



Towards a green and inclusive post-pandemic recovery  
of  
the Blue Economy and coastal communities

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RRR Call Funded Projects' Virtual Networking Event

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# Research team

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# Funding agencies

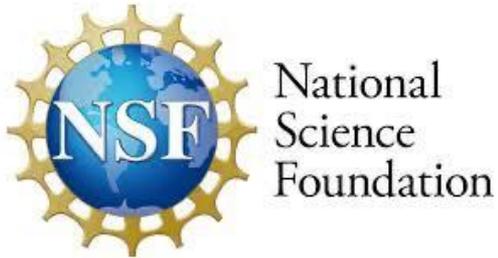
UMass  
Amherst



Canada



Federal Ministry  
of Education  
and Research



UK Research  
and Innovation

# 1. Project Overview and context

# Aims and focus of the project

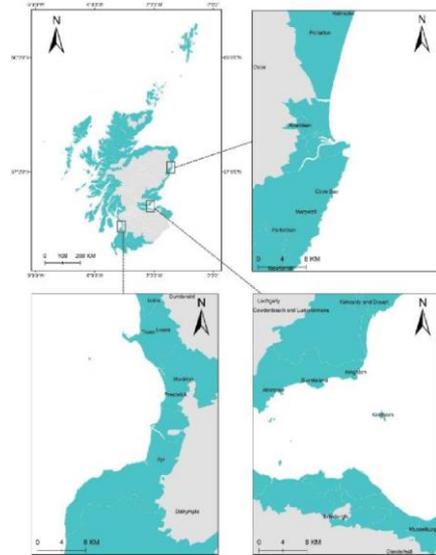
- **Overall aim:** to provide science-based guidance for post COVID recovery of coastal communities through a trans-national comparative study across coastal areas in Costa Rica, Germany, Scotland (UK), and the USA
- **Specific aim** is to understand:
  - the socio-economic impacts brought by COVID-19 on coastal communities
  - how these responded to the crisis
  - what elements of resilience can be identified in communities' response to the pandemic that could be considered efficient to further support and transfer to other regions, and to minimize future crisis.
- **Focus:** coastal regions that are mostly dependent on their Blue Economy

# Scientific Objectives

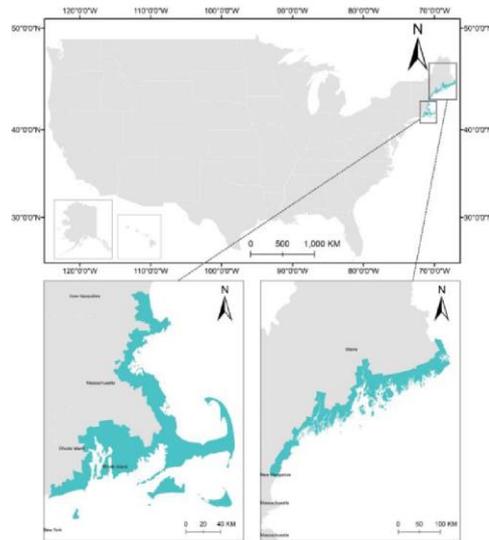
- Investigate the **impacts of COVID-19** and subsequent response measures on the Blue Economy and specifically changing inequalities and vulnerabilities of selected coastal regions as well as their natural environment
- Assess **opinions and preferences for recovery** in each sector of the Blue Economy
- Investigate current **financing as well as regulatory/policy bottlenecks** towards a greener/more resilient and equitable future for the Blue Economy
- Characterize key **enabling factors across all regions that lead to response performance** so as to inform the development of future strategies for a green and inclusive coastal recovery, benchmarked against the Sustainable Development Goals and the Paris Agreement

