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Environmental communication in Mexico: between multidisciplinarity, practice, and socio-environmental conflict

Comunicación ambiental en México: entre la multidisciplina, la práctica y el conflicto socioambiental

Comunicação ambiental no México: entre a multidisciplinaridade, a prática e o conflito socioambiental

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ABSTRACT | This article, based on a systematized bibliographic review of the scientific production published between 2000 and 2021, outlines a picture of environmental communication in Mexico, to establish a possible configuration of this field. Based on the analysis of 34 scientific articles, this paper describes the profile of the field in the current context, according to the predominant approaches, both in the observed professional practices, their research, their corresponding disciplines, and the goals and characteristics of their studies. The results show that Environmental Communication, as a discipline, has scant theoretical and methodological advances, and it is mainly made up by contributions from researchers in communication and natural sciences. The majority of this research is focused on the media's managing of environmental topics and the work of other disciplines that observe the need of including communication to address the different perspectives and situations involved in socioenvironmental issues. There is little reflection on the paradigms of contemporary environmentalism and the role of communication in socioenvironmental issues that would allow for research relevant to the national context.

KEYWORDS: environmental communication; environmental justice; science communication; sustainability's paradigms; Mexico.

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RESUMEN | *A partir de una revisión bibliográfica sistematizada de la producción científica publicada entre 2000 y 2021, este artículo establece un panorama de la comunicación ambiental en México, para delinear una posible configuración de este campo. Con base en el análisis de 34 artículos, se describe el perfil del campo en el contexto actual, en función de los enfoques predominantes tanto en las prácticas profesionales observadas como en su investigación, las disciplinas de procedencia, objetivos y las características de los estudios. Los resultados muestran que la comunicación ambiental, como campo disciplinar, tiene escasos avances teóricos y metodológicos propios, y que está constituida de aportes de investigadores de la comunicación y las ciencias naturales, principalmente. Predominan las investigaciones enfocadas en el manejo mediático de los asuntos ambientales y los trabajos de otras disciplinas que observan la necesidad de incluir a la comunicación para abordar las distintas perspectivas y situaciones involucradas en las problemáticas socioambientales. Se observa una escasa reflexión sobre los paradigmas del ambientalismo contemporáneo y el rol de la comunicación en las cuestiones socioambientales, que permita una investigación pertinente al contexto nacional.*

PALABRAS CLAVE: *comunicación ambiental; justicia ambiental; comunicación de la ciencia; paradigmas de sustentabilidad; México.*

RESUMO | A partir de uma revisão bibliográfica sistemática da produção científica publicada entre 2000 e 2021, este artigo traça um panorama da comunicação ambiental no México, com o objetivo de delinear uma possível configuração deste campo. Baseado na análise de 34 artigos, é descrito o perfil do campo no contexto atual, em função das abordagens predominantes, tanto nas práticas profissionais observadas quanto em sua pesquisa, as disciplinas de origem, objetivos e as características dos estudos. Os resultados revelam que a comunicação ambiental, como campo disciplinar, tem escassos avanços teóricos e metodológicos próprios; que é composta por contribuições de pesquisadores da comunicação e das ciências naturais, principalmente. Predominam pesquisas voltadas para a gestão midiática das questões ambientais e trabalhos de outras disciplinas que observam a necessidade de incluir a comunicação para abordar as diferentes perspectivas e situações envolvidas nas questões socioambientais. A produção científica apresenta pouca reflexão sobre os paradigmas do ambientalismo contemporâneo e o papel da comunicação nas questões socioambientais, que permita pesquisas pertinentes ao contexto nacional.

PALAVRAS-CHAVE: comunicação ambiental; justiça ambiental; comunicação ciência; paradigmas de sustentabilidade; México.

INTRODUCTION

Given the increasing recognition that environmental action in all its forms is interconnected with communication issues (Irwin et al., 2018), environmental communication (EC) is becoming increasingly relevant to society-environment relations on a global scale[1]. Due to its characteristics, this field constitutes a crucial form of environmental action that aims to foster understanding, management, engagement, and collective participation around socioenvironmental issues (Irwin et al., 2018), making it indispensable to generate a social transition towards sustainability (Klöckner, 2015).

Understanding and knowledge of environmental communication as an emerging field in Latin America (Román Núñez & Cuesta Moreno, 2016; Nepote et al., 2020) involves recognizing the differences in relation to the countries and theoretical-epistemic trends of the so-called global North (Thaker, 2021), mainly in terms of advances in its theoretical-conceptual construction, cultural perspective, historical-political context (Takahashi, 2022), its different practices and objects, as well as its underlying epistemological referents (Thaker, 2021; Cuesta Moreno, 2016). In the more developed nations, EC is oriented towards driving behavioral changes in the population and establishing conditions for negotiating conflicts arising from environmental issues, in line with the sustainable development paradigm (Michelsen, 2003; Adomßent & Godemann, 2011) or the conservationist paradigm (Pezzullo & Cox, 2018). In Latin America, this construction increasingly addresses the region's unique conditions of political, social, economic and cultural struggles (Takahashi, 2022).

