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DE **INVESTIGACIÓN EN ANTROPOLOGÍA SOCIAL**

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Introduction

The dialogue between Anthropology and Public Policy studies is critical for a better understanding of the cultural framing of public problems and their possible solutions. Public policy represents a multidisciplinary, multi-methodological, and problem-oriented approach that centres on the study of the actions that states and governments should undertake to improve the livelihoods of their societies. It aims to identify the causes that trigger and shape political and policy processes and their consequences for the population, to offer alternatives to correct their deficiencies and strengthen their virtues (Dewey, 2016; Hill and Varone, 2021; Cairney, 2012; Roth, 2018). Anthropology, in turn, with its focus on the study of the localised development of organisations, languages, and ideas, can be considered crucial to understand diverse systems of power, creative and authoritative discourses, and forms of political participation. It can shed light on the lived experiences and culturally rooted perspectives of the people affected by public problems, potentially enhancing the device of informed and viable policies with the potential of addressing their causes. Finally, the implementation of public policy should be more keenly observed by anthropology as many of its insights and proposals may become academically relevant if often obviated in terms of social and political transformations (Kirsch, 2018). The dialogue between these two disciplines is even more necessary when analysing problems affecting indigenous communities that, in Mexico and the Latin American region

covered here, have been historically—and many continue to be—vastly misunderstood, socially obviated, and politically excluded from public policy development.

As this literature review hopes to show, to revert such historical neglect by States and governments actors, is now precisely what is required to formulate and implement better public policies, namely policies that can tackle the causes of public problems and build more just, democratic and equitable communities facing global economic, political, social, cultural and environmental challenges (Crate and Nutall, 2016). The adoption of theoretical and methodological tools from Anthropology and Public Policy may help to address the power unbalances, ethnic discrimination, and epistemic elitism which, among other issues, obstruct the development of public actions that can effectively improve the living standards of indigenous communities. This literature review explores databases and repositories between March and August of 2021, looking for academic journal articles and books on local, traditional, and indigenous knowledge published in English and Spanish. It aims to provide scholars, students, and engaged researchers with some basic definitions and trajectories, lines of inquiry, and the current use and academic understanding of these terms.

Considering the above, we focus in particular on exploring what is known as 'situated' or 'place-based knowledge', and how an anthropological perspective highlights the value of such knowledge in the creation and analysis of public policies. Policies garner meaning relationally, within a geographic and social space, rather than in a neutral-legal-rational space as is sometimes assumed by some scholars. Put simply, by failing to understand policymaking as a situated process, policies are likely to take on forms that poorly reflect the reality of how people live and engage with such policies in practice. This work, therefore, interrogates the value of anthropological perspectives to public policy, with a focus on the intersections of complex policy problems and indigenous communities. We ask: what is the role of place in how policy interventions are

experienced and made meaningful? What role(s) can local knowledge play in the policymaking process? In this way, particularly by examining the idea of situated knowledge, we seek to explore how place impacts the understanding and experiences of public policies.

The article proceeds as follows: we first locate our discussion within the existing approaches and debates in public policymaking, which tend to, broadly speaking, favour a legal-rational approach to policy analysis. We then introduce the concepts of 'place' in general and 'situated knowledge' as vital to understanding the role that locality plays in the generation of knowledge, and the value that such local, or indigenous knowledge can add to public policymaking. In the third section, we demonstrate our argument by reviewing existing research on local and indigenous knowledge as related to a range of policy problems.

What Counts as Knowledge in Public Policy

Anthropological insights into public policy have tended to focus on the *impact* that policies have on communities, to understand how policy interventions are experienced. However, policy has remained a blind spot in anthropology (Shore, 2012). The combination of an anthropological perspective with public policy studies represents a promising route to gain a better understanding of the causes of public problems and the solutions that can be formulated and implemented to address them. Such a task becomes especially relevant in the current context of environmental, political, and social crises that can be observed across all regions of the world. When anthropology and policy studies are linked, a clearer grasp of the meanings that policies have for various stakeholders, as well as the forms of knowledge that are or should be deemed valuable for policy design, analysis, and evaluation, can be achieved. Further, it can be determined how marginalised knowledge can be incorporated into the different stages of the policy process. One way it does this—which is our focus in this paper—is by offering a locally grounded, or *situated*, perspective of public policy.

The value of an anthropological perspective is also demonstrated in relation to 'wicked' policy problems that are often of transnational or global scales (Stone, 2019; Peters, 2015). These problems

are characterised by high levels of complexity and uncertainty, lack simple solutions, have no clear endpoint, are constantly transforming, and involve competing understandings and interpretations of risk. Frequently cited examples of 'wicked' problems include financial crises, environmental sustainability, obesity, ageing populations, poverty, and terrorism. When a policy problem is too complex to conduct an objective evaluation of its causes and consequences, people are far more likely to rely on experiential knowledge to make sense of it. We might even say that the more complex the public problem, the more important it is to understand its local, place-based interpretations and understandings. From those interpretations, policy solutions can be devised not only for that community but beyond it.

Such place-based perspectives are particularly important when accounting for the experiences of indigenous communities, who not only have often been excluded from participating in the development of public policies but who draw significantly upon local and place-based knowledge in their engagement with public policy. Evidence from Latin America shows that, therefore, indigenous communities have tended to be the groups most often excluded from political participation, making them susceptible to violent, corrupt, and clientelist practices, which leave them among the poorest and most marginalised in the region. The diverse experiences of indigenous communities demonstrate why local forms of knowledge matter. Without incorporating these perspectives in the policy process, we continue to alienate and marginalise locally situated worldviews, which further perpetuates inequalities.

The value that local knowledge has for the formulation and implementation of public actions that hold the potential of addressing public problems is underscored in several current policy research agendas. After a period when policy studies were colonised by New Public Management (NPM) and Rational Choice perspectives in the 1980s and 1990s, which stressed the relevance of technocratic knowledge for the development of public action, policy research

in the present century has leaned more towards the need of rendering organised and non-organised civil society groups a central space in public affairs. The issue is certainly not new in the study of public policy, but in fact, can be found at the heart of the origins of policy studies in the work of John Dewey (1927). Existing influential conceptualisations of deliberative democracy and governance are based on the incorporation of local knowledge into political and policy processes. However, one limitation can be observed: the literature often focuses more on questions of 'when' and 'how' knowledge matters in public policy, or, how knowledge is utilised, but it is somewhat less concerned with the question of what is regarded as valid or legitimate knowledge. Daviter (2015) discusses the political uses of knowledge, focusing on the effects of knowledge on how policy change takes place. He identifies 'knowledge creep' and 'knowledge shift' as being associated with incremental and more fundamental policy change, respectively. This question is especially relevant when researching the problems affecting indigenous communities in the Americas and beyond, whose knowledge has historically been marginalised.

The role afforded to ideas in shaping policy change has indeed grown significantly in stature over the last two decades (Béland, 2009). The ideational shift emphasises the fundamental role of ideas in policymaking processes; ideas that are generated from the interpretations of the causes of public problems, the objectives of public action in addressing such problems, and the instruments required to achieve those objectives (Hall, 1993). The exchange of ideas among political and social actors triggers and shapes public policy. Recently, policy learning has advanced an agenda that aims to achieve a deeper and more comprehensive understanding of how the flow of ideas can unfold to create successful solutions to public problems (Dunlop et al., 2018; Dunlop and Radaelli, 2018). For example, Radaelli (1995) explores the different perspectives on what might be considered knowledge in a public policy context and outlines three approaches. One approach concerns evaluation

research—the process of assessing policy effectiveness, utilising a particular type of knowledge (measures of policy impact) to inform future policymaking.

A second approach relates to the idea of epistemic communities—networks of professionals and recognised experts who are understood to possess relevant knowledge for policymaking in each policy field. Third, he identifies economic paradigms as constructing interpretations of causal relationships as dominant in society, which can influence policy debates by selecting and organising knowledge in certain ways. In this way "*economic knowledge is transmitted*" into policy choices (p. 166). Fourth, agenda setting may be described as a process that imposes a limited definition of what constitutes valid knowledge and that tends to rely heavily on the contributions of policy experts. Policy problems are concretised as real and thinkable only as soon as they pass the political threshold of being granted a place on the agenda, which in turn confers legitimacy to existing knowledge about the problem. Fifth, Radaelli (1995) highlights the role of advocacy coalitions, wherein a range of policy actors is brought together by a shared belief system. Such coalitions of professionals and experts serve as important routes through which knowledge reaches the policymaking process (Radaelli, 1995).

What is common to these diverse ways of thinking about the way knowledge permeates the policy process is their reliance on various types of policy elites—professionals with formally recognised expertise linked to their role—and top-down flows of knowledge distribution. This is not to say that lay knowledge is dismissed outright by these perspectives, but that, at best, non-expert knowledge is relegated to a secondary, supporting role. It is there to inform the analysis of the expert. One of the problems of existing research on learning and ideas in public policy is that it fails to recognize and examine the power imbalances that inexorably appear when problems affecting the most marginalised communities are analysed. Such is the case of public policy concerning indigenous commu-

nities in the Americas. For example, although there is a substantial amount of literature on participatory processes and governance in Mexico and other countries in Latin America, it tends to centre on urban settings and ignores the realities faced by indigenous people living in the peripheries or in more rural settings. Decolonial and development studies do incorporate anthropological perspectives, but they fail to bridge the gap with policy studies (Villagómez-Reséndiz and González-Rivadeneira, 2020; Barrera-Bassols et al., 2009). Current insights on policy learning and ideas can contribute to an understanding of how to reduce power imbalances and incorporate indigenous communities into policymaking processes.

Indigenous Communities and Public Policy

Indigenous communities across the Americas have been historically excluded from participating in the development of public policy processes. According to the 2020 national census, 6.1 percent of the population in Mexico speaks an indigenous language. As in the rest of the continent, they are and have tended to be the group that is the most omitted and most repressed from political participation, and the most subjected to violent, corrupt, and clientelistic practices (Retamar, 2005; Barrera-Bassols et al., 2009; Tapia, 2002; Kaliman, 1999). As a consequence, people from indigenous communities tend to be among the poorest and more vulnerable, and marginalised in the region.

Exploring how indigenous knowledge can be incorporated into public policy processes represents an area of opportunity for academic research. The voices of indigenous people, which are seldom heard in subnational or national politics, are essential to the identification, prioritisation, and resolution of the problems that cause their condition of marginalisation. The valuable knowledge that these communities have regarding the causes of public problems, the objectives that they may pursue to address such problems, and the public policy instruments that could be designed and im-

plemented to achieve those objectives, should be incorporated into policy-making processes.

Historically, as an academic discipline anthropology has engaged with cultural diversity by analysing the interconnected elements that comprise different people's individual lives and their collective practices, while seeking to understand broader schemes such as structural, functional, and emotional relations. While investigating political, economic, religious, symbolic, biological, and ecological 'spheres,' anthropologists strive to understand the relationships between them as produced by the human subjects at the centre of their research, within the context of the specific territories—the *place(s)*—that they inhabit. The sum of these various components has been defined, tautologically perhaps, as cultures, societies, or people.

What these units do, and how they think and create in an original form has been recognized as a system of knowledge, one that is particular, local, or indigenous. However, in a globalised world where environmental and interspecies transformations denote an underlying network of planetary influences, how are such localised forms of knowledge discerned, stabilised, and even produced? What are the existing and emerging political potentialities of such conformations? Often, these debates pinpoint particular political movements, they identify groups and territories. Beyond epistemological generalisations about what constitutes knowledge, the first step in identifying a system of knowledge is empirical; it necessitates approaching a given social group close enough to understand what values, concepts, and practices motivate and are, at times, politically activated as a particular expression of said knowledge. In other words, we need to engage ethnographically.

