

Improving coastal urban flood risk management in San Francisco de Campeche, México

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Support Material

Appendix A: SWOT Analysis to implement social intervention.

Appendix B: Social Action Climate Program for San Francisco de Campeche.

Appendix A

SWOT Analysis to implement social intervention.

Melding influence areas and social diagnoses provides environmental elements that will impact social intervention strategies. A Strength, Weakness, Opportunity, and Threat (SWOT) analysis addresses city contexts and systemic relationships. First, design and intervention proposals, as well as all possible execution phases that influence those plans are considered. Those variables were then grouped into four categories. Each variable is weighted relative to impact probability, where 1 represents low, 2 medium, and 3 high. This academic exercise identifies system conditions, helps prevent impacts and establish action forecasts (Ramírez, 2009).

Considered variables in each category are shown as follows:

Table 1. Strengths Weighted Variables

No.	Variables considered as Strengths	Impact probability
1	Social system in equilibrium (good communication, cohesion, integration, participation, etc.)	2
2	Population's knowledge about causes and consequences of climate change in the local environment	2
3	Risk management initiatives	2
4	Local legal tools on climate change and risk management	3
5	Social perception information of climate change and associated risks	3
6	Knowledge about vulnerable zones and their characteristics	3
7	Population and NGOs involved in activities that address climate change	1
8	Possibility to access economic funding for environmental and risk education activities	2
9	Human capital specialized in climate change and disasters risk management	2
10	Governmental entities and public servants' quick response	1
11	Harmonization with national climate change instruments and disaster risk reduction	3
12	Harmonization with international climate change instruments and disaster risk reduction	3

Table 2. Opportunities Weighted Variables

No.	Variables considered as Opportunities.	Impact probability
1	Society's initiatives to implement environmental education activities	2
2	Interested population in participating in management and educational activities	2
3	Stability of population's economic welfare	2
4	Institutional interest to implement mitigation and adaptation measures	2
5	Educative and research institutions interested in climate change monitoring	3
6	Scientific information related to social perception of climate change	3
7	Acknowledgement of local climate change consequences from different social actors	3
8	Contribution to advance in climate change and risk prevention at local and state levels	3
9	Support networks strengthen with government entities	2
10	SDO, article 6 of the UNFCCC, Paris Agreement, and Sendai Framework compliance (empowerment and climate action, and disasters risk reduction)	3
11	Groups creation, civil society organizations	2
12	Auto adaptation actions for risk reduction	3

Table 3. Weakness Weighted Variables.

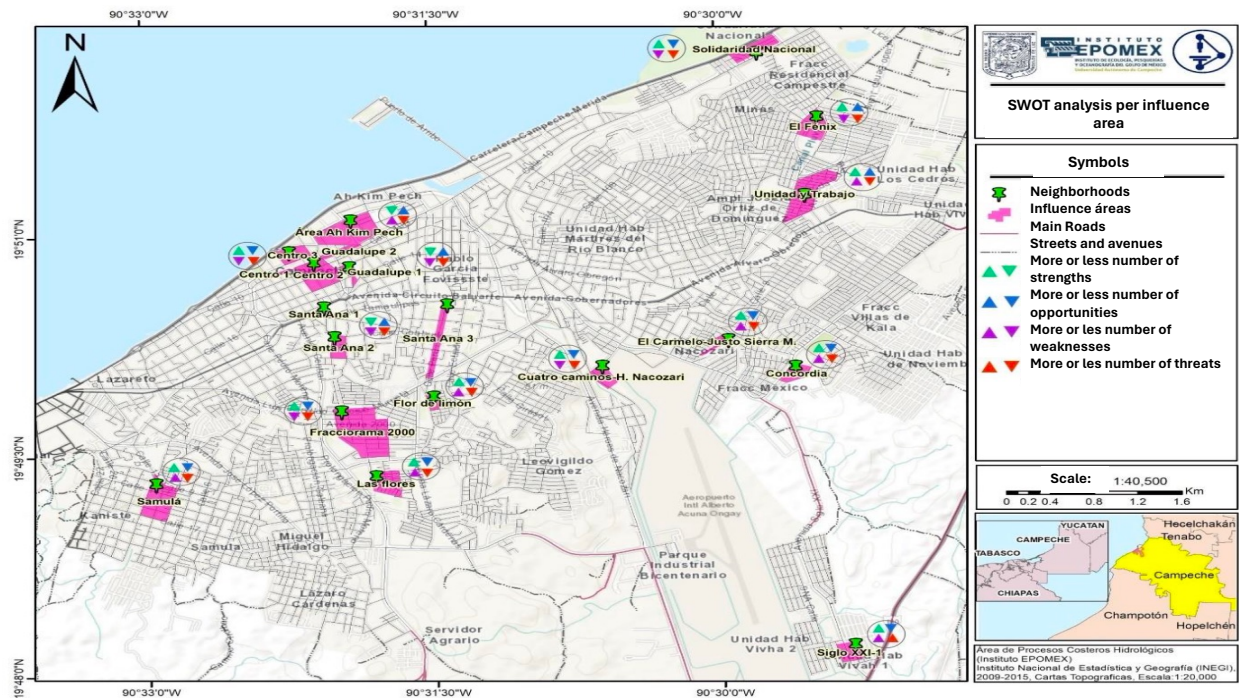
No.	Variables considered as Weaknesses	Impact probability
1	Lack of communication among inhabitants	2
2	Lack of leadership	1
3	Marginalization	1
4	People's little interest in decision making process	3
5	Low social participation	2
6	Lack of labor opportunities, low salaries, reduced economic family capacity	1
7	Rejection to new environmental knowledge and those related to sustainable activities	2
8	Inability to integrate social actors in activities implementation	2

