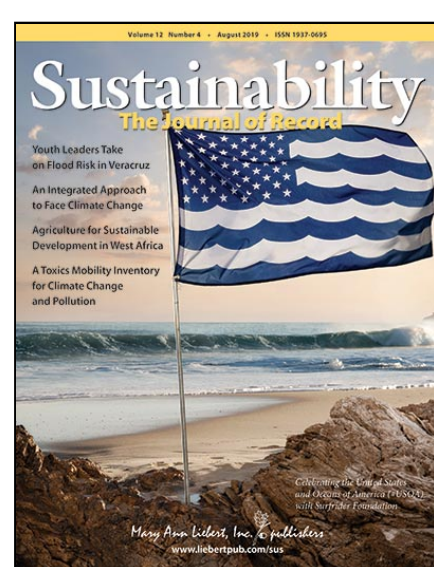


González Gaudiano, E. J., & Maldonado González, A. L. (2019). Climate Resilience: Youth Leaders Take On Flood Risk in Veracruz, Mexico. *Sustainability: The Journal of Record*, 12(4), 196-198. ISSN digital: 2071-1050. <http://dx.doi.org/10.1089/sus.2018.0032>



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Editor: **Jamie Devereaux**

ISSN: 1937-0695 | Online ISSN: 1937-0709 | Published Bimonthly | Current Volume: 12

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# Climate Resilience: Youth Leaders Take On Flood Risk in Veracruz, Mexico

Edgar J. González Gaudiano and Ana Lucía Maldonado González

## Introduction

The collaborative research presented in this article was carried out by members of Environmental Education for Sustainability, a program attached to the Educational Research Institute at Universidad Veracruzana, Mexico. This interdisciplinary working group investigates challenges and problems related to environmental and educational processes from a perspective that includes social context in a political action framework. These investigations follow the 2030 UN Agenda for Sustainable Development, especially the Sustainable Development Goals (SDGs) that correspond to climate action (SDG 13), but they also address sustainable cities and communities (SDG 11). In addition, research problems related to other goals such as quality education (SDG 4), good health and well-being (SDG 3), and responsible consumption and production (SDG 12) are addressed indirectly.

In this investigation, the researchers were centrally located in urban, peri-urban, and rural areas in order to view education from both inside and outside of the school environment (e.g., community, virtual schools, etc.). Their work focused on differ-

ent population sectors, for example, civil society organizations, indigenous peoples, the school community, and others.

## The Project

### Description

This research was carried out in the municipalities of Tlacotalpan, Coaxtla, and José Cardel in La Antigua, all located in the state of Veracruz. The inhabitants of these towns have been periodically affected by the ravages of climate change due to the higher frequency, duration, and intensity of extreme hydrometeorological phenomena that produce floods of varying magnitudes.

The study consisted of three stages. 1.) Research with young people, high school teachers, and municipal agents concerning their physical and social vulnerability to climate threats. (See Methods section.) This stage also addressed how these groups perceive community resilience, and their own abilities to recover and cope with an environmental contingency. 2.) Participatory workshops held in the high schools gave teachers and young people an opportunity to address topics related to strengths and weaknesses discussed in the study. 3.) The work-

shop *Acciones Comunitarias ante el Riesgo de Inundaciones* (Community Actions in the Face of Flooding Risk) was held at Universidad Veracruzana and aimed at a small group of young leaders.

This article describes the general context as well as the theoretical approaches and the methodological design of each stage, which have been detailed in depth in previous publications.<sup>1-4</sup>

The high schools selected for this research are located in the municipalities of Tlacotalpan, Coaxtla, and José Cardel, small cities located in low-lying areas and near rivers that often overflow and cause flooding during the rainy season. In 2010 Hurricane Karl seriously affected these localities and since then, their vulnerability has become more evident, although their resilience capacities are also evident. Therefore, the study focused on both vulnerability and resilience in these three localities, and the potential of young people as agents of change to participate together with local actors before, during, and after an event, such as a flood.

Anderson and Woodrow<sup>5</sup> have clearly informed the concept of physical

Universidad Veracruzana, Instituto de Investigaciones en Educación, Xalapa, Veracruz, Mexico.