The ethnographic method has proven the most important tool in anthropological work since its inception, providing qualitative means of collecting, analysing, and transmitting information (Nazarea, 2006; Sillitoe, 1998). Specialists from a wide variety of fields, such as geography, agroecology, political science, sociology, and other scholarly disciplines, have adopted ethnographic elements

to enhance their research endeavours. The ethnographic approach maintains a central focus on human communities that inhabit certain territories, be they urban or rural areas, and that share common histories. As a result, the concept of indigenous or local knowledge constitutes a framework for thinking about who, when, and how things are understood, challenged, and transformed in each place (Villagómez-Reséndiz and González-Rivadeneira, 2020; Peredo and Barrera, 2019; Lizcano and Fernández, 2014; Barrera-Bassols et al., 2009; Fischer, 2000).

Thus, the idea of place and territorial adherence have played a vital role in understanding indigenous, or at least culturally specific societies (Gierhake and Azero, 2020; Nyantakyi-Frimpong, 2020; Diver, 2017; Pacheco, 2017; Bolados, 2012; McCall, 2011; Barrera-Bassols et al., 2009; Mora-Delgado et al., 2009; Berghöfer et al., 2008; Genet, 2006; Kaliman, 1999). However, anthropological insights seldom intersect with other academic disciplines or applied endeavours, with the different practitioners driving global development strategies and public policymaking. In addition, linguistic and geographical differences, as well as specific cultural practices in academia multiply and, most times, occlude conceptual similarities and discussions. Thus, bridging disciplinary, geographic, and linguistic borders in favour of a larger discussion about what counts as local or indigenous knowledge, and for whom, becomes paramount as a source for future policymaking and academic endeavours.

The literature review and annotated bibliography explore recent debates as well as emerging conceptualizations that have been presented in Spanish language publications—focusing on Latin American contexts—in addition to those in English regarding local and indigenous knowledge from anthropological and social theory perspectives. The objective is to analyse the existing literature surrounding local knowledge (and its varied synonyms and equivalents) by investigating the following: (1) the defining concepts and theories of indigenous and local knowledge, including its cognates and variations, and its spheres of influence; (2) the processes of systemization and transmission of local knowledge that such defini-

tions entail and aim to describe; and (3) the proposed applications of that knowledge beyond academia, with particular attention to the growing regional movements calling for the integration of local knowledge in public policies in different parts of Latin America.

First, we ask what is local knowledge, and how can we differentiate between combined or distinct knowledge traditions? How can specific groups of people employ such knowledge systems in their struggle for political representation, territorial preservation, and community-building? Many authors (Nugroho et al., 2018a; Nugroho et al., 2018b; Monroy-Sais et al., 2016; Riat, 2016; Hernández and Vargas, 2015; Dib and de Viana, 2011; Mora-Delgado et al., 2009; Berghöfer et al., 2008) have argued that local knowledge reflects a community's cultural creativity and adaptation to its natural environment, including the specific ways in which it interacts with and transforms its surroundings. However, the question may be raised: is local knowledge more simply a component of typologies manufactured by researchers?

Several of the texts included in this commented bibliography use a variety of concepts and theories to describe specific types of knowledge that are associated with certain practices and organisations. Subjects range from the defence of native maize seeds in Mesoamerica (Barrera-Bassols et al., 2009), to the introduction of alien species in European ecological systems (Adamski and Gorlach, 2007). Other scholars conduct analyses on how situated knowledge establishes the basis for public policies around the world, from Indonesia (Nugroho et al. 2018a; Nugroho et al., 2018b) to the United States (Fischer, 2000) and Mexico (Díaz et al., 2005), and to countries throughout Central and South America (Pinheiro, 2017; Oñate et al., 2014; Betancourt et al., 2013; Correa et al., 2012; Berghöfer et al., 2008; Mejía, 2008). The report that follows analyses these issues through different lenses that, altogether, constitute what is meant by 'local' knowledge within varied academic research contexts, and what have been and could become its potential applications.

Methodology

The present work was prepared from a systematic identification of the literature in which local knowledge occupies a salient position, deriving from English and Spanish-based publications in anthropology and social sciences during the last four decades. Encompassing multiple disciplines, the available research on local knowledge as a subject of both cultural and political analyses as related to the transformation of academic institutions and the influence of policymaking initiatives in an array of fields proves to be a growing field of study (Aikenhead and Ogawa, 2007; Bohensky and Maru, 2011; Briggs and Sharp, 2004; Durie, 2005; Maila and Loubser, 2003; Nakata, 2002; Odora Hoppers, 2002; Smylie et al., 2004).

This literature review focuses on relevant research generated during the 1980s through to the present day; however, the greater part of our research analyses journal articles and book chapters published from 2000 to 2020. Although studies of indigenous knowledge systems existed before the 1980s—significantly within the field of anthropology—this decade saw the emergence of a multidisciplinary drive to better understand non-Eurocentric knowledge systems and practices (Maila and Loubser, 2003; Purcell, 1998). This shift may be attributed, at least in part, to the mounting failures of Western approaches to development projects (Briggs and Sharp, 2004; Agrawal, 1995; Woodley, 1991), particularly in consid-

eration of public policies related to health, environment, education, and politics (Adams, 2004).

Although the literature on local knowledge is vast and originates from various actors such as researchers from universities around the world, and indigenous activists, organisations, and academics, in this article we have limited our review to the results from eight groups of databases, which are listed in the table below (*Table 1*). Thus, this review of the available literature also demonstrates that, despite the large number of texts on the subject, the access to and representation that indigenous academics have in relevant databases in the world remains scarce.

The relative absence of publications by indigenous academics in the selected research databases has resulted in the relegation of certain discussions to the periphery. This is demonstrated by the lack of conceptual recognition and consensus concerning the notion of 'indigenous' that is considered in the present article. Nevertheless, research should be understood as a review of the available literature, rather than as a text that intends to interrogate existing categories, concepts, and theories, or to create entirely new ones.

The databases that were selected are widely used in Mexico and are, notably, freely accessible. Although there are many more possible sources of information such as university libraries and governmental and non-governmental organisations, among others, we selected those that would be free and accessible to the public. Among the extensive number of texts that we could have referenced on the subject, we narrowed our review to those in which local knowledge is a central topic of discussion, discarding others wherein local knowledge was mentioned tangentially. However, should there be the opportunity to expand our investigation in the future, we would hope to return to the publications that were omitted here, and to expand our research using a broader range of databases.

This article originates from a research project funded by the University of Edinburgh titled 'Exploring risk and resilience knowledge: encounters between the scientific, indigenous and policy

communities of practice in Mexico'. Due to contractual parameters related to issues such as time and financing, the research we conducted covered the months of March to May 2021, which limited the number of databases and texts that we could include in our literature review. Despite these factors, we believe that the number of texts analysed proves sufficient for the scope of a literature review.

The table below (*Table 1*) presents a summary of the key terminology used to conduct our research, in addition to the primary research databases employed. The numbers in each column represent the articles that our searches returned because of the specific terms used, according to each database. These numbers include only the articles that were analysed and included as part of the final report for our research. As the table indicates, we used both English and Spanish translations of the relevant terminology, and in some cases, Portuguese. For example, searching 'indigenous knowledge' or '*conocimiento indígena*' in Google Scholar, returned dozens of texts in both languages, 32 of which we refer to in our analysis, including works such as Semali and Kincheloe's 2011 edition of their book titled *What is Indigenous Knowledge? Voices from the Academy.*

Table 1: Quantitative summary of materials reviewed, categorised by key search terms and scholarly databases consulted.

Search Terms by Databases Español / English	Scielo	Redalyc	Dialnet	Google Scholar	JSTOR	Research Gate	Academia	Databases of university journals and/or books
Conocimiento indígena/indigenous knowledge	5		9	33	12			
Conocimiento local/local knowledge	5	4	3	12	6	6	2	6
Conocimiento nativo/ native knowledge								
Saberes indígenas	2			3				
Saberes locales				12				
Saberes nativos								
Indigenismo/indigeneity								
Ontología indígena/indigenous ontologies				9				
Traditional (ecological) knowledge		1		2	1			
Total	12	5	12	71	19	6	2	6
133								

The information from the reviewed literature concerning indigenous, local, and traditional knowledge can be grouped into three categories: the first, which we have labelled 'Conceptual Definitions and Characteristics', encompasses the different academic definitions for what constitutes indigenous, local, and traditional knowledge; the second, 'Processes of Knowledge Cultivation and Transmission' is comprised of studies that focus on how such knowledges are produced and transmitted over time; and the third, 'Creation of Communities with an Agenda' includes a discussion of how those knowledge systems may be integrated into academic agendas as well as into the policymaking processes for various fields of public policies, whose decisions largely affect specific, localised communities.

Conceptual Definitions and Characteristics

To better understand the processes through which indigenous, local, and traditional knowledge is generated and communicated, as well as the potential applications for those knowledge systems, we must first determine what academics, public policy practitioners, and members of indigenous or local communities have defined as comprising those knowledge systems. Several fundamental questions directed our analysis of the literature we reviewed: What is indigenous knowledge? How does it differ from other commonly used terms such as 'local knowledge,' 'traditional knowledge,' or even less commonly used terms such as 'endogenous knowledge' or 'folk knowledge'? How does it compare with broadly accepted notions of other knowledge systems, such as modern, Western science? What are some of the critiques regarding how indigenous knowledge has been, or is currently, defined?

Sillitoe (1998) observes that the distinctions between indigenous and non-indigenous knowledge "*have a contentious political edge, with connotations of superiority and inferiority*" (p. 223). Where Eurocentric thought has claimed dynamism, objectivity, and universality (Briggs and Sharp, 2004; Chambers and Gillespie, 2001; Retamar, 2005) indigenous knowledge has been characterised as static, subjective, and applicable only to localised settings (Battiste,

2005). Purcell presents a historical definition of indigenous knowledge as cultural knowledge "*based precisely on* subjective *historical or cultural experience and uncontrolled, undocumented observations*" (Purcell, 1998, p. 259). In contrast, he states, Western science has been recognized as dictating that knowledge must demonstrate objectivity, rationality, replicability, and verifiability, and that the methods of discovery of knowledge demand a rational explanation, codification, experimentation, and empiricism.

In the last 20 years, the discourse surrounding indigenous and non-indigenous knowledge systems has changed. There continue to be critics of the concept of indigenous knowledge. One example is Horsthemke (2008) who, based on the philosophical definition that has been proposed for knowledge which necessitates the three essential components of belief, truth, and adequate justification, argues that indigenous knowledge is not knowledge at all. However, many academics no longer deny the intellectual and material value of indigenous, local, or traditional systems of knowledge and practice, particularly in addressing some of today's most pressing issues, such as climate change adaptation (Petzold et al., 2020). Others merely challenge the explicit meanings of the terminology used, noting the difficulty of distinguishing among different terms, and understanding indigenous knowledge as an 'umbrella term' (Nakata, 2002; Ngulube and Onyancha, 2020). Durie (2005) has even observed that "*Western science has become a dominant global knowledge system and has often been accused of intolerance towards other persuasions*" (p. 305).

Consistent with the observations made by authors such as Battiste (2000), Ngulube and Onyancha (2020), and Agrawal (2002), there remains little consensus on the explicit definitions given to indigenous, local and traditional knowledge; on the nuanced distinctions between those and other terms often used interchangeably; and on the criteria that scholars employ to distinguish this knowledge from that of the Western or scientific tradition. In the reviewed literature, scholars used an array of terms as equivalents,

but demonstrated a preference for 'indigenous knowledge' as the most used term (Ngulube and Onyancha, 2020), likely due, at least in part, to its prevalence in development discourse (Sillitoe, 1998).

