



Social Impact Assessment

of the compounding impacts
of COVID-19 and the
Wakashio oil spill

PRELIMINARY FINDINGS REPORT
OCTOBER 2021

Stanford
SCHOOL OF EARTH, ENERGY
& ENVIRONMENTAL SCIENCES
Emmett Interdisciplinary Program
in Environment and Resources

DYNAMIA

About this Preliminary Report

This report provides a snapshot of the compounded impacts of COVID-19 and the MV Wakashio oil spill on the south-east coast of Mauritius. The objective is to provide interested stakeholders with an initial understanding of the socio-economic situation and needs of the villages in the region. This is the first in a series of documents. Dynamia and its research collaborators intend to publish further thematic reports and peer-reviewed articles exploring themes associated with the social impacts of the oil spill.

Authors

Amandine de Rosnay | Thierry Le Breton

Dynamia Associates & Developers,

5, The Country Side,
Vivea Business Park, St Pierre,
Mauritius

Josheena Naggea | Krish Seetah

Emmett Interdisciplinary Program in Environment and Resources, Stanford University,

473 Via Ortega, Y2E2 Suite 226,
Stanford, California,
United States of America

Pricila Iranah

Department of Biology, University of Nebraska at Kearney,

Kearney, Nebraska 68845
United States of America



"Cite as De Rosnay*, A., Naggea*, J., Le Breton, T., Seetah, K., and Iranah, P. (2021). Social Impact Assessment of the compounded impacts of COVID-19 and the Wakashio oil spill in Mauritius. Dynamia, Mauritius.

(*denotes equal co-authorship)

Important notice

The content of this document is copyrighted and protected by intellectual property laws in Mauritius. This includes all logos, design elements and content representing original intellectual property. You may not reproduce, in whole or in part, any of the content herein without the written consent of Dynamia (info@dynamia.mu)



Table of Contents

Acknowledgements	4	Social Register of Mauritius	51
Glossary	5	Submission of claims regarding loss caused by MV Wakashio	52
List of Abbreviations	6	Synthesis of findings on social, economic and environmental impacts	54
List of Figures	6	Livelihood and social cohesion	54
List of Tables	8	Business impacts	55
Introduction	10	Hospitality	55
Brief contextual overview	10	1.Hotels	55
Main actors involved in the oil spill response	11	2.Seasonal rental of bungalows	57
Historical context of fishing villages	12	3.Restaurants	59
Tourism context	13	Recreational activities	60
Research rationale	15	Other businesses indirectly impacted	61
Research methodology	15	Mauritius as a destination	61
Limitations of the study	17	Financial impact on the operations of non-profit organisations	62
Baseline of the region under study	18	Mental and physical health	62
Demographics	18	As a result of the pandemic	62
Education	19	As a result of the oil spill	63
Poverty and inequality	20	Immediate response and governance	62
Employment and economic structure	20	Perception regarding the COVID-19 response	65
Recent and future developments	22	Perception regarding the Wakashio response	66
Preliminary analysis of survey results	23	Gendered impacts	66
Demographic profile of respondents	23	Environment	68
Household Survey demographics	24	Lack of transparency and communication	72
COVID-19 and Wakashio: degree of affect	26	Intangible heritage	73
Impact on economic activities and financial consequences for households	28	Summary of socio-economic impacts ranked by impact significance	74
Challenges arising from financial difficulties	32	Conclusion and recommendations	84
Investigating challenges linked to access to food & household expenses	34	Impacts on households and communities	84
Impact on education	40	Impacts on businesses and economic activities	85
Impact on health	40	Other lessons learnt and recommendations	86
Access to health services	42	References	88
Impact on business activity	43	Annexes	88
Impact on fishing related activities	45		
Assistance received by respondents since the onset of the COVID-19 pandemic	48		

Acknowledgements

We wish to thank The Tiffany & Co. Foundation for providing funding to Wildlife Conservation Society to support this study. We especially thank Dr Tim McClanahan, Dr Nyawira Muthiga and Dr Jennifer O’Leary for their invaluable contribution in the conceptualisation of the study.

We also thank Professor Larry Crowder for his input on the study design and Dr Sangeeta Mangubhai and Dr Natalie Ban for their support with the survey design. We extend our gratitude to the UN Resident office and the UN-GEF-Small Grants Programme for helping us reach out to key contacts to understand the responses to the oil spill. We also thank the Mauritius Research Platform on COVID-19 and Statistics Mauritius for providing us with valuable data to contextualise our findings, as well as Kantar Mauritius for sharing their nationwide pulse survey findings on the oil spill crisis. We also acknowledge the support of Dr Pramod Kumar Chumun, Dr Ranjeet Bhagooli, Vasisht Seetapah and Sandy Monrose during field visits in the aftermath of the oil spill. We thank all our field assistants without whom this work would not have been possible: Marwyn Anasamy, Yash Gopalsing, Raisha Ramkissoon, Anouska Geerowar, Humaira Auchoybur, Nuzhah Tarsoo, Sheila Seewoodhary, Liliane Chan, Arvind Ramnuth, Vishal Erriah, Nooreza Immambocus and lastly, Kersley Govind and Alexandre Rogers for helping with the training of field assistants and compilation of this report. We also want to thank our reviewers for their thoughtful comments on this document.

We would like to specially acknowledge all our interviewees and survey respondents who offered their time and partook in the survey despite their challenging circumstances.

TERM	DEFINITION	PAGE
Artisanal fishing 	Also known as traditional/subsistence fishing. Artisanal fisheries are traditional fisheries involving fishing households, using relatively small amounts of capital and energy, relatively small fishing vessels (if any), making short fishing trips, close to shore, mainly for local consumption.	10
Gleaning 	A fishing method used in shallow coastal, estuarine and freshwaters or in habitats exposed during low tide. Other terms may be used for this type of fishing, especially “gathering” and “collecting.” Both women and men glean, but in many countries and regions gleaning is mostly done by women and children.	10
Environmental Sensitive Areas (ESA) 	ESAs are a conservation planning mechanism used by countries all over the world, including Mauritius. Their principal objective is to identify and protect a country’s natural resources. ESAs are sites that have special environmental, aesthetic, historical and cultural attributes.	10
GINI Coefficient 	The Gini coefficient or index is a measure of the distribution of income across a population. The coefficient can take any value between 0 to 1. A coefficient of 0 indicates a perfectly equal distribution of income or wealth within a population. A coefficient of 1 represents a perfect inequality when one person in a population receives all the income.	20
The International Tanker Owners Pollution Federation Ltd (ITOPF) 	A not-for-profit organisation established on behalf of the world’s shipowners to promote an effective response to marine spills of oil, chemicals and other hazardous substances. ITOPF has responded to over 800 incidents involving oil or chemical spills worldwide.	69
Mangroves 	A woody tree or shrub that lives along sheltered coastlines within the tropic or subtropic latitudes. Mangroves play an important role in the coastal ecosystem of Mauritius. Mangrove and Coral reef management and protection is one of the key strategies in addressing coastal zone challenges in Mauritius.	10
Ramsar site 	A site designated to be of international importance under the Ramsar Convention on Wetlands for containing representative, rare or unique wetland types, or for its importance in conserving biological diversity.	6
Very Low Sulphur Fuel Oil (VLSFO) 	A new type of low-sulphur fuel whose use is mandated in marine shipping by the international Marine Organization (IMO) in a drive to improve air quality, preserve the environment and protect human health. VLSFO is a replacement for heavy fuel oil and its mandatory use became effective on 1 January 2020.	10

List of Abbreviations

ABBREVIATION	EXPLANATION
FPS	Fisheries Protection Service
ITOPF	The International Tanker Owners Pollution Federation Ltd
MRA	Mauritius Revenue Authority
MWF	Mauritian Wildlife Foundation
NHS	National Household Survey
NPO	Non-Profit Organisation
PPP	Purchasing Power Parity
SME	Small and Medium Enterprise
SRM	Social Register of Mauritius
VCA	Village Council Area
VLSFO	Very Low Sulphur Fuel Oil

List of Figures

	PAGE
Figure 1 Photos of the Dutch Landing (top left); Battle of Grand Port Monument (top right); Ile aux Fouquets (bottom left); Ile de la Passe (bottom right). Photos by Thierry Le Breton	14
Figure 2 Map of villages affected by the oil spill	16
Figure 3 Gender distribution of survey respondents	23
Figure 4 Education levels of survey respondents	24
Figure 5 Household annual earnings in MUR of respondents pre-COVID-19	25
Figure 6 Percentage of respondents categorising how their lives changed in the past 3 years	26
Figure 7 Percentage of respondents categorising the degree of affect due to COVID-19	27
Figure 8 Percentage of respondents categorising the degree of affect due to the oil spill	27
Figure 9 Change in households' main source of income for those employed in the fishing and agricultural sectors (spill site only)	29
Figure 10 Change in households' main source of income for those in employment or other source of regular income (spill site only)	29
Figure 11 Change in households' main source of income for those in self-employment (spill site only)	30
Figure 12 Change in households' main source of income for those who depend on external support (spill site only)	30

List of Figures

Figure 13	Mean percentage decrease in earnings per household	30
Figure 14	Percentage of households with debt	31
Figure 15	Amount of debt per household	32
Figure 16	Percent of respondents who have had to engage in new economic activities since June 2020	32
Figure 17	Percentage who have moved out of their villages over the two time periods	33
Figure 18	Types of challenges faced by respondents	34
Figure 19	Reasons related to food insecurity issues faced in the spill sites	35
Figure 20	Frequency of locally caught seafood consumption before March 2020	36
Figure 21	Change in local seafood consumption due to the COVID-19 lockdown	36
Figure 22	Change in local seafood consumption due to the oil spill	37
Figure 23	Coping strategies used as a response to lack of food access	38
Figure 24	Coping strategies used as a response to financial difficulties	39
Figure 25	Mental health symptoms reported in the oil spill sites, as a result of the lockdown and the oil spill	42
Figure 26	Size of respondents' businesses	43
Figure 27	Change in level of business activity for those from the tourism industry compared to the same period in 2019	43
Figure 28	Change in level of business activity for those in other types of business activities compared to the same period in 2019	44
Figure 29	Most important reason given to explain the change in business activity intensity	44
Figure 30	Percentage of respondents whose primary livelihood is fishing and gleaning	45
Figure 31	Change in the amount of fish caught compared to the same period in 2019	47
Figure 32	Observed change in fish price compared to the same period in 2019	47
Figure 33	Respondents who received a form of external assistance	49
Figure 34	Type of assistance received by respondents	49
Figure 35	Entity which provided respondents with compensation (financial support)	50
Figure 36	Entity which provided food packs	50
Figure 37	Entity which provided training	50
Figure 38	Entity which provided loan extensions	50
Figure 39	Households listed under the SRM	51
Figure 40	Fisher households listed under the SRM	51
Figure 41	Claims submission (spill sites) for all coastal residents surveyed	52
Figure 42	Fisher claims submission (spill sites)	52
Figure 43	A timeline of the impact of the events on tourism	56
Figure 44	The contribution to household income from revenue generated by seasonal rentals	58
Figure 45	Photos of closed restaurants in Mahebourg in the middle of lunch hour in December 2020	60
Figure 46	Before and after clean-up operations at an affected site with mangroves at Riviere des Creoles (Source: Polyeco Mauritius)	71

List of Tables

	PAGE	
Table 1	Population per VCA under study	18
Table 2	Education statistics 2011: illiteracy and percentage of children not in school between 10-14yrs	19
Table 3	Gender breakdown of employed workforce of legal working age per district (2011)	21
Table 4	Employment rates comparison between reference and oil spill sites (2011)	21
Table 5	Employment sector and occupational group per district	21
Table 6	Household composition of respondents	24
Table 7	Percentage of income earners per household pre-COVID-19	25
Table 8	Percent change in number of income earners per household and gender distribution	28
Table 9	Mean earnings decrease per activity for the spill sites	31
Table 10	Percentage of households facing various economic challenges since June 2020 due to their financial situation	33
Table 11	Ability of each household member to have three full meals a day	35
Table 12	Degree of involvement in the oil spill clean-up	40
Table 13	Physical health impacts categorised by spill involvement	41
Table 14	Reasons highlighted by those who reported difficulties in obtaining medical certificates	42
Table 15	Categories of fishers surveyed in this study	46
Table 16	Decrease in rental sales due to COVID-19 and the oil spill for seasonal rentals on the south-east coast	58
Table 17	Perceptions of Mauritians surveyed at national level by Kantar Mauritius concerning the oil spill in August 2020 and March 2021	73
Table 18	Ranking of impacts with respect to COVID-19 and the oil spill and associated recommendations	75
Table 19	Relative Development Index (2011)	88
Table 20	Estimations for decrease in seasonal rental sales on the southeast coast	90
Table 21	Different levels of support provided by the MV Wakashio Assistance and Support Cell	91
Table 22	Extension of MV Wakashio Solidarity Grant (Rs 10,200) by the MV Wakashio Assistance and Support Cell	92
Table 23	Payment of Business Continuity Grant by the MV Wakashio Assistance and Support Cell (one-off Payment)	93



Executive Summary

Background and context

As a globally interdependent economy, an isolated island nation and a recognised biodiversity hotspot in the Western Indian Ocean, Mauritius is highly vulnerable to a range of exogenous factors and environmental stressors. On 25th July 2020, the Japanese-owned, Panama-flagged MV Wakashio bulk carrier vessel, owned by Okiyo Maritime Corp./Nagashiki Shipping Co Ltd, ran aground and wrecked off the island's south-east coast. On August 6th, an estimated 1,000 tonnes of fuel oil spilled along more than 30 km of coastline. The Wakashio oil spill is of particular interest for two main reasons: (1) It occurred in a region with multiple conservation areas including two Ramsar sites, two fishing reserves and several island nature reserves, and (2) the Wakashio Spill is the first oil spill involving a new type of Very Low Sulphur Fuel Oil (VLSFO)ⁱ mandated by the International Maritime Organisation (IMO) in 2020 to reduce air pollution. The impact of VLSFO on the marine environment and people after a spill has been understudied as this is the first reported spill since VLSFO came into use.ⁱⁱ

This incident occurred while the island was and still is dealing with the impacts of the COVID-19 pandemic. With closed borders worldwide and very strict quarantine rules for entry into Mauritius in 2020, COVID-19 has disproportionately affected the tourism sector and all directly and indirectly dependent businesses. The Wakashio oil spill resulted in the closure of the lagoons, beaches and fishing activities between Le Bouchon and Trou D'eau Douce villages from August to December 2020, severely affecting coastal communities who were previously active in both the fisheries and tourism sectors.

Objectives

The aim of this study is to:

- identify and investigate the cumulative socio-economic impacts of two events – the COVID-19 pandemic and the MV Wakashio oil spill – on the south-east coast of the island;
- to provide an independent and comprehensive social impact assessment for the benefit of all stakeholders;
- to provide a transparent, evidence-based and inclusive understanding of the situation to stimulate constructive dialogue between stakeholders and policymakers.

This report provides an initial socio-economic assessment of the direct and indirect impact of these adverse events on the vulnerable communities of the south-east region and seeks to highlight their economic, health and socio-cultural needs in the aftermath of these two events in 2020. Effects regarding job losses, changes in income, food security, mobility, poverty and inequality levels, education, gender inequalities, physical and mental health, amongst others, have been captured to the greatest extent possible. The information contained in this report can be utilised by concerned stakeholders to provide a holistic response to these two events.

i Scarlett, Alan G. et al. 2021. "MV Wakashio Grounding Incident in Mauritius 2020: The World's First Major Spillage of Very Low Sulfur Fuel Oil." *Marine Pollution Bulletin* 171: 112917. <https://doi.org/10.1016/j.marpolbul.2021.112917>.
<https://doi.org/10.1016/j.marpolbul.2021.112917>.

ii Lewis, Dyani. 2020. "How Mauritius Is Cleaning up after Major Oil Spill in Biodiversity Hotspot." *Nature* 585(7824): 172.

Methodology

The research team used a mixed-method approach to empirically assess impacts in the affected areas. This study consisted of 792 in-person household surveys, 22 interviews, seven community meetings, and 10 online surveys with seasonal renters, in addition to walk-ins in businesses located in the oil spill-impacted area. The household surveys were conducted across 12 oil spill-impacted sites and four reference sites at Village Council Area (VCA) level, between November 2020 and January 2021. Of the 792 households, 564 were from the oil spill-impacted region on the south-east coast and 228 were from reference sites in the West and North of the island. These reference sites were only impacted by COVID-19 but not the oil spill and are situated in regions where communities also rely heavily on tourism and artisanal fishing.

Findings

Our findings indicate that the oil spill-impacted sites bear the brunt of the two compounded exogenous shocks. Already affected by relatively slower economic development than the rest of the country, the overlap of both events has created unprecedented pressure on the region. These two shocks have disproportionately affected the most vulnerable coastal communities who were dependent on the fisheries and tourism sectors. According to Statistics Mauritius, ~50% of the working population in the spill sites are self-employed or seasonal workers, often operating in the informal sector, with indirect linkages to tourism and fishing.

Our results also indicate that post lockdown (March-June 2020), both reference and oil spill sites experienced a reduction in household earnings, averaging -40.5% for the reference sites and -47.5% for the spill sites. By November, whilst earnings in the reference sites had recovered to an average of -32%; earnings in the spill sites continued to decline to -56.6%. Those most affected, such as those involved in seasonal labour, fishing and gleaning, saw a decline in household earnings of up to 71% in the spill sites, while the reference sites in the North and West coasts of the island began to recover from the effects of COVID-19 from June to December 2020. In contrast, the sites associated with the oil spill show a continuous decline across the assessed socio-economic indicators, suggesting that vulnerable respondents in this area will likely struggle to recover financially. The conclusion drawn is that the oil spill further eroded the resilience of these vulnerable populations. While recovery for some may be rapid once the economy opens, the road to recovery is likely to be more complex for others who have accumulated debt, exhausted personal savings, and sold productive assets such as boats.

In terms of COVID-19's economic impacts on households, the reference sites showed a decrease of only 1% in the number of income earners per household after the 2020 lockdown period, with this proportion remaining stable until November 2020. The spill sites saw their number of household earners decrease by 3% and recover by 1% after the oil spill. The small percentage decline in income earners per household can be attributed to Mauritius' strong social welfare policies as well as various forms of government assistance established in response to the pandemic and the oil spill. However, the overall amount earned per household has decreased considerably.

These economic hardships have affected the capacity for families to purchase basic food items, pay for household expenses and cover business expenses. Our findings have shown that the economic hardships have been exacerbated by the oil spill because the 2020 COVID-19 lockdown had already resulted in a loss of household income. Several other social impacts were also noted: physical and

Executive Summary

mental health issues have arisen, caused by increased anxiety and depression due to the pandemic, physical exposure to the fuel oil, and increased feelings of anger due to the oil spill. Some families were unable to send their children to school as they could no longer afford to provide lunch, which is an important compounding factor considering that schools were closed during the 2020 COVID-19 lockdown between March and June 2020, and again in August 2020 following the oil spill. Those in the fishing trade reported a more substantial psychological impact; they consider their professions to be a way of life, not simply a job. This disruption to their worldview has resulted in feelings of 'loss of the future' and fears due to anticipated difficulties in finding other means of income.

In terms of the impact on economic activities, most people employed in the tourism sector in the south-east coast could not benefit from domestic tourism like those on the rest of the island. The oil spill hampered any form of recovery from COVID-19, and many small and medium bed-and-breakfasts and restaurants noted they were at risk of closing their businesses within months. Across all sites, business ventures have suffered, as the spending power of locals has diminished substantially.

The small-scale fisheries sector was also particularly affected, as both commercial and subsistence fishers could not carry out their fishing activities during the 2020 lockdown, exacerbated by the restrictions on fishing from August to December 2020 due to the oil spill. Our survey results from the oil spill-impacted sites indicate a 51% reduction in fishing income due to the 2020 COVID-19 lockdown, reaching a 72% reduction in fishing revenue due to the oil spill. Fishers were affected by a combination of factors: a forced unemployment period, a reduction in revenue and increase in household debt, a drastic change in their diet composition, health issues and damage to fishing equipment. Although registered fishers and applicants of Fisher Registration Cards were granted a monthly compensation of Rs 10,200 (around USD 250), along with a Bad Weather Allowance, many fisher households expressed economic difficulties. Fisher revenues diverge greatly based on gear type and fishing efforts. Establishing a fair compensation range is also challenging as most fishers have been underreporting their catch. In addition, the support package excludes unregistered fishers (who have no record of registration application), particularly subsistence fishers, further threatening food security along the south-east coast.

Of the groups that are disproportionately impacted by COVID-19 and the oil spill, women are one of the hardest hit, with impacts that could potentially exacerbate inequalities between men and women. As highlighted in the Gendered Voices Issues 1-4 by UNDP Mauritiusⁱⁱⁱ, COVID-19 has the potential to accentuate the feminisation of poverty in Mauritius: currently, 11% of the poorer segment of the population constitutes women living under the poverty line, compared to 9.6% males in the same category. Similarly, the challenges facing women in the fisheries sector have become apparent. In Mauritius, of the 1,902 registered fishers in Mauritius^v, only 35 are women. And of these 35, more than 50% are located in the oil spill-affected region. Although there is an equal to larger number of unregistered fishers compared to registered ones, fisherwomen and gleaners are overwhelmingly unregistered and far less likely to be recognised. A system that therefore does not account for unregistered fishers inadvertently accentuates gender inequalities^v. Both COVID-19 and the oil spill impact have demonstrated the dangers of gender-neutral policies, which exclude women from receiving relief, and have exposed the weaknesses that are entrenched in our systems and economies.

iii United Nations Development Programme Mauritius, "COVID-19: INCREASING INEQUALITIES BETWEEN WOMEN AND MEN," n.d.

iv Mauritius Fishermen Cooperative Federation Ltd, 2019

v Josheena Naggea, Emilie Wiehe, and Sandy Monrose, "Inequity in Unregistered Women's Fisheries in Mauritius Following an Oil Spill," *Women in Fisheries Information Bulletin*, no. #33 (March 2021), <https://spccfpstore1.blob.core.windows.net/digitallibrary-docs/files/0d/0d8232f2d0fbad10dc7260b7e734aea9.pdf>.

Coping strategies across all coastal residents have included:

- Engaging in new economic activities, usually in the daily labour sector, with skippers and fishers being hired by the oil spill clean-up crews
- Spending savings
- Taking on more debt
- Selling productive assets (boats, motors, cars, etc.)
- Relying on cheaper food, decreasing protein intake, especially fish
- Increased dependency on the generosity of family and friends

There is a clear demarcation in the level of satisfaction of the respondents with respect to the help received from the government for the pandemic versus how the government's response to the oil spill. Respondents were mainly satisfied with the response to the pandemic, but mostly dissatisfied with the oil spill response. Several issues were highlighted, including (1) a slow response at the start of the spill, (2) increased distrust due to the lack of open communication and scientific information about response measures and environmental impacts of the disaster.

The combination of the psychological impact related to the COVID-19 pandemic and the Wakashio oil spill, the heavy financial burden, debt accumulation, food insecurity, reduced school attendance, health impacts, and the unequal distribution of assistance could eventually cause many to fall into poverty traps, and lead to the fragmentation of the social fabric of the region. Without local assistance and support, coastal residents will continue to suffer from the combined impacts of both incidents.

Recommendations

Based on the findings, our key recommendations from this study include:

- Beneficiaries of employment and business support should be determined on a more in-depth 'needs-based' assessment to better evaluate the types of challenges faced by businesses, especially the micro businesses and SMEs in the region. Including those indirectly affected.
- Financial support packages should include a gender focus targeted at improving women's care and economic roles, while setting up mechanisms to support women in these roles so they can recover from both the COVID-19 and oil spill crises.
- Physical health monitoring and psychological support and monitoring should be largely increased in the oil-spill impacted communities. A more thorough investigation should be undertaken by public health officials. In addition, a mental health support cell should be set up and adequately communicated to impacted families. NGO staff should also be adequately trained for this role.
- Results of the toxicity tests conducted on the range of mobile and sessile marine species fished and consumed along the impacted coastline need to be shared with consumers. It is important to sensitise coastal residents to the potential consequences of consuming seafood from the area affected by the oil spill. Additionally, should/when the seafood will be deemed safe by the tests, the scientific results will help seafood restaurants.
- Long-term environmental monitoring to keep track of the ecological health of the different habitats in the impacted area (corals, mangroves, seagrass) should include coastal residents and businesses given their dependence on these resources.
- As of this writing, Mauritius is still reeling from both shocks. Ongoing monitoring of the situation is required to assess the full extent of the impacts of the two events, and to keep up with the growing needs of the affected communities.

Introduction

Brief contextual overview

As a globally interdependent economy, an isolated island nation, and a recognised biodiversity hotspot, Mauritius is highly vulnerable to a range of exogenous factors and environmental stressors. The aim of this study is to investigate the cumulative socio-economic impacts of two events on the south-east coast of the island, namely the COVID-19 pandemic and the MV Wakashio oil spill.

On 25th July 2020, the Japanese-owned, Panama flagged MV Wakashio bulk carrier vessel, owned by Okiyo Maritime Corp./ Nagashiki Shipping Co Ltd, wrecked off the island's south-east coast, spilling over 1,000 tonnes of fuel oil along more than 27km² of coastline. The bulk carrier, measuring some 300 m in length and 50 m in width, had a crew of 20 members on board and contained no cargo. This incident occurred while the island was and still is dealing with the impacts of COVID-19. With closed borders worldwide and very strict quarantine rules for entry into Mauritius, COVID-19 has disproportionately affected the tourism sector and all annexed and indirect businesses. The Wakashio oil spill, for its part, led to the closure of the lagoons, beaches and fishing between Le Bouchon and Trou D'eau Douce, and has strongly affected coastal communities who were active in both the fisheries and tourism sectors.

The south-east coast of Mauritius is known for its artisanal fishing villages and concentration of protected sites of ecological importance. It is a unique area in that it is one of the least developed regions of the island, with some of the last vestiges of traditional artisanal fishing. The region is also home to several Environmental Sensitive Areas (ESA) of the island. Its unique biodiversity including complex reef systems, mangroves, marine parks, and islets are of international importance. Additionally, the Wakashio Spill is the first incident since a new type of Very Low Sulphur Fuel Oil (VLSFO) has been mandated by the International Maritime Organisation (IMO) to reduce air pollution. Its impact on the marine environment and people during a spill has been understudied¹. These combinations of factors make this an oil spill of international interest.

The coastal population of these regions is highly dependent on both tourism and fishing activities, which happen to be the two economic sectors hit hardest by these two events. The ocean holds important socio-cultural values for these coastal communities. Furthermore, the resilience of these communities and of the natural environment are of utmost importance in facing climate change threats. This complex context must therefore be considered in understanding the socio-economic impacts of these crises

¹ Scarlett, Alan G., Robert K. Nelson, Marthe Monique Gagnon, Alex I. Holman, Christopher M. Reddy, Paul A. Sutton, and Kliti Grice. "MV Wakashio Grounding Incident in MAURITIUS 2020: The World's First MAJOR Spillage of Very Low Sulfur Fuel Oil." *Marine Pollution Bulletin* 171 (2021): 112917. <https://doi.org/10.1016/j.marpolbul.2021.112917>.

Main actors involved in the Oil Spill Response



* United Nations team: International Maritime Organisation, UN-Environment, UN Office for the Coordination of Humanitarian Affairs, UN Office of the Resident Coordinator, International Organization for Migration, UN Office on Drugs and Crime, UN Development Programme, World Health Organization.

** Only main nonprofit organisations have been listed. Many other civil society groups were involved in the volunteer responses including Rezistans ek Alternativ, Rotaract Club of Mahebourg, the Mauritius Scuba Diving Association, Mauritius Red Cross Society, Leo Club Grand Port, Lions Club Grand Port, FoodWise

*** UN Experts have been deployed under the UN Disaster Assessment and Coordination (UNDAC) mechanism for the Wakashio Oil Spill

Introduction

Historical context of fishing villages

As our study deals with several fishing villages, it is important to provide an overview of the historical context to situate the current socio-economic circumstances. Since the 1850s, the fishing profession has been associated with people belonging to the Creole community (Mauritians of African descent), offering them a means of self-subsistence and food independence. It was not until the 1980s that this started to change as the value of fresh fish on the market rose² and more people joined. Improved access to coastal zones, better cold storage, as well as the rise of a middle class able to afford such a commodity led to the more widespread consumption of fresh fish. Artisanal fishing went on to become a means to accumulate wealth as well as a symbol of social status³. Many artisanal fishers have remained independent over time and chosen not to form unions or collaborations, until the establishment of the Association des Pêcheurs Professionnels de l'Île Maurice (APPIM)⁴ in the 1960s.

Decades later, the 1990s government policies and programmes designed to encourage fishers to fish outside the lagoon seem to have instead encouraged some fishers to keep their licences to benefit from monetary incentives, even if fishing was no longer a viable primary activity. Whilst gleaning has been practiced by women since the 19th century, it was during the 1990s that fishing became a more accessible practice for women, and a reliable source of food security for their household. To date, most of their activity seems to be largely for subsistence purposes⁵. To this day, over and above being an income source, the ability to fish is strongly associated with freedom and independence, while access to the sea is an essential element of their livelihood and wellbeing.

For several decades, the government has undertaken numerous measures to sustain the artisanal fishery sector, such as the Rs 60 million annually disbursed as Bad Weather Allowance (a policy introduced in 1965) to compensate artisanal fishers on days where fishing cannot be carried out due to adverse weather conditions.⁶ The government has also spent approximately Rs 50 million on projects for artisanal fishers' relocation to off-lagoon fishing and adoption of aquaculture between 2012 and 2017.⁷ However, these measures have proven insufficient as the artisanal fishery production from 2012 to 2017 has declined, while total local fish consumption has risen. In 1990, the proportion of artisanal fish catch stood at 96%, close to the Maximum Sustainable Yield (MSY) threshold of 1,700 tonnes.⁵ Following strong measures introduced to sustain fishery development and to prevent stock depletion in the lagoons, the proportion of artisanal fish catch decreased to 33% in 2013⁸.

Today, the fisheries sector is a priority for the Mauritian economy, accounting for 19% of total exports, while also providing an important source of income and nutrition. It is also a major investment area for fishing, the seafood hub and aquaculture, which helps account for the 19%. These capital-intensive activities are related to offshore fishing (or deep-sea fishing), which account for 95% of the catches – a volume that continues to increase over the years. In contrast, coastal fishing, which is an artisanal and small-scale activity, accounts for only 5% of the national fish production, with a slightly

2 Ollivier, Lydia. "Les Pêches Artisanales Mauriciennes. Mutations Récentes D'une Activité Sécularisée." *Cahiers d'outre-mer* 46, no. 183 (1993): 325–48. <https://doi.org/10.3406/caoum.1993.3490>.

3 Ibid.

4 Ibid.

5 Ibid.

6 This monthly allowances was paid at a daily rate of Rs 365 per day in 2019; and now at Rs 425 (11\$) per day

7 Mauritius. National Audit Office. *Moving Towards Sustainable Artisanal Fishery in Mauritius* : Ministry of Ocean Economy, Marine Resources, Fisheries and Shipping, 2018. https://nao.govmu.org/Documents/Reports/P04_Artanal_Fishery.pdf

8 Republic of Mauritius, "Millennium Development Goals Report 2015," 2015,

http://www.undp.org/content/dam/mauritius_and_seychelles/docs/Procurement/Government-Report/Millennium%20Development%20Goals%20Final%20National%20Report%202015%20pdf.pdf.

decreasing trend over the years. Overall, the fisheries sector contributed 1.3% to GDP, supporting the livelihoods of about 1902⁹ registered artisanal fishers and around 320 fishers working on fishing banks.¹⁰ Artisanal fishing is the principal source of fresh fish supply to the local market, which helps to alleviate poverty and ensure food security by providing employment in coastal communities.¹¹

The oil spill-impacted sites have a total of 631 registered fishers, of which 20 are women (Mauritius Fishermen Cooperative Federation Ltd, 2019).