In the Latin American environmental discourse, diverse ontological assumptions coexist. The spectrum ranges from developmentalism and neo-extractivism promoted by national governments and private capital (Lander, 2019), to direct social resistance to territorial plundering (Svampa, 2008). This results in divergent ideas about the civilizational model, the forms of human-environment relationship (Machado, 2017) and the notion of nature, which in many rural Mesoamerican societies is embodied in the territory or natural environment (Giménez, 1999).

1. Several terms stress the person-environment interaction, such as socioecological systems (Manfredo et al., 2016), socioenvironmental, and environmental. Herrera (2018) defines the latter as the links and relationships between human and ecological systems that overcome the artificial society-nature dichotomy. This paper uses the term socioenvironmental, based on the assumption that environmental problems are always social.

	Weak sustainability	Strong sustainability	Super-strong sustainability
Developmentalism	**Sustainable development**	**Sustainability**	**Popular environmentalism**
It drives continued economic growth; capital is key.	Seeks environmental viability of economic development.	Proposes cultural transformations to create adaptive societies in accordance with the environment's capabilities.	Social environmental struggles linked to environmental degradation in terms of human health, livelihoods, and wellbeing.

Figure 1. Paradigms and ethical-political positions on socio-environmental relations in Mexico

Source: Own elaboration based on Ángel Maya (2003), Gudynas (2004), and Martínez Alier (2020).

Gudynas (2004) classifies the diversity of environmentalism trends according to how sustainable they are: zero (developmentalist model, progress paradigm, and predominantly economic criteria); weak (attempts to articulate progress with technical environmental management); strong (criticizes the progress model, considers nature as a resource, promotes the preservation of natural capital), and super strong (decisively criticizes the progress paradigm, promotes an ethic of nature's intrinsic values and has a political focus). These categories coincide with four trends in the ethico-political postures observed in the disputes over life models in the country: developmentalism, sustainable development, sustainability, and popular environmentalism (figure 1).

Although the environmentalism of the poor refers to social movements for environmental justice in countries of the global South (Martinez Alier, 2021; Thaker, 2021), in Mexico it has been linked to certain forms of local socioenvironmental relations with roots in traditional indigenous and peasant cultures (Navarro, 2012), such as indigenous communality (Rendón, 2011), and traditional ecological knowledge (Toledo & Barrera-Bassols, 2008), which in the last half century have been joined by territorial defense movements as a direct expression of the protection of such ways of life (Bartra, 2014).

In a qualitative study of Ibero-American scientific production on environmental communication, Cuesta Moreno (2016) found that authors have not reflected on the concept of environment, which is implicitly configured from the modern episteme that externalizes nature and makes it susceptible to usufruct. Among other reasons, this is the result of the internalization of a postcolonial perspective by large segments of Latin American societies (Machado, 2017; Lander, 2019), specifically in certain academic communities that address environmental and communicational issues. On the other hand, environmental communication is generally understood "as a process in which messages are developed and exchanged in order to promote

pro-environmental knowledge, attitudes, and behaviors" (Cuesta Moreno, 2016, p. 125), a limited perspective even from the broad field of communication. These two aspects coincide with the theoretical thinking of developed nations on the function of environmental communication, and are key to understanding the existing approaches in the region, since this concept is closely linked to the idea of environment (Cuesta Moreno, 2016; Thaker, 2021).

The multidisciplinary scope (Nepote et al., 2020) of environmental communication hinders its conceptual construction. This lack of delimitation and the field's transversal nature, open to a variety of perspectives and disciplines, are recognized by different authors (Godemann & Michelsen, 2011; Meisner, 2015; Fischer et al., 2016; Irwin et al., 2018). Therefore, a genuine theoretical framework is not yet available to refer to a theory of communication for sustainability (Fischer et al., 2016).

The transdisciplinary nature of communication had already been noted by Martín-Barbero (1993), encouraging the integrity of the objects of study, beyond disciplinary delimitations. In the field of environmental communication, such condition can be observed in scientific production reviews conducted by Vicente Mariño (2009), Román Núñez and Cuesta Moreno (2016), Herrera (2018), or Nepote and colleagues (2020). These cover different periods, analysis scales (Ibero-America, Latin America, global approach), objectives, and theoretical-epistemic assumptions, although they coincide in identifying diverse disciplines in research on communication and environment. The above prevents outlining a common conceptual framework. For example, Herrera (2018) focuses on science communication, Román Núñez and Cuesta Moreno (2016) on communication for conservation, and Nepote and collaborators (2020) address scientific dissemination on environmental issues.

