultural	River MEYUCA
56	744 000,00	Agricultural	River MEYUCA O LAS PITAYAS
57	1 923 264,00	Agricultural	River LAS PITAYAS
58	1 179 360,00	Agricultural	Stream PASO DEL BUEY O TECOLOTEPEC
59	808 704,00	Agricultural	River CHIQUIHUITERO
60	15 768 000,00	Agricultural	River LAS FLORES, EL TELAR O JABALI, Streams SAUDA O MOMOXTLE Y EL SALTO
Total volume	**55 072 348,80**		

Source: Authors' elaboration based on REPDA

In view of the above, the water from rivers and streams constitutes one of the first elements for agricultural and flower production; the water resource of these tributaries is derived by canals until it reaches the farmland. For this, it is necessary to build agreements and hydraulic works between social organizations. In Coatepec Harinas and according to REPDA data there are 60 users with a concession title for agricultural use, with producers among their members (small and medium), companies, and 15 Irrigation Units (UR).

To illustrate the above, the operation of a UR, located in the community of Ixtlahuaca, is described below, with the aim of showing part of the results obtained, which allowed to know the organization and operation of social actors in the configuration of the social territory through its territoriality and management of water resources, as well as the relationship of the context and situation that it has with goal six of sustainable development 2030 in the period from 2019 to 2020.

In the UR everything begins once the river water has been diverted; the liquid enters a general canal l approximately 2 m wide by 1.5 m high, through which it will circulate by means of gravity. In its first kilometers, the canal is lined with cement to later modify its measurements by a secondary canal approximately 1.50 m wide and 80 cm deep.

Subsequently, divisions into canals of one meter wide by 60 cm are presented to supply the users that make up the UR. The derivations are presented by means of drawers that are made in thecanals, as shown in image one, whose function is to concentrate a greater volume of water and divert it through gates to anothercanal.

Figure 1. Derivative work

Figure 2. Storage tank

Source: Authors

The secondary canals, in addition to supplying water to the users, are used to fill storage works that are generally of two types. Community storage tanks provide water to the lands located in the upper parts, as can be seen in Figure 2.

Another type are the *reservoirs* whose construction is based on the financial capacity of the users, they fulfill the function of reservoirs so that the producer has water available at any time. Their construction and location is shown in Figure 3. They are located near the greenhouses. This type of *reservoir* is of different sizes: four by five meters, four meters deep, being privately owned. Also, there are community *reservoirs* which measure 40 by 50 meters and are 10 meters deep as seen in Figure 4.

Figures 3 and 4. Reservoirs: left – private property next to greenhouses, right – community

Source: Authors

For proper distribution of water between users and the administration of the hydraulic work there is a committee of social organization that is comprised of a president, a secretary and a treasurer. There is also a person in charge of the distribution of water among users, whose activity involves knowing and visiting all the existing hydraulic works. He is called "the gutter, delivery man or plumber"; he knows the general and secondary canals and the ditches through which the water flows, as well as the intakes, valves and gates, which make up the system to assign, supply, divert and regulate water.

The distribution of water is on Sunday in a period from March to June. It starts on the first Sunday of March in two ways, one following the list and two based on the place that users get when they arrive at the committee's

offices, which opens at 7 am, although there are users who arrive at 5 am. For the assignment you must have met at least two requirements; 1) having participated in the tasks involving the cleaning of the general canals, 2) The payment for the right to water is between $ 400 and $ 500 pesos, about 17 to 21 euros and $ 20 to $ 25 dollars at the exchange rate at the closing of the year 2020.

The volume is assigned based on local measurement unit called "melga" that according to the plumber is equivalent to water flowing through a 10-inch canal from 7 am to 1 pm and 1 pm to 7 pm, for those users who only require half a water tank or the equivalent of the volume that can reach the farmland in a period of three hours.

