



Remembering cyclones : from psychosis to resiliency

Remy Pitot

► To cite this version:

Remy Pitot. Remembering cyclones : from psychosis to resiliency. Architecture, space management. 2022. dumas-03676929

HAL Id: dumas-03676929

<https://dumas.ccsd.cnrs.fr/dumas-03676929>

Submitted on 24 May 2022

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons Attribution - NonCommercial - NoDerivatives 4.0 International License



Remembering cyclones: from psychosis to resiliency

The tell tales of Carol, Gervaise and Hollanda, the trio that shook Mauritius

Mémoire de master en séminaire Architecture, Ressources et Risque Cyclonique
ENSA NANTES 2022

Remy Pitot

ECOLE NATIONALE SUPERIEURE D'ARCHITECTURE DE NANTES
DOCUMENT SOUMIS AU DROIT D'AUTEUR

Remembering cyclones: from psychosis to resiliency

The tell tales of Carol, Gervaise and Hollanda, the trio that shook Mauritius

Preface

Social Memory forms part of a new discipline that has yet to be fully discovered and find its way in our society but it has shown strong merits and importance in building resilience in communities.

I have always wondered, why concrete has suddenly become such an important part in the Mauritian society in the late 1900s. It seems that using anything other than concrete today feels a bit like fiction- It turns out it is the result of a psychosis that lies within the community after the Cyclone Carol. A disaster that has turned tables and reshaped the Mauritian landscape drastically.

This study focuses on the link between the concept of memory and community resiliency. It is aimed to understand the role of memory in Mauritius through local experiences, know-how and expertise, and how the transmission of this knowledge between generations help in the fight for resiliency.

Acknowledgement

Through this initiation to research, before all else I would like to thank the **ENSAN Mauritius** and **ENSA Nantes** team.

I would like to send special thanks to **Pascal Joanne**, Architecte DPLG et docteur de l'université de Nantes (2003), researcher at CRENAU and lead professor in “architecture, ambiances, urbanité du master 2 Ville et Environments Urbains” at ENSA Nantes for his continuous support and guidance throughout this research without which, it would not have been possible. This research represents more than just a university work. It represents the possibility to open the mind to new possibilities, and bring a piece of valuable information to my community.

I would also like to thank **Alexandre de la Foye**, professor at ENSA Nantes and researcher at CRENAU for the development of this research seminar “Architecture, Resources et Risque Cyclonique”, and by his precious help and

guidelines in the beginning of this research.

This research would have not been possible without the help of the **Mauritian community**. I would like to thank each one of them who, supported my ambitions, ideas, and especially to the individual I have interviewed. Thank you for your time and your experience, they have been of valuable information for me.

I would also like to thank my **family and friends** for the constant support during this research. I would like to give a special to **Henriette Valentin Lagesse**, Architect in Mauritius who have been of great help to me.

Lastly, a special thanks to my **parents and brothers**, who were always of support during my studies, but also during this research.

Glossary

Keywords

Social Memory
Collective Memory
Cultural Memory
Vulnerability
Risk
Risk perception
Cyclonic activity

Disaster: “The actual condition of loss of economic, social, cultural or geographic value”

Risk: “The conditional probability and magnitude of harm attendant on exposure to a perturbation or stress”

Hazard: “The threat of a stress or perturbation to a system and what it values”

Resilience: “The ability of a system to absorb perturbations or stresses without changes in its fundamental structure or function that would drive the system into a different state (or extinction)”

Vulnerability: “The degree to which a person, system or unit is likely to experience harm due to exposure to perturbations or stresses”

Risk Culture: “The lack of exposition to risk within the country, determine the ability to identify, understand and manage the current and future risks”

Definitions taken from the work:
Turner, B.L., Roger Kasperson, Pamela Matson, James McCarthy, Robert Corell, Lindsey Christensen, and Noelle Eckley et al. 2003. “A Framework for Vulnerability Analysis In Sustainability Science”. Worchester: PNAS. <https://www.pnas.org/content/pnas/100/14/8074.full.pdf>.

Table of Content

Preface	4	Chapter 3	73
Acknowledgement	6	3.1 Carol, Gervaise and Hollanda; taken by storm	74
Glossary	8	3.2 Mauritius, memory and experience	75
Introduction	14	3.3 An analysis of the role and use of collective memory in the Mauritian community	77
Chapter 1	25	3.4 Anchored down memories	87
1. Social Memory	26	3.5 The lessons from the deadly trio	104
1.1 Collective Memory	27	Conclusion	110
1.2 Cultural Memory	28	List of figures	116
Chapter 2		Bibliography	117
2.1 Mauritius: The star and Key of the Indian Ocean	33	Annex	123
1598 to 1710 – The Dutch East India Company	38		
1715 to 1810 – The French East India Company	40		
1810 to 1968 – The British Ruling	45		
2.2 Post-Independence concretization	62		
2.3 Unlocking the future	70		



Figure 1: Image of damaged construction from Cyclone Carol in Port-Louis Mauritius
Vintage Mauritius. N.d. Image. <http://vintagemauritius.org/category/galleries/>.

*"Design for the present, with an awareness of the past for the future
which is unknown"*
Norman Foster (2007)

Introduction

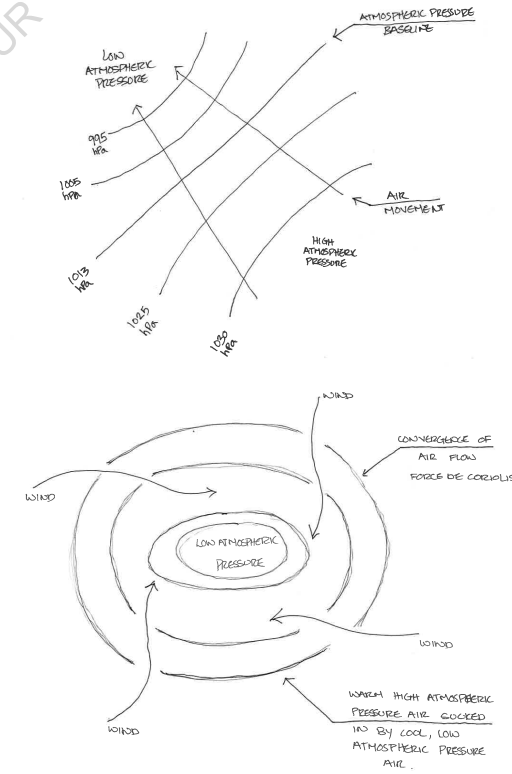
*We are today in a world where things are changing faster than most people can keep up with. Adaptability is beginning to become one of the most looked-after skills in concept design and structure. Just like Norman foster once said, “**the key to a resilient design is the awareness of the past for an unknown future**” (Foster 2007). Is this awareness of the past a key aspect that we hold on to today? Or is it something that we take for granted and follow the natural trend set by our elders? Or maybe, something we are unaware of?*

The Island of Mauritius has a long and rich history of a number of settlers that dates back as far as the first landing of the Dutch in 1598 up until its independence from the British in 1968. This persistent change in settlement patterns of Mauritius has created a strong cultural diversity and an adapted colonial architecture across the Island. From an imported French architectural style in the early 18th century to a more climate and cyclone adapted architecture in the 20th century, the traditional colonial architecture of Mauritius has seen a progressive evolution through history (Lagesse 1986). This architecture of the past has been prominently erased in the early 1970s to be replaced with a more robust, solid construction – the concrete. As if, modernism only truly made landfall in Mauritius after its independence and/or after cyclone Alix and Carol in 1960, unlike the western world that went through the modernism period in the early 1900s, through the deployment of their new

artillery of new material, construction methods and technologies. All the necessary tools to embrace minimalism and functionality into one solid and robust design. Could this delayed modernism movement in Mauritius be because of the new global movement of “post-modernism” of the western world? Or the development of an open free market into the new world because of the Island’s new leadership post-Independence? Or could it be because of an economic boom, shooting the country’s development? Or could it be that of the threats of **cyclones**? The natural mechanism of fear, grasping concrete and steel as the only stable and solid material for safety and **resiliency**?

Cyclonic activities are a meteorological phenomenon that provokes high winds (up to around 350 km/h), torrential rains, and high tides. The formation of cyclones is a complex process (Barré et. Al. N.d.), but it must meet the following

Figure 2:
Formation of
cyclonic activities
Barré, Christian,
Alexandre de la Foye,
and Sophie Moreau.
n.d. Conception
Paracyclonique. Les
grand ateliers de l'isle
d'abeau. p8.
Original image reworked
by Remy Pitot



conditions: It must be over warm bodies of water (26 degrees C or higher), near the equator to allow the **Coriolis force** to appear and it must be in a **depression zone**. The structure of cyclones revolves around a central vertical structure, also known as the eye. The atmospheric pressure within the eye is extremely low, and the wind speed is practically null. This low-pressure area causes a movement of air from the high-pressure zones in the surrounding to move towards the center (*Figure 2: Formation of cyclonic activities*). The stronger winds of the cyclones are as a result located on the periphery of the eye and become weaker as we move away from its center (*Figure 3: Schematic representation of cyclones*). There are typical cyclonic formation zones around the world, and in the Indian Ocean Mauritius island is settled right in the center of cyclonic activity (*Figure 4: Cyclones Activity zone in the Indian ocean*).

Cyclones become a threat to communities through the natural hazard itself coupled with the **vulnerability** of humans. Even though cyclones are often presented as **natural disasters**, they are anything but a natural disaster. Cyclones only become disasters when the vulnerability of the settlement is exposed to the hazard. Disasters are therefore according to Walshe et. Al., (N.D), “a result of actions, decisions and structures people live with and in”. If the community is not vulnerable to the hazard, the hazard (cyclone) is not a disaster. What is known is that Mauritius has always been a cyclone’s prey and over the evolution of Mauritius, numerous cyclones have claimed the lives of many, left many injured and an even greater number homeless.

Up until the writing of this master’s thesis, Mauritius has not been hit by a major cyclone since the cyclone Gervaise in 1975 (Wind gust of 280 km/h), or the slightly weaker Hollanda

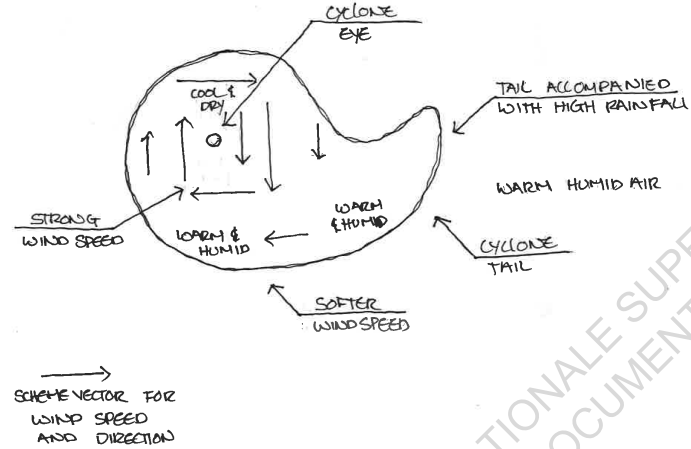


Figure 3: Schematic representation of cyclones
 Barré, Christian, Alexandre de la Foye, and Sophie Moreau. n.d. Conception Paracyclonique. Les grand ateliers de l’île d’abeau.
 Original image reworked by Remy Pitot

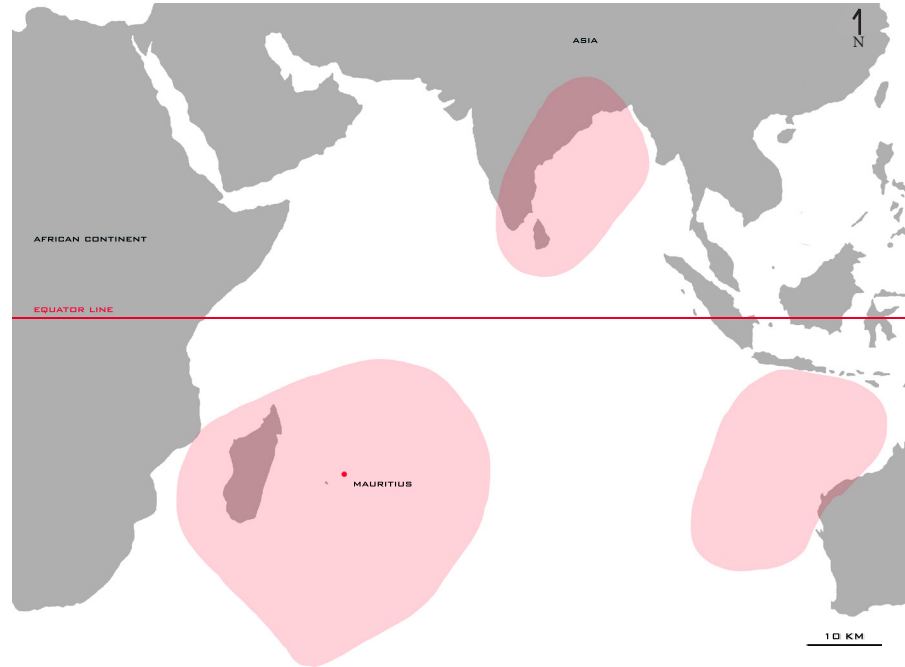


Figure 4: Cyclones activity zone in the Indian ocean
 “Mauritius cyclones”. 2021. Mauritius Inside Out. <https://www.mauritiushinsideout.com/mauritus-cyclones.html>.
 Original image reworked by Remy Pitot

in 1994 (Wind gust of 280 km/h), and today only few people live to remember and can tell the tales. Upon reflecting on Norman Foster (2007) quote: *“Design for the present, with an awareness of the past for the future which is unknown”*, one could ask the following questions: What if people forget, or have already forgotten? Are we designing with an awareness of the past? Are we designing for the future? What is the importance of remembering cyclonic disasters? Amongst other possible answers, perhaps this “memory”, or awareness of the past results in a current risk awareness in individuals, or perhaps because it allows people to learn from the past experiences and develop new techniques and mechanism to become more resilient towards the possibility of a new disaster. Mauritius will face another cyclone; when? How strong? How disastrous will it be? Is Mauritius at risk?

While for the past fifty years, **concrete** has been the primary method of construction in Mauritius, the world is beginning to transition into a more sustainable, **ecological**, and green world. Through this transition, we seek to reverse the negative impact of buildings on our environment and quality of life. This transition on the other hand, will come at the cost of the use of new materials, technologies, and an overall deeper and more complex ecosystem that I believe Mauritius is unprepared for and could be of danger in the fight to resist future cyclonic activities.

It leaves to question if **we can appeal to the transmission of cyclonic memories to help in the fight to build a safe and resilient future in Mauritius.**

This research will analyze the importance, the means, and transmission forms of cyclonic memories in Mauritius through the role that

cultural and collective memory has on Mauritian society, and advise how we can use these elements of memory transmission in this **ecological transition.**

It is said that people who remember tragic events are less susceptible to risk than those who are unaware or forget. As discussed in this paper, the use of collective and cultural memory is of high importance and is a critical component in reducing the country’s **risk** to cyclonic hazards.

This research will follow a development of concepts by firstly dissecting **social memory**. To understand the role of social memory in disasters, the sub-concepts; collective and cultural memory will be explored in detail. This will be followed by an in-depth investigation of its purpose, leaning particularly to its role in disasters. The second section will discuss the **temporal structure** of Mauritian history and its

architectural evolution. The timeframe in which Mauritius was developed can be summarized into 4 distinct phases – the Dutch East India Company, the French East India Company, the British ruling, and the last phase, what I call the “**post-independence concretization**”. This section of the research will highlight the big axis in which architecture has adapted itself with overtime time to our local climate and in a cyclone prone environment.

While this early adaptation of the traditional colonial house may have been helped through the use of memory, the third section will examine the stories that are told and shared, and the cultural memory currently present within the Mauritian community. While the testimonies used as examples throughout the paper are specific to some living conditions, this paper will argue that understanding the local context and the elements it brings forward is fundamental for the successful use of memory. Lastly, the analysis

will highlight the importance, how, whether the use of cyclonic memories can in fact be of help, and suggest a potential toolbox of ways and methods in which memory can be of use to improve resiliency in Mauritius in this future potential ecological transition period.

I wish to precise that the study conducted is not aimed or biased to any social class in particular. This research utilizes three types of data gathering techniques.

Firstly, a series of interviews with volunteering individuals, regardless of their social, economic, and cultural backgrounds. These interviews are completely intuitive to the interviewee, free to discuss cyclonic events as they see fit. A set of questions on the other hand has been redacted preliminary to the interviews to redirect the discussion to cyclonic memories if need be. These interviews are targeted to understand the

role of memory before, during, and after the cyclonic activities, and understand if memory can be of use in its fight to resiliency against cyclonic activities.

Secondly, a series of randomly distributed anonymous questionnaires are issued to understand the position in which Mauritians stand in relation to the current phenomenon of global warming and determine if there is a tendency or indication of this ecological transition movement from the community.

Lastly, secondary source media such as the internet, documentation, archives, and research papers available online, in libraries, and government archives will be used to supplement my research.

ECOLE NATIONALE SUPERIEURE D'ARCHITECTURE DE NANTES
DOCUMENT SOUMIS AU DROIT D'AUTEUR

Chapter I
Social Memory in society

The definition and role of **memory** is in theory very simple, but yet complex due to the nature of the environment, the culture of communities, the type of events, the development patterns and qualities, and historical perspective through temporal evolution. Memory helps to inform people on their environment, **educate** and aim to alter the **risk interpretation** as well as alter their **responses to future disasters**. It allows the population to be less susceptible to risk and helps them survive in particular environments. Memory consequently enables people to learn from past experiences and allows them the possibility to have an application of this knowledge into their present and/or future circumstances (De Jong and Van Tilborf 2021). It is as a consequence, important in the way people respond to risk and become resilient. Consequently, societies progressively create cultural ways to deal with disasters¹, environmental risks, and climate issues (Walshe, Adamson, and Kelman, N.d.).