STUDIES CONDUCTED IN MEXICO

If we add to the above the reviews conducted in Mexico in the field of communication in recent decades, the panorama becomes even more dispersed, as these allow us to state the absence of environmental communication in the country's communication research (Karam, 2004; Fuentes, 2011). Based on a general exploration of the last 25 years in the Catalog of Documentation in Communication Sciences (cc-doc), González Victoria and colleagues (2017) point out the scarce literature on the communication-environment approach within the field of communication, although they do not specify the number of articles or review them. To date, a review of the scientific production on communication and environment that accounts for the state of knowledge on this field in the country was not found.

At this point it is worth asking whether research on environmental communication has such a dispersion that it could make it unattainable as a field of theoretical reflection and practice. If this is the case, what is being studied in the field of environmental communication and under what epistemological assumptions regarding sustainability?

The above has been raised by authors of environmental communication in Latin America as a need to conduct research relevant to local environmental issues in communication, under the assumption that the concepts of environmental communication are influenced by these paradigms (Cuesta Moreno, 2016; Nepote et al., 2020; Thaker, 2021). These conceptualizations have been approached from diverse perspectives and in different historical-cultural contexts in the region (Cuesta Moreno, 2016; Román Núñez & Cuesta Moreno, 2016; Herrera, 2018; Nepote et al., 2020; Takahashi, 2022), although there has been a lack of a proper review of research on communication and environment in Mexico.

OBJECTIVES

The revision objectives were as follows: 1) to explore the objectives, approaches, and general characteristics of research on communication and environment recorded by communication research and related disciplines; 2) to distinguish the communication specialties linked to environmental issues, and 3) to identify the notions of environmental communication in research on communication and environment to have indicative elements of the underlying epistemological referents on sustainability.

METHODOLOGY

We conducted a systematized bibliographic review of the academic production on communication and environment carried out in Mexico, published in the 2000-2021 period, based on the following phases (García-Vinuesa & Meira-Cartea, 2019): delimitation of the field of study, selection of information sources, search under inclusion/exclusion criteria; coding, management, and debugging of the results, and elaboration of the statistical analysis and data interpretation. The procedure is shown in figure 2.

The choice of scientific articles was based on the assumption that academic research production is often considered a primary criterion for the environmental communication field development (Thaker, 2021), and that they produce empirical and theoretical knowledge about it. The final corpus consisted of 34 peer-reviewed research papers, published in English or Spanish in indexed journals and in the CONEICC Research Yearbooks between 2000 and 2021, that address environmental communication in Mexico, from the previously mentioned disciplines.

