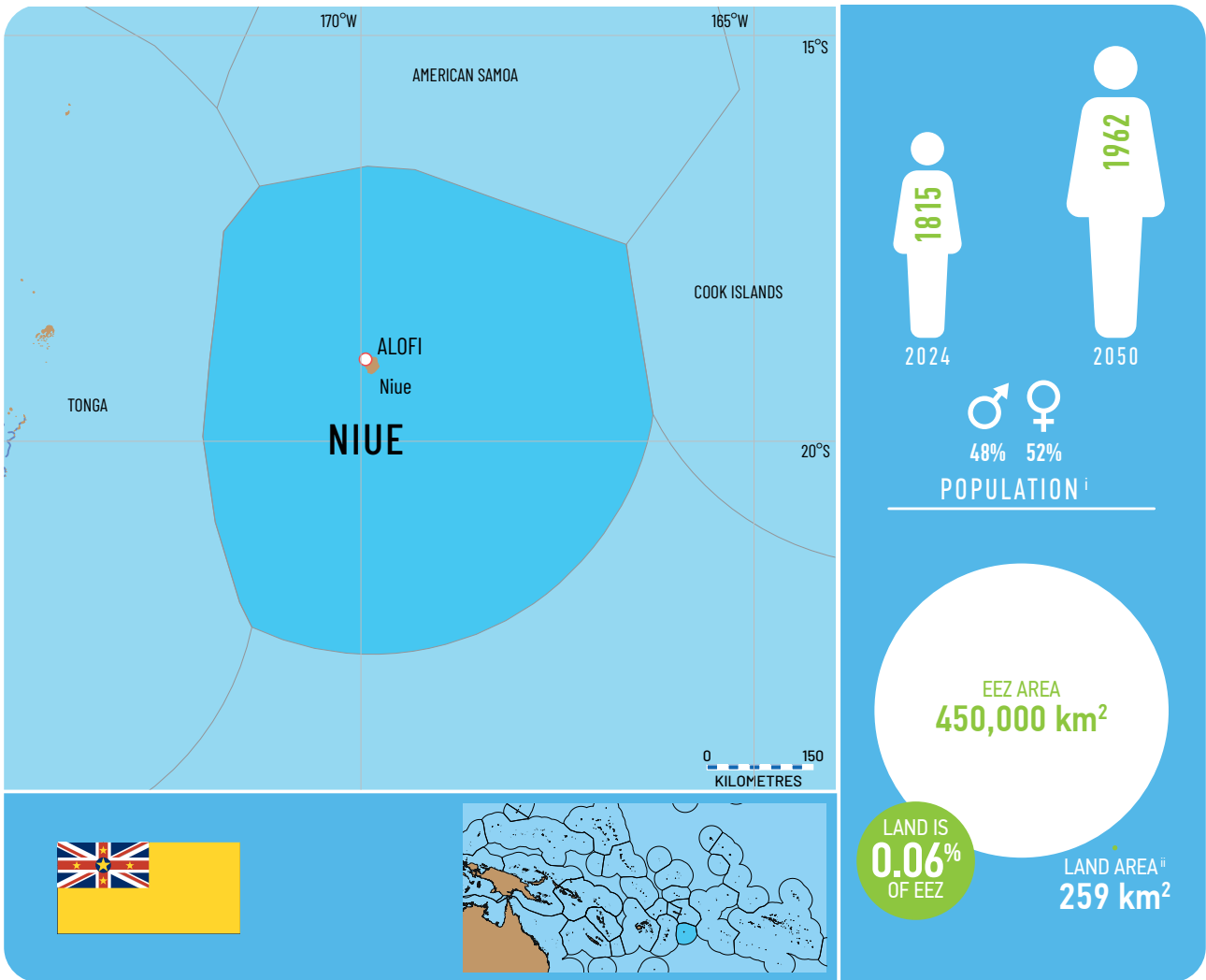


# NIUE





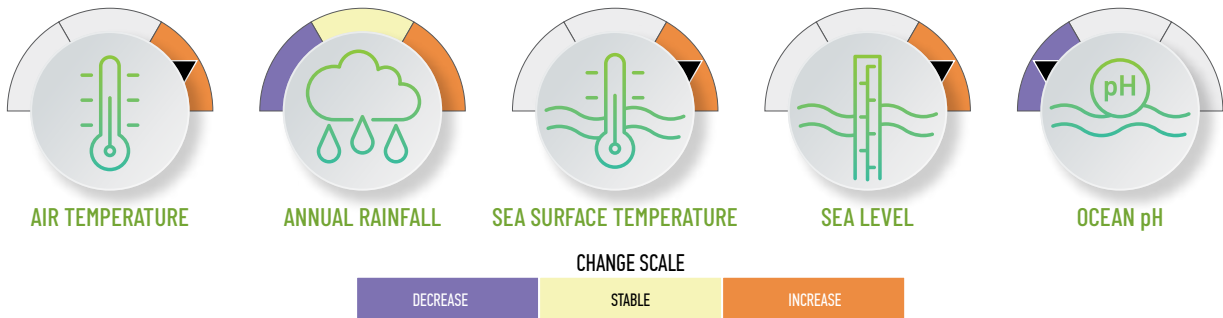
# NIUE



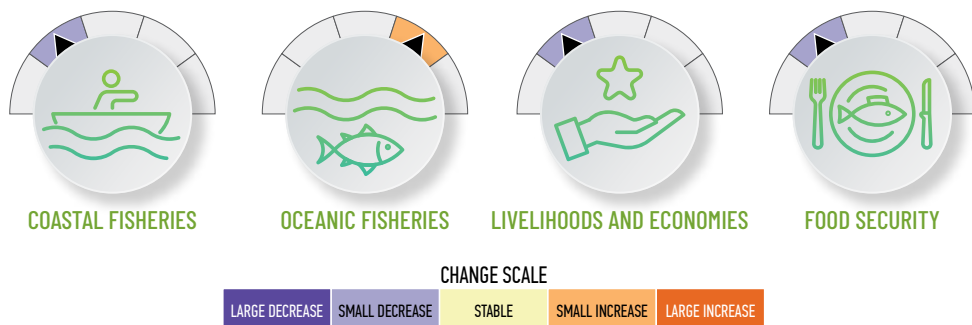
\* Annual average using 2014–2024 data

## SUMMARY OF CLIMATE CHANGE PROJECTIONS

2050



## SUMMARY OF CLIMATE CHANGE IMPLICATIONS<sup>iii</sup>



<sup>i</sup> Data source: SPC Pacific Data Hub <https://pacificdata.org/population-dashboard>

<sup>ii</sup> Data source: SPC Statistics for Development Division <https://sdd.spc.int>

<sup>iii</sup> Relative to the Reference Periods 2010–2020 for coastal fisheries and 1980–2010 for oceanic fisheries.

# RECOMMENDED ADAPTATION ACTIONS

These recommended adaptations are based on the key vulnerabilities and implications of climate change for fisheries and aquaculture (further details in Chapter 10) and should be initiated or strengthened. A range of supporting policies are provided in Table 10.1 for decision-makers to select those that are most appropriate to their context and priorities. Central to all future adaptation are the following principles:

1. Strengthen data collection by improving (or establishing) national fisheries and aquaculture monitoring systems linked to management decision-making.
2. Integrate local knowledge to inform adaptation actions for coastal and freshwater ecosystems, food security, and cultural heritage. Equity - especially gender equity – and social inclusion need to be a key focus.