1. Social Memory

Social Memory was first popularized by Bertalanffy (1968), who highlighted that *“any system – human or natural- is imbued with a ‘memory’ that relates the system to past events. It implies that knowledge, experience, and accumulated wisdom are passed on within a community and any community system will be at its specific starting point because of the history of decision-making trajectories preceding that starting point”*. It is further argued that *“Social memory comes from the diversity of individuals and institutions that draw on reservoirs of practices, knowledge, values, and worldviews, and that*

¹ It is important to note that I refer to disasters here, rather than hazards as they are two different concepts. In order for a memory to be effectively memorialized and transmitted, it needs to come from a disaster, and not a hazard. Hazards only become disasters when the population or settlements are vulnerable. The vulnerability to a disaster is therefore *“the degree to which, a person or system is likely to experience harm due to exposure to the perturbations or stress”* (Turner et al. 2003).

social memory is, therefore, crucial for preparing a system for building resilience”. Social memory, as a result, is crucial in **disaster management**. According to Kansteiner (2002), it is a *“memory attached to natural disasters in the communities around the world that originates from the shared communication about the meaning of the past events that are anchored in the life of these individuals”*.

While the **knowledge and learning processes** evoked might be important, how they function and how they are passed on is another crucial step. Some argue, according to Wilson (2015), that it is most successful when the actions or response to the perturbation are put into formal or non-formal traditions as this memory can be subject to decay over time. For this reason, the concept of social memory consists of two important sub-concepts that are crucial: **collective and cultural memories**.

1.1 Collective Memory

Collective memory results in two diverse disciplinary approaches to its understanding.

1. As an extension and series of collection of individual memories,
2. As a social and political process derived to make meaning of the past that operates through all levels of society.

In simple terms, it is the experiences of one through oral traditions. This, typically shared by the group, family, and friends, tend to disappear with the passing of the witness (De Jong 2021). If the disaster is not recurrent, the memories will eventually fade away resulting in a lower risk awareness amongst the population.

While collective memory seems undeniably effective in its core definition, collective memory can also **anchor disasters** in the past and not necessarily act as a reminder or warning of risk as research by Monteil et al. (2020) demonstrates. Through the buildup of anxiety and high-level traumatic events, there are possibilities that a drastic **transitional pathway** is chosen. Supported by Wilson (2015), once this transitional pathway has been taken, it may become difficult to leave due to numerous reasons, including cultural, socio-economic, political, and institutional factors, and may result in two possible outcomes.

One is where humans are able to adapt to, learn from and anticipate new situations, while the other is the burying of and decay of experiences that was created by the **trauma**, by suppressing these memories which will eventually begin to erase themselves progressively.

1.2 Cultural Memory

In contrast to collective memory, cultural memory aims at providing the population with the **knowledge, practices, and sets of techniques** to survive in disaster-prone environments. Cultural memory further enables people to **make sense** of the disaster they have just been through and can be of equal help in the recovery phase. An incredibly important aspect in ensuring that resiliency can be built. Here, the transmission of memory is not through the oral traditions but instead, they focus on the handing down of information from generation to generation with a more set-in-stone method (De Jong 2017).

There could be the use of paper mediums, architectural mediums (monuments), narratives, songs, writings, poems, seminars, museums, tours, images, etc. They are mediums that can be transmitted through the medium to long-term and can last generations, unlike collective

memory which is more geared to the short-term transmission and typically dies with the last eyewitness. It is therefore not only about having the past scientifically examined and recorded, but it is more about **how the past is remembered** and how these events are re-interpreted and shared over the years.

Cultural memory is not only helpful for the individuals at risk themselves, but it may also provide the disaster managers additional insights into the community within which they act for. This way, the **disaster managers** receive additional insights into the community perceptions and behaviors but most importantly can integrate the knowledge and capacities into their contingency plans for added benefits (De Jong 2017).

While collective memory has its importance in helping build resiliency in Mauritius on some levels, cultural memory brings a toolbox of

different distinguished and equally as important aspects as well.

There are three main purposes of cultural memory according to De Jong and Tilborf (2021).

1. Used as a knowledge repository allowing communities to receive crucial information on the hazards.

Cultural memory functions as a source of historical experience. While it mainly bases itself on tangible sources such as the media, images, or monument evoked above, intangible sources derived from collective memory can also be of valuable importance. The collective memory, if gathered, analyzed, transcribed, and shared, will have evolved from being a short-term intangible state (collective memory) to a medium to a long-term tangible asset (cultural memory). This information can provide

communities with important information on precursory signs, possible vulnerable locations, changes in landscapes, areas susceptible to danger or safety as well as components that are typically vulnerable to cyclonic risks. In addition, it may also provide information on community mitigation, through the possible actions taken to reduce risk to the communities from cyclonic hazards. This first-hand knowledge and elements will be studied in greater depth later on in this chapter.

2. It allows communities to develop contingency plans and can encourage sets of strategies and practices in how a country deals and responds to the hazard.

The cultural memory can additionally help communities in interpreting the event or past events, and create a potential response plan. It is an important aspect in the way communities

can explain and react to the event through the remembrance, memorialization and comparison of the event. This is supported by Engel et al. (2014), stating that *“communities living in hazard-ridden or disaster-prone areas develop through memory, an array of coping mechanisms as well as more deeply embedded practices to deal with threats and opportunities their environments encompass ... Experiencing recurrent disaster pushes communities to develop cultural strategies and practices to deal with these adverse events and ensure increasing levels of resilience”*. Examples of which are discussed in section 2 of this paper; through the history and the evolution of the local traditional colonial architecture, and how small elements varied were typically nationally adapted for comfort and safety.

3. It helps provide the communities with explanations of the events, assisting in the mitigation of the trauma and its acceptance allowing these individuals to move on, adapt and respond for the better to future events.

A series of psychological studies have shown that the aftermath of some traumatic event can disturb a community's foundation. It is therefore important to the community to understand and accept an event in the fight for resiliency. Making sense of the traumatic experience is thus the essence of dissipating fear and allow to find ways to recover and improve themselves on. On the other hand, if due to the trauma the communities fail to understand and accept the events, there is the possibility that these memories are suppressed, and overtime buried and forgotten within the community. Making the people unprepared and vulnerable to the next hazard.

ECOLE NATIONALE SUPERIEURE D'ARCHITECTURE DE NANTES
DOCUMENT SOUMIS AU DROIT D'AUTEUR

Chapter II **Mauritius, a multi-cultural development**

Star and Key of the Indian Ocean

The diverse origins of Mauritius that we know today comes from every corner of the globe. This land has been receiving over the past few centuries the seeds from a swarm of different religions, cultures, races as well as lifestyles. Nested in the middle of the Indian Ocean, the island was the perfect place for stop-overs for the first trade routes of the Western world and Asia before being permanently colonized by multiple European countries. Mauritius was clearly a strategic position back then, and remain a strategic position today. Although, highly diversified in comparison (Lagesse 1986).

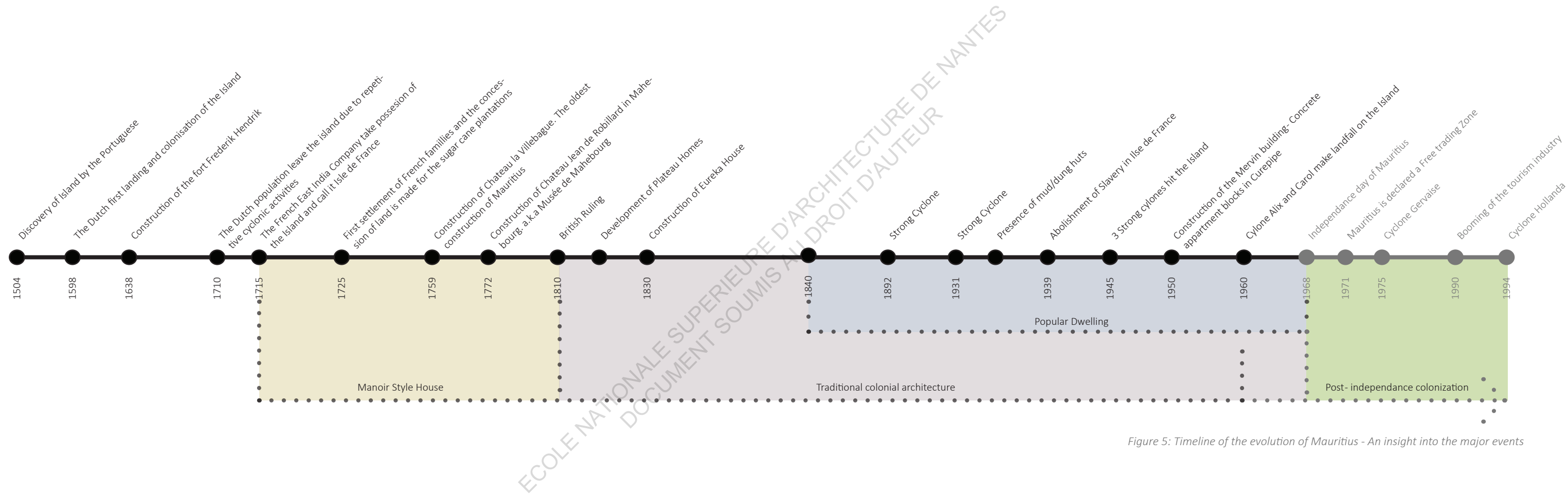


Figure 5: Timeline of the evolution of Mauritius - An insight into the major events

1598 to 1710 - The Dutch East India Company

In 1598, Dutch ships entered Grand Port as a safe-haven during a strong tropical cyclone. During this time, the island of Mauritius was only considered as a transit destination during their expeditions. A place, with the main purpose of refueling goods. Although Mauritius at this point was looked at as being potentially a lucrative site for long term colonization, the **constant cyclonic activity** on the island only kept the island as a temporary stopping point. This was a struggling time for the settlers because of the lack of local know-how for hurricane proof constructions. The Dutch settlement in Mauritius was thus in small scale, and had little to no impact on the urban and architectural development of the island that can be visibly seen today.

While the first building constructed by the Dutch was the Frederik Hendrik fort in Grand Port in 1638, the later was built in stone for protection

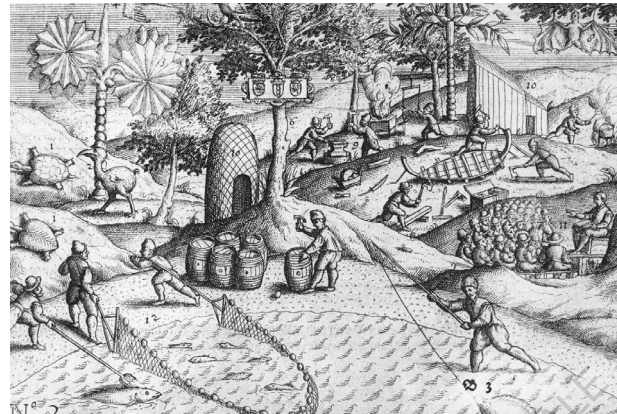


Figure 6: Copper engraving from 'Het Tweede Boeck' showing Dutch activities on the shore of Mauritius during the 1598 voyage of Admiral Jacob van Neck.

Nations online. 2021. Mauritius. Image. <https://www.nationsonline.org/oneworld/mauritius.htm>.



Figure 7: Archived drawings of the Dutch early settlement

Nations online. 2021. Mauritius. Image. <https://www.nationsonline.org/oneworld/mauritius.htm>.



Figure 8: Remains of the Fort Frederik Hendrik in Old Grand port

Personal Image

against potential attacks, while the dwellings are believed to have remained in light materials. During this period, little to no evidence can be found on their habitations except for some captured copper engravings found in archives. Through these, they can be assumed to represent the living conditions of the Dutch during this period.

We notice through these copper engravings that the settlements were simple and in a hut like style. While the latter is only representative, we can nevertheless only rely on the ruins of the Frederik Hendrik fort in figure 8 in Grand Port to confirm the presence of the Dutch settlement and architecture in Mauritius during the early 18th century (Old Grand Port Heritage Site and Museum 2021).

By 1710, the colony left the island as a result of a powerful cyclone, and all infrastructures would be dismantled before setting sail.

1715 to 1810 – The French East India Company

Following the long partial Dutch colonization period, the French settled of the Island and called it **Ile de France** in 1715. The island was once more primarily utilized for refueling until 1725. This date is important as the true colonization history of Mauritius begins: whole French families were brought into the Island to begin its exploitation. The concession of land was made to a handful of families for them to govern and develop the land and the sugar economy. To sustain this development, slaves were brought in from numerous countries across Africa and Asia. During the French colonization, the island had developed to a thriving colony and a booming economy - culturally, economically as well as architecturally. There were two distinct type of habitation: the laborers who lived in mud/dung huts, and the French settlers who lived in French Provincial Homes, also known as “**Manoir style house**” in Mauritius according to Lagesse (1986).



Figure 9: Initial design
Saglio, Christian, Isabelle Desvaux de Marigny, and Henriette Valentin Lagesse. 1991. Mauritius Style, Life On The Verandah. 1st ed. Mauritius: Les Nouvelles Editions du Pacifique.



Figure 10: Jean de Robillard House in the early 1930's
Saglio, Christian, Isabelle Desvaux de Marigny, and Henriette Valentin Lagesse. 1991. Mauritius Style, Life On The Verandah. 1st ed. Mauritius: Les Nouvelles Editions du Pacifique.



Figure 11: Musée de Mahebourg in 2020
Personal Image

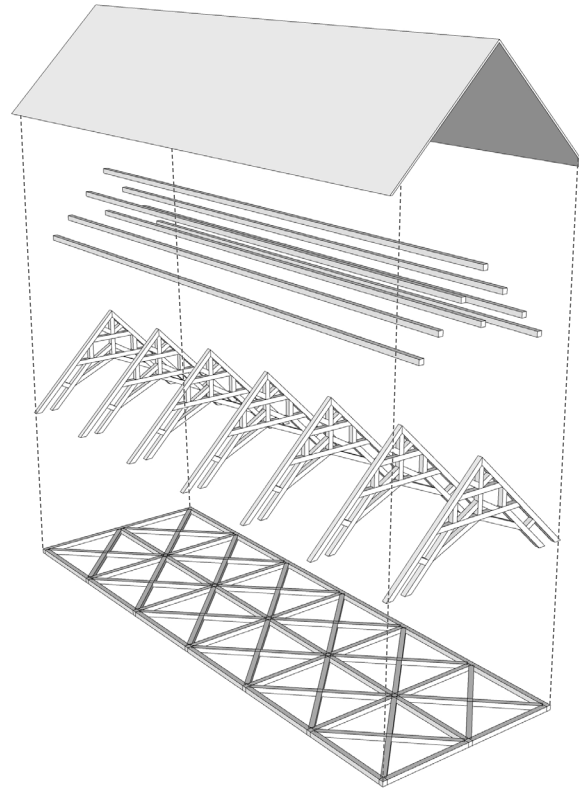


Figure 12: Schematic perspective of the typical inverted hull roof structure of the “Manoir style” houses in Mauritius

The French provincial style

The first dwellings in Mauritius were very primitives of the known “**French provincial architecture**” (Figure 9-11). The construction was either entirely built of wood or stone, rectangular-shaped, and does not present at this point in time any specific colonial attributes typically seen today in Mauritius. This is because they were an architectural model imported from France. As supported by Lagesse (1959), it is “*the kind of architectural inspiration that they brought with them.... which they owned in France but had to abandon, and for their new home in Mauritius*”.

The structure of the house is very **symmetrical**, interconnecting rooms, and they tend to have a balanced proportion. These homes clearly share the characteristics of “the French abode of the XVIII century”, which show clear signs in time that there have been little to no added modifications made. For exemple, the Château de Jean de

Robillard in figure 9-11 and Maison René le Juge de Segrais et de Mongoust.

In comparison to the aesthetics and design of the French Provincial architecture, the structure of the homes was indeed different from the late 19th and 20th-century traditional colonial homes. Typically built by the ship carpenters in the past, the roof structures showed few characteristics of **naval architecture**, a form that was typically present in the manoir style homes during that period.

The Jean de Robillard house for instance, is today known as the Musée de Mahebourg, which still stands and is one of the oldest colonial homes in Mauritius. Through the image of its evolution, it is clear that the house has not undergone any modification overtime under the different governance the country went through and remained in its original state in form and

structure. If compared and analyzed, these structures look similar to the ones of the **hulls of a ship** (Figure 12)². Due to their strong and robust roof structure, they were designed to withstand strong wind loads instead of water pressure. This structure is fascinating and would require a special detailed study to understand what makes the strong nature of this structure and how the forces are distributed. In addition, through the use of shingles and the lack of overhangs, these homes managed to withstand three centuries' worth of cyclones.

The constructive elements that can be considered as advantageous for the Manoir style home are the lack of architectural elements on the structure envelope, as well as the lack of decorative elements from which strong winds can engulf itself in weak spots. Instead, these homes are characterized by their **strong stone structural base and columns** and

strong roof structures that ensure its solidity and stability in harsh weather conditions, but not an architecture that is necessarily adapted to the hot humid tropical climate that is Mauritius at this point in time. While few of these homes have remained in their original state over the years, many others are believed to have been modified on multiple occasions, altering the appearance of the home³.

Furthermore, if the images of figure 9-11 are to be looked at carefully, the Jean de Robillard house in the early 1930s shows a distinct contrast in the color of the roof shingles. Although not supported by any evidence or testimonies, one hypothesis could be that the latter were damaged or blown off due to

² Figure 12 is a reconstructed schematic perspective from a photograph

³ Figure 14 The oldest house in Mauritius is le "chateau de la Villebague, built in 1759. This typical "manoir style house" has received over the years modifications in order to adapt to the local climate.

a cyclone while having the core of the house remained intact; possibly the 1931 cyclone that hit Mauritius (*annex 2*). Some research suggests that the use of shingles on constructions of the past were used as **elements to be sacrificed** during strong storms as they are easily replaced while limiting the impacts on the core of the house itself (Lagesse 1986).

