



2013

Case Study prepared for the Global Assessment Report on  
Disaster Risk Reduction 2013

**Good practices used at the Peninsula de Yucatan, Mexico**

**Jimena Cuevas**  
CIESAS, México

Geneva, Switzerland, 2013

## Good practices used at the Peninsula de Yucatan, Mexico

Jimena Cuevas  
CIESAS  
Mexico

Hurricanes, storms, rains, floods are hydrometeorological phenomena that have affected the Peninsula de Yucatan since it exists. Its inhabitants are used to live with these phenomena and its consequences. But, how did they learn to do so? In a first moment, these inhabitants have developed by themselves some extraordinary practices which along the time were included in their life as usual practices. Then, the good operation of these practices has been recognized by the authorities as *good practices* to address extraordinary situations.

The aim of this paper is to show how some citizens, the authorities, and social organizations all together have developed some *good practices* in order to address these hydrometeorological phenomena and how now they have learned to live with them. In other words, it will be shown how this people have produced its own space to live there safe.

According to the Millenium Development Goals (MDGs) in the last ten years the UNDP has done an excellent job in the Southeast Mexico. They have given different kinds of workshops to develop these *good practices* with the people. The UNDP began working at the Peninsula de Yucatan in 1994. Some activities were financed by the UNDP in order to improve the life quality and to maintain the environment in good conditions. They carried out a financial program “Small donations program” which was working very well (UNDP, 2002).

Meanwhile, in 2002 more than 500,000 victims, 37,900 destroyed houses, 86,400 damaged houses among other losses triggered by the hurricane *Isidore* had highlighted that the people and the UNDP hadn't enough skills to address that kind of disaster. They had realized that they needed to be organized. In first place to address the emergency immediately and in second place to be able to recover after the emergency had happened.

In order to achieve this aim the UNDP promoted the creation of Experts Units. Consequently the Disaster Reduction and Recovery Unit had assigned \$US 100,000 for that mission. So as to accomplish the goal they had established agreements with the local and national governments and with NGO'S. The UNDP was in charge to coordinate the agreements between all the institutions and organizations.

First of all, they have noticed that they needed to create a service to attend the emergency immediately and to recover after it has happened. Therefore, they made up the Micro Regional Units with a view to attend contingencies and disasters. Since then, the UNDP job has been focused on assisting the municipalities in a technical way. That is to say that they help them in different issues. As an example, the UNDP guide them in the development of restoration, reconstruction and recovery plans. As well as they advice them to take advantage of the resources provided by the government for that matter, among others.

Along the paper it will be shown how the citizens, authorities and UNDP all together have learned to develop and to include the *good practices* in order to live safe.

### *The Peninsula de Yucatan as a region*

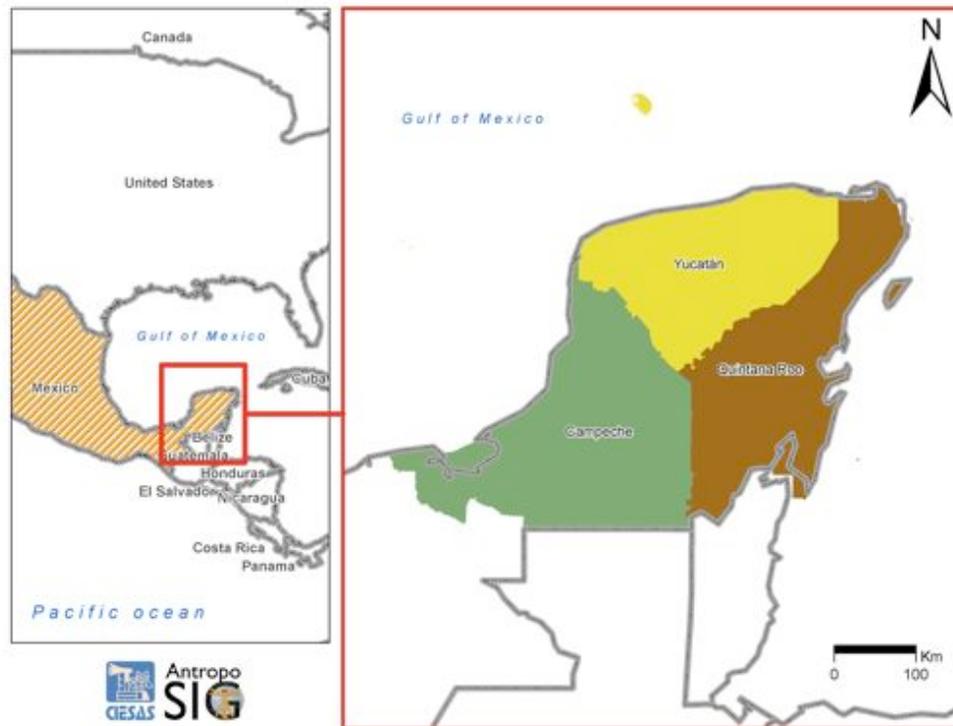
The Mexican region so-called Peninsula de Yucatan is located at the Southeast of Mexico. This region is composed by three states: Campeche at the West, Yucatan at the North and Quintana Roo at the East. The Peninsula de Yucatan is officially bilingual (spoken languages Spanish and Maya) and multicultural with a population of approximately 4,103,596 inhabitants (INEGI, 2010). Even though the Peninsula de Yucatan is well-known because of its natural resources and touristic attractions the whole region is characterized as a very poor zone. Overall in the rural areas the inhabitants live with less than \$US 4 per day.