3. Implement effective governance, including through community-based management and scaling-up of successful initiatives, to ensure adaptation actions reflect local needs and priorities.
4. Diversify and secure funding to support national- and community-level actions, alongside capacity building to sustain adaptation initiatives.



## *Food and nutrition security*

### Recommended adaptations

**Food and Nutrition 1:** Implement sustainable ecosystem-based approach to fisheries management

**Food and Nutrition 7:** Promote education and awareness on the importance of protecting aquatic habitats, species and the foods they supply



## *Economies and government revenue*

### Recommended adaptations

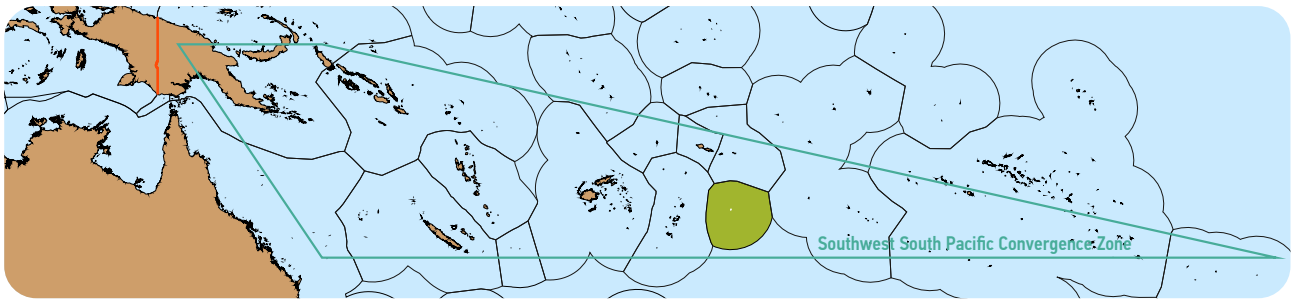
**Economic Revenue 2:** Develop policies and strategies that integrate climate change implications into fisheries and aquaculture management

**Economic Revenue 3:** Implement energy efficiency programs for fisheries and aquaculture

**Economic Revenue 4:** Promote improved safety at sea

**Economic Revenue 6:** Climate-proof infrastructure

# Projected changes in atmospheric and oceanic climate



Niue is in the Southwest Pacific Convergence climate zone and is expected to experience the following climate changes by 2050 under a medium greenhouse gas emissions scenario (SSP2-4.5) and a high emissions scenario (SSP5-8.5)<sup>iv</sup>, relative to 1995–2014 baseline (further details in Chapter 2).