1810 to 1968 – The British Ruling

The British were to colonize Mauritius right after the French up until Mauritius's independence in 1968. It is during this period that Mauritius has seen the most development- economically, culturally, architecturally as well as in urban development. While the economy and development of Mauritius were supported by the sugar economy and the inexpensive labor it offered, the battle of the abolishment of slavery of the world in 1865 was a challenge for Mauritius. Instead, it remained well implanted

in the community until 1939. The indentured laborers were brought from India and Africa, although not considered slavery, they were forced to work for free under contract until 1922.

Throughout the first twenty years of the 1900s, the Europeans began to lose their position of domination, and the indentured laborers began to develop settlements, on small parcels of land that were made available to them on designated properties.

The demographic and **social structure** of Mauritius pre-independence was at this point, entirely modeled by the sugar economy and its past.



Demographic structure of Mauritius

Franco-Mauritians : 2%
Chinese-Mauritians : 3%
Créoles : 27%
Indus-Mauritians: 68%

Out of these population groups, their roles and functions were clear in the community.

Throughout the ruling of the Europeans in Mauritius, the demographic structure remained rather similar with the Franco-Mauritians at the summit of the structure at all times. Each ethnic group had clear functions and roles in the economy. The Franco-Mauritians were property holders and developers in the Sugar industry. They are wealthy and hold power. The Chinese-Mauritians were the merchants, bringing in materials needed for construction and most food supplies needed. The creoles and Indus-Mauritians were the laborers, destined to work in fields.

The rise of the traditional colonial architecture

The era of the British settlement in Mauritius has seen the most **diverse architectural evolution**. While the French were never chased away from

the Island upon the new British Governance, the British were to allow the European and non-European existing families to remain on their properties, maintain their religions, laws, customs, but live under its new British laws and governance.

From mud/dung huts to the so-called “**popular dwelling**”, from the **Manoir style to the Plantation and Plateau Homes**, the French Provincial Architecture slowly shifted to a more adaptable and **climate-friendly architecture**. This transition, according to Lagesse (1986) gave rise to the term **Traditional Colonial House**, extracted from her thesis “*The traditional Colonial Architecture of Mauritius*”.

Plantation Houses

Given that the main economic activity was sugar cane, most of the agricultural land was used as plantations. In 1860 there were 260 independent

sugar cane plantations, but as the years passed, these factories closed down, and in 2020, only 5 remained.

Plantation houses typically belonged to the independent sugar cane plantation owners, and were not necessarily atypical in style, or had special characteristics. They tend to keep the core of the house in a French Provincial style but what makes these houses unique and distinguishable today are through the large, magnificent grounds from which stand century-old trees, large homes with large rooms, and the lack of elaborate details and decorations.

La Villebague house built in 1759 or la Maison d’Eureka built-in 1830 for instance (*Figure 13-14*), through a very **symmetrical approach** of the construction with its centered entryway, shows clear signs of the French Provincial Architecture as mentioned previously. Over

time it has adapted itself into the local context and climate. These two examples are now considered traditional colonial architecture as indicated by Lagesse (1986).

Some **key characteristics** that these homes have adapted to the local context and climate are the verandah's roof not connected to the main structure of the house; some houses built turrets; the conversion of windows to doors for all-around access and cross ventilation; the overhangs on the windows and doors; the awning to ventilate the roof; were some of the main characteristics amongst other attributes.

Together with its strong core derived from the French provincial architecture, the house has mutated into a **climate-adapted architecture** to deal with the everyday hot and humid temperate, as well as protect the core of the house against cyclonic activities. Research in Para cyclonic

activities by Barré et. Al. (N.d.), and supported by Lagesse (1986) suggested that the verandahs in traditional colonial homes were additions made to the main house, sometimes on all four elevations to help with climate comfort, but was a part of the house that was accepted by the community to be **sacrificed** in the event of a cyclone. For this reason, the verandas were not connected to the main house, as to not damage its core in case it was to be blown off.

Thus, the most visible changes made to the “manoir style” homes to adapt to the Mauritian climate and possible cyclone risks were through the **envelope of the construction**, all while ensuring that the core of the house itself is solid and protected (shutters etc.).

Plateau Houses

As mentioned, the majority of the population lived on sugar cane properties in the early 20th century, but malaria outbreaks caused many of the inhabitants to flee on numerous occasions to the center of the island for protection and prevention. Mainly, the Curepipe / Forest Side, Vacoas, Quatre Borne, and Rose Hill (see Figure 15: Urban development on the central plateau in Mauritius in the early 20th century), being the major towns where climatic conditions could limit these outbreaks; a colder, humid climate.

With the development of the plateau houses during the British ruling, there are a number of special attributes in their construction and a design that is normally not seen in Plantation houses. The Plateau houses tend to have a beautiful mix of two major influencers, the French and the British. Their shapes and size

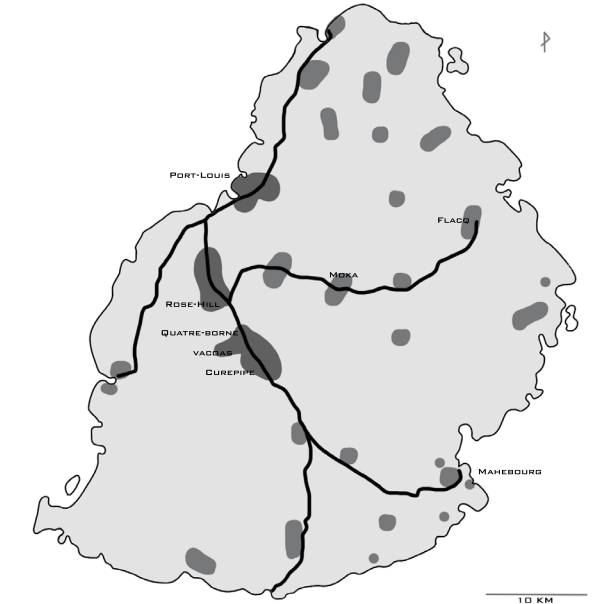


Figure 15: Urban development on the central plateau in Mauritius in the early 20th century

Koop, Kirsten. 2004. "L'île Maurice À L'ère De La Mondialisation. Un Modèle D'un Développement De Rattrapage ?". Cairn. <https://www.cairn.info/revue-autrepart-2004-3-page-109.htm>Original Image reworked by Remy Pitot

tend to differ amongst them, giving a variety of silhouettes. Some of the major elements that are often recurrent in the plateau homes were the simple shaped large columns, colonnades and balustrades, turrets, and glazed verandahs (Saglio, Desvaux de Marigny and Valentin Lagesse 1991). These characteristics give clear contrast between the Plateau and Plantation styles (Figure 16-21). While the Plateau House may physically look different, it is based on the same **structural concept** and typical interior layout, making the core of the house similar to the traditional colonial home of the plantation house. One, on the other hand, that is adapted to its new climatic conditions – cold and humid.

On plateau homes, verandah's that are wind facing are closed off through glass screens for comfort. Not with large glass panels, but a series of heavy-mullioned small glass panels for a number of reasons. Primarily as a method to warm the

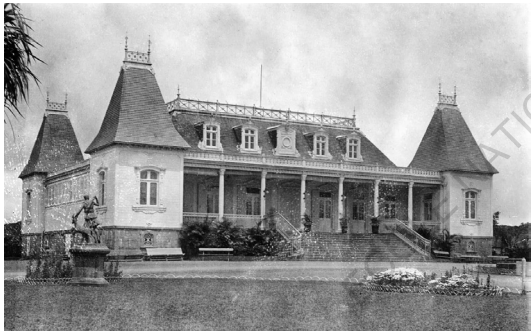


Figure 16 -17: Traditional colonial houses in Curepipe

Top: Typical house in Curepipe, 1953

Bottom: Municipal council of Curepipe

Saglio, Christian, Isabelle Desvaux de Marigny, and Henriette Valentin Lagesse. 1991. *Mauritius Style, Life On The Verandah*. 1st ed. Mauritius: Les Nouvelles Editions du Pacifique.



Figure 18 -21: Traditional colonial houses on the Plateau

Top Left: House of Verdun

Top Right: Unknown location but on central plateau

Bottom Left: Unknown location but on central plateau

Bottom Right: Unknown location but on central plateau

Saglio, Christian, Isabelle Desvaux de Marigny, and Henriette Valentin Lagesse. 1991. *Mauritius Style, Life On The Verandah*. 1st ed. Mauritius: Les Nouvelles Editions du Pacifique.



veranda; a greenhouse-like system; and to block off of the cold humid wind on the plateau. The reason for the use of heavily mullioned panels is for **protection against cyclones** (Lagesse 1959).

It is clear through the architectural temporal study that the traditional colonial houses that we know today can be seen as a **well-adapted construction**, climatically as well as structurally against cyclonic activities. As Lagesse (1959) mentioned in his thesis,

“Cyclones are amongst the most frightening things one can experience in tropical climates. When one has lived through a really bad cyclone, one remembers it all one’s life. Whenever the first settlers or their descendants designed a house, safety against very high wind pressure seems to have been at the back of their minds constantly”.

He furthermore mentions

“The structure of these earlier houses, whether of timber or stones, were tremendously solid. Timber post were rarely less than 6”x6”, often 9”x9” and sometimes more, always square. Joists were 12”x8” and spaced 3’... After some time, the settlers realized that such sizes were wasteful, and that when properly constructed, and woven together by intricate bracing techniques, the cyclones made no impression on lighter structures...The structure became economical”.

The laborers dwelling

As for the majority of the population who were slaves or merchants during this period, from which their origins varied across Africa and Asia primarily, there is a clear differentiation in their habitation style amongst themselves. These huts were traditionally made out of local materials, mud, cow dung, straw, ravenala, and some could

also have been in stone according to Filliot. Some examples of the dwellings can be seen in *“Figure 22 : Primitive hut styles from various african origins”*, showing the variety of styles and origins of hut styles (Lagesse 1986).

As evoked, in part due to the long-delayed process of the abolishment of slavery in Mauritius, the dung/mud huts remained well implanted in Mauritius up to the 1930s (*Figure 23 and 24: Hut in Port-Louis, 1909*). These dwellings were considered to be as **primitive** as the first settlers dating back to the 18th century. Over the years, on the other hand, these dwellings have lightly evolved. Mostly in its sheer dimension.

After the 1930s, while some of the dwellings remained in straw and mud, a new type of dwelling was developed; the **popular dwelling**. It was mostly categorized by the use of colored corrugated iron for its envelope and roof, while

some others were constructed in wood for its envelope and corrugated iron for its roof. It is to note that these homes were developed and used by a portion of the population only, mainly the newly merchants, traders, private laborers etc. These homes were the smaller asymmetrical version of the traditional colonial homes, already well implanted in Mauritius by the elite population. It was considered to be an adaptation of the existing style, employed by all Mauritians irrespective of their cultural background (Saglio, Desvaux de Marigny and Valentin Lagesse, 1991).

It is obvious that these small self-made constructions are in fact more **fragile** and **susceptible** to the harsh climate and weather patterns of Mauritius. Yet, many of these loved traditional homes have long lasted and resisted the majority of cyclones, the majority of them for more than a century as they tend to follow the construction style and attributes of their

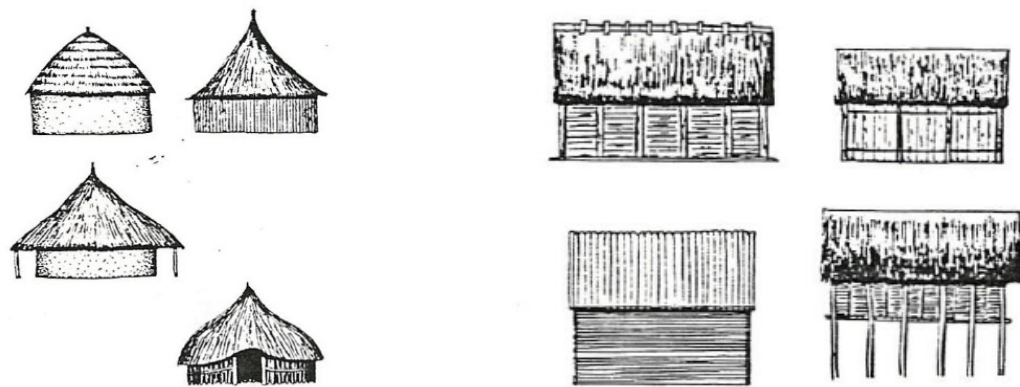


Figure 22 : Primitive hut styles from various african origins
Lagesse, Henriette. 1986. "The Traditional Colonial Architecture Of Mauritius". Master.



Figure 23 and 24: Hut in Port-Louis, 1909
Vintage Mauritius. N.d. Image.
<http://vintagemauritius.org/category/galleries/>.



Figure 25: Two story boutiques in Beau-Bassin.

Saglio, Christian, Isabelle Desvaux de Marigny, and Henriette Valentin Lagesse. 1991. *Mauritius Style, Life On The Verandah*. 1st ed. Mauritius: Les Nouvelles Editions du Pacifique.



Figure 26: Corner boutiques

Saglio, Christian, Isabelle Desvaux de Marigny, and Henriette Valentin Lagesse. 1991. *Mauritius Style, Life On The Verandah*. 1st ed. Mauritius: Les Nouvelles Editions du Pacifique.



Figure 27 : Hut in Tamarin, 1970
Vintage Mauritius: N.d. Image.
<http://vintagemauritius.org/category/galleries/>.

traditional colonial model (Saglio, Desvaux de Marigny and Valentin Lagesse 1991).

A prolonged life for the huts

The colonial development of Mauritius was slow but steady over the three centuries of its existence. During the independence's early days around 1970, 95% of the economy is still supported by the sugar industry, an industry where prices are low and little profits are made due to the long recessions the world encountered. The country seems to continue to **drown in poverty** and around 70% of the population are still living under the poverty line in popular dwelling style homes, including cow dung and straw hut.

The majority of these straw and wood dwellings have on the other hand quickly disappeared after Mauritius's independence. However, due to the low social and economic statuses of this

population segment in the early 1960/'70s, the rebuilding of these huts after a disaster cannot be dismissed either as many were financially unstable and did not have the resources to build otherwise.

This can be supported by a testimony from the interviews realized, stating that:

“à l’époque, il y avait beaucoup de maison en bouse de vache et toiture en paille... Je ne me rendais pas compte de la pauvreté du pays à l’époque, mais là, je me rends compte que la situation avec un gouvernement qui ne faisait pas de maison pour les pauvres, la situation était dramatique” - A. M, 2020.

(Translation: Back in the days, there were a lot of homes in cow dung and a straw roof.... I never realized the extent of poverty in our country back in the days, but now I do realize the situation, coupled with a government that did not help the poor; it was a dramatic situation)

In addition to this, some images of straw huts that are believed to be dated in the early 1970s could help support this argument (*Figure 27: Hut in Tamarin, 1970*), and given that they are not a unique case, we can assume that the huts in Mauritius were very much present in the early 1970s.

2.2 Post-Independence concretization

According to K. Koop (2004), while the early independence days were harsh for Mauritius, it took a few years before Mauritians began to stabilize economically and socially. In 1971, Mauritius was declared a free trading zone to boost its economy and development. It's only after this tentative to open Mauritius up to the world, that the country slowly started to take off for new objectives. In the 1980s, Mauritius begins with the diversification of their industry in textile for example due to the low labor cost it can offer. In the 1990s, the tourism industry takes off, boosting even further the Mauritian economy and its development. By then, the unemployment rate has fallen to almost 0%, and the poverty line decreased from 70% in the 70's down to 18% by 1994 (Koop 2004). The middle-class population has strengthened drastically and has finally the necessary means to build and develop properties for themselves and become financially stable.

Putting it into perspective, coupled with the growing economy, it is noticeable that the **rapid development** of Mauritius post-independence has been heavily supported by the “third” big globalization period of the 1970s, because of the shrinking world, a concept where speed, time, and distance enabled the countries to trade at ease and with speed. It has facilitated movements and has influenced our local architecture greatly. Mauritius began to embrace concrete as the construction method (Tanusree 2021). An architectural model based on modernism, changing drastically the urban landscape.

Modernism according to Ibelings (1998), was the radical architectural change that began just after World War I and ended just after World war II. It formed the basis for building. It embraces architecture in its simplest form, by acknowledging that “**less is more**” (M. Van Der Rohe) and leaned towards a method

of standardization, systematization, mass production, functional logic, and economies of scale. It was the new architectural style that the global culture adopted as it was a “building fit”. It is important to note however, that concrete was present and utilized in Mauritius before the 1960s, but it was not being exploited until the 1970s. Concrete construction before the 1970s was typically limited to larger buildings or apartment flats.

Together with one of the strongest cyclonic activities known to Mauritians in 1960 and the low economic status of Mauritius at the time, the country had become **extremely vulnerable to cyclonic hazards**. It was mentioned on multiple occasions during interviews and mentioned by K. Koop (2004) that there was **poor financial stability** and purchasing power of families across the island, and overall low building maintenance in the mid-1900s;

“ On se nourrissait beaucoup du jardin. Le poulet par exemple c’était le dimanche. Il n’y avait pas de supermarché, et on pouvait pas financièrement de toute les manières. Par contre la boutique chinoise du coin, été assez pour nous fournir avec les aliments de base. Les grains, le whisky le rhum”- P. B (2021).

(Translation: We were consuming a lot from our garden. We ate chicken on a Sunday for example. There were no supermarkets around, and financially, we couldn’t afford either way. On the other hand, the Chinese shop around the corner was enough for the basic food supplies. Grains, Whiskey and Rhum)

“Ensuite il y avait la boutique du chinois. On y faisait nos courses de bases, du riz, des lentilles, du savon etc. Mais on n’avait pas beaucoup d’argent. On prenait que les aliments de base. Je me souviens j’ai commencé à travailler à 17 ans pour contribuer à payer l’écolage de mes frères” - C. T (2020).