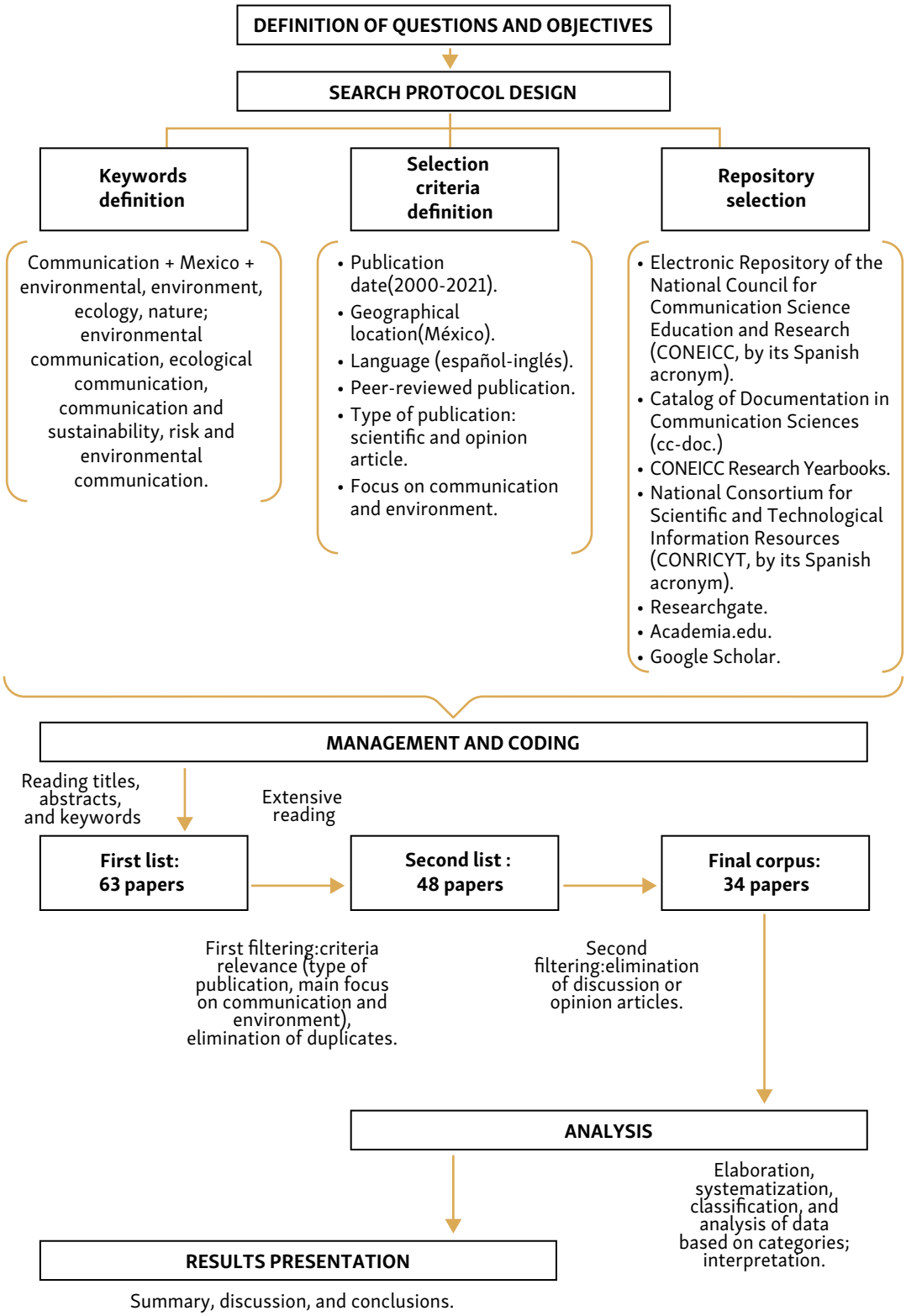

Figure 2. Methodological procedure of the systematized bibliographic review

Source: Own elaboration.

Analysis categories. To outline the scientific production profile in the environmental communication field, we considered the articles' general characteristics, such as the publications' profile, authorship and research type (Ki et al., 2022), by intention and by methodology. This study used Sauvé (2000), who distinguishes between theoretical research, intervention research, evaluative research, descriptive research and interpretive research, to classify intentionality. These last two types are included in this study as exploratory research. To classify the methodological approach, Ki and colleagues (2022) differentiate the macro level (qualitative, quantitative, critical, and mixed) and the micro level, based on the research methods applied (ethnography, case study, questionnaire, interview, content analysis, among others). The review of the articles also identified the disciplines involved, the research topics, and the theoretical references (Ki et al., 2022).

The analysis categories were defined as concepts of environmental communication (Ki et al., 2022), the trends in the specialty of communication used regarding the environment, and the notions of sustainability implicit in the research. On this last point, based on Gudynas (2004), we considered the paradigms on socioenvironmental relations in a sustainability perspective (figure 1).

RESULTS

Publications general characteristics

The papers were published in 17 national and 11 foreign journals –from Spain, the United States, Brazil, Canada, the United Kingdom, and Colombia–, of which eight belong to the broad field of communication, one to health communication, and another to science communication (table 1). Other journal topics are environmental management, environmental pollution, sociology, social sciences, health, administration, science and technology, psychology, education, and economics. Six journals are defined as multidisciplinary and two as interdisciplinary.

Of the articles, 14 were written by a single author and 20 were co-authored: five were written by two authors; six by three; three articles were written by four co-authors; one was written by five; three were written by six; one has seven authors, and another has eight authors (Cubillas-Tejeda et al., 2011). Among the six authors with the highest production in these topics, either as sole author or first author, four come from the field of communication, one from psychology, and one from ecology (table 2). Others are at the interface of science communication, risk communication, and environmental communication.

Journals	Country	Field/topic	Papers
Anuario de Investigación de la Comunicación CONEICC	Mexico (CONEICC)	Communication	3
Comunicación y Sociedad	Mexico (Universidad de Guadalajara)	Communication	3
Global Media Journal México	Mexico (UANL)	Communication	1
Global Media Journal	Mexico (ITESM)	Communication	1
Revista Internacional de Contaminación Ambiental	Mexico (UNAM)	Atmospheric Sciences	2
Sintaxis. Revista científica del Centro de Investigación para la Comunicación Aplicada	Mexico (Universidad Anáhuac)	Communication	2
Ánfora	Colombia (Universidad Autónoma de Manizales)	Social and Human Sciences	1
Children's Geographies	Reino Unido (Taylor & Francis)	Multidisciplinary	1
Ciência & saúde coletiva	Brazil (Associação Brasileira de Saúde Coletiva)	Health Sciences	1
CienciaUAT	Mexico (Universidad Autónoma de Tamaulipas)	Multidisciplinary	1
Convergencia, revista de ciencias sociales	Mexico (Universidad Autónoma del Estado de México)	Social Sciences	1
Culturales	Mexico (Universidad Autónoma de Baja California)	Multidisciplinary	1
Emerging Trends in Education	Mexico (Universidad Juárez Autónoma de Tabasco)	Education	1
Entreciencias: diálogos en la Sociedad del Conocimiento	Mexico (UNAM)	Multidisciplinary	1
Environmental Management	United States (Springer Nature)	Environmental Systems Management	1
Espiral, Estudios sobre Estado y Sociedad	Mexico (Universidad de Guadalajara)	Social Sciences and Humanities (interdisciplinary)	1
Estudios sobre el Mensaje Periodístico	Spain (Universidad Complutense de Madrid)	Communication	1
Horizonte sanitario	Mexico (Universidad Juárez Autónoma de Tabasco)	Health Sciences	1
International Journal of Business and Management	Canada (Canadian Center of Science and Education)	Management and Finance	1
Mediaciones Sociales. Revista de ciencias sociales y de la comunicación	Spain (Universidad Complutense de Madrid)	Social Sciences and Communication	1
Observatorio (OBS*) Journal	Spain (Universidad de la Rioja)	Communication (interdisciplinary)	1
Psicología para América Latina	Mexico (Unión Latinoamericana de Entidades de Psicología)	Psychology	1