# Coastal regions considered

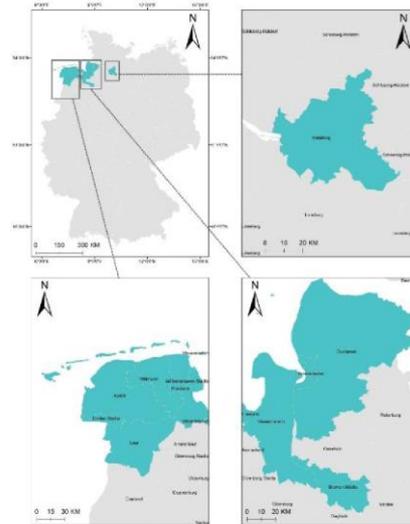
## Scotland



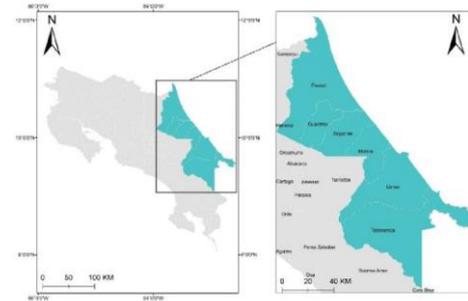
## USA



## Germany



## Costa Rica



# Importance of the Blue Economy

- “Economic activities related to oceans and coasts” (European Commission 2021)
- Estimated value of ocean-based economic activities: is 1.5 trillion US dollar, with potential to double until 2030 (OECD 2016)
- Climate Change threats: ocean warming, acidification, changes in (1) spatial distribution and abundance of (2) fish stocks or structure and functions of marine and coastal ecosystems (IPCC 2019)
- Examples of impacts from COVID-19:
  - disruption of supply chains and labour supply
  - freeze of production and trade
  - unemployment, loss of earnings or unpaid labour
  - livelihoods at risk



## Meyer Werft, Germany

Fabrice Renaud (2023)

## Isle of Skye, Scotland

Fabrice Renaud (2023)



# Background: Costa Rica Blue Economy



Tourism contributes approximately 8.2% of the country's Gross Domestic Product (GDP) and is an important source of foreign exchange earnings.

Tourism and fishing is the main economic activity on the coasts



In addition to generating 15.5% of the country's total employment, including direct and related employment.

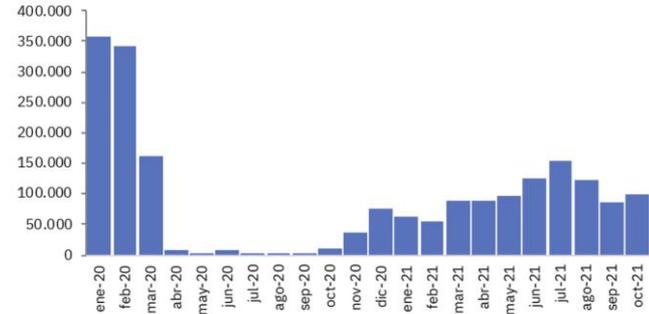


Every 10 hectares protected are marine areas



Sport fishing and tourist fishing contributes around 520 million dollars annually and generates 33,000 direct and indirect jobs.

Gráfico 1  
Legadas internacionales por todas las vías



Fuente: Jiménez Fontana, 2021, con datos del ICT.

One of the immediate effects at the beginning of the pandemic was the drastic drop in the entry of international tourists to Costa Rica. Between February and April 2020, the number of foreign people who entered the country monthly increased from 341,008 to 3,803 (graph 1). Since the end of the second half of that year, with the opening of borders, a slow recovery has been observed in international arrivals. In 2020, 1,011,912 international tourists entered; However, this figure is equivalent to a third of the total received during 2019 (3,193,008).