9	Lack of presence of related institutions to climate change and natural risks in the communities	1
10	Lack of population's motivation to participate in environmental education campaigns for the adoption of other mitigation and adaptation measures	2
11	Little capacity to access credits or financial programs for environmental education and risk management	2
12	Discontinuity of plans and programs due to policy and administrative changes	3

Table 4. Threats Weighted Variables.

No.	Variables considered as Threats	Impact probability
1	Changes in social actors' agendas	2
2	Neighbor conflicts	1
3	Unforeseen related to climate	2
4	Reduction in the people's purchasing power	1
5	Distrust and apathy of the public	1
6	Insecurity	2
7	Disinterest of municipal government to address citizen's demands	2
8	That social actors do not have time to participate in the activities	3
9	Rejections to the presence of institutions	1
10	Vulnerability to threats and natural risks	3
11	Health risks	3
12	Disinterest of local government and institutions to implement environmental education programs and risk management initiatives	2

The second analysis compared strengths, opportunities, weaknesses, and threats per influence area. From each table's 12 variables as a reference, a mean of 6 determines higher or lower variables' frequencies per category. Map 1 shows greater or lesser variable frequencies per category, compared with each mean in each of the 15 previously identified influence areas. SWOT results were related to variables and probabilities. Figure 1 illustrates variable frequencies per analytical category impact probabilities.



Map 1. Compared analysis between the influence areas according to the number of identify variables in each category SWOT.

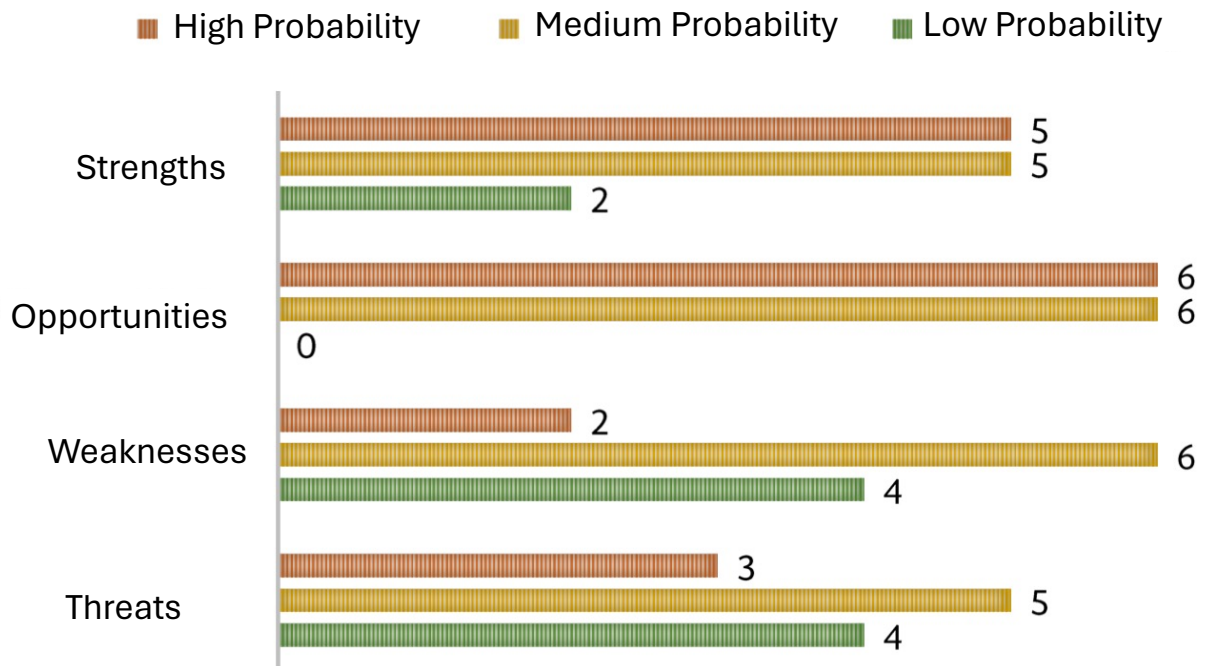


Figure 1. Variables' frequencies per impact probability presented in the different analysis category.