AIR TEMPERATURE



RAINFALL



SEA SURFACE TEMPERATURE



SEA LEVEL



OCEAN pH

|      |                             |                 |                |                 |                |      |
|------|-----------------------------|-----------------|----------------|-----------------|----------------|------|
| 2050 | MEDIUM EMISSIONS (SSP2-4.5) | +0.7 to +1.1 °C | -2.3 to +5.5 % | +0.6 to +1.1 °C | +0.1 to +0.3 m | -0.1 |
|      | HIGH EMISSIONS (SSP5-8.5)   | +0.9 to +1.6 °C | -2.8 to +6.4 % | +0.8 to +1.5 °C | +0.2 to +0.4 m | -0.1 |
|      | CONFIDENCE <sup>v</sup>     | HIGH            | MEDIUM         | HIGH            | HIGH           | HIGH |

Niue is also expected to experience the following changes to regional climate processes by 2090 under a medium and high greenhouse gas emissions scenario, relative to 1995–2014 baseline.



TROPICAL CYCLONES



EL NIÑO SOUTHERN OSCILLATION (ENSO)



MARINE HEATWAVES

|      |                             |   |  |  |
|------|-----------------------------|---|--|--|
| 2090 | MEDIUM EMISSIONS (SSP2-4.5) | Decrease in frequency;<br>Increase in intensity | ENSO will continue as a source of interannual variability;<br>La Niña and El Niño extremes are projected to increase | 2–9 times more frequent (global projection)  |
|      | HIGH EMISSIONS (SSP5-8.5)   |   |  | 3–15 times more frequent (global projection) |
|      | CONFIDENCE <sup>v</sup>     | LOW TO MEDIUM                                   | LOW  | N/A  |



OCEAN CIRCULATION



OCEAN STRATIFICATION



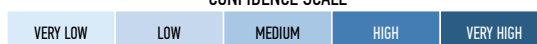
OCEAN OXYGEN CONTENT



NITRATE CONCENTRATION

|      |                             |  |  |         |                           |
|------|-----------------------------|--|--|---------|---------------------------|
| 2090 | MEDIUM EMISSIONS (SSP2-4.5) | Intensification and poleward extension of northern and southern hemisphere subtropical gyres |  | -6.6 %  | -0.60 mmol/m <sup>3</sup> |
|      | HIGH EMISSIONS (SSP5-8.5)   |  | +0.58 kg/m <sup>3</sup> (between 0 and 200 m); Mixed layer depth shoals by 19.5 m (global) | -11.2 % | -1.00 mmol/m <sup>3</sup> |
|      | CONFIDENCE <sup>v</sup>     | MEDIUM   | VERY HIGH  | HIGH    | N/A                       |