Reciis Revista Eletrônica de Comunicação, Informação e Inovação em Saúde	Brazil (Instituto de Comunicação e Informação Científica e Tecnológica em Saúde)	Health Communication and Information (interdisciplinary)	1
Revista de Comunicación de la SEECI	Spain (Sociedad Española de Estudios de la Comunicación Iberoamericana)	Humanism and Communication Networks	1
Revista Iberoamericana de Comunicación	Mexico (Universidad Iberoamericana)	Communication	1
Science Communication	United States (SAGE)	Science Communication (multidisciplinary)	1
Tópicos en educación ambiental	Mexico (Academia Nacional de Educación Ambiental)	Environmental Education	1
UVserva	Mexico (Universidad Veracruzana)	Multidisciplinary (university observatories)	1
Total			34

Table 1. Journals that published articles on communication and environment

Source: Own elaboration.

Author	Field	Papers
Patricia Andrade del Cid	Communication	4
Alicia Castillo	Ecology	3
Julieta Carabaza	Communication	3
Susana Gómez Loperena	Communication	2
Cruz García Lirios	Psychology	2
Raquel Aparicio	Communication	2
Total		16

Table 2. Authors with the highest number of papers

Source: Own elaboration.

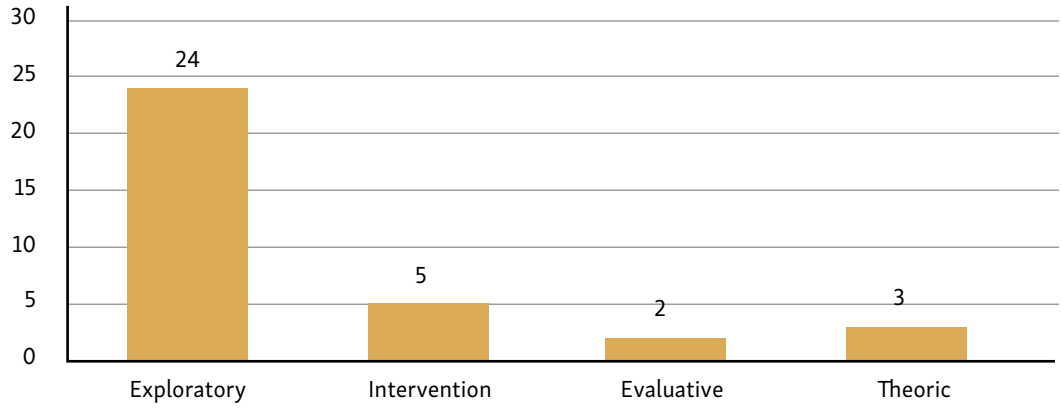

Figure 3. Research types

Source: Own elaboration, based on Sauvé's typology (2000).

Regarding the studies' contribution type –classified based on their intention (Sauvé, 2000)–, 24 articles are exploratory (descriptive and interpretative, one of them is a review), five are intervention articles, and two are evaluative; two elaborate theoretical discussions on environmental communication, and one on environmental risk communication (Figure 3). Two of the five intervention articles are also evaluative, but their main component is intervention.

As for the articles' disciplinary field, 22 come from a single discipline (15 from Communication, two from Ecology, two from Psychology, one from Biology, one from Law, and one from Criminology); six studies involve two disciplines (Biology-Ecology, Geography-Hydrography, Communication-Administration, Communication-Marketing), and another six bring together three or more disciplines (Cubillas-Tejeda et al, 2011; Coronado-Salas et al., 2012; Meza-Lozano et al., 2016; Börner et al., 2017; González Victoria et al., 2017; Domínguez et al., 2021), which are specified in table 3. I.e., in 12 articles there was more than one disciplinary view.