# Sustainability

The Journal of Record

## Climate resilience.

Journal:	<i>Sustainability: The Journal of Record</i>
Manuscript ID	SUS-2018-0032.R1
Manuscript Type:	Case Reports
Date Submitted by the Author:	n/a
Complete List of Authors:	GONZALEZ-GAUDIANO, EDGAR; UNIVERSIDAD VERACRUZANA, INSTITUTO DE INVESTIGACIONES EN EDUCACION MALDONADO-GONZALEZ, ANA; UNIVERSIDAD VERACRUZANA, INSTITUTO DE INVESTIGACIONES EN EDUCACION
Manuscript Keywords (Search Terms):	environmental education, climate change, vulnerability and resilience
Abstract:	<p>This research was carried out in the municipalities of Tlacotalpan, Cotaxtla and La Antigua, located in the state of Veracruz. The habitants of these towns have been periodically affected by the ravages of climate change due to the higher frequency, duration and intensity of extreme hydrometeorological phenomena that produce floods of different magnitude. The study consisted of three stages: 1) A research with young people, high school teachers and municipal agents and their physical and social vulnerability to climate threats. In the same way, this stage also tackled how these people perceive the community resilience about themselves to recover and cope with an environmental contingency; 2) Participatory workshops were held in the high schools and teachers and young people tackled topics related to strengths and weaknesses detected in the study; 3) The implementation of the workshop Acciones comunitarias ante el riesgo de inundaciones (Community actions in the face of flooding risk) held at Universidad Veracruzana and aimed at to a small group of young leaders.</p>

## Case report

### Climate resilience. A study with young people

Edgar J. González Gaudiano  
Ana Lucía Maldonado González

The collaborative research presented here was carried out by members of the *Environmental Education for Sustainability* studies line, which is attached to the Educational Research Institute at Universidad Veracruzana, Mexico<sup>1</sup>. This interdisciplinary working group addresses its investigations on challenges and problems related to environment and educational processes from a perspective that includes the social context in a political action framework. These investigations follow the 2030 Agenda, especially the Sustainable Development Goals (SDGs) which corresponds to climate action (13), as well as to sustainable cities and communities (11). In addition, research problems related to other goals such as quality education (4), good health and well-being (3), and responsible consumption and production (12) are addressed indirectly. In this investigation environment constitutes a nodal centre and the view of education is from the inside and outside the school environment (community, virtual, etc.). Our researches are centralised in urban, peri-urban and rural areas and are aimed at different sectors such as civil society organisations, adults, young and indigenous people, as a whole with the school community and population groups.

#### ***Project description***

This research was carried out in the municipalities of Tlacotalpan, Cotaxtla and La Antigua, located in the state of Veracruz. The habitants of these towns have been periodically affected by the ravages of climate change due to the higher frequency, duration and intensity of extreme hydrometeorological phenomena that produce floods of different magnitude. The study consisted of three stages: 1) A research with young people, high school teachers and municipal agents and their physical and social vulnerability to climate

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<sup>1</sup> <https://www.uv.mx/iie/grupos-de-investigacion/educacion-ciudadania/>

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3 threats. In the same way, this stage also tackled how these people perceive the community  
4 resilience about themselves to recover and cope with an environmental contingency; 2)  
5 Participatory workshops were held in the high schools and teachers and young people  
6 tackled topics related to strengths and weaknesses detected in the study; 3) The  
7  
8  
9 implementation of the workshop *Acciones comunitarias ante el riesgo de inundaciones*  
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11 (Community actions in the face of flooding risk) held at Universidad Veracruzana and  
12 aimed at to a small group of young leaders.

13  
14  
15 Due to the space available here, we will describe in a general way some context  
16 conditions, as well as the theoretical approaches and the methodological design of each  
17 stage, which have been already exposed in previous publications<sup>2</sup>.