CONFIDENCE SCALE

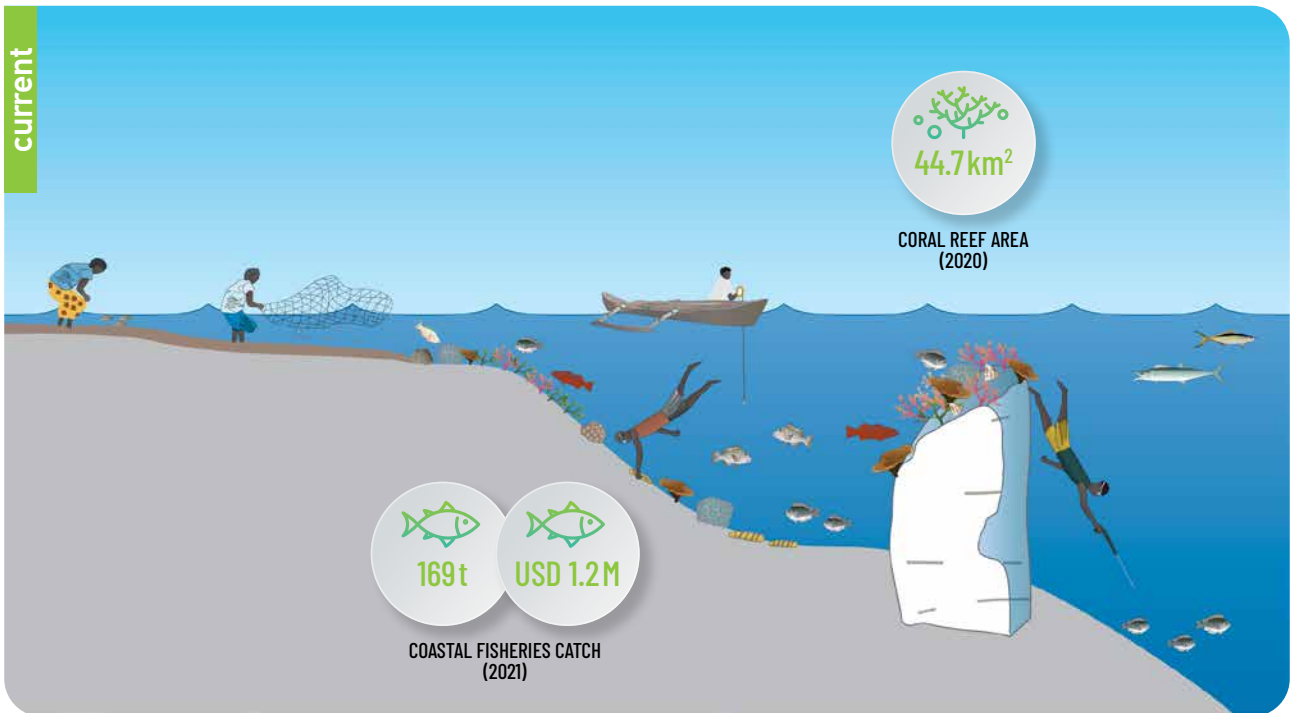


<sup>iv</sup> The shared socioeconomic pathways (SSP) represent plausible futures of how society's choices might affect greenhouse gas emissions, and how those choices might influence climate change.

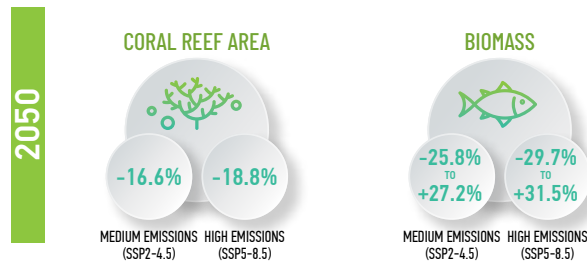
<sup>v</sup> Confidence levels reflect uncertainty in attribution of the observed impact to climate change.

# Coastal fisheries

Coastal fisheries in Niue target demersal fish (including snapper), invertebrates gleaned from intertidal habitats (e.g. octopus, lobster and crab), and nearshore pelagic fish (including tuna, scads and wahoo) using a range of fishing methods. These species are critically important for food, local livelihoods and jobs (further details in Chapter 3).



Coastal fish and invertebrates are expected to be directly impacted by increasing sea surface temperature, ocean acidification (declining pH), changing rainfall patterns, and indirectly impacted by declines in coastal habitats (coral reefs, seagrass meadows and mangroves) by 2050. This will drive changes in habitat area, fish biomass and coastal fisheries catches.