In our analysis we focus on the terms 'indigenous knowledge,' 'local knowledge,' and 'traditional (ecological) knowledge' as those with the greatest usage, and those wherein some authors note nuanced distinctions in their defining characteristics (Ngulube and Onyancha, 2020). According to many authors (Agrawal, 1995; Battiste, 2005; Berkes and Berkes, 2009; Bohensky and Maru, 2011; Briggs and Sharp, 2004; Chambers and Gillespie, 2001; Durie, 2005; McGuire-Kishebakabaykwe, 2010; Ngulube and Onyancha, 2017), 'indigenous knowledge,' as a generalised term, refers to a situated body of knowledge that is cultivated within a particular community, and generated from the interconnected relationships, understandings, and practices that are embedded in the particular land or environment of its inhabitants. Brush (1993) and Berkes and Berkes (2009) further explain that the understandings that constitute indigenous knowledge are generated by reading and interpreting signals from the land, animals, and plants, and that these understandings shape the way the people who possess such knowledge construct their livelihoods.

Deviating from historically accepted assessments of indigenous knowledge, many scholars now regard indigenous knowledge systems as dynamic, acknowledging the nuanced awareness that residents of an area have concerning their relational interdependence with their natural environment, and the sophisticated systems of organisation they have developed to compile and transmit knowledge about local flora and fauna, cultural beliefs and their history as a means of enhancing their lives and achieving continuity (Semali & Kincheloe, 2011; Posey, 2003). Posey (2003) further asserts that indigenous systems of knowledge embody the concept of sustainability, as their inherently holistic qualities allow them to constantly evolve through experimentation and innovation, responding to new insights and external stimuli.

Beyond the primary characteristic of an enduring relationship between indigenous populations and their territories or natural environment, Durie expands the definition of indigenous knowledge to include several secondary characteristics. He contends that the key elements of time (relationships that endure over centuries), identity (customs and rituals celebrating relationships and shaping social interactions), knowledge (the establishment of distinct methodologies and an environmental ethic), sustainability (balanced economic growth in the community) and a shared language constitute an indigenous knowledge system (Durie, 2005, p. 302). Although these characteristics may manifest in different ways for different indigenous groups, beliefs in reciprocity, communal values and spiritual relations appear as common themes that prove instrumental to sustained indigenous knowledge systems (Hart, 2010; Smylie et al., 2004; Ngulube and Onyancha, 2017).

Indigenous knowledge proves technical, practical, and multi-faceted. As Horowitz (2015) indicates, it can encompass knowledge of locally available natural resources such as foods, herbs, medicines, and timber—and not just what exists, but how to harvest and prepare it, and equally as important, how to avoid depleting the available resources. Posey's (2003) reference to the Shuar people of the Amazonian lowlands in Ecuador, who have 800 species of plants they use for medicine, food, animal feed, fuel, construction finishing, and hunting supplies, exemplifies just how extensive that technical knowledge can be.

Horowitz (2015) adds that indigenous knowledge extends beyond the technical expertise appreciated by Western scientists, to include social taboos, sacred places, and an understanding of how spirits must be approached or placated. As Rotorangi and Russell (2009) argued years before, "*the ecological is not disconnected from the social, from the economic, from the spiritual, nor from the personal or collective actors*" (p. 211). Ultimately, a distinguishing characteristic separating indigenous knowledge from Western scientific knowledge, as Wilson and Inkster (2018) contend, is the way indig-

enous people view the land, animals, and plants as living entities within their rights, rather than mere resources for humans to own, manage and exploit.

According to some contemporary scholars, the term local knowledge differs from indigenous knowledge. While indigenous knowledge may only be held by indigenous people (Berkes and Berkes, 2009), local knowledge is that which is produced in a specific place by local people possibly, but not necessarily, where indigenous populations may live (Nugroho et al., 2018, citing Geertz, 1983; Diaz et al., 2005). Many authors associate local knowledge more so with rural, peasant societies located on the margins of large cities (Bernardo and Morales, 2011; Diaz et al., 2005; Peredo and Barrera, 2019; Riat, 2016). Despite these technical distinctions, local knowledge, like indigenous knowledge, represents an experiential learning process that is mediated by the environment where a local population lives, and which contributes to that population's survival (Adamski and Gorlach, 2007; Barrera-Bassols et al., 2009; Peredo and Barrera, 2019; Riat, 2016). Both local and indigenous knowledge systems create social structures and practices centred on their contextualised ecological knowledge, which are meant to maintain and reproduce their cultural heritage through intergenerational transfers of that knowledge (Dib and de Viana, 2011; Mora-Delgado et al., 2009; Villagómez-Reséndiz and González-Rivadeneira, 2020).

Similarly to local knowledge, in the definitions of 'traditional (ecological) knowledge,' there is significant overlap with indigenous knowledge. For Correa, et al. (2002), the distinguishing characteristic is that traditional knowledge does not imply a historical connection between local human populations and ecosystems; rather, it draws more broadly from information related to species identification and classification (Armatas et al. 2016).

A critique of indigenous, local, and traditional knowledge systems lies in Watt's observation that local knowledge is unevenly distributed among the members of a local society and is subject to

the influence of other knowledge systems (Hernandez and Vargas, 2015). Yet, Folke (2004) contends that although traditional monitoring methods may be imprecise and predominantly qualitative rather than quantitative, they still prove valuable as complements to Western science-based approaches due to the fact that they are founded on observations over long periods, incorporate large sample sizes, are inexpensive, and invite the collaboration of local harvesters and researchers.

Ultimately, a lack of consensus regarding widely accepted definitions for 'indigenous,' 'local' and 'traditional' knowledge systems remain. Battiste and Youngblood (2000) suggest that this may be due, at least in part, to the fact that these forms of knowledge cannot, and need not, be categorised into Eurocentric thought. The processes of defining and categorising are not part of indigenous thought; therefore, they assert, the process of cultivating knowledge and understanding it is more important than the process of classification. In focusing more on the generative and communicative processes of indigenous knowledge systems, both academics and public policymakers can utilise indigenous knowledge to respond to pressing issues in the fields of agriculture and the environment, education, and health and in transforming political participation and the power dynamics among non-indigenous and indigenous communities.

Processes of Knowledge, Cultivation, and Transmission

Local knowledge, as it has been observed in its definitions in disciplines such as anthropology and other social sciences, reflects a close relationship between communities and their physical surroundings, wherein 'communities' refers to those rural and urban enclaves that have a history of adaptation to their environment. Through adaptation, social groups cultivate a set of situated practices and knowledge over an extended period. Thus, according to many of the authors of the literature reviewed here (Villagómez-Reséndiz and González-Rivadeneira, 2020; Barrera-Bassols et al., 2009; Retamar, 2005), local knowledge is understood as being specific to the context in which it arises, and as being transmitted through concrete processes of socialisation and communication.

In this section, we aim to assess how knowledge is created and imparted in local societies around the world with special emphasis on Latin America and, specifically, Mexico. Based on this assessment, it will be possible to evaluate and identify the key issues, debates, and gaps in the literature consulted. As will be shown, there are different positions about the genesis of knowledge and its transmission methods. By recognizing how knowledge is created and transmitted from the sources consulted, we can analyse, synthesise,

and critically evaluate the multiple definitions and applications of the concept in different research contexts.

Many authors (Nugroho et al., 2018a; Nugroho et al., 2018b; Riat, 2016; Hernández and Vargas, 2015; Dib and de Viana, 2011; McGuire-Kishebakabaykwe, 2010; Mora-Delgado et al., 2009; Adamski and Gorlach, 2007; Retamar, 2005; Kaliman 1999; Gómez, 1995) consider local knowledge to be the result of a constant and dynamic communication process; however, others indicate that certain theoretical perspectives such as cognitive anthropology conjecture the opposite, stating that knowledge is not the outcome of communication but, rather, that it enables communication (Villagómez-Reséndiz and González-Rivadeneira, 2020; Correa et al., 2012; Brush, 1993).

For Ward Goodenough (in Villagómez-Reséndiz and González-Rivadeneira, 2020) culture and, therefore, knowledge, consists of a set of information that is stored in the minds of people and displayed in society in an orderly way. Yet, many of the studies reviewed offer a different panorama, arguing that being more than just a simple compilation of data, knowledge is created in a practical manner, through complex social relations (Villagómez-Reséndiz and González-Rivadeneira, 2020; Ngulube and Onyancha, 2017; Hart, 2010; Berkes and Berkes, 2009; Aikenhead and Ogawa, 2007; Battiste, 2005). Therefore, what emerges as knowledge, specifically local forms of knowledge, points towards the apprehension processes that constantly occur between people from different age groups. For this reason, the cultivation of knowledge is a process of intergenerational transmission (Hart, 2010; Berkes and Berkes, 2009; Nazarea, 2006; Durie, 2005).

When speaking of local knowledge in academic terms, four qualifiers are commonly used to distinguish the different kinds of knowledge as social concepts: 'local,' 'indigenous,' 'scientific,' or 'modern' (Lizcano and Fernández, 2014; Retamar, 2005; Kaliman, 1999). However, the generation and transmission of knowledge among humans is made possible by socialisation and is marked by

a social group's sustained, historical presence in a specific environment (Merino, 2015; Retamar, 2005; Briggs and Sharp, 2004; Tapia, 2002). According to Retamar (2005), the colonisation of the Americas and the rise of positivist scientism, have resulted in the election of some forms of knowledge over others, granting them credibility according to their adherence to methods that reflect the principles of 'modern' science. Hence, a geopolitical context frames how we look at knowledge and our ability to distinguish local knowledge systems from the Western tradition (Retamar, 2005; Tapia, 2002; Kaliman, 1999).

Local forms of knowledge, as presented in the literature reviewed, are organised here by (1) their forms of emergence and transmission; (2) how they relate to other forms of knowledge; and (3) how these different knowledge systems are integrated for the creation of communities with an agenda (such as networks of scientists, or public policymakers). Tracing the constitution and the relationship between local-indigenous and modern forms of knowledge will contribute to an understanding of how these conceptions emerge and develop into politics.

The Emergence of Situated Knowledge: Approaches to the Notions of 'Local' and 'Indigenous'

For Retamar (2005), the differentiation between local and Western knowledge is based on the colonisation process undertaken by the European nations in the rest of the world. According to his analysis, local knowledge is a process of struggle for the recognition of existence, which explains why various indigenous sectors of the continent have launched a series of mobilizations and resistance to national States to destabilise the Western rational premise. The uprising of the *Ejército Zapatista de Liberación Nacional* (EZLN) in Chiapas, Mexico in 1994 is one example of such mobilisations.

This movement has pondered the recognition of other knowledge regimes beyond the Western one, in addition to having sought from it, other forms of political action that are sustained from the methods of local organisation among the various Mayan groups of Chiapas.

From the above, we have a starting point: knowledge is local as far as it challenges the presumed universality of an established rational order. Retamar (2005) describes local knowledge as an exercise in asserting the identities of each social group and individual in the face of the colonial impetus to assign categories that these actors do not recognize as their own. In this way, knowledge is forged when the coexistence of ethnic and mestizo groups in the vast geographies of Latin America is recognized.

According to the reviewed literature, the knowledge that is asserted as universal derives from a situation of colonial origin that is expressed in specific cases. An example of this is the defence of native maize in the Purhépecha basins of Pátzcuaro and Zirahuén. According to Barrera-Bassols et al. (2009), local knowledge is built through oral traditions in family nuclei and has as its purpose agricultural production and food self-supply. To meet that purpose, an attempt is made to transmit a series of practices to younger members of families to recreate forms of survival based on subsistence; however, when this is threatened, what arises is a confrontation that aims to defend the environment, in this case native maize. Therefore, the process of knowledge creation is linked to a technical application that is born in the family and becomes a collective mechanism of adaptability to natural or social risks.