18  
19  
20 The high schools selected to carry out this research are located in the  
21 municipalities of Tlacotalpan, Cotaxtla and José Cardel. These are small cities located on  
22 low areas and near to rivers that usually overflow and cause flooding during the rainy  
23 season. In 2010, with the passage of Hurricane Karl, these localities were seriously  
24 affected, and since then, their vulnerability became more evident, although its resilient  
25 capacities were also evident. Therefore, the interest on searching for both aspects (   
26 vulnerability and resilience) in these three localities and the potential of young people as  
27 agents of change to participate together with local actors before, during and after a  
28 contingency of such magnitude.

29  
30  
31 We approach Anderson and Woodrow (1989) with the concept of physical  
32 vulnerability (land, climate, location, productive activity, housing, health); social  
33 vulnerability (political, institutional, leadership, economic and social organisation system);  
34 and motivational-attitudinal vulnerability (social groups self-perception in terms of their  
35 ability to manage environmental conditions). On the other hand, resilience, according to  
36 Adger (2000), can be conceived as the ability of groups or communities to cope with  
37 instability events without losing the capacity for self-organisation.

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40 Based on our findings, we can state that vulnerability and resilience are inversely  
41 proportional, but they are both located, unequal and cumulative, since they reveal in a  
42 differential, individual and collectively way depending on the exposure to threats and  
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55 <sup>2</sup> See: González- Gaudiano *et al.* (2015); González-Gaudiano & Maldonado (2017); González-Gaudiano *et*  
56 *al.*, (2018); Maldonado *et al.* (in press).  
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3 particular conditions of existence. Even then, no one is vulnerable and resilient to  
4  
5 everything nor any time. Threats can become a risk to vulnerable populations with wide  
6 ranging of social resilience that is conceived as a volatile and dynamic process, in which,  
7  
8 risks factors and protection against to climate phenomena, like in this particular case, have  
9  
10 simultaneous influence.

11  
12 This research project lasted three years (2015-2017). In the beginning, we  
13 analysed the theoretical and conceptual aspects that supported our rationale behind the  
14 research as well as the methodological design, first from an interpretive paradigm, then  
15  
16 reflective critic. Mixed methods were used: surveys, semi-structured interviews,  
17  
18 participatory workshops, direct observation to community participants. In the first stage, the  
19  
20 fieldwork consisted on the implementation of a survey to young students of every study  
21  
22 locality as the representative sample (411 surveys in total). The survey was applied during  
23  
24 the school day, in the classroom. This survey privileged analytical categories of perceived  
25  
26 risk, social vulnerability and community resilience. A pilot test in a different location had  
27  
28 been conducted previously; the Cronbach Alpha coefficient of the survey was (.83). In  
29  
30 addition, fifteen semi-structured interviews were conducted to key actors (scholar  
31  
32 administrators and municipal and community agents mainly). These interviews made it  
33  
34 possible to explore and expand every category of the survey with received personal  
35  
36 opinions of the topics in question.

37  
38 In a next stage, the results of the surveys and interviews were considered to  
39  
40 design and develop participatory workshops with young people about climate change,  
41  
42 extreme hydrometeorological phenomena, flooding, risk, vulnerability and resilience,  
43  
44 health and responsible consumption. In addition, some workshops about the same previous  
45  
46 topics but adapted to groups of teachers were implemented. These subjects are inside of the  
47  
48 Sustainable Development Goals (13, 11, 4, 3 and 12).

49  
50 In 2017, a small group of young leaders and teachers of these three high schools  
51  
52 were invited to participate in the workshop Acciones comunitarias ante el riesgo de  
53  
54 inundaciones (Community actions in the face of flooding risk), held at Universidad  
55  
56 Veracruzana. Their participation was important because we needed to share the results of  
57  
58 the research while supporting the community in climate resilience. Based on what the  
59  
60 information proposed on the workshop, when the young people came back to their

1  
2  
3 communities, they conducted activities and share them with other young people, even  
4  
5 communities spaces were open in order to present proposals to face together the climate  
6 events that have affected their localities. Young people were assumed as agents of change  
7 and participated in the construction of sustainable cities and communities (SDGs 11).  
8  
9

### 10 11 12 ***Outcomes***

13 The research allowed to identify communities' prevention actions and collaborative work  
14 against future contingencies, adopted by previous flooding experiences. Besides, essential  
15 aspects that contribute to resilience in the communities, which could be developed with  
16 accurate educational strategies inside and outside the school environment have been  
17 recognised.  
18