At 43,379 square kilometers and with over 1,955,577 people Yucatan is the smallest state of the peninsula and the most populated. Yucatan is divided into 106 municipalities. 83 percent of its population lives in urban areas and the other 17 percent lives in the rural zones. Commercial sector, farming and agricultural activities, fishery and ecotourism are some of the main economic activities (Gobierno del H. Ayuntamiento, 2010).

The state of Quintana Roo is situated in the East part of the peninsula. Quintana Roo's area (50,000 km<sup>2</sup>) is the second largest in the peninsula after Campeche which is 57,924 square kilometers. Quintana Roo has a resident population of around 1,325, 578 inhabitants (INEGI, 2010). In the case of Quintana Roo, even though, the fishery industry represents an important economic activity, in the last three decades the tourism industry has

been developing in an important way. It has been reflected in the local and national economy.

Map. 1. Peninsula de Yucatan



Source: AntropoSIG, CIESAS, 2013, created by Israel Hinojosa Baliño

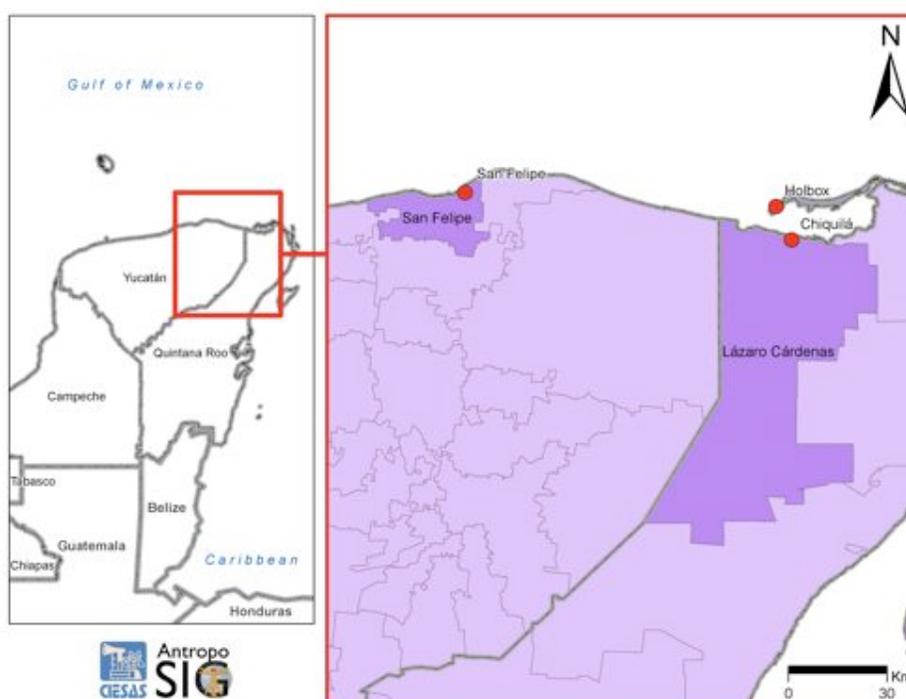
The Peninsula de Yucatan has a huge coast, so the fishing and touristic activities have been developed as some of the most important economic activities. The majority of the fishermen of the region is organized as cooperatives. As well as some other inhabitants that work on the tourism industry. At the inside of the cooperatives, the people are organized as members and some of them are in charge or it. One person must be the President, other member the Secretary, one more the Treasurer among other charges.