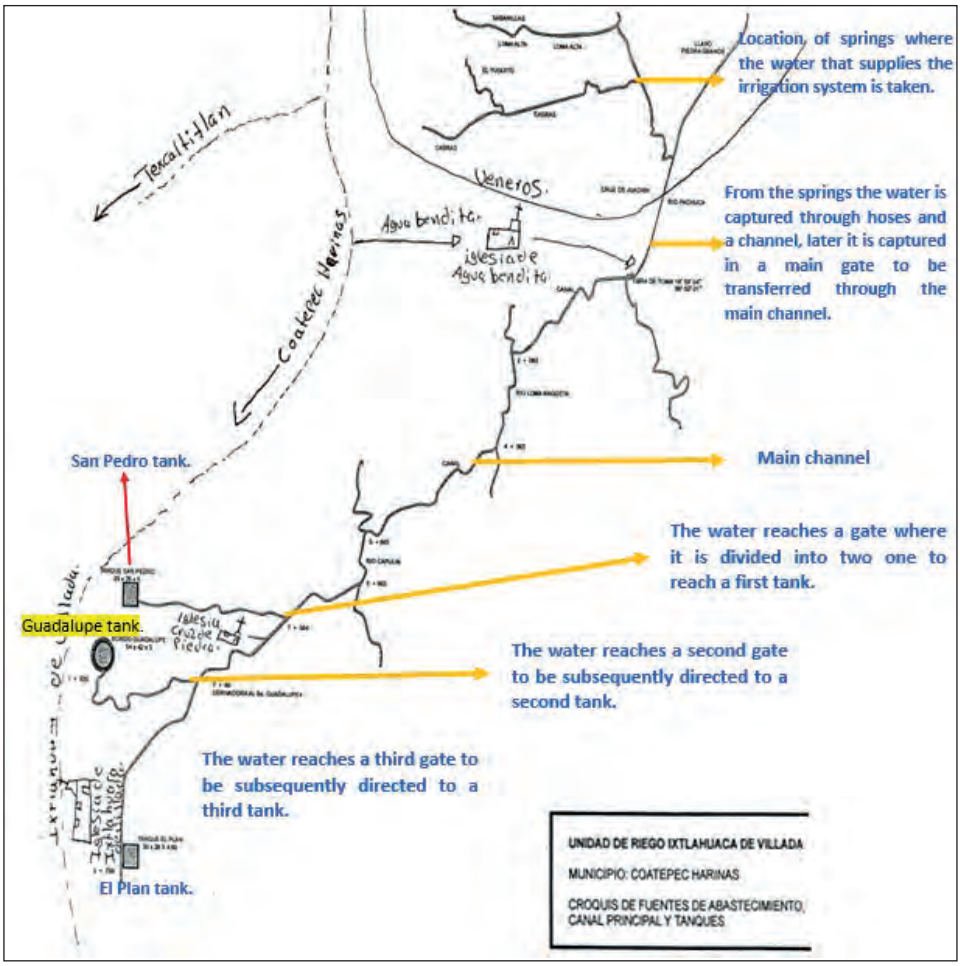

Figure 5. Sketch of the irrigation unit, Ixtlahuaca de Villada, from the springs through general canals to tanks

Source: Authors (document edited with the sketch of the Irrigation Unit)

Watering is done before 7 pm after the plumber closes the valves. From July to September, when the rainy season is more constant and intense, the water that flows through the canals is not used since the rainfall is now the one that encourages the development of open-air crops and the one that fills the reservoirs. The water in the canals in the rainy season flows freely, being used by a producer who can make use of it at no cost. After the rainy season, that is, from October to February, a second stage of irrigation distribution among producers occurs.

Figure 5 shows the UR sketch that was described in the previous paragraphs. It should be noted that said document is presented on the basis of the scheme with which the committee and the plumber work. You can see the tributary and the derivations that are made for the control and access of water, as well as the infrastructure works carried out.