19 Similarly, it was possible to identify social learnings in these communities  
20 acquired from these experiences, which have reduced their vulnerability in certain aspects,  
21 regardless of those physical and social conditions that represents objective risk factors.  
22 Nowadays, these communities recognise and give more importance to the probability of  
23 affectation due to recurrent flooding events, what does not happened in 2010 when they  
24 ignored the alerts of civil protection agents that in any case arrive late.  
25  
26

27 Young people are aware of the risks around them and the precarious organisation  
28 that the government authorities have when working on to prevent them, which forces them  
29 to put effort into the strengthening of their abilities to implement their own initiatives to  
30 reduce vulnerability and increase their climate resilience and what is more, they want to  
31 carry it out. Thereby, they became actively involved and participated during the  
32 development of the research what confirmed our hypothesis about their willingness to act  
33 as agents of change within the community and their families. Young people want to be  
34 taken into account and they also want to have leading roles in community processes that  
35 strengthen the social cohesion, solidarity and climate resilience in their localities.  
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### 50 ***Future planning***

51 The results of the research can be adapted to communities with similar conditions of  
52 vulnerability against extreme hydrometeorological phenomena. In this process it is  
53 important to recognize young people as agents of change who wish to participate and  
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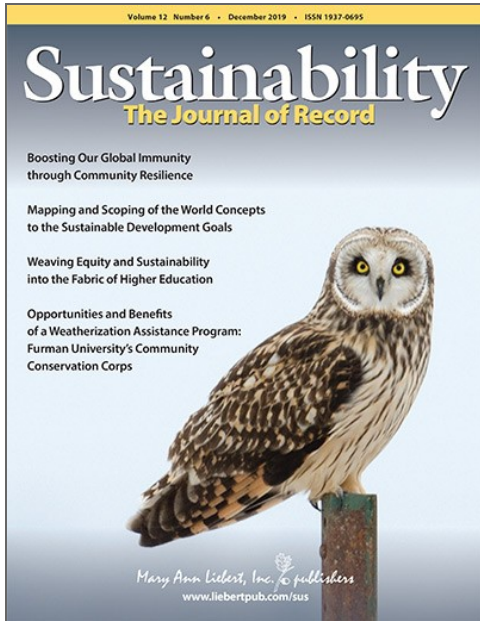
contribute to community well-being. The learning derived from previous experience can be a trigger of climate resilience processes both to face adverse situations and to obtain benefits from it. However, the potential of this learning could be used if it is aimed at strengthening the effective and timely response capacity that helps to mitigate the impact of environmental contingencies, which are prone to change the social and economic dynamic, and consequently, the quality of life of the communities. This is the importance of educational intervention strategies we need to highlight. So, adversity can be an agent of change of processes that contribute to improve communication skills, coordination, leadership, organisation and solidarity, which become immediately effective only if the community is organised and fully aware of its vulnerabilities and risks. The previous elements can strength governance processes that produce better interactions and agreements between local authorities and citizens, in order to prevent and solve the growing problems resulting of the adaptation to climate change through a consensual management of the necessary social changes.

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The Journal of Record

**Editor: Jamie Devereaux**

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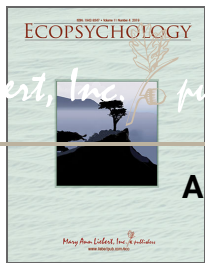
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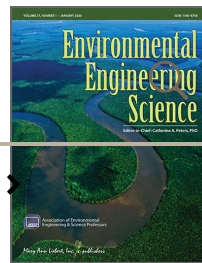
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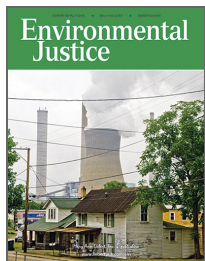
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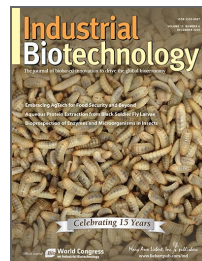
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