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# Sustaining cultural and biological diversity in rapidly changing communities: the revitalization of the Voladores ritual in northern Veracruz (Mexico)

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**Abstract** This paper aims to contribute to the ongoing debate on the protection of cultural and biological diversity, and their interconnectedness. It highlights the importance of understanding the dynamic and complex strategies that cultures are developing to protect their biocultural diversity in the face of the ongoing cultural, economic, and social reductionist transformations occurring worldwide. We analyze Totonac society in the present time, and provide evidence on how cultural revitalization processes are emerging from the grass roots, by focusing on the ceremony of the Voladores, a pre-Hispanic ritual performed by several indigenous groups in Mesoamerica. The preoccupation of Totonac communities to safeguard this millenary tradition fostered a process of dialogue, reinforced local institutions, and catalyzed the development of strategies to preserve a tree species and its habitat.

**Keywords** Biodiversity conservation · Radical ecosystem approach · Post-normal principles · Innovation · Totonac communities

## 1 Introduction

Sustaining both biological and cultural diversity is a desirable social goal in the political rhetoric about conservation. Ecologists argue that biological diversity acts as a buffer in natural systems, providing them with the capacity to cope with unexpected and large-scale changes (Folke 2006). Research has shown that in a similar way, cultural diversity increases the resilience of social systems by providing new adaptation strategies,

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articulating traditional knowledge, and creating institutions to deal with the challenges, opportunities, and threats posed by change (Cumming et al. 2005). New threats are being posed by the speed and magnitude of global change and by the growing complexity of societies and their impacts on the biosphere. Uncertainty and unpredictability of responses to such change have equally increased.

The third Global Biodiversity Outlook, the 2010 flagship publication of the Secretariat of the Convention on Biological Diversity (CBD), states that over the past 50 years, there has been an increase in the parallel extinctions of biological and cultural diversity, which includes human beings, species, ecosystems, languages, cultures, and traditional knowledge. Not surprisingly, critics point to the failure of the CBD to meet its major conservation goal of diminishing losses by 2010 (WWF 2010; Butchart et al. 2010). One of the main reasons for this criticism is that there has been no evidence for a significant reduction in the rate of the decline and pressures will continue to increase in the future (Pereira et al. 2010). In addition to planetary losses, recent studies show that the diversity of the world's indigenous languages—which represent 80–85 % of the total number of languages—declined by 21 % at both the global and regional levels (Lewis 2009; UNESCO 2011). Biolinguistic projections show that within the next 100 years 50–90 % of the world's languages will disappear, along with the corresponding value systems, world views, artistic expressions, knowledge, and social norms (Nettle and Romaine 2000).

In recent years, commentators have recognized the need to document how communities and societies conserve ecological and cultural diversity in the face of the cultural, economic, and social transformations occurring worldwide. Aside from the idealization that accompanies the conservation discourse on the connectedness between people and nature, the recent framing of research and action in conservation and development has clearly recognized that the protection of biocultural diversity depends on maintaining and strengthening the vitality and resilience of indigenous and local cultures and the environments on which they depend (Maffi 2007; Apgar et al. 2011). The present paper discusses how the link between biocultural diversity and the vitality of local cultures can be maintained and strengthened in practice, by reporting the findings of a case study.

Section 2 reviews the key principles underlying recent debates and conventions on the protection of biocultural diversity. The review suggests that creativity, innovation, and sovereignty are fundamental to the protection of biocultural diversity in an uncertain world. This in turn leads to the identification of two principles that can be used to evaluate the effectiveness of communities' efforts to protect their biocultural diversity: a radical ecosystems approach, and communities' autonomy and self-determination. Section 3 presents a documented case study on the revitalization of the Voladores traditional ritual in the Totonac indigenous communities in northern Veracruz (Mexico), over the 2010–2012 periods. The ways in which these communities apply the two aforementioned principles is evinced by highlighting the actions they have put in place to protect their cultural tradition and restore their natural environment. Our field research identified indicators that the Voladores efforts may be effective in renewing and restoring an ancient cultural practice that gives meaning to and strengthens indigenous identity for young Totonac leaders and future decision-makers.