Overall, the members are organized within the cooperatives in order to be protected in a legal way as well as to have a safe economy. A characteristic of a fishing cooperative is that each cooperative must focused on catching only one kind of marine product in order to cover the market demand. That's why some fishermen only catch lobster, other just octopus and others focus exclusively on catching fish-scale.

In the same way, any cooperative as an organization establish agreements to market the product. In other words a member doesn't have to concern about the marketing. In addition to this as a legal organization they are able to ask for credits if they needed. That is to say that if they need to purchase new fishing equipment they can do it with the financial credit. Benefits that couldn't be taken in advantage by those who works as self-employed workers.

Some examples of these kinds of cooperatives are established in the municipalities of San Felipe in Yucatan and in Lázaro Cárdenas in Quintana Roo.

Map.2 San Felipe and Lázaro Cárdenas



Source: AntropoSIG, CIESAS, 2013, created by Israel Hinojosa Baliño

San Felipe is a small municipality within the state of Yucatan. It is settled over 680.85 square kilometers. The municipality has a resident population of around 1,838 inhabitants. The economically active population is conformed by 33 percent of the whole population. Of this total around 60 percent of the inhabitants works on the fishery and cattle industry.

The tourism, commercial and service sectors are served by 40 percent of the economically active population (Gobierno del H. Ayuntamiento, 2010).

The fishery industry of San Felipe is organized in five cooperatives. The cooperatives called “Pescadores Unidos de San Felipe” and “Pescadores Legítimos de San Felipe” are the main ones. Among the 850 members of the cooperatives and the self-employed fishermen they have a fishing fleet of 322 boats used for catching the regional marine species.

The fishermen used to catch all kind of fish-scale and octopus in its season. The amount of catching varies depending on the weather. For example during the winter season the fishermen only are able to go fishing twice per week because of the strong winds well-known as “Nortes”. In the winter season each cooperative can catch about eight to 15 tons. That means that each boat can fish about 100 to 150 kilograms per week. However, during the best season each cooperative is capable to catch between 250 and 300 tons per week. In order to market the marine product, the cooperatives have established sale agreements with an enterprise from Merida City named Atlántida S.A. This enterprise markets the product. The best fishes are for the export market and the rest for the national market.

Figure 1. Pier of San Felipe



Source: Jimena Cuevas, 2013

Lázaro Cárdenas is a municipality within the state of Quintana Roo. It is situated over 3,381 square kilometers. Lázaro Cárdenas has an estimated resident population of 22,917 inhabitants. The economically active population is conformed by 47 percent of the total population. Fishery, cattle, agricultural and commercial sector are the principal economic activities (SEDE, 2005).

In Lázaro Cárdenas, the fishery sector is conformed by 24 cooperatives. They have a fishing fleet of 785 boats. It is conformed by 14 mother ships, 49 deep-sea fishing boats and 722 coastal fishing boats. According to the Mayor of Lázaro Cárdenas, during his labor period from 2008 to 2011, the entire fishermen community has caught 4,095,000 kilograms of the overall production (lobster, octopus, shark and fish-scale). They sold their production into the local and national market. Along these three years they have earned \$US 3,337,620 (Angulo Cupul, 2011).

Chiquilá and Holbox Island are the most important fishermen communities of the municipality. Both are recognized as the best fish-scale catchers communities, so the fishery is a very important economic activity in these places. Particularly, the fishery industry of Chiquilá is organized in seven cooperatives. Some of them are “La Chiquilá”, “La Isla Blanca”, “Porvenir” and “Punta Chen”.

In this geographical region is used the catch of fish-scale (robalo and mero), octopus and lobster. In terms of economic gain each fisherman is able to earn about \$US 500 to \$US 150 per week, but it depends on the weather conditions. The cooperatives sale the product to Don Raúl Valerio, a local resident who purchases the entire marine production of both cooperatives of Chiquilá and Holbox. This man markets the production into the national market. He sends it to a big fish market called “La Nueva Viga” in Mexico City.

Figure 2. Pier of Chiquilá



Source: Jimena Cuevas, 2013

According to the mentioned above, in his review of work in 2011, the Mayor of Lázaro Cárdenas Clementino Angulo Cupul informed that in Chiquilá was invested \$US 108,420 for strengthening the fishing activity. These resources were provided by the regional fund “much mukil” and 70 fishermen and their families were favored. As well as storage services, ice factories, fisheries and the pier were restored with \$US 616,200 provided by FIFOPESCA (Fondo de Fomento a la Pesca) (Angulo Cupul, 2011). Additionally, in order to not damage anymore the environment, the national and the local governments in collaboration had invested \$US 683, 592 in the purchase of new ecological boat motors. 98 Chiquilá and Holbox Island fishermen were favored with the boat motors replacement (Angulo Cupul, 2011).