For Kaliman (1999), a case like the previous one confirms that local knowledge is based on the socialisation of collective knowledge. This prompts an important discussion: is the knowledge to which we appeal local, indigenous, or of another kind? Kaliman (1999) asserts that when a social organisation is based on transmitted knowledge that is represented in practices and organisational forms in collective nuclei, we can approach the indigenous reality

not only of different groups in the Americas but of other latitudes in the world, because we recognize that knowledge can be situated and explored within the daily dynamics of social groups.

Chambers and Gillespie (2001) state that members of indigenous groups commonly share language, identity, social and political institutions, as well as religious traditions and practices, among other aspects of social life that indicate belonging to a particular group. Thus, the concept of indigeneity makes sense as it explains that knowledge is based on a cultural unit that comprises a 'community.' Nevertheless, Horowitz (2015) points out that when there are processes of miscegenation, this conceptual baggage may be lost, effectively decreasing the intergenerational transmission of knowledge, which can have negative impacts on the immediate environment that the social group inhabits.

Although, in contrast to other analyses, his position defines indigenous communities as closed entities, Horowitz (2015) notes that political struggles make indigenous peoples resilient and adaptable to change; they demonstrate what knowledge is defended, who are the actors involved, and what territory is affected. For Nakata (2002), this is fundamental to persist because the indigenous knowledge of the communities involves a series of collective rights, values, and interests that are reflected in their knowledge systems, which are forged, according to Posey (2003), in the appropriation of ecosystems for an extended period.

Returning to Kaliman (1999) and Retamar (2005), local knowledge can be conceived in its specificity as indigenous, since the local is a counterweight to the universal. The term 'indigenous' more adequately elucidates those struggles for recognition in the face of long-standing processes such as colonisation. Perhaps therein lies the specific differentiation between what is indigenous and what is local; that is, a dissimilarity of a political agenda. For this reason, the methodic value of intergenerational transmission is essential to identifying those specific practices to which societies themselves refer as disruptive events, such as extractivism or exogenous inter-

ventions of any kind. The case of the defence of native maize in Michoacán, Mexico (Barrera-Bassols et al., 2009), illustrates that the social struggle has behind it a social group that, knowing the effects of the introduction of new species, has organised to prevent the loss of native species and with them, the associated knowledge that is founded in their Purhépecha identity, as pointed out by these authors.

In a study of local knowledge in the United States, Fischer (2000) discusses what is local and forces the reader to contrast with the methods of transmission of knowledge in areas that are considered indigenous. In this regard but in a case study in another latitude, Nugroho et al. (2018b) discuss the issue of local knowledge within public policies in Sulawesi, Indonesia. For these authors, local knowledge contains a series of more complex mechanisms of creation, teaching, and socialisation than scientific knowledge, all of which are built collectively. However, when this collective knowledge is linked to other knowledge systems, such as state-implemented public management, it tends to be gradually erased and thus community-State or community-science relations generate contexts of little transparency. Nugroho et al. (2018b) show us that despite this, it is possible to generate binding strategies between citizens and public policy planning agencies; therefore, in Sulawesi in the central region of Java, the transmission of knowledge made sense as local autonomies were created for public management. In this way, the State relied on forms of local organisation in the region to achieve the goals of the Department of Rights.

With this review of authors who cover different geographies in their research, we note that local and indigenous knowledge, although they go together, have certain procedural and historical differences even when the objectives to which they appeal are similar. From the recognition of existence to the connection to scientific sectors, there is an important gradient in the search for spaces and in the formulation of new hierarchies that are more symmetrical between the local-indigenous and the State, and Western science.

In the next subsection, we will observe what triggers this need for recognition, as it derives from natural events and the struggle for territories that jointly appeal to risk management. From an analysis of the arguments made in various texts reviewed here, we can begin to discern the paths that can be followed in the search for symmetry of knowledge. In this sense, it will be possible to observe that symmetry implies full recognition of the difference in perspectives. Symmetry is not only levelling the different types of knowledge but weighting them as different. In this difference, it can be noted that there will be a greater range of possibilities to understand phenomena of various kinds and, therefore, apply a greater number of possible understandings and resolutions to problems.

Disruptive Elements in the Socialisation of Local Knowledge

In Mexico, as in other regions of the world, there are disruptive events that tend to *disregard or relegate* local knowledge in favour of development, political and agri-food projects that do not recognize the *in-situ* practices that their implementation may affect. These events impact the generation and transmission of local knowledge, for which communities and social organisations appeal to the defence of their place-based practices and their civil rights to counteract the effects of endogenous practices that do not recognize the virtues of local knowledge.

As already reviewed, the case of San Francisco Pichátaro (Barrera-Bassols et al, 2009) and the defence of maize is an emblematic example. In the first place, as a symbol, native maize indicates a series of adaptive biological processes that have occurred because of human accompaniment in the Michoacán Lake area of Pátzcuaro and Zirahuén, and which have translated into a series of agroecological practices that define the Purhépecha identity in the region. These practices are reproduced daily in Mesoamerica and have been

transmitted and reformulated over time. But, when this network of practices and knowledge is threatened by endogenous disruptions, communities like San Francisco Pichátaro have responded by seeking alliances to preserve and socialise their knowledge.

Particularly in this case, local knowledge has had a series of dynamizations that involve actors beyond the community. For example, in the face of the possible introduction of genetically modified maize, indigenous communities created a regional organisation called *Organización Regional de Agricultores Purhépechas en Defensa del Maíz Criollo* (ORAPDMC). They developed a strategy of social resistance, articulating their opposition in scientific terms, and created activist support networks to legitimise their practices and knowledge around maize, which were threatened by the possible contamination of seeds and attacks against local practices, knowledge, and biosecurity.

Consequently, social resistance networks are one more way of making local or indigenous knowledge explicit to socialise, share and reinforce it. However, this is not the only way to activate modes of socialisation of local knowledge in the face of disruptive elements to ensure its continuity. Increasing environmental risks make it necessary to acknowledge and employ those types of knowledge that are useful to adapt and, to a certain extent, survive the harsh conditions that communities face. For this reason, it is necessary to mention the case analysed by Lizcano and Fernández (2014) about the "*killer lakes*" of Cameroon, which occurred in 1986 and was one of the deadliest environmental catastrophes during the 1980s in Africa (p.136).

Lizcano and Fernández (2014) explain that in August 1986, 53 people died in a small town near Lake Nyos in Cameroon due to toxic gases that emerged and affected all living beings in a surrounding area. After several hours, the death toll grew to 1,746 dead, with 20,000 more people affected by vomiting and fever. Events such as rebel incursions and chemical tests were ruled out; scientific specialists adopted the hypotheses of volcanological and limnological

origin; however, the local population interpreted the tragedy as deriving from a mythical fact. They relied on local mythology to problematize a complex ecological phenomenon that had affected their community. For the Bafmen people, their indigenous knowledge maintains that ancestors and spirits inhabit the lakes of Cameroon, who sometimes leave the bodies of water to seek revenge. The Bafmens believed that this is what occurred in this event that caused the death of hundreds of people.

The environmental incident demonstrates an important part of local knowledge: authentic risk management from Bafmen geomitologies (Lizcano and Fernández, 2014). An elderly survivor of the catastrophe, upon hearing the roar of the gases from Lake Nyos, came out of his hut and shouted that those who wanted to survive needed to drink palm oil. Those who did, survived; those who did not, died or suffered very serious injuries. This case shows that local knowledge is built around the society-individual-environment relationship, which is accumulated orally and disseminated among members of social groups and can contribute to preventive measures in events such as that of the killer lakes.

For a case like the one in Cameroon, it is necessary to put into perspective that local or indigenous knowledge is socialised in the search for a better quality of life, and that it becomes part of a *corpus* that is capable of safeguarding human survival as was previously indicated. In this regard, Gierhake and Azero (2020) contend that local knowledge is part of traditional know-how, since based on experience a set of knowledge is adapted from the understanding of the territory and its phenomena, to strengthen adaptive skills and social well-being.

For his part, Gómez (1995) argues that local knowledge, such as the kind discussed in the case of Cameroon, is the result of cultural diversity responding to the ecological frameworks where societies settle; that is, to achieve objectives such as the safeguarding of life itself, it is necessary to interact with the surrounding environment. Such interactions are the only way for local groups to determine

how natural resources should be used and for what, and to create the native technologies that are necessary for the use of those natural resources. These ideas transcend the territorial and social boundaries of indigenous societies, as they are also integrated into modern and mestizo societies around the world.

Although a large number of authors that we have reviewed tend to make a distinction between the local and the modern, it is important, as Villagómez-Reséndiz and González-Rivadeneira (2020) point out, to explore the processes of local knowledge as something else beyond the coarse essentialization that builds the idea of the '*noble* savage' who guards nature and its contexts in the best possible way; on the other hand, as these two authors mention, essentializing local knowledge prevents the capacity of societies from being recognized as historical agents of their own social change, since by not critically considering the ways of transmission of local practices, the potential of social struggles are nullified.

Therefore, another disruptive element that influences the transmission and communication of local knowledge within societies can come as an unwanted result of collaborative work with other knowledge systems, such as scientific and the modern knowledge carried by the State. An example of these situations appears in the analysis by Correa et al. (2012), which covers the coastal populations of El Valle (Pacific), and Sapzurro–Darién (Caribbean), in Colombia. Although local fishermen could be considered specialists in local ecological knowledge because they maintain enduring relations with the sea, their way of knowing the world is different from the State system of knowledge, which is hegemonic in the region for issues of public policy and marine management and is expressed through local legislation.

Through orality, the more experienced older members of the communities, teach the younger ones to make methodical observations of the species and natural phenomena that occur in the area. They intertwine this knowledge with religious perspectives, magical practices, and beliefs that do not necessarily contain rigorous

Western schemes and logic. In such a way, as Correa et al. (2012) indicate throughout their text, this local ecological knowledge in the communities studied in Colombia helps the inhabitants to solve immediate problems based on the activation of memory or experience.

Environmental management in the face of the risks that may arise would ideally be formulated from local expert knowledge due to the close links that these groups have, and the profound knowledge they have accumulated of the sea. However, as Retamar (2005) points out, and as we mentioned previously, local knowledge is, in its origin, a search for recognition. When an exceptional event occurs, it is usually not resolved with the direction or aid of the local fishermen; rather, Western scientific 'expert' knowledge is applied and used to govern the lives of people whose own knowledge and practices are not necessarily validated. Faced with these scenarios, the logics of inherited practices tend to diminish, and, with them, environmental management tends to be less and less efficient. One way to resolve these dynamics is to integrate local knowledge practices with scientific knowledge to enhance the strategic nature of knowledge in contexts such as the one to which we referred. In this way, for Correa et al. (2012) the knowledge of fishermen is increasingly valued by scientists as it illustrates specific, situated knowledge, fills in the research gaps, and gives rise to new hypotheses about ecological-human links as well as the environmental management that the inhabitants conceive of by themselves.

Local knowledge systems become, at times, part of specific public policies, although under a clear hierarchical relation with scientific knowledge which is sanctioned by the state. This unequal relationship can produce unpredicted success but also conflicts (Nugroho et al., 2018a; Nugroho et al., 2018b; Adamski and Gorlach, 2007; Díaz et al., 2005; Fischer, 2000). Such entanglements accelerate local processes of adaptation and innovation. In the next section of this literature review, we observe how local knowledge is linked to other knowledge systems, and how this influences production and transmission in communities.