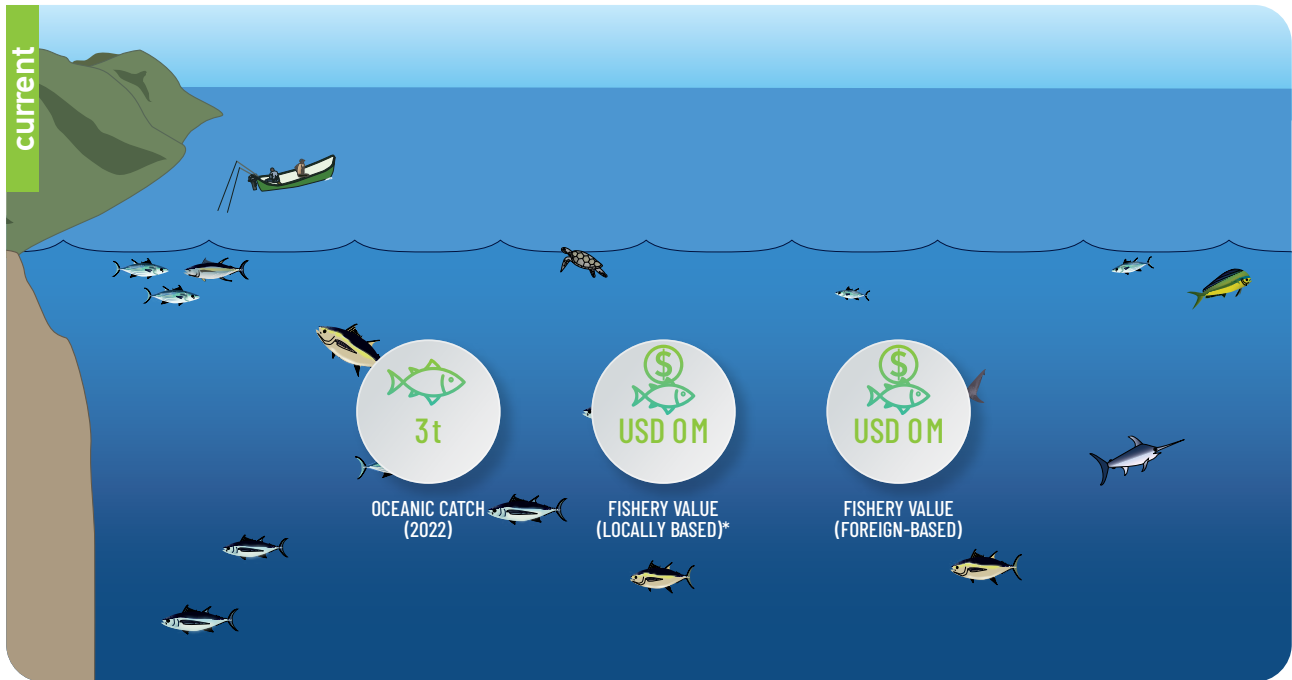


*Stock assessments are lacking so the status of coastal fisheries cannot be determined.*

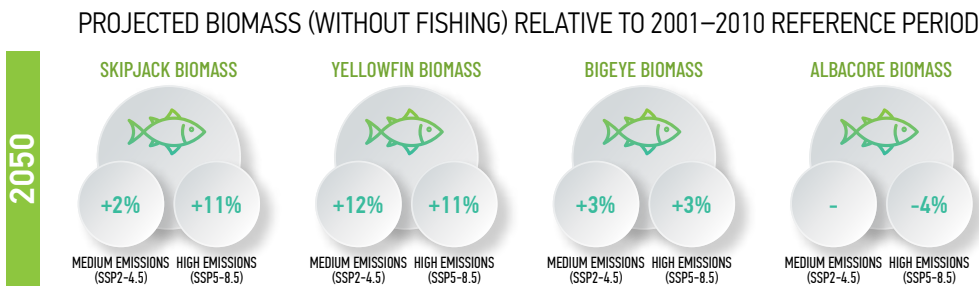
<sup>vi</sup> Relative to the Reference Period 2010–2020.

# Oceanic fisheries

In 2021, there were no locally based or foreign vessels fishing within Niue’s exclusive economic zone (EEZ)<sup>vii</sup>. Niue has some locally based trolling in nearshore habitats for albacore and other tuna species.



Offshore tuna are expected to be directly impacted by changes in ocean temperature, stratification and oxygen content, and indirectly impacted by changes in available spawning habitat area by 2050. This is expected to shift the distribution of tuna, with increasing biomass likely.



# Freshwater and estuarine fisheries

There are no current freshwater or estuarine fisheries in Kiribati, but there may be opportunities in the future.

# Aquaculture

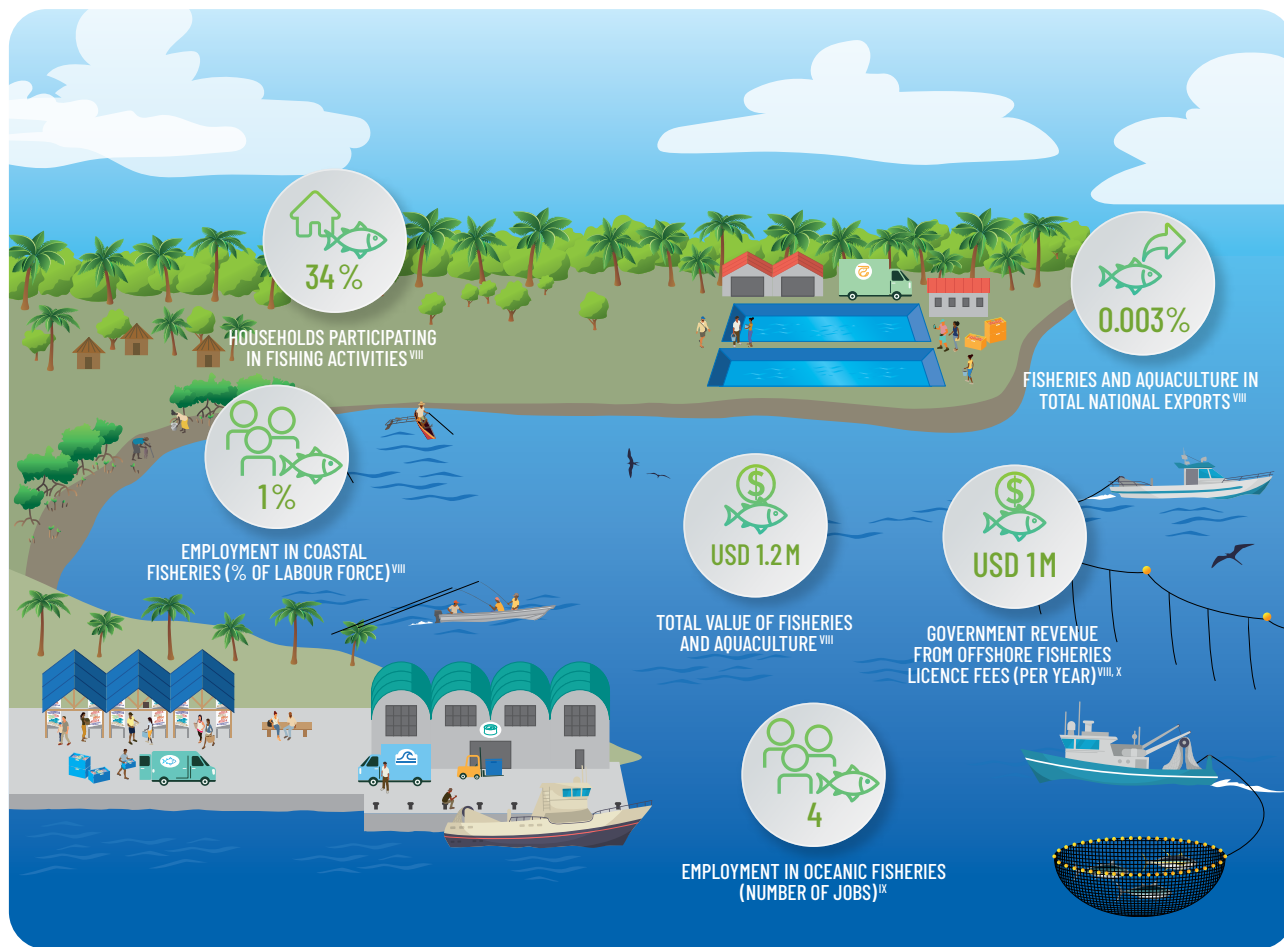
There is currently no aquaculture production, but future opportunities may exist.