On the other hand, the tourism industry is also organized in six cooperatives “Fraternidad”, “Yaliquí”, “Miramar”, “Pescadores de Chiquilá”, “Servidores de Chiquilá” and “Isla Pájaros”. Each cooperative doesn’t have a lot of boats as the fishery cooperatives have. The biggest tourist cooperative has 20 boats.

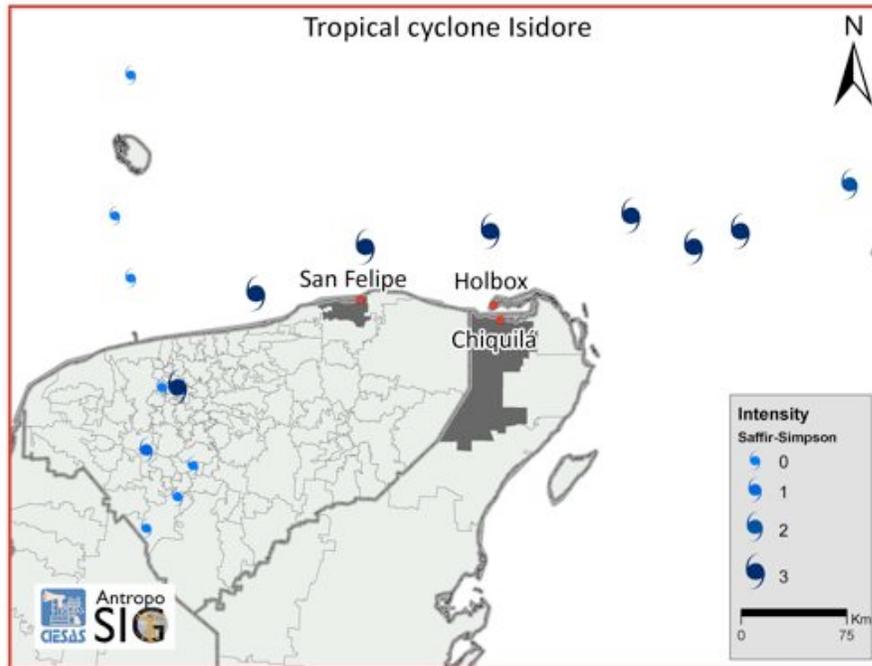
### *Good practices in San Felipe and in Lázaro Cárdenas*

In the cases of Yucatan and Quintana Roo the development of the good practices is related, in first place, with the hurricanes and in second with other hydrometeorological phenomena as heavy rains, strong winds, floods. They usually live with this kind of phenomena and they have learned how to protect themselves and their belongings. However, sometimes the adverse conditions don't allow them to protect everything. These extraordinary cases had highlighted that they need to do more to safeguard some important issues as the economic matters.

In 2002 Yucatan was devastated by the hurricane *Isidore*. The total economic losses were more than 500 million American dollar (CENAPRED, 2003). In particular, in the fishery industry the total economic losses were estimated at around 8 million American dollar. El Cuyo, Río Lagartos, Las Coloradas, Telchac, Chicxulub and Celestún were some of the fishermen communities affected by the phenomena. All together had lost 1,102 fishing boats and 651 boat motors (*El mundo al día*, 01/10/2002).

On the other hand, in the livestock sector the total economic losses were estimated at around 69 million American dollars. In the affected municipalities died 8 million chickens. Around 301 pork farms were damaged in which died 42, 200 pigs. It wasn't reported any cow, ox, or calf death, only was damaged the livestock facilities (CENAPRED, 2003).

Map 3. Hurricane *Isidore* trajectory



Source: AntropoSIG, CIESAS, 2013, created by Israel Hinojosa Baliño

After *Isidore* they realized that they had very high economic losses. Furthermore, they hadn't any saved money and the fishermen neither had fishing tools to start working again and reactivate their economy. The other people who used to raise farm animals into their yards lost them because their houses are placed near the shore, as a result the animals died drowned because the heavy rain and the consequently floods. Both fishermen and small producers asked for some credits in order to start the recovering.