## 2 Protecting biological and cultural diversity: a post-normal problem

A recent framing of biological conservation research has contributed to a shift from the Western post-colonial conservationist notion that referred to indigenous people as

"poachers" (see Adams 2004), towards a less discriminating discourse that appreciates the fact that "other" cultures regard and relate with nature in different ways. This integrative view constitutes one of the pillars of the CBD (1992) and the Universal Declaration on Cultural Diversity (UDCD) (2001) that explicitly link the value of biodiversity with that of traditional cultures preservation. Beyond political recognition, the subsistence of an "inextricable link" (as stated in the Belém Declaration, p.1) between biological and cultural diversity is quite self-evident. By valuing natural heritage and traditional knowledge, a society gives meaning to a natural system through its language and other cultural features, such as religious rituals, celebrations, and costumes, which carry intrinsic value, be it sacred, spiritual, or aesthetic. Less evident is the nature of that link and how it can be measured. Pretty et al. (2009) have documented the rise of several new scientific disciplines and sub-disciplines that address the interconnections between biological and cultural diversity. Some authors have found parallels between cultural and ecological systems by looking at the processes that permeate the social and biophysical worlds (Allen 2003; Pfeiffer and Voeks 2008; Turner et al. 2003). In order to provide quantitative data on the links between biological and cultural diversity at the global, regional, and local scale, languages have often been taken as "proxy" indicators of cultural diversity. The biocultural diversity literature has focused heavily on the co-occurrence of linguistic and biological diversity in biodiversity hotspots and high biodiversity wilderness areas (Moore et al. 2002; Ibisch et al. 2010; Gorenflo et al. 2012).

The more recent debates on development and conservation have gone beyond the use of indicators to include radical doubts and deep ethical questions, recognizing that the root causes for biological and cultural diversity losses are linked to the prevailing economic development paradigm. Calling on science and policy for a strategic approach from a positivist perspective, Ibisch et al. (2010) use the example of the chimpanzees in Côte d'Ivoire. Considering that the number of chimpanzee nests has dropped by 90 % since 1990, the authors wonder to what extent it is useful to increase efforts to monitor the obvious decline and raise the general question: Is conservation research in a position to change the course of development and degradation?

In the early nineties, Funtowicz and Ravetz (1993) introduced the concept of post-normal science to highlight the need for the "orthodox" practice of science to transition from a reductionist "search for truth" to addressing urgent societal problems. Such approach continues to be relevant with respect to current and salient policy questions of sustainability. Post-normal conditions characterize problems related to the conservation of biological and cultural diversity: facts are highly uncertain (not only technically or methodologically, but also in epistemological and ethical terms), and decision-making is urgent, crucial and includes divergent interests (Ravetz 2006; Friedrichs 2011). The post-normal call for including substantial uncertainty in decision-making has been complemented in recent years by the call for including creativity and innovation, as these are becoming key aspects of biocultural conservation actions in an uncertain world. With respect to biodiversity conservation, the CBD ecosystem approach invites scientists and decision-makers to deal with inevitable ecosystem change. In this view, the central goal of ecosystem management must be to protect the system's "creativity" (Lister 1998). "Fostering creativity and innovation" is also repeatedly mentioned by the UDCD, article 1 of which explicitly states as follows: "As a source of exchange, innovation, and creativity, cultural diversity is as necessary for humankind as biodiversity is for nature". Innovation and creativity appear particularly important for traditional societies that many studies describe as "locked" into undesirable states and having lost control of the processes that are shaping and affecting them (Toledo 2005). Locked (Delgado et al. 2009) means that societies are stuck in a

circular way of thinking that prioritizes economic development and progress over traditional features as the means to overcome poverty; economic progress also degrades the environment, which negatively affects possibilities to improve well-being.

If biocultural diversity conservation can be promoted by "unlocking" indigenous people and supporting their self-determination and autonomy (as suggested by Apgar et al. 2011), a key goal for communities should be to increase resilience, i.e. the possibility of achieving desirable states by adapting and surviving in the face of cultural, economic, and social change.