In view of the above, the social actors exerted they territoriality under that conditions into the municipality territory. In relation to the ten highlighted data, the two tables summarize the variables related to the case study. Similar results, especially for UR and small producers are shown, while companies have better conditions regarding the first two actors since these are located in the urban peripheries, a few kilometers from the municipal head or urban infrastructure, while the others are located more than three kilometers from the urbanized areas.

Table 2. Contextualization of the variables of the problematization of objective six

Relationship with notable data	Variables	Irrigation units	Small producers	Company
1	Access and security	No	No	Yes
	Consumption vs affectation	Yes	Yes	Yes
2, 6 y 7	Sanitation	No	No	Yes
3	Women and water management	Yes	Yes	Yes
4	Water treatment	No	No	No
5	Shortage	Yes	Yes	Yes
7	Surplus	Yes	Yes	Yes
8	Pollution diseases	No	No	No
9	% water for irrigation	100	100	100
	% water for human consumption	0	0	0
10	Natural hydric disasters	No	No	No

Source: Authors' elaboration based on the methodological analysis

Table three shows the contextualization of the variables in relation to the six goals and two subgoals established by the UN to face the problems of goal six, considering that these should be met by 2030. The results also show hydrosocial territoriality.

Table 3. Contextualization of variables regarding the goals of objective six

Relationship with goals	Variables	Irrigation units	Small producers	Company
1	Equitable access and affordable price	Yes	Yes	Yes
2	They have adequate sanitation	No	No	No
3	Actions to avoid polluting	No	No	No
	Use of eco-technologies	Yes	Yes	Yes
	% use of rainwater	20%	20%	20%
4	Actions for efficient use	Yes	Yes	Yes
5	Government programs	Yes	Yes	Yes
6	Ecosystem protection actions	No	No	No
6 a	Water management training	No	No	No
6 b	Supports for water management	No	No	No

Source: Authors' elaboration based on the methodological analysis

As can be seen in Table 3, the actors of the hydrosocial territory are managing to respond to three and a half goals established. Considering that there are eight goals in total, actions are still needed on four and a half goals, which are related to care, treatment and protection of water resources, as well as the impact of these actions on other ecosystems and living beings.

Discussion

The conception of hydrosocial territory allows to reveal and analyze the relationship that occurs between society and nature, which according to Sandoval (2017) is a perspective to explain the inseparable social and natural imbrication in the spaces where human activities are based.

In this regard having water services is an essential task for achieving the other 17 sustainable development objectives, especially that the water resource is vital to humans. Despite the difference in volumes assigned to the different social actors found in Coatepec Harinas, at the moment there have been no problems due to distribution, access, assigned volume that represent risks in continuity and in possible outbreaks of conflict between social actors or with community authorities in the case of water. Within the concept of hydrosocial territory, three dimensions are presented in which social activity, hydraulic work and the guidelines through which order between actors is maintained stands out (Damonte, 2015).

The relationship between the importance of objective six and the hydrosocial territory that is the subject of the study is manifested in the results

found, in which social actors with fewer resources: UR and small producers have fewer opportunities. If technology and sustainable development of their productive activity is compared to companies, it in turn exposes the concordance in the lack of services related to sanitation and efficient use of water resources.

Therefore, the use of water in the municipality should have the priority to obtain economic resources, as the issues of contamination, treatment, efficient use of water resources are still neglected, which leads to a negative impact on ecosystems related to water, including forests, mountains, wetlands, rivers, aquifers and the social actors of the hydrosocial territory, which at the same time reflects a territoriality destined to survival and economic development.

Bibliography

Boelens, R., Hoogesterger, J., Swyngedouw, E., & Vos, J.y. (2016). Hydrosocial territories: a political ecology perspective. *Water International*, 41(1), 2–14.

Capel, H. (2016). Las ciencias sociales y el estudio del territorio. *Biblio 3W. Revista Bibliográfica de Geografía y Ciencias Sociales*, XXI(1,149). Retrieved from: http://www.ub.es/geocrit/b3w1149.pdf (access: 11.10.2020).