(Translation: Ans then, there was the Chinese shop. We were doing our grocery shopping there for the basic food supplies. Rice, lentils, soap, etc. But we didn’t have a lot of money. We were just taking the essentials. I remember, I started to work when I was 17 years old to help pay for the school fees of my brothers)

“On vivait bien simplement. On n’avait pas de sous pour les restaurants etc. On avait un grand jardin potager, papi distribué ses légumes tout autour et ils partageaient ce qu’ils avaient eux aussi”- A. M (2020).

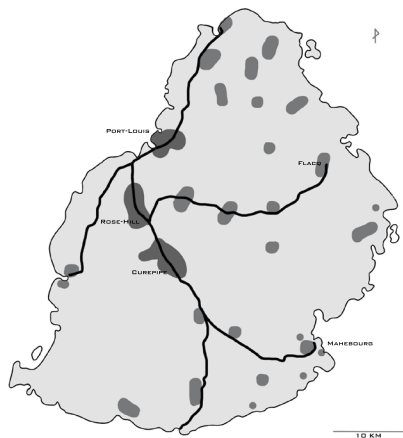
(Translation: We had such a large yard with plenty of fruits, we created our vegetable gardens and shared all the extra’s with our neighbors and friends, and they were sharing with us what they could too).

While the financial stability for a great deal of families was relatively low at the time, homes were as mentioned, for the most part **not well maintained** as a reason. E. H (2020) further explained

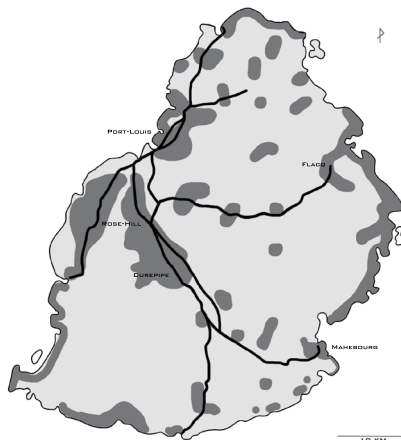
“Vu la maintenance qui se fait ici, les petites fuites, voilà des choses comme ça, c’est une maison qui n’est pas maintenu comme il le faut”

(Translation: Judging from the maintenance done here, small leaks, and things like that, it’s a house that is not maintained as it should be).

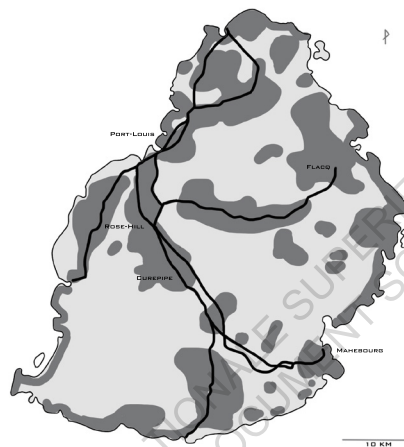
In addition, according to the reconstruction program post-Carol of 1962, it was mentioned that *“Due to a typical tradition of cooking indoors on wooden stoves in Mauritius, this practice diminished the duration of the quality of the corrugated iron roof by 10 years”* (Le Mauricien 1961).



1970 - Mauritian Socio-Spatial Structure



1990 - Mauritian Socio-Spatial Structure



2000 - Mauritian Socio-Spatial Structure

Figure 28: Evolution of the Socio-Spatial structure in Mauritius
Koop, Kirsten. 2004. "L'île Maurice À L'ère De La Mondialisation. Un Modèle D'un Développement De Rattrapage ?". Cairn. <https://www.cairn.info/revue-autrepart-2004-3-page-109.htm>Original
Image reworked by Remy Pitot

This shows that because of the local living styles, the **integrity and solidity** of the corrugated iron could have been compromised.

Other academic sources further explain, "However, it should be acknowledged that the effect of cyclone Carol was amplified by the preexisting fragile house structures (further fragilized by the first cyclone of the year, Alix)" Murday and Reddi (2021).

The **poor maintenance** coupled with the strong cyclone, generated chaos in Mauritius, leaving people in a state of psychosis ever since. Cyclone Carol alone has made 80,000 people homeless, which accounted roughly to 1/8th of the total population. An impact that has indeed had a high societal impact in Mauritius. This major event according to Rouphail (2019) "has redefined the migration patterns of the country, and began to focus on the concept of Cités in Mauritius". An

agglomeration of concrete houses to support and ensure security to **vulnerable families**; a major element that began the extensive development and concretization of Mauritius (Figure 28: Evolution of the Socio-Spatial structure in Mauritius).

It can therefore be, although arguably, that it is from the 1970s that Mauritius truly begins to transition from the traditional colonial structure to concrete. Four images aid with the understanding of this rapid concretization that has taken place in Mauritius (Figure 29 -32: The College Royale junction in Curepipe from 1940-1979)⁴. These images were taken at three-time intervals with the focus on the same street junction, at the royal college of Curepipe. In 1940, we notice that the construction and development of Curepipe

⁴While in this paper, we are assuming that it is believed to have been a general case across the island, further studies in different cities across the island is needed to confirm this fact



Figure 29 -32: The College Royale junction in Curepipe from 1940-1979

Top Left: Curepipe junction, 1940

Top Right : Curepipe junction, 1970

Bottom Left: Curepipe junction, 1976

Bottom Right: Curepipe junction, 1979

Vintage Mauritius. N.d. Image.
<http://vintagemauritius.org/category/galleries/>.

turned around the use of light materials in colonial traditional-style houses. Some popular dwellings were used as shops and habitations, some stone structures for public facilities such as the royal college or the church, and many traditional colonial-style houses. In 1970, we notice a couple of construction in concrete, mainly the Merven building that was constructed in 1950 consisting of shops on the ground floor and apartments on the two upper floors, while the other constructions were the popular dwelling and traditional colonial homes. In 1976 and 1979, the same junction is transformed with concrete on all sides, following the same concept of shops on the ground floor and apartments on the upper levels.

It is therefore possible that, and only a hypothesis, that the **transitional pathway** taken by Mauritius from colonial architecture during the British ruling to the post-independence concretization in the 1970's was for a good part; as a reason of the

traumatic event of Cyclone Carol in Mauritius.

2.3 Unlocking the future

While we are all aware, at least most of us on **climate change and global warming** which are the defining issues of the 21st century, the reasons and sources for global warming can be disputed. The construction industry today is responsible for 40% of the total carbon emission in our environment (Ahmed et. Al. 2021). Thus, the importance given to green, sustainable, and ecological buildings is progressively taking higher importance and we are slowly beginning to see a massive transition.

The Mauritian government has shown interest, since 2008 through the MID report (Maurice, Ile durable 2008), to support and progressively transition Mauritius into a more **ecological system**, and since 2021, now aims “to facilitate economic growth that respects the limitations of natural resources”. Supported by economist P. Espitanlier-Noel (2020), “There is no doubt that

we have no choice but to work towards ambitious ecological goals in Mauritius”.

While these are proven global statistics and seem to show a trend towards ecological sustainability, it is important to have the Mauritian population be willing to take part in this transition. To determine if the community is feeling concerned about global warming as well as validate my initial hypothesis in regards to the ecological transition I believe we will be entering into in the near future, an online questionnaire was created and free for any Mauritians and non-Mauritians living in Mauritius to participate in. The questionnaire was created and aims to be as unbiased as possible on who were to participate in this study. The data received with this questionnaire is believed to reflect the world’s tendencies to the ecological transition in Mauritius due to the correlation of similar positive answers amongst the participants.

Out of the 77 participants randomly selected, 95 % of the people are feeling concerned about global warming, and believe that we are not currently heading towards sustainable and ecological development in Mauritius (Annex 4). The participants expressed concerns about the current construction methods inciting them to review and **question the way we build in Mauritius**. The beginning of insights into a global movement towards ecological, green, and sustainable architecture and development.

Although there are various ways in which a movement towards sustainable construction can be done, it is seen through the survey that there is an interest leaning towards the use of **natural resources** as a possible construction material. These include stone or wood, as well as a re-utilization of local materials in Mauritius according to the study i.e. Circular economy (Figure 33 and annexed). The materials preferred

by the population seem to lean to the materials that, were once popularized in Mauritius during the colonial times. It must be noted that this transition into ecologically and sustainable development will most probably see an equal evolution in the materials, which could, and should, lean on cyclonic memories to help in this transition.

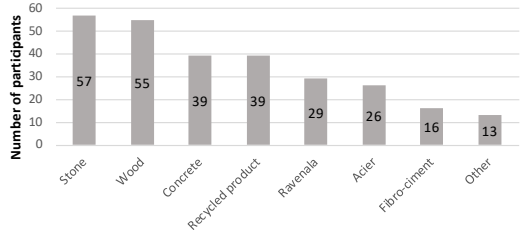


Figure 33: Bar chart showing the preferred materials participants would like to use for future constructions

ECOLE NATIONALE SUPERIEURE D'ARCHITECTURE DE NANTES
DOCUMENT SOUMIS AU DROIT D'AUTEUR

Chapter III
Social memory in the Mauritian society

3.1 Carol, Gervaise and Hollanda; taken by storm

Over the past 60 years, more than 40 cyclones have come and gone. Some are more disastrous than others. While other cyclones have also had a strong impact in Mauritius, the results of the interviews conducted mentioned only cyclone 1945, Carol, Gervaise, and Hollanda as having had a considerable impact (Annex 1). With the help of the testimonies, backed up with photographs and press releases, there is evidence of the impact of cyclone Carol on Mauritian society. The extent to which it has impacted Mauritians can only, for someone who has never experienced extremes tropical cyclones, be felt through the tales of the lived ones.

As there are many references in regards to cyclone Carol and Gervaise, it is therefore important to highlight the extent of the damages it has caused – A country whose population was about 800,000 people in 1960:

Carol destroyed over 70,000 homes, damaged

120,000 homes, leaving 42 deaths and 1,700 people injured while the wind gusts associated with Carol were recorded at 256km/h. Cyclone Gervaise on the other hand, was the strongest cyclone in terms of quantitative values, but the second strongest cyclone according to the participants interviewed. Gervaise brought Mauritius wind gusts of 280km/h, but as records show, only one house was destroyed, leaving 11,320 homes damaged and killing 24 people.

The identification of Carol as the “**real cyclone**” can therefore only be explained by analyzing the experiences that come along with the event. This is since the **level of severity** of the hazard alone cannot solely be explained by quantifiable data such as the wind speed, gusts, and trajectory, but must take into account the vulnerability of the population as well (Walshe, Adamson, and Kelman, N.d.)⁵.

⁵ As a reminder, Chapter 2 of the research has mentioned the high vulnerability and low maintenance of the constructions during cyclone Carol, a major influencer on why it was so devastating to the community.

Through the colonization and architectural evolution timeframe looked at in part 1 of this paper, we have seen how Mauritian architecture and Mauritians, in general, has progressively evolved and adapted themselves to the local climatic conditions of being in a hot, humid, and tropical environment as well as an environment of seasonal cyclones that constantly threatens the country. This **adaptation** can be considered as an improvement in resilience against the occasional harsh climate. We could argue that this improvement in resiliency over time is due to the **gain of experience**, and suggest that memory and personal experiences played an important role in its development and adaptation to the Mauritian environment. While we could say that the question of memory will keep evolving and adapt in Mauritius in the future, we have seen that the concretization of Mauritius was in part, used as a drastic and sudden tool to deal with tragic events. This movement from one architectural style to the other in the 1970s resulted in a quick loss of the number of popular dwelling and

traditional colonial homes in Mauritius. This, in part through the failure to rebuild what had been lost during Carol in 1960, and the other, as the mechanism to assure solidity and resiliency. While the use of concrete may very well be of good use today, I stand to question whether memory could help Mauritius in the ecological transition I believe is soon going to happen. The question here is not only on how this memory is expressed but also, how it is transmitted and passed down to others.

3.2 Mauritius, memory and experiences

Indeed, although it is difficult to procure media and documentation from cultural memory in Mauritius due to the lack of archives and the recording of events, there is nevertheless some documentation available. As N. Mahadoo (2020) mentioned, “*On a du allé dans les archives pour recueillir des informations, car pour envoyer certaines informations au data base des Nations Unis, il fallait aller fouiller de partout. Souvent*

aussi, ses informations étaient dans la presse mais archivé". Some relevant sources were indeed found in the municipal libraries and online where there are free consultations, but these are limited. On the other hand, some important data, such as the archives from all cyclonic activities, the extent of damages, maps, photographs, responses, and recoveries are stored in the government archives in Port-Louis of which, I was unable to gain access from despite my numerous letters and emails requesting a consultation for education purposes.

While information from cultural memory is, but not readily available to the community, collective memory on the other hand which is usually shared through oral traditions is also not typically recorded nor archived.

For this reason, I have conducted a series of open interviews with members of the Mauritian society who were willing to share their cyclonic experience with me to help combine as much information as possible

and **understand the role and importance of memory in resiliency**. Irrespective of their social, economic, or cultural background, I was able to conduct interviews with several individuals who expressed their experience for three cyclones; namely Carol, Gervaise, and Hollanda.

The interviews conducted were open-ended and free for the participant to share their experience in whichever way they see fit. Preliminarily to the interviews, a series of standardized questions were created to redirect towards the core of this research if need be - to their personal experience during a cyclonic activity (Annex 3). These interviews were then transcribed to make sense of their experience. While the interviews were typically long, between 1.5 to 2 hours, there was the need to categorize the information gathered. I thus propose to do so in the form of a table under a series of criteria to facilitate its comprehension. A total of 7 criteria have been developed to regroup information that was found to

be potentially helpful in understanding the experience, how they lived through the cyclonic activity as well as the vulnerabilities or potential qualities indirectly expressed within their speech. They are categories that classify the information and data which could be potentially helpful in developing methods to become more resilient. These categories have been firstly drafted intuitively from a cross lecture of the testimonies received, then developed to be in line with the core definition of collective and cultural memory. The main criteria developed are as followed and explained briefly in the results of the findings:

1. Warning signs
2. Act of commemoration
3. Zone or territory subject to vulnerability
4. Qualities or fragility of construction materials
5. Architectural elements that are vulnerable
6. Secondary or collateral damage
7. Systems put in place to protect or deal with the hazard.

3.3 An analysis of the role and use of collective memory in the Mauritian community

I propose, with the help of the criteria just established to develop a table that summarizes the important information I believe could be beneficial in understanding if we can appeal to the transmission of cyclonic memories to help in the fight to build a safe and resilient future in Mauritius. The table portrayed (Annex 1) consequently includes the initials of the names of the participant⁶, the cyclone from which they refer to, the type of construction they live in at the time, the testimony in their own words, and whether the testimony is a personal experience (collective memory being shared), or a testimony that instead, originates from cultural memory. While not all categories could be of help for this study, it is worth mentioning due to its importance towards the participant which reflects the conditions of the past.

⁶ Some of the participants wished to remain anonymous. Therefore, only the initials of the participants will be used in the published paper.

Warning signs

Warning signs are the precursory signs that arise before or during a hazard, whether from **human or non-human behavior**; including **environmental factors**. They are subjective information and are unproven. Yet, many communities around the globe use these precursors or warning signs to protect themselves against potential hazards and supported by De Jong, Helena, and Anne Van Tilborf (2021) where “*The research shows that the Simeulue detected the tsunami very early due to their knowledge of the changing environment which enabled them to escape to the mountains*”.

The precursory signs are typically information that is transmitted amongst the families from generation to generation as a way to determine the presence of and prepare for any potential hazard.

In light of today’s advancement in technology, it is true that the meteorological centers provide such

information, by first spotting a cyclonic formation, tracking the growth, evolution, and through various models, the ability to predict trajectories (within a noticeable margin of error). It can be noted that cyclonic activities are extremely unpredictable and their trajectory and intensity are often uncertain.

While most of the warning signs that are evoked during the interviews are **subjective**, some might be perceived as unimportant to the research as it does not necessarily bring added value in contrast to what meteorological services predict. For instance, the bright pink sky before a cyclone is a popular sign that a cyclone is coming.

On the other hand, there were two mentions during the interviews with regards to the precursor signs that can potentially be important as it dictates the intensity of cyclones, and are therefore worth noting and mentioning.

« *Le temps se dégrade petit à petit. Le ciel devient rouge, et on dit que le plus rouge, le plus fort le cyclone* » C. T (2020).

« *Le peuple aussi disait, si ce n’est pas les manguiers ou les litchis qui fleurissent très tôt, c’est une annonce d’un gros cyclone* » A. M (2020).

Although additional research is needed to prove this fact, warning signs remain valid in relationship with the core questioning of this research. The oral traditions of the experience from the past generations understood that through some particular precursory warning signs, the possibility that a strong cyclone would hit the island was possible, and can allow the community to prepare for such an event.

Act of commemoration

While the initial intention of the interviews was for the participants themselves to share their own experiences, the candidates voluntarily shared **anecdotes or stories** of the cyclonic experience of

their relatives or friends in numerous occasions. This is evidence that collective memory is present within the community, as illustrated through the sharing of their experiences and stories from one generation to the other.

« *Mais je souviens ma tante, elle habitait Quatre bornes, elle avait des panneaux en tôles pour mettre sur toutes ses fenêtres* » A. G (2021).

« *Ma maman me racontait que sa maison a bougé de son socle* » A. G (2021).

« *Franzo habitait les plats Merven à Curepipe. La toiture des Laurent s’est levée et a passé près de leurs flats. A quelques mètres et s’est posée dans le terrain vague pas très loin* » A. M (2020).

« *Il y avait tonton Christian aussi, lui le toit du voisin s’est écrasé sur la devanture de sa maison* » A. M (2020).