vii Data from 2021: Gillett R., Fong M. (2023) Fisheries in the economies of Pacific Island countries and territories (Benefish Study 4). Pacific Community (SPC), Noumea, New Caledonia.

\* Value of local tuna harvested by nearshore trolling is reported as part of the coastal commercial catch.

# Livelihoods and economies

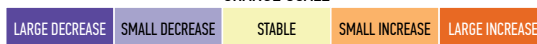
Fisheries are important for local culture and trade, providing household income, jobs and government revenue in Niue (further details in Chapter 7).



The projected decrease in coastal fisheries catches is expected to affect subsistence and artisanal fisheries and the number of people engaged in coastal fishing activities. No significant impacts are expected to livelihoods or GDP. No significant impact is expected on government revenue because no purse-seine fishing is likely in the EEZ.



CHANGE SCALE



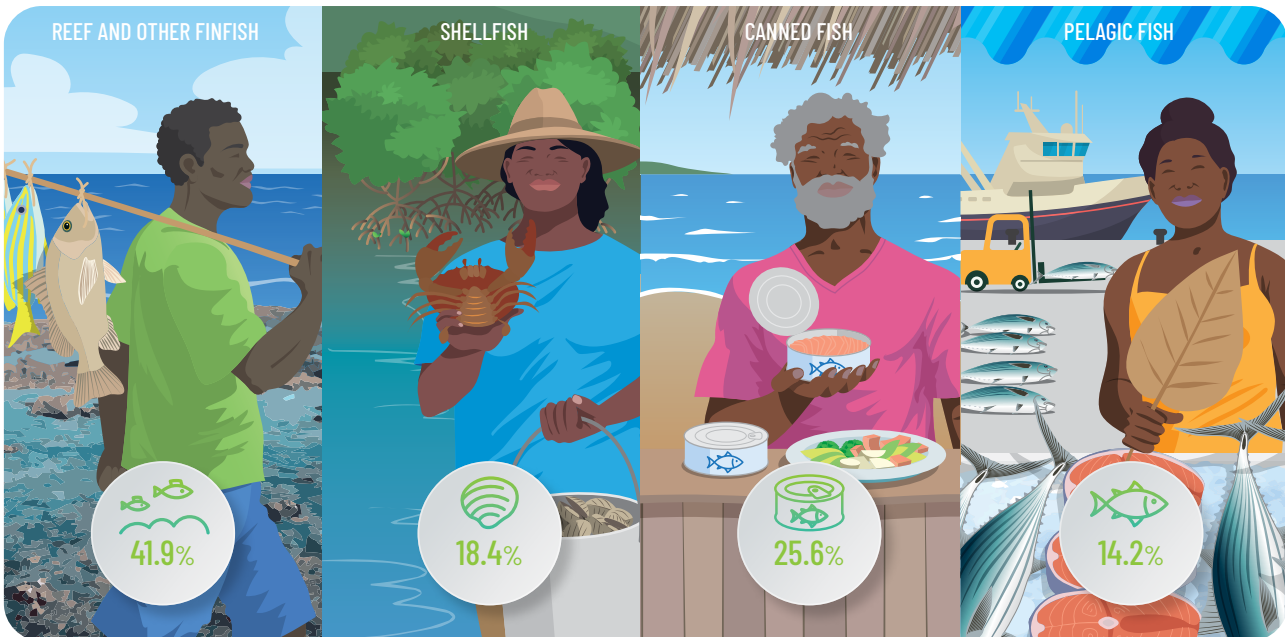
viii Data source: Gillett R., Fong M. (2023) Fisheries in the economies of Pacific Island countries and territories (Benefish Study 4). Pacific Community (SPC), Noumea, New Caledonia.