Damonte, H.G. (2015). Redefiniendo territorios hidrosociales: control hídrico en el Valle de Ica, Perú (1993–2013). *Cuadernos de Desarrollo Rural*, 12(76), 99–134. Doi.10.11144/Javeriana.cdr12-76.rthc.

Delaney, D. (2005). *Territory: a short introduction*. London: Blackwell Publishing.

Duarte-Abadia, B., Boelens, R., & Roa-Avedaño, T. (2015). Hydropower, encroachment and the repatterning of hydrosocial territory: The case of Hidrosogamoso in Colombia. *Human Organizatión*, 74(3), 243–254.

Grupo Aduar (2000). *Diccionario de Geografía Urbana, Urbanismo y Ordenación del Territorio. Barcelona, España*: Ariel Referencia.

Hernández, B.C. (2018). El Macizo Colombiano como territorio hidrosocial (1990–2018). *Revista Controversia*, 210, 203–242.

Naciones, U. (2018). La Agenda 2030 y los Objetivos de Desarrollo Sostenible: una oportunidad para América Latina y el Caribe (*LC/zG. 2681-P/Rev. 3*). Santiago.

Real Academia Española (2019). Diccionario de la lengua española (ed. R.A. Española). Retrieved from: dle.rae.es: https://dle.rae.es/territorio (access: 11.10.2020).

Registro Púlico de Derechos de Agua (2020). Base de datos del REPDA. CONAGUA, México. Retrieved from: https://app.conagua.gob.mx/Repda.aspx (access: 7.11.2020).

Rodríguez de Francisco, J.C., & Boelens, R. (2016). PES hydrosocial territories: De-territorialization and re-patterning of water control arenas in the Andean highlands. *Water International*, 41(1), 140–156.

Rodríquez, S.A. (2017). Configuración hidrosocial: ¿paisaje, territorio o espacio? *Waterlat Gobacit Network, Working Papers. Tematic Area Series – Ta*, 4(3), 27–41.

Sandoval, A. (2017). Exploración de las contribuciones del enfoque "hidrosocial" a los estudios de caso sobre agua. *Waterlat-Gobacit Network Working Papers*, 4(3), 16–26. Doi:10.5072/zenodo.167124.

Sistema de Naciones Unidas en México (2020). Marco de Cooperación de las Naciones Unidas. México: Naciones Unidad México.

Unidad de Riego de la Comunidad de Ixtlahuaca de Villada (2019). Comité de la Unidad de Riego. Municipio de Coatepec de Harinas del Estado de México. Trabajo de campo.

Abstract

Objective six of sustainable development 2030: characterization in hydrosocial territory in the south of the State of Mexico

Objective six has as a priority "to guarantee the availability, sustainable management of water and sanitation for all". This is an important human right, yet, there are millions of people who have difficulties in accessing basic services related to water. Such is the case of the equitable and fair distribution of volumes of liquid among the different social actors, which are found in the so-called hydrosocial territories.

The concept of hydrosocial territory under the interaction between nature and society is represented by the water element and the human being. This relationship sets the standard for interrelationships marked by various sociocultural manifestations, as well as hydraulic work, regulations and agreements that make it constant, durable and dynamic. Human action encourages the formation of hydrosocial territories in which the different social actors seek access and control of water.

In this sense characterizing a territory as hydrosocial concerns the investigation of the relationships between three elements; water, territory and society. The latter being the one that develops economic activities, based on water resources, through the infrastructure in the municipality of Coatepec Harinas, in the State of Mexico.

The objective of the work is to present the characterization of the hydrosocial territory in which the forms of social organization presented by small entrepreneurs, producers and irrigation units that carry out agricultural and floricultural activities using the water resource are described and with this they have built a territoriality and the configuration of the hydrosocial territory.

Keywords: water, social actors and territoriality