Tourism Context

The tourism sector directly contributed 8.2% to GDP in 2019 and 23.8% indirectly. It accounted for 22% of total employment, 60.3% of services exports and 35% of total exports.¹² As a direct result of the fall in tourism as from April 2020, total arrivals for the year dropped to approximately 310,000 (compared to 1383,488 for 2019). The Bank of Mauritius had forecasted Rs 65 billion in revenue for the year 2020, had the pandemic not occurred.

In the South-East, the Blue Bay Marine Park is known for its diverse and rich fauna and flora, especially the corals, including a specimen of *Porites* (brain coral) measuring some 6-7 metres in diameter. 108 species (33 genus) of coral, 233 fish species and 201 species of molluscs were inventoried in 2012.¹³ Around 25 boat operators routinely operate around Blue Bay Marine Park, taking tourists and locals to visit not only the marine protected area but also the numerous islets around it. Tours typically leave from Blue Bay and travel as far as Ile aux Cerfs on the Eastern coast. The neighbouring Ile aux Aigrettes, a small yet important ecotourism destination covering 27 ha and managed by a local NGO, the Mauritian Wildlife Foundation (MWF), was declared a Nature Reserve in 1965. Today, it is an internationally recognised model of island conservation and offers visitors guided walking trails along a dry coastal forest in discovery of unique endemic flora and fauna, as well as to learn about the restoration work of the NGO.¹⁴ In 2019, the NGO welcomed 17,900 visitors on the island. The region is also home to five islet National Parks (Île aux Fous, Île aux Fouquets – Le Phare -, Îlot Vacoas, Rocher des Oiseaux, Île de la Passe) and two islet Nature Reserves (Ilot Marianne and Ile aux Aigrettes), all protected by the The Native Terrestrial Biodiversity and National Parks Act 2015. The islet Nature Reserves are also protected under the Forest and Reserves Act 1983, amended 2003.

From a broader perspective, Mahebourg was designated as a Tourism Zone by the Ministry of Tourism in the context of the National Development Strategy for Mauritius¹⁵. The town's 17,000 inhabitants and its surroundings offer a great diversity of natural and cultural heritage, lending this region an authentic character. This is all inscribed in Mahebourg's history as the first historical port of the country for Dutch settlers. Mahebourg and its surroundings, which has seen less development, is steeped in historical vestiges and local cultural traditions (e.g. Mahebourg Naval Museum,

9 Mauritius Fishermen Co-operative Federation Ltd, Port Louis, Mauritius

10 Mauritius. National Audit Office. Moving Towards Sustainable Artisanal Fishery in Mauritius : Ministry of Ocean Economy, Marine Resources, Fisheries and Shipping, 2018. https://nao.govmu.org/Documents/Reports/P04_Artinal_Fishery.pdf

11 Lailjee, Ayyam Velmurugan, and Awindra Kumar Singh, "Chapter 14 - Climate Resilient and Livelihood Security – Perspectives for Mauritius Island," in Biodiversity and Climate Change Adaptation in Tropical Islands (London: Elsevier Academic Press, 2018), 403-431.

12 UNDP Mauritius et al., "The Socio-Economic Impact Assessment of COVID-19 in Mauritius," March 2021, https://www.mu.undp.org/content/mauritius_and_seychelles/en/home/library/socio-economic-impact-assessment-of-covid-19-in-mauritius.html, Page 21.

13 The Ministry of Agro Industry and Food Security Mauritius, "Fifth National Report on the Convention on Biological Diversity," April 2015, <https://www.cbd.int/doc/world/mu/mu-nr-05-en.pdf>.

14 "Île Aux Aigrettes," Mauritian Wildlife Foundation, n.d., <https://www.mauritian-wildlife.org/ileauxaigrettes>.

15 Ministry of Housing and Lands, "National Development Strategy Executive Summary," 2003.

Introduction

Fort Frederick Hendricks, Ile de la Passe, fortifications of Pointe Diable, regattas, cassava biscuit factory, etc.¹⁶) as well as nature reserves rich in endemic biodiversity (Ferney Valley, Ile aux Aigrettes, le Val Nature Park). Mauritians also attach deep historical and cultural value to the bay of Mahebourg, where the naval Battle of Grand Port took place between two Napoleonic warships and the British army in 1810. To date, it is a known and prized fact by Mauritians that this Napoleonic victory is engraved on the Arc de Triomphe in Paris. Remains of the sunken boats during this battle still lie at the bottom of the bay and attract amateur divers. Another shipwreck of interest in Grand Port is “Le Coureur,” a ship carrying a convoy of clandestine slaves from Madagascar at a time when the slave trade had recently become illegal¹⁷.



Figure 1 Photos of the Dutch Landing (top left); Battle of Grand Port Monument (top right); Ile aux Fouquets (bottom left); Ile de la Passe (bottom right). Photos by Thierry le Breton



16 Summers, G.D. Landscapes, Seascapes, and Coastal Defenses: A Case Study from Southeast Mauritius. *Int J Histor Archaeol* (2021). <https://doi.org/10.1007/s10761-021-00607-6>

17 Archéologie Marine: Le Négrier «Le Coureur» à Découvrir En 3D." *L'Express*, September 30, 2018

Research rationale

Like much of the rest of the world, Mauritius has been severely impacted by the COVID-19 pandemic. Today, more than a year since its outbreak, it is still too early for the world and Mauritius to fully assess the magnitude of the impact and potential long-term economic, health and socio-cultural changes that may result from the outbreak. However, drawing on 2020's experiences and with the benefit of hindsight, certain lessons can be learned to better prepare for future crises.

In addition to the pandemic's impact, the oil spill exacerbated poverty and social pressures in the region. The difficult socio-economic context, murky circumstances surrounding the MV Wakashio running aground and the subsequent response, and the potential environmental and health impacts of the spill, resulted in much social upheaval in Mauritian society, including one of the island's largest peaceful protests since the 1980s, which reportedly had a turnout of 10% of the island's population¹⁸.

As such, it is important to assess the region's socio-economic wellbeing in a comprehensive and holistic manner, to mount the best possible short and long-term response. In view of the inevitable politicisation of both events, we aimed to provide the Mauritian public with a neutral, fact-based and non-partisan analysis of the impacts and response.

This preliminary report's main objectives are:

1. To provide an independent and comprehensive social impact assessment for the benefit of all stakeholders.
2. To provide a transparent, scientific and inclusive understanding of the situation in order to stimulate constructive dialogue between stakeholders.

Research methodology

Primary data collection

The research team used the following methodological approaches to collect evidence in order to assess impacts in the targeted areas, using the framework employed in Terrapon-Pfaff et al.(2017)¹⁹ the Institute of Sustainable Development (2007)²⁰

(i) Household survey*

The study included 792 in-person household surveys conducted across 12 oil spill-impacted sites and four reference sites at the VCA level, between November 2020 and January 2021. Of the 792 households, 564 were from the oil spill-impacted region on the south-east coast and 228 were from reference sites in the north-western and south-western regions of the island. Reference sites were those which were impacted by COVID-19, but not by the oil spill, with communities heavily reliant on tourism and artisanal fishing. The perception of respondents were sought for three time frames 1) before COVID-19, 2) between June-July 2020 (after the 2020 Covid-19 lockdown/pre-oil spill) and 3) after the oil spill in August 2020.

¹⁸ Leighton G Luke, "Mauritius Government Facing Record Public Discontent after Oil Spill," Future Directions International (FDI), September 2, 2020. <https://www.futuredirections.org.au/publication/mauritius-government-facing-record-public-discontent-after-oil-spill/>.

¹⁹ Terrapon-Pfaff, Julia, Thomas Fink, Peter Viebahn, and El Mostafa Jamea. "Determining Significance in Social Impact Assessments (SIA) by Applying Both Technical and Participatory Approaches: Methodology Development and Application in a Case Study of the Concentrated Solar Power Plant NOORO I in Morocco." *Environmental Impact Assessment Review*, September 2017, 138-50. <https://doi.org/https://doi.org/10.1016/j.eiar.2017.06.008>

²⁰ International Institute for Sustainable Development. Rep. *Social Impact Assessment (SIA)*. International Institute for Sustainable Development, n.d. <https://www.iisd.org/learning/eia/wp-content/uploads/2016/05/SIA.pdf>.

* The data from the household surveys, key informant interviews and community meetings have been collected as part of Josheena Naggea's dissertation research. Only preliminary results have been shared in this report. More in-depth analyses will be made available in subsequent publications.

Research methodology

For the oil spill sites, we selected the 12 impacted villages on the south-east coast of the island as identified by the UNDP-IOM preliminary social impact assessment report (2020). For reference sites, which were only affected by COVID-19 and not the oil spill, four villages - Le Morne on the western coast, and Baie du Tombeau, Pointe aux Piments, and Trou aux Biches on the north-west coast were selected for the household surveys.

(ii) Key informant interviews and community meetings

We conducted 22 key informant interviews with economic actors, government officials, NGOs, the local UN resident office and environmental experts individually, and 7 community meetings which were attended by 120 community members from oil spill-impacted sites (mostly fishers, boat operators and skippers). We iteratively analysed and distilled over 50 transcript pages from the interviews using an inductive approach.

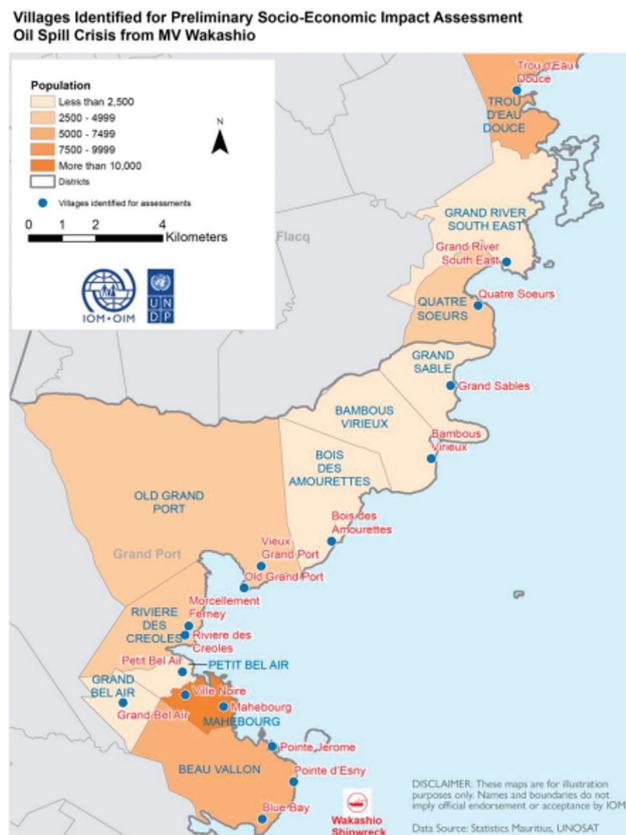
(iii) Online surveys for seasonal rentals

We performed a specific survey to assess the economic impacts on the seasonal rental of private accommodations. Since this activity is partly informal, official statistics are not available. The economic parameters were estimated by making an inventory of the number of residences referenced on websites (e.g. Airbnb) as well as the daily rental rates to which we associated the usual occupancy rate during these periods of the year, during the COVID-19 period and during lagoon closure periods due to the oil spill.

Secondary data collection

We conducted a literature review to understand frameworks used to assess socio-economic impacts of oil spills and COVID-19 to better contextualize the Mauritian case. We collected local and international media articles, local company annual reports and other relevant reports, followed by a review of the existing quantitative data from official sources like Statistics Mauritius, including the socio-economic Key Performance Indicators (KPIs) in our targeted region. We used this data as our baseline reference.

Figure 2 Map of villages affected by the oil spill (source: UNDP-IOM report, 2020)



Limitations of the study

1. With regards to the quantitative data, it must be noted that the reference group serves as a comparison to the region under study, especially in highlighting the differences between the impact of COVID-19 and the impact of the Wakashio oil spill. However, we acknowledge the limitations of the smaller sample size of the reference sites with respect to the oil spill sites.
2. During the field work, despite efforts made to achieve gender balance, men were generally more available or willing to take the survey. Male perspectives will be more prominent and could result in some biases.
3. The data was analysed using a distributional method only, and therefore provides us with a preliminary 'snapshot' of the situation on the ground. More in-depth data analysis will be released over the course of 2021 and 2022.
4. We strove to interview specific government institutions to give them appropriate representation in this report. However, most had not responded by the time of publication and their responses will be included in subsequent publications, where applicable.
5. Many of the impacts of both the COVID-19 pandemic and the oil spill are still ongoing. This assessment reflects results from the immediate months following the oil spill, but long-term monitoring of social impacts will also be required.
6. This report is not meant to provide specific information about compensation, and might not reflect the full range impacts felt by coastal residents and businesses.



Baseline of the region under study

It is important to understand the general context of these districts and villages and compare them when possible, to the national context. Most of the baseline is analysed using the latest national census dating back to 2011, which provides statistics by district and VCA. When possible and available, more recent data and reports were used. However, the recent data obtained tend to be at national level, or at best at district level. Although it is dated, the 2011 census data is the latest and most reliable data available.

Demographics

Table 1 Population per VCA under study

POPULATION BY VILLAGE COUNCIL	1 JULY 2019
District of Flacq	1,387,36
Grand River South East	2,159
Quatre Soeurs	3,398
Trou d'Eau Douce	5,811
District of Grand Port	112,847
Bambous Virieux	1,522
Beau Vallon	7,025
Bois des Amourettes	1,913
Grand Bel Air	1,566
Grand Sables	2,221
Mahebourg	15,441
Old Grand Port	3,020
Petit Bel Air	1,206
Riviere des Creoles	3,119
Reference sites	
Le Morne (Black River)	1,489
Trou aux Biches (Pamplemousses)	2,566
Baie du Tombeau (Pamplemousses)	15,261
Pointe aux Piments (Pamplemousses)	6,868

Both districts in the oil spill area are considered to be entirely rural by Statistics Mauritius. As with the rest of the island, the population of this district has a balanced gender distribution, but with an ageing population. Between 2011 and 2015, there was a moderate population growth in most villages; however, between 2016 and 2017, villages started experiencing a slight population decline with an increasingly ageing population, in line with national statistics. The average household size for Flacq is 3.62, and 3.56 for Grand Port.

Baseline of the region under study

Education

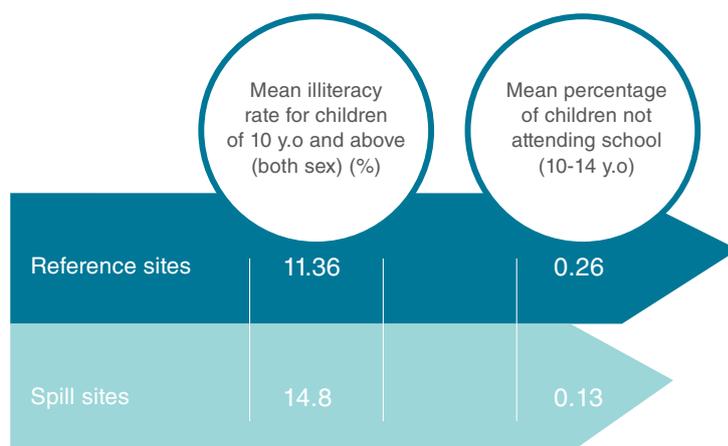
In 2018, the national adult literacy rate²¹ for Mauritius was 91.3%. Though the adult literacy rate has been fluctuating in recent years, the trends display an increase from 2011 to 2018, ending at 91.3% in 2018. The adult literacy rate for both sexes was estimated at 89.8% according to the census carried out by Statistics Mauritius in 2011. Male literacy was 92.3% and female at 87.3%.

As of March 2011, there were 305 primary schools with 116,068 pupils (51% boys, 49% girls). The Gross Enrolment Ratio (number of students enrolled per 100 population aged 6 –11) was 100% and the pupil/teacher ratio stood at 27:1. For secondary schools, in the same year, there were 180 schools providing secondary education in the academic stream: enrolment was 115,289 (48% boys, 52% girls) and the number of teachers was 7,873. The Gross Enrolment Ratio (number of students enrolled per 100 population aged 12 – 19) works out to 70% and the pupil/teacher ratio 15:1. Since 2005, with the introduction of 11-year schooling, education in Mauritius is free and mandatory until the age of 16²². The high drop-out rate between primary and secondary school has been an area of concern for the government for some time.

For our VCAs under study, the illiteracy²³ rates in 2011 were relatively high in the region, with 13.29% for children aged 10 years and above in the district of Flacq, and 12.14% in the district of Grand Port (compared to a national average of 9.82%). The percentages of children aged 10-14 not attending school in Grand Port (0.12%) and Flacq (0.14%) are on par with the national average of 0.13% for Mauritius.

The mean illiteracy rate for children aged 10 years and above is higher in the oil spill sites than the reference sites; however, the mean percentage of children not attending school is higher in the reference sites, which is surprising as it does not correlate with the findings on illiteracy rates.

Table 2 Education statistics 2011: illiteracy rate and percentage of children not in school between 10-14yrs



21 Adult literacy rate is the percentage of people ages 15 and above who can both read and write with understanding a short simple statement about their everyday life. UNESCO Institute for Statistics, "Youth/Adult Literacy Rate," n.d., <http://uis.unesco.org/en/glossary-term/youthadult-literacy-rate>.

22 International Bureau of Education. "World Data on Education - Mauritius." *International Bureau of Education*, no. 6th Edition (August 2006). http://www.ibe.unesco.org/fileadmin/user_upload/archive/Countries/WDE/2006/SUB-SAHARAN_AFRICA/Mauritius/Mauritius.pdf.

23 Defined as "Percentage of persons aged 12+ years who can, with understanding, both read and write a simple statement."

Baseline of the region under study

Poverty and inequality

At the national level, the headcount poverty level was 6.9% in 2012; measured by the international standard of US\$2 per day (in 2005 Purchasing Power Parity), poverty was less than one percent. Mauritius' growth has not been equally shared, despite the general improvement in welfare in the 2000s²⁴. Between 2001 and 2015, the income gap between the poorest and the richest 10% of households increased by 37%²⁵. Measured by the GINI Coefficient, inequality has been on the rise. The Central Statistics Office of Mauritius data shows that income inequality has worsened over 2006–2012. The GINI coefficient, which stood at 0.388 in 2006, rose to 0.413 in 2012. Compared to 1996, when it was 0.387, the figures reveal that social inequality is at its highest point in 20 years²⁶.

Up until 2011, Statistics Mauritius also ranked villages in terms of Relative Development Index, which was used to measure the 'relative development' of villages. This method was discontinued as it does not match international standards. However, it is the only measure that provides information at VCA level and is therefore being used for the purpose of this report. This can be found in Annex 1 on pages 88-89.

Employment and economic structure

At the national level, according to Statistics Mauritius, the employment rate decreased to 92.92% in the first quarter of 2020, from 93.63% in the fourth quarter of 2019; the unemployment rate, for its part, remained static at 21% in 2020, up from 6.7% in the previous year. Between 2001 and 2015, inequality in household income increased, particularly in income from labour. This can be attributed to the skills shortage and/or mismatch created by structural changes as the economy progressively shifted from traditional and low-skilled sectors to services. This transformation generated an increase in the demand for skilled workers which was not matched by graduates, despite an increase in the supply of skilled workers.²⁷ In terms of gender parity, the national averages for gender distribution in employment for 2019 were unbalanced, with the employed population comprising 62% males and 38% females; women are paid on average 30% less per hour than their male counterparts.

At the VCA level, based on the 2011 census, the villages we assessed had low employment levels, with only around 50% of adults of legal working age in formal employment for both districts; an important difference was documented in the gender balance, with about 30% of those employed being women. There is a 10% difference in the mean employment rates between the reference sites and spill sites, which should be taken into consideration when analyzing the results of our survey. However, in both districts, the rate of employment for men is greater than that of women.

24 World Bank Group. 2015. Mauritius : Inclusiveness of Growth and Shared Prosperity. World Bank, Washington, DC. © World Bank. <https://openknowledge.worldbank.org/handle/10986/23804> License: CC BY 3.0 IGO.

25 World Bank Group. 2018. Mauritius Addressing Inequality through More Equitable Labor Markets. World Bank, Washington, DC. © World Bank. <https://openknowledge.worldbank.org/handle/10986/29034> License: CC BY 3.0 IGO."

26 BUNWAREE, Sheila. "The Fading Developmental State: Growing Inequality in Mauritius." *DEVELOPMENT JOURNAL (by the Society for International Development)* 57, no. 3-4 (n.d.): 578–90. <https://doi.org/10.1016/j.strueco.2019.01.001>.

27 World Bank Group. 2018. Mauritius Addressing Inequality through More Equitable Labor Markets. World Bank, Washington, DC. © World Bank. <https://openknowledge.worldbank.org/handle/10986/29034> License: CC BY 3.0 IGO

Baseline of the region under study

Table 3 Gender breakdown of employed workforce of legal working age per district (2011)

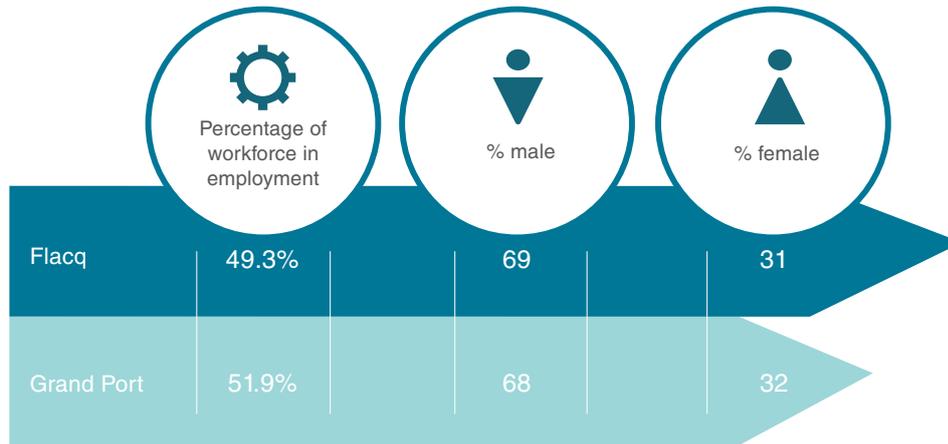
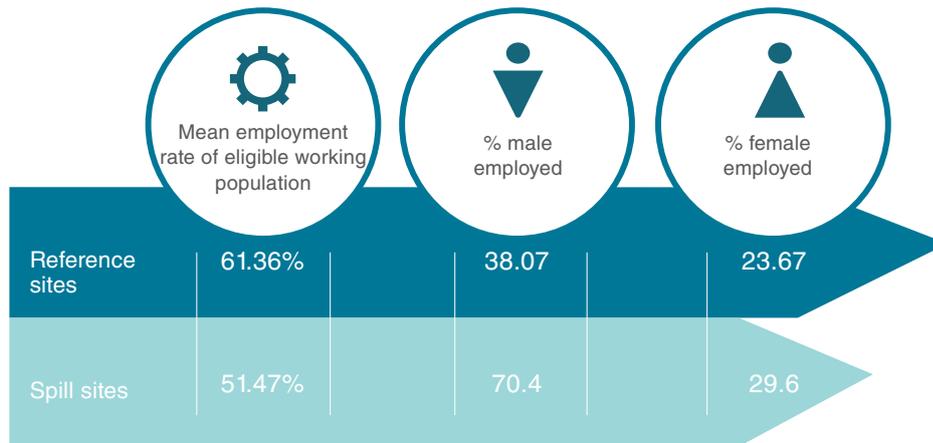


Table 4 Employment rates comparison between reference and oil spill sites (2011)



According to the data based on the 2011 Country census, the regions of Grand Port and Flacq appear to have a centralised economy based on three main employment sectors, and three main occupational groups (See table 5).

Table 5 Employment sector and occupational group per district

	FLACQ DISTRICT	GRAND PORT DISTRICT
1 st sector of employment	Manufacturing	Manufacturing
2 nd sector of employment	Accommodation and food services	Construction
3 rd sector of employment	Agriculture, forestry, and fishing	Agriculture, forestry, and fishing
1 st occupational group	Services and sales workers	Services and sales workers
2 nd occupational group	Craft and related trade workers	Elementary occupations
3 rd occupational group	Elementary occupations	Craft and related trade workers

Baseline of the region under study

As the biggest employers for this region include sugar estates Omnicane (2019: 1542 employees, Rs 4.6 billion turnover)²⁸ and Beau Vallon (2019: turnover of Rs 46 million), the airport, and 4-5-star hotels along the coast (accommodation and food services), it can be deduced that most full-time employees are either in the agriculture or tourism sectors. Self-employed individuals are most likely in the fishing, construction, crafts and elementary occupations²⁹. The occupational groups and education levels in the region indicate a low-skilled population, and are therefore harder to employ in the services industry, a point reinforced by the World Bank (2020)³⁰.

Recent and future developments

Some recent and important urban developments have taken place in the area, with several additional projects planned. Two new malls, Plaisance Mall and Beau Vallon Mall, opened in 2019, a new road for the airport was built in 2018, while a new luxury hotel, Anantara IKO, started operations in January 2020. Proposed projects include a Property Development Scheme by the sugar company Omnicane Ltd, an extension of Sir Seewoosagur Ramgoolam Airport, a Government Master Plan for the development of Mahébourg as a touristic hub, and potentially a new hotel on Pomponette beach.

In the coming years, if these projects are materialised, the region will likely see an increase in tourism and urbanisation with the potential for an influx of relatively wealthier inhabitants settling in the region. Despite the government's hopes to spur economic development through infrastructure development, the nexus between infrastructure, inequality and resilience is complex³¹. Whether or not infrastructure development will be beneficial for poverty alleviation depends on various factors, and they may increase connectivity for rural and remote areas in a way that could benefit access to goods and services, and job opportunities. However, experts have the overall sense that investments and the quality of services favour wealthier areas and that the design of infrastructure and the operation of public services tend to follow the wider balance of power³².

This could lead to gentrification of the region, if infrastructural development does not integrate the needs of the local population. For instance, should the region's economic development depend increasingly on tourism and the sales of property in Property Development Schemes aimed at wealthier individuals, and thus the service sector, a large portion of the unemployed labour force could be left out. The structure of the local economy will continue to be homogenous, which will affect its ability to be resilient to exogenous shocks.

28 Omnicane Ltd, "Integrated Report 2019," 2019, <http://www.omnicane.com/sites/default/files/articlepdf/omnicane-integrated-report-2019.pdf>.

29 Elementary occupations consist mainly of simple and routine tasks which mainly require the use of hand-held tools and often some physical effort. Most occupations in this major group require skills at the first ISCO skill level (a primary education which generally begins at the age of 5, 6 or 7 and lasts about 5 years) The International Standard Classification of Occupations (ISCO), "MAJOR GROUP 9: ELEMENTARY OCCUPATIONS," International Labour Organization, n.d., <https://www.ilo.org/public/english/bureau/stat/isco/isco88/9.htm>.

30 World Bank Group, "Mauritius - Earnings Mobility and Inequality of Opportunity in the Labor Market," March 22, 2019, <http://documents.worldbank.org/curated/en/104241556030746321/Mauritius-Earnings-Mobility-and-Inequality-of-Opportunity-in-the-Labor-Market>.

31 United Nations, "Global Sustainable Development Report 2016; Chapter 2: The Infrastructure – Inequality – Resilience Nexus," 2016, https://sustainabledevelopment.un.org/content/documents/10786Chapter2_GSDR2016.pdf.

32 United Nations, "Global Sustainable Development Report 2016; Chapter 2: The Infrastructure – Inequality – Resilience Nexus," 2016, https://sustainabledevelopment.un.org/content/documents/10786Chapter2_GSDR2016.pdf.

Preliminary analysis of survey results

Based on our surveys conducted with 792 respondents, with 71% from the spill sites and 29% from the reference sites, we present our exploratory survey findings below:

Demographic profile of respondents

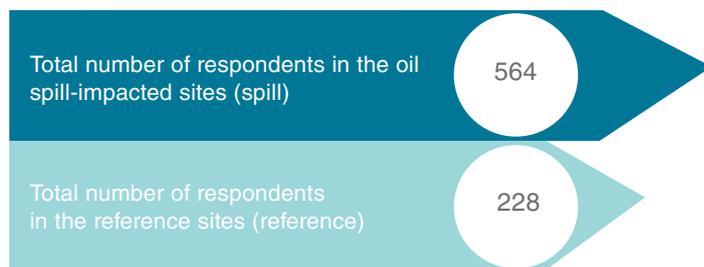
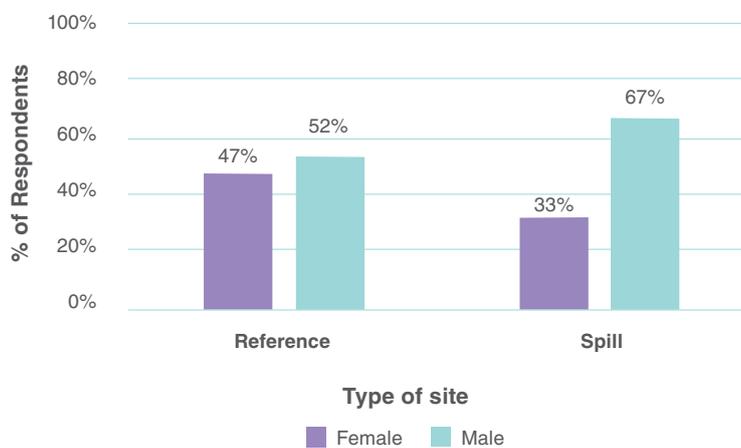


Figure 3 shows that in both sets of sites, the percentage of participating males is higher than the percentages of females. However, reference sites present a better gender balance. We should therefore be cautious about the gendered impacts of the oil spill which we explore further in the report on page 66.

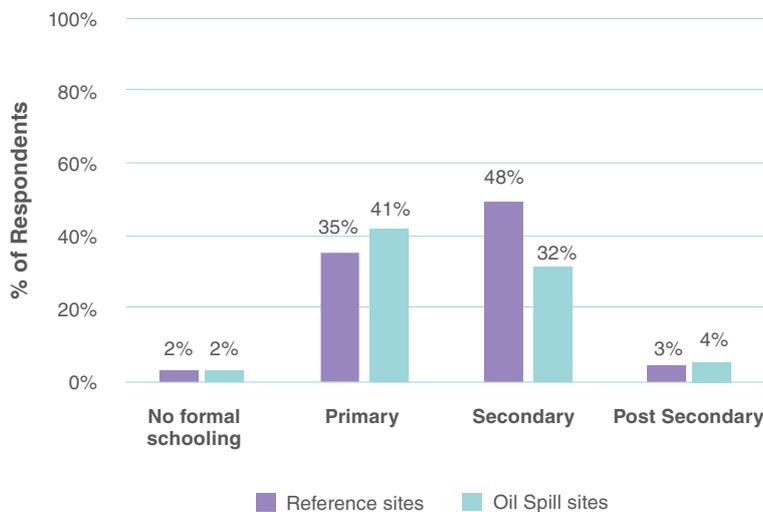
Figure 3 Gender distribution of survey respondents



Preliminary analysis of survey results

Figure 4 indicates that respondents in reference sites have a lower rate of primary school education rate than spill sites. However, respondents in reference sites have a higher rate of secondary schooling, suggesting a higher level of education for communities in the reference sites versus spill sites. This correlates with the 2011 census on illiteracy rates (as described above).

Figure 4 Education levels of survey respondents



A recent World Bank report on the labour market shows that poorly educated workers have less labour mobility than their better educated peers³³, representing a barrier for them to achieve higher earnings and work towards closing the income gap. In contrast, their better educated peers have steadily increased their earnings by 24% between 2005-2015, further widening the income gap.