Links to Other Knowledge Systems

Let us take up again those examples that, from local knowledge itself, seek recognition within the modern hierarchy of human knowledge. Starting from there, we will be able to observe how local, indigenous, and ecological knowledge generates new intersections with other knowledge systems for a common purpose, which aims, among other things, to legitimise a territory, defend a native resource or create new and better conditions for citizenship in general. In this way, it will be possible to make visible those hierarchies that, based on the authors reviewed, need to be deconstructed to achieve a genuine symmetry between peoples and societies in contexts such as Latin America and Mexico, without ignoring examples from other geographies analysed by the authors of the texts included in this review. Within this framework, the authors propose innovative ways for the creation and socialisation of local knowledge, which consequently is the basis for establishing new communities of knowledge that find their niche in development projects, academia, or State and regional public policies.

For Mexico, the text by Barrera-Bassols et al. (2009) denotes some questions in this regard. The authors mention the two logics that come into conflict concerning a resource such as maize. In the first instance, the industrialised agriculture of five transnational companies, under the perspective of technoscience, seeks to generate lucrative profits via the production of transgenic seeds, mainly to produce tortillas. On the other hand, there is the system of agriculture that is developed from the local knowledge of indigenous peasants in San Francisco Pichátaro, who through practices inherited from several generations, only seek a subsistence-based food supply, and generate agricultural sales in regional markets. The conception of production in the second case does not cause unsustainable stress on the lands of the basin and guarantees both the reproduction of communal identity practices and the sowing of native seeds.

In this sense, the authors themselves adhere to a militant ideology as far as their approach is derived from ethnoecology, a scientific perspective that is related to the peasant and indigenous resistance movements within the contexts of extractive projects. The socialisation of the practices that produce knowledge is immediate, given that the intervention of seeds that have been modified using agrochemicals is, from their perspectives, a way of attacking the indigenous intellectual capacity that, for centuries, has self-determined their ability to produce their own germplasm. In resistance to these interventions, indigenous populations find it necessary to generate alliances that promote the continuity of practices that demonstrate how native maize can continue meeting the present and future needs of peasant communities in the lake basins of Michoacán in Mexico.

A case like this is only one aspect of how local knowledge can be created, socialised, and linked to other knowledge systems. As Hiwasaki et al. (2015) indicate, promoting the transmission of local knowledge increases community resilience to risk factors, whether social or environmental. Further, as mentioned by Diver (2017), indigenous knowledge can have even greater implications by shaping new forms of negotiation in scenarios such as public policies.

For example, Berghöfer et al. (2008) refer in their analysis of Cabo de Hornos, Chile that the need to link the local knowledge of the Yagán ethnic group to public policies is necessary to safeguard identity and practices in this southern region of Latin America. They observe that elements of global culture have been replacing ethnic culture and the European heritage that took root in the 19th and 20th centuries, and that economic relationships and the introduction of exotic species have affected the native marine biota in recent decades. To avert this problem and safeguard local knowledge, the Yagán indigenous community of Puerto Williams, descendants of European colonisers, recently settled residents (namely, fishermen, military personnel, and retirees), families of the Chilean Navy on Navarino Island, and government authorities

collaborated to ensure that the Cabo de Hornos area was declared a UNESCO Biosphere Reserve. Thus, in their analysis, the authors present different modes of socialising knowledge and how various social actors relate to their natural environment to shape cognitive landscapes, material and non-material interactions, and concrete forms of kinship. For this reason, local knowledge can be seen as a way of exploring and interpreting the environment, developing adaptive ways of living, and co-inhabiting by doing so. In this specific case, it proved necessary to relate the existing knowledge systems to achieve synergy in the preservation and management of resources from a local perspective.

Although the previous examples appear to successfully link knowledge systems and transmit them beyond the intra-community spheres, some examples fail to do so due to the power relations that exist between knowledge regimes. The case analysed by Peredo and Barrera (2019) illustrates one example of such a failure. In carrying out extensive documentation of native species in southern Chile, they realise that it is impossible to compile sufficient quantitative data on agroecosystems since local knowledge is based on long-standing experience, whereas scientific knowledge is based on immediate trace evidence. The conjunction of knowledge systems is complicated by this differentiation; however, the authors assert that it is necessary to develop collaborative frameworks since participatory research can endow both academia and public policies with viewpoints that, generally, are not seen or considered. The fact persists, however, that the information flow of local knowledge remains contained in local spheres, which makes such collaboration very difficult to achieve.

Díaz et al. (2005) state that the defining characteristic of the transmission of local knowledge is its reproduction in channels, such as oral storytelling, which are *comprehensible* only by *people who pertain/belong* to the local community. Achieving other forms of transmission that promote inter-group socialisation can be complex and are dependent on the condition that scientific knowledge

systems do not eclipse local points of view. Faced with this challenge, how would it be possible to generate widely readable and applicable linking mechanisms that contribute to collaborative agendas and preserve methods for socialising local knowledge?

For Aguilar-Peña et al. (2020), interculturality is the bridge between Western and indigenous cultures. In Colombia, which is a multi-ethnic and pluricultural country, local and traditional health systems provide an example of this situation, given that in their link to the Western model (allopathic or biomedical) there is a process where local knowledge that is transmitted internally between communities is articulated with biomedicine through symmetrical rather than hegemonic relationships. Thus, they achieve the task from Retamar (2005) that we referred to at the beginning of this second section, wherein local knowledge is recognized and integrated into healthcare using traditional medicine, and where it can be observed that the benefits of local knowledge are recognized and applied beyond the community sphere. In this situation, the best of cases is achieved: special recognition of traditional medicine as an asset culminates in the creation and application of public policies that acknowledge the value of resources, practices, and people of a specific place. To conclude this section, which serves as a bridge to the third part of this literary review, we affirm that the most significant gaps in the construction of local knowledge and its transmission are the problems of the hierarchy of hegemony processes.

Creation of Communities with an Agenda

In this interface of anthropology with public policies, this section reviews the role of local knowledge in the establishment of political agendas. To do this, we understand public policies as devices that can be expressed in four different but interrelated ways: (1) as a particular form of knowledge and its representations; (2) as a language of power; (3) as a form of political technology; and (4) as a product of intermediation and "*translation*" between different actors (Agudo, 2009, p. 64). This analytical framework will be used to explain how the academic literature reviewed here locates subaltern knowledge in decision-making processes at different levels.

Local Knowledge in Service of Health

Reflections on the various ways in which it is possible to incorporate subaltern knowledge into public health policies have been tackled in different ways. On the one hand, the academic literature on indigenous knowledge and public policies has paid attention to the conflicts that involve the 'appropriation' of indigenous knowledge for more universal curative purposes, given the emergence of

public policies that defend the use of traditional medicine by the health systems of different countries.

In 1992, the United Nations (UN) recognized indigenous rights over their traditional knowledge through the Convention on Biological Diversity (UN, 1992). Per this position, some years later, the United Nations Educational, Scientific and Cultural Organisation (UNESCO, 1999) urged states to direct public policies that capitalise on the value of traditional indigenous systems, which are understood as accumulated sets of theoretical knowledge, practical experiences, and representations possessed by indigenous peoples or local communities that are linked to a millenary history of interaction with their natural environment (UNESCO, 2005). The status that these actions conferred on the indigenous made it possible to create a series of policies focused on the promotion, respect, development, and inclusion of traditional medicine within the health systems in different countries.

The term 'intercultural health' in the global discourse emerges as a new paradigm that seeks to recognize that all medical systems are limited in their ability to solve current health problems, thus acknowledging that non-Western health systems whose principles, specialists, treatments, and elements correspond to ancestral ways of understanding and practising medicine, can enhance medical treatments (Bolados, 2012). Aguilar-Peña et al. (2020) make use of interculturality as a bridge between Western culture and indigenous culture. In this convergence of knowledge, the indigenous health model is identified as a cultural response to the need to maintain health and treat disease. It can be understood as a hierarchically organised model in which the health of the individual depends—in addition to their habits—on harmony with nature, spirit, gods, and their community.

Thanks to intercultural studies, it is known that health must also be intercultural. However, the use of these concepts, beliefs, practices, material, and symbolic resources with ancestral roots in a universal system such as public health has not been without contra-

dictions. In the opinion of Ouriques (2013), the field of indigenous health is constituted as a colonial meeting zone between indigenous peoples and the agents of the nation-state who are responsible for the implementation of public policies. As a result of an asymmetric power relationship, indigenous knowledge about traditional medicine—practices, approaches, knowledge, health beliefs that incorporate plant, animal, and/or mineral-based medicines, spiritual therapies, manual techniques, individually applied exercises, or in combination to maintain well-being, in addition to treating, diagnosing and preventing diseases (WHO, 2002)—is valued more as heritage than as knowledge. According to this understanding, it is used in 'alternative' therapies or unconventional practices that do not enjoy real recognition, acceptance, and inclusion in national health systems (Guzmán-Rosas and Kleiche-Dray, 2017).

Western science as a modern institution is considered the only legitimate medium for the production and dissemination of knowledge; therefore, it retains the power to establish a hierarchy of knowledge and to repress or silence those other systems that are considered invalid (Ouriques, 2013). When this scientific position is transferred to politics, the national states maintain a utilitarian vision when it comes to assimilating the practices and practitioners of traditional medicine in their official health systems, assuming only those praxes that can be apprehended from biomedical rationality.

Regarding technical issues, traditional medicines are only integrated into the official health system after being subjected to two processes: (1) the scientific validation of their knowledge and practices; (2) the qualification of their practitioners. The first seeks to purify traditional medicine of cultural traits by producing scientific evidence to certify its effectiveness or validity. The second, on the other hand, argues that indigenous professionals should be duly qualified in courses that instruct them on basic knowledge of public health, as a means of regulating their profession.

The professionalisation of indigenous knowledge and the creation of experts in this matter (indigenous or non-indigenous) have

collateral effects (Barros de Melo et al., 2009). In reviewing the Chilean experience, Bolados (2012) highlights how the pressures from the State towards indigenous organisations to incorporate indigenous healing practices into the public apparatus fostered their progressive bureaucratization and neo-liberalization. Thus, the use of indigenous medicine as a form of valorisation of their traditional knowledge must try to move away from the traditional way in which public policies '*assimilate*' the realities of those whom it intends to serve.

In a symbolic dimension, the knowledge used to face health-disease problems is linked to language, social relationships, spirituality, and a collective vision of the world (UNESCO, 2005). However, the true nature of this knowledge is blurred outside the framework of the communities where it is produced. While indigenous voices speak of the dynamic, incomplete character, noting the constant processes of revision that their traditional medical systems undergo, public policies operate with an instrumentalized and stereotyped notion that hardly allows the integration of some of the practices and practitioners into the official health system.

All of this focuses on displacing the traditional indigenous therapeutic space in favour of forms and places that have been instituted by the bureaucracy of public health. From a Foucauldian perspective, this could qualify as a new art of government in which the ethnos appears as a strategy for incorporating indigenous minorities into current neoliberal policies, but also as a socio-political mechanism to regulate the lives of these populations (Bolados, 2012). How public policymakers implement, enable, incorporate, or promulgate indigenous cultures, through the appropriation of their health practices, must take into account the complexities of working with indigenous knowledge, given the differences in values and unequal power relationships between actors (Bergeron et al., 2021; Diver, 2017).

On the other hand, the academic literature on indigenous knowledge and public policies has focused on the conflicts that in-

volve the '*presence*' of indigenous populations. They are concerned with determining how to create a health system that can address the difference that the presence of indigenous populations implies, as well as how to integrate into a public policy that difference in terms of knowledge, language, practices, and traditions.