In the municipality of San Felipe in Yucatan, before *Isidore* the fishermen already used to safeguard their fishing tools. They used to tie some of their small boats at the fishing pier, but this practice wasn't enough for *Isidore*. After this expensive disaster, the members of the fishery cooperatives and non-members fishermen started looking for some others protection options. They realized that they had to take the boats out of the shore and moved them to a safer place. They found a water body (*brazo de agua*) protected by mangrove placed inside the community as a safe place. They noticed that the boats could be protected from the strong winds inside the mangrove and by sinking them into the water body. In the same way they had to find an alternative to safeguard the boat motors and the

other fishing tools. They began to move these tools to storehouses 32 kilometers away from the community in the next municipality named Panabá (see map 4 below). They transport the boats motors into cattle trucks.

When a hurricane is near the community, the Director of Civil Defense of San Felipe has to warn the entire community. He tells the inhabitants to keep safe their documents and to be ready in case of evacuation. Also he warns the fishery and cattle sectors. In particular, he asks the cattle sector to take down their weather-vanes if they have it and to not tie their cows, calves, oxen, so in case of floods the cattle protect themselves looking for dry high places (Montoya, January 2013).

When a hurricane touch land the people from San Felipe knows how to protect themselves and how to not lose much money by protecting their fishing tools because they have learned how to work all together. When they have the emergency, the different sectors –fishery and cattle– and the local government work all together coordinated. They have established agreements with the cattle industry (Coral Marrufo, November 2012).

The cattle industry usually provides support to the fishermen by lending them their cattle trucks for the transportation of boat motors and people. As well as of lending their livestock facilities to keep the boat motors inside their storehouses and also use them as shelter for people. The only benefit for the cattle sector of doing this is to be helped the next time when they will needed. For example in case of wildfire. The livestock sector knows and has proved that the people of San Felipe help them to put out the fire if necessary. In others words the community acts in a supportive way in order to be everybody protected (Montoya, January 2013).

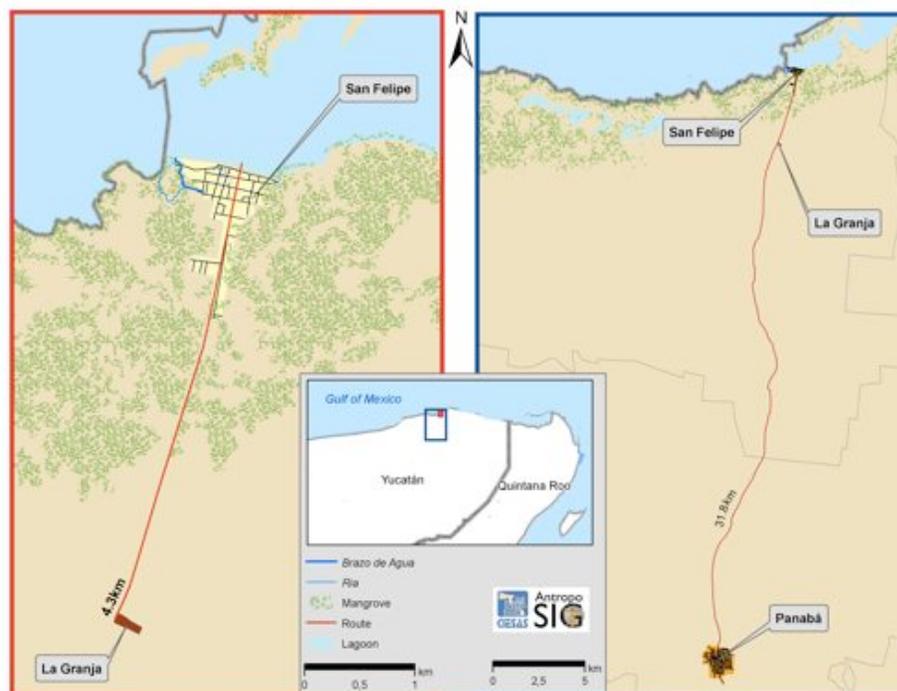
On the other hand, we have previously mentioned that *Isidore* also triggered a high economic losses on small producers. Those families who had farm animals as hens, cocks, geese, pigs, calves, sheep into their yards had lost everything. Some families live exclusively from this economic activity, some others, like some fishermen families usually have few animals in order to have some savings, so if they needed they can sale the animals. In 2002 some families had been affected on this matter.

In order to recover the economic losses and to avoid new animal losses, in 2003 the Mayor Joaquín Díaz Mena promoted the relocation of farms in a new place 4 kilometers away from the shore sea (see map 4 below). The local government invested in the purchase

of a big ground and divided it into 60 plots for the small producers. The Mayor donated the ground and around 12 families moved their farms there. Nowadays this place is well-known as “La Granja”. From then until now five families continue raising their animals there.