ix Primarily in tuna-related employment, including harvest, processing, observers, government and ancillary services. Data source: FFA (2022) Tuna Fishery Report Card 2022. Pacific Islands Forum Fisheries Agency, Honiara, Solomon Islands.

x Average value 2017–2021

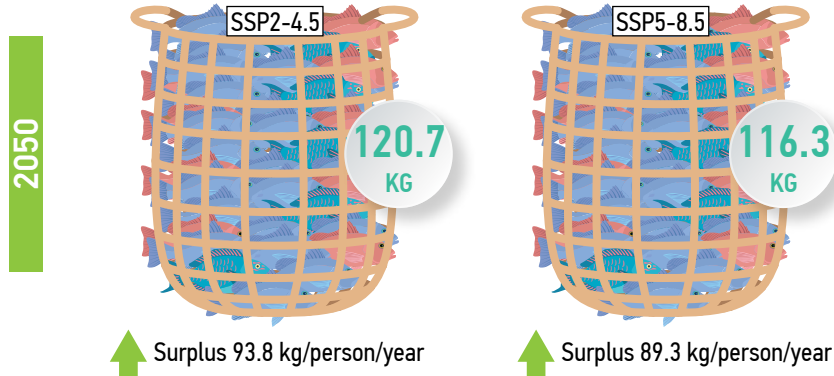
# Aquatic food security

Aquatic (blue) foods provide an important source of nutrition in Niue, and current consumption is 33 kg/person/year, including locally and imported reef and other finfish, shellfish, canned fish and pelagic fish (further details in Chapter 8)<sup>xi</sup>.

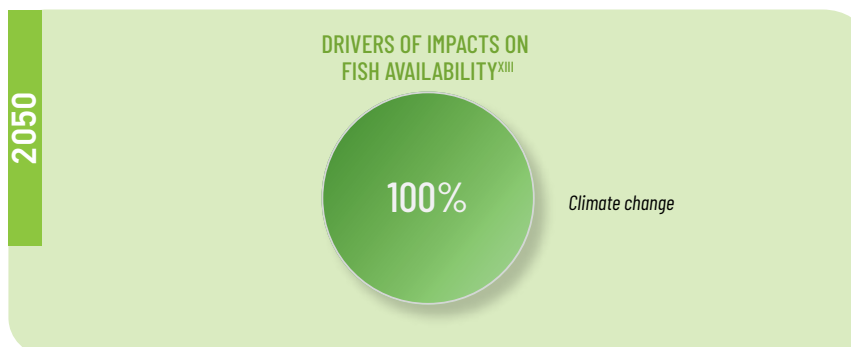


Niue is not expected to experience a deficit in fish supply by 2050 based on current fisheries catch rates and average consumption. However, there is expected to be a decline in available whole fish by 2050<sup>xii</sup> due to climate change impacts on coastal fisheries; but with sufficient access to aquatic foods, Niue has **low vulnerability** and will remain aquatic food secure by 2050.

## HOW MUCH FISH WILL BE AVAILABLE PER PERSON IN 2050?



To meet the future needs of a growing population and address declining catches for local consumption under climate change, sustainable coastal and estuarine fisheries management is essential.



<sup>xi</sup> Data estimated for whole fish from: Sharp M.K., Andrew N.L. (2024) Aquatic food consumption in the Pacific region. Food Systems Brief No. 22. Pacific Community, Noumea, New Caledonia. Note that reef and other finfish include freshwater and estuarine fish.