The results showed that not only the participants referred to anecdotes from their relatives when asked

to share their personal experiences, but have shared relevant and important information indirectly in their speech. For example, some have revealed a couple of methods to protect their homes from potential damage, while others shared experiences of what failed within the construction and the extent of this damage.

Zone or territory subject to vulnerability

According to Barré et. Al. (N.d.), due to the unique topography and urban fabric of countries around the globe, the effects of wind is constantly varied and unpredictable. While this is true, the results showed in particular that an area in Mauritius was subject to stronger winds and gusts. Making the **zone or territory potentially more vulnerable**. A **wind pattern** ranking from East to West, then from the West to East after the cyclone, creating a strong wind corridor was mentioned in the region of Moka/St Pierre, on the central plateau of Mauritius.

« Ressentir des vents violents venant de la chaine de montagne - vent de l'est avant le centre, puis de l'ouest après le passage. La trajectoire du cyclone était plein sud et nous a traversé de Nord en sud. » A. C (2020).

« Entre St Pierre et les montagnes, on aurait dit qu'il y avait un couloir de vent qui été terrible. Presque toutes les maisons en bois été à terre » C. T (2020).

A “couloir de vent (a wind corridor)” was mentioned. The region of Moka is located on the center of Mauritius and is surrounded by a series of mountains, typically located to the north and south of the town. Together with the change in elevation between the coastal region of the east of the island and Moka, and the mountain range; there is the possibility of the creation of a funnel effect (Barré et. Al. N.d.). This effect is represented schematically in figure 34. This potential increase in wind speed as a result can be significant in making this region more vulnerable to cyclonic winds⁷.

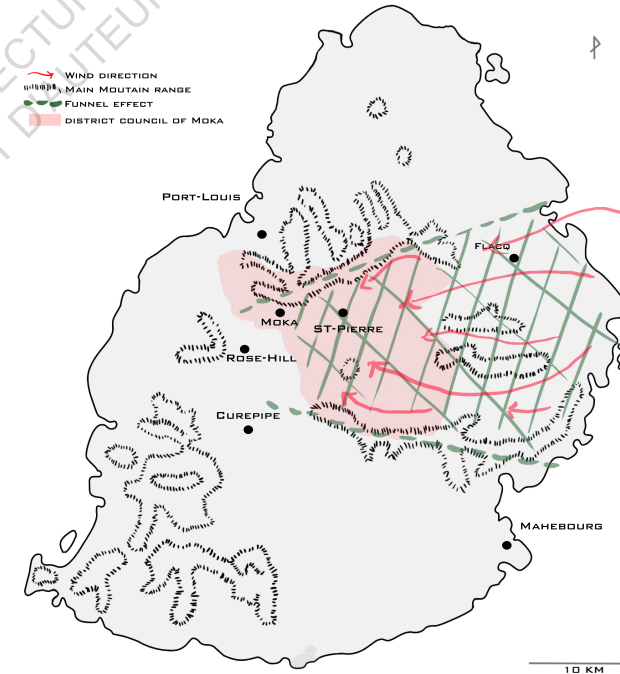


Figure 34: Potential wind acceleration zone in Mauritius from a change in elevation and funnel effects

Qualities or fragility of construction materials

While the cyclonic event itself is traumatic to some, participants often make reference to the way their home were constructed as well as its material. Often indicating the **architectural elements that failed** but also, indirectly indicating some of the strong structural elements of their homes.

It is undeniable that most participants used the newly built area of the house as a refuge during the cyclone (if they had any). While some of the extensions were still constructed in light materials, some of these additions were also built-in concrete. These spaces were used as they were aware that it was more robust and subject to withstand stronger wind loads.

⁷ The wind rotation of the cyclone in the southern hemisphere is East to West when the hazard is located north, and West to East when the cyclone is located South of Mauritius. Ref image.

According to Barré et. Al. (N.d.), an increase in elevation can have an increase in wind speed of up to 20%, and the funnel effect between hills and mountains can equally have an increase in wind speed of up to 10%.

« On s'est réfugié dans la cuisine arrière de la maison, qui été plus récente. Il y avait de la tôle en toiture. A chaque coup de vent, on entendait coiiinnccc » A. M (2020)

« Nous étions logés dans une partie de la maison construite en béton » C. T (2020)

On the other hand, there is a recurrent material that shows **weakness and vulnerability** during the cyclones according to the participants. The corrugated iron sheets used as roofing materials were on numerous occasions referred to as being **dangerous as well as a volatile material**.

« Les feuille de tôle de l'usine qui faisait le toit s'envoler comme des cerf-volants dans le ciel. Ces tôles de l'usine auraient pu venir dans notre direction. Des lames de rasoir qui s'envolent dans le ciel. Ça aurait pu être très dangereux » C. T (2020).

With the exception of one testimony, who supported the use of corrugated iron as being solid and robust as it withstood the hazard without any issue. It is to be noted on the other hand that the construction was new and well-constructed. Should there be a lack of maintenance, there is no doubt that this habitation becomes extremely vulnerable to cyclonic winds.

« Nous ti ress dans enn lakaz en tole derriere proprietaire. Proprietaire la ki ti ranze sa lakaz la pou mo mama. Nous lakaz pane ggne narnien ler cyclone la ine passer. Lakaz la ti neuf et solid » L. J (2021).

(We were staying in a corrugated iron shack behind the owners house. The owner had built the home for my mum. Our house did not get damaged in any way. It was new and solid)

Another candidate, on the other hand, shares the guidelines on how to maintain the corrugated iron to **help increase resiliency** during a cyclonic hazard. This material which is being perceived to be dangerous and

weak against cyclonic activities by many.

« Vu la maintenance qui se fait ici, les petites fuites, voilà des choses comme ça, c'est une maison qui n'est pas maintenue comme il le faut, ça m'étonnera que la tôle soit revissée tous les quatre matins, et on dit toujours qu'il faut revisser la tôle pour mesure de sécurité » E. H (2020)

Architectural elements that are vulnerable

Similarly to the “Qualities or fragility of construction materials”, the testimonies revealed particular elements that were the “weak” architectural or structural elements of the construction. They are elements that would give way during the cyclone and could be making the lives of some and other **habitations more vulnerable**. The results suggest that the roof and verandah of the habitations were the elements that were susceptible to damage.

« Je me souviens du toit en bardeau qui c'était ouvert, et il y avait un ciel livide » A. M (2020).

«Le toit de la maison est parti en une fraction de seconde » K. A (2021).

« Rivière Noire les toitures des maisons de la montagne on atterrit dans notre jardin qui se trouvait à la preneuse ouf le désastre » M. N. G. D (2021).
«Engouffrement du vent dans les pans de la toiture à travers les lucarnes » C. T (2020).

Additionally, the windows of the home that were not protected by shutters were also subject to damage.

« Les vitraux étaient fragiles, d'où pourquoi les anti vols. Mais je me souviens une des vitres à exploser dans le salon. Maman a bloqué avec son duvet en plein nuit pour bloquer » A. G (2021).

⁸ According to Barré et. Al. (N.d.); p37, a sudden change in pressure inside the habitation lead to a variation in pressure between the interior and exterior and can lead to the construction envelope being ripped out (Figure 35: Schematic drawing of effects of pressure loads on constructions from cyclonic winds).

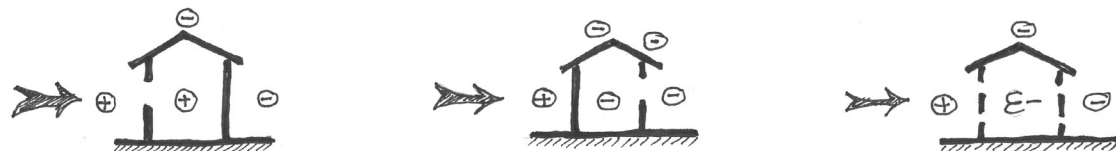


Figure 35: Schematic drawing of effects of pressure loads on constructions from cyclonic winds
Barré, Christian, Alexandre de la Foye, and Sophie Moreau. n.d. Conception Paracyclonique. Les grand ateliers de l'isle d'abeau.
Original image reworked by Remy Pitot

Secondary or collateral damage

While the data and results focus highly on the damages on the construction itself, it must not be forgotten that the environment can also be impacted and that this **surrounding environment** can also impact the habitation. There have been many mentions of trees falling, which can be a hazard to the habitations if fallen on.

“Beaucoup d’arbres au sol” A. M (2020).

« Il y avait un arbre immense, qui es tombé pendant le cyclone et qui a défoncé mon toit près de la cuisine »

E. H (2020).

« Petit conifère est tombé sur notre varangue. Ça a fissuré notre varangue mais pas détruite » A. G (2021).

Together with the wind, cyclones can also rapidly bring a large amount of water, causing floodings in some cases.

« Les maisons étaient inondées. des gens qui était restée bloquée dans leurs maisons, et d'autres été complètement inondé » P. B (2021).

Finally, there were on occasion, **structural elements** that gave way coming from the neighboring construction, which could potentially be dangerous and life-threatening for some.

« Les feuille de tôle de l'usine qui faisait le toit s'envoler comme des cerf-volant dans le ciel. Ses tôles de l'usine auraient pu venir dans notre direction. Des lames de rasoir qui s'envolent dans le ciel. Ça aurait pu être très dangereux » C. T (2020).

« Le toit de la maison des voisins qui était en bois, s'est levé en un morceau pour venir se déposer dans notre jardin » C. T (2020).

« Le soucis avec les réservoirs d'eau, c'était les couvercles en métal. Les couvertures partaient dans le vent. Il y a eu des cas de décapitations et de grosses lacérations de ses couvertures » P. B (2021).

Systems put in place to protect or deal with the hazard

As mentioned earlier in this research, the maintenance of the traditional colonial homes is believed to have been neglected at the time for multiple reasons (ref to chapter 2), which could lead to insinuating that part or sections of the homes were thus more vulnerable to strong winds. For this reason, several candidates have explained methods in which, they have **protected themselves** against potential entry points from the wind or rain such as windows and doors, or through the protection of an entire portion of the house as it had become compromised.

« *Le vent s'engouffrait. Papa a cloisonné le couloir entre les deux parties de la maison* » C. T (2020).
« *Isoler l'arrière cuisine de la maison pour empêcher le vent de s'engouffrer* » E. H (2020).
« *On se protégeait donc des cyclones par abriter les fenêtres. On venait fixer des plaques en plywood sur les fenêtres* » P. B (2021).

« *Les vitraux étaient fragiles, d'où pourquoi les anti vols. Mais je me souviens une des vitres a explosé dans le salon. Maman a bloqué avec son duvet en plein nuit pour bloquer* » A. G (2021).

Some participants have also mentioned methods to help the habitation become less vulnerable to strong winds.

« *d'ouvrir quelques impostes pour la circulation d'air* » A. G (2021).
« *Mon papa m'avait toujours dit qu'il fallait entre-ouvrir des impostes de chaque coins de la maison pour laisser l'air circuler dans la maison* » R. C (2021)

The 7 criteria evoked earlier seem to **show success** in classifying the information received for the interviews for the collective memory analysis. The participants seemed involved and knowledgeable on various techniques taught from the elders and from their own personal experience. A strong indication that **collective cyclonic memory is playing an important role** in the Mauritian community.

3.4 Anchored down memories

The “Story of the 1945 cyclones” is a book written by Hazakeesingh (1948), which recorded the stories of several people from the Mauritian society that have lived through the 1945 cyclone. It is important in the sense that it is a form of “**memoire**” of the stories and experiences of inhabitants during the said event. The author has successfully assembled the collective memory and materialized it into cultural memory. An important transition from short-term memories to long-term memories.

The personal recollection of experiences that are transcribed into his book share valuable information with regards to cyclones. The title refers to “cyclones” rather than cyclone because in 1945, Mauritius was hit by three consecutive cyclones, in a span of 3 months. One of the major reasons according to Hazakeesingh (1948), that had brought Mauritius to its knees.

Firstly, the author (Hazakeesingh 1948) stated that there were **no visible warning signs** that the first cyclone was approaching the Island. Being in a time where there were no meteorological services, the habitants relied on environmental signs and/or simple home weather stations. Although, some inhabitant knew the approach of the cyclone through the barometer which began to indicate a drop in atmospheric pressure.

The lack of precursory warning signs seems to contradict the results discussed in part 3.3, where the sky changes color, ants seek refuge in the homes etc. indicating a way, according to the interviews, to effectively alert for the incoming hazard. It must be noted that, the cyclones in 1945 were not, quantitatively, strong cyclones. The author further described the first, being the strongest of the three cyclones to have “wind gusts of 156 km/h”. Comparatively, it is a low value against the recorded values of Carol (256km/h) or Gervaise (280km/h).

There is a possibility that the lack of precursory warning signs is due to the cyclone being a weak system. Potentially indicating why, the population at the time did not noticeably see any perturbation in the environment. It is therefore judicious to **question the overall validity** of the precursory warning signs and its **reliability** into determining the degree and threat of a cyclone. More specific orientated research would be needed at this time.

The author of “story of the 1945 cyclones” (1948) further describes Port-Louis as being “*flattened*”. It was mentioned as well in the region of Bell Village, near Port-Louis that some houses that were built in concrete and covered with corrugated iron roofing and was further described as “*most severely hit*”, and “*some walls had crumbled down*”. The most common damages of the constructions at the time nevertheless remained to be the roof and the verandah’s that were typically blown away. In addition, the author mentioned that the “Hauts plateau” was greatly hit

compared to other regions of Mauritius (Hazakeesingh 1948). From theories, damages and testimonies gathered so far, there seem to be a **correlation in an increase in wind speed** in some regions of Mauritius, hence an increase in vulnerability to homes located in the Moka and Plaines Wilhems district (Central plateau of Mauritius).

The **materialization of collective memory** into cultural memory, as discussed is an effective way to anchor down experiences. The journalism industry can play an equally important role in the recording and transmission of cultural memory.

When events occur, journalists tend to be one the first individuals on site, documenting through the use of photographs and testimonies the places that were the most damaged on the island. As le Mauricien, an independent newspaper company, published in 1960 with the population, « *Vous avez pu constater vous-même l’étendue des dégâts – vous en êtes d’ailleurs*

les victimes directes et vous savez tous que jamais dans son histoire notre vieille capitale n’avait été aussi durement éprouvée ». This detailed article, filled with photographs, testimonies as well as the letter sent from the mayor was published and shared in 1960 shortly after cyclone Carol. Unfortunately, the article is not available on the net. They can only be accessed through authorization and must be dug in the archives.

Overtime, a lot of information, personal experiences and images have been gathered in Mauritius. The material is available, but the disadvantage is that they are not made available to the public, and while they remain in archives, they remain of little to no use.

While newspaper companies and organizations may not easily share the archive documents, one organization, Vintage Mauritius has taken the initiative to respond to this need by gathering and sorting out historic photographs, anecdotes and stories from the past in “*the early days where everything was different*”

(Vintage Mauritius N.d). These images come from newspaper archives and the Mauritian community who wish to share their libraries and testimonies. Figure 36 illustrates all the photographs related to cyclonic activities gathered on Vintage Mauritius, with even postcards dating as far back as the 1892 cyclone.

The analysis of the damages sustained on constructions in the images shows, although not exclusively, that the typical **weakness from the constructions** once more originate from the roof and the verandah’s.

So far this research mentioned exclusively how memory is transmitted, how they are transmitted, which information can be taken from these experiences. In contrast, social memory (collective and cultural memory) does not solely provide methods or ways for communities to rely on so they become more resilient, but should also be a way to **remind communities** in the aftermath. It is how this memory stays alive within the community that helps in resiliency and allow

Cyclone 1892

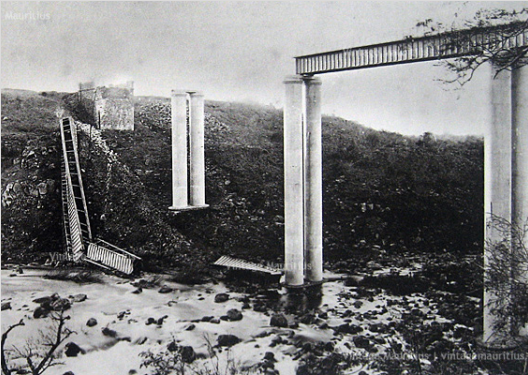
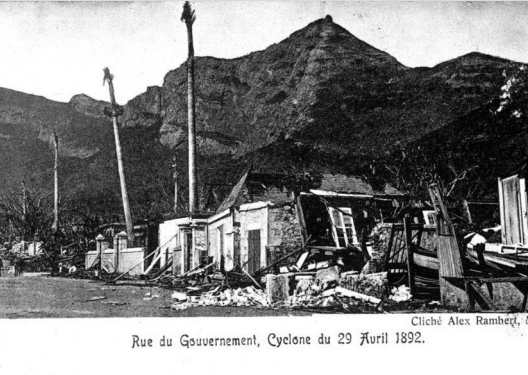


Figure 36: A collection of images from Vintage Mauritius

Top Left: Rue du Gouvernement, Port-Louis, 1892.

Top Right: Railway Viaduct, GRNW, 1892.

Bottom Left: Port-Louis, 1892.

Bottom Right: Port-Louis, 1892.

Vintage Mauritius. N.d. Image.
<http://vintagemauritius.org/category/galleries/>.

Cyclone 1945



Top Left: Unknown Location. Before 1945 cyclone.

Bottom: Unknown Location. After 1945 cyclone.

Vintage Mauritius. N.d. Image.
<http://vintagemauritius.org/category/galleries/>.

Carol- 1960



Top Left: College Saint-Joseph

Top Right: : Unknown Location

Bottom Left: Dr edouard-laurent-deforges street.

Bottom Right: Port-Louis

Vintage Mauritius. N.d. Image.
<http://vintagemauritius.org/category/galleries/>.

Top Left: colonial house Montalieu of labat

Top Right: : Curepipe adventist church

Bottom Left: Curepipe royal road

Bottom Right: Curepipe Town Hall

Vintage Mauritius. N.d. Image.
<http://vintagemauritius.org/category/galleries/>.