This initiative has covered a double benefit. As we have said, the reproduction of the farm but also with this action the Mayor has attacked a health problem. Before *Isidore* the bad smells of the pigs, hens, etcetera began to become a health problem. In this way, by doing this good practice the small producers can maintained their animals safe from floods and they also not have to spend money buying new animals after an emergency. The savings of each family depends on the amount of animals each family has. Obviously the cost of the animals is varied too. For example, the meat pig cost around \$US 2.50 each kilogram, a calf \$US 400, a sheep \$US 100, a hen \$US 5 and some cocks around \$US 200. Some families only have 10 pigs but others which work exclusively on this can have 40 pigs, 5 calves, 5 sheep, 200 hens. They never have the same number of animals because along the year they sale and purchase new ones. With this good practice each family can save between 3,500 to 20,000 American dollars.

Map 4. Hurricane *Isidore* trajectory

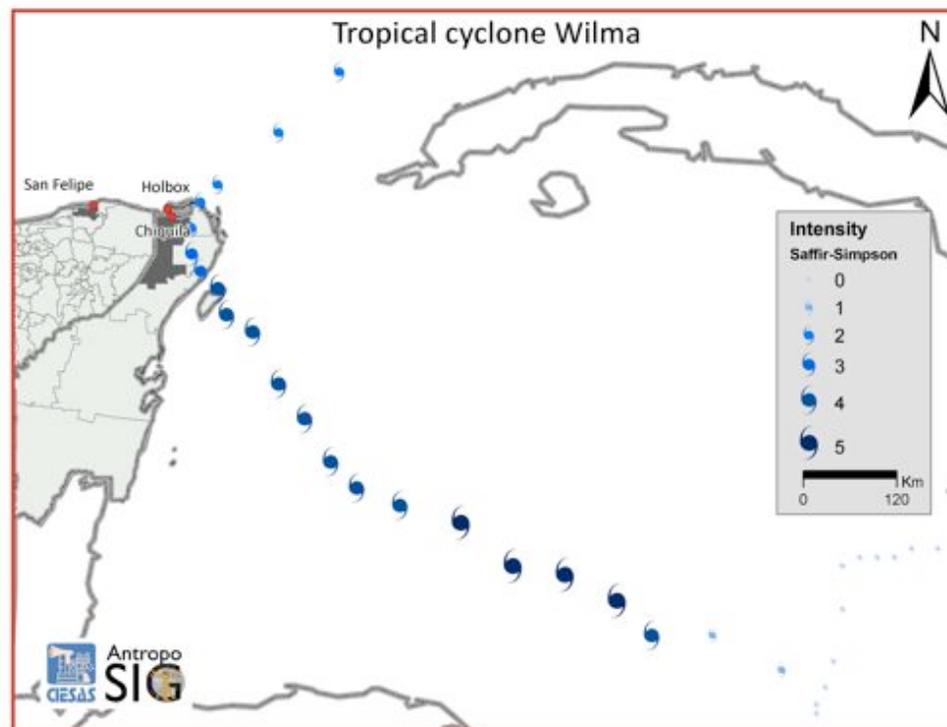


Source: AntropoSIG, CIESAS, 2013, created by Israel Hinojosa Baliño

The important thing here is to highlight that in San Felipe they have developed these good practices by coordinating the sectors involved. The economic interests were at stake, so they have to invest previously and at the moment in order to save money after an emergency. On the matter the local government has played an important role. They have to set aside part of the budget to use it for previous investment and in case of emergency. For instance at the emergency moment they have to pay the gasoline used for the transportation of the people.

The efficient use of these good practices has been proved several times after *Isidore*. The next emergency of which had to recover was the hurricane *Wilma* in 2005. According to a document published in 2007 by the UNDP, carrying out the good practice of safeguarding the fishing tools was very successful. After *Wilma* touched land the fishery industry of San Felipe only lost 4 of the 350 boats. It means that the fishery losses were very low. The losses were estimated around \$US 140,000. They only lost one percent of the entire fishery fleet.

Map 5. Hurricane *Wilma* trajectory



Source: AntropoSIG, CIESAS, 2013, created by Israel Hinojosa Baliño

In contrast in the municipality of Quintana Roo named Lázaro Cárdenas near San Felipe they lost 365 boats. The economic losses were estimated around \$US 12,775,000. It means that they lost 52 percent of the fishery fleet (Moya, 2007). After *Wilma* the fishermen of Lázaro Cárdenas have realized that they had lost more than the half of their fleet unlike their Yucatan neighbors in San Felipe who had lost almost nothing. Subsequent to this experience in Lázaro Cárdenas started reproducing the good practice of protecting their fishing tools. On that matter the UNDP has played an important role.