Household Survey demographics

Table 6 Household composition of respondents

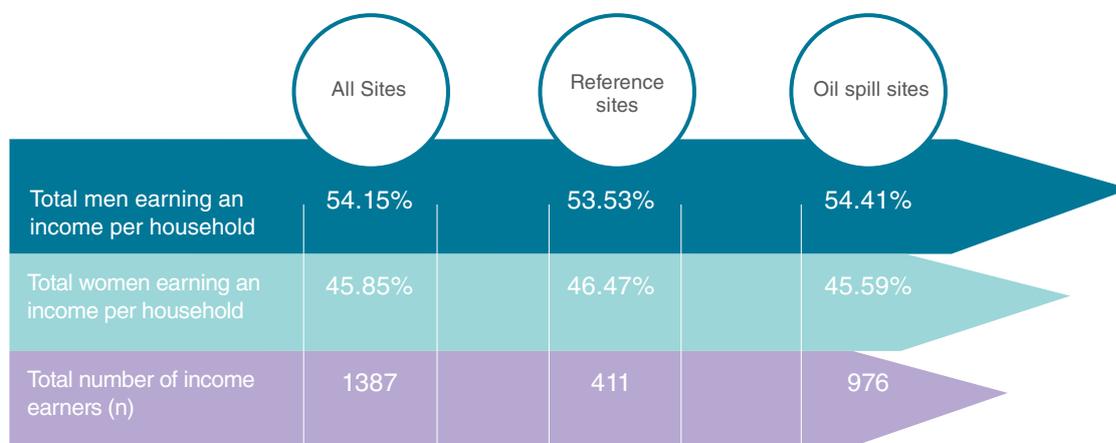
NUMBER OF PEOPLE PER HOUSEHOLD	REFERENCE SITES	OIL SPILL SITES
TOTAL number of households	228	565
TOTAL number of people	666	1742
Adult Male (aged 18 and above)	224	556
Adult Female (aged 18 and above)	222	545
Children Male (aged less than 18)	143	336
Children Female (aged less than 18)	77	305
Average number of people per household	3.08	2.92

³³ World Bank Group. "Mauritius - Earnings Mobility and Inequality of Opportunity in the Labor Market," March 22, 2019, <http://documents.worldbank.org/curated/en/104241556030746321/Mauritius-Earnings-Mobility-and-Inequality-of-Opportunity-in-the-Labor-Market>.

Preliminary analysis of survey results

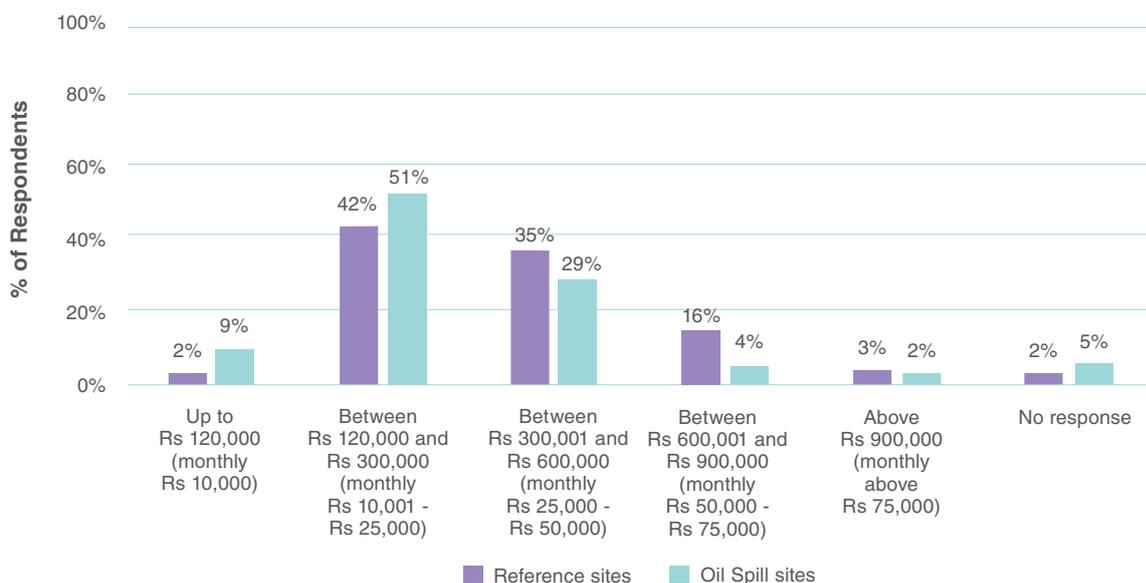
In the survey, we asked each respondent to list the number of individuals in their household. The findings in table 6 show a slight decline in the average number of individuals per surveyed household (2.92) compared to the 2011 census for the spill sites (3.59). For developing regions, this would usually indicate a slow rate of urbanisation and industrialisation, according to the convergence theory³⁴. However, in the Mauritian context, cultural factors have to be taken into consideration, as multigenerational households are still a common occurrence. The table also shows that there are more adults per household than children, in line with the nation's ageing and declining population rate.

Table 7 Percentage of income earners per household pre-COVID-19



As shown in Table 6, the spill sites have an average of >3 individuals per household, with more adults than children per household. This would indicate an average of 1.5 working adults per household. Thus, despite fairly low levels of official employment, most households have income earners. Income could come from sources other than official employment, such as the informal labour market, and could also potentially show respondents benefiting from some form of other remittance i.e., retirement pensions.

Figure 5 Household annual earnings in MUR of respondents pre-COVID-19



34 <https://faculty.cnr.ncsu.edu/nilspeterson/wpcontent/uploads/sites/17/2016/10/Bradburyetal2014.pdf>

Preliminary analysis of survey results

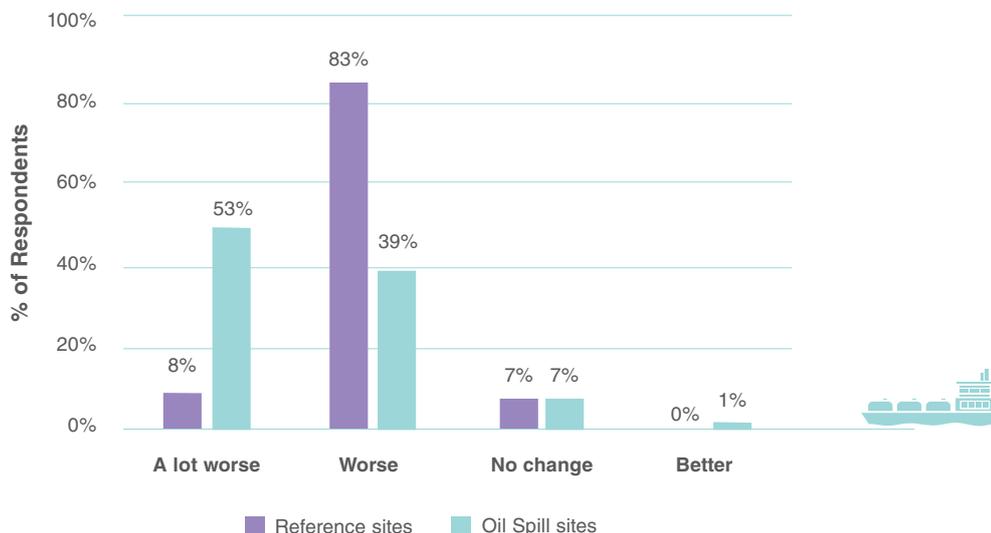
Figure 5 shows that both groups earn between Rs 120,000 to Rs 600,000 annually. However, the reference sites have a larger percentage of higher earners than the oil spill sites, with the most significant difference in the brackets of those earning the minimum wage and those earning over Rs 600,000 a year.

Overall, the demographic and household composition of the respondents match the picture provided by the 2011 census, showing only slight changes in the past 10 years. One can conclude that the oil spill affected region has benefited little from the Gross Domestic Product (GDP)³⁵ growth of the country (fluctuating between 3.00 and 4.5 between 2010-2019), and that wealth and the associated indicators have also not improved. This conclusion is reinforced through community meetings, whereby participants mentioned very slow development in the region and geographical isolation from areas where they could be employed.

The reference sites, chosen for their structural and cultural similarities to the spill sites, are also coastal villages dependent on tourism and fishing, and are better off than the oil spill sites, with minor differences in levels of education, number of formally employed individuals per household, and earnings per household.

COVID-19 and Wakashio: degree of affect

Figure 6 Percentage of respondents categorising how their lives changed in the past 3 years (no response from 8 respondents)



In the first survey question, when asked about how their lives have changed in the past three years, (Figure 6) the majority of respondents indicated that their lives have been negatively impacted. In the oil spill sites, 53% of the population qualify their lives as “a lot worse” and 40% as “worse”; whilst in the reference sites, the majority qualified their life as “worse” in the last three years. When asked the reasons, most mentioned COVID-19 and/or the oil spill, with only a few mentioning other personal issues like a death in the family.

35 Nicholas Jones et al., “GDP Growth (Annual %) - Mauritius,” The World Bank Data, April 28, 2021, <https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG?locations=MU>.

Preliminary analysis of survey results

Figure 7 Percentage of respondents categorising the degree of affect due to COVID-19 (no response from 5 respondents)

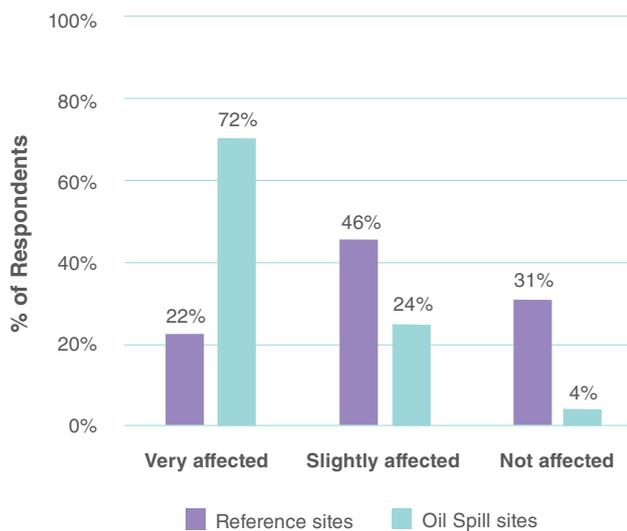
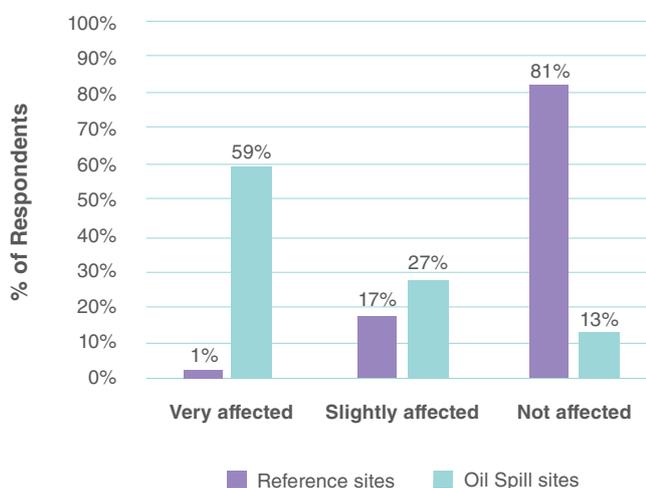


Figure 7 demonstrates that the reference sites were overall much less affected by COVID-19 than the oil spill sites. In fact 72% of respondents in the oil spill sites state having been “very affected”. For the reference sites, 46% were “slightly affected” and 31% were “not affected”.

Some disparity in these answers was expected given the difference in the socio-economic structure of the reference and oil spill sites; however, these findings are still unexpected. One possible explanation is that given the smaller sample size of reference sites, no one with serious direct impacts of the pandemic were in the participant pool (someone getting sick, death in family/friends, job loss); alternatively, another explanation is that the survey was undertaken after the oil spill, and the participants therefore responded to the survey through a negative lens.

Figure 8 Percentage of respondents categorising the degree of affect due to the oil spill



Preliminary analysis of survey results

Respondents at the reference sites were “largely unaffected” by the spill (81%) even though 17% reported being “slightly affected”. This could be as a consequence of emotional, political and environmental factors. For the oil spill sites, 59% noted being “very affected,” and 27% “slightly affected”. The results demonstrate that even for the oil spill sites, COVID-19 impacted the majority of the population regardless of their economic activity.

Impact on economic activities and financial consequences for households

Table 8 Percent change in number of income earners per household and gender distribution (with a total of 666 income earners in reference sites and 1,742 income earners in oil spill sites)

	BEFORE COVID-19		BETWEEN JUNE AND JULY		AFTER THE OIL SPILL	
	Reference sites	Oil Spill sites	Reference sites	Oil Spill sites	Reference sites	Oil Spill sites
Total income earners per household	61.71%	56.03%	61.11%	53.10%	61.26%	53.73%
Income earners - men (n=751)	54.41%	53.32%	54.16%	53.68%	53.95%	53.53%
Income earners - women (n=636)	46.47%	45.59%	46.68%	45.84%	46.32%	46.05%

The table above is divided in three time intervals, with the goal of comparing indicators before and after the two main events being studied in this report: – pre-March 2020, which reflects “normal circumstances” before COVID-19 reached Mauritius’ shores – between June and July 2020, which represents ‘post-COVID-19 lockdown 2020’ and ‘pre-oil spill’ circumstances, i.e the period after the COVID-19 lockdown and before the MV Wakashio ran aground – the ‘post-oil spill’ period, from August 2020 onwards.

Reference sites show a decrease of less than one percent in the number of household earners after COVID-19, remaining static until November 2020. In the spill sites, the number of household earners decreased by three percent after the lockdown and recovered by less than one percent after the oil spill. The percentage decline in income earners is less significant than expected, most likely as a result of the government’s strong social welfare policies and relief measures, i.e. welfare benefits and the Wakashio Solidarity Fund. The <1 percent recovery can in part be attributed to the numerous fishers and skippers being employed by private companies such as Polyeco and Le Floch Depollution for the oil spill clean up operations (see Figure 11, ‘other’ category).

Figures 9 to 12 below show the type of economic activity that generated the greatest source of income for households from January to November 2020, for the spill sites only.

- The most affected activities showing a continuous decline after both events are: fishing and gleaning; fish trading (Fig. 9).
- Those in full-time employment (Fig.10) were not severely affected, as they could benefit from the government’s Wage Assistance Scheme created to support employees affected by the pandemic.
- The self-employed (Fig.11) were affected by COVID-19 but picked up again, slightly below pre-COVID-19 levels.
- Those with declining main sources of income have had to rely on other sources of main income such as pensions, social welfare (Fig.12), agriculture and employment as oil-spill cleaners.

Preliminary analysis of survey results

- Most of those employed by the clean-up companies were registered fishers, skippers or volunteers, usually leaving behind women³⁶ and individuals without driving licences but whose livelihoods may still have depended on fishing. It is also important to note that the oil spill clean-up crews stopped working in January 2021, and have thus re-entered the labour market as unemployed at the time of writing. This is exacerbated by the fact that fishing has been prohibited in the lagoon for multiple months after the oil spill in several affected sites. It is only as from 29 March 2021 that in-lagoon fishing was allowed again from La Cambuse to Mahebourg and from Bois des Amourettes to Trou D'eau Douce (although offshore fishing is no longer restricted since December 2020), and most tourist-dependent nautical activities have been at a near standstill due to closed borders. This will further increase the financial burden on the state as an increased number of people will seek government support in view of their dwindling resources until fishing and maritime activities resume.

Figure 9 Change in households' main source of income for those employed in the fishing and agricultural sectors (spill sites only)

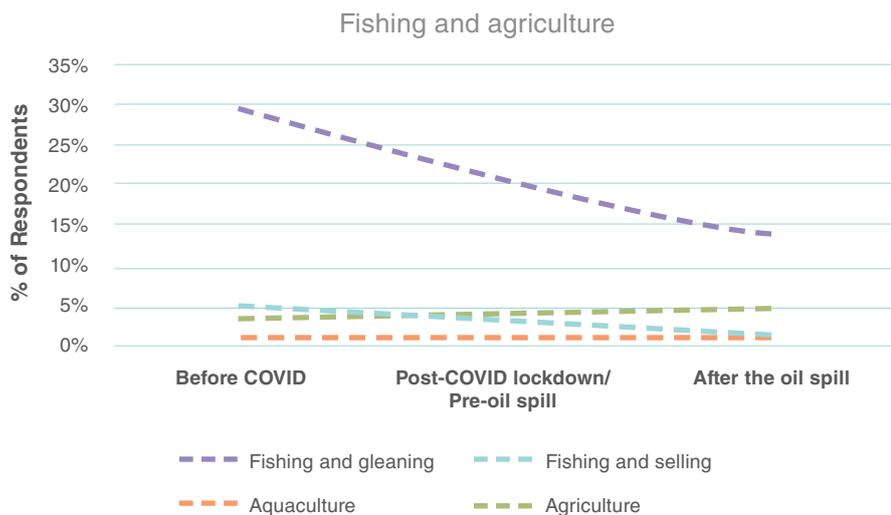
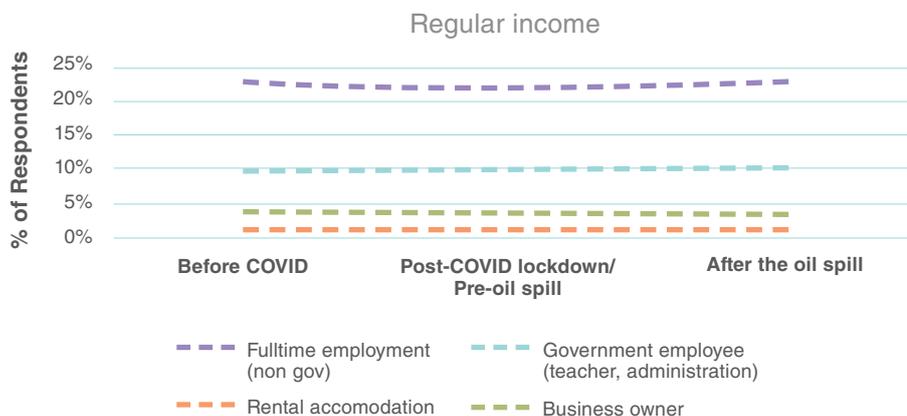


Figure 10 Change in households' main source of income for those in employment or other source of regular income (spill sites only)



³⁶ Josheena Naggea, Emilie Wiehe, and Sandy Monrose, "Inequity in Unregistered Women's Fisheries in Mauritius Following an Oil Spill," *Women in Fisheries Information Bulletin*, no. #33 (March 2021), <https://spccfpstore1.blob.core.windows.net/digitallibrary-docs/files/0d/0d8232f2d0fbad10dc7260b7e734aea9.pdf>.

Preliminary analysis of survey results

Figure 11 Change in households' main source of income for those in self-employment (spill sites only)

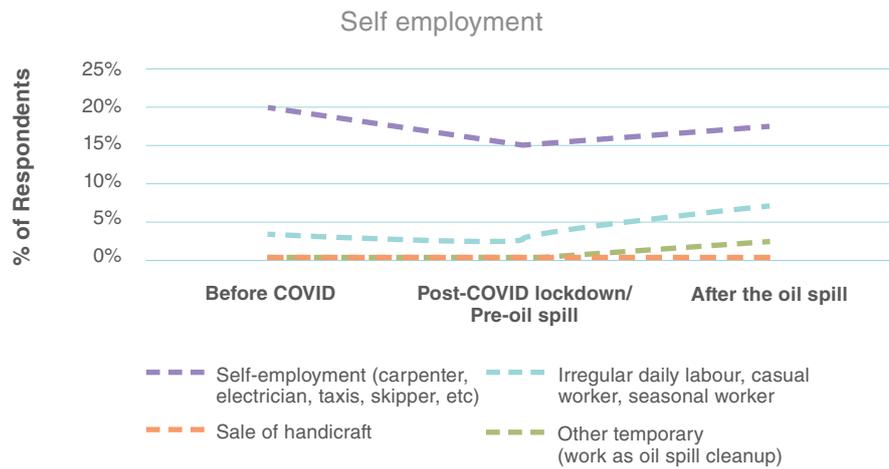


Figure 12 Change in households' main source of income for those who depend on external support (spill site only)

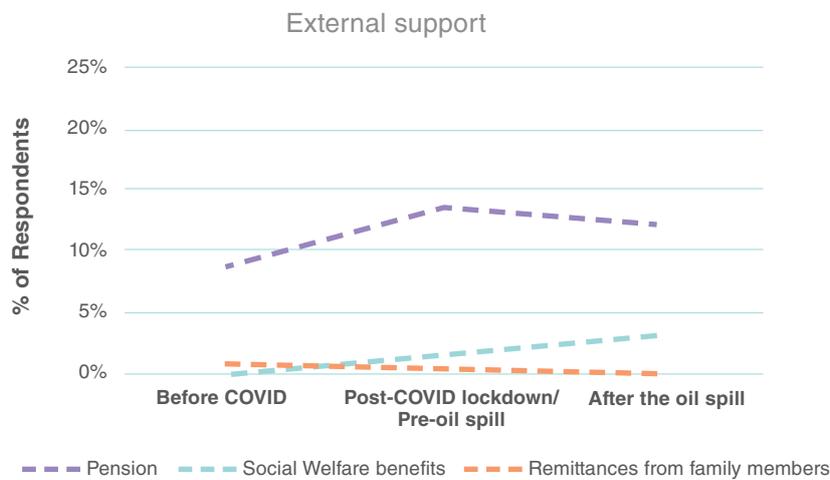
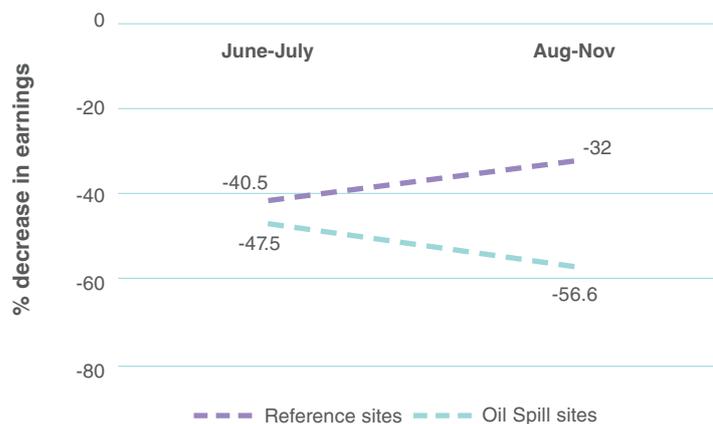


Figure 13 Mean percentage decrease in earnings per household



Preliminary analysis of survey results

By June 2020, at the time of the reopening of the economy following the three-month lockdown, both sites had experienced a reduction in household earnings by -40.5% for the reference sites and -47.5% for the spill sites. By November, whilst earnings started recovering to -32% in the reference sites, the spill sites saw their earnings continue to decline to -56.6%. This represents a 25% difference in household earnings post oil spill.

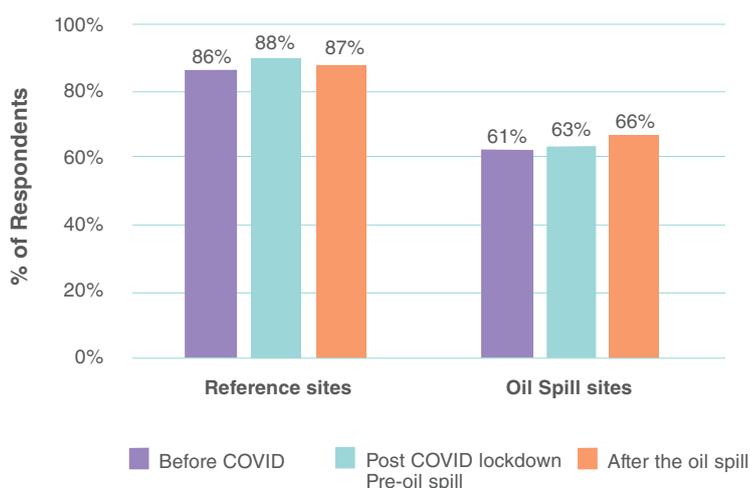
Table 9 Mean earnings decrease per activity for the spill sites

ACTIVITY	JUNE-JULY 2020	AUGUST-NOV 2020
Fishing and gleaning	-51%	-72%
Fish trading and selling	-47%	-62%
Agriculture	-42%	-55%
Self-employed	-49%	-53%
Irregular day labour	-50%	-74%
Employed	-34%	-35%

The mean percentage decrease in earnings per activity continued worsening for all activities, declining by more than 50% for all but the fully-employed, and declining by up to 70% for those employed in fishing and seasonal day labour. The beneficiaries of the Wage Assistance Scheme have been the least affected.

The UNDP report, “The Socio-Economic Impact Assessment of COVID-19 in Mauritius”, shows that at the national level “overall households registered a 25% fall in income, with the worst impact felt in households that largely depended on the tourism sector, 70% of which survived on less than half of their usual incomes.”³⁷

Figure 14 Percentage of households with debt

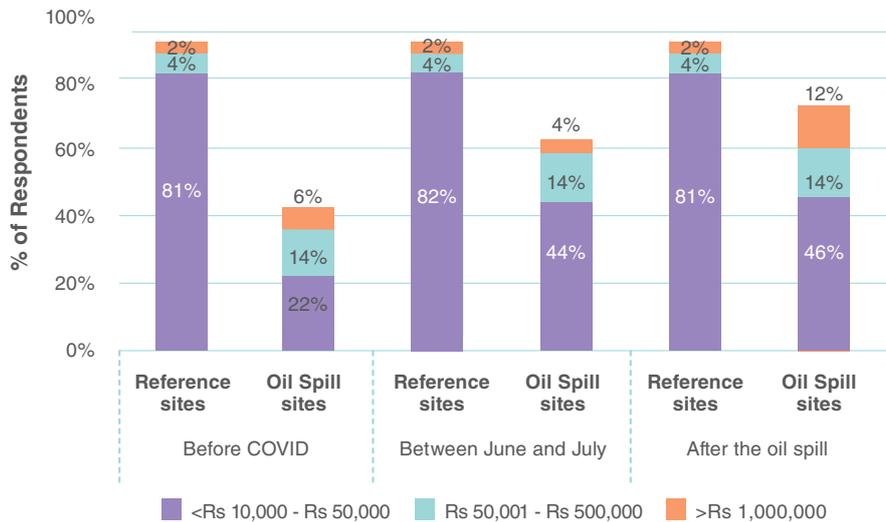


Reference sites have a higher percentage of households with debt, but while their debt remained more or less constant, households at the oil spill sites saw their debt increase from 61% to 63% after COVID-19 lockdown and continue to increase to 66% after the oil spill.

³⁷ Pusz, Ewelina, Riad Sultan, Aveeraj Peedoly, and Monica Pudaruth. Rep. *The Socio-Economic Impact Assessment of COVID-19 in Mauritius*. UNDP Mauritius, March 2021.

Preliminary analysis of survey results

Figure 15 Amount of debt per household



The amount of debt per household shown in Figure 15 indicates that whilst more households in reference sites have debt, their debt level amounts to <Rs 50,000.

Households in the spill site, have a greater range of debt – and a significant increase of those owing <Rs 50,000, from 22% before COVID-19 up to 46% after the oil spill. After the oil spill, households in spill sites saw a 10% increase in debt of Rs 50,000 - Rs 500,000 and of >Rs 1,000,000 compared to the reference sites. Thus, households with debt in the spill sites tend to be more indebted than households in the reference sites.

To conclude this section, the south-east coast has borne and continues to bear the financial brunt of two compounded exogenous shocks. The overlap of both events has prevented the region’s villagers from recovering from the first shock, before being struck by a subsequent calamity. This has resulted in continued negative impacts on most economic activities, sources of income, amount of income earned and increased debt. Whilst most households in the reference sites show evidence of initial stages of recovery post-pandemic, the spill sites display a continued decline in the economic indicators assessed, increasing their likelihood of being further pushed into poverty.

Challenges arising from financial difficulties

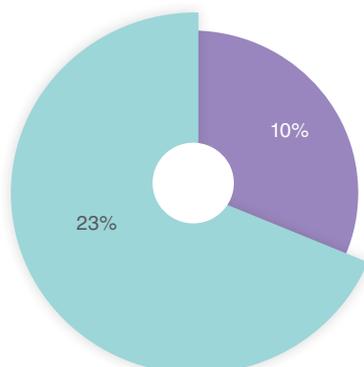
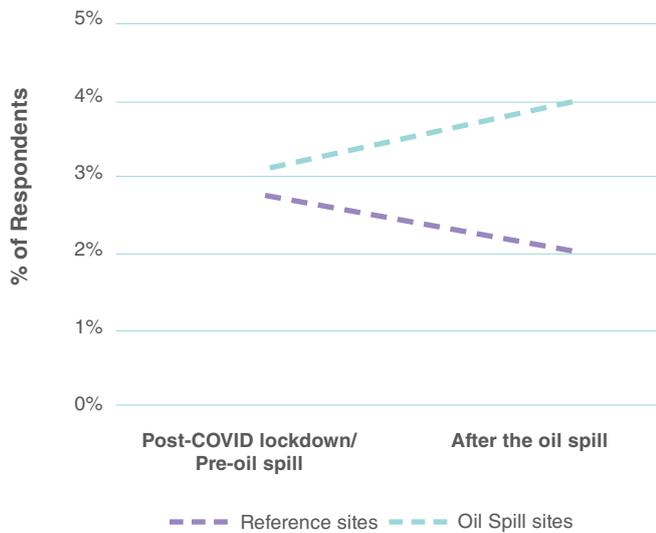


Figure 16 Percent of respondents who have had to engage in new economic activities since June 2020

Preliminary analysis of survey results

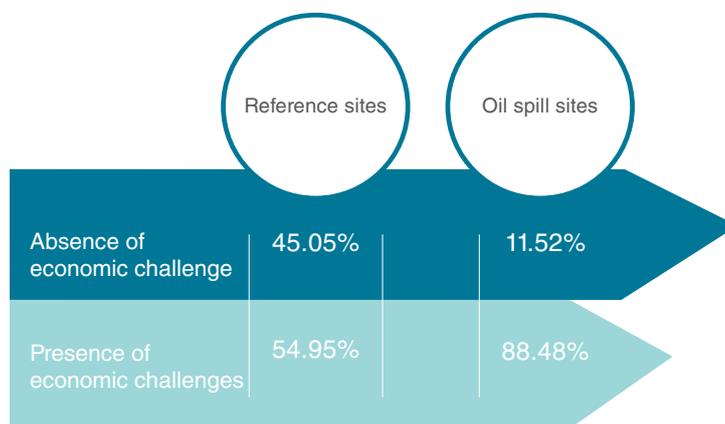
23% of respondents in the spill sites versus 10% in the reference sites have had to engage in new economic activities to subsist. The new economic activities were mostly seasonal and elementary in nature, such as construction work, baking, crafts, etc.

Figure 17 Percentage who have moved out of their villages over the two time periods



Various reasons lead to migration within countries, from climate change to conflict and work-related reasons. For small islands, migrants travel relatively small distances. In Mauritius, changes in employment can often catalyse mobility at the national level, as people dependent on public transport must move closer to their new place of work. Figure 18 shows a slight increase in relocation between June and November for the spill sites, in contrast to a decrease in the reference sites. This indicates that at reference sites, people have moved out temporarily as a result of COVID-19 and returned shortly after. Based on more qualitative responses, those in the spill sites have continued to move out due to the smell of the spill and to find work elsewhere in the immediate aftermath of the soil spill.