# Blue Economy Sectors: Germany



<https://us.123rf.com/450wm/travelpeter/travelpeter1701/travelpeter170100042/72356126-traditional-crab-fishing-trawler-at-north-sea-in-wadden-sea-east-frisia-germany.jpg>

## Tourism

- 58% of total tourism earnings in Germany (Bjarnason et al. 2017)
- 2022: 4.06 Million visitors at North Sea (Statista)
- 43% of tourists choose destination because of the flora and fauna (Institut für Tourismus- und Bäderforschung in Nordeuropa GmbH 2017)

Anzahl der Personen in Deutschland, die in den vergangenen 12 Monaten an die Nordsee in den Urlaub gefahren sind, von 2019 bis 2023 (in Millionen) available at <https://de-statista.com/statistik/datenstudie/1720364/umfrage/besuche-erledigte-arrivals-nordeutscheaer/>  
Bjarnason et al. 2017; [https://ips.waddensea-worltheritage.org/reports/tourism-2017/abstract\\_5](https://ips.waddensea-worltheritage.org/reports/tourism-2017/abstract_5)  
Institut für Tourismus- und Bäderforschung in Nordeuropa GmbH 2017; Nationalpark Niedersächsisches Wattenmeer: Gästebefragung „Wattenmeer 2017-zusammenfassung.pdf“  
nachhaltiger Tourismus“. Available at <https://www.nationalpark-wattenmeer.de/wp-content/uploads/2020/03/gaestebefragung-wattenmeer-2017-zusammenfassung.pdf>

## Fishery

Biggest fishery sector in Wadden sea: shrimp fishery

- **40-45% of the national park area fished** by shrimp fisheries (MSC 2023)
- 20% of total earnings in German Sea Fishery (North and Baltic) Sea, with 8.000 employees (Centenera 2014)
- Economic relevance of Northern Sea shrimp rather limited, but prestigious role as tourist attraction (Centenera 2014)

Marine Stewardship Council 2023, available at <https://www.msc.org/de/fisch-nachhaltigkeit/unsere-fischereien/krabbenfischerei-im-wattenmeer>  
Centenera 2014 Fischereiaussschuss European Parliament available at [https://www.europarl.europa.eu/RegData/etudes/STUD/2011/460041/IPOL-PECH\\_ET\(2011\)460041\\_DE.pdf](https://www.europarl.europa.eu/RegData/etudes/STUD/2011/460041/IPOL-PECH_ET(2011)460041_DE.pdf)

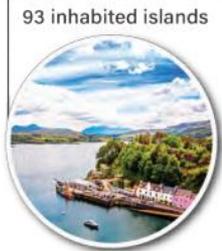


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# The Importance of Scotland's Blue Economy



18,743 km of coastline



93 inhabited islands



125,000 km of rivers and streams



75,500 jobs in the marine economy  
Contributing to 2.8% of total Scottish employment

16 million domestic day trips to Scotland's coasts annually



1.9 GW of installed operational capacity from six offshore wind farms, supporting 2,200 jobs



9,636 Mt CO<sub>2</sub> equivalent stored in 'Blue Carbon'  
Equivalent to total carbon stored in Scotland's terrestrial ecosystem



A Marine Protected Area network covering 37% of Scotland's Seas



Home to 6,500 complex and 40,000 single cell species



A marine area of 617,000 km<sup>2</sup>  
Seven times greater than the land



£5 billion in GVA generated from the marine economy in 2019

Marine tourism  
Fish related  
Oil and gas support services  
Transport related



£614 million of Scottish-farmed salmon exports in 2020  
40% of total UK fish and seafood exports



10,000 maritime students trained annually at City of Glasgow College



£877 million of Scottish seafood exports in 2020  
£709 million of which was export to the EU



30 million tonnes of exports through Scottish ports in 2020

# Massachusetts | The largest single contributor to the Northeast Blue Economy

**MASSACHUSETTS** accounts for over **1/3** of the Northeast's ocean economy employment and GDP, which has increased by **30.7%** from pre-recession levels (adjusted for inflation). Suffolk County is the largest Blue Economy employer and producer in MA.