Rima Family Private collection



Top Left: Curepipe Town

Top Right: : Damaged construction
Unknown Location

Bottom Left: Damaged construction
Unknown Location

Bottom Right: Escaplon

Vintage Mauritius. N.d. Image.
<http://vintagemauritius.org/category/galleries/>



Top Left: Damaged construction
Unknown Location

Top Right: : Notre dame du rosaire

Bottom Left: Port-Louis

Bottom Right: Port-Louis

Vintage Mauritius. N.d. Image.
<http://vintagemauritius.org/category/galleries/>





Top Left: Rue des Forges, Port-Louis

Top Right: : Rue des Forges, Port-Louis

Bottom Left: Port-Louis

Bottom Right: St-jean, Quatre borne

Vintage Mauritius. N.d. Image.
<http://vintagemauritius.org/category/galleries/>.

Top Left: St-jean, Quatre borne

Top Right: : Curepipe Road

Bottom Left: Curepipe Market

Bottom Right: Damaged construction
Unknown Location

Vintage Mauritius. N.d. Image.
<http://vintagemauritius.org/category/galleries/>.

Gervaise - 1975



Top Left: Boats crashing, location unknown

Top Right: : Curepipe Market

Bottom Left: Damaged construction
Unknown Location

Bottom Right: Post-office, Vacoas

Vintage Mauritius. N.d. Image.
<http://vintagemauritius.org/category/galleries/>.

Top Left: cDamaged construction
Unknown Location

Top Right: : Damaged construction
Unknown Location

Bottom Left: Damaged bridge and bus

Bottom Right: Damaged construction
Unknown Location

Vintage Mauritius. N.d. Image.
<http://vintagemauritius.org/category/galleries/>.



Hollanda - 1994



Berguita - 2018



Top: Damaged construction Unknown Location

Bottom: Damaged car by tree

Vintage Mauritius. N.d. Image.
<http://vintagemauritius.org/category/galleries/>.

communities to deal with forthcoming hazards.

The variable return periods of large tropical cyclones in Mauritius⁹ points to the possibility of a '**disaster gap**'; that a long interval between disasters can result in at risk of the communities forgetting their exposure and practices of response (Pfister et al., 2002). This, is further supported by (Choudhury et al. 2021), who argues that social memory tends to fade away over time. As a result, a **manifest** to the events, through narratives or songs for example can be a good way to help communities not slide into this 'disaster gap'. It is a unique way to indicate and remind the Mauritian community of the potential danger.

⁹ As discussed earlier in this paper, it is possible that the community has "forgotten" the threats of cyclones. The last considerable strong cyclone which had a significant impact on the Mauritian community dates back to 1975. Today, this means only the people in the 55 years old or more age group will remember.

A popular Sega song in Mauritius is a good example of this manifest to help remember and keep the memory alive. The Sega song by Serge Lebrasse (1960), "A Cause sa cyclone la", evokes a slight overview of the horrors of the Carol experience in a unique way, and a way that that is essentially, cultural memory (*ref pg.102*).

Through the testimonies and data gathered in sources, the question of memory and how it is transmitted highlighted in this research shows interesting and potentially valuable information with regards to Mauritian architecture. The majority of interviews have primarily highlighted that the roof of their habitations were the elements that, was subject to damages or destruction, and the photographic collection gathered from vintage Mauritius further support this argument.

While it is true that most of the construction were traditional colonial houses that used wood as the primary construction material for the walls as well as the roof, some of these homes had already shifted

A cause sa cyclone la - Serge Lebrasse 1960

L'anné 1960, zamais mo pa pu blié / *The Year 1960, I will never forget*

Mo ti manz enn fois par zour, mo ti dormis kot mo gegner / *I was eating once a day, and sleeping where I could*

Sanla fine arriver, a cause cyclone Alix, a cause cyclone Carol / *This is what happened, because of cyclone Alix, because of Cyclone Carol*

Ti balier l'Ile Maurice / *It wiped Mauritius out*

A cause ca cyclone la, a cause ca cyclone la / *Because of this cyclone, because of this cyclone.*

Mo lakaz vine cordeon, comment enn l'évantail / *My home was like an accordion, or like a Chinese fan,*

A cause ca cyclone la, a cause ca cyclone la / *Because of this cyclone, because of this cyclone.*

.....

Mo ti enn papa zenfant, Mo ti ena tou mo fami / *I was a father, and had a whole family,*

Carol finn ramass zot, fine amene zot r li / *Carol has taken them, and brought them with it*

A cause ca cyclone la, a cause ca cyclone la / *Because of this cyclone, because of this cyclone.*

.....

towards corrugated iron as their roof materials, and concrete for the walls for some others. Yet, a good majority of these house still suffered tremendous damages from the strong cyclonic winds. While there is no doubt that concrete is stronger and was used as a way to protect themselves from the strong winds in the 1970's until today, we have seen that some concrete homes nevertheless did not withstand the strong winds. Supported by Architect H. Valentin (2020), "*Je pense qu'il y'a des gens qui font des maisons qui ne sont absolument pas anticyclonique... Je pense qui si on a un très très gros cyclone, comme Hollanda, qu'il y'auras beaucoup de dégâts* ».

In addition, cyclonic conditions, winds, direction and gusts are unpredictable and will always differ from the direction, trajectory and the nature of the storm itself.

On the other hand, there seem to be a **recurring pattern** that indicate that the haut plateau, mainly the region of Curepipe and Moka, as well as Port-

Louis are more susceptible to higher winds than the coastal regions of Mauritius. The hypothesis remains that it is because of the mountain ranges of Mauritius, that channel the wind to one specific territory (the plateau), or that the increase in elevation of the terrain can cause the wind to have an increase of up to 20%, or both could be true. Although a hypothesis, more focused research is needed to validate this statement.

3.5 The lessons from the deadly trio

Indeed, social memory does provide clues and information about resiliency in society against cyclonic activities. On the other hand, how we make sense of it and how can it be used within the community to become more resilient remains an important question. Collective memory, present in our society is shared amongst the population, in the hope that the last eyewitnesses will not take their stories with them after death. It is the reason why the **transformation of collective memory to cultural memory is important** in such circumstances as seen with the example of “The story of the 1945 cyclone”. While this transformation is of importance in our society, how can we have effective memory when the cultural memory, within the country itself is often held in private archives and held by the government themselves and not easily made available to the public?

It is important to ensure that there is a system that preserves and enables the transmission of the

local Mauritian know-how and lessons to future generations. With the help of the collection, archiving, the transmission of knowledge and experiences, it will benefit to further gather insights into community behaviors, **pinpoint knowledge gaps** and determine the capacities for risk reduction (De Jong 2021). Whether deliberate or spontaneous, it is a process wherein the different parties mentioned throughout this research should participate in sharing experiences, opinions, come to an understanding and learn from each other in this climate-induced, disaster-prone environment that is Mauritius. An important contribution to adaptive resilience (Choudhury et al. 2021).

After the 1945 cyclone, according to Hazakeesingh (1948), the Island had begun to put in place, an organization with the sole dedication to help the community in need during such disasters, as well as create an adequate response plan to such events. Unfortunately, these measures were set up under

British governance and vanished at some point along the line. When, how, was it successful? Little information is available, and therefore difficult to establish its effectiveness and purpose. Yet again in 2013, the government of Mauritius, together with the UN and other Worldwide organizations, began the creation of the first contingency plan. A plan wherein disaster managers follow protocols before, during, and after the disaster. A plan that was established initially under the Prime minister’s office, and has now become an independent government catastrophe management center. It is a center put in place and works in conjunction with the UN and other international collaborators (Mahadoo 2021). This risk disaster management plan is responsible for (Ministry of Environment, Sustainable Development, and Disaster and Beach Management 2015):

- the risk reduction and management policies
- Promoting a culture of safety and resilience at all levels through the use of knowledge, innovation, and

education and,

- Coordinate the implementation of the obligations of the state under disaster management treaties

The collective and cultural memory within the community in Mauritius is consequently, important for disaster managers. Its influence on the knowledge, abilities to find explanations, behaviors, and making sense of the past is critical to have a handle on the community’s resiliency. On the other hand, the way communities respond in return to the disaster managers might differ from what is expected. There is always the possibility that the risk perception amongst the community is lower due to their previous experiences, or through the lack of exposure to the risk hazard as established in the case of the Mauritian community. The community may feel in a state where they believe they are safe and resilient when in turn, are in fact vulnerable. Since the memories of the past hurricanes from 1975 to the present had a low impact in Mauritius, it can lead people to believe, although not exclusively, that cyclones do not cause much damage, especially on concrete homes.

In recent years, due to global warming, cyclonic activities are becoming more frequent and stronger than before. Scientists now talk about the possibility of super cyclones rather than intense tropical cyclones. Supported by N. Mahadoo (2021) « *Avec le changement climatique, on risque de ne plus avoir que des cyclones tropicale intense, mais des super cyclones comme on dit. A ce moment-là, nos infrastructures sont à zéro* ». This would lead to the community having an **inaccurate perception of the risks** and overall unpreparedness. Together with the slow transition into an ecological world, where the primary “natural” and “renewable” materials begin to form the core of constructions, it is important, more than ever to support and lean on local know-how and experiences to build resilience. As P. Lagesse (1956) mentioned in his research on traditional colonial house structures in Mauritius, “*After some time, ... and that when properly constructed, and woven together by intricate bracing techniques, the cyclones made no impression on lighter structures*”. These bracing techniques and inverted

ship hull roof structure for example are elements that could benefit specific detailed research, and if validated, used within the Mauritian community to improve resilience.

As with any country around the world, construction guides are made available to the architects and the public to ensure coherent and adapted construction. In addition to the traditional general building guides, a series of precautions, methods, and techniques from the experiences mentioned in this paper could be highlighted to help sustain resilient development. For instance, there could be sets of rules developed that are specific in predefined zones or territories (just like the current specific rules to construction on the shoreline in Mauritius) to meet certain conditions that necessitate particular interventions. Given that the research has indicated flooding as part of the secondary damages to the constructions due to the torrential rains that cyclones bring forward, and that the traditional colonial houses are on an elevated

basement as a reason, all buildings for example could be required to be elevated by X cm if the parcel/ construction meet some specific conditions (i.e. parcels of land from which, there is less than X% slope). These simple guidelines would then in turn improve the resiliency of future construction in Mauritius.

Sensibilization campaigns could be of equal help in ensuring that structures are maintained and cared for prevailing the cyclonic event. It was established in the data collected that trees and flying corrugated iron sheets were most vulnerable and potentially hazardous. A sensibilization campaign could be set up to educate, and inform the residents of Mauritius for example on how to properly maintain the roofs, verify the bolts (as they tend to rust quickly), and tighten them before the yearly cyclonic seasons. These campaigns could also suggest to residents to be wary of large trees and branches that are near their homes (the trimming of branches that are close to the home or over the home as they can be extremely dangerous

to the occupants) are just some examples that can help become more resilient, and overall reduce the vulnerability of the population. These sensibilization campaigns can take the form of gathering in the community centers or as graphic media on national television for example. The information and method of transmission are non-exclusive and non-exhaustive.

In addition, there are many research papers today, just like the work of Barré, de la Foye and Moreau. n.d. “Conception Paracyclonique” overlooks in detail the **conception and the application of architectural elements**, mechanisms, and devices that **reduce the vulnerability of the construction**. Together with the experience learned from the local, context (Mauritius), this abovementioned research can propose alternative methods to effectively build structures that are adapted to a hot, tropical climate and cyclonic prone environment. For example, the reason for the lack of decorative elements and overhangs from the manoir style and traditional colonial homes is because they are

a weak spot for the wind to engulf itself in and damage or potentially lift the roof. Other safe alternatives are proposed in this research to help build a climatic adapted and safe structure against cyclones all while minimizing these “said” weak spots.

Lastly, the sharing platform such as Vintage Mauritius is a good example of methods to keep memories alive within the community. This technology allows people to share their experiences, photographs, and stories. It seems to show potential success of a social learning mechanism for building community resilience to cyclonic activities.

The tools available to safely transition into a more ecological, climate-friendly future are indeed available. It is **how we interpret and translate** the memories from experience and knowledge into qualitative data in the Mauritian context, and **how we make sense of it** that is important. It is seen that collective and cultural memory does in fact bring valuable information and

tools to the communities. In order for some of this information to be of utility, there are ways in which officials or communities can be of help.

Conclusion

How memory and disasters played an intricate role in the development structures and patterns of Mauritius is far from being **linear. Nor is it circular.** Its role in disaster management and resilience in our society is constantly evolving and evidently forms part of a **new discipline** that merits extensive and additional research. The need to account for historical processes is of high importance and fundamental to understanding the risks and vulnerabilities of communities as well as improving resiliency. The culture of social memory makes sure that experiences, interpretations, and the local know-how are shared from generation to generation, with the hope that they are not faded out with the last witnesses.

There are no specific ways in which memory helps in the fight against resilience in a cyclone-prone environment. Instead, they are a unique to every communities around the world, and will differ from the local culture, beliefs, environment, political and social context. But through people's personal experience, it is possible to **develop a set of tools** to help deal with and limit the vulnerability of the people against

these strong cyclonic winds. Whether it comes from the traditional 'handing down of information' from generation to generation also known as collective memory, or more geared towards collective sharing through tools, mechanisms or through government led processes, they each contribute to **become more resilient and overall less vulnerable.**

Yet, a number of questions still persist. How will we deal with the future cyclones in Mauritius? Will Mauritius face a 'disaster gap'? If so will we be resilient if our community transitions into a more ecological-orientated architecture? Or will we have forgotten the mechanisms and tools our ancestors have developed? Or more generally, how do we become more resilient without losing our identity?

Many questions are still left unanswered, and maybe they are meant to remain so. The aim of this study is not to give tangible solutions to communities with ways to reduce the cyclonic risk and vulnerabilities, it is instead aimed at **highlighting the importance that memory plays in resiliency**, to understand if it can be

of any help in the future. In parallel, it also studies the obstacles that lie within the communities' memory transmission, and propose, although preliminary, possible ways to surmount it. It is by no means, a method to rely on. Instead, this research is used to further **challenge the archetype** of cyclonic memory to dig deeper into its relationship; between **social memory, communities, and resiliency**.

We have seen that the architecture of the past – from “manoir style” to traditional colonial architecture and popular dwellings – is unique to Mauritius and represents a strong cultural appropriation as well as a strong climate and cyclone adapted construction. This adaptation was overall a slow and steady evolution, showing that memory in society is the result of **a community's improvisation based on past events acting out as a slow development and adaptation over time**. Indeed, many of these constructions did not survive, but the hypothesis remains; because of the low economic and maintenance of Mauritius in the mid 1950s, coupled with strong cyclonic winds, chaos was unfortunately created

together with a state of psychosis, **spelling the end of an era in Mauritius**; the one of the Traditional Colonial Architecture. The conservation of the remaining traditional colonial architecture is therefore important as it serves as a reminder of the past, as well as **climatic and cyclone-resistant prowess**.

The memories of such tragic events are yet, still very well present and anchored into the Mauritian society. In part, for the ones who have lived through such events, as they remember it like it was yesterday and possess the ability to share in detail their experiences; what the living conditions were, how they have dealt with the cyclone, how their house struggled, what happened around them, and even knows the stories of their friends and families. In other parts, there is the possibility that this memory is also carried by individuals who fit in the “disaster gap” category - although more research is needed to support this statement.

Through memories and the transmission of memories, we have seen how the experiences from the Mauritian

population and its inhabitants can **help in mitigating the risks and improve resilience**. These propositions included in part the re-orientation of the construction guides (PPG) to provide guidelines to some “at stake” territories or certain parcels of land that are subject to be more vulnerable than others, the development of a sensibilization campaign, as well as the support and promotion of a community based platform that collects and transmits the experiences and memories of the local population of Mauritius.

Indeed, it must be mentioned that they are just suggested methods and they are by no means “recommended” nor “valid”. They are just propositions amongst many possible methods.

This research is just the beginning of a possible extensive investigation of the links between cyclonic memory and resilience in Mauritius. This cross-disciplinary research is a new and rather undiscovered field, and much additional work is needed to support and confirm the ideas and hypotheses made in this paper. It would be important to develop a better

understanding of what is perceived by memory to the Mauritian population, and understand how they make sense of it by following the path of the individuals that have lived through the major cyclonic activities elaborated in this research, as well as those members of the community who are situated in this 'disaster gap'. This with the intention to establish the differences in perspective and possibly determine the extent cyclonic memory transmission truly has.

A number of studies, through research papers, testimonies and online documentations have revealed the positive links between traditional colonial architecture and its ability to resist strong cyclonic winds. To validate this statement and propose techniques and methods to adapt possible future constructions to be resistant to cyclones, a detailed study of the traditional colonial homes structure could help. For example, detailed measurements of the inverted hull like roof structure, or detailed bracing joints as mentioned by Lagesse (1959), coupled with an analysis on how forces are dissipated in the structure and of the joints and connections.

ECOLE NATIONALE SUPERIEURE D'ARCHITECTURE DE NANTES
DOCUMENT SOUMIS AU DROIT D'AUTEUR

Bibliography, resources and Annex

Figure 1: Image of damaged construction from Cyclone Carol in Port-Louis Mauritius

Figure 2: Formation of cyclonic activities

Figure 3: Schematic representation of cyclones

Figure 4: Cyclones Activity zone in the Indian ocean

Figure 5: Timeline of the evolution of Mauritius- An insight into the major events

Figure 6: Copper engraving from 'Het Tweede Boeck' showing Dutch activities on the shore of Mauritius during the 1598 voyage of Admiral Jacob van Neck.