To render this concept operationally, we propose two key principles related to social organization that could be drawn on to indicate whether long-term sustainable socio-ecological processes have been activated and are placing biocultural diversity on the path to preservation:

- Social groups operate within a radical (in its literal meaning of "root") ecosystem approach (Ibisch et al. 2010) and recognize the root causes common both to the erosion of biodiversity and cultural practices;
- Actions support the self-determination and well-being of local communities; social groups envisage and discuss their own alternative development opportunities.

We then observed how these principles are applied in collective processes and actions that the descendants of an indigenous group, the Totonacs from Northern Veracruz, took to preserve a pre-Hispanic ritual, the ceremony of the Voladores (Fig. 1). In 2009, the ritual ceremony was recognized by UNESCO as an intangible cultural heritage. This recognition was based on the fact that many of these ceremonies have survived the homogenizing process of modernity and have adapted to the demands of tourism and trade markets without losing the essential elements that are meaningful for indigenous communities. On the other hand, UNESCO's formal recognition increased demand for the Voladores to be hired for cultural events all over the country, and from other parts of the world. The Voladores reinforced the ritual performance as a primary income source and as the possibility to access financial and social benefits from the state or from private initiatives. Many companies also seeked the possibility of exploiting the ceremony for touristic and economic purposes.

## 3 A revitalization process: the ritual ceremony of the Voladores

We worked closely with local Totonac communities and organizations located in the lowlands close to El Tajín, an archaeological area sacred to Totonac culture. Our aim was to identify strategies for strengthening inter-institutional cooperation for the management and conservation of the natural and cultural heritage of El Tajín. While conducting that research, we assisted and accompanied local communities and grass roots organizations towards a central common aim; the recovery of an ancient cultural tradition.

In the following sections, we illustrate the ritual (Sect. 3.1), we describe the pressures threatening the ceremony (Sect. 3.2), we document actions and strategies undertaken by the Voladores (Sect. 3.3), and we assert that the process initiated by them and by their communities represent a relevant effort in accordance with the two principles described above (Sect. 3.4).

Our observations are based on three types of first-hand data collected in the field. Firstly, information was gathered through participant observation by spending several periods in the study area over the 2010–2012 years. The time spent in situ varied, depending on the

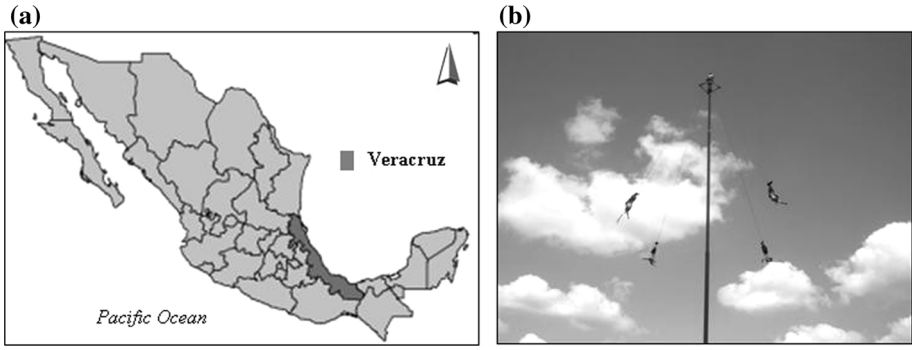


**Fig. 1** Veracruz state, Mexico (**a**) and the Voladores traditional ritual (**b**)

objectives pursued during each visit. Workshops lasted a week, however, the period when social organization practices and the ritual itself was documented, lasted 6 months. This prolonged stay by one of the researchers allowed for a detailed record of the ritual ceremony during different celebrations and in different communities as in Sect. 3.1.