Number of source fields	Fields	Papers
One	Communication	15
	Ecology	2
	Psychology	2
	Biology	1
	Law	1
	Criminology	1
Two	Biology-Ecology	2
	Management-Communication	2
	Management-Marketing	1
	Hydrology-Geography	1
Three or more	Chemistry and Environmental Sciences, Toxicology, Education	1
	Chemistry, Toxicology, Education	1
	Chemistry, Medicine, Stomatology	1
	Social Sciences, Ecology, Education, Chemistry	1
	Communication, Social Sciences, and Political Sciences	1
	Computer Science, Pedagogy, Environmental Engineering	1
Total		34

Table 3. Disciplinary field

Source: Own elaboration.

Topics	Number of papers
Environmental issues in the media	13
Risk communication, human and environmental health	5
Environmental communication, population and ecosystems	4
Social perception of environmental issues and media	3
Science communication on environmental issues	3
Publicity on environmental issues	3
Access and transparency on environmental issues	2
Environmental communication and environmental education	1
Total	34

Table 4. Topics studied

Source: Own elaboration.

The topics addressed in the research articles are grouped into eight clusters (table 4).

Theoretical references

In 22 articles, communication theories are the central theoretical referents and complement the theoretical frameworks of the rest. It is the case, for example, of articles coming from other disciplines –such as Law (Anglés Hernández, 2008), Criminology (Carpio et al., 2018), Administration (Trujillo et al., 2014), and Psychology (García Lirios et al., 2015)–, which use communication theories to approach their objects of study (access to environmental information, illegal species trafficking, business marketing, and environmental risk psychology, respectively).

All the studies use theoretical references from different communication areas: 21 take up aspects of dissemination and the media, journalism, information, and advertising, and 13 draw from some communication specializations, specifically science communication, risk communication, and environmental communication.

In the field of communication, one group of authors refers to it as a constitutive element of culture and alludes to authors such as Martín-Barbero, Serrano, Castells, and Luhmann, while another resorts to structural perspectives, such as the theories of agenda setting, framing, and the American school of media and mass communication. Three incorporate theories of risk perception, two of social representations, and two on media representations. In 13 of the 34 articles, a mixture of weakly articulated communication theories and elements was observed, as in García Lirios (2013) and Gómez Loperena and colleagues (2017).

The four texts coming from the natural sciences, specifically Ecology, are oriented to social communication systems related to ecosystem management and to promote the vision of sustainability at the community scale (Castillo, 2000, 2000a, 2003; Rodríguez Luna & López-Hernández, 2014). They turn to communication theories linked to these purposes, although in Castillo's case they do not come from

the conventional field of communication but from the natural and environmental sciences of other countries that have developed empirical and theoretical work in these intersections. Four articles are based on theoretical referents coming from human health and environmental toxicology, which incorporate theory on risk perception and communication (Cubillas et al., 2011; Coronado-Salas et al., 2012; Meza-Lozano et al., 2016; Börner et al., 2017) (figure 4).

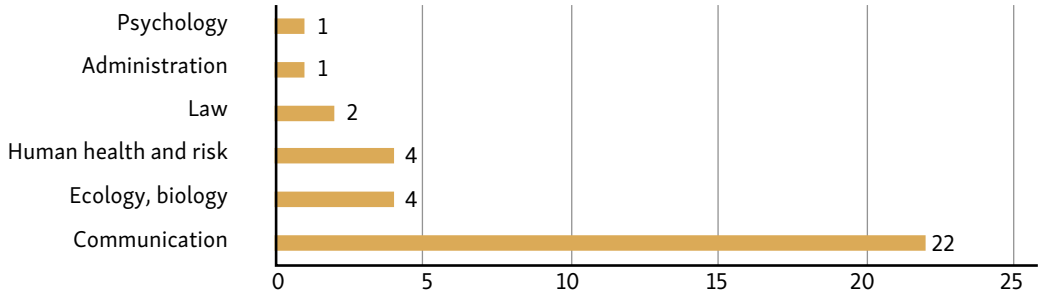

Figure 4: Predominant theoretical references

Source: Own elaboration.

Research methods

Most of the research studies are of a mixed nature (18, 53% of the total), since they use data collection or analysis methods with a quantitative and qualitative approach, mainly exploratory research on environmental content in printed and digital media. Qualitative methods were used in 14 studies (41%), and two used exclusively quantitative methods (6%). No critical studies were identified (table 5).

Type of work (Sauvé, 2000)	Research approach (macro level)	Papers	Methods
Exploratory	Mixed	16	Surveys, hemerographic research, content and statistical analysis, in-depth interviews, survey with visual descriptive techniques (drawings and photographs); quantitative and qualitative analysis. Ethnomethodology, retrospective study, cyberethnography, bibliographic review. Proposal development.
	Qualitative	6	Content analysis, documentary research and analysis, qualitative and semiotic analysis of linguistic and visual discourse, quantitative content analysis. Ethnography, case studies, communication proposal design.
	Quantitative	2	Survey, quantitative content analysis.
Intervention	Qualitative	4	Design and implementation of risk communication program, systematization. Digital ethnography.
	Mixed	1	Mixed methods, risk communication program proposal.
Evaluative	Qualitative	1	Multiple case studies, interviews.
	Mixed	1	Case studies, content analysis.
Theoretical	Qualitative	3	Theoretical-conceptual elaboration, literature review.