Figure 7: Archived drawings of the Dutch early settlement

Figure 8: Remains of the Fort Frederik Hendrik in Old Grand port

Figure 9: Initial design

Figure 10: Jean de Robillard House in the early 1930's

Figure 11 : Musée de Mahebourg in 2020

Figure 12: Schematic perspective of the typical inverted hull roof structure of the "Manoir style" houses in Mauritius

Figure 13: Maison Eureka, Moka

Figure 14: Château de la Villebague

Figure 15: Urban development on the central plateau in Mauritius in the early 20th century

Figure 16-17: Traditional colonial houses in Curepipe

Figure 18-21: Traditional colonial houses on the Plateau

Figure 22 : Primitive hut styles from various african origins

Figure 23 and 24: Hut in Port-Louis, 1909

Figure 25: Two story boutiques in Beau-Bassin.

Figure 26: Corner boutiques

Figure 27 : Hut in Tamarin, 1970

Figure 28: Evolution of the Socio-Spatial structure in Mauritius

Figure 29-32: The college royale junction in Curepipe from 1940-1979

Figure 33: Bar chart showing the preferred materials participants would like to use for future constructions

Figure 34: Potential wind acceleration zone in Mauritius from a change in elevation and funnel effects

Figure 36: A collection of images from Vintage Mauritius

Ahmed, Noha, Mohammed Abel-Hamid, Mahmoud Abd El-Razik, and Karim El-Dash. 2021. "Impact Of Sustainable Design In The Construction Sector On Climate Change". Ain Shams Engineering Journal 12 (2). <https://www.sciencedirect.com/science/article/pii/S2090447920302446>.

Antoine, Le Blanc. 2012. "Remembering Disasters: The Resilience Approach".

Barre, Christian, Alexandre de la Foye, and Sophie Moreau. n.d. Conception Paracyclonique. Les grand ateliers de l'isle d'abeau.

Bertalanffy, Ludwig Von. 1968. "General System Theory As Integrating Factor In Contemporary Science And In Philosophy" 2: 335-340. https://www.pdnet.org/wcp14/content/wcp14_1968_0002_0000_0335_0340.

De Jong, Helena. 2017. "Using Cultural Memory As An Asset In Disaster Risk Reduction". EDUCEN. <https://cultureanddisaster.eu/toolkit/8.cultural-memory.html>.

Cashman, K. V., & Cronin, S. J. (2008). Welcoming a monster to the world: Myths, oral tradition, and modern societal response to volcanic disasters. Journal of Volcanology and Geothermal Research, 176(3), 407-418.

Choudhury, Mahed-UI-Islam, C. Emdad Haque, Ainun Nishat, and Sean Byrne. 2021. "Social Learning For Building Community Resilience To Cyclones: Role Of Indigenous And Local Knowledge, Power, And Institutions In Coastal Bangladesh". Ecology And Society 26 (1).

De Jong, Helena. 2021. "Using Cultural Memory As An Asset In Disaster Risk Reduction". EDUCEN. <https://cultureanddisaster.eu/toolkit/8.cultural-memory.html>.

De Jong, Helena, and Anne Van Tilborf. 2021. "The Role Of Memories Of Disaster". EDUCEN. <https://cultureanddisaster.eu/handbook/1.3-role-memories-disaster>.

Engel, K., Frerks, G., Velotti, L., Warner, J., and Weijs, B. 2014. "Flood disaster subcultures in The Netherlands: the parishes of Borgharen and Itteren". Natural hazards 73 (2): 859-882.

Espitalier-Noel, Philippe. 2020. "Engaging The Ecological Transition For A Sustainable Mauritius". Linkedin.Com. <https://www.linkedin.com/pulse/engaging-ecological-transition-sustainable-mauritius-espitalier-no%C3%ABl/>.

Foster, Norman. 2007. My Green Agenda For Architecture. Video. Tedtalk.

Hazareesingh, K. 1948. The Story Of The 1945 Cyclone. 1st ed. Port Louis: Government printer.

Ibengs, Hans, Robyn de Jong-Dalziel, and Patricia Molegraaf. 1998. Supermodernism : Architecture In The Age Of Globalization. Rotterdam: Nai Publishers.

Interviewee A. C. 2021. Cyclonic Memory experience. Interview by Remy Pitot. Telephone. Curepipe. Mauritius.

Interviewee A. G. 2021. Cyclonic Memory experience. Interview by Remy Pitot. In person. Phoenix. Mauritius.

Interviewee A. L. 2021. Cyclonic Memory experience. Interview by Remy Pitot. In person. Quatre borne. Mauritius.

Interviewee A. M. 2020. Cyclonic Memory experience. Interview by Remy Pitot. In person. Curepipe. Mauritius.

Interviewee B. P. 2021. Cyclonic Memory experience. Interview by Remy Pitot. In person. Quatre borne. Mauritius.

Interviewee C. T. 2020. Cyclonic Memory experience. Interview by Remy Pitot. In person. Curepipe. Mauritius.

Interviewee E. H. 2020. Cyclonic Memory experience. Interview by Remy Pitot. In person. Grand Baie. Mauritius.

Interviewee K. A. 2021. Cyclonic Memory experience. Interview by Remy Pitot. In person. Curepipe. Mauritius.

Interviewee L. J. 2021. Cyclonic Memory experience. Interview by Remy Pitot. In person. Vacoas. Mauritius.

Interviewee M. N. G. D. 2021. Cyclonic Memory experience. Interview by Remy Pitot. In person. Beau Champs. Mauritius.

Interviewee P. B. 2021. Cyclonic Memory experience. Interview by Remy Pitot. In person. Forest Side. Mauritius.

Interviewee S. C. 2021. Cyclonic Memory experience. Interview by Remy Pitot. In person. Quatre borne. Mauritius.

Kansteiner, W. 2013. "Finding Meaning In Memory: A Methodological Critique Of Collective Memory Studies". Australian Journal Of Communication 40 (1): 179-197.

Koop, Kirsten. 2004. "L'île Maurice À L'ère De La Mondialisation. Un Modèle D'un Développement De Rattrapage ?". Cairn. <https://www.cairn.info/revue-autrepart-2004-3-page-109.htm>.

Lagesse, Henriette. 1986. "The Traditional Colonial Architecture Of Mauritius". Master.

Lagesse, Pierre. 1959. "The Creole House Of Mauritius 1730-1890". Master Thesis, Cambridge university.

Lebrasse, Serge. 1960. A Cause Sa Cyclone La. Video. Mauritius: https://www.youtube.com/watch?v=XRVRQAd-YW8&ab_channel=BongoJoeRecords.

“ Le Problème Propriétaires-Locataires de Maisons : Une Lettre de la ‘Port Louis House Owners Association’ ”, Le Mauricien, 29 March 1960.

“ Le Programme National de Reconstruction : Première Etape : 3000 Maisons A Abercrombie D’ici le Début de 1962 ”, Le Mauricien, 12 May 1961.

“Lettre du Maire Aux Résidents et Contribuables de Port Louis ”, Le Mauricien, 08 March 1960.

Lewis, Roger. 2002. “Will Forces Of Globalization Overwhelm Traditional Local Architecture?”. The Washington Post. <https://www.washingtonpost.com/archive/realestate/2002/11/02/will-forces-of-globalization-overwhelm-traditional-local-architecture/a4df29f8-7056-46ed-ad60-18be3e606323/>.

Madsen, Wendy, and Cathy O’Mullan. 2013. Responding To Disaster: Applying The Lens Of Social Memory. Ebook. Australian Journal of Communication. https://www.researchgate.net/publication/265966366_Responding_to_disaster_Applying_the_lens_of_social_memory.

Mahadoo, Navin. 2020. Red Cross. Interview by Remy Pitot. In person. Curepipe, Mauritius.

Mauriciennes, Histoires. 2016. “Maurice À La Merci Des Cyclones”. Histoires Mauriciennes. <https://histoiresmauriciennes.com/maurice-a-la-merci-des-cyclones/>.

Mauriciennes, Histoires. 2017. “Histoire(S) Des Cyclones : Aux 19E Et 20E Siècles”. Histoires Mauriciennes. <https://histoires-mauriciennes.com/histoires-des-cyclones-aux-19e-et-20e-siecles/>.

“Mauritius cyclones”. 2021. Mauritius Inside Out. <https://www.mauritiusinsideout.com/mauritius-cyclones.html>.

McCarthy, Robert. 2016. “A Movement In A Moment: The International Style”. Phaidon. <https://www.phaidon.com/agenda/architecture/articles/2016/june/30/a-movement-in-a-moment-the-international-style/>.

Ministry of Environment, Sustainable Development, and Disaster and Beach Management. 2015. “National Disaster Risk Reduction And Management Centre”. Port-Louis: Republic of Mauritius.

Murday, Linganaden E., and Sadasivam J. Reddi. 2021. “Cyclones And Migration In The District Of Port-Louis In The 1960S”. Ph.D, University of Mauritius.

Nations online. 2021. Mauritius. Image. <https://www.nationsonline.org/oneworld/mauritius.htm>.

“Old Grand Port Heritage Site And Museum”. 2021. Mauritius Inside Out. <https://www.mauritiusinsideout.com/old-grand-port-heritage-site.html>.

Rouphail, Robert M. 2019. ““Essentially Cyclonic:” Race, Gender, And Disaster in Modern Mauritius”. Ph.D, University of Illinois.

Saglio, Christian, Isabelle Desvaux de Marigny, and Henriette Valentin Lagesse. 1991. Mauritius Style, Life On The Verandah. 1st ed. Mauritius: Les Nouvelles Editions du Pacifique.

Seetah, Krish. 2021. “History”. Stanford, Mauritian Archeology. <https://mauritianarchaeology.sites.stanford.edu/history>.

Sengupta, Tanusree. 2021. “Shrinking World”. Budding Geographers. <https://www.buddinggeographers.com/shrinking-world-2/>.

The National Institute of building Science. 2018. “Good Practices In Resilience-Based Architectural Designs”. Whole Building Design Guide. <https://www.wbdg.org/resources/good-practices-resilience-based-arch-design>.

The World Bank. 2016. “Disaster Risk Profile: Mauritius”. Southwest Indian Ocean Risk Assessment And Financing Initiative. Washington D.C USA: The World Bank Group.

Tobias, Michael. 2020. “Introduction To Resilient Design: What Is Resilience?”. Nearby Engineers. <https://www.ny-engi-neers.com/blog/introduction-to-resilient-design>.

Turner, B.L., Roger Kasperson, Pamela Matson, James McCarthy, Robert Corell, Lindsey Christensen, and Noelle Eckley et al. 2003. “A Framework for Vulnerability Analysis In Sustainability Science”. Worchester: PNAS. <https://www.pnas.org/content/pnas/100/14/8074.full.pdf>.

Valentin Lagesse, Henriette. 2021. Posture as an architect with regards to the Mauritian development. Interview by Remy Pitot. Telephone. Moshi. Tanzania.

Valette, Jean. 1975. “Filliot (Jean-Michel) : La Traite Des Esclaves Vers Les Mascareignes Au Xviii Siècle”. Revue Française D’histoire D’outre-Mer, no. 226-227: 355-356. https://www.persee.fr/doc/outre_0300-9513_1975_num_62_226_1841_t1_0355_0000_2.

Vintage Mauritius. N.d. Image. <http://vintagemauritius.org/category/galleries/>.

Walshe, Rory A., George C.D Adamson, and Ilan Kelman. N.d. “Helices Of Disaster Memory: How Forgetting And Remembering Influence Tropical Response In Mauritius”. International Journal Of Disaster Risk Redusction Manuscript.

Wilson, Geoff. 2015. “Community Resilience And Social Memory”. Environmental Values 24 (2): 227-257. <http://www.jstor.org/stable/43695225>.

Name of interviewee	Cyclone	Construction type	Categorisation	Testimony from the participants	Type of Memory
C. T	Carol	Traditional colonial home	Warning signs	Les chiens avaient fini de savoir que quelque chose n'allait pas bien. Ils avaient des comportements bizarres. Le temps se dégrade petit à petit. Le ciel devient rouge, et on dit que le plus rouge, le plus fort le cyclone. L'humidité très forte.	Collective Memory
P. B	Gervaise	Concrete home		Les guêpes venaient se réfugier dans les maisons. Il y avait aussi beaucoup d'humidité. Une chaleur d'enfer. Les feuilles avaient un frémissement. Et puis le ciel rose. Comme des nuages stratifiés et roses. Et aussi les courpas sur les murs. Les fourmis dans la maison. L'eau de pluie devient sommate. Il y avait beaucoup de fourmis.	
A. M	Carol	Traditional colonial home		Le peuple aussi disait, si ce n'est pas les manguiers ou les litchis qui fleurissent très tôt, c'est une annonce d'un gros cyclone.	
A. C			Act of commemoration	Mémoire de 60 ans - Lettre à la famille	Cultural Memory
C. T	1945			Mais le pire souvenir que j'ai c'est celui de ma maman en 1945, où elle été au pied du Peter Both Maman avais été traumatisée par Carol en 1960.	Collective Memory
A. G	Carol	Mais je souviens ma tante, elle habitait Quatre bornes, elle avait des panneaux en tôles pour mettre sur toutes ses fenêtres. Ma maman me racontait que sa maison a bougé de son socle.			
S. C	Gervaise	Popular dwelling	M'a permis de retirer cette magnifique photo. Chez lui c'était grand. Je vais l'agrandir aussi pour garder dans mon salon pour que mes enfants puissent montrer à leur enfants.	Cultural Memory	
L. J	Carol		Mo rapel mo mama ti racont moi sa cyclone la commen li ti hier, enn desastre lor la fami. Ti ena in perdi la vie, lakaz ine envoler. Nek pens sa cyclone pe fer moi ggne frisson.		
P. B	Gervaise	Concrete home	Le sable avec le cyclone et la mer ont bouché les piscines, et dans certains bungalows de l'hôtel, le sable bloquait les portes de chambres devant leur terrasse. Donc certains touristes étaient bloqués chez eux.	Collective Memory	
A. M	Carol		Franzo habitait les plats Merven à Curepipe. La toiture des Laurent s'est levée et a passé près de leurs flats. A quelques mètres et s'est posée dans le terrain vague pas très loin Il y avait tonton Christian aussi, lui le toit du voisin s'est écrasé sur la devanture de sa maison.		
C. T		Traditional colonial home	Nous étions sur une propriété, nous avions un grand jardin, on avait des légumes, papa avait un poulier, on avait des lapins, on ramassait nos œufs. Nous étions autonomes. Tous les légumes, on se débrouillait comme ça. On faisait notre beurre. Ensuite il y avait la boutique du chinois. On y faisait nos courses de bases, du riz, des lentilles, du savon etc. Mais on n'avait pas beaucoup d'argents. On prenait que les aliments de base. Je me souviens j'ai commencé à travailler à 17 ans pour contribuer à payer l'écolage de mes frères.	Collective Memory	
P. B		Gervaise	Concrete home		On se nourrissaient beaucoup du jardin. Le poulet par exemple c'était le dimanche. Il n'y avait pas de supermarché, et on pouvait pas financièrement de toutes les manières. Par contre la boutique chinoise du coin, été assez pour nous fournir avec les aliments de base. Les grains, le whisky le rhum.
A. M	Carol	Traditional colonial home	Il n'y avait plus rien dans notre jardin. Papa qui aimait planter en plus. Il avait ses légumes. On vivait bien simplement. On n'avait pas de sous pour les restaurants etc. On avait un grand jardin potager, papi distribuait ses légumes tout autour, et ils partageaient ce qu'ils avaient eux aussi		
A. C			Zone or territory subject to vulnerability	Ressentir des vents violents venant de la chaine de montagne - vent de l'est avant le centre, puis de l'ouest après le passage. La trajectoire du cyclone était plein sud et nous a traversé de Nord en sud.	
C. T				Entre St Pierre et les montagnes, on aurait dit qu'il y avait un couloir de vent qui été terrible. Presque toutes les maisons en bois été à terre.	