Table 10 Percentage of households facing various economic challenges since June 2020 due to their financial situation



Preliminary analysis of survey results

Figure 18 Types of challenges faced by respondents (55% from reference sites and 88% from spill sites as per table 10)

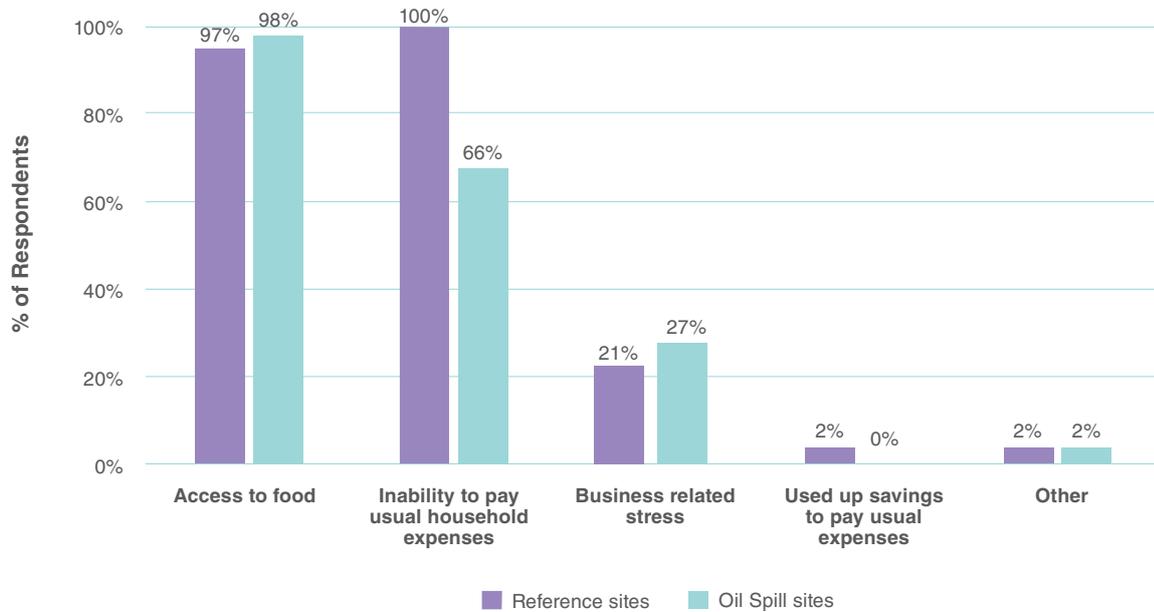


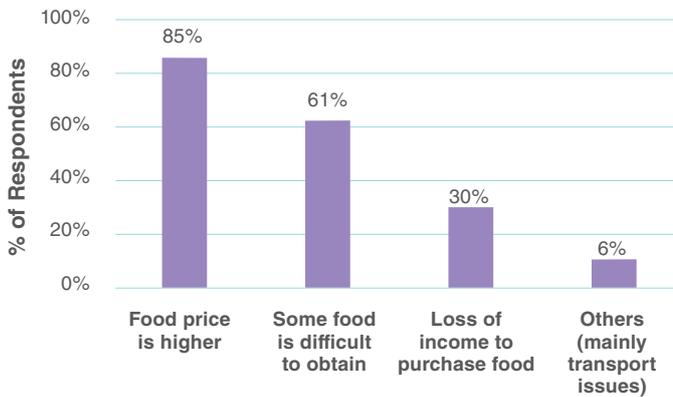
Table 10 and Figure 18 show that in spill sites, 33% more respondents have faced personal economic challenges due to their financial situation than in reference sites. Both reference and spill sites follow similar patterns regarding the type of challenges they have faced: access to food was the greatest hurdle, with nearly 100% of respondents with financial difficulties reporting this factor as a major concern. Other major challenges included the inability to afford everyday expenses, which, in the comments section of the survey, were attributed to high utility bills and loan payments. It was noted that companies (utilities, credit facilities) were putting pressure on the respondents to recoup their money, causing them severe stress. Financial stress documented by business owners included unpaid business loans, the inability to receive new loans, continued business costs, debtors owing money and bankruptcy. In the ‘other’ category, many mentioned having to support family members who had lost jobs and could no longer sustain themselves.

Investigating challenges linked to access to food & household expenses

As shown in Figure 18, access to food was a major problem faced by all respondents. This section seeks to investigate these challenges, with a focus on the spill sites.

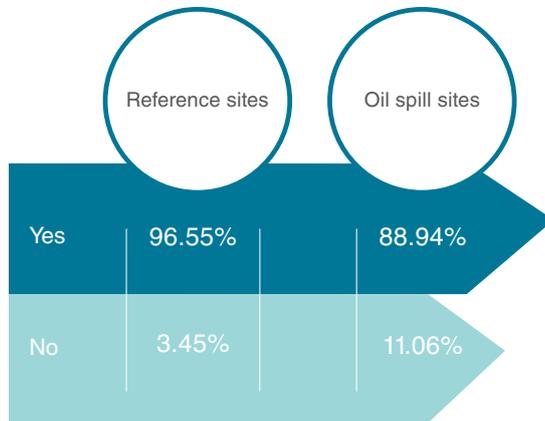
Preliminary analysis of survey results

Figure 19 Reasons related to food insecurity issues in the spill sites



85% of respondents revealed that the main food security issue they faced was the rising cost of food. Indeed, Mauritius’s dependency on food imports, the disruption of supply chains since the pandemic, the depreciation of the Rupee and the temptation for supermarkets to raise prices all contributed to higher prices³⁸, and a reduction in selection of available foods.

Table 11 Ability of each household member to have three full meals a day



Despite challenges in accessing food, the majority have been able to have regular meals; however, once again, the spill sites have faced more challenges than the reference sites.

³⁸ World Health Organization Mauritius, "Inter Action Review 1 (January - August 2020) - Best Practices and Experience of Mauritius' Preparedness and Response to COVID-19 Pandemic," October 2020, <https://reliefweb.int/sites/reliefweb.int/files/resources/Mauritius%20Inter-Action%20Review%201%20COVID-19%20%20Report.pdf>.

Preliminary analysis of survey results

Figure 20 Frequency of locally caught seafood consumption before March 2020

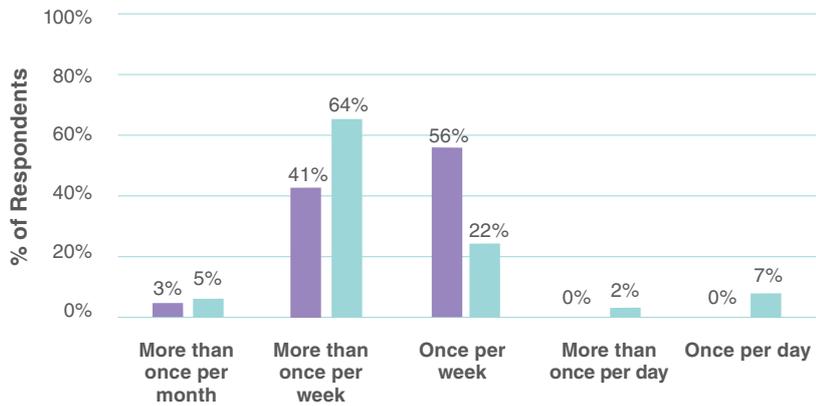


Figure 20 shows that locally caught seafood is important in the diet composition of the coastal respondents across both oil spill and reference sites. 87% of respondents from oil spill sites indicated consuming locally caught seafood once per week to more than once per week.

Figure 21 Change in local seafood consumption due to the COVID-19 lockdown

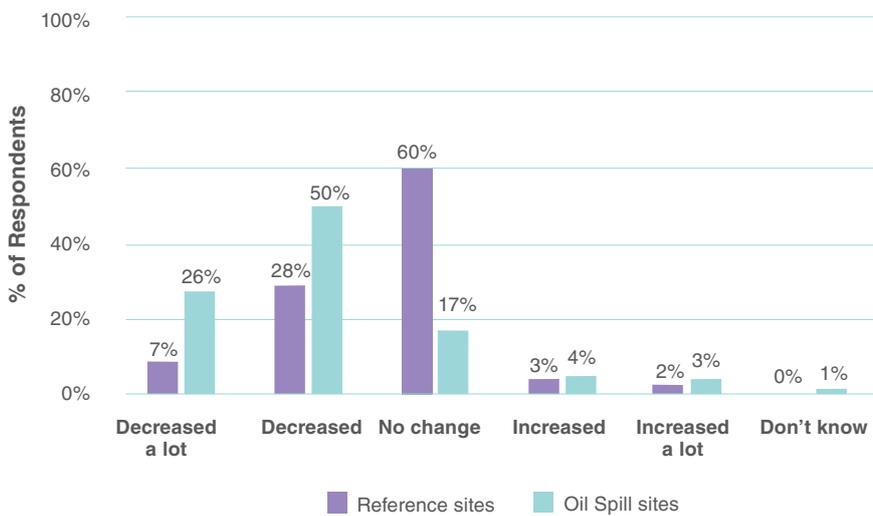


Figure 21 shows a more significant decrease in locally caught seafood consumption across oil spill sites due to both COVID-19 and the oil spill event. No respondents reported an increase in seafood consumption.

Preliminary analysis of survey results

Figure 22 Change in local seafood consumption due to the oil spill

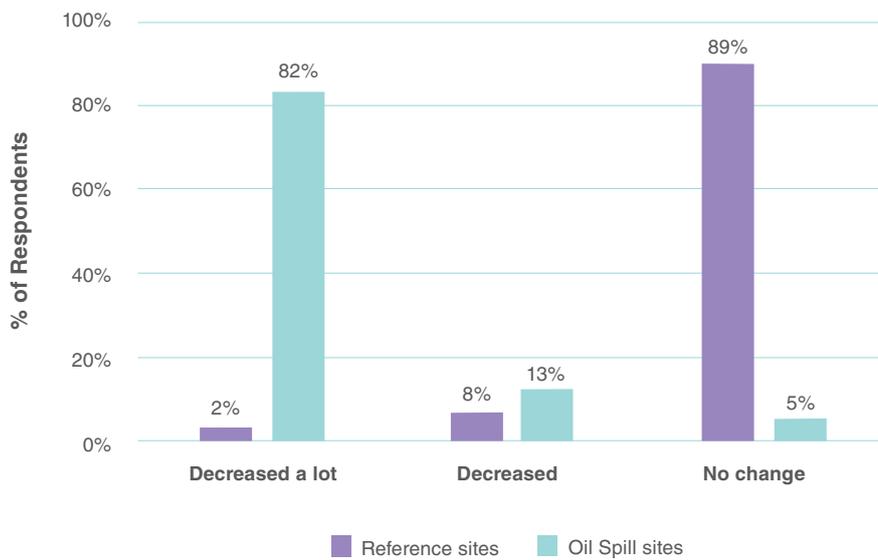


Figure 22 shows that following the oil spill event, 89% of respondents across reference sites indicated “no change” in their seafood consumption, while 95% of respondents across oil spill sites indicated a decrease in their seafood consumption. No respondents reported an increase in seafood consumption.

Preliminary analysis of survey results

Figure 23 Coping strategies used as a response to lack of food access

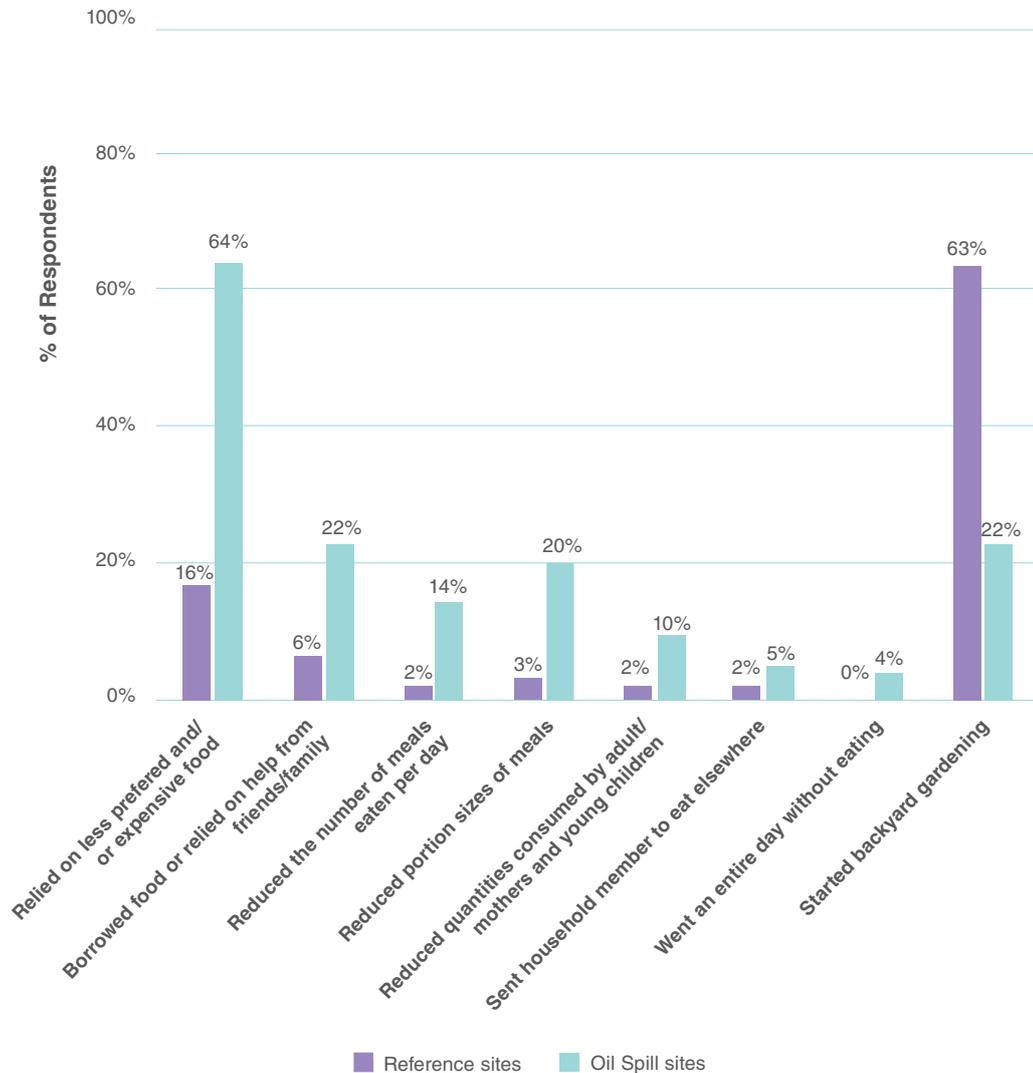
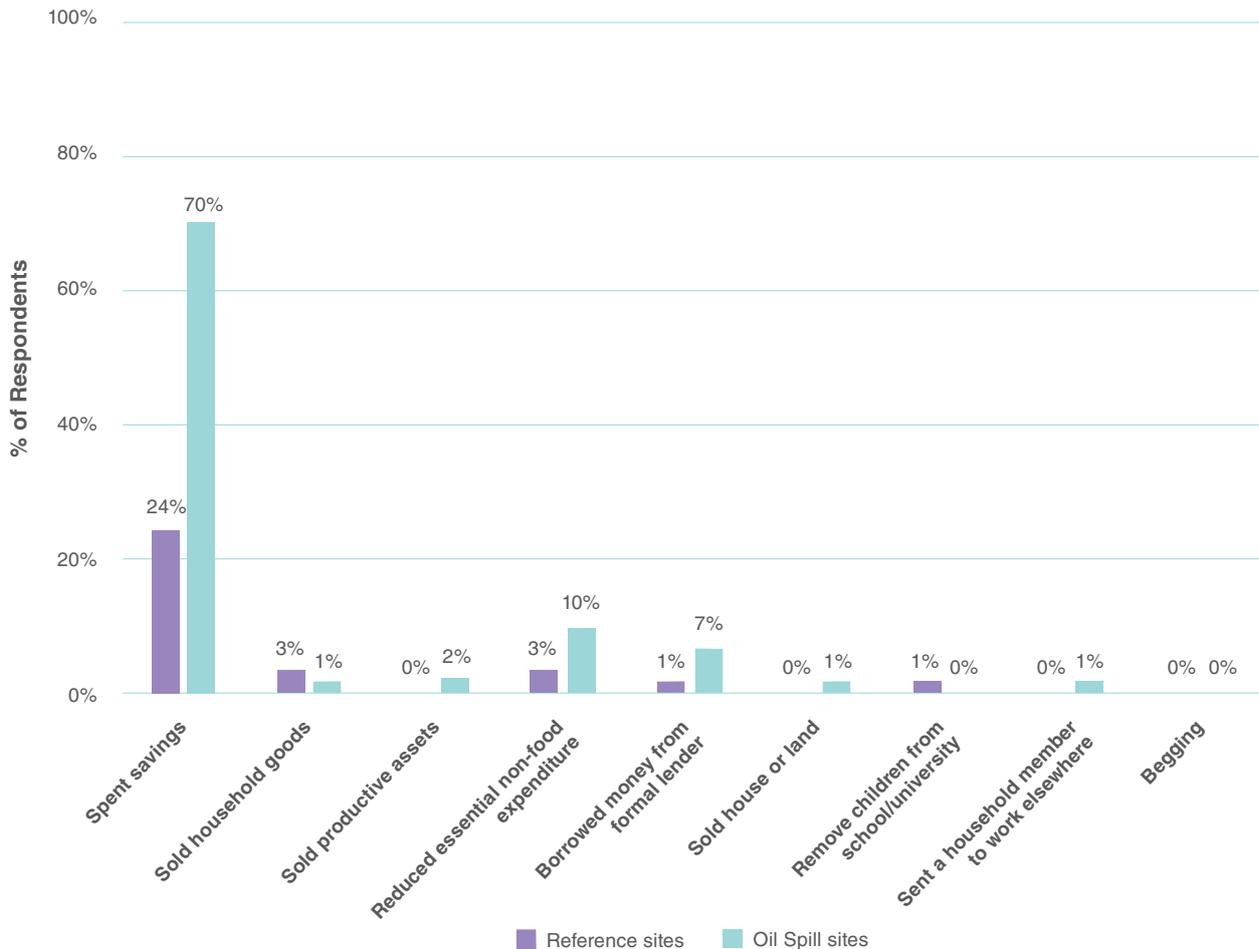


Figure 23 shows the various methods used by households to cope with food insecurity. Households in reference sites have had less reason to resort to these methods; however, many in the spill sites have used a variety of the listed approaches. The most used method was “to rely on less preferred and less expensive food”, with respondents commenting that they eat more vegetables and less meat or fish to save money. The second most used method was backyard gardening (22%), though not everyone had the space to do so; followed by “relying on friends and family” (22%), and “reducing meal sizes” (20%).

Preliminary analysis of survey results

Figure 24 Coping strategies used by households as a response to financial difficulties



As 66.39% of respondents at the oil spill sites had difficulties paying household expenses, it is necessary to assess the coping strategies used in response to this challenge. To cope with the added financial stress, most were forced to spend their savings. Respondents mentioned spending the savings they had accumulated to build a house or buy land. Other strategies used in the spill sites included decreased spending on non-essential items, the accumulation of more debt, and 2.14% selling off productive assets (boats, engines, motorbikes etc.). Those who resorted to begging mentioned having sold everything they could possibly sell, spending all their savings, and having no revenue whatsoever.

The UNDP report, "The Socio-Economic Impact Assessment of COVID-19 in Mauritius", shows that at the national level "households relied on less and cheaper food, used savings, and reduced proportion of meals. However, the poor households responded to lower income differently by purchasing food on credit or seeking assistance from relatives and/or friends. An attempt to capture the coping strategies of the poor households, often not enrolled in the Social Register, revealed that close to 97% of the households spent all their income on necessities during the lockdown while about 40% sold assets and 27% purchased food on credit. Children in 62% of these households were not able to access online classes in contrast to 85% attendance recorded in the National Household Survey (NHS); thus, posing significant challenge in closing the gap in access to education to break the poverty cycle among the vulnerable."³⁹

39 Pusz, Ewelina, Riad Sultan, Aveeraj Peedoly, and Monica Pudaruth. Rep. *The Socio-Economic Impact Assessment of COVID-19 in Mauritius*. UNDP Mauritius, March 2021.

Preliminary analysis of survey results

Impact on education

During the lockdown in March, all schools were closed, and classes were delivered remotely. For the public sector schools, classes were broadcasted through dedicated TV and radio channels. This measure did not guarantee access to education during this time, due to challenges such as lack of radios or TVs, busy and/or small households with no adequate space for learning, unpaid utility bills (as substantiated by the data in Fig.19, etc). Public schools re-opened on 1st July 2020, after almost three months of closure.

On the south-east coast, public schools were closed again for two weeks due to the foul smell and potential health impacts of the spill. When the oil spill occurred, respondents reported children having headaches, nausea, vomiting and fainting during the first few days, when schools were still open. Several parents stated during the survey that they decided not to send their children back to school regularly even after the reopening of schools due to difficulties in providing lunch, further highlighting food security issues.

Impact on health

Research has shown that exposure to heavy fuel oil can have short-term respiratory health impacts, as well as potential neurological long-term impacts.⁴⁰ From the community meetings conducted before administering the survey, one of the most immediate and commonly reported impacts was related to health. A number of community members also expressed dissatisfaction with the health services, and the associated worry of not having their health concerns taken seriously. The findings from the community meetings are in line with research highlighting the potential mental health impact on communities living near oil spills^{41, 42} especially when compounded by COVID-19.

Taking these points into consideration, a health section was included in the survey. As the authors of this report are not in the medical or psychological field, the results presented below have not been analysed. The findings are intended to inform healthcare professionals and other qualified experts and allow them to draw conclusions based on their knowledge.

The first section assesses physical health. For this we asked respondents to account for symptoms they experienced and know were associated to the oil spill, and not Covid-19. For this, it was also important to consider whether respondents had direct contact with the oil spill and to assess if this affected the responses.

Table 12 Degree of involvement in the oil spill clean-up

	REFERENCE SITES (%)	OIL SPILL SITES (%)
no	93	50
yes, as a paid worker only	0	10
yes, as a volunteer only	7	34
yes, both as a volunteer and a paid worker	0	6

40 Margaret A. McCoy, Judith A. Salerno, and Institute of Medicine, Assessing the Effects of the Gulf of Mexico Oil Spill on Human Health: a Summary of the June 2010 Workshop (Washington, D.C.: National Academies Press, 2010). doi: 10.17226/12949.

41 Katherine Harmon, "Scientific American," Scientific American (blog), August 16, 2010, <https://blogs.scientificamerican.com/observations/oil-spills-human-health-impacts-might-extend-into-the-future/>;

42 José Manuel Sabucedo et al., "Psychological Impact of the Prestige Catastrophe," International Journal of Clinical and Health Psychology, 2009.

Preliminary analysis of survey results

Table 13 Physical health impacts categorised by spill involvement (spill sites only)- results in percentages (includes 1.6% of “no response”s)

	NONE	HEADACHE	NAUSEA	VOMITING	DIARRHOEA	SORE EYES	RUNNY NOSE	SORE THROAT	COUGH	NOSE BLEEDS	RASH	BLISTERS	SHORTNESS OF BREATH	DIZZINESS	OTHER	TOTAL SYMPTOMS
Not involved in clean-up	60.1	29.7	19.6	5.4	0.7	21.4	6.5	14.1	10.1	1.1	2.2	0	8.7	8.3	1.5	9
yes, as a paid worker	27.3	47.3	23.7	12.7	7.3	21.8	5.5	7.3	27.3	5.5	9.1	0	12.7	12.7	3.6	14
yes, as a volunteer	42.3	39.7	29.1	6.4	2.7	26.9	12.2	19.1	11.1	3.7	6.4	1.1	11.6	6.4	1.1	13
yes, both as a paid worker and a volunteer	6.1	66.7	66.7	12.1	3.0	57.6	18.2	39.4	18.2	0	3	0	27.3	15.2	0	23
Most common symptoms	33.9	45.8	34.7	9.2	3.4	31.9	10.6	19.9	16.7	2.6	5.2	0.3	15.1	10.6	1.5	15

Table 13 displays the results of the combination of two questions: "How involved were you in the oil spill clean up?" and "Please tick all the following symptoms that you have experienced since August 2020." The results are for the oil site only. The list of symptoms was drawn up based on studies around the potential immediate health impacts of oil spills. The findings revealed that respondents who were most involved in the clean-up operations presented more symptoms. The most common symptoms were headaches, nausea, sore throats, cough and shortness of breath.

The following section assesses the impact on mental health. Respondents were asked to recognize mental impacts of the pandemic, then report any cumulative impacts of the oil spill. The list of symptoms was drawn up based on literature around the potential psychological impacts of oil spills and pandemics^{43,44,45}.

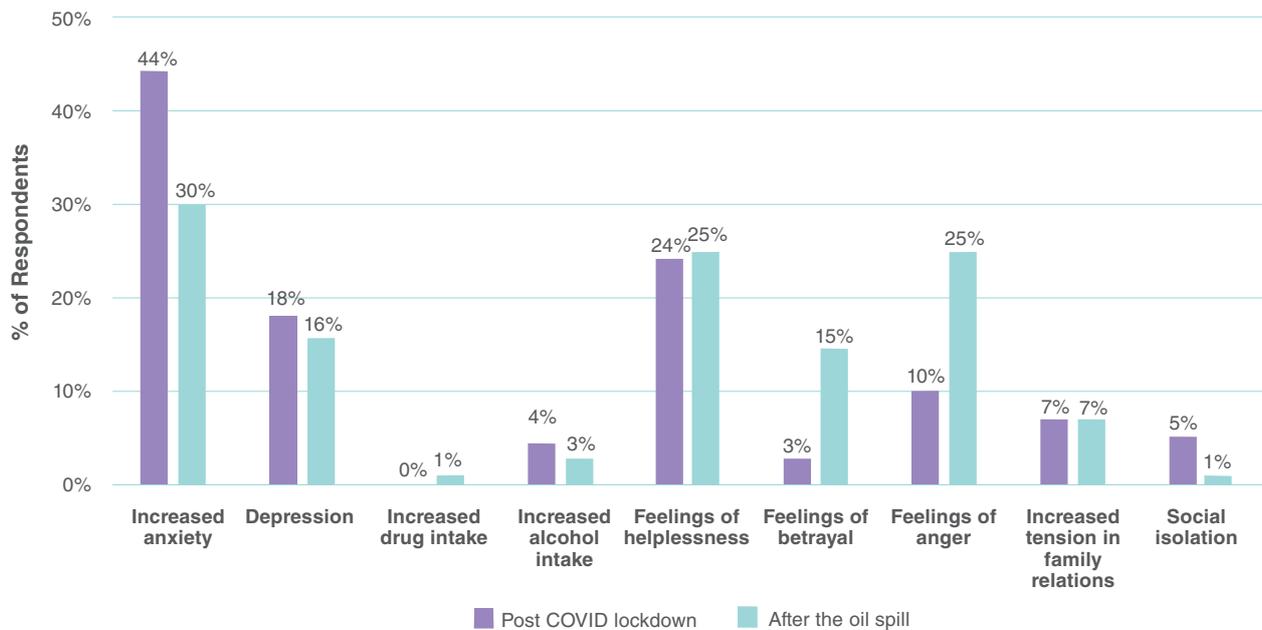
43 *Human Dimension Impacts from Oil Spills and Spill Response*. Social and Environmental Research Institute (SERI), n.d. <https://www.seri-us.org/human-dimension-impacts-from-oil-spills-and-spill-response>.

44 *Human Dimensions Impacts of Oil Spills - Physical Health Impacts*. Social and Environmental Research Institute (SERI), n.d. <https://static1.squarespace.com/static/5e9f1ce4bd9f581568061427/t/5eef1707f4e1119cdb68feb/1592586610725/HDoilPhysicalHealth.pdf>.

45 *Human Dimension Impacts from Oil Spills and Spill Response*. Social and Environmental Research Institute (SERI), n.d. <https://www.seri-us.org/human-dimension-impacts-from-oil-spills-and-spill-response>.

Preliminary analysis of survey results

Figure 25 Mental health symptoms reported in the oil spill sites, as a cumulative result of the COVID-19 lockdown and the oil spill



The graph shows that immediately following COVID-19, the dominant impacts were increased feelings of anxiety, helplessness and depression. Following the oil spill, the dominant mental health impacts varied, ranging from feelings of anxiety, helplessness, depression, feelings of betrayal and anger towards decision-makers.

Access to health services

Post oil-spill, 21% of respondents with either physical or mental health symptoms sought medical help, of which 65% went to public hospitals and 21% went to private practices. 38% of those who sought medical help had difficulties in obtaining health certificates. The most frequent reasons given by hospitals and clinics are summarised in Table 14. Health certificates may be required for legal action and receiving compensation.

Table 14 Reasons highlighted by those who reported difficulties in obtaining medical certificates

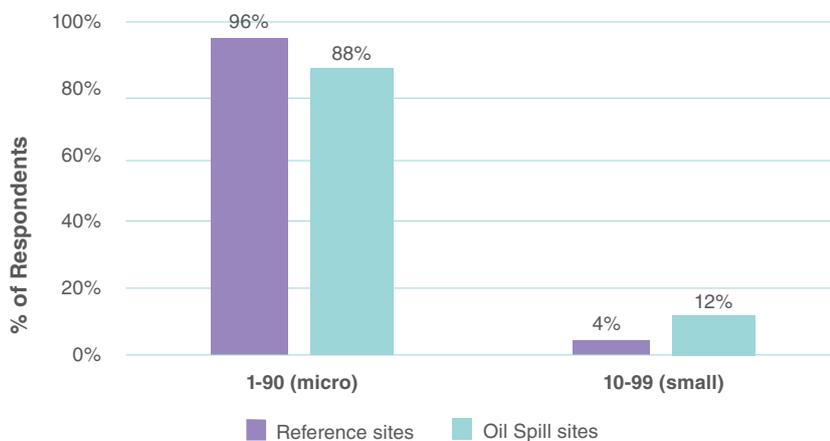
	FREQUENCY
Only medicines given, no certificate given	16
We were told we would be compensated with a medical note	6
Certificate refused by hospital - no explanation given	4
Hospital mentioned that the oil spill was no danger for us and dismissed us	4
Doctors accused us of faking symptoms	3
Did not ask for a certificate /did not know to ask	16

Preliminary analysis of survey results

Impact on business activity

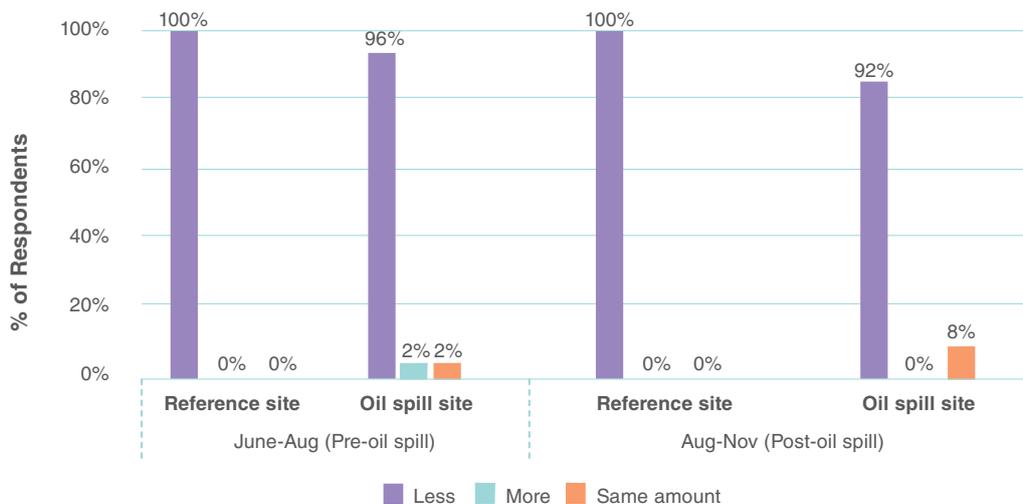
During the survey, respondents were asked whether or not they were business owners and their level of business activity in their primary occupation for (1) fishing related activities, (2) tourism related activities and (3) all other activities. 20.6% respondents claimed to be business owners in reference sites compared to 12.9% in spill sites.