Table 5. Types and methods of research in communication and the environment

Source: Own elaboration.

Environmental communication and sustainability concepts

Two main trends can be distinguished in the references on communication: an idea of communication of an informative, linear nature, where environmental issues are understood as informative content through the media, and one where it is seen as an intersubjective or social process. These approaches are in line, on the one hand, with an instrumental vision of communication to disseminate environmental contents and, on the other, with a socio-constructivist perspective of communication as a process or cultural phenomenon, in congruence with the theoretical references mentioned above. Overall, 29 studies lack a specific reference to environmental communication, although five point out elements (functions, characteristics, objectives) in this sense (table 6).

Five articles develop conceptualizations of environmental communication and delineate its organic profile, i.e., they propose to define a specific notion of environmental communication (table 7).

As a whole, it can be observed that a significant number of research studies arise from the need or interest in highlighting human-nature relations and related issues, whether seen as a conflict, a problem, an opportunity for conservation or even for the sustainable use of natural resources. At least eight of these studies (tables 6 and 7) recognize the importance of having inter-subjective or interpersonal communication schemes to solve socioenvironmental problems, beyond media work.

Regarding articles related to risk communication, the authors highlight the relevance of communication in human and environmental health issues (Cubillas et al., 2011; Coronado-Salas et al., 2012; Meza-Lozano et al., 2016; Börner et al., 2017), as it implies people's wellbeing in terms of the health of their physical environment as a starting point for any environmental communication strategy or initiative that seeks to drive social action in the solution of problems that directly affect populations. Specifically, Börner and colleagues (2017) describe risk communication as a form of community intervention that seeks to raise awareness and actively involve vulnerable population groups in promoting environmental health based on critical reflection on local living conditions and daily opportunities to improve individual practices, subsequently fostering people's responsiveness as agents of change. These elements intersect with the purposes of environmental communication (table 7).

Articles from the natural sciences, especially Ecology, provide theoretical approaches that give depth to the communicative task.

Author(s)	Concept of communication on environmental issues
Castillo (2000a)	Multidirectional instrument for social and attitudinal change, to promote awareness and social participation in environmental management, and to exchange knowledge.
Rodríguez Luna & López-Hernández (2014)	Social phenomenon that allows interaction among people. It serves to adequately inform and critically sensitize the population, to promote their participation in decision making in the face of the environmental crisis.
Gómez Loperena et al. (2018)	Information with environmental content and its intersubjective exchange.
Nepote et al. (2020)	Dissemination of science on environmental issues.
Aparicio (2020)	Environmental journalism as a line of environmental communication.

Table 6. Concepts of communication related to environmental issues

Source: Own elaboration.

Author(s)	Environmental communication concept
Castillo (2003)	Environmental information for decision-making in ecosystem management, to solve environmental problems, and to build sustainable societies.
Aparicio Cid (2016)	Focused on human-environment relations, its objective is the optimal development of people and social groups in their relationship with the environment to maintain the viability of vital social and natural systems. It arises from a vision of complexity; it privileges the notion of communication as a space for sociocultural transformation.
Sánchez & Ramírez (2019)	It is oriented to elaborate a social pact that seeks to reconstruct the relationship between human beings and nature through solidarity, recognition of the other, and the difference that promotes pluralism. It incorporates elements of risk communication and development communication.
Domínguez et al. (2021)	Inform, educate, and promote the change of attitudes and values congruent with the environment conservation or restoration; achieve communication processes focused on sensitizing indigenous populations on the importance of building collective solutions to the environmental problems they face.
Mares Ortega (2021)	Horizontal, interpersonal communication that involves people in the critical analysis of key issues to solve socio-environmental problems, detonates participatory processes, and is oriented to build processes and contexts, rather than events.

Table 7. Environmental communication notions

Source: Own elaboration.

From the field of communication, the works of Ortega-Gaucín and Peña-García (2016), and González Victoria and colleagues (2017) offer a critical qualitative analysis of their objects of study, broadening the scope of conventional research on media and information dissemination. Likewise, studies coming from Psychology (García Lirios et al., 2015), Criminology (Carpio et al., 2018), and multidisciplinary (Domínguez et al., 2021) make relevant contributions to a multidisciplinary construction of the field, with new approaches and applications that expand the horizon of environmental communication research and practice in Mexico discussed above.

In most of the articles, the underlying notions of sustainability are not explicit, so they were inferred from their theoretical references and research assumptions.