In the fishermen community Chiquilá in Lázaro Cárdenas before *Wilma* some fishermen as their own used to safeguard their boats but this individual practice wasn't enough to protect the economic interests of the community. After *Wilma* the UNDP began working with the fishermen cooperatives to guide them how to use public investment in order to protect their belongings and besides to not reconstruct risks again. More exactly, they were in charge to support them by guiding on the identification of the economic risks and vulnerabilities of using the investments. That is to say, by applying this analysis tool they were able to assess the risk of using the investments and they could evaluate if the good practice was going to work or not (Coral Marrufo, November 2012).

According to Xavier Moya,<sup>1</sup> the fishermen of Chiquilá asked the UNDP the purchase of trailers for reproducing the good practice used in San Felipe. They have realized that if they moved out their boats one kilometer away from the shore sea they could safeguard inside the community their boats and motors.

The UNDP had worked a lot to accomplish this good practice. Marivel Valerio, the communitarian advisor of the UNDP at the moment, had to organize some workshops with the community in order to explain them how important was to protect their fishing equipment investment. That is to say, the UNDP was in charge of making sure that the fishermen were aware on how much they could saved if they safeguarded their equipments. At the end the goal was achieved and the UNDP arranged the purchase of some trailers (Valerio, January 2013).

By using the trailers some fishermen were capable to move out their equipment and protect their boats and motors inside a ranch named San Eusebio six kilometers away from Chiquilá. Even though the trailers were used by all the cooperatives in a supportive way,

---

<sup>1</sup> Xavier Moya is the current Director of the UNDP in the Peninsula de Yucatan and Tabasco.

the cooperatives have realized the good use of the trailers and have decided to invest and buy their own.

By now in Chiquilá they have around 14 trailers, it means one trailer per each cooperative. It is important to highlight that if people is aware on how much they could loose they are going to invest some money in order to ironclad their equipment investment. That is to say that at the emergency moment each cooperative is going to use their economic funds to buy gasoline or to rent a vehicle for pulling the boats to a safe place. In economic terms it means that each cooperative member will invest about \$US 30 in order to safeguard the fishing equipment which can cost about \$US 35,000 (Valerio, January 2013).

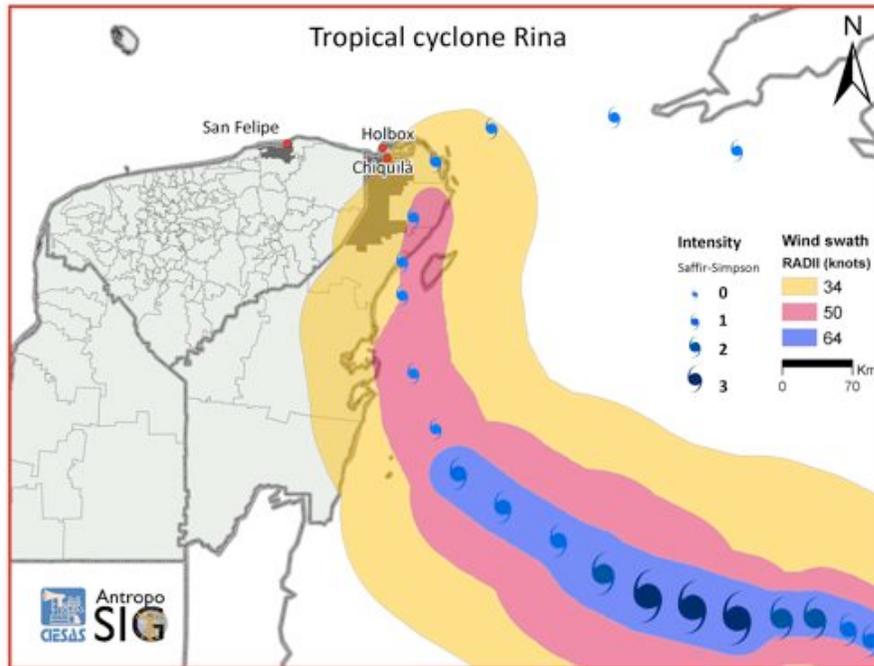
In the same way the use of this good practice was reproduced in the Holbox Island placed in front of Chiquilá. By carrying out this good practice both Chiquilá and Holbox are able to safeguard around 500 boats and their motors.