Figure 26 Size of respondents' businesses



All business owners surveyed had either micro or small businesses⁴⁶. None surveyed owned a large venture. However, we also interviewed several larger businesses, especially those in the tourism industry, as part of our key informant interviews. See page 60.

Figure 27 Change in level of business activity for those from the tourism industry compared to the same period in 2019 (n=41 from spill sites and 10 from reference sites)



⁴⁶ Three criteria are proposed to define an SME, i.e. number of employees, turnover and total assets. An establishment should meet at least two of the three specified criteria to be classified as an SME.

Micro enterprise: 1-5 employees; Turnover (Rs) Not more than 2 million; Total assets (Rs) Not more than 2 million

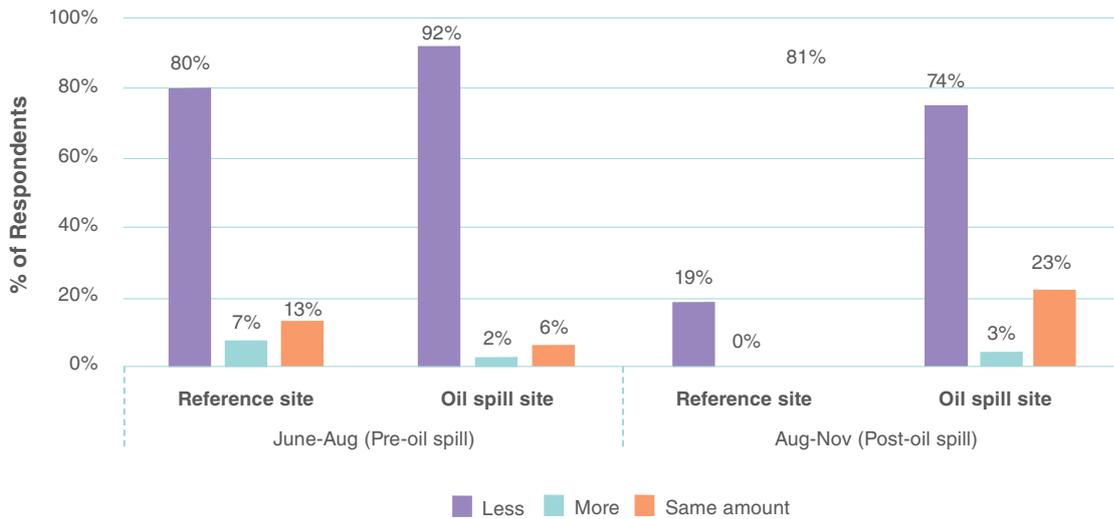
Small enterprise: 6-20 employees; Turnover (Rs) More than 2 million but not more than 10 million; Total assets (Rs) More than 2 million but not more than 20 million

Medium enterprise: 21-100 employees; Turnover (Rs) More than 10 million but not more than 50 million; Total assets (Rs) More than 20 million but not more than 50 million

Ministry of Business, Enterprise and Cooperatives, "10-Year Master Plan For The SME Sector in Mauritius: Accelerating SME Innovation & Growth," 2017.

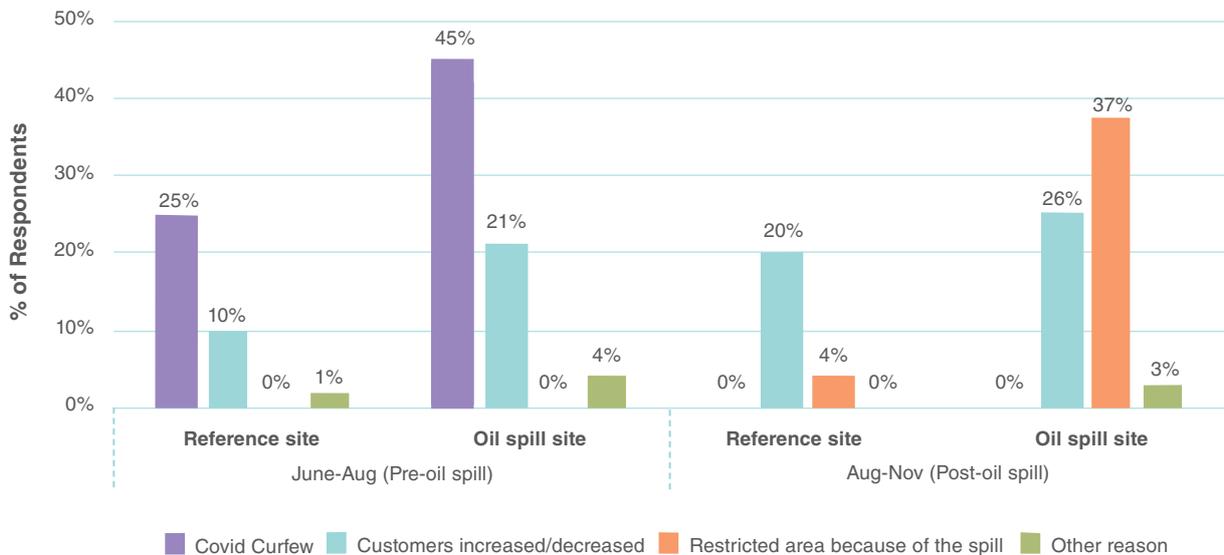
Preliminary analysis of survey results

Figure 28 Change in level of business activity for in other types of business activities compared to the same period in 2019 (n=42 from spill sites and 7 from reference sites)



For all other business activities, the results show a decrease in activity for both subsets of sites immediately after the lockdown, followed by an increase in activity from August at the reference sites, and a much lower recovery rate at the spill sites.

Figure 29 Most important reason given to explain the change in the level of business activity



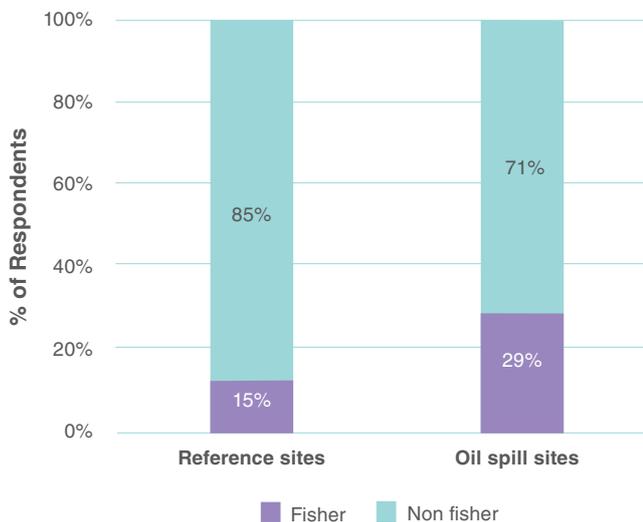
Between June and July 2020, the COVID-19 lockdown was the main reason for decreased activity levels, followed by a decrease in customers. After the oil spill, the oil spill sites continued to show a decrease in activity, due to restrictions in certain areas, followed by a general decrease in customers.

Preliminary analysis of survey results

Impact on fishing related activities

The oil spill-impacted sites have a total of 631 registered fishers, of which only 20 are women (Mauritius Fishermen Cooperative Federation Ltd, 2019). The community meetings revealed that 75% of households from villages such as Anse Jonchee, Bambous Virieux, Vieux Grand Port fish for either subsistence, commercially or both. It was important to focus on fishers, as this community has been heavily and directly impacted by the inability to fish during both the 2020 lockdown and for multiple months after the oil spill. Fishing in lagoon areas in several affected coastal villages resumed in March 2021.

Figure 30 Percentage of respondents whose primary livelihood is fishing and gleaning



29% of the oil spill site respondents are fishers (n=163) compared to 15% fishers (n= 34) surveyed in reference sites, presenting an adequate sample size to gain relevant insights". Of the respondents in oil spill sites, some 65% are registered and 35% are unregistered. Of the registered fishers in the oil spill sites, 16% are female (n=17) and 84% are male (n=89), compared to 7% female fishers (n=2) and 93% male fishers (n=28) surveyed in the reference sites. Of the unregistered fishers in the oil spill sites, 23% are female (n=13) and 77% are male (n=43), compared to 25% female (n=1)and 75% male (n=3) in the reference sites.

Preliminary analysis of survey results

Table 15 Categories of fishers surveyed in this study

TYPE OF SITE	FISHER REGISTRATION STATUS	AGE GROUP	NUMBER OF FISHERS SURVEYED	% OF TOTAL FISHERS SURVEYED PER TYPE OF SITE
Reference sites	Registered	18-39	11	32%
		40-49	12	35%
		50-59	4	12%
		60+	3	9%
	Unregistered	18-39	2	6%
		40-49	2	6%
Oil spill sites	Registered	18-39	15	9%
		40-49	32	20%
		50-59	33	20%
		60+	26	16%
	Unregistered	18-39	18	11%
		40-49	11	7%
		50-59	16	10%
		60+	11	7%

It must be highlighted that unregistered fishers cannot benefit from the Wakashio Solidarity Grant - a government assistance of Rs 10,200 provided to fishers in the oil spill-impacted area. Those who applied for registration in the past, but are not currently officially registered, have received government assistance.

Preliminary analysis of survey results

Figure 31 Change in the amount of fish caught compared to the same period in 2019.

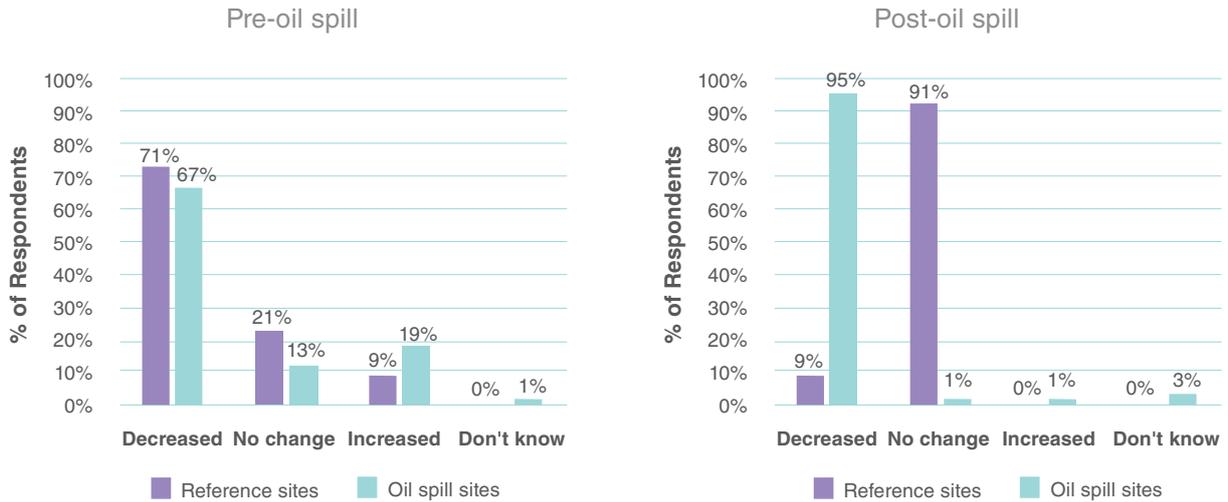
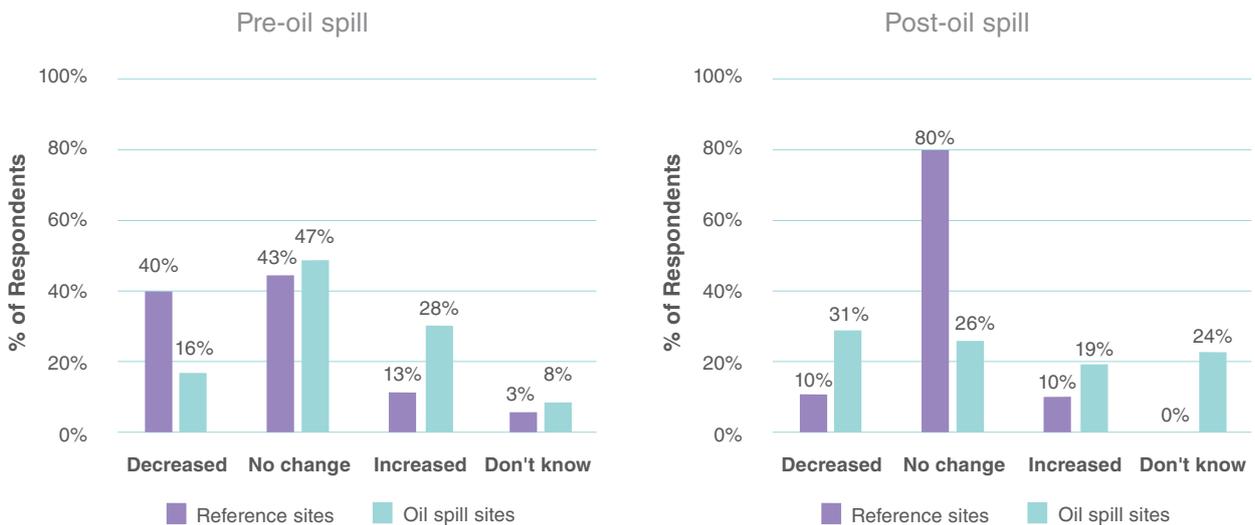


Figure 31 shows that pre-oil spill, there was a decrease in the number of fish caught, mostly due to the March to June lockdown. Respondents were asked whether the amount they fished had changed since COVID-19 and the 2020 lockdown. As from August (post oil spill), those at the spill sites could not fish at all, while those at reference sites experienced a resurgence matching last year's levels.

Figure 32 Observed change in fish price compared to the same period in 2019



However, Figure 32 shows that there does not seem to be a clear pattern in the prices of fish over time, especially in the reference sites. The results suggest that price changes were not determined by regional market forces, but were set by individual fishers or their middlemen. Since this question was not relevant to respondents in the oil spill sites, as they were legally prohibited from selling fish, the "no change" answer refers to "no fish to sell." Other possibilities include the continuation of fishing despite the ban, or that fish came from other regions of the island.

Preliminary analysis of survey results

In terms of sales of fish, little changed between the different periods we studied. Before the oil spill, fishers from reference sites who sold 91% of fish caught to middlemen and marketplace compared to 94% after the spill. However, some differences were observed for the spill sites such as: lower sales to middlemen or the market, and reduced consumption. From spill sites, 75% of respondents sold their fish to middlemen and marketplace, which then decreased to 50% after the spill. Since the oil spill, 44% of fishers from the spill sites said they could not fish, whilst the rest continued to fish, with 50% selling to middlemen and the marketplace. This could be because they fished in other regions, or because they resumed fishing once traces of oil were no longer visible. This raises concerns with regard to the monitoring of the ocean during the ban, as well as the monitoring of the toxicity of fish for consumption. Enforcement officers on the south-east coast mentioned having limited resources to monitor lagoon areas along the impacted coast effectively, which echoes the limited infrastructural/logistical capacity of the Fisheries Protection Agency⁴⁷.

Assistance received by respondents since the onset of the COVID-19 pandemic

Government support measures

Some important government support measures include:

COVID-19 Wage Assistance Scheme: paid to those that have been in employment for at least 3 months Rs 1,821 million from 16 March - 31 March ; Rs 3,343 million in April, Rs 2,797 million in May and Rs 549 million in June for Mauritius in 2020.

COVID-19 Self-Employed Assistance Scheme: Rs 5,100 per month paid out to self-employed people who suffered a loss of revenue. From 16 March to 15 April amounted to Rs 1,035 million, Rs 477 million from 16 to 30 April, Rs 942 million in May, and Rs 9 million in June for Mauritius in 2020.

COVID-19 Food distribution: Distribution of basic food commodities to vulnerable groups: Rs 8 million (averaged Rs 1,001 per beneficiary). A total of 17,936 food packs were distributed to 7,900 households in the Social Register of Mauritius, while 19,779 food packs were distributed to beneficiaries of Carer's Allowance⁴⁸.

MV Wakashio Solidarity Grant: A Solidarity Grant of Rs 10,200 has been paid since August 2020 to fishers, fishmongers and Pleasure Craft Licensees/Operators/Workers. The Solidarity Grant amount is over and above the payment of the following: daily rate of Rs 800 for the cleaning of beaches and lagoons; allowance under the Wage Assistance Scheme; allowance under the Self-Employed Assistance Scheme; and bad weather allowance to fishers.

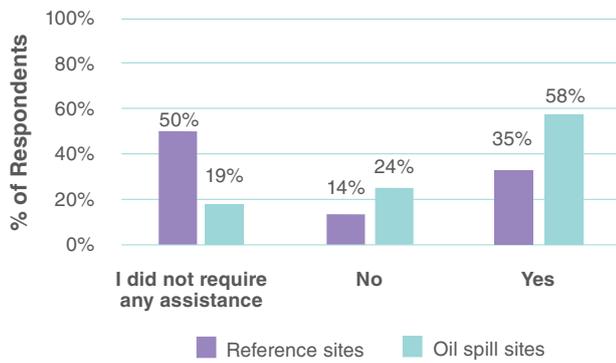
⁴⁷ Mauritius. National Audit Office. *Moving Towards Sustainable Artisanal Fishery in Mauritius : Ministry of Ocean Economy, Marine Resources, Fisheries and Shipping, 2018.*

⁴⁸ UNDP Mauritius et al., "The Socio-Economic Impact Assessment of COVID-19 in Mauritius," March 2021,

https://www.mu.undp.org/content/mauritius_and_seychelles/en/home/library/socio-economic-impact-assessment-of-covid-19-in-mauritius.html.

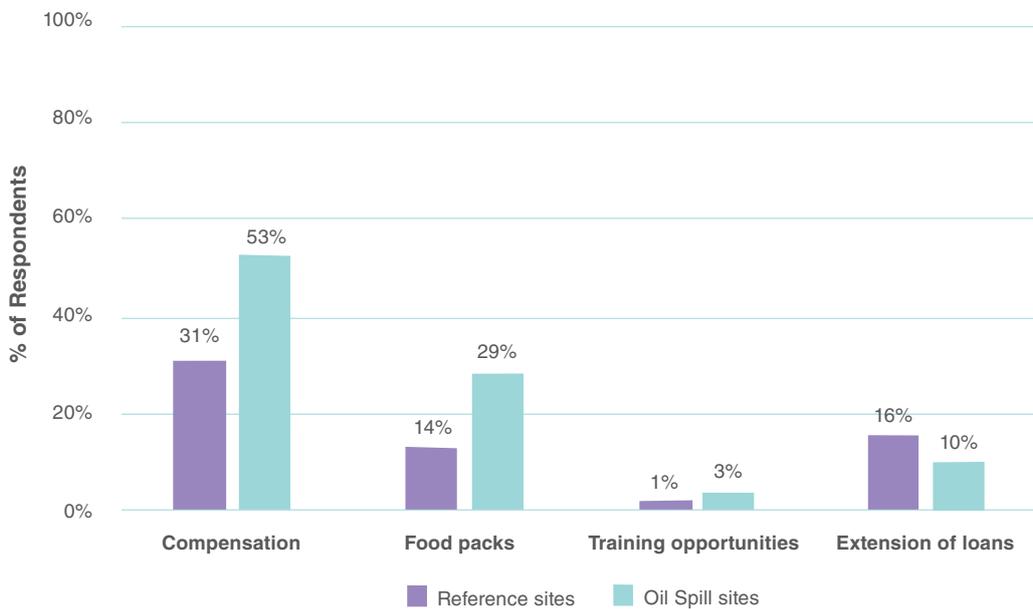
Preliminary analysis of survey results

Figure 33 Respondents who received a form of external assistance



More respondents (58%) from the oil spill sites received assistance than the reference sites, with (50%) in reference sites not requiring any help. Figure 33 also shows that 24% of respondents who needed assistance did not receive any.

Figure 34 Type of assistance received by respondents



Most of the assistance received was in the form of monetary compensation and food packs across all sites, with over 50% of respondents in oil spill sites receiving some form of assistance.

Preliminary analysis of survey results

Figure 35 Entity which provided respondents with compensation (financial support)

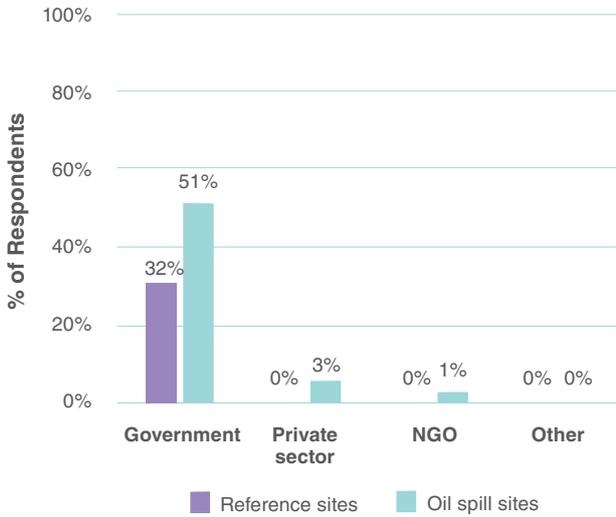


Figure 36 Entity which provided respondents with food packs

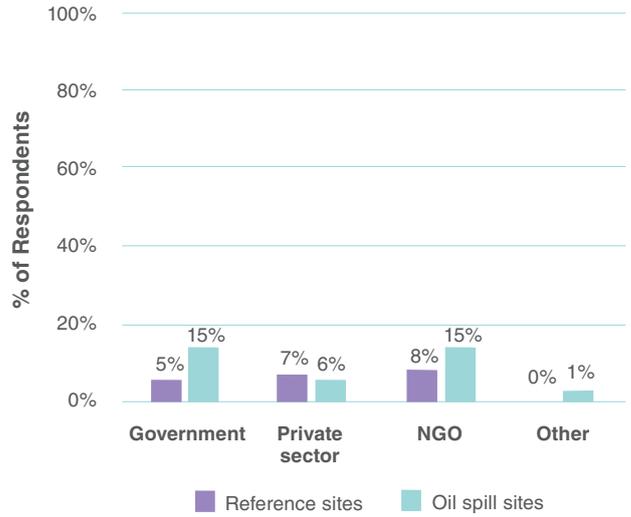


Figure 37 Entity which provided respondents with training

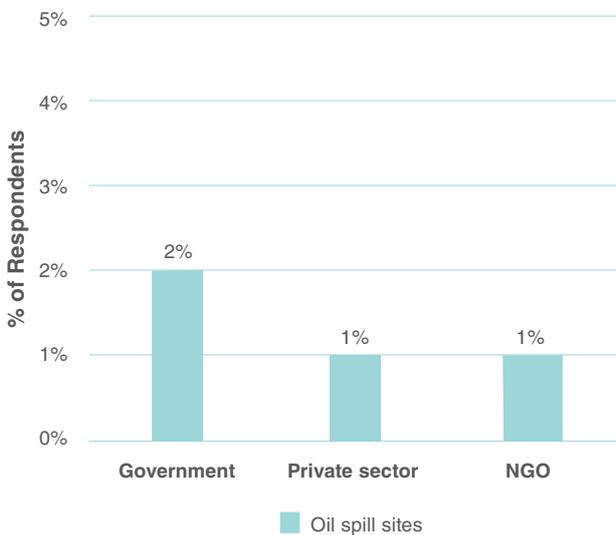
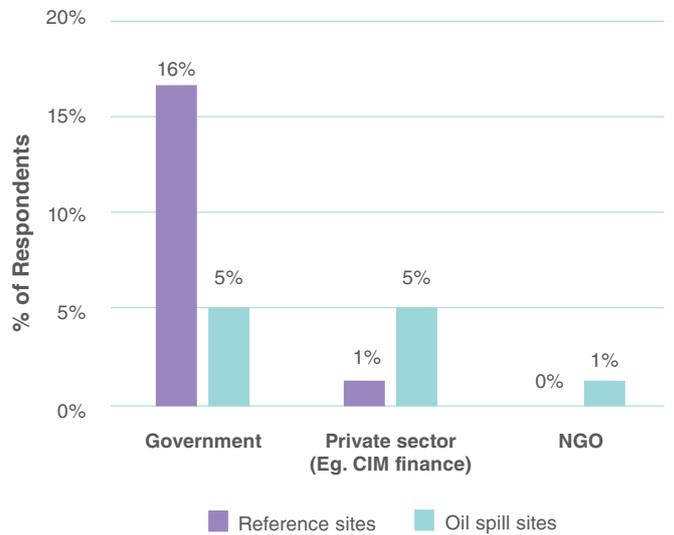


Figure 38 Entity which provided respondents with loan extensions



In most cases, the majority of external assistance came from government entities, except for the distribution of food packs where NGOs played an important role. According to the 2021 UNDP report “The Socio-Economic Impact Assessment of COVID in Mauritius”, both on a national and household level, recovery measures undertaken by the national government were most significant in attenuating the population from the severe impacts of the pandemic. Households reported being highly satisfied with the various national measures (e.g. social distancing, mask wearing, hygiene increase, wage assistance scheme, food pack distribution, and the debt repayment moratorium)⁴⁹.

49 UNDP Mauritius et al., “The Socio-Economic Impact Assessment of COVID-19 in Mauritius,” March 2021, https://www.mu.undp.org/content/mauritius_and_seychelles/en/home/library/socio-economic-impact-assessment-of-covid-19-in-mauritius.html.P8

Preliminary analysis of survey results

Social Register of Mauritius

As a fundamental component of the Government's anti-poverty policy, the Social Register of Mauritius (SRM), established in 2008, aims to register and identify the poor and their socioeconomic profile, with the goal of better informing policymakers on the effective demand for pro-poor policies⁵⁰. Around 11,108 households representing 43,957 beneficiaries were registered and determined eligible under the SRM for empowerment support in November 2018⁵¹. The number of households eligible under the SRM fluctuates. Based on survey findings, 13% of the household respondents were registered under the SRM in the oil spill-impacted sites compared to 5% in the reference sites. From the oil spill sites, 22% of respondents (n=156) with fishing as their primary livelihood were listed under the SRM and received social aid, compared to 15% in the reference sites (n=34). It would be worth assessing, over the longer term, if additional households from the oil spill-impacted villages will be eligible for registration under the SRM.

The respondents registered under the SRM acknowledged receiving the Rs 5,100 per month for two months from the Government of Mauritius through the Mauritius Revenue Authority (MRA), as well as food packs from the authorities and NGOs to help them cope with the economic burden of COVID-19 and the 2020 lockdown. They also received masks, sanitisers and medical help. With respect to the oil spill, responses were varied: some received grants by the government, as well as food packs from NGOs, and one respondent mentioned receiving an allowance to help repair his fish traps.

Figure 39 Households listed under the SRM

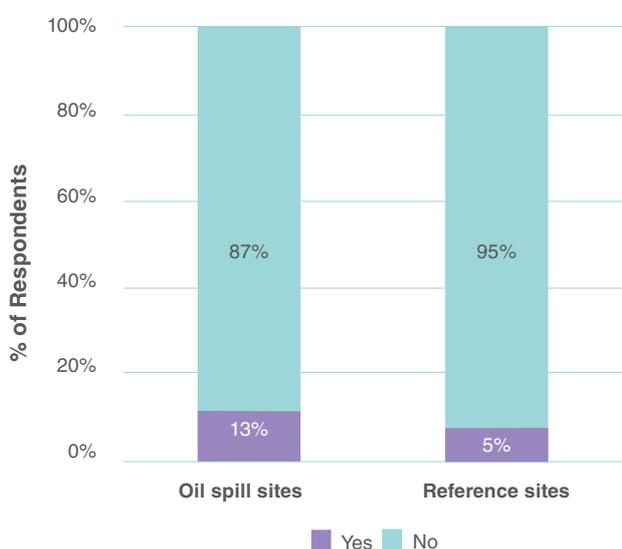
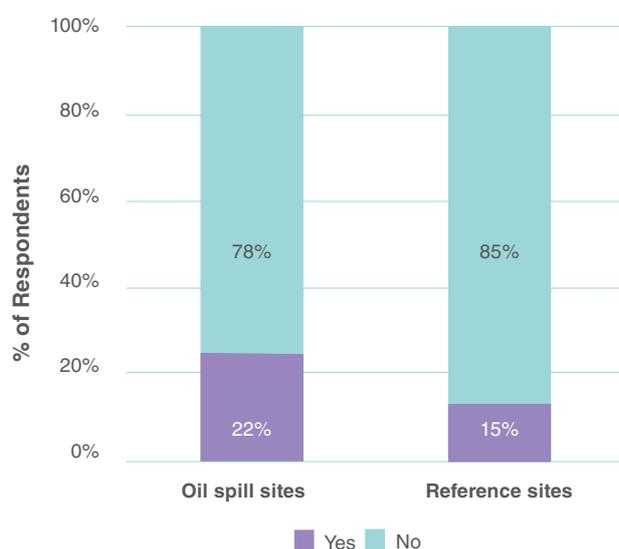


Figure 40 Fisher households listed under the SRM



50 Technology Facilitation Mechanism (TFM) | Department of Economic and Social Affairs: Social Register of Mauritius," United Nations (United Nations, n.d.), <http://stisolutions4sdgs.globalinnovationexchange.org/innovations/social-register-mauritius>.

51 "The Number of Households Eligible under the Social Register of Mauritius Keeps Fluctuating, Says Minister Wong," The Republic of Mauritius: News, April 24, 2019, <http://www.govmu.org/English/News/Pages/The-number-of-households-eligible-under-the-Social-Register-of-Mauritius-keeps-fluctuating,-says-Minister-Wong.aspx>.

Preliminary analysis of survey results

Submission of claims regarding loss caused by MV Wakashio

The government launched an online platform to facilitate the submission of claims by any person or entity incurring a loss or damage due to contamination resulting from the escape or discharge of bunker oil by the MV Wakashio, or the cost of preventive measures from the grounding of the ship and the subsequent oil pollution. All the claims submitted through the e-platform have been channelled to the ship owners and/or insurer for assessment and approval.⁵²

Figure 41 Claims submission (spill sites) for all coastal residents surveyed

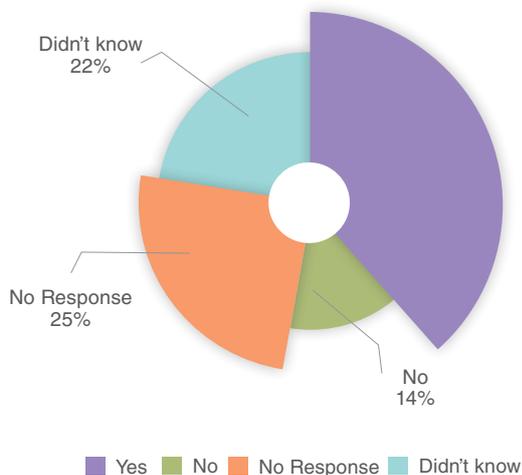
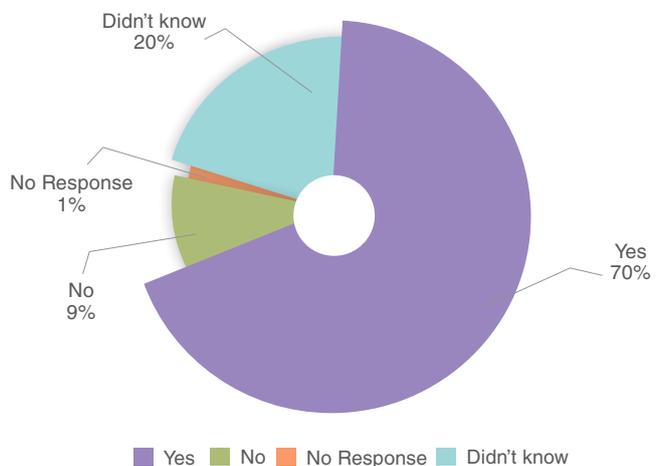


Figure 42 Fisher claims submission (spill sites)



Respondents from the oil spill sites were asked if they completed the claims process, summarised in Figures 41 and 42. 39% of respondents had submitted their claims either online, through the Citizen Support Unit offices, or by means of their dedicated Fisheries Protection Service (FPS) office in their village if they were registered fishers or applicants to become a registered fisher. Of the respondents whose primary livelihood is fishing (n=159), 70% had completed their claims process, mostly through the FPS office.