Regarding the struggles that indigenous peoples have experienced for the realisation of their fundamental right to health, Hernán (2020) comments on the Social Determinants of Health. Indigenous peoples have worse health than non-indigenous peoples; they are overrepresented among the poorest and most disadvantaged populations; they have a shorter life expectancy, and their possibility of improving these disparities is limited. Considering the circumstances in which these populations are born, grow, work, live, and age, including the broader set of forces that influence their conditions of daily life, this necessitates the creation of political actions aimed at reducing inequalities that affect them in a particular mode (Hernán, 2020).

Public policies to address inequalities generally focus on disadvantaged groups—without going into more detail—which offers only a partial understanding of the disparities. Rather than seeking to delineate the structures, mechanisms, discourses, institutions with actions that generate social inequalities, we strive here to deepen an understanding of how they take shape in indigenous populations as a segment within the most vulnerable populations (García-Ramírez and Vélez-Álvarez, 2013).

For Fernandes et al. (2020) and Durey and Thompson (2012), it is essential to reduce ethnic and racial inequalities first, because they mostly affect the indigenous population because of 'white' cultural dominance in health service delivery. The multiple ways in which certain actions or actors perpetuate forms of intolerance related to racial or ethical prejudices lead to the analysis of how public policies address the otherness that, ultimately, indigenous populations assume.

Since the end of the last century, many governments have been interested in the insertion of indigenous people into national health systems. Gradually, institutional programs and strategies have been created to benefit these populations with rural centres, clinics, and hospitals that apply indicators of cultural relevance (Campos et al., 2017). The term 'intercultural health' does not end in the use of traditional medicine in the health system, it extends to the treatment given to the indigenous population in health institutions. Therefore, it refers to innovative state actions that have been promoted in the field of indigenous health, among them, the formation of associations of indigenous therapists; legal recognition of their curative activities; incorporation of hospitals located in indigenous territories; the emergence of federal and state offices to support 'traditional' and alternative-complementary medicines; the initiation, development, and implementation of theoretical-practical platforms for courses, workshops, and diplomas dedicated to the so-called 'intercultural health'; changes and adaptations in institutional establishments that validate the cultural relevance of their facilities; training health workers to acquire skills in the intercultural field; the teaching of medical anthropology and interculturality in universities and higher education centres, among other aspects (Campos et al., 2017).

In the case of Mexico, since the 1980s the Mexican government has been developing actions directed especially at native peoples—around 62, according to linguistic criteria. Based on this political will, the implementation of so-called mixed hospitals, the training of intercultural managers, the creation of intercultural courses and diplomas, and, in general, the state conception in this field, which is intercultural health, has been achieved. However, Campos et al. (2017) point out that indigenous health and institutional medical care continue to be precarious in terms of human and material resources (health personnel, medicines, etc.), and discriminatory to the form and content of the care provided. For some authors (Mejía, 2008; Pinheiro, 2017; Preciado, 2019), a possible way out of this sit-

uation is to encourage the participation of indigenous populations in the health services intended for them. Participation applied to the field of indigenous health can be understood as the integration of these populations in different moments: planning, evaluation, control of actions, and implementation of health services. However, this topic appears only peripherally in their works.

The literature referenced up to this point shows an openness in the interpretation of public policies. While the authors speak of the '*appropriation*' of the indigenous through their healing practices or the '*understanding*' of the differences that they imply in terms of care, they enunciate two different ways in which policies can be expressed: (1) as a particular form of knowledge and representations of it (traditional medicine); and (2) as a political technology; that is, as a series of procedures aimed at governing difference.

Local Knowledge as Informing Decision-Making

In the meantime, the literature on local knowledge and public policies has shown a marked interest in procedural issues. Most of the authors focus on the recognition of local knowledge in the decision-making process, an analytical line that emphasises the connection between public policies and power—although it is not limited to this approach alone.

For Adams (2004), in recent years, some forms of 'usable' knowledge have begun to influence politics. In particular, local knowledge has played an important role in public policies, either as a way of calling for contextualised solutions to social problems or of governing by making use of it. Affirming a widespread understanding within academia, Diaz et al. (2005) define local knowledge as a form of knowledge produced by indigenous communities around the world that has been inherited through oral traditions. This makes it the only type of knowledge that exists 'within' and is 'developed' in the specific conditions of indigenous populations belonging

to a given geographical region. This understanding enables a reflection on the diverse ways in which this local knowledge can be used for the detection of community problems and the creation of public policies based on local solutions. Alazraqui et al. (2007) and Ruiz-Lurduy et al. (2016) consider that the medical solutions of certain communities can be considered useful knowledge for the management of their health interventions. In this sense, the literature on local knowledge connects with the recognition of traditional (indigenous) healing practices as a sort of '*appropriable*' knowledge that exceeds their usual uses and that is part of the public policies implemented by different countries. Ortega-Bolaños and Alba-Muñoz (2017) focus on the need for a permanent conversation between indigenous social actors and policymakers during the political decision-making process anchored at local levels.

Even if the range of usable information for public policies is complex because policy debate is still dominated by instrumental and centralised information that is constructed and controlled by functional and managerial experts—the creed of expertise—local knowledge makes it possible to think about the desired future for political decision-making (Adams, 2004). To this purpose, Ortega-Bolaños and Alba-Muñoz (2017) propose a model where the construction of the social problems in the health of certain communities, in this case, rural communities, their solutions, and implementation are based on the active participation of the locals, so that the social actors become creators of their policy formulation.

In their proposal, participation acquires a double dimension. First, it can be thought of as demand, to the extent that the local population makes visible their felt needs concerning their conceptions of health and illness. Second, it can be thought of as a supervision mechanism. For the authors, the involvement of the communities in the detection of their health problems and the consequent search for solutions has no other function than to ensure that public policy proposals follow their own needs, which in turn, confers a sense of social appropriation to the programs implemented.

This understanding enables a look at local knowledge (or local in a general sense) that goes beyond the indigenous; that is, beyond the practices belonging to ancestral populations. An interpretation within academia relates local knowledge to certain rural enclaves, and occasionally urban ones, where situated knowledge is produced, usually about the immediate environment. We would speak, then, of a knowledge that also exists 'within' and is 'developed' in specific conditions but not necessarily related to the identity of certain populations as 'indigenous. Concerning the characteristics of local populations' involvement in politics and, particularly, in the process of shaping public policies, Guiñazú (2017) comments that the most extended vision on this issue reproduces the traditional model of participation in the identification of the problem, decision-making, co-management, and self-management of programs. Therefore, local participation as a process does not acquire any particularity.

However, in the opinion of Purcell (1998), local knowledge can be one of the ways to increase the participation of these communities and their autonomy and ownership of development projects to disrupt the enduring hierarchy of power relations. Thus, participation as content or discourse would have the particularity of making visible a knowledge that was once undervalued.

In the academic literature that discusses the interactions of local knowledge and public policies, this interpretation is not usually explicitly shown. For example, some authors (Correa et al., 2002) ignore the task of conceptualising the local on the assumption of a consensus that is misleading when referring to this topic. The plasticity of the term 'local' in the literature, especially on public policies, demands, in the first instance, its conceptualization to avoid misunderstandings.

In any case, what proves interesting is how academia situates public policies in their relationship with local knowledge in three different but interrelated ways: (1) as a particular form of knowledge and representations of it; (2) as a form of political technology

to govern at a local scale; and (3) as a product of intermediation or 'translation' between diverse actors, a role that is played by participation.

Local Knowledge as a Solution to Environmental Challenges

Citing the fifth assessment report (AR5) of the Intergovernmental Panel on Climate Change (IPCC), Petzold et al. (2020) assert that there is a growing necessity to consider non-Western, indigenous knowledge systems in climate change research, and as vital to finding solutions to growing environmental challenges such as climate change adaptation, struggles for water, land use, biodiversity, and sustainable resource management. For Rist and Dahdouh-Guebas (2006) the integration of indigenous knowledge in the efforts of conservation and sustainable management of natural resources will be increasingly important in policies at the international and national levels, both in industrialised countries and in those with a developing state. *However*, the growing interest in making use of indigenous knowledge for these '*purposes*' places academia in front of an essential epistemological disquisition.

For Mercer et al. (2007), it becomes clear that the vulnerability of indigenous communities to environmental hazards cannot be addressed only using their knowledge. In this framework, there seems to be a consensus on the importance of combining indigenous and Western knowledge (Bohensky and Maru, 2011; Briggs and Sharp, 2004; Chambers and Gillespie, 2001; Jiménez-Naranjo and Mendoza-Zuany, 2015; Mercer et al., 2007; Rathwell et al. 2015) to mitigate the intrinsic effects of environmental processes and, therefore, reduce the vulnerability of indigenous communities.

Castleden et al. (2016) argue that the disproportionate way in which environmental problems affect indigenous populations has been due, in large part, to the over-reliance on Western science

with the consequent underestimation of the vast wisdom based on indigenous knowledge systems and relational practices regarding their environment. The reasons for this bias are obvious: colonial and racist policies, programs, and practices have persisted across time and space. To recognize the complex and controversial histories of the colonisation of the nation-state, the dialogue between indigenous and Western knowledge must be based on respect for indigenous philosophies, ontologies, and epistemologies.

Diver (2017) studies how the formulation of environmental policies is shaping and is shaped by indigenous knowledge. In her study of the science-policy interface, she notes that researchers have identified linkages between traditional ecological knowledge as a subcomponent of broader indigenous knowledge systems and Western scientific knowledge. At the same time, many indigenous communities are seeking to engage more effectively in environmental policy processes that impact indigenous peoples by creating their science programs or leveraging existing policy frameworks. To understand these forms of knowledge co-production, the author suggests the conceptual framework of 'indigenous articulations' (Clifford in Diver, 2017), where indigenous peoples self-determine the representations of their identities and interests in a contemporary social and political context. The concept of articulation envisages a model in which indigenous and Western knowledge is connected, but through a specific bond that can be broken. In this way, indigenous communities can frame and reformulate their representations of knowledge, uniting (or disengaging) ideas from their knowledge, and Western or even other forms of knowledge (Rathwell et al., 2015).

How the literature focuses on the process of construction and implementation of environmental public policies that can foster a co-production of knowledge, obviates the fact that the environmental conflicts that involve indigenous peoples are not simply a problem of ill-designed policies; rather, they emerge as a result of the permanence of a colonial pattern of domination that denies

indigenous ontologies (Merino, 2015). The case of the indigenous struggle for water is representative given that these populations often see water as a living entity to which they have a sacred responsibility. Such a perspective frequently conflicts with Western societies' view of water as a 'resource' that can be owned, managed, and exploited (Wilson and Inkster, 2018). This problem, rarely shown explicitly in the literature, uncovers the complexities involved in the term indigenous knowledge.

In this case, the literature on environmental solutions highlights an understanding of public policies as a language of power that attempts to capture the otherness of ancestral knowledge and use it. In short, knowledge systems are systems of domination. The existence of a plurality of knowledge communities with a multiplicity of ways of understanding, perceiving, experiencing, and defining reality, also implies a multiplicity of ways of controlling or ordering those realities—although usually the literature makes visible the Western way of knowledge and domination (Cashman, 1991).