Secondly, information was compiled through interviews. Twelve in-depth interviews with elders, both former Voladores and women, were used to understand the key variables and processes (social, institutional, and ecological) that were shaping the changes in the area. Unstructured interviews were also conducted in different time periods and used to understand perceptions of the residents. Interviews were conducted using two guiding questions: (1) How has the landscape changed? (2) How has the life in the community changed? The answers highlighted the widespread sensitivity and concern for the land use change occurring in the area, mainly from primary forest to grasslands, and the associated loss of knowledge and use of the natural resources; elders had a special concern for those changes occurring in their traditional livelihoods, since today families' income heavily depends on tourism. This has increased economic vulnerability of families and has represented radical changes in their lifestyles. Additional information was gathered through 65 drawings that were compiled from 10-year-old children attending six schools close to the archaeological area. Children were asked to draw their surroundings and the main elements contained. Their drawings included two elements: deforested mountain peaks and tourists visiting the site and attending the Voladores' show. Our overall analysis of the experience allowed us to understand the pressures undermining the ceremony, as explained in Sect. 3.2.

Thirdly, information was gathered through meetings and workshops organized with different social actors as part of a strategic planning process oriented towards visualizing a desirable future for the region. Community representatives were asked to list sustainability indicators for the area and to rank them in a decreasing order of importance. Participants identified as priority actions the need to strengthen and recover the traditional values of community decision-making and cooperative work, and the need to develop further intergenerational indigenous values. These priorities were assumed by the Voladores and constituted the basis for the actions to which we assisted and that we describe in Sect. 3.3.

### 3.1 The ritual ceremony

The ritual ceremony of the Voladores ("flying men") is a fertility dance performed by several ethnic groups in Mexico and Central America. The main purpose is to express

respect for and harmony with the natural and spiritual worlds. During the ceremony, four young men climb a wooden pole eighteen to forty metres high; a fifth man, the *Caporal*, stands on a platform on the top of the pole and plays songs dedicated to the sun, the four winds and each of the cardinal directions. After this invocation, the others fling themselves off the platform. Tied to the platform with long ropes, they hang from it as it spins, twirling to mimic the motions of flight, and gradually lowering themselves to the ground. The key element of the ceremony is the "flying pole". To be used as the pole a tree should have several characteristics: it should measure at least 20–30 m high, it should have a straight, strong structure, and it cannot be too far away from its final destination, as it must be dragged to the area where it will be erected. The whole selection and transportation process constitute a ritualistic and religious experience that include chants, dances, and prayers performed by community members and leaders. Indeed, the flight is only the last part of the ritual that begins with the felling of the tree. One group, led by the Caporal, goes to the forest and chooses the straightest, tallest, and strongest tree, after asking for forgiveness to the god of the mountains, the *Kiwíkgolo*. The area around the tree is cleared, while special tunes are played on handmade flutes. Four days later, the dancers return, and the ceremony and music begin again; this step concludes with the ceremonial tree cutting. Once the tree has fallen, it is tied with thick rope to facilitate its transportation to the centre of the community. The ceremony is, in essence, a ritual to establish communion and communication with the gods by making offerings for the fertility of the earth. Before entering the sacred space of the ceremony, practitioners must comply with strict ascetic norms: fasting, retreat, abstinence from sex and alcohol, and prayer and meditation.

If a dancer does not comply with these norms, it may lead not only to his death, but also to other consequences for the community, such as natural disasters, disease, famine, and conflict.

This ritual is a tradition in most Totonac communities and can be considered a cultural keystone practice, as defined by Brosi et al. (2007). However, the ceremony is performed in different ways and contains peculiar features according to the region of origin, and the transformations that have occurred. Within the Totonac culture, there are significant differences between the ritual performed by the Totonac living in the lowlands and those living in the highlands. It is held during very important celebrations: patron saint festivities and/or carnivals, solstices and equinoxes, festivities during the Day of the Dead, and those in accordance with the agricultural calendar. Only men participate in the dance; most of the sons of Voladores continue the tradition of the fathers. The flying pole (*Zuelania guidonia*, or *tsakatwiki* in Totonac) is a key element of the ceremony and part of the Totonac identity. As such, the trees used for the pole can be defined as a cultural keystone species (Garibaldi and Turner 2004), meaning a species that is used intensively, is prominently featured in narratives and ceremonies, and the disappearance of which would have significant cascade effects on the culture. The ceremony has not remained unchanged over time, as the Totonacs have adapted themselves and their beliefs to modern contexts. During colonization, the ritual incorporated elements from Catholicism, due to the influence of Spanish missionaries. At present, the ceremony synthesises the cosmogony, the values, and the identity of contemporary communities.