The authorities clearly stated that “all claims, other than those already compensated for in any manner whatsoever, should be substantiated by clear documentary evidence such as an invoice, work sheets, log of activities or equipment, explanatory notes, accounts and photographs. It is the responsibility of the claimants to submit sufficient evidence to support their claims with clear justifications to be provided in form of an attachment so as to explain the amount being claimed.”⁵³

The fishers who did not submit their claims were most likely unregistered fishers who thought they might not be eligible.

52 “E-Platform Launched to Facilitate Submission of Claims Regarding Loss Caused by MV Wakashio,” Republic of Mauritius, August 20, 2020, <http://www.govmu.org/English/News/Pages/E-Platform-launched-to-facilitate-submission-of-claims-regarding-loss-caused-by-MV-Wakashio.aspx>. See also: <https://blueconomy.govmu.org/Pages/Claims-for-MV-wakashio.aspx>

53 “E-Platform Launched to Facilitate Submission of Claims Regarding Loss Caused by MV Wakashio,” Republic of Mauritius, August 20, 2020, <http://www.govmu.org/English/News/Pages/E-Platform-launched-to-facilitate-submission-of-claims-regarding-loss-caused-by-MV-Wakashio.aspx>.



Synthesis of findings on social, economic and environmental impacts

This section combines information collected from our interviews, community meetings, the short survey conducted for seasonal renters and existing documentation on the impacts of COVID-19 and the oil spill in Mauritius. The research team conducted seven community meetings with fishers, skippers, and women-only groups. These meetings, held within the first few weeks of the oil spill, provided clarity on the key issues facing coastal communities, and served as the foundation for the preparation of the household survey. Alongside the survey, we carried out informal walk-ins in businesses in and around Blue Bay and Mahebourg predominantly, the most economically active region (as shown by the baseline study) of our research sites. In addition, we carried out 22 key informant, semi-structured interviews with economic actors, local environmental experts, NGOs, UN representatives and public entities. This chapter is organised by the frequency of themes discussed during interviews, from most frequent to least frequent.

It is important to highlight that for this section much of this analysis is summarizing people's perceptions of the events and their aftermath, which are based on a mix of facts and experience, as well as personal observations and feelings. The thematic trends that emerge have enabled an understanding of the social and political 'mood' and key issues to complement our survey findings.

Livelihood and social cohesion

One of the most worrying aspects of the pandemic and oil spill events amongst all interviewees is the impact on society and people's livelihoods. Many have been concerned about the emerging social issues and their potential long-term ripple effects. Given the slow pace of improvement, people will start suffering from other dire problems, such as substance abuse, domestic violence, suicides and other health issues for people who require medical care abroad. The social fabric is also under pressure, with tensions running high. There are feelings of "anger" and "betrayal" with respect to how beneficiaries for assistance from the Government have been selected. The process does not seem to be clear or fair to the resource-users or business owners who have been impacted. Some community members believe that those with "vices", such as drug users, should not be receiving any help even if they are in poverty. Substance abuse, notably the synthetic drug market, has been an increasing problem on the island, with Mauritius being used as part of a larger international drug trafficking network⁵⁴. Those who fall prey to addiction in Mauritius are generally vulnerable youth.⁵⁵

There has also been some controversy related to those who were hired by the clean-up crews, mainly licenced fishers and skippers. However, women and older men from the region have been excluded, exacerbated by the fact that several people who do not live in the region were employed by the clean-up crew. This has caused disagreements in the area. On the other hand, a clean-up company attested that they employed people from surrounding areas who were already actively engaged as volunteers since the spill.

According to the official response from the local police force (Mahebourg police station), the region did not experience an increase in crime, except perhaps some petty theft. However, studies in Mauritius have shown an increase in gender-based violence by 5-fold due to the pandemic⁵⁶. A similar trend has been observed globally whereby COVID-19 has compounded the existing gender-based violence⁵⁷. In addition,

54 Richard Chelin, "Drug Trafficking / Synthetic Drugs on the Rise despite Mauritius's Best Efforts," ENACT Africa, April 20, 2020. <https://enactafrica.org/enact-observer/synthetic-drugs-on-the-rise-despite-mauritiuss-best-efforts>.

55 Dangerous Paradise - Sex, Drugs and HIV." *The New Humanitarian*, November 26, 2007. <https://www.thenewhumanitarian.org/fr/node/259923>.

56 Dabee, Anjalee, and Renooka Beejan. "A Call to Action Against Gender-Based Violence : Putting Women's Rights at the Centre of the COVID-19 Response." *United Nations Mauritius* (blog). UNDP Mauritius and Seychelles, December 4, 2020. https://www.mu.undp.org/content/mauritius_and_seychelles/en/home/blog/2020/a-call-to-action-against-gender-based-violence--putting-womens-r.html.

57 Vahedi, Luissa, Jessica Anania, and Jocelyn Kelly. *Special Report - Gender-Based Violence and COVID-19 in Fragile Settings: A Syndemic Model*. UNITED STATES INSTITUTE OF PEACE, August 2021. https://www.usip.org/sites/default/files/2021-08/sr_501-gender-based_violence_and_covid-19_in_fragile_settings_a_syndemic_model.pdf.

Synthesis of findings on social, economic and environmental impacts

the oil spill has increased the number of spouses spending more time at home and without a source of revenue, both of which are usually causes for security concerns for vulnerable populations, especially women and children. Whilst the Mauritian Government has set-up a National Strategy and Action Plan to eliminate Gender-Based Violence (GBV) in Mauritius – immediate help and support are most likely needed in the spill sites.

At national level, Statistics Mauritius has recorded in 2020 an increase of 23.1% of 'Offences' reported to the Police, excluding contraventions, mainly due to a rise in drug offences (+7.4%), but partly offset by a decrease in assault (-10.7%)⁵⁸. A more detailed and granular look at these types of figures in the locality would be useful in giving us a better picture of the social tensions and potential threat to cohesion.

Coastal residents have also highlighted a loss in their way of life and quality of life: the inability to access the sea for recreational activities or gleaning for subsistence as a group activity in the aftermath of the oil spill. Many residents from the oil spill-impacted sites expressed struggling with a major change in their diet composition and a decrease in the quality of their meals as they can no longer depend on their seafood catch for their daily meals or to prepare their customary "carri" (curry). They now have to resort to using their savings to cover these additional food costs. More subtle practices like a barter system between fishers and community members was also ruptured when fishing was prohibited (e.g. fishers would exchange fish for vegetables and fruits with other community members or even trade their fish for payment of mechanical services for boat repairs.)

Business impacts

We examine the major business sectors impacted by COVID-19 and the oil spill and how that links to community livelihoods in this subsection. Commenting on the overall structure of the local economy, one local researcher interviewed mentioned that the decline of the textile industry in the early 2000s had a major impact on the regions' employment levels, especially for women who often worked as seamstresses in the factories. In addition, the decline of the sugar industry⁵⁹ and the consolidation of sugar mills have also impacted employment levels, particularly for men.

Hospitality

1. Hotels

The greatest impact on the tourism industry has been the pandemic and subsequent border closures which only reopened in October 2020 and with a strict 14-day quarantine. The 'Association des Hoteliers et Restaurateurs de l'île Maurice' (AHRIM) 2019/20 annual report⁶⁰ gives a comprehensive analysis of the financial impacts on the local tourism industry.

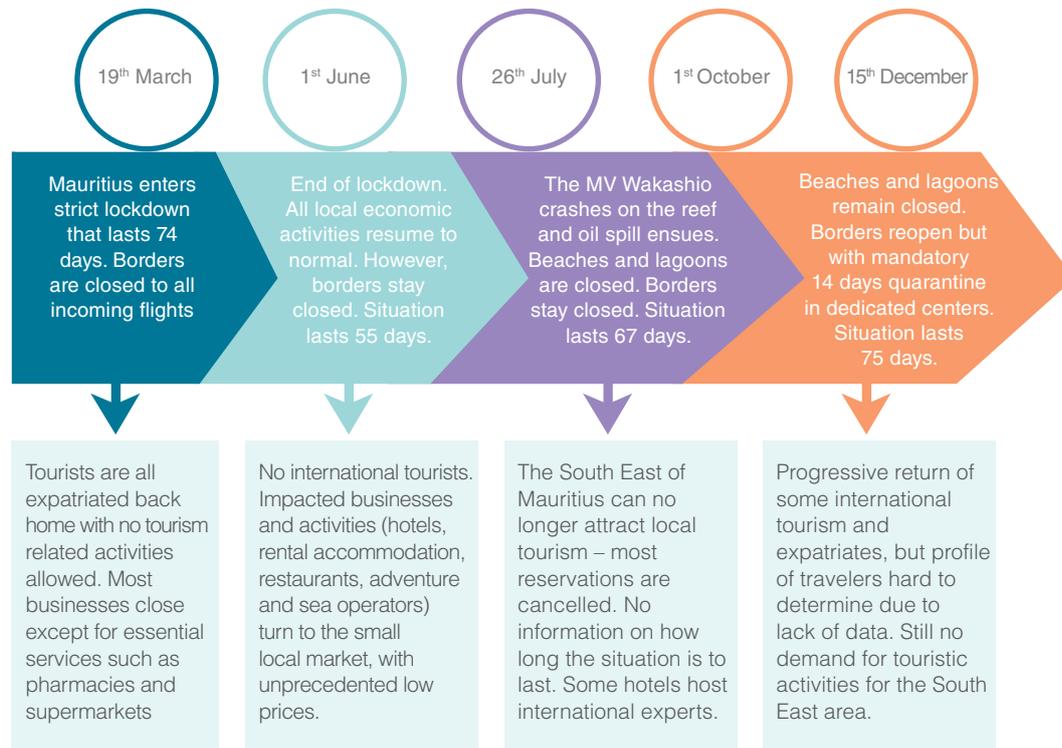
58 *Crime, Justice and Security Statistics, 2020 (Police, Prosecution, Judiciary, Prisons and Probation)*. Statistics Mauritius, n.d. https://statsmauritius.gov.u.org/Documents/Statistics/ESI/2021/EI1595/CJS_Yr20_300621.pdf.

59 R. N. G. Kee Kwong, "Status of Sugar Industry in Mauritius: Constraints and Future Research Strategies," *Sugar Tech - An International Journal of Sugar Crops and Related Industries*, March 1, 2005.

60 Association of Hoteliers and Restaurants in Mauritius, "2019/2020 Annual Report," 2020, <https://www.ahrim.mu/wp-content/uploads/2020/11/Ahrim-AR-20192020-WEB-Single.pdf>.

Synthesis of findings on social, economic and environmental impacts

Figure 43 A timeline of the impact of the events on tourism



Mauritian borders were open from October 2020 to early March 2021, and tourists were welcome in Mauritius, provided they completed the mandatory 14-day quarantine at their expense, at a facility of their choosing. However, it is difficult to assess the profile of travellers coming through, and whether hotels benefited from these incoming travellers beyond the paid quarantine. Quarantine prices are regulated by the government and depend on the star rating of each hotel. Interviewees from the hospitality industry have stated that hotels have not shown much economic improvement when the borders opened in 2020, and they believe that if there are any foreign tourists coming through, they do not stay at hotels after their 14-day quarantine. Having no other data on traveller profiles at the time of the interviews, they could only speculate that incoming travellers were retirees or Europeans who regularly travel to Mauritius. As such, they are well acquainted with the island and are therefore likely renting houses rather than staying at hotels after the quarantine period.

Hotels that have opted to work with the Mauritian government and selected as quarantine centres have been doing better financially than the others. Those which stayed open to local tourism have stated that they were barely breaking even. Operating as a quarantine hotel is complex due to the strict sanitary measures that need to be applied and the toll on all staff. Other hotels chose not to be quarantine hotels as they were concerned about the potential long-term stigma of being associated to the virus. Other hotels decided to close down entirely until the borders were fully reopened, while many others serve the Mauritian population mainly on weekends. According to the interviewees, the decision to stay open is not solely for financial purposes, but also for maintenance issues, and ensuring that training and the quality of the service remains of a high standard. Several interviewees have mentioned that what distinguishes Mauritian hotels from its foreign counterparts is the quality of service that is both extremely professional and friendly;

Synthesis of findings on social, economic and environmental impacts

in consequence, many feared a decline of that quality. Additionally, several interviewees noted that some issues arose in hotels open to domestic tourists, who tend to be more reckless, with increased reports of damage and theft from hotel properties.

With regard to the impact of the Wakashio oil spill, the hospitality landscape is more complex. Hotels that are quarantine centres, such as Preskil Hotel on the south-east coast (located very close to the Wakashio wreck), have not been affected by the spill and subsequent beach and lagoon closures as quarantined guests are confined to their rooms and prohibited from accessing the beach. Other hotels, also on the south-east coast, such as Astroea and Peninsula Bay in the Blue Bay area, won tenders to host the international clean-up crews and experts. As such, owing to the tender, they ended up recording more revenue after the oil spill than they would have in the event of no oil spill, where they would likely have been shut due to the pandemic. Other hotels in the region, from where the spill could be smelled and seen, faced a more challenging situation. With the absence of international tourists, or local tourists during the weekend, many smaller hotels such as Bed & Breakfasts closed their doors either temporarily or permanently. A guest-house owner interviewed stated to have lost 95% of revenue but chose to stay open to allow their staff to receive the Wage Assistance Scheme (GWAS). The scheme is an economic measure introduced by the Mauritian government in March 2020 as a wage subsidy to employers, including businesses in the private sector, in response to the COVID-19 pandemic to guarantee that all employees were paid a salary during the national lockdown in 2020.⁶¹ Between the lockdown and the spill, they were able to reopen for local tourists, offering a 75% reduction on prices. The oil spill presented an unexpected opportunity to host guests for a limited time, after which they had no visibility on whether they could continue operating.

2. Seasonal rental of bungalows

Following a review of available rentals on sites such as Airbnb, an estimated 65% to 80% of beach residences and apartments in the Pointe d'Esny and Blue Bay area are intended for rental purposes. Whilst the majority of owners declare at least part of the rental income as mandated by local legislation, national statistics do not fully reflect the actual volume of business generated by the seasonal rental of vacation villas.

Yet, due to the importance of this economic activity which was directly affected by the Wakashio oil spill, and given the scarcity of data on this subject, the best approach to estimate any losses was to carry out an inventory of all the residences listed on AirBnB (as one of the most commonly used websites by potential renters). 310 rentals in the region of Blue Bay, Pointe d'Esny and Mahebourg were identified ranging from luxury beach villas to guest rooms, along with their daily rate and the maximum number of guests allowed.

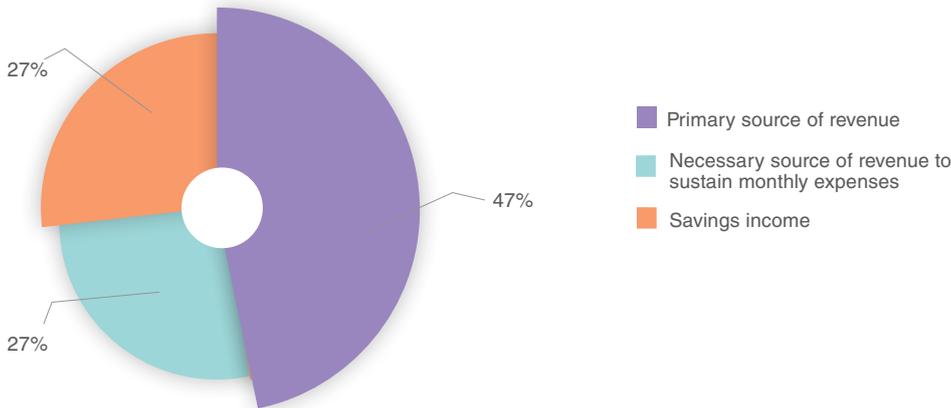
As with all types of businesses associated with tourism, short-term seasonal rentals had already been de-facto put to a halt by COVID-19. In assessing how seasonal rentals were affected, the goal was to understand (1) if owners experienced a decline in rental opportunities during the post-lockdown period, with the borders still closed, even in the absence of international tourists in Mauritius (2) if the oil spill affected the reservations already made for the year 2021.

Among the 15 individuals who responded to the survey request, the loss in rental activities has had a direct impact on their standard of living. For almost half of them, rental accommodation represents their main source of income.

⁶¹ Mauritius Revenue Authority (MRA), "Government Wage Assistance Scheme (GWAS)," Mauritius Revenue Authority, March 2020, <https://www.mra.mu/index.php/disclaimer?id=269>.

Synthesis of findings on social, economic and environmental impacts

Figure 44 The contribution to household income from revenue generated by seasonal rentals



It should be noted that despite being referred to as "vacation rentals", 50% of the owners are also positioned in the medium (less than 12 months) to long term rental market (more than 12 months) and have all been affected by the lockdown. Decreases in rental sales are highlighted in Table 16 below. The findings show that rentals remain primarily oriented towards foreigners, including those residing in Mauritius as expatriates. Additionally, regardless of whether they operate in the short-term or long-term rental market, all the owners were affected by the pandemic.

Table 16 Decrease in rental sales due to COVID-19 and the oil spill for seasonal rentals on the south-east coast

	Decrease in rental sales during lockdown period (between 19 th March and 30 th May)	Decrease in rental sales post lockdown/ pre-oil spill (1 st June - 5 th August)	Decrease in rental sales after the oil spill and continued closed borders (6 th August - 30 th September)	Decrease in rental sales after the oil spill and the conditional reopening of borders (1 st October to 15 th December)
Short-term rentals (less than 1 month)	100%	100%	76%	94%
Mid-term rentals (less than 12 months)	70%	74%	72%	72%
Long-term rentals (more than 12 months)	70%	80%	70%	78%

The pandemic had the most significant impact on the rental income of vacation bungalows and guesthouses. During the lockdown period, short-term rentals completely ceased, while medium or long-term rentals managed to sustain 30% of their income, mostly by lowering the rental rates.

Synthesis of findings on social, economic and environmental impacts

Once the 72-day lockdown period ended in 2020 (Figure 44), business did not immediately resume in the rental market. Borders remained closed to tourists, while medium to long-term tenants, mainly expatriates working in Mauritius, preferred to return to their country of origin, which further exacerbated the drop in income. During this post-lockdown period (1st June - 5th August), the rental accommodations in the region repositioned themselves on long-term offers and offered cheaper rates to target the local market.

However, this strategy of "repositioning the supply" was cut short by the oil spill. Reservations made by Mauritians for staycations at an exceptionally discounted rate were cancelled following the oil spill. The oil spill represented a significant shock for the owners because it left them no time or resources to adapt, in addition to the lack of visibility into the future caused by the pandemic. It has resulted in a situation of stress and uncertainty for these families reliant on rental revenues.

Considering this rental survey and responses from informal meetings, the occupation rate for seasonal rental accommodation is estimated at an average of 65% annually. In applying this to the rental volume available on Airbnb for the region of Mahebourg - Pointe d'Esny, losses are estimated at (with a certain margin of error) Rs 210 million over the year 2020. The losses for the period involving the Wakashio oil spill and the closure of the beaches are estimated at Rs 107 million, although it is not easy to distinguish the impacts of Covid-19 from that of the spill. (See calculation in the Annex 2, page 90)

This also affects employment in the region, as this activity employs full-time or part-time house staff for the maintenance of the accommodation. Owners were asked about the number of direct jobs funded by their rental activities, referred to as "full time equivalent" jobs equal to a 40-hour work week. Two part time positions are also equal to and referred to as "full-time equivalent". Based on their responses, these rentals employ an estimated 400 full-time equivalent jobs. Respondents mentioned that they might have to reduce their workforce by around 50% during the year 2021. This slowdown in seasonal rental activities would therefore impact more than 200 people with modest incomes.

3. Restaurants

Restaurants in the region, especially in Mahebourg, depend on both tourism and locally caught seafood and have been heavily impacted. Various visits along that coastline at different times across several months after the oil spill, showed a deserted town. One restaurant owner stated that besides the GWAS, restaurant owners were not receiving any other support. He further stated that if he was unable to generate income by at least selling fish to locals by March 2021, he would be forced to consider selling the restaurant. The restaurant lost about 70% of its usual monthly revenue due to the pandemic, and an additional 25% with the oil spill. The restaurant is now only open upon request. Another restaurant in the center of Mahebourg village saw a 60% revenue decrease per month, and just as it was about to break even, "had a double misfortune with the spill as locals are not visiting the region and those who live in the region are spending less money as a result of job losses."

Another interviewee is the wife of a fisherman and owner of a small fast-food restaurant (known locally as a "snack") that typically cooks and sells the catch her husband brings back. The household is thus entirely dependent on fishing. 70% of her clients are usually tourists and 30% Mauritians. Because of the pandemic, she was forced to adapt her prices and products to local needs, but with the advent of the spill, sales are down to nil. She is unable to sell fish from other regions, as it may negatively impact her credibility, trustworthiness and reputation in the long term. Prior to the pandemic, she had taken a loan from the Development Bank of Mauritius (DBM) to expand her snack. The construction works have had to be put on hold, but they still have a monthly debt repayment of Rs 15,000. Having not been able to receive a

Synthesis of findings on social, economic and environmental impacts

suspension for the debt, the Government Wakashio Solidarity Grant of Rs10,200 granted to her is instead de facto retrieved by the DBM for her loan repayment. No other help, such as food vouchers, has been received and the family is surviving with help from their working adult children.



Figure 45 Photos of closed restaurants in Mahebourg in the middle of lunch hour in December 2020



Recreational activities

The owner of a diving centre interviewed has experienced a 90% revenue loss since the pandemic. Because this business has multiple centres in other coastal regions of the island, they were able to work with Mauritians over the weekends. However, their south-east centres were heavily impacted by the spill and have been unable to operate in the region. Although the beaches were officially opened in early December, they did not want to risk sending divers in the lagoon. The business owner cited a mistrust in authorities due to a perceived lack of open communication about the results of the water quality tests, as well as some personnel developing rashes after conducting boat maintenance in the Blue Bay area and subsequently having to go to the hospital. They reported that the personnel was sent away from the hospital by doctors stipulating they only had minor allergies, while the divers believed that the rashes had a direct link to being in the water around the oil spill impacted area.

Boat skippers and business owners of pleasure crafts and catamarans were similarly affected, mostly by the pandemic, and made worse by the oil spill. Following the closure of his regular place of employment, one skipper states having managed to gain temporary employment with the oil spill clean-up crews. This interviewee no longer sees a future as a skipper or in tourism, and has to make alternative career plans.

Synthesis of findings on social, economic and environmental impacts

Despite the opening of beaches in December 2020, tourist operators have been struggling to convince local clients and overseas agencies about the safety of recreational activities in the south-east region. Many are demanding to know about the water quality assessment results, which operators do not have access to. As such, due to the stigma surrounding the oil spill and the lack of information about the water quality, many have been unable to sustain their businesses despite the reopening of the beach and recreational activities in the lagoon.

Other businesses indirectly impacted

Much of this coastline is either mostly dependent on fishing, especially further up the coastline on the east, or a combination of fishing and tourism, especially in the south. Thus, all businesses are being affected. Smaller businesses like shops, snacks and hairdressers are indirectly affected as the local population is no longer spending at the same rate and on the same types of goods/services as pre-pandemic times. Several shops have also been unable to restock their products due to economic challenges.

Mauritius as a destination

This theme received mixed responses with respect to which event would most impact Mauritius' image as a destination, depending on the stakeholder group being interviewed.

Those working in the tourism sector believed that the closure of borders mandated by the Government in 2020, coupled with a lack of visibility into when the borders will reopen and under what conditions, could damage the image of Mauritius as a destination. In their view, though the Government was quick to act in keeping the island safe while the rest of the world is still seeing spikes in infections, the inconsistency in messages and lack of both communication and visibility have already damaged Mauritius' reputation in relation to international tourist operators. After borders reopened in 2020, international travellers were allowed in Mauritius, but the conditions for travel were challenging with few flights, difficulties in coordinating with the different actors such as flight operators and quarantine centres. They believed it could take a while for foreign operators to recommend Mauritius as a destination. Others believed that as soon as global travel resumes, after months of confinement and sedentary lives, tourism will be quick to pick up.

Some believed that the oil spill would have a negative impact on the international image of Mauritius and would affect tourism in the future. The spill garnered negative international attention and criticism of the Government in the international press. As a result, "the image of Mauritius as a paradise destination has been tarnished." Others believed that the absence of international tourists on the island at the time of the spill was helpful in limiting the damage to the island's reputation, and that the event will soon fade from memory as it will get lost in today's fast-paced news cycle. Others yet believed that the remains of the Wakashio shipwreck could have been a popular tourist attraction.

Synthesis of findings on social, economic and environmental impacts

Financial impact on the operations of Non-Profit Organisations

The MWF's Ile aux Aigrettes eco-tour has seen an important decrease in the number of visits due to the pandemic and the oil spill. In a normal year, the islet receives around 18,000 visitors, of which 8,000-9,000 are Mauritians (including 3,500-4,000 pupils and teachers) and another 8,000-9,000 are foreigners. In 2020, the islet received only 2,945 visitors compared to 17,900 in 2019.

The eco-tour activities reopened for approximately 5 weeks between the end of the lockdown in June, when activities were allowed to operate again, and the Wakashio oil spill on 5th August. During that time, they recorded only 217 visits compared to 3,650 visits for the same months of July and August in 2019. During the clean-up stages of the oil spill, they closed again from September to November 2020. It is only in December 2020 that the Government announced the reopening of such activities. The islet had to be cleaned up and prepared for incoming visitors (mostly Mauritians), and remained closed until the 8th of December 2020. However, rates for Mauritian citizens (adult ticket: Rs 250) are substantially lower than rates paid by foreigners (adult ticket: Rs 800), and are not sufficient to offset the difference. Hence, the loss in revenue has been considerable for the eco-tour which helps support conservation activities on the island. Since December 2020, the islet has been receiving daily visits but in reduced numbers, as only Mauritians and a small number of foreign tourists have gone through quarantine.

Financially speaking, the MWF was able to receive funding in the aftermath of the oil spill through crowdfunding, as well as donations from Japanese citizens through the Japanese Boat Foundation (Rs 1.5 million) to support conservation activities on Ile aux Aigrettes. Moreover, they incurred additional costs pertaining to the relocation of numerous endemic species away from the islet due to the spill. The foundation relies heavily on funding from corporations, which they worry will be compromised in 2021 due to the dire economic situation.

The NGO Eco-Sud has actively participated in supporting the mobilisation of the civil society and support actions to protect the coastline from the oil spill: organising the storage and distribution of materials received from donations, registering around 7,000 volunteers, sensitising people on safety issues, advocating for more transparency from the authorities in the management of this crisis. Their crowdfunding initiatives allowed them to raise Rs 21 million between August and October 2021. Though they have been involved in food distribution and the set up of a health/psychological support cell in impacted areas, as of 2021, donations they have received will be allocated to 1) Cleaning and protecting the coastline, 2) creating alternative livelihoods, and 3) the restoration of the affected ecosystems.

Mental and physical health

As a result of the pandemic

With regards to the pandemic, a number of interviewees found that the lockdown was difficult to live through, with feelings of social isolation. However, they also acknowledged the necessity of this hardship to protect Mauritians, knowing that the whole nation and rest of the world was in a similar situation. They agreed that the lockdown policy had been necessary and successful as Mauritius had become a COVID-19 safe country in 2020.

Synthesis of findings on social, economic and environmental impacts

However, a study on domestic violence was carried out by Statistics Mauritius and the World Bank, with the results showing an increase of abuse towards women. Accordingly, *“the period also registered an increase in incidents of domestic violence by 33%, with 93% of the cases perpetuated against women. Unfortunately, most of these cases were not reported to authorities, with 37.5% of victims having kept it to themselves and 62.5% preferring to confide in other people. Among the poorest of the poor, the incidence of domestic violence was 9% being twice as high as among the respondents in the National Household Survey (NHS).”*⁶²

As a result of the oil spill

Local NGOs working on the ground were asked about any changes in behaviour and general attitude since the oil spill. They noted that people were ‘unmotivated’ and ‘apathetic’, and that ‘they lost their bearings.’ They also noted in the fishing communities a feeling of ‘loss of the future’ as “the affected population finds it difficult to anticipate the future, so the proposals for alternative occupations are not of great interest.” Environmental experts also noted that the sea and ocean were part of the community’s way of life and that the spill is seen as ‘a traumatic event.’ To them, “being a fisher” is much more than a job; it is an identity, part of their customs and culture, and as such an “essential element of the social fabric of the communities.” Economic solutions intended for them must thus take this aspect into consideration. Alternative livelihoods for fishers, especially older generations, may not be well received; instead, projects on sustainable fishing outside of the lagoon in non-contaminated areas should be envisaged. There are also constraints for off-lagoon fishing, from lack of training to fish off-lagoon, to difficulties in accessing boats and adequate engines to fish in these areas. Fishing off-lagoon presents limitations related to access, which need to be evaluated especially for women fishers (further explored in the Gender section on page 66).

A team from MWF on Ile aux Aigrettes reported health effects such as nausea, headaches and the hospitalisation of one staff for 3 days because of a severe asthma attack. This occurred even though hours spent on the islet reserve per person was strictly monitored.

An environmental expert also questioned the potential long-term physical impacts of the oil spill, as the fuel leaked was a new type of low sulphur oil which has a different chemical composition than the traditional fuel types used in Mauritius. Its potential effects on physical health are unknown. For this reason and indemnification⁶³ purposes, it would be important to continuously monitor the community’s health, especially those who sought medical attention.⁶⁴

Immediate response and governance

COVID-19: The government put in place a number of schemes to support communities and businesses impacted by COVID-19.⁶⁵ The most important support has been the Government Wage Assistance Scheme (GWAS), which subsidizes the basic salary of employees for businesses. There are a number of conditions attached to this, further elaborated in the 2020 budget,⁶⁶ such as refund of the GWAS by profitable businesses and the prohibition of terminating employees.

62 UNDP Mauritius et al., “The Socio-Economic Impact Assessment of COVID-19 in Mauritius,” March 2021, https://www.mu.undp.org/content/mauritius_and_seychelles/en/home/library/socio-economic-impact-assessment-of-co

63 Indemnification “to make compensation to for incurred hurt, loss, or damage”

64 The initial physical and health symptoms experienced by volunteers and health residents surveyed are summarised in Table 13 and Figure 26.

65 MINISTRY OF FINANCE, ECONOMIC PLANNING AND DEVELOPMENT, “Covid-19 Support,” Covid-19 Support § (n.d.), <https://mof.govmu.org/Pages/Covid-19-Support.aspx>.