In an understanding that uses the notions of local and indigenous as synonymous, Horowitz (2015) states that the success of shared decisions between native and exogenous people is the power of the indigenous as a political force. At the same time, this conception of native people is a form of recognizing the local knowledge that they preserve to achieve successes such as defending water, managing resources, and sharing the benefits of all this with members of their community. From a different perspective, Bixler (2013) emphasises the need to theorise at the interface of narratives of environmental change and situated knowledge. In doing so, he constructs an idea of local knowledge as a way of exploring and interpreting the environment to develop adaptive alternatives for living and cohabiting (Berghöfer et al., 2008; Bernardo and Morales, 2011; Bixler, 2013). In this proposal, it is possible to perceive an understanding of local knowledge as a compilation of information concerning the contexts or environments of certain

communities, including knowledge of specific characteristics, circumstances, events, and relationships, as well as an understanding of their significance. In these terms, Corburn (2003) notes the importance of never ignoring the 'experience' of those communities that can be both geographically located and contextual to specific identity groups.

Academic literature has explored different ways to integrate local knowledge into environmental public policies. Based on the assumption of the communities' centrality in risk management—considering that their inhabitants are the first to have references of the hazards that may affect them—some authors have focused, once again, on the decision-making process. Corburn (2003) reflects on how local knowledge can improve planning for communities facing the most serious environmental risks and draws two possible scenarios for the incorporation of local knowledge into the political arena. In the first one, some of the disadvantaged populations that experience the greatest environmental risks are demanding a greater role in researching, describing, and prescribing solutions to ameliorate the hazards they face. In the other one, the need to take local knowledge into account puts pressure on policymakers to find new ways to merge specialised knowledge with contextual intelligence possessed only by residents.

Failing et al. (2007), for their part, speak of the importance of local knowledge to describe values, explore hypotheses, clarify uncertainties, identify, and evaluate options, make decisions, and facilitate mutual learning. Taking local knowledge as a kind of technique that is specific to some communities, the authors point out a quite clear procedure when it comes to conveying solutions to certain environmental hazards (Hiwasaki et al., 2015). Horowitz (2015), in turn, considers that local knowledge can be useful in forging political alliances. This has to do with the conjugation of different perspectives: those of the authorities, research institutions, and local populations. However, the interest in working together must be founded in the desire to validate local ways of knowing the realities

that, essentially, contribute to the construction of better adaptive environments (Adamski and Gorlach, 2007).

Concerning this, Barrera-Bassols et al. (2009) affirm that the application of local knowledge passes through social struggles. This implies a fight for the recognition of a knowledge that has customarily been rejected because it owes its origin, proof, degree of verification, truth, status, or currency not to distinctive professional techniques, but to common sense, casual empiricism, or reflective speculation. In the same way, it involves the fight for integrating this knowledge into environmental decision-making (Failing et al., 2007).

Even if the application of this knowledge occurs through public risk management policies, Hernández and Vargas (2015) point out that in disaster contexts local knowledge is often ignored. Occasionally, too, those who intend to use it have proven incapable of adapting it to a different scenario, so that its validity is reduced to previously explored functionalities. In this understanding, the academic literature has only configured a restricted area of opportunity for the design of public policies.

Intercultural Education: The Role of Local Knowledge

Another topic that is covered in the academic literature on *subaltern knowledge* is that related to education. If in the past schools were conceived as instruments to deny cultural differences and assimilate indigenous people into the dominant culture, within the past few decades the approach has been changing. To the extent that education becomes a means to enhance the dialogue of knowledge while valuing traditional knowledge and practices, academia echoes—albeit peripherally—that it is relevant to thinking about the future of these people.

From this reflective perspective, Grupioni (2000) defends the distinction between '*indigenous education*' and '*education for indige-*

nous peoples' as a matter that was consolidated a couple of decades ago and is still in force. The first term refers to the traditional processes and practices of socialisation and transmission of specific knowledge from the indigenous registry. It includes the processes by which a society internalises in its members a specific way of being that guarantees the survival and reproduction of values and attitudes considered fundamental to be transmitted and perpetuated. The second term, '*education for indigenous peoples*', has taken on a new form in recent years because the discussion now centres on indigenous school education. This supposes the diffusion of a set of practices and interventions that correspond to the situation of insertion of indigenous groups in a national society, involving agents, knowledge, and diverse institutions. This modality is directly related to the policies implemented by states with indigenous populations, following the same parameters that the formal school uses to reproduce, adapt or communicate knowledge.

Starting from the concept of '*education for indigenous people*', Grupioni (2000) is interested in the conditions for public policies that meet the demands of indigenous peoples in terms of education. This implies teaching and learning processes that allow access to universal knowledge while continuing to value their languages and traditional knowledge (Mawere, 2015). The problems that this issue involves are more evident in the work of Martínez (2016) who considers that the tension between the universal and the local could affect—or be affected by—how different actors understand the role of formal education. On one hand, allies and leaders see the Intercultural School as a space to preserve indigenous languages and cultures, which means a conducive space to root a knowledge that, typically, is subject to an oral tradition. On the other hand, parents and students aspire for a formal educational system that gives them access to Western knowledge, given that indigenous knowledge tends to be reproduced outside educational institutions in the family and community environment.

This contradiction that seems insurmountable, in many cases, is resolved with the desire to create educational initiatives that mix both experiences in an environment of respectful dialogue between indigenous and non-indigenous peoples, between the indigenous school and the non-indigenous school, and between public policies and specific cultural practices, such as those of these communities. To this end, certain conditions must be met: (1) the ratification of legislation on indigenous peoples and their right to a differentiated education (Grupioni, 2000; Imperatriz and Gobbi, 2009); (2) the creation of administrative actions where the responsibility and coordination of educational initiatives are managed jointly with indigenous organisations (Grupioni, 2000; Jiménez-Naranjo and Mendoza-Zuany, 2016); and (3) the creation of strategies that allow the exercise of educational creativity and innovation, which give new meaning to the school for indigenous populations (Durie, 2005; Imperatriz and Gobbi, 2009; Maila and Loubser, 2003).

In the opinion of Durie (2005), the educational system should perfect its approaches to educating at the interface by adding the perspectives of indigenous elders in the curriculum of Intercultural Schools, thus exposing students to academic methods where learning outcomes depend on active involvement in indigenous formalities, and participation in experiential learning modes that combine indigenous knowledge and other knowledge systems, such as science, to generate new insights, built from two systems. When there appear to be two ways of approaching this issue—that coming from universal approaches to knowledge and understanding, or that of indigenous peoples who try to vindicate ancient wisdom as foundations of paths towards the future—Durie (2005) proposes a third option: the interface. This approach recognizes the distinctiveness of different knowledge systems but sees opportunities for employing aspects of both so that dual benefits can be realised, and indigenous worldviews can be matched with contemporary realities.

In a constant search for ways to promote an interlocution of indigenous people with their culture and with the non-indigenous world, Ahenakew (2016) believes that educational public policies should move toward actions *by, for,* and *with* indigenous peoples, not just *about* them. Likewise, the actors involved in the implementation of these policies must work rapidly to shorten the distance between the design of the policies, their implementation, and the attainment of results.

In their analysis of the meanings constructed by educational and community subjects about the public policies implemented in Mexico, Jiménez-Naranjo, and Mendoza-Zuany (2016) perceive an advance in the design of educational policies for the strengthening of indigenous education in the country. However, they believe that it is important to conciliate between the design of the policies, the reality of the contexts, the needs of the subjects, and the recognition of the educational proposals. On the one hand, the implementation of public policies is slow. In addition, there is often resistance both at a structural and actionable level, and the rhythms of appropriation and significance that the subjects grant to policies and their implementation draw a multifaceted panorama.

What appears interesting about the literature on indigenous education is how it proposes a view of public policies as a product of intermediation or '*translation*' between different actors. This representation exhibits how policy regimes are (re)produced, subverted, or appropriated by different actors who translate official representations into their values, interests, and ambitions (Agudo, 2009).

Local Knowledge in Struggles for Power

Another issue that is treated in the literature is associated with politics and power struggles.

Agrawal (2002) asserts that turning indigenous knowledge into scientific knowledge has fostered the perception that the former is

worth saving but has done little to change the prevailing power relations between different social groups. The question of power, how it is exercised and the effects it produces must remain central precisely because the holders of indigenous knowledge have not had much power to influence what is done with their knowledge or with themselves in political terms. From another point of view, Ahenakew (2016) believes that practitioners should avoid grafting indigenous knowledge onto non-indigenous forms of knowledge as an exercise in mere assimilation so as not to contribute to the nullification of indigenous peoples in their relationship with the state and the value of their knowledge.

Diver (2017), on the other hand, thinks that existing knowledge integration concepts are insufficient to address current challenges regarding power asymmetries and indigenous knowledge. Seeking an alternative, his concept of 'indigenous articulations,' as referenced above, allows indigenous peoples to self-determine representations of their identities and interests in a contemporary socio-political context. In doing so, it has broader implications for understanding how indigenous knowledge is shaping science-policy negotiations and vice versa.

For Battiste and Youngblood (2000) another solution to the conflicting relationship of indigenous knowledge with Western-colonising scientific knowledge could be for legislators to ratify intellectual property laws to stop the assault on indigenous language and culture, the unauthorised commercialization of indigenous art, and the use of indigenous ecological knowledge in the development of pharmaceuticals without consent, recognition, or benefit to indigenous communities.

From a similar point of view, Brush (1993) proposes to grant sovereign protection of the rights of indigenous peoples, preventing the appropriation and exploitation of their knowledge beyond their communities. In his opinion, specific knowledge from indigenous sources should have the same legal status as specific scientific knowledge, which is achieved through intellectual property rights.

Indeed, practitioners in this area should explore opportunities to extend intellectual property rights to include indigenous knowledge. However, to this author, it is not only a justifiable problem but also an ethical one. The process of commercialization of indigenous knowledge often violates the collective value system of certain communities.

From the standpoint of the growing articulation of indigenous communities (Weiss, 2015), the academic literature has focused on participation as a way of giving visibility to the 'indigenous question' in the public sphere. While Guiñazú et al. (2019) analyse the implementation of participatory and indigenous public policies, they delve into the notions of empowerment, co-option, and participation linked to a vision of the indigenous operating in these policies. This alludes to situated forms of indigenous agency that dispute and question modelled forms of participation on which politics, in general, are based (Guiñazú et al., 2019).

Using the case of an indigenous conservation area in Oaxaca, Bray, Duran, and Molina-Gonzalez (2012) demonstrate the importance of inter-community collective action as a key in multi-scale governance. In their fieldwork, they note that conflicts are often negotiated in multiple arenas, that rules emerge on multiple scales, and that management involves multiple actors even if indigenous populations become increasingly important. From a different perspective, some authors (Boadu and Ile, 2018; Rose, 2003) argue that the failure of some social policies or intervention programs is due to the lack of local participation in their design, implementation, and evaluation. The participation mechanisms employed by political implementers and governments tend to pacify the demands of the poor population or a community, creating an '*illusion of participation*' (Boadu and Ile, 2018). Rose (2003) finds that the main motivation for participation is more '*extractive*' than a genuine attempt to foster local responsibility or accountability. Hence, local communities' capacity to influence, control, implement, and evaluate social policies is a pendant task.

In Purcell's (1998) view, policymakers can use indigenous knowledge to increase indigenous peoples' participation, political autonomy, and appreciation for public projects, which would break the long-lasting colonial hierarchy of power relations. In the same way, Rathwell et al. (2015) propose that policymakers can legitimise the social and cultural media that are used to transmit knowledge—for example, the use of native languages, oral traditions, etc.—with the purpose of giving voice and ownership to local communities. Not in vain, Aguilar-Peña et al. (2020) consider that to make these public policies a reality, there must be political will.

Some research highlights a sort of '*epistemological anxiety*' towards indigenous or local knowledge as significant barriers to its effective use in decision-making (Taylor and Loë, 2012). Even when state and local actors, scientists, or non-scientists, highlight the need for researchers and professionals to take into account the attitudes of all types of participants when considering how to overcome the challenges related to the integration of local knowledge in public management, they share similar reservations about the effectiveness of this knowledge in the political arena.