Along this time, since 2002 in San Felipe this good practice has been used around ten times as well in Chiquilá and Holbox Island it has been reproduced five times after hurricane *Wilma*. On November 2011 with hurricane *Rina* was used this practice again. The good development of it was reflected in the savings of millions of dollars. Each municipality had saved around \$US 6, 545,000<sup>2</sup> (Coral Marrufo, November 2012).

---

<sup>2</sup> The complete fishing tools cost around US \$ 35,000. The boat motor costs US \$ 15, 000, a boat US \$ 7,000 besides fishing equipment.

Map 6. Hurricane *Rina* trajectory



Source: AntropoSIG, CIESAS, 2013, created by Israel Hinojosa Baliño

Figure 3. Trailers in Chiquilá



Source: Marivel Valerio, 2011

Figure 4. Trailers in Chiquilá



Source: Marivel Valerio, 2011

### *Shaping the present and the future*

It is important to highlight the huge savings generated by scaling up the reproduction of these practices. The use of these practices safeguards the economy at many scales. In first place it protects the household economy. That is to say that each fisherman do not has to spend money after each emergency either they do not have to stop fishing because they have their fishing equipment. The fishermen are capable to catch again after one week or 15 days the hurricane had passed. At the first moment they only fish for feed themselves. In the same way the local economy doesn't stop growing up because they can be able to continue with the common activities. As a whole region there can continue with their activities specially receiving tourists, that is one of the most important issues. At the end the sum of each represents a considerable saving.

As a first conclusion it is important to say that these good practices continue to operate, in first place, because they are utterly useful and in second place because the interested people keep investing in its reproduction. For example, in 2011 in San Felipe with a public investment they got a ramp and a boom in order to speed up and to make easy the equipment safeguarding. In response on the fishermen cooperatives demands, the

Mayoress in charge Adlemi Marrufo negotiated an economic resource with the API (Administración Portuaria Integral) in order to build a ramp in the shore and to install a boom over the ramp. With these two new elements the fishermen can put their boats over the ramp and with the boom hook the motors and move them in an easier way into the cattle truck.

Figure 5. Ramp and boom in San Felipe



Source: Jimena Cuevas, 2013



Source: Jimena Cuevas, 2013

On the other hand in Chiquilá and Holbox their investment is focused on maintaining greased the trailers and keeping them in the shade.

As a recommendation these kind of practices can be understood as a Business Continuity Plan which allows to reactivate the local economy as quickly as possible. In the same way these good practices can be promoted as local public policies in order to avoid the welfare policies. That is to say that would be better to invest on the economical necessities of the economically active population in order to reactivate the local economies instead on investing on those kind of policies which only give immediate money.

## References

Angulo Cupul, Clementino. 2011. *Tercer informe municipal de Lázaro Cárdenas*. Quintana Roo.

CENAPRED (Centro Nacional de Prevención de Desastres). 2003. *Impacto socioeconómico de los principales desastres ocurridos en la república Mexicana en el año 2002*. Mexico: CENAPRED.

Gobierno del H. Ayuntamiento. 2010. *Perfil municipal de San Felipe, Yucatán. Administración 2007-2010*. Yucatán: Gobierno del Ayuntamiento.

Hidalgo, Hugo and Angélica Méndez. 2007. *Diagnóstico organizacional y de necesidades en las comunidades pesqueras en el sistema arrecifal mesoamericano*. Livingston: Mar Fund.

INEGI (Instituto Nacional de Estadística y Geografía). 2011. *Censo de Población y Vivienda 2010*, Mexico: INEGI.

Moya, Xavier. 2007. *Metodología para el análisis de riesgos por sistema, hacia políticas públicas poco vulnerables ante contingencias*. Mexico: UNDP.

SEDE (Secretaría de Desarrollo). 2005. *Plan Gran Visión 2000-2025 Quintana Roo. Avances al 2005*. Quintana Roo: Secretaría de Desarrollo de Quintana Roo.

UNDP. 2002. *Atención a contingencias en la Península de Yucatán. Documento de proyecto*. Mexico: UNDP.

## Interviews

Coral Marrufo, Roberto. Interviewed on November 2012. He is a stockbreeder of the municipality of San Felipe. He had worked for the UNDP as a communitarian advisor until 2011. Currently he works at the local government of San Felipe in Yucatán.

Montoya, Feliciano. Interviewed on January 2013. He is the current Director of Civil Defense of San Felipe.

Valerio, Marivel. Interviewed on January 2013. She was the communitarian advisor of the UNDP in Chiquilá until 2011.