Fourteen articles were placed in the Development category, because they do not make explicit reference to the development model as a generator of the socioenvironmental issues being studied (Svampa, 2019; Martínez Alier, 2021), e.g., the articles by Ramos Rodríguez and colleagues (2011), Coronado-Salas and collaborators (2012), and García Lirios et al. (2015).

In the Sustainable Development category, there were 12 articles that reveal the remediation of environmental problems and indicate some elements of the life model that causes the problems. In four of them, there are some critical remarks to the modern lifestyle, although without making a deep questioning about the causes of the socioenvironmental problems (Castillo, 2003; Anglés Hernández, 2008; Méndez Fierros, 2007; Börner et al., 2017). In others, the causes of the problems are neither problematized nor questioned, but the formation of an environmental culture is invoked from the informative dissemination of issues to be solved (Carabaza, 2004; Gómez Loperena et al., 2017; Gómez Loperena et al., 2018; Andrade del Cid & Pablo Contreras, 2019).

Eight articles were identified in the Sustainability category (González Victoria et al., 2017; Carpio et al., 2018; Sánchez & Ramírez, 2019; Aparicio Cid, 2016; Aparicio, 2020; Nepote et al., 2020; Domínguez et al., 2021 and Mares Ortega, 2021). Seven explicitly criticize anthropocentrism and global capitalism as sources of planetary imbalance. Four define notions of environmental communication: Aparicio Cid (2016), Sánchez and Ramírez (2019), Domínguez and colleagues (2021), and Mares Ortega (2021). Neither an approach to popular ecology nor proposals for environmental communication linked to social movements for environmental or territorial defense were identified.

DISCUSSION

Communication and environment studies conducted in Mexico in the last decades have been approached by researchers of Communication, Sociology,

Psychology, Management, Law, Natural and Health Sciences, interested in studying different environmental problems in relation to human groups, from diverse approaches and focuses that involve social communicative phenomena. An important number of empirical works are related to the informative management of the mass media about environmental problems or to the social perceptions of the environment due to the effect or influence of the mass media. They predominantly come from the field of Communication, which can be explained by the fact that this discipline has been primarily oriented towards examining media coverage and its effects on audiences (Ki et al., 2022).

However, there is a considerable number of multidisciplinary studies that study or elaborate interpersonal communication schemes with the purpose of analyzing diverse socioenvironmental issues, in some cases from Health Sciences, Earth Sciences, and Ecology. This scenario involves a complexification of the conventional notions of communication –media, mass, and linear–, giving this field a constructivist character and a multidisciplinary one to the research on environmental communication conducted in Mexico, which coincides with the research carried out on the subject in Latin America (Nepote et al., 2020).

We found a significant number of empirical papers (30), one review and three theoretical studies. The predominance of mixed (53%) and qualitative (41%) methodological approaches, and a small percentage of quantitative papers (6%) found in this study is similar to the results in Nepote and colleagues (2020) –with 45% of the articles being qualitative, 34% mixed, and 2% quantitative–, in contrast to the research in the United States, where 63% of the production is quantitative and 14% qualitative (Ki et al., 2022).

In several empirical works, authors seek to delineate elements or concepts for situated environmental communication –even four elaborate and implement environmental risk communication programs–, although most of them resort to conventional communication theories to elaborate their theoretical references, despite the fact that a broad understanding of environmental communication implies understanding communication beyond its instrumental functions (Cuesta Moreno, 2016). However, the number of researches that demonstrate interest in broadening the perspective to build the field in a diversified spectrum of needs, objectives, contexts, and practice areas is significant.

Regarding the notions of sustainability underlying the research on environmental communication, in most of the studies there is a prevailing uncritical view of the development model, under visions that normalize the consequences of this model or that seek palliative solutions to socioenvironmental challenges. This is in line with what Cuesta Moreno (2016) pointed out about Ibero-American authors

not reflecting on the notion of the environment, but rather operating under an episteme that naturalizes the developmentalism paradigm (Thaker, 2021). However, eight works reveal important critical elements that prefigure a strong notion of sustainability, closer to the country's socioenvironmental problems, although not a single study located in the paradigm of popular environmentalism was identified. This result coincides with that of the review carried out by Nepote and colleagues (2020), which did not found "works oriented to aspects of environmental activism despite the fact that Latin America is one of the regions with the highest number of socioenvironmental conflicts in the world" (p. 496).

CONCLUSION

This paper aimed to explore the profile of environmental communication research in Mexico based on studies that address the communication-environment binomial. Based on the results, it is considered that environmental communication has the possibility of configuring itself theoretically and methodologically with contributions from multiple disciplines and social agents, establishing itself as a transversal field in cultural practices and as a tool to promote greater awareness, agency, and social participation in the resolution of the country's environmental problems. This demands a reflective and critical theoretical-conceptual definition, a broad perspective of the communicative phenomenon that accounts for the role of communication in socioenvironmental conflicts beyond the media sphere, and an ethical-political stance that accompanies the causes of a strong environmentalism, equity, and social justice.

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