In an interesting look, Merino (2015) recognizes the tendency to pass off social conflicts—as could be the case of extractive industries in Peru—as governance problems; that is, as conflicts generated from poorly designed policies in terms of income distribution, formal political participation, transparency, or conflict management. However, the governance approach obviates the historical connection between these conflicts and the exploitation or dispossession of indigenous peoples, and the permanence of colonial patterns of domination. The main argument of Merino (2015) is that many social conflicts do not derive from problems of governance but, more profoundly, they emerge due to divergences that transcend the current governance and express different political ontologies. With this idea, the author calls for reflection on how certain issues are '*visualised*' or '*interpreted*,' which also implies those issues that are not possible to observe or understand given the approach.

For Agudo (2009), the forms of knowledge and interests implicit in the policy texts, their construction of places and problems, or their representations and categorizations of the 'beneficiaries' are essential when carrying out a literature review such as the one we intend.

In the same interpretive line, Betancourt et al. (2013) point out that within the nation-state there is not only the national territory, but there are diverse peasant and indigenous territorialities that support diverse economies, politics, cultures, and epistemes formed in the place. These territorialities, which were historically ignored or subordinated by the colonial regime and the nation-states, place us in front of a series of tensions, primarily territorial, that cannot be made invisible.

The academic literature that reflects on the agendas of local communities has taken a different course from the establishment of a link between politics and development programs. For Sillitoe and Marzano (2009), in the last two decades, local participation, local knowledge, and other sociocultural values of communities that have been neglected have become some of the fundamental paradigms in the literature on community development. This is due to the evident connection that is possible to establish between local traditions and how these communities can make it possible to face certain problems related to development.

From a perspective that links politics to development programs—another theme present in academic literature, especially on local knowledge—Radcliffe (2005) explores the relationship between the institutionalisation of 'ethnodevelopment' and the creation of indigenous experts through the participation of indigenous social movements in a popular formation that emphasises indigenous knowledge. In analysing the actions that take place at the interface of development policy, the author focuses on the processes of representation, negotiation, and incarnation involved in indigenous professionalisation, as activism shapes small-scale policymaking (Radcliffe, 2005). Even when there are extensive stud-

ies on local knowledge or indigenous philosophies, the challenge is how to integrate these knowledge systems into contemporary development theories, methods, and practices. In that sense, development researchers still struggle to conceptualise, understand, and accurately employ indigenous knowledge and other cultural realities when analysing the development process.

For Hooli and Jauhianen (2018) the know-how that local knowledge generates is important for both the creation and implementation of innovative policies in developing countries, as it can facilitate participatory processes of local communities. In their opinion, the way certain populations learn to act and interact, and the practical knowledge they produce in these activities provide them with a capacity for positive social change. For their part, Nugroho et al. (2018a) estimate that anthropology can provide an analysis of the importance of local knowledge (values, beliefs, meanings) in the state framework given that it highlights the interaction between different knowledge systems: local knowledge of communities, expert knowledge, and knowledge of the state itself. Only in this way, according to the authors, authentic public management can be built where the importance of local knowledge is linked to the development of public policies.

However, Taylor and Loë (2012) highlight that, although local communities understand the value of their knowledge, very few identified its importance in the early stages of the political collaboration process, that is, in the formulation of problems or the establishment of protocols or programs. Participation is the dimension most attended to when reflecting on the conditions of possibilities to create. In any case, what remains interesting is how academia situates public policies in their relationship with the agendas of indigenous peoples and local communities in two different ways: (1) as a particular form of knowledge and representations of that knowledge; and (2) as a form of political technology to govern at a local scale. Rather than seeking to delve into an individual ontology, the academic literature on the agendas of indigenous popula-

tions and local communities focuses on the limitations of silencing various ontologies and on the potential to embrace what we might call ontological plurality (Rist and Dahdouh-Guebas, 2006; Yates et al., 2017). From this starting point, the authors to whom we refer here explore the conditions and dimensions of a dialogue between ontologies and the roles that public policies could play in this process. In this sense, it is important to take into consideration that the actors do not operate between State institutions and society, but rather between different social worlds, rationalities, or knowledge systems that are interconnected in the processes of creation, implementation, and review of public policies (Agudo, 2009).

Conclusions

In the literature on *subaltern knowledge* reviewed for this paper, there is a tendency to make the indigenous figure invisible in academia. The authors address the indigenous as a subject or object of anthropological study. However, indigenous perspectives on themselves—in this case, on indigenous knowledge—are mostly absent from academia (Battiste and Youngblood, 2000). Research has focused mainly on the attitudes of scientists toward local or indigenous knowledge. Studies of the opinions of local, indigenous, or non-scientific actors about their knowledge are much less common (Taylor and Loë, 2012). Durie (2005) considers that academics should research the interface, which means that indigenous communities should have a space to participate in their studies and can provide information on the processes used. Other authors (Briggs and Sharp, 2004; Hart, 2010; McGuire-Kishebakabaykwe, 2010), instead, think that academics should carry out collaborative research processes, from inception to publication, involving local researchers and indigenous academics.

For Battiste (2005), the task of indigenous scholars, when they have been able to participate in collaborative research, has been to affirm and activate the holistic paradigm of their knowledge to reveal the richness of indigenous languages, worldviews, teachings, and experiences that have been systematically excluded from contemporary educational institutions and Eurocentric knowledge systems. Through this act of intellectual self-determination, the

author points out that indigenous scholars are developing new analyses and methodologies to decolonise themselves, their communities, and their institutions. However, the academic literature does not tend to delve into these forms of decolonisation.

In general terms, local and indigenous knowledge is currently in search of a necessary recognition in the context of new struggles for self-determination, political autonomy, and the safeguarding of their knowledge in the face of extractive and globalising processes. In this sense, we ask specifically in this final section: Does the conjunction of local knowledge with scientists provide schemes for these objectives of the people and their struggles?

At least from academia, the initial starting points are indicated. In the first place, it is necessary to grant a symmetrical recognition to local and indigenous knowledge, and, for this purpose, it is necessary to know the historical background and the processes of the past that currently frame the behaviour and practices of ethnic groups, peasants or citizens that are subverting the universal schemes around the world as reviewed in various texts (Barrera-Bassols et al., 2009; Betancourt et al., 2012; Dib and de Viana, 2011; Fischer, 2000; Nugroho et al., 2018a; Nyantakyi-Frimpong, 2020; Oñate et al., 2014; Retamar, 2005; Riat, 2016; Villagómez-Reséndiz and González-Rivadeneira, 2020). In this way, native ontologies and local perspectives will have meaning for those who interpret them, specifically speaking of academics who, through the ethnographic method and the analysis of public policies, are getting closer to recognising the organisational schemes of small communities in facing challenges such as natural disasters and environmental management (Genet, 2006; Hernández and Vargas, 2015; McCall, 2011; Mora-Delgado et al., 2009; Peredo and Barrera, 2019; Lizcano and Fernández, 2014; Riat, 2016); public policies that do not recognize the diversity of knowledge regimes (Adamski and Gorlach, 2007; Nugroho et al., 2018a; Nugroho et al., 2018b); conflicts over territories and their resources (Barrera-Bassols et al., 2009; Berghöfer et al., 2008); and more problems that will inevitably arise in the future.

The challenge is, therefore, to know how communities create their *corpus*, giving meaning to the affronts of the present. From there, other ways of recognition are possible. The most important could be the insertion of this knowledge that structures social lives into public policy schemes. Recognition is a matter of putting into practice those ways of preconceiving life and giving them a more encompassing symmetry within hierarchies that, historically, have omitted voices that do not adhere to the universalist rationality scheme, as indicated by Kaliman (1999) and Retamar (2005).

In a different sense, Durie (2005) talks about the importance of indigenous researchers who can preserve cultural beliefs and values through the control exercised over research protocols and processes, which could be extended to public management. However, litigation on the agendas of local or indigenous communities tends to legitimise the figure of an external expert–anthropologists, consultants, and public managers, to name a few. For Agudo (2009), 'knowledge' must be withdrawn from its contexts of production and particular epistemic communities in order to be transferred to other production units; failure to do so would be tantamount to neglecting the role of academic consultants (knowledge owners). This logic underlies the interpretations of this literature when it comes to understanding public policies for indigenous people or local communities.

The impending challenge for both academics and government agencies is to bridge the gap between so-called universal and local types of knowledge, thus incorporating indigenous people as political actors whose knowledge is valuable to the identification and understanding of the causes of public problems and the public actions required to address them. Rather than classifying indigenous knowledge as a distinct type of information that can be incompatible with universal or scientific knowledge, the value of all knowledge types should be recognised and used to devise solutions to society's problems or, at least, to understand their diverse sources. As we know, the production of scientific knowledge is based on

the collection of primary data, namely local knowledge, from which scientists can explore its possible applications. However, if 'classic' anthropological research has shed light on the specific manifestations and inner logics of said local forms of knowledge, it has also, at times, conceptualised such configurations as radically incompatible with other, less local traditions. In other words, what makes something indigenous does not automatically render it unintelligible for anyone else and, as we have shown in this review, it is almost always the opposite; both local and indigenous formulations (about for example weather patterns, botany, human behaviour, territorial organisation, food production, etc.) tend to be useful in the mitigation and resolution of social or, indeed, environmental problems.

Scientific knowledge must not only be produced for academic purposes but also, and perhaps mainly, for public use and understanding. Public decisions and government actions, as we have reviewed, work best when fed with findings from academic research on local forms of knowledge. If a link is built between these indigenous and scientific systems of knowledge, both can play a fundamental role in the design, implementation, and evaluation of public policy. To achieve this goal, a dialogue is needed between political science and public policy theories and research on the one side, and anthropological theoretical insights and empirical information on the other. The literature review conducted here shows that few researchers have attempted to dissolve the boundaries between those disciplines mentioned, namely, the frameworks in which knowledge is produced and organised. This review presents an open field for how political theories on deliberative democracy, social participation, local government, agenda-setting processes, and policy implementation, among many others, can be applied and shaped by identifying and engaging in dialogue with indigenous formulations. Such interactions can then be organically institutionalised to gain a better understanding of the causes of specifically localised public problems in indigenous contexts. In short, the identification and thoughtful considerations of local knowledge in

such contexts need to be ingrained in any research attempting to understand and provide solutions to problems affecting particular social groups and communities.

This literature review has shown how gross generalisations often misunderstand local realities and can even create more problems when enforced without proper consent. The relation between local or indigenous (discrete, cultural, and not authoritative) and universal (as nonlocal, institutionalised, and authoritative) knowledge should not be applied as a unidirectional relation, that is, based only on pre-existent power structures and narratives. Universalising agendas can not only enrich and improve local realities but can become *universal* through productive dialogues with such localised experiences. Acknowledging the need for such dialogues between political science and anthropology, between academics and policymakers, will allow contemporary societies to find better and more nuanced solutions to their multiple and growing problems.

At the interface of anthropology and public policy, the reviewed literature understands the value of local or indigenous knowledge for social transformation. Academia situates public policies in their relationship with the agendas of indigenous peoples and local communities in two different ways: (1) as a particular form of knowledge and representations of that knowledge; and (2) as a form of political technology to govern at the local level. However, indigenous communities, as subjects, continue to be socially neglected and politically excluded from public life, that is, from decision-making processes. The actions that the states or governments undertake to improve the livelihoods of their societies, especially in Latin America, look at the indigenous from a subaltern point of view. To this extent, the political actions that they intend to create and/or promote for their benefit end up being ineffective.

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