### 3.2 Pressures undermining the preservation of the ceremony

Environmental, political, social, and economic pressures threatening the preservation of the Voladores ceremony have emerged inside and outside the realm of the Totonac

communities. Due to deforestation occurring throughout Veracruz, *Z. guidonia*, the tree species that supports flyers, while they perform this ritual, has become scarce. In recent years, many communities have replaced *Zuelania* sp. with a metal poll. In fact, according to Ellis et al. (2010), only 26 % of the state's natural vegetation cover remains, including secondary vegetation, and only 8.6 % of this vegetation can be considered well conserved. Historically, land use underwent considerable changes during and after the Agrarian Reform period (1915–1965). By 1960, almost half the cultivated land had been granted to *campesino* farms. The state would grant credits to *campesinos* for the acquisition of seeds, cattle, manure, machinery, etc. The Mexican government was determined to implement large-scale irrigation systems, which would contribute to an apparent era of increased agrarian productivity. Coffee, banana, and citrus fruit plantations became part of the landscape. In particular, extensive cattle grazing, practiced by wealthier landowners, accelerated the reduction of most of the native forest fragments and small-scale agro-ecosystems. Today, the reduced number of *Zuelania* sp. populations correlates to Sarukhan and Larson's (2001) alarming estimate that in the latter decades of the past century about 500,000 hectares of forest were lost in the region. Because most of the land has been converted to pasture and would require many years to recover, Totonac communities face the challenge of sustaining growing populations in the context of limited agricultural territory, which has been divided and used. Consequently, the number of landless families has increased, making them poorer and economically more vulnerable to change. Land has become an expensive commodity, making Totonac families increasingly depend on government aid and occasional touristic revenues, insufficient to cover their basic day to day needs. Families have looked for other means of subsistence, for example as paid workers for other landowners, construction workers, or oil company employees. Another alternative source of subsistence for many families has entailed seasonal migration to seek job opportunities elsewhere, in particular in the northern Mexican states and the United States (Silva-Rivera et al. 2011). Tourism is one of the strategies that the state and federal government have encouraged over the past two decades to increase revenues and investments in the area. An annual arts and music festival called the Identity Festival is the main source of income. Since the first Identity Festival was held in 2000, yearly tourist traffic has grown from 200,000 to 700,000 people.

The shift from a traditional subsistence economy to a revenue livelihood has weakened some persisting values in Totonac indigenous culture, such as mutual trust, collective work, social networks, and reciprocity. For example, the way in which collective work is organized has changed: people generally prefer to contribute to community festivities or events with money instead of work. In many ways, the growing tourism has accelerated imminent processes of change in traditional cultural practices. For example, community members are hired to perform in tourist festivals, fairs, and cultural events all over the country. Supply exceeds demand, leading inevitably to the rise of internal conflicts among flyers. Secondly, those groups hired to perform the flight often agree to present a shorter version of the ceremony where only the most spectacular parts are performed (i.e. just the flight). This implies a progressive erosion of knowledge, since only those parts of the ceremony that the entrepreneurs consider appealing remain and are transmitted. As a consequence, the younger generations of performers do not need to be knowledgeable about the complete ritual. Along with the ceremony, the dancers' ascetic principles and traditional codes of ethics and conduct are being gradually lost. At the same time, outsiders are left with a merely commercial or recreational image of the ritual flight.

### 3.3 Responses of the Voladores

The process of candidature to UNESCO ignited a debate on the content of the ceremony management plan. During the discussion sessions, a general concern was that the younger generations had progressively forgotten the primary value and significance of the ritual; fewer young Totonacs were speaking their original language as first language to communicate. Community leaders recognized that the root pressures threatening preservation of the ceremony derived from the tension between tradition and modernity and the mainstream idea of development. Moreover, government privatization for the expansion of the oil industry, cattle ranching, and other economic activities has left little space for self-subsistence agriculture (Guardado 2013), which means a disconnection to the land. After intense discussion sessions, it was decided that fragmentation was one of the main obstacles to activism and organization. After the designation, a safeguard plan stating the core principles, values, and long-term strategies for preserving the ritual was agreed upon among Voladores, guided by a team of anthropologists (Plan de Salvaguarda 2011). Three main actions derived from this document were to determine the path that the organization would follow over the coming years: a) the establishment of a Council of Voladores composed of representatives from different regions and from different Voladores organizations, including younger representatives; b) the implementation of a sacred tree restoration project; and c) the re-organization of a previously existing educational programme for young Voladores.