A. C			Qualities or fragility of construction materials	Nous étions logés dans une partie de la maison construite en béton.	Collective Memory
				La maison été en bois, tout en bois et il y a eu des pans qui se sont cassé	
C. T	Carol	Traditional colonial home		Les feuille de tôle de l'usine qui faisait le toit s'envoler comme des cerf-volants dans le ciel. Ces tôles de l'usine auraient pu venir dans notre direction. Des lames de rasoir qui s'envolent dans le ciel. Ça aurait pu être très dangereux. Entre St Pierre et les montagnes, on aurait dit qu'il y avait un couloir de vent qui été terrible. Presque toutes les maisons en bois été à terre. C'est pour cela qu'après, on a tout construit en dur, avec des dalles plates. Les gens ont arrêté de construire en bois.	
L. J		Popular dwelling		Nous ti ress dans enn lakaz en tole derriere proprietaire. Proprietaire la ki ti ranze sa lakaz la pou mo mama. Nous lakaz pane ggne narnien ler cyclone la ine passer. Lakaz la ti neuf et solide.	Cultural Memory
P. B	Gervaise	Concrete home	Architectural elements that are vulnerable	La structure était la même que le bois, mais en béton. Donc tu imagines, à quel point c'était solide. On se protégeait donc des cyclones par abriter les fenêtres. Heureusement encore il n'y avait pas des grandes ouvertures en aluminium et baies vitrées comme aujourd'hui, c'était plus des portes en bois et plus souvent des petits panneaux. Certaines fenêtres oui étaient cassées, mais sinon, pas grand-chose. Alors dans les cités, ils fabriquaient leurs cuisines en bois et tôles. Là, il y avait beaucoup de dégâts. Beaucoup de maisons écrasait à Flac. C'étaient des maisons en tôle, donc les dégâts étaient plus important. Pendant Hollanda, je me rappelle un mur en pierre de chez moi bougeait. Je me souviens du toit en bardeau qui c'était ouvert, et il y avait un ciel livide. On s'est réfugié dans la cuisine arrière de la maison, qui été plus récente. Il y avait de la tôle en toiture. A chaque coup de vent, on entendait colinnccc... Franzo habitait les plats Merven à Curepipe. La toiture des Laurent s'est levé et à passer près de leurs flats. A quelques mètres et c'est poser dans le terrain vagues pas très loin. Il y avait tonton Christian aussi, lui le toit du voisin s'est écrasé sur la devanture de sa maison.	Collective Memory
	Hollanda			Les vents enlevant toute la toiture au-dessus de l'usine mont désert Alma Engouffrement du vent dans les pans de la toiture à travers les lucarnes.	
A. M		Traditional colonial home			
		Concrete home			
A. C					
C. T	Carol	Traditional colonial home	Architectural elements that are vulnerable	Le toit de la maison des voisins qui été en bois, s'est levé en un morceau pour venir se déposer dans notre jardin Mais c'était à une époque où tout été fragile. Les maisons en tôle, en bois, les cahuttes. Toutes les chambres couler. Papa appelait entre les deux logis Worchesterfall. Tellement ça coulait.	Cultural Memory
				Quelques portes étaient cassées, une lucarne s'est envolée. Papa devait accrocher avec la porte de la Terrace. La porte était en métal et vitrée, mais il fallait attacher les barreaux à la maison pour que la porte reste fermée et ne s'ouvrait pas. Et mamān le tenait pour qu'il ne soit pas aspiré. Les vitraux étaient fragiles, d'où pourquoi les anti vols. Mais je me souviens une des vitres à exploser dans le salon. Maman a bloqué avec son duvet en plein nuit pour bloquer.	Collective Memory
A. G	Gervaise	Concrete home		Vu la maintenance qui se fait ici, les petites fuites, voilà des choses comme ça, c'est une maison qui n'est pas maintenue comme il le faut, ça m'étonnera que la tôle soit revissée tous les quatre matins, et on dit toujours qu'il faut revisser la tôle pour mesure de sécurité.	Cultural Memory
E. H					
M. N. G. D	Gervaise	Traditional colonial home		Moi j'ai vécu Gervaise ouf nous avons eu à partir de notre maison Colonial sur la propriété de Beau Champ un choc véranda parti, arraché.	Collective Memory

M. N. G. D	Hollanda	Concrete home	Architectural elements that are vulnerable	Rivière Noire les toitures des maisons de la montagne on atterrit dans notre jardin qui se trouvait à la preneuse ouf le désastre.	Collective Memory		
P. B	Gervaise	Popular dwelling		Certaines fenêtres oui étaient cassées, mais sinon, pas grand-chose.			
K. A				Le toit de la maison est parti en une fraction de seconde.			
A. M				Je me souviens du toit en bardeau qui c'était ouvert, et il y avait un ciel livide.			
A. C	Carol	Traditional colonial home	Secondary or collateral damage	Couchant au sol toute les plantation de canne à sucre	Collective Memory		
C. T				Le toit de la maison des voisins qui était en bois, s'est levé en un morceau pour venir se déposer dans notre jardin			
				Les feuille de tôle de l'usine qui faisait le toit s'envoler comme des cerf-volant dans le ciel. Ses tôles de l'usine auraient pu venir dans notre direction. Des lames de rasoir qui s'envolent dans le ciel. Ça aurait pu être très dangereux.			
				La cours, inondée.			
				Toutes les routes étaient bloquées. Il y avait de l'eau de partout.			
A. G				Gervaise			Tout c'est envolé, les poteaux électriques été tordus, au sol
							Nos bambous été au sol, il y avait plus une feuille sur les arbres.
E. H				Hollanda			Nous n'avons pas eu de dégâts d'eau.
							Petit confière est tombé sur notre varangue. Ça a fissuré notre varangue mais pas détruite
P. B	Gervaise	Concrete home	Secondary or collateral damage	Il y avait un arbre immense, qui es tombé pendant le cyclone et qui a défoncé mon toit près de la cuisine.	Collective Memory		
				Les maisons étaient inondées. des gens qui était restée bloquée dans leurs maisons, et d'autres été complètement inondé.			
				Le sable avec le cyclone et la mer ont bouché les piscines, et dans certains bungalows de l'hôtel, le sable bloquait les portes de chambre devant leurs terraces. Donc certains touristes étaient bloqués chez eux.			
				Un petit peu de dégâts d'eau au niveau du sol mais pas grand-chose.			
				Beaucoup d'arbres à terre.			
A. M	Carol	Traditional colonial home	Secondary or collateral damage	Le soucis avec les réservoirs d'eau, c'était les couvercles en métal. Les couvertures portaient dans le vent. Il y a eu des cas de décapitations et de grosses lacérations de ses couvertures.	Collective Memory		
				Il n'y avait plus rien dans notre jardin. Papa qui aimait planter en plus. Il avait ses légumes.			
				Il y avait quelques perrons pour aller dans la cour.			
				Beaucoup d'arbres au sol.			
C. T	Gervaise	Concrete home	Systems put in place to protect or deal with the hazard	Le vent s'engouffrait. Papa a cloisonné le couloir entre les deux parties de la maison.	Cultural Memory		
A. G				d'ouvrir quelques impostes pour la circulation d'air.			
E. H				Vu la maintenance qui se fait ici, les petites fuites, voilà des choses comme ça, c'est une maison qui n'est pas maintenu comme il le faut, ça m'étonnera que la tôle soit revissée tous les quatre matins, et on dit toujours qu'il faut revisser la tôle pour mesure de sécurité.			
P. B				Isoler l'arrière cuisine de la maison pour empêcher le vent de s'engouffré.			
R. C				On se protégeait donc des cyclones par abriter les fenêtres. On venait fixer des plaques en plywood sur les fenêtres.			
A. G	Gervaise	Concrete home	Systems put in place to protect or deal with the hazard	Mon papa m'avait toujours dit qu'il fallait entre-ouvrir des impostes de chaques coins de la maison pour laisser l'air circuler dans la maison.	Cultural Memory		
				Les vitraux étaient fragiles, d'où pourquoi les anti vols. Mais je me souviens une des vitres a explosé dans le salon. Maman a bloqué avec son duvet en plein nuit pour bloquer.	Collective Memory		

YEAR	DATE-MONTH	NAME	CLASSIFICATION	NEAREST DISTANCE FROM MAURITIUS	HIGHEST GUSTS RECORDED KM/H	LOWEST PRESSURE HpA	Homes destroyed	Home Damaged	Death	shelter
1892	29-Apr	-	Tropical Cyclone	Over Mauritius North	216	947				
1931	5-7 Mar	-	Intense Cyclone	-	180	969				
1945	16-17 Jan	-	Intense Cyclone	Over Mauritius	156	953				
1945	1-2 Feb	-	Intense Cyclone	South	150	969				
1945	6-Apr	-	Intense Cyclone							
1946	30 Jan-1 Feb	-	Intense Cyclone	Close West	129	984				
1958	6-9 Apr	-	Intense Cyclone	80 km West Reunion	129	1004				
1960	16-20 Jan	Alix	Intense Cyclone	30 km off Port-Louis	200	970				
1960	25-29 Feb	Carol	Intense Cyclone	Over Mauritius	256	943	40000	120,000	91	168000
1961	22-26 Dec	Beryl	Intense Cyclone	30 km West	171	992				
1962	27-28 Feb	Jenny	Intense Cyclone	30 km North	235	995				
1964	17-20 Jan	Danielle	Intense Cyclone	40 km South West	219	974				
1966	5-7 Jan	Denise	Severe Depression	65 Km North West	197	1003				
1967	11-14 Jan	Gilberte	Severe Depression	Centre over Eastern island	142	978				
1970	23-25 Jan	Hermine	Severe Depression	240 km West South West	125	999				
1970	27-30 March	Louise	Intense Cyclone	140 km East	140	988				
1972	11-13 Feb	Eugenie	Severe Depression	240 km North North West	132	1002				
1975	5-7 Feb	Gervaise	Intense Cyclone	Over Mauritius	280	951	1	11320	24	
1978	18-21 Jan	Fleur	Intense Cyclone	80 Kkm South East	145	986				
1979	21-23 De	Claudette	Intense Cyclone	Over Mauritius	221	965				
1980	24-28 Jan	Hyacinthe	intense Cyclone	80 km North West	129	993				2000
1980	3-4 Feb	Jacinthe	Intense Cyclone	150 km South East	129	992			1	
1980	12-13 Mar	Laure	Intense Cyclone	30 km North East	201	989	26	2178	12	
1981	5-7 Jan	Florine	Intense Cyclone	80 km West Reunion	135	1003				
1982	5-6 Feb	Gabrielle	Moderate Depression	100 km North West	145	1001				
1983	23-26 Dec	Bakoly	Intense Cyclone	55 km South West	198	992				
1989	27-29 Jan	Firinga	Cyclone	80 km North West	190	994	844		1	
1989	4-6 Apr	Krissy	Severe Depression	30 KM South	150	976				
1991	8-Feb	Bella	Intense Cyclone		210					
1994	9-11 Feb	Hollanda	Intense Cyclone	20 km North West	216	984	450			
1995	7-8 Jan	Christelle	Moderate Cyclone	Over Mauritius	109	994				
1995	24-27 Feb	Ingrid	Cyclone	100 km North East	153	989				
1995	8-13 Mar	Kylie	Severe Depression	135 km West North West	114	1005				
1996	24-25 Feb	Edwige	Moderate depression	100 km North	162	1009				
1996	14-16 Apr	Itelle	Intense Cyclone	275 kn North	109	1011				
1996	6-8 Dec	Daniella	Intense Cyclone	40 km South West	170	998			3	
1998	10-11 Feb	Anacelle	Cyclone	50 km East	121	985				50
1999	8-10 Mar	Davina	Intense Cyclone	25 km South East	173	974			1	
2000	27-29 Jan	Connie	Intense Cyclone	200 km North West	122	1003	5			
2000	13-15 Feb	Eline	Severe Depression	130 km North	129	1006				
2002	20-22 jan	Dina	Very Intense Tropical Cyclone	50 km North	228	988			4	500
2003	12-13 Feb	Gerry	Tropical Cyclone	100 km North North East	143	990				
2003/04	31 Dec - 04 Jan	Darius	Severe Tropical Sotrm	40 km South east	113	994				
2005	22-24 Mar	Hennie	Severe Tropical Sotrm	60 km South East	112	990				
2006	03-04 Mar	Diwa	Severe Tropical Sotrm	220 km North North West	126	1005.7				
2007	22-25 Feb	Gamede	Tropical Cyclone	230 km North West	158	995.5			2	

QUESTIONNAIRE

General:

- What’s your name?
- What was the name of the cyclone?
- Which year was it?
- How old were you when you experienced the cyclone?
- Where on the island were you living at? Can you describe the environment of the home
- How many people lived in household?
- Can you briefly describe the household and home? Material, structure and roof?
- What were the living conditions like at the time?
- How were you feeding yourself? where did the food came from? Store? Garden?

Before the cyclone:

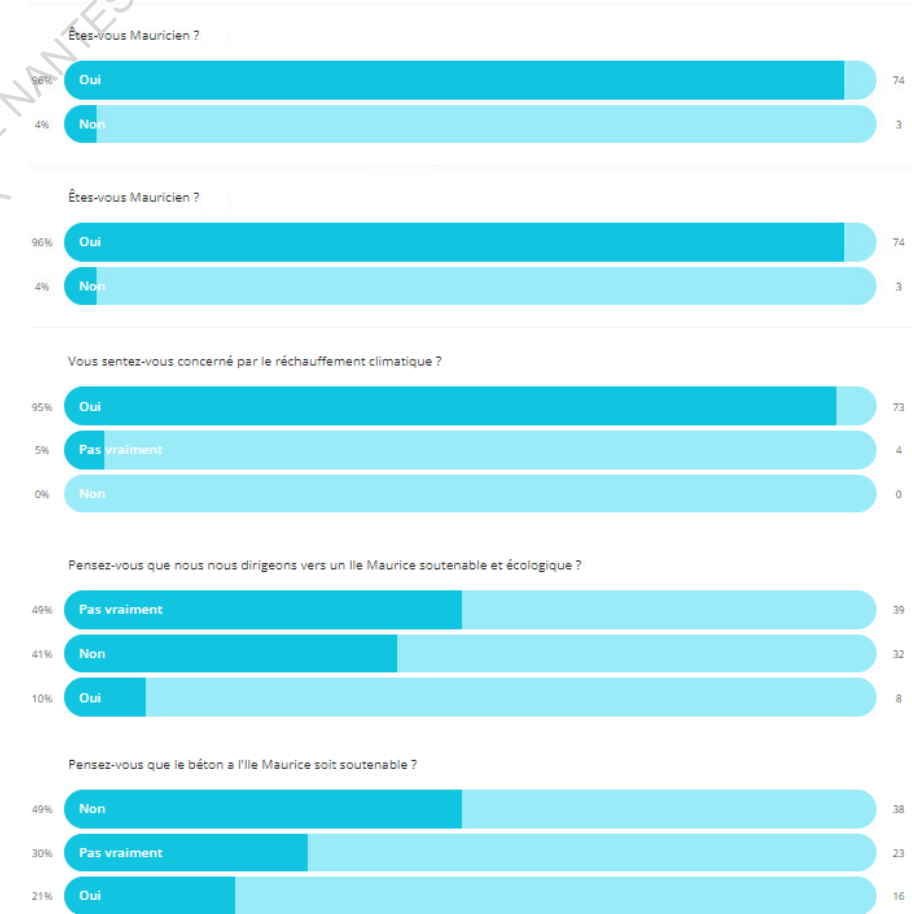
- How did you first hear about the cyclone? Media? Did you feel a change in the environment?
- When did you hear about the cyclone prior to it making landfall? A day? Week?
- What was your initial reaction? How did you feel? Were you scared? Anxious? How did you prepare yourself for the cyclone? Did you cater for groceries? Was the home mended or protected in any way?
- What was the environment like prior to the cyclone? Calm? Windy? Sunny? Hot? Humid?
- Any particular smells? What did the sky look like? How did it feel?
- How was the general ambiance?
- Anything different you could remember? Animalistic behaviors?
- How was the general feel inside the house? Panic? Safe? How did the other members act?

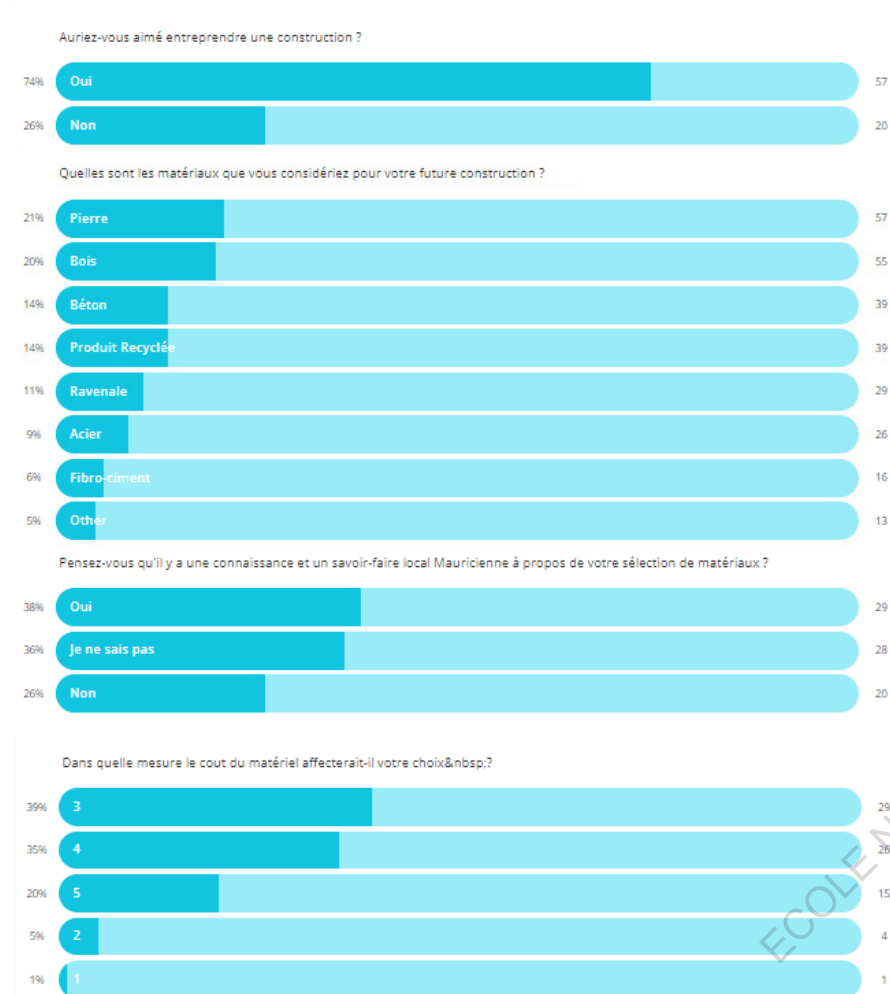
During the cyclone:

What was the wind speed? Was it warm? Cool? Humid? lots of gusts?
Did it rain a lot? Before? During? After? What was the water level like in the garden or street?
Was the home safe from water?
What did you see, hear, smell? Inside and out?
How did it feel?
What did you do during the cyclone?
Did you respect all the instructions given by the Mauritius Meteorological Services?
Did any associations or group of social workers came to see if you are coping well with the cyclone? If yes, What did they say or do?
Does your house suffer any damages during the cyclone? If yes, what damages? What do you do?
How did you feel overall?

After the cyclone:

How did the home stand against the cyclone?
Were there any damages? If so, what were they?
How long did it take to repair? Did you have the financial needs for sufficient repairs?
What was the environment like? The garden? street? Neighborhood?
Were there issues on public infrastructures that limited traveling?
How could you help prevent better for this natural catastrophe? Construction? What would you do differently?
Did any association or social worker came to check if you or your house suffered any damages?





ECOLE NATIONALE SUPERIEURE D'ARCHITECTURE DE NANTES
DOCUMENT SOUMIS AU DROIT D'AUTEUR

Mémoire de master en séminaire Architecture, Resources et Risque Cyclonique
ENSA Nantes
Remy Pitot