Appendix B

Social Action Climate Program for San Francisco de Campeche

Climate change education is a tool that facilitates people and society's adaptation to changing world conditions, by constructing knowledge throughout different social sectors. A main objective in environmental education focuses on individual improvement through integrated learning. This knowledge considers theoretical and practical aspects, mindsets, aptitude, values, and developing a moral compass regarding green projects that can improve social wellbeing (Heras, 2016 cited by López-Morales, 2019). Our proposal dovetails with Municipal Government development plans and with the State Civilian Protection Secretariat in Campeche.

Public opinion, perception, social needs, and informant life histories nourish this program, which also takes into account risk management scientific knowledge that impacts SFC city's systems' resilience capacities. These activities aim to generate critical thinking about climate change local causes and consequences.

The objectives of the intervention program are to promote education strategies to rise population's awareness in climate change and natural disasters risk reduction topics to create a deep conscience at community and personal levels on the causes, consequences, and capacities to address the problematic. And to create active listen spaces among social actors to strengthen community organization and participation in the solution of socioenvironmental problems.

The elements of the Climatic Empowerment Action that are taken in this program (European Commission, 2020) are the following: education, information public access, formation, public participation, and social sensitization.

To focus on climate change education also represents an opportunity area in natural risks management, because it conveys knowledge and encourages communication, critical thinking, and early action so communities are prepared and properly respond to natural threats (Fig. 1).

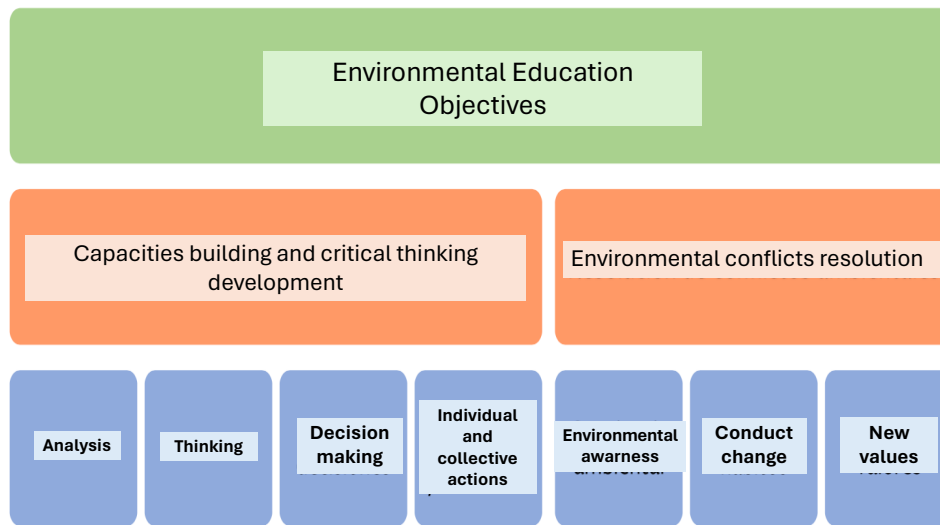


Figure 1. Environmental education objectives used in proposed activities' design

While three related subjects comprise this program, each possesses particular strategies and activities: Theme 1: To foster social cohesion and community participation for solving socioenvironmental problems; Theme 2: Individual and collective environmental education for climate change action; Theme 3: Places for local risk management social feedback. Theme strategies, objectives, and goals are the following:

Axis 1. Encouragement of social cohesion and community participation in the solution of socioenvironmental problematic.

Strategy 1. Organization, and community participation promotion

Objective: To promote community organization to build social networks capable to actively participate in the solutions of issues and common interest conflicts.

Goals:

- a. Promote leaderships that organize and mobilize neighbors to keep common interest communication topics.
- b. Create neighbor groups capable of participating in decision making process that involves their community.

Strategy 2. Creation of active listen spaces

Objective: To establish spaces where social actors expose their socioenvironmental problems and propose collective solutions.

Goals:

- a. Increase communication among neighbors.
- b. Create a communication channel between inhabitants and decision makers.
- c. Encouragement individual critical thinking in relation to socioenvironmental problematics.

Axis 2. Environmental education for individual and collective climate change action taken.

Strategy. Sensitization campaign for the climate change response and adaptation of the inhabitants of SFC.

Objective: Communicate the direct impacts of climate change in people's daily life, and provide solutions that can be done individually or collective to increase adaptation capacities and responses.