66 Renganaden Padayachy, “National Budget 2020-2021,” National Budget 2020-2021 § (2020), <http://budget.mof.govmu.org>.

Synthesis of findings on social, economic and environmental impacts

Oil Spill: Following the Wakashio oil spill, the Government offered different categories of allowances to affected persons: (i) a Solidarity Grant, plus Bad Weather Allowance of Rs 425 daily where applicable for registered fishers and applicants of fisher registration (ii) a Solidarity Grant of Rs 10,200 for fishmongers (iii) Rs 15,300 (Solidarity Grant and Self-Employed Assistance Scheme of Rs 5,100) for self-employed persons in Pleasure Craft;⁶⁷ and Rs 20,400 (Solidarity Grant and Wage Assistance Scheme of Rs 10,200) for workers in Pleasure Craft as from August 2020. In order to benefit as a fisher, a beneficiary must show a valid proof of registration. Existing applicants of the fishing registration cards in the impacted region were also eligible for the Rs 10,200 monthly package.⁶⁸ The insurer (Japan P&I Club) has disbursed Rs 6 million to a proportion of affected residents in January and February 2021 as compensation.

MV Wakashio Assistance and Support Cell: The cell spearheaded by the National Social Inclusion Foundation (NSIF) was set up by the Mauritian Government in September 2020 following the oil spill and was tasked with identifying affected individuals. It was created in an effort to understand impacts of the closure of the beaches and lagoon areas on coastal communities and business operators. The cell operates specifically in a demarcated area from Le Bouchon to Trou D'eau Douce/ Ile aux cerfs, which aligns with the oil spill-impacted sites under study. The action plan of the cell is specific to the oil spill to make a clear distinction between impacts due to COVID-19 and impacts due to the oil spill. A month after the oil spill, one of the fundamental actions taken by the cell was to organise a participatory workshop comprised of 52 representatives from civil society, government institutions and the private sector; the goal was to compile first-hand perspectives of happenings on the ground, take recommendations from the diverse set of stakeholders, and share them with relevant government authorities. Based on feedback from this workshop, the cell used both top-down and bottom-up approaches to compile a list of actors to be supported. This was done (1) by using specific lists of stakeholders provided by different government departments (e.g. they relied on official data from the Ministry of Blue Economy, Marine Resources, Fisheries and Shipping for fisher information and the Ministry of Tourism for information on tourist operators) and (2) by conducting site visits of impacted villages, meetings with local businesses, NGOs, schools.

The Cell has gathered key inputs and proposals from representatives of NGOs, Ministries and public institutions and a number of affected economic operators in the region including non-registered artisanal fishers, pleasure craft operators, taxi drivers, car and scooter rental operators, restaurants and 'snacks', guest houses and tourist residences, tourist and other shop operators, beach hawkers and traders, self-employed individuals dealing in handicrafts and other goods.

However, people engaged in the informal economy such as skippers who used to get paid on a daily basis tend to get left out of "official" lists, despite facing economic hardship from the oil spill. The lack of a specific gender focus in the approach might also make women employed in the informal economy along the affected coast less likely to be supported.

The cell has proposed a package of measures to support economic actors in the south-east region (detailed in Annex 3), which includes: Payment of a Solidarity Grant, a business continuity grant or the waiving of administrative fees. Anyone identified as an affected person was eligible for the solidarity grant, a monthly compensation of Rs 10,200 from Aug 2020 until Dec 2020,⁶⁹ except for eligible fishers who continued to receive their allocation beyond Dec 2020. This identification process entailed complicated procedures

67 MV Wakashio: Solidarity Grant of Rs 10,200 to Those Affected by the Oil Spill," MV Wakashio: Solidarity Grant of Rs 10,200 to those affected by the oil spill § (2020), <http://www.govmu.org/English/News/Pages/MV-Wakashio-Solidarity-Grant-of-Rs-10,200-to-those-affected-by-the-oil-spill.aspx>.

68 Andrew Wasike. "Mauritius Provides Aid to Fishers Affected by Oil Spill." *Anadolu Agency*, August 27, 2020. <https://www.aa.com.tr/en/africa/mauritius-provides-aid-to-fishers-affected-by-oil-spill/1955094>.

69 "MV Wakashio: Solidarity Grant of Rs 10,200 to Those Affected by the Oil Spill," MV Wakashio: Solidarity Grant of Rs 10,200 to those affected by the oil spill § (2020), <http://www.govmu.org/English/News/Pages/MV-Wakashio-Solidarity-Grant-of-Rs-10,200-to-those-affected-by-the-oil-spill.aspx>.

Synthesis of findings on social, economic and environmental impacts

of validation. People who were identified at a later stage were compensated retroactively. The business continuity grant, a one-off payment, aimed to help small businesses cover maintenance of their assets/equipment (e.g. for cars, boats, restaurants). The identification of affected actors has been a complex process, as was the prioritisation of these actors: for instance, registered fishers were prioritized, followed by existing applicants for a fisher card. Any person with double employment was excluded, further leaving out potential grantees as a high percentage of people in the area are employed in the informal economy with several seasonal jobs.

Fisher compensation: A report by Federation des Pecheurs Artisans de l'Océan Indien (FPAOI) in collaboration with the Mauritius Fishermen Co-operative Federation Ltd (MFCF) and Apostleship of the Sea (AOS), which looks into 12 fishing cooperatives and 4 fishing associations, has summarised ways in which registered fishers have been affected, as well support measures recommended by fishers.⁷⁰ 631 registered fishers have been affected in the oil spill sites across the 12 VCAs. Out of these, 20 are women from the village of Bambous Virieux. The combined value of their fisheries catch was recorded at Rs 8,453,608 for the 2018/2019 period and Rs 6,868,680 for the 2017/2018 period. Fishers were affected by a forced unemployment period, a reduction in revenue and increase in household debt, a shortage of fish on the market and lower quality of their diet, health issues and damage to fishing equipment. Some of the recommended measures were: financial aid to sustain their family needs, alternative livelihoods with a reasonable salary until the situation is back to "normal", adequate compensation for damages caused to the environment and resulting losses in fishing revenue, provision of a support system to help them navigate the crisis, revisiting and relaxing loan payments to acquire boats and engines, training to develop new techniques of fishing and other economic activities, help set up funds to acquire semi-industrial boats for fishing off-lagoon.

A key concern with compensation for fishers is that one size does not fit all: fisher revenues diverge greatly based on gear type, fishing effort etc; seine fishers have a much higher fisheries catch than other gear types; users of fish traps who operate off-lagoon have a higher catch than those fishing in the lagoon. Additionally, family sizes differ. Registered fishers with two or more children at high school or university level have been struggling to cover the education fees of their children with the fixed allocation they have been given.

Choosing a fair range of compensation is also highly challenging. It is well known among fisher communities that most of them have been underreporting their catch to FPS officers for fear of having to pay taxes. In a 2019 household survey along four of the oil spill-impacted sites, namely Mahebourg, Beau Vallon, Vieux Grand Port and Trou D'eau Douce, fishers reported an average daily catch value of Rs 1,439.46.⁷¹ When asked in the November - December 2020 survey in the 12 oil spill-impacted VCAs, fishers reported an average daily catch value of Rs 3,179, which shows a wide variation. However, even when considering the lower compensation value of Rs 1,439.46 over 24 working days ($1,439.46 * 24$) amounting to Rs 34,545, the Rs10,200 and bad weather allowance fall short for fishers and their family.

Perception regarding the COVID-19 response

The overall perception of the response to the pandemic from those interviewed at the time of writing was that Mauritius was in a privileged position to be COVID-safe in 2020, as a result of government action. However, many found the lack of clarity on the timeline for the opening-up of our borders and as a result, the

⁷⁰ FPAOI, "Synthèse de l'enquête sommaire sur l'impact de la marée noire sur l'activité des pêcheurs de la région sud-est de l'île Maurice suite à l'échouement du MV Wakhasio" (2020)

⁷¹ Naggea, dissertation data

Synthesis of findings on social, economic and environmental impacts

economy, to be challenging. Whilst most realised not much could be done to solve this global problem, the situation remains an operational and financial challenge for those employed in the tourism sector, as well as a source of anxiety for many others. A key concern which frequently came up in interviews and surveys conducted was the GWAS, which provided financial help to employees earning a salary of Rs 50,000 or below. However, that help did not extend to business owners, presenting a real challenge for SMEs (who typically have less cashflow and savings). This was reflected in the survey response, which showed that those employed received a stable monthly income, but that for others such as SME owners the situation was more complex. SME owners are more dependent on a cash flow, without which it is harder to operate. Without support – these SMEs had limited options – except a) become dormant until things pick up, b) borrow and indebt themselves, c) go under voluntary administration, or d) close down.

Perception regarding the Wakashio response

The perception of the response to the oil spill was much more critical. Many noted a lack of government presence and coordination in those first critical days after the ship ran aground, before it started leaking oil, and that the worst of the disaster could have been avoided. It was noted that in 2016 the MV Benita had crashed in a similar way and in the same region, which could have served as a precedent to avert disaster. It was also noted that Mauritius has two contingency plans, one national and one regional, in the case of an oil spill event, but that neither seemed to have been consulted nor implemented when the MV Wakashio was first grounded on the coral reef. “A lack of preparedness, a lack of the precautionary principle and an absence of coordination and decision-making” is how the government response was typically described by the local experts interviewed. With regard to the subsequent coordination of the clean-up events, as noted above, many criticised a lack of communication and information-sharing. According to a few, this has impeded the long-term work for ensuring a continuous scientific approach to monitoring and strategy development for both environmental conservation and socio-economic wellbeing.

On the other hand, interviewees praised the response of civil society, including NGOs and the private sector, as well as the national sentiment, the willingness of so many Mauritians to work together, to volunteer their boats, equipment and bodies to act quickly in protecting the coastlines from the oil slick. Unfortunately, there was also a lack of coordination amongst various actors and in some instances, unintentionally treading in oil slick in muddy areas, which can cause more harm than good. However, interviewees believed this coordination role should have been taken on by the authorities. Unfortunately, their lack of presence in the beginning created a power vacuum that was filled with the best of intentions, and the relative success of the artisanal sugar cane booms in stopping most of the oil slick from reaching the shores and containing the oil to facilitate pumping out of the water.

Gendered impacts

The COVID-19 lockdown caused much disruption to women, as highlighted in the Gendered Voices Issues 1-4 by UNDP Mauritius.⁷² The report demonstrates how COVID-19 has the potential to accentuate the feminisation of poverty in Mauritius. Currently, 11% of the poorer segment of the population constitutes women living under the poverty line, compared to 9.6% males in the same category. Mauritius lags behind

⁷² United Nations Development Programme Mauritius, “COVID-19: INCREASING INEQUALITIES BETWEEN WOMEN AND MEN,” n.d.

Synthesis of findings on social, economic and environmental impacts

in gender equality measures related to economic participation, ranking 115 out of 153 countries according to the 2020 Global Gender Gap Index, a global report of the World Economic Forum which attempts to measure the gap between women and men along 4 key dimensions: 1) economic participation and opportunity; 2) educational attainment; 3) health and survival; and 4) political empowerment. Several factors explain this low number, such as the significant difference in labour force participation. For example, in 2019, 46% of women 16 years and older were active in the economy versus 73% of men in the same age category⁷³. Based on World Bank findings, a gender pay gap of 28% in the private sector and 23.4% gender pay gap exists across different occupational levels in Mauritius. As women are more highly represented in sectors most impacted by COVID-19 (e.g. the hospitality industry and tertiary sectors), it was concluded that if their situation was not addressed, it would only be exacerbated. Based on the UNDP Human Development Report 2019, women achieved higher education levels than their male counterparts in both public and private sectors. However, women comprised 57% of the unemployed in the first quarter of 2020. Barriers to women's participation in employment, as highlighted by a World Bank Group Study (2018)⁷⁴, have been identified as having to bear the cost of household work, resulting in them having to opt out of activities which compete for their time, forcing them to settle for less competitive, remunerative positions, which provide them with greater flexibility.

In the oil spill-impacted sites, the compounding crises of the pandemic and the oil spill have highlighted an important policy and research gap: women in fisheries often go uncounted. Meetings with community groups and community leaders revealed it is well known that hundreds of people fish for subsistence along the oil spill-impacted, southeast coast of the island. These subsistence fishers are not formally recognised through any registration process. Women tend to be largely unregistered artisanal fishers who walk along the coast at low tide to forage for food sources: shellfish like "Tek tek" (*Donax* spp.), "Mangouak" (*Isognomon* spp.), "Betay" (*Trachycardium* spp., *Gafrarium* spp., *Asaphis* spp., *Tellina* spp.), "Bigorneau" (*Littorina* spp.), "Gono Gono" (*Pleuroploca trapezium*) as well as invertebrates like octopus, and a variety of fish, - This process is known as gleaning⁷⁵. Although applicants of fisher licenses were eligible for the Rs 10,200 monthly oil-spill compensation,⁷⁶ unregistered fishers and gleaners who have not previously applied for a registration license – who fish mostly for subsistence – failed to receive any financial support. This has led to not only economic loss but also food insecurity within their households, and an emotional loss of a way of life from not being able to glean anymore.⁷⁷

The COVID-19 lockdown caused much disruption to women, as highlighted in the Gendered Voices Issues 1-4 by UNDP Mauritius.⁷⁸ The report demonstrates how COVID-19 has the potential to accentuate the feminisation of poverty in Mauritius. Currently, 11% of the poorer segment of the population constitutes women living under the poverty line, compared to 9.6% males in the same category. As women are more highly represented in sectors most impacted by COVID-19 (e.g. the hospitality industry and tertiary sectors), it was concluded that if their situation was not addressed, it would only be exacerbated.

In understanding how women gleaners have been affected, there is the concern that the current system is set up in a way that disadvantages women in fisheries. Out of the 1,902 registered fishers in Mauritius⁷⁹,

73 Josheena Naggea, Emilie Wiehe, and Sandy Monrose, "Inequity in Unregistered Women's Fisheries in Mauritius Following an Oil Spill," *Women in Fisheries Information Bulletin*, no. #33 (March 2021), <https://spcftpstore1.blob.core.windows.net/digitalibrary-docs/files/0d/0d8232f2d0fbad10dc7260b7e734aea9.pdf>.

74 World Bank Group, "Mauritius Addressing Inequality through More Equitable Labor Markets," 2018, <https://openknowledge.worldbank.org/handle/10986/29034>.

75 Brandon Wei, "Foraging Food, Forging Bonds," *Hakai Magazine* - Coastal Science and Societies, March 8, 2021, <https://www.hakaimagazine.com/news/foraging-food-forging-bonds/>.

76 Andrew Wasike, "Mauritius Provides Aid to Fishers Affected by Oil Spill," *Anadolu Agency*, August 27, 2020, <https://www.aa.com.tr/en/africa/mauritius-provides-aid-to-fishers-affected-by-oil-spill/1955094>.

77 *Supra*, note 35

78 United Nations Development Programme Mauritius, "COVID-19: INCREASING INEQUALITIES BETWEEN WOMEN AND MEN," n.d.

79 Mauritius Fishermen Cooperative Federation Ltd, 2019

Synthesis of findings on social, economic and environmental impacts

only 35 are women. More than half of these registered women fishers are located in the oil spill-affected zone. Although there is likely an equal to larger number of unregistered fishers compared to registered ones, fisherwomen and gleaners are far less likely to be registered or recognized at all. Globally, gleaning is considered an “invisible” profession, which often goes uncounted⁸⁰. As women are overwhelmingly unregistered, a system which does not consider unregistered fishers inadvertently further exacerbates gender inequalities. The oil spill has made visible the inequalities between men and women fishers that already existed in the Mauritian context.⁸¹

Both the COVID-19 and oil spill impact demonstrate the risk of gender-neutral policies and interventions accentuating inequalities between women and men in Mauritius. The UNDP Policy Briefing Note on “The Gendered Implications of the COVID-19 Pandemic: The Mauritius Context”, the article on “Inequity in unregistered women’s fisheries in Mauritius following an oil spill” and the more recent UNDP newsletter “*Impacted Livelihoods: Women in Oil Spill Affected Areas*”⁸² call for more policies targeted at improving women’s care and economic roles while setting up mechanisms to support women in these roles. A gender lens needs to be applied to policy-making and decision-making to support the COVID-19 and oil spill recovery.

Environment

Mauritius declared a “state of environmental emergency” on 7th August, after the MV Wakashio vessel began leaking oil. Local community groups reacted swiftly to restrain the spread of the oil using several methods including actively making artisanal booms using sugarcane bagasse. The spill has affected highly ecologically sensitive sites including numerous types of protected areas in the region as well as public beaches and smaller mangrove forests.⁸³

Divergence in perception of the oil spill damage on the ecosystem: Local experts interviewed felt that the international experts downplayed the impacts of the spill, referring to the catastrophe as a “small” oil spill. They expressed anger at some of the public comments made by international experts who said the damages were limited and nearly over, as clean up initiatives would be complete. Local environmental experts believed that the approach and communication lacked scientific evidence and understanding of local socio-ecological systems. Their expert opinion was that the unique biodiversity in the impacted area, already been eroded by the lack of adequate environmental stewardship, was further weakened by the Wakashio oil spill. Indeed, even though the MV Wakashio oil spill is of a smaller scale in terms of volume of oil spilled as compared with previous oil spill disasters such as the Deepwater Horizon spill in April 2010 where 4.9 million barrels of crude oil spilled into the Gulf of Mexico, the location of the spill in an environmentally important area⁸⁴ made it a disaster of catastrophic proportions for the local context.

Impact on coral ecosystems: Whilst the short-term visible nuisance of the heavy oil has now mostly disappeared, the toxicity for corals, invertebrates and other species may have long-term impacts. In a recent study published by McClanahan & Muthiga (2020), looking into the health of coral communities

80 Lesley OGDEN, “Fisherwomen – The Uncounted Dimension in Fisheries Management,” *BioScience* 67, no. 2 (February 2007): pp. 111-117, <https://doi.org/10.1093/biosci/biw165>.

81 Supra, note 35

82 UNDP Mauritius, “Impacted Livelihoods: Women in Oil Spill Affected Areas,” n.d., https://issuu.com/dldstudio/docs/gendered_voices_-_environment_special_i01v02?fbclid=IwAR1im0bedt_36JkWkSRgC8e9GJICJKYvFiSlciqsi2_xRlt9anu71BmLFI.

83 Seveso, Davide et al. “The Mauritius Oil Spill: What’s Next?” *Pollutants* 1(1): 18–28 (2021).

84 Seveso, Davide et al. “The Mauritius Oil Spill: What’s Next?” *Pollutants* 1(1): 18–28 (2021).

Synthesis of findings on social, economic and environmental impacts

over a 15-year interval, it was found that coral cover (the proportion of reef surface covered by coral) declined by 40% over the study period in Mauritius. Although the loss of coral and taxa was most strongly associated with the distribution of rare hot water that occurred between 2004 and 2016, human pressures do not enable these corals to adapt to unusual hot and calm water stresses. This research has shown that the conservation of coral species, as well as other marine species they host, will need to positively utilize aspects of the human and tourism economies to engage in active conservation and prevent further losses and extinctions.⁸⁵

As such, the pollution caused by the oil spill could further destroy corals or considerably weaken corals in the area, limiting their chances of recovery. Combined with warming waters due to ongoing climate change, this could prove to be the final straw. The impact on smaller species has the potential to affect fish stocks, while oil chemicals could accumulate in fish over time.

Impact on mangrove ecosystems: One expert mentioned that it would have been relatively easy to limit the damage had the spill only affected the sandy beaches.

However, the oil slicks trickled deep into the roots of mangrove habitats, pebbles and the muddy substrate, which serve as shelter to species like marine invertebrates, making the clean up more challenging as mangroves are often dense and inaccessible. They are essential components of the food chain, especially for migratory birds, and baby fishes and crabs which feed on them. This disaster will potentially decrease nature's resilience and its ability to act as a first line of defense against the impact of climate change such as storm surges, floods, erosion, etc. It was highlighted by Polyeco Mauritius that specialised nozzles were used to clean the mangrove areas (Figure 46).

In disentangling the concern about the divergence of opinion between local and international experts, it was revealed that this mixed reaction is due to the different perspectives of the problem. Having worked on some of the world's largest spills, like the Deepwater Horizon Spill, international oil clean-up experts view the Mauritian oil spill as comparatively smaller and that the damages are limited relative to what 'could have been'. Mauritian environmental experts, on the other hand, are dedicated to the fragile ecosystems around the south-east coast and do not believe these damages to be negligible. It is important to note that given the sensitive location of the spill around important conservation areas, the concerns are legitimate. The International Tanker Owners Pollution Federation Ltd (ITOPF) defines spills with more than 700 tonnes of oil as "large spills", which makes the Wakashio spill an important one to evaluate in the short and long term.⁸⁶ In combination with the fact that the impact of the spilled VLSFO has not been extensively studied, this makes the understanding of impacts even more uncertain.

Ecological Monitoring: An Integrated Marine Monitoring Strategy was developed jointly by the Government, civil society organisations, academic partners, international development partners (from Japan, France, the UK), and the United Nations following the Wakashio oil spill to (i) Inform a scientifically robust assessment of the environmental impact of the oil spill incident which occurred in Mauritius (ii) Allow monitoring of the recovery of the local ecosystem in the short to medium term, immediately post impact (iii) Provide a framework for an ongoing, integrated marine monitoring strategy which will track the progress of the Mauritius ecosystem towards improved environmental status in the longer term (and inform recommendations on if/what restoration techniques might be required to support recovery). The

85 L. R. McClanahan and Nyawira A. Muthiga, "Oceanic Patterns of Thermal Stress and Coral Community Degradation on the Island of Mauritius," *Coral Reefs - Journal of the International Coral Reef Society*, October 2020, pp. 53-74, <https://doi.org/10.1007/s00338-020-02015-4>.

86 International Tanker Owners Pollution Federation Ltd (ITOPF), "Oil Tanker Spill Statistics 2020," ITOPF, n.d., <https://www.itopf.org/knowledge-resources/data-statistics/statistics/>.

Synthesis of findings on social, economic and environmental impacts

group established the Albion Fisheries Research Center (AFRC) as the lead organisation on ecological monitoring across multiple habitats and species (fish, biota, corals, seagrass and mangrove ecosystems); the Mauritius Oceanographic Institute (MOI) as the lead to monitor the physical impacts of booms; the National Environmental Laboratory as the lead for water/sediment quality monitoring; and the National Parks and Conservation Service and MWF as the lead for terrestrial monitoring.

While this multi-sectoral collaboration is highly commendable, there still is much confusion around safety to be in the lagoon after the spill, despite frequent press releases by the authorities and beaches being reopened since December 2020. However, there has been reassurance by an expert interviewee that multiple environmental indicators were closely monitored by the Ministry of Environment, and reached a healthy level, before the decision to reopen beaches was taken.

In the affected villages, there have been several reports of coastal residents consuming seafood from fish and octopus to sessile organisms like mollusks from the lagoon, despite a ban on any type of fishing in the lagoon. It is important for toxicity results to be shared, and for the public to be sensitized on the short - and long-term health impacts of the spill.

Inclusion of civil society in the contingency plan: In the aftermath of the oil spill, the UNDP-GEF Small Grants Programme played an important coordination role in linking the UN team and local NGOs involved in clean up and recovery efforts. 36 civil society representatives attended a dialogue session on 14th August 2020 at Eco-Sud's office, where international experts expounded on the clean up operations being undertaken and civil society organisations explained the volunteer clean-up activities as well as their concerns about the oil spill response. The meeting was important in ensuring that volunteer action be halted and instead taken up by the assigned clean-up crews. A key recommendation was also to include civil society in the new oil spill contingency plan for Mauritius, given the important role they played in the Wakashio spill response.

Clean-up activities: Polyeco Mauritius and Le Floc Depollution were brought on board to lead the oil spill clean-up along the affected south-east coast. Both companies employed community members who previously volunteered in assisting with the clean-up. This was beneficial for coastal residents who lost their jobs due to COVID-19 and the oil spill. Polyeco has highlighted the positive outcomes of this collaboration, including Mauritius now having trained community members who understand safety regulations and how to respond to oil spills in the future. The additional benefits of the establishment of Polyeco in Mauritius meant that there was a quicker and more efficient response to the following oil spill threats, the tugboat Sir Gaetan in September 2020 and a Chinese fishing vessel, the FV Lurong Yuan Yu, in March 2021. However, local experts interviewed have questioned the approaches used during the clean-ups, highlighting that there could be potential negative impacts of the clean up, such as high pressure hosing in mangrove areas. They asserted that all options must first be evaluated to determine whether the benefits of the response will outweigh the costs or negative impacts caused by the remedial action. It is important that priorities are well defined including which sites will be treated, in what order and how. Wrong or inappropriate cleaning methods could end up causing additional damage to vulnerable ecosystems and result in additional negative socioeconomic impacts on the local communities. As such these impacted ecosystems would require long-term monitoring.

Synthesis of findings on social, economic and environmental impacts

Figure 46 Before and after clean-up operations at an affected site with mangroves at Riviere des Creoles (Source: Polyeco Mauritius)



Community-based monitoring of mangroves: The NGO Reef Conservation developed the SOS Mangrove Programme following the grounding of the MV Wakashio. Its primary aim is to establish a baseline and evaluate the initial spatial and temporal shifts in biodiversity and structure of the mangrove ecosystem as a response to its first oil exposure. The results of the baseline and initial surveys will help determine the restoration actions for sites where mangroves have been affected. Emergency visual surveys have been implemented to evaluate the short-term impact of the oil-spill on the mangroves. In addition, Reef Conservation took part in all surveys organised with the team of international and local experts involved to obtain a quantitative baseline data on the mangrove forests located in the impacted area. The NGO has simultaneously organised presentations to raise awareness about the importance of mangroves and the impact of the oil spill during various educational programmes (Bis Lamer, Eco-School, Young reporters for the Environment initiative). The NGO is hoping to include community residents in its monitoring initiatives through a “citizen science initiative” which would include an online survey and the development of a smartphone application in collaboration with Plymouth University, whereby users can share their photos of the changing landscape in Mauritius to better assess impacts of the spill on the coast impact and mangrove ecosystems.

Relocation of endemic species: During the first few days of the spill, the MWF had to relocate and reintroduce to the wild several individuals of species, such as the critically endangered Mauritius olive white-eye (*Zosterops chloronothos*), the endangered Mauritius fody (*Foudia rubra*), Aldabra tortoises (*Aldabrachelys gigantea*), the endangered Mauritius fruit bat (*Pteropus niger*) and plants from the nursery. Unfortunately, some of them died while in captivity in Black River. They had to quickly relocate individuals of those species from Ile aux Aigrettes because of the risk of not being able to access the island, and the uncertainty of not knowing the outcome of the 3,000 tonnes of oil still onboard the ship. There was also a risk that the Government would prohibit access to the islet in case of another leakage. Under such circumstances, the NGO would not have been able to feed and take care of the animals. In addition, fumes and smells from the oil plumes could have affected the animals on the islet.

Synthesis of findings on social, economic and environmental impacts

Respite for the environment: One of the positive impacts of the COVID-19 pandemic, the lockdown and absence of tourists is the respite it provided to the environment, especially to marine life. Less fishing, less swimming and churning of boat engines near corals, less noise disturbance for a few months could largely benefit the fauna and flora. Several experts interviewed noted that this could become a regular practice, whereby certain areas of the “wild” Mauritius and ocean stretches would be closed to tourism and fishing for a couple of months a year so as to give nature some respite and the ability to regenerate. This could be in the form of seasonal protected areas in marine and coastal regions.

Lack of transparency and communication

Several interviewees expressed concern about the lack of transparency and communication from the authorities. For many, this was at the crux of the current trust deficit with regards to the Government's handling of the Wakashio situation. One interviewee was more nuanced by acknowledging that the Government's frequent communication through press conferences was a good practice, but that it lacked science-based evidence. Messages given to the population lacked ‘hard facts’, the various laboratory tests results, and were too often tinted by “attempts at minimising the situation” or “passing political messages.” Many complained that the government did not publish the various reports and findings on an issue with significant health, environmental and economic repercussions. A lack of inter-ministerial and departmental communication was also noted by interviewees involved in cross-sectoral meetings.

The lack of transparency was also demonstrated in the results shared by a nationwide survey conducted by Kantar Mauritius Market Research in August 2020 and March 2021. Below are some additional findings by the Kantar survey:

- The lack of transparency around the oil spill response increased from 75% in August 2020 to 82% in March 2021.
- In March 2021, 74% of Mauritians still felt concerned by the impacts of the oil spill, a 14% decline from the concern expressed in August 2020.
- In August 2020, 15% of Mauritians were satisfied with the government's management of the environmental crisis, increasing to 27% in March 2021.
- In August 2020, 82% of Mauritians were satisfied with involvement of the private sector in dealing with the oil spill crisis, decreasing to 77% in March 2021.
- In August 2020, 89% of Mauritians were satisfied with the NGO response in dealing with the oil spill crisis, increasing to 92% in March 2021, highlighting the importance of civil society in the relief and recovery phase of environmental disasters.
- 85% of Mauritians believed the oil spill negatively affected the country's reputation at international level.

Synthesis of findings on social, economic and environmental impacts

Table 17 Perceptions of Mauritians surveyed at national level by Kantar Mauritius concerning the oil spill in August 2020 and March 2021

STATEMENTS	AUGUST 2020	MARCH 2021
The oil spill will have a negative impact on the health of Mauritians	82%	73%
The oil spill will have a negative impact on the economy of Mauritius	79%	87%
The oil spill will have a negative impact on the environment in Mauritius	87%	92%
Consuming fish from the impacted region is dangerous	96%	88%
Financial compensation will help solve issues linked to the oil spill	44%	61%
Mauritians will be able to solve the issues linked to the oil spill	75%	86%

Among the respondents, 60% believed the economic, health and environmental impacts of the oil spill will be felt mostly at regional level around the area of Mahebourg on the south-east coast.

Change in concern for the environment: We also gauged people's perceptions regarding their concern for the environment. Initial findings from household surveys showed that people were more concerned about the environment as a result of both COVID-19 and the oil spill events and more so in oil spill sites compared to the reference sites. This could be an indication of the higher level of care and/or a higher need of the environment and its services to communities. Respondents highlighted now being able to see the vulnerability of the lagoon and connected ecosystems and the need to protect them against a wide range of stressors, including oil spills. Respondents were able to more directly link “loss of nature” and “a loss of jobs and livelihoods”, and the direct link between nature, livelihoods and food security became more established.

Intangible heritage

It was also noted that these coastal fishing villages are some of the last remaining vestiges of a way of life which over time has disappeared in other parts of the island. Artisanal fishers in Mauritius represent a distinct community intrinsically tied to the history of the island, and its turbulent past of enslavement and indentureship. Fishing communities became established following the abolition of slavery. In the south of the island, formerly enslaved peoples of African descent appear to have adopted boat building practices from French-descent Mauritians, with direct links to the small pirogues of Brittany. In the north, similar coastal communities were established; however, these were mainly populated by the descendants of indentured laborers. Given this historical significance, artisanal fishing in Mauritius is an important form of intangible heritage. The ties to a culturally significant village like Mahebourg could also explain the frustration linked to the oil spill impact and responses in the relief and recovery stages.

Summary of socio-economic impacts ranked by impact significance

The following table assesses the analysed impacts (direct and indirect) of the compounded effect of the two events on the south-East region under study, based on our combined study approach.

Due to the complexity of dealing with two exogenous shocks, one which has passed and one which is an ongoing and rapidly changing situation, we have not ranked impacts in terms of their likelihood of continued risk/threat. We are therefore ranking the issues in order of their measured magnitude only. Magnitude of impacts take into consideration: (1) who is impacted, (2) the duration and permanence of that impact, (3) the severity of the impact, (4) existing vulnerabilities and how adaptable/resilient a population is, (5) how much importance, concern, and/or expectations is attached to the issue. To assess the level of socio-economic impacts, we look at the level of threat and/or benefit using an assessment of significance on a five-point scale.⁸⁷ This scale works for both positive and negative impacts (these will be shown as red for negative impacts or green for positive impacts).⁸⁸ It is also important to note that impact significance is taken into consideration by existing support mechanisms at the time of the research, and thus we are dealing with 'residual impacts' after the immediate response.