The Council of Voladores is now the directing board of an organization composed by more than 400 members organized in several commissions that serve different purposes (Trejo-González 2012). The Council assumed a critical and conscious perspective on the group's weaknesses and a practical sense of what needed to be done in order to achieve its main goals. The Council has increasingly gained recognition at the regional scale for various reasons, the most important is that there is a spiritual basis at the core, where Totonac values dictate social organization and decision-making forms: the elders' and leaders' decisions are highly respected. The spiritual role assumed by the Council allows it to address and discuss sensitive topics, like the possibility of women actively participating in the ritual.

During the period of our observations (2010–2012), we witnessed that the Council had strengthened in its own organizational structures and decision-making processes, including the way in which Voladores relate with external agents and exercise influence at a community and regional scale. The Council has gained autonomy and now plays a central role in decision-making in areas related to social organization, education, cultural recreation, and ecological preservation in the region. Moreover, the organization's influence in the region makes them a powerful political agency in a historically conflictive context, where oil companies and national investors also converge. Leaders become aware of the need to make alliances with other Voladores, with academic and government institutions. As a result, the Council is now promoting meetings with Voladores from other parts of Mexico and Mesoamerica aimed at discussing issues linked to the promotion of the Voladores' image as well as common social, environmental, and economic problems faced by their communities. The Council has increased its ability to negotiate, whether in agreement or disagreement, with external agents such as transnational corporations that seek to use the Voladores' image for commercial purposes. For example, Coca-Cola Inc. used an image of a caporal in a special edition 355-ml can.

A further example is the successful negotiation of a land deal for reforestation actions and the establishment of a nursery with the municipal government. In fact, the second

action that resulted from the safeguard plan was the development of a specific project for the restoration of *Z. guidonia* populations and other native flora used for the ritual, including palm and vine species used to adorn the altars and to weave around the flying pole. There had been various unsuccessful attempts to establish a programme to recover *Z. guidonia* populations by various agencies and research institutions.

These had not stimulated much interest, and the Voladores and their advisors had overlooked that empirical knowledge and worthy intentions could not fill a knowledge gap on the technicalities of ecological restoration. The positive turn of events inspired the Voladores to lead the initiative and, having realized that there was something missing, they proceeded to contact a research centre from the local university that focuses on tropical ecology. This collaboration was determinant for the steps that followed. Within the terms of the negotiation with the municipal government, forest restoration plans materialized in 2013 when a 2 ha parcel was donated to the organization for this purpose. In order to make explicit that conservation activities were linked to the survival of local languages and to the maintenance of local ecological knowledge and values, the Voladores assigned the responsibility of collecting seeds and establishing and maintaining the nursery in collaboration with the researchers to the young Voladores.

To address the general concern that the younger generations progressively have forgotten the primary value and significance of the ritual, the proposed solution was to encourage "the pride" of being Voladores among younger members. Attention was directed to the revitalization of a previously existing education programme that manifested as a "school of flyers". Located in the local Centre for Indigenous Arts, a social investment project created around 2004 by the state of Veracruz, the school's main aim was to safeguard the full traditional ritual and its meaning, since the ceremony embodies the essential elements of being Totonac (including speaking the Totonac language). The spaces in the centre were originally conceived as a place for exhibitions and activities and as a school for local gastronomy, dance, language, art, and handicraft skills among others. Increasingly, the school has gained independence from the original project; however its establishment was not without complications. To begin with, there were difficulties related to deciding "who" would teach, as well as "what", and "how". These were no trivial problems, as they relate to fundamental aspects of the Totonac identity. Long and heated discussion was given to analyze the intergenerational gaps, and the philosophical reasoning behind the purpose of education, as well as the role that teachers should play in the process. Today, the school is guided by the Council of Elders and aims to develop its own pedagogic method based on the notion of indigenous arts education by transferring interest, wisdom, and experience from the older people acting as teachers to the younger generations (young adults, teenagers, and children of both sexes). The school has expanded beyond its initial scope, and it is educating young people that are becoming leaders in their communities.