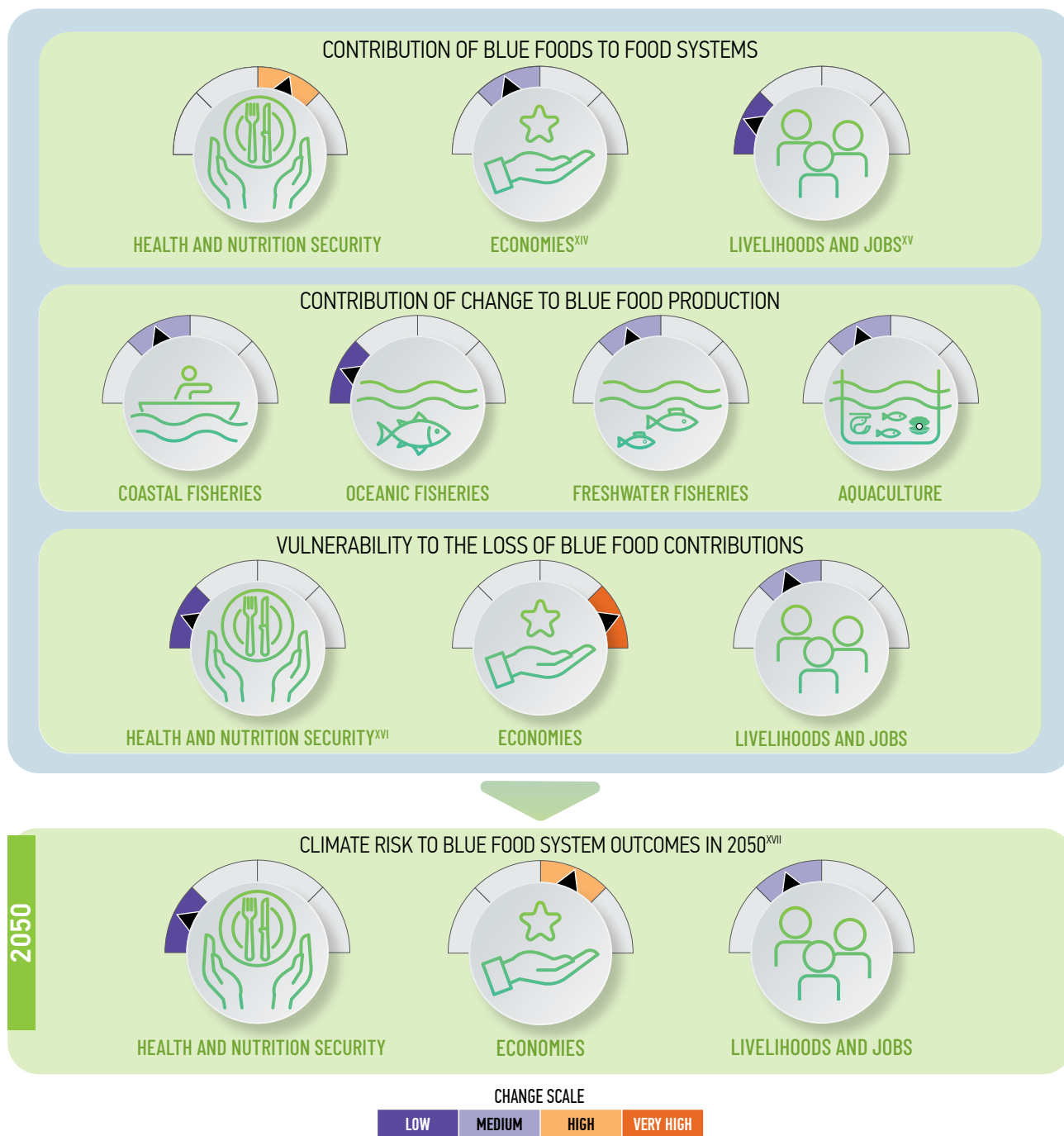
<sup>xii</sup> Based on projected coastal, estuarine and freshwater fisheries catches by 2050 from Chapters 3 and 5.

<sup>xiii</sup> Based on current aquatic food consumption levels.

# Blue food production systems

In the Pacific Islands region, blue foods contribute significantly to nutrition security and health, economies, livelihoods and jobs. By comparing contributions, climate impacts, and vulnerabilities across these outcomes, priority climate actions can be identified for sustaining their role in sustainable development under climate change (further details in Chapter 9).

In Niue, blue foods are most important for nutrition security and health. Compared to other Pacific islands, projected climate impacts to blue food production by 2050 are medium to high. Socioeconomic conditions make Niue highly vulnerable to climate-induced economic losses.



Altogether, the contributions of blue foods to sustainable development – especially economic – in Niue face medium to high levels of climate risk, due to higher levels of dependence and vulnerability. Priority climate actions can focus on reducing vulnerability through broader sustainable development and economic diversification.

xiv Including variables such as total fisheries production value and foreign access fees.

xv Including variables such as total number of jobs across supply chains, share of households for which fishing is the main source of income and gender equity considerations.

xvi Including nutrition-related health outcomes such as nutrient deficiencies and noncommunicable diseases.

xvii Risk is shown for a high-emissions scenario (SSP5-8.5). Rapid emissions reduction would reduce climate risk.

2050