Scale:

1. **Minimal:** No noticeable change experienced by people in the locality.
2. **Minor:** Mild deterioration/improvement, for a reasonably short time, for a small number of people who are generally adaptable and not vulnerable.
3. **Moderate:** Noticeable deterioration/improvement to something that people value highly, either lasting for an extensive time, or affecting a group of people.
4. **Major:** Substantial deterioration/improvement to something that people value highly, either lasting for an indefinite time, or affecting many people in a widespread area.
5. **Transformational:** Substantial change experienced in community wellbeing, livelihood, amenity, infrastructure, services, health, and/or heritage values; permanent displacement or addition of at least 20% of a community.

⁸⁷ *Human Dimensions Impacts of Oil Spills - Physical Health Impacts*. Social and Environmental Research Institute (SERI), n.d. <https://static1.squarespace.com/static/5e9f1ce4bd9f581568061427/t/5eec170714e1119cdb68feb/1592586610725/HDOilPhysicalHealth.pdf>.

⁸⁸ *ibid*

Summary of socio-economic impacts ranked by impact significance

Table 18 Ranking of impacts with respect to COVID-19 and the oil spill and associated recommendations

KEY INDICATOR ASSESSED	SUMMARY OF IMPACT	COVID-19 & 2020 LOCKDOWN IMPACT SIGNIFICANCE	OIL SPILL IMPACT SIGNIFICANCE	RECOMMENDATIONS
Permanent loss of jobs	Our results show a decline of 3% in household income earners in the region under study. Thus, no consequential permanent loss of jobs. This however needs to be monitored as the community continues to bear heavy financial brunt.	1	1	Continued monitoring as the COVID-19 pandemic is an ongoing and rapidly changing situation
Loss of income for those in the fishing trade	During the 2020 lockdown, this activity was not permitted and affected a substantial portion of the region's community. However, as this resumed after three months, the impact was short-lived and recovery had begun. The oil spill, however, closed fishing activities for an extended period and has created safety concerns around fish in the region creating additional barriers for selling fish which will last years. While fishing off-lagoon is allowed, fishers are often not prepared for this type of fishing due to unfavorable weather conditions or lack of experience. As a result, this population lost up to 70% of their usual income due to both events.	3	5	For both events, registered fishers received various forms of monetary compensation from government schemes. However, the oil spill compensation has not been completed yet as of today. Women were most often left out of the schemes as they are often not registered. However, our results show households suffered from numerous hardships due to their financial situation. Therefore, the MV Wakashio Assistance and Support Cell needs to review its list of beneficiaries based on communities' measured needs, with a gendered approach. Alternative livelihoods, and/or help in fishing from other regions outside of the lagoon necessary.

Summary of socio-economic impacts ranked by impact significance

KEY INDICATOR ASSESSED	SUMMARY OF IMPACT	COVID-19 & 2020 LOCKDOWN IMPACT SIGNIFICANCE	OIL SPILL IMPACT SIGNIFICANCE	RECOMMENDATIONS
Loss of income for those doing seasonal work (non-touristic activities)	During the lockdown, no activity was permitted. However, as this resumed after three months, the impact was short-lived and recovery for most activities had begun. However, agriculture was heavily impacted as farmers could not sell produce to hotels anymore. In addition, the spill affected the local populations spending power – which had an indirect impact on all other sectors	3	3	The MV Wakashio Assistance and Support Cell needs to review its list of beneficiaries based on communities' measured needs, using a gendered approach.
Loss of income for micro-SMEs	During the lockdown, most businesses' ability to function was heavily impacted; however, as this resumed after three months, the impact was short-lived and recovery for non-touristic activities had begun. The spill did not impact those jobs further	2	2	
Loss of income Micro-SMEs	Most business-owners have micro enterprises that were heavily impacted; 92% reported less activity after the lockdown and 74% after the spill. COVID-19 presented longer-term consequences, lower purchasing power, inflation, loss of tourism revenue etc.	4	3	Focusing only on those who are direct 'sea users' such as fishers and skippers, as has been done thus far, is an oversimplification of the socio-economic impacts of the oil spill. Business support should be defined and decided based on a more in-depth needs

Summary of socio-economic impacts ranked by impact significance

KEY INDICATOR ASSESSED	SUMMARY OF IMPACT	COVID-19 & 2020 LOCKDOWN IMPACT SIGNIFICANCE	OIL SPILL IMPACT SIGNIFICANCE	RECOMMENDATIONS
				assessment. It is important to better evaluate the types of challenges faced by businesses. A working group made up of business experts, consultants, and local business owners could be created to coordinate these actions.
Loss of income-Guest House	The pandemic has had a huge impact on all tourism activities across the island with 90% less revenue for most involved. B&Bs having usually less cash flow are more vulnerable. Those in the spill sites also lost local tourism at a time where they could have earned some revenue. A number mentioned having to close their businesses if the situation lasted a few more months.	4	5	Business support should be defined and decided based on a more in-depth needs assessment. It is important to better evaluate the types of challenges faced by businesses. A working group made up of business experts, consultants, and local business owners could be created to coordinate these actions.

Summary of socio-economic impacts ranked by impact significance

KEY INDICATOR ASSESSED	SUMMARY OF IMPACT	COVID-19 & 2020 LOCKDOWN IMPACT SIGNIFICANCE	OIL SPILL IMPACT SIGNIFICANCE	RECOMMENDATIONS
Loss of income - Hotels	The pandemic has had an enormous impact on all tourism activities across the island with 90% less revenue for most involved. Those in the spill sites also lost local tourism at a time where they could have earned some revenue. However, a couple of hotels were able to host international spill experts.	4	4	The reopening of borders and the management of the 'image' of Mauritius as a destination. It is also a good time for hotel managers to re-think their offerings and changing consumer demand.
Loss of income - Restaurants	The pandemic has had an enormous impact on all tourism activities across the island with 90% less revenue for most involved. Most restaurants in the regions have a seafood menu/speciality and they could not sell fish either due to restrictions and/or to stigma associated with the fish of the region. A number mentioned having to close their businesses if the situation lasted a few more months.	4	5	Business support should be defined and decided based on a more in-depth needs assessment.
Loss of income - Seasonal rentals	Rental accommodation in the region usually refers to secondary homes that allow families to receive additional income and to live a more comfortable lifestyle and support some local employment as gardeners/cleaning staff.	2	2	The reopening of borders and the management of the 'image' of Mauritius as a destination. Marketing towards Mauritians to restart local tourism as the lagoon waters are safe. The official publication of the data on water safety to reassure visitors.

Summary of socio-economic impacts ranked by impact significance

KEY INDICATOR ASSESSED	SUMMARY OF IMPACT	COVID-19 & 2020 LOCKDOWN IMPACT SIGNIFICANCE	OIL SPILL IMPACT SIGNIFICANCE	RECOMMENDATIONS
Indebtedness and depletion of savings	Overall, the lockdown forced households to rely entirely on their savings in a financially vulnerable region. By the time the oil spill occurred, households had to rely on borrowed money, increasing the community's indebtedness (6% increase in those taking debts, and 20% increase in the amount of debt)	3	4	As communities start receiving compensation and reparations, it would be important to ensure financial training and planning. Indebtedness in vulnerable populations can often become intractable if not managed adequately. ⁸⁹
Loss of productive assets	2.4% sold productive assets. While this is a small proportion of the community, the impact for these people is important as the ability to re-start their economic activity is being seriously eroded.	1	5	Identify those who have spent savings, accumulated debt and sold productive assets as their situation is extremely precarious and additional support is needed.
Loss of future	Many in our community meetings and interviews have mentioned feeling like they could no longer foresee/plan/understand what their future will look like. A feeling that whatever is coming next could be worse than what has been experienced. This can strongly affect the adaptability and long-term resilience in these communities.	2	4	Much more communication and mental health support is required, with frequent check-ins. Workshops brainstorming on future possibilities, upskilling, etc. should be organised.

⁸⁹ Engelbrecht, Lambert. "INDEBTEDNESS OF FINANCIALLY VULNERABLE HOUSEHOLDS: WHAT DO SOCIAL WORKERS DO?." *Social Work/Maatskaplike Werk* 42, no. 2 (n.d.). <https://doi.org/http://dx.doi.org/10.15270/45-2-212>.

Summary of socio-economic impacts ranked by impact significance

KEY INDICATOR ASSESSED	SUMMARY OF IMPACT	COVID-19 & 2020 LOCKDOWN IMPACT SIGNIFICANCE	OIL SPILL IMPACT SIGNIFICANCE	RECOMMENDATIONS
Fish stock, toxicity, and food chain	<p>During the lockdown the marine life was left to 'rest' for three months, which can only be beneficial for its health.</p> <p>Post oil spill, this indicator is difficult to assess as no results have been published to the public. Experts who have been part of the national oil spill committee have indicated that the water is safe now. However, the fish toxicity is less clear as these are pollutants that accumulate over time in the food chain.</p>	3	4	<p>The official publication of the data on toxicity and safety.</p> <p>The continued monitoring in a scientific and rigorous manner. Frequent communication and sensitisation on the potential health impacts of eating toxic seafood.</p>
Food shortages and diet changes	<p>98% reported issues with access to food – 80% continued with three meals a day but with poorer diets especially families reliant on seafood; the longer this lasts the more health issues will arise. It must be noted that this is the situation despite food assistance from various entities.</p>	2	3	<p>With the current assistance the region avoided a higher risk/threat level. However, unevenness in food distribution was noted. Food independence and security needs to be established in the medium term. We acknowledge some programmes are being put in place by NGOs. Thus, we recommend a more efficient database and coordination between active stakeholders.</p>

Summary of socio-economic impacts ranked by impact significance

KEY INDICATOR ASSESSED	SUMMARY OF IMPACT	COVID-19 & 2020 LOCKDOWN IMPACT SIGNIFICANCE	OIL SPILL IMPACT SIGNIFICANCE	RECOMMENDATIONS
Education and school attendance	The lockdown meant that children moved to 'online/radio/TV' learning. This has impacted all Mauritians, however more so in vulnerable communities as many did not have appropriate learning spaces. Schools were closed for another two weeks after the oil spill, which may seem short; however, due to financial difficulties, several families chose not to send their children to school.	4	3	More in-depth research on the impact on children's education in the area to guide a targeted response.
Mental Health	Following the 2020 lockdown, the dominant impacts were increased feelings of anxiety, helplessness and depression (between 30% to 45% of respondents). Following the oil spill, the dominant mental health impacts varied, ranging from feelings of anxiety, helplessness, depression, feelings of betrayal and anger towards decision makers (between 15-25% of respondents)	3	3	A mental health support cell should be set up and adequately communicated to impacted families
Physical Health	The majority of those involved in the cleanup operations have had symptoms of headaches, nausea, sore throats, cough, and shortness of breath. Less common symptoms include rashes and nose bleeds. Research shows that exposure to these specific fumes can cause long term and serious health issues.	n/a	n/a	We cannot rank the magnitude of this impact; however, we do recommend continued monitoring of those that were the most exposed to the fumes. Thus far, the official

Summary of socio-economic impacts ranked by impact significance

KEY INDICATOR ASSESSED	SUMMARY OF IMPACT	COVID-19 & 2020 LOCKDOWN IMPACT SIGNIFICANCE	OIL SPILL IMPACT SIGNIFICANCE	RECOMMENDATIONS
				response towards physical health in response to the oil spill have been reported to be quite poor, with difficulties in access to health services or proof of health concerns experienced due to the spill (e.g. medical certificates).
(out) migration/ displacement	3% after the lock down and up to 4% after the oil spill	2	2	The overall recovery of the region's economy and the availability of jobs will determine whether people move back
Community and social cohesion	There have been instances of community solidarity and neighbours helping each other out. And there have been rising tensions due to perceived unfairness in the distribution of help post-oil spill. This, combined with existing feelings of anger and dissatisfaction towards authorities and the damage of their natural heritage and way of life, could affect social cohesion in the long term.	1	3	A mental health support cell should be set up and adequately communicated to impacted families. Group sessions can also lessen group tension and strengthen social cohesion

Summary of socio-economic impacts ranked by impact significance

KEY INDICATOR ASSESSED	SUMMARY OF IMPACT	COVID-19 & 2020 LOCKDOWN IMPACT SIGNIFICANCE	OIL SPILL IMPACT SIGNIFICANCE	RECOMMENDATIONS
Crime and violence	<p>According to the official response from the Mahebourg police station, there has been no increase in crime and violence. However, studies in Mauritius by Statistics Mauritius and the World Bank have shown an increase in gender-based violence because of the 2020 lockdown. In addition, the oil spill increased the number of spouses and time spent at home, without a revenue, which can be causes of security concerns, especially for women and children.</p>	n/a	n/a	
Social consequences of the impact on the environment	<p>During the lockdown, the environment was free from human interference, giving it a chance to recover. The oil spill has added stressors, pollutants, and damage to vulnerable ecosystems and unique biodiversity that support a range of ecosystem services to vulnerable populations, and which provide physical protection against climate change impacts – eroding these communities resilience and adaptation capacity</p>	2	5	<p>Ongoing monitoring of the various ecosystems, restoration, and conservation to increase their resilience to global warming, adoption of the precautionary principle, support to the conservation community, including local experts and civil society.</p>

Conclusion and recommendations

Impacts on households and communities

The spill sites could be showing signs of developing into classic poverty traps⁹⁰, exacerbated by the relative geographic isolation of many of these villages and the under-developed economic structure of the region. Poverty traps are self-reinforcing mechanisms in which undermined development and improvement efforts create further conditions of poverty. Poverty traps often result from geographic isolation, illiteracy, debt bondage, malnutrition and illness, low-skills, high-fertility, subsistence, farm erosion, mismanagement of key environmental services, criminality, and working capital that are too low for entrepreneurs to develop.

Our findings show that the oil spill and pandemic created significant financial losses for households despite the various government schemes, debt accumulation, food insecurity, reduced school attendance, health impacts and psychological trauma from these stressors. It would be erroneous to assume that the lifting of the fishing ban will return life to 'normal.' Over the last year, residents have sold productive assets, debt has increased, and people have suffered from the psychological trauma of two compounded disasters. Many obstacles exist for those who wish to return to work. It is of high importance for all actors involved in the area to be aware of these ongoing challenges, and to continue supporting and monitoring vulnerable families and individuals.

The combination of the trauma of the last few months, the heavy financial burden, psychological impacts and perceived unfairness in the distribution of support and help could lead to the fragmentation of the social fabric of these communities.

Recommendations:

1. The government's social support mandate, the "MV Wakashio Assistance and Support Cell", should be extended both in time and in scope in order to monitor the socio-economic situation of the impacted areas. The cell has so far been an important actor by serving as the communication conduit between the various local actors and government entities, and this is likely to be an ongoing need for the foreseeable future.
2. Technical and financial support may be needed to restart activities. We would especially recommend financial capacity building and training, especially with regard to the management of accumulated debt and establishing a plan per family to avoid further spiralling.
3. Until some form of financial stability is achieved, food insecurity and school attendance (linked to food insecurity) will continue to be affected. Until most affected individuals have found a way to be active members of the labour force, food support will be needed. Currently, a combination of actors have taken on this burden, without much coordination and inevitably with some families falling through the cracks. A more official and coordinated approach for food support should be created with a strategic plan that details who to help, for how long help may be needed, and the various forms of help possible over and above food packs. Additionally, government schools should be providing balanced school meals to all children until economic activities are allowed to resume fully and by all.
4. The question of schooling deserves a more in-depth look, because children in the area had already lost nearly five months of school. Any additional issues and stressors would have an important impact on children's education. Interviews with schools, teachers, and with children (with the adequate psychological support) would provide clearer answers on the true impact of these events on schooling, and the results should guide the appropriate response.

90 Stephen C Smith, *Poverty Traps and Global Development*, 2006, <https://www.theglobalist.com/poverty-traps-global-development/>.

Conclusion and recommendations

5. Financial support packages should include a gender focus targeted at improving women's care and economic roles, while setting up mechanisms to support women in these roles to recover from both the COVID-19 and oil spill crises.
6. We recommend long-term physical health monitoring and psychological support and monitoring in the affected communities. Our findings indicate that these health issues have not been adequately considered and the absence of a specialised unit to provide support has been deployed to provide support.
 - a. A more thorough investigation of the health impacts on the communities should be undertaken by public health officials. Adequate monitoring should be put in place as a response to support both long-term health impacts.
 - b. A mental health support cell should be set up and adequately communicated to impacted families. Mental health can be difficult to tackle, as it often carries taboos in our society; this should be taken into consideration. Mental health can affect people's ability to be active members of their families, communities and of the greater economy, which could further impede a family's ability to recover from the crises.
 - c. Numerous NGOs such as Lovebridge, CARITAS and Eco-Sud have assisted affected people in coming to terms with the mental health issues experienced as a result of the oil spill. It is important that NGOs work with qualified professionals in providing such services. These efforts also need to be supported by the government.
7. Long-term environmental monitoring to keep track of ecological health and the different habitats in the impacted area (corals, mangroves, seagrass) should be shared with and include the involvement of coastal residents and businesses in the impacted areas given their dependence on these resources.
8. Toxicity tests on the range of mobile and sessile marine species consumed along the impacted coastline need to be shared with consumers. As of December 2020, several coastal residents have resumed consumption of seafood from the lagoon include sessile organisms like molluscs (despite the ban on fishing in the lagoon), and it is important to sensitise them on the potential harmful short- and long-term impacts of consuming seafood from that area.

Impacts on businesses and economic activities

The study shows a “one size fits all” assistance strategy for a fairly limited scope of beneficiaries, who are usually directly financially impacted by the spill. It is a difficult task to provide compensation ‘deserving’ recipients of monetary support, especially when faced with two overlapping shocks. However, focusing only on those who are direct ‘sea users’ such as fishers and skippers, as has been done thus far, is an oversimplification of the socio-economic impacts of the oil spill. There are a number of indirect impacts for which the distinction between COVID-19 impacts and oil spill impacts is not clear. For example, the COVID-19 pandemic and associated closures had a negative impact on the restaurant sector of Mahebourg and Blue Bay area, reducing incomes by up to 70%. However, the addition of the oil spill affected access to both fresh fish and local customers, resulting in an income decline of nearly 100%. This could make the difference between a restaurant closing and remaining afloat until tourism reopens.

Conclusion and recommendations

Recommendations

Business support should be defined and decided based on a more in-depth needs assessment. It is important to better evaluate the types of challenges faced by businesses, especially the micro businesses and SMEs of the region. This would allow a better understanding of the gaps not filled by the current assistance schemes, such as the existing and missing resources, as well as current strengths and weaknesses. This could reveal some new pathways for interventions and support such as providing technical support on how to manage loans and payment freezes or how to re-start a business after it has been dormant. It could also reveal new potential partnerships between businesses. or between the public-private sector.

Various levels of support schemes could then be developed depending on the level of impact felt, and the needs of the businesses. A working group made up of business experts, consultants, and local business owners could be created to coordinate these actions.

Other lessons learnt and recommendations

The environmental impact clearly had significant emotional and economic consequences for the communities and the nation at large. As a society, we must acknowledge the diverse values and contributions of the natural environment to people, especially when they are directly intertwined with livelihoods. We must learn to respect it and live with it in harmony. Oil spills are regular occurrences everywhere in the world; but as a small island nation that relies heavily on our oceans, we can better prepare for future events:

- Adopt the precautionary⁹¹ principle when fragile ecosystems are at stake.
- Provide support to the conservation community to be trained to deal with oil spills, given the numerous shipping lanes around Mauritius
- Improve integration of NGOs in oil spill contingency plans as they end up playing a pivotal role in times of crisis as experienced with the Wakashio oil spill⁹²
- Include local experts in the strategy and management of the clean-up operations, and share information openly and transparently
- Strengthen regional collaborations for oil spill responses⁹³

It is important to note that Mauritius is still reeling from both shocks. Thus, the socio-economic impacts noted in this summary are likely to further erode the economic and social structure of this vulnerable region. Ongoing monitoring of the situation is required to assess the full extent of the compounded impacts of the two events, and to keep up with the growing needs of households.

91 C Gollier and N Treich, "Encyclopedia of Energy, Natural Resource, and Environmental Economics," in Encyclopedia of Energy, Natural Resource, and Environmental Economics, n.d., <https://www.sciencedirect.com/topics/earth-and-planetary-sciences/precautionary-principle>.

92 United Nations Mauritius and Capacity for Disaster Reduction Initiative (CADRI), "Disaster Risk Management: A Capacity Diagnosis," Disaster Risk Management: A Capacity Diagnosis § (2020).

93 Ernesta Swanepoel, "Oil Spills in the Western Indian Ocean: National Contingency Plans Fall Short," ISSAfrica, December 8, 2020, <https://issafrica.org/research/africa-report/oil-spills-in-the-western-indian-ocean-national-contingency-plans-fall-short>.



Annex 1

As the table below shows, several of the villages within Grand Port and Flacq districts have amongst the lowest Relative Development Index (RDI) in Mauritius. In fact, all of the VCAs within our study are below the national median of 0.76. Nevertheless, our sites under study all rank fairly low, with Le Morne ranking completely at the bottom. Thus, we are studying the impacts of two catastrophic events (COVID-19 and the oil spill) on some of the most vulnerable populations of Mauritius.

Table 19 Relative Development Index⁹⁴(2011)

Spill sites VCAs

Reference sites VCAs

VCA's for the districts of Grand Port and Flacq and reference VCAs	RDI *	Rank out of 145
St Julien D'Hotman East VCA	0.8119	15
Brisee Verdier VCA	0.8043	25
New Grove VCA	0.8030	26
Plaines des Roches VCA	0.7993	30
Mare d'Albert VCA	0.7980	31
Bon Accueil VCA	0.7948	33
Nouvelle France VCA	0.7930	34
Lallmatie VCA	0.7871	37
Medine Camp de Masque VCA	0.7844	41
Laventure VCA	0.7835	42
Montagne Blanche VCA	0.7794	45
Tamarin VCA	0.7794	44
Mare Tabac VCA	0.7773	49
St Julien (Haut de Flacq) VCA	0.7762	51
Camp de Masque VCA	0.776	52
Union Park VCA	0.7744	55
Centre de Flacq VCA	0.7743	57
Bananes VCA	0.7713	58
Rose Belle VCA	0.7701	60
Republic of Mauritius TOTAL	0.7663	

⁹⁴ RDI was an index computed by the Statistics Mauritius to measure relative development for the small areas in the country in various dimensions, namely: (i) housing and living conditions; (ii) literacy and education; and (iii) employment. It was discontinued in 2011.

VCA's for the districts of Grand Port and Flacq and reference VCAs	RDI *	Rank out of 145
Mahébourg VCA	0.7661	65
Camp de Masque Pavé VCA	0.7637	73
Écroignard VCA	0.7553	83
Camp Ithier VCA	0.7512	86
L'Escalier VCA	0.7505	87
Mare La Chaux VCA	0.7486	89
Pointe aux Piments VCA	0.7428	92
Sébastopol VCA	0.7359	95
Grande Rivière Noire VCA	0.7324	97
Amaury VCA	0.7294	98
Baie du Tombeau	0.7284	99
Trou D'Eau Douce VCA	0.7275	100
Queen Victoria VCA	0.7231	103
Riv du Poste VCA	0.7213	104
Plaine Magnien VCA	0.7195	106
Bel Air Riv. Sèche VCA	0.7182	108
Trois Boutiques VCA	0.7171	109
Cluny VCA	0.7127	111
Petit Bel Air VCA	0.7102	112
Grand River South-East VCA	0.7039	115
Beau Vallon VCA	0.7038	116
Quatre Cocos VCA	0.6986	118
Clémencia VCA	0.694	119
Rivière des Créoles VCA	0.6887	123
Grand Bel Air VCA	0.6718	125
Quatre Soeurs VCA	0.6659	127
Olivia VCA	0.6642	128
Old Grand Port VCA	0.6601	129
Poste de Flacq VCA	0.6592	130
Mare Chicose VCA	0.6577	131
Grand Sable VCA	0.6574	132
St Hubert VCA	0.6169	139
Bambous Virieux VCA	0.6000	141
Bois des Amourettes VCA	0.5974	142
Le Morne VCA	0.4613	145

Annex 2

Table 20 Estimations for decrease in seasonal rental sales on the south-east coast

	Decreases in rental sales due to COVID-19 between 19 th March and 1 st June	Decreases in rental values due to COVID-19 in a normal period (1 st June-26 th July)	Decreases in rental sales in a COVID "post lockdown" situation but including the Wakashio incidents and all the restrictions linked to it	Decreases in rental sales in a COVID "post lockdown" situation including the Wakashio incident and the restrictions linked to it but with the borders being reopened (1 st October to 15 th December)
Rental Stock of the South East Region available on AirBnB (EUR)	30,340	30,340	30,340	30,340
Euro/MUR	45	45	45	45
Number of rental days for the period	74	55	67	75
Annual filling ratio (in a business as normal situation)	65%	65%	65%	65%
Estimation of the rental income for the region of Mahebourg in a "business as usual" period of time (EUR)	1,459,354	1,084,655	1,321,307	1,479,075
Loss of revenue during the period	90%	90%	85%	85%
Estimation of revenue losses during the period (EUR)	1,313,419	978,190	1,123,111	1,257,214
Estimation of revenue losses during the period (MUR)	59,103,837	43,928,528	50,539,993	56,574,619
	Total of annual revenue losses			210,146,976
	Total of revenue losses during the period COVID-Wakashio (C+D)			107,114,612

Annex 3

Tables 21 and 22 show different levels of support provided by the MV Wakashio Assistance and Support Cell has been set up by Government in September 2020 following the oil spill from MV Wakashio in the South east region of Mauritius.

Table 21 Different levels of support provided by the MV Wakashio Assistance and Support Cell

Component	Purpose
MV Wakashio Solidarity Grant (Rs10,200) Self-employed Assistance Scheme (Rs 5,100)	To support livelihoods and ensure food security
Business Continuity Grant	To provide financial assistance towards maintenance costs and/or running expenses e.g. utilities
Administrative relief	To waive off administrative fees
Non-refundable Wage Assistance	To waive off refund of wage assistance paid under the Government Wage Assistance Scheme
Loan and lease moratorium	To reduce or defer interest and principal repayments of loans and leases
Protection from asset repossessions by banks and financial institutions	To avoid loss of assets and closure of businesses
Express loan assistance from DBM	To help businesses remain afloat and prepare for recovery or to support reorientation towards alternative activities
Duty free facilities	To provide incentives for investment in support of recovery

Annexes

Table 22 Extension of MV Wakashio Solidarity Grant (Rs 10,200) by the MV Wakashio Assistance and Support Cell

OPERATORS								
	Pleasure craft operators	Taxi owners	Scooter rental operators	Restaurant owners	Guest house	Other tourists operators	Beach hawkers	Beach traders
No. of beneficiaries	790	281	4	59	120	32	56	29
Monthly amount (Rs)	8,058,000	2,866,200	40,800	601,800	1,224,000	326,400	571,200	295,800
Amount for the period Aug 2020 to Dec 2020 (Rs)	40,290,000	14,331,000	204,000	3,009,000	6,120,000	1,632,000	2,856,000	1,479,000
Amount already being paid (Rs)	40,290,000							
Amount recommended for payment (Rs)		14,331,000	204,000	3,009,000	6,120,000	1,632,000	2,856,000	1,479,000
Total amount recommended (Rs)		Rs 30m						

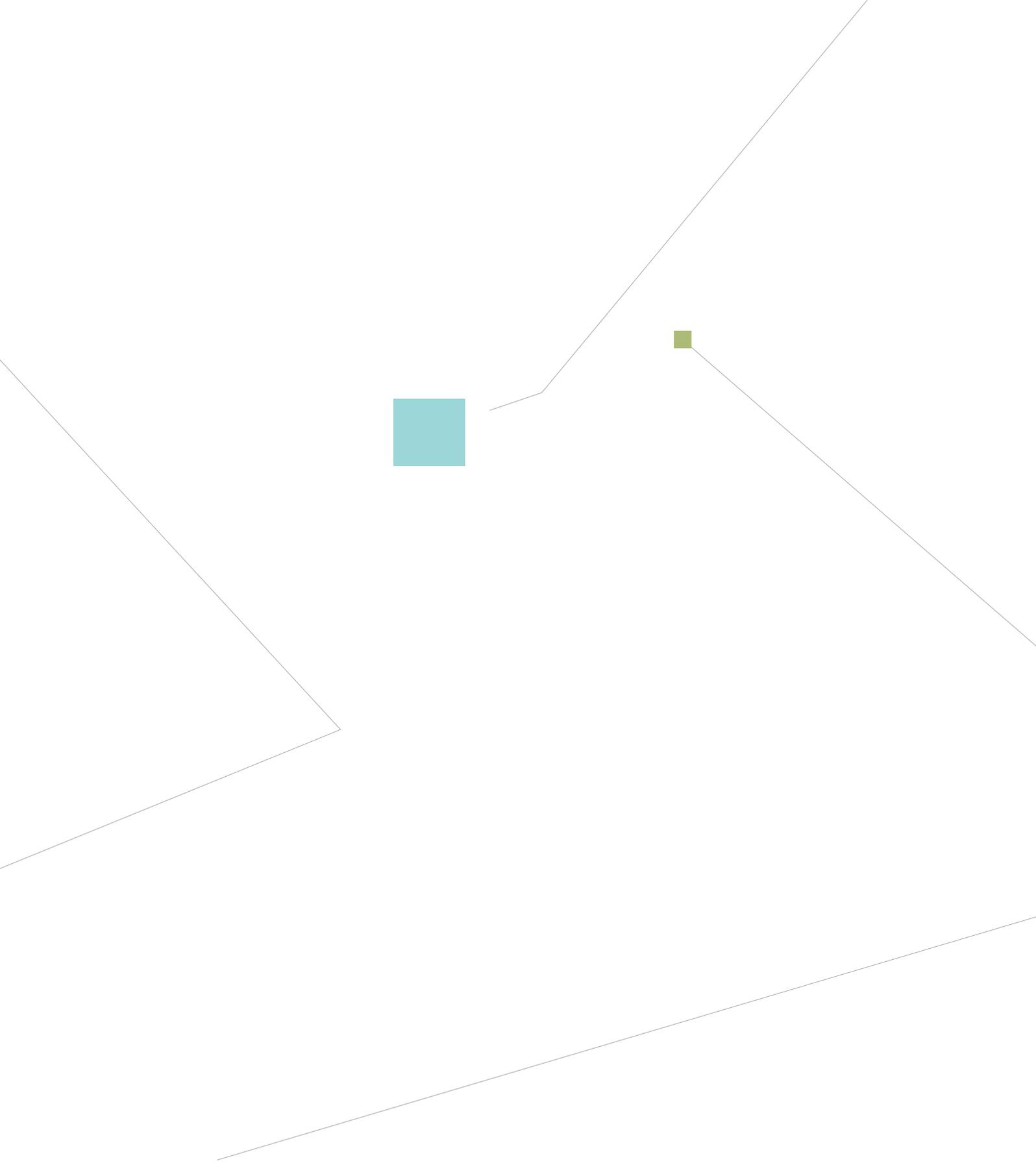


Table 23 Payment of Business Continuity Grant by the MV Wakashio Assistance and Support Cell (One-off Payment)

OPERATORS								
	Pleasure craft operators	Taxi owners	Scooter rental operators	Restaurant owners	Guest house	Other tourists operators	Beach hawkers	Beach traders
No. of beneficiaries	340	281	4	59	120	32	56	3
Amount recommended (Rs)	2,500 – 7,500	5,000	1,500	5,000	5,000	5,000	0	5,000
Amount recommended for payment (Rs)	1,600,000	1,500,000	100,000	300,000	600,000	170,000	0	15,000
Total (Rs)	Rs 5 million							







DYNAMIA

Dynamia Associates & Developers,
5, The Country Side,
Vivea Business Park, St Pierre,
Mauritius