### 3.4 A promising process

Having pinpointed the main issues that Totonac families confront with regards to their cultural values and sense of identity and connection with the land, we argue that in the study area a community and regional multidimensional cultural and ecological restoration process are in place, in accordance with the two aforementioned principles. Groups are operating within a radical ecosystem approach, and people envisage and discuss their own alternative development opportunities for the future, based on their own values and at their own pace, deciding when and how to create networks and growing aware of their political

responsibility as a whole. Moreover, we think that despite the social, political, and economic struggles that they face, the actions undertaken by Voladores are giving meaning to the designation of the ceremony as Intangible Cultural Heritage of Humanity by UNESCO. In this way, the Voladores are demonstrating that the award is not a benchmark for increasing tourists, as often perceived and managed, but can be turned into a catalyzer for local communities' development and well-being.

The key grounds supporting our argument are the following: firstly, the Voladores have identified that the current development paradigm is the root cause of the erosion of biological and cultural diversity and on the basis of that assumption the problem was rationalized and translated into action. The Council's strategy for preserving the ritual included a long-term reflection on the future of their families and communities and the development of an enduring systemic vision for the future. Two of the most important grass roots initiatives that emerged, such as the young Voladores education project and the Voladores' organization, can be seen as processes that strengthen the socio-ecological system's resilience when faced with global forces, increasing youth pride in their cultural heritage and minimizing conflicts. Rituals such as the flying men who reconcile the heart of the sky with the earth, like many other religious rituals, contribute to maintaining social cohesion by channelling everyday frictions and conflicts into a community celebration that incorporates music, dance, eating, and drinking. The realm of ritual and spirituality may at times seem far from political decision-making. However, in this case those aspects strengthened Council leadership and allowed the Voladores to harness the tension between conservation and creativity. It follows that the path undertaken by the Council—which maintains a central role in ritual practices—seems promising because the process of engaging in deep reflection to creatively overcome adversity is useful when facing current crises (such as a social conflict within the society), as well as dealing with new challenges.

Also, the strategies followed and the decisions taken by the Voladores are rooted in local values and Totonac people's creativity. The school and the centre did not aim to build external knowledge on indigenous knowledge; instead, the indigenous perspective was both the starting point and the end goal of endogenous development. Moreover, actions are deliberately carried out in the Totonac language, pursuant to the notion that the loss of a language may be accompanied (or somehow, generate) the loss of other features or moral and spiritual values such as knowledge and beliefs that the language encodes, as suggested by Maffi (2002). The rhythm of action is dictated by the members of the Council of Voladores and by the Council of Elders, and it does not match with research or political times. As highlighted by Davidson-Hunt et al. (2012), the cultural revitalization processes should include the time to remember—and memorialize—the loss experienced through processes of colonization and globalization. Finally, as described, discreet leadership, conscientious decision-making, and expansion of their support network through strategic alliances are qualities that the organization has maintained despite the difficulties.

These are some fundamental conditions that favour the communities' autonomy and control over some of the external processes that affect their well-being and threaten their natural and cultural heritage. Our case study is a paradigmatic example of situations in which indigenous societies are constrained into conditions of land scarcity and the erosion of social rules and behaviours. Even though the Totonac revitalization process is far from having solved the problems that affect their families and communities, if the organization continues moving on this direction, it is likely that long-term socio-ecological processes will bring a much needed improvement in Totonac families' living conditions. Under this framework, biocultural diversity—"the diversity of life in all its manifestations (biological, cultural, and linguistic) which are interrelated within a complex socio-ecological adaptive

system (Maffi and Woodley 2010)"—could be on the path to recovery. As highlighted by Maffi (2007), we think that this case study concurs to the idea that there is an evident convergence between the way in which biocultural diversity, self-determination, autonomy and well-being of communities support each other.

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