Goals:

- a. Spread knowledge about causes and consequences of climate change and the influence that they have in the social system of inhabitants.
- b. Motivate SFC inhabitants' interest for climate change.
- c. Promote critical thinking about the city's environmental problems, so the public will interest, take conscience, and participate in changing attitudes and actions with the environment.

Axis 3. Spaces for social communication for local risks management.

Strategy. Participative education for community risk management.

Objective: Community training in disaster risks reduction topics to increase their resilience and response capacity development.

Goals:

- a. Promote population knowledge about the main risks causes that impact their welfare to motivate a critical awareness for the problematic and move forward the development of agreements, responses, and solutions.
- b. Leaders boost capable of motivate the community members to actively participate in commitments, agreements, and decisions development related to disasters risks prevention and reduction.

Each activity is divided in five phases: planning, management, communication, implementation, and evaluation.

Axis 1

Activity 1: Neighbor Meetings

Planning: Periodical neighbor meetings to maintain the presence and evaluate the commitments and advances in improvement of priority identified issues.

Management: Get municipal permits for using public spaces.

Communication: House to house visits, periphonium in the streets, and social networks.

Implementation: a) present the program, b) identify the main environmental problems in their neighborhood, c) promote critical thinking, d) brainstorm of possible solutions and commitments, e) involvement government representants to compromise with the community, f) create groups

to monitor the actions and present the results to the community, g) keep the communication and feedback the collective solution proposals.

Evaluation: Develop a collective memory describing the results (ideas, demands, proposals, etc.), created social relationships, constructed support networks, and created neighbor groups. Photographs will be taken and keep the control of the number of participants per meeting.

Activity 2: Workshop: Community Leaders

Planning: the objective will be to train the community in leadership, community empowerment, and conflict resolution.

Management: Get municipal permits for using public spaces.

Communication: Interested people will be invited through social networks.

Implementation: There will be five sessions of one hour covering the following topics:

- Session 1: The leader and the teamwork.
- Session 2: Communication strategies.
- Session 3: Conflict resolution mechanisms.
- Session 4: Leaders and Institutions: organization, citizen complaints, and decision making.
- Session 5: Final thoughts, dialog with authorities and awards ceremony.

Evaluation: During session 4 leaders will expose their neighborhood problems, as well as the strategies that they will implement to reach agreements with their neighbors and then propose solutions. Photographs will be taken and keep the control of the number of participants per session.

Axis 2

Activity: Sensitization campaign for the climate change response and adaptation of the inhabitants of SFC.

Information capsules: "Climate change in my city".

Planning: Design and record information capsules about the influence of people's activities in SFC over climate change, and direct consequences in the daily life.

Management: Ask radio stations in the city to broadcast the capsules.

Communication: Ask local radio stations a space to promote the program social action for climate.

Implementation: Broadcast the capsules in radio and use other platforms of social networks to inform the society about climate change.

Evaluation: Design and implement interviews to the population about the information that was broadcasted.

Graphic material: "Our actions count to solve climate change".

135 Planning: Design infographics to sensitize and inform the population about new actions to
136 mitigate and adapt to climate change.

137 Management: Ask local newspapers to publish the material.

138 Communication: Send the material through different social networks platforms.

140 Axis 3

141 Local Action Plan for the Risk Disasters Reduction.

142 Planning: Create spaces for the Secretary of Civil Protection (SCP) together with the population
143 develop activities that consider people's perception, capacities, priorities, and needs facing
144 floodings. This activity complements the learnings acquired in the other strategies and activities
145 of the program. Lessons learnt by the community and the SCP from past flooding events would
146 result in innovative actions to address risk disasters.

147 Management: Coordinate with the SCP the activities with the communities.

148 Communication: House to house visits, periphonium in the streets, and social networks.

149 Implementation: This activity will consider the institutional capacities of the SCP to implement
150 activities.

151 Evaluation: A final report of the activities and a survey to assess the results. This part should be
152 placed as annexes.

153 During all the development of the Social Action Climate Program for SFC, the focus will be the
154 community participation to enhance the learning process, the adaptative response to climate
155 change, and disaster risk reduction (Oxfam-Québec, 2014).

156 Jara (2018) considers that evaluation, is an educational fact, useful for all the people that
157 participate in the experience. Evaluation should reach practical conclusions and must mutually
158 feedback to improve the practice quality. The evaluation of the activities of the program are
159 going to analyze the effectiveness and to quantify results to contribute to the processes
160 systematization that resulted from the program implementation. According to Jara (2018), the
161 systematization will cover five steps: 1) Starting point, living the experience, 2) Initial questions,
162 3) Recovering of the lived process, 4) Critical interpretation, and 5) Communicate the lessons
163 learnt.