## Massachusetts Blue Economy in 2016

**\$7.4 B**

GDP

**95.1 K**

Employees



## 2. Literature Review Findings

# Literature review approach

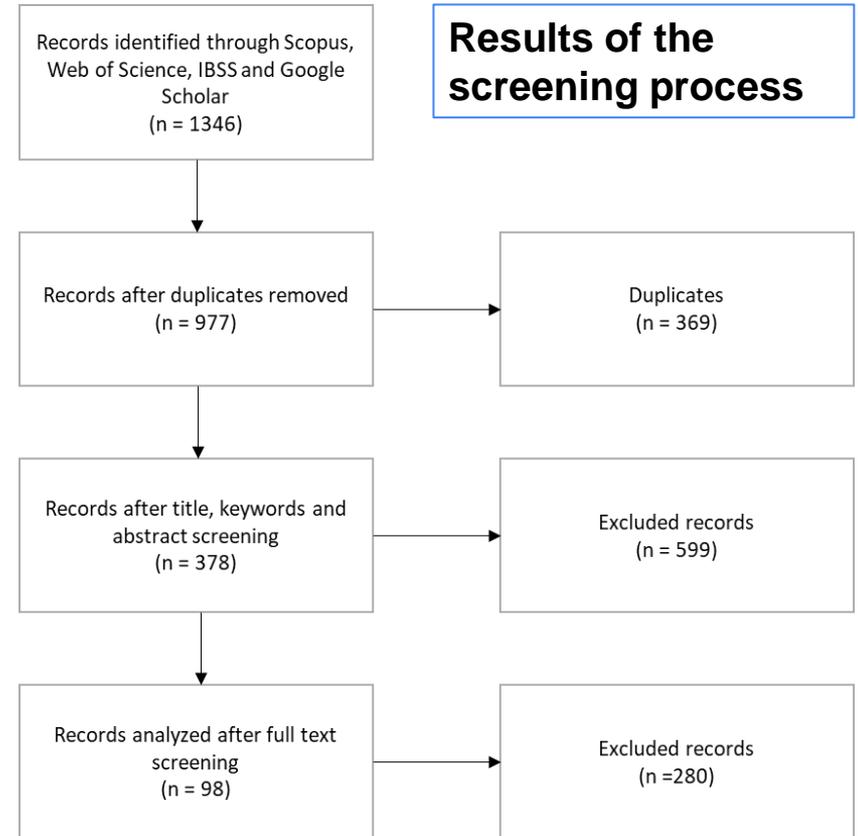
- **Objectives:**

- document impacts, response measures and recovery strategies of Blue Economy sectors
- analyze green recovery in the Blue Economy context
- develop a conceptual green recovery framework to inform policy-making

- **RepOrting standards for Systematic Evidence Syntheses**

(ROSES, Haddaway et al. 2018):

- transparency
- enable repeatability



# Heatmap showing prevalence of impacts, response, (green) recovery and policy recommendations in the reviewed literature

Number of publications with...																			
Total count of assessed publications = 98	Impacts addressed		Response addressed	Effectiveness of response measures addressed				Recovery addressed	Effectiveness of recovery strategies addressed				Green recovery addressed	Effectiveness of green recovery strategies addressed				Policy recommendations provided	
	Impacts positive	Impacts negative		Response effective	Response sometimes effective	Response not effective	No statement made		Recovery effective	Recovery sometimes effective	Recovery not effective	No statement made		Green recovery successful	Green recovery sometimes successful	Green recovery not successful	No statement made		
Fishery	13	44	26	5	5	1	15	10	1	2	0	7	1	0	0	0	1	26	
Aquaculture	3	17	8	1	1	1	5	2	0	0	0	2	1	0	0	0	1	8	
Shipping	2	24	9	1	4	0	4	5	1	0	0	4	0	0	0	0	0	6	
Ship building	0	2	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	
Transportation	3	19	3	0	0	0	3	1	1	0	0	0	1	0	0	0	1	4	
Tourism	1	27	10	1	1	1	7	6	1	2	0	3	1	0	0	0	1	11	
Port	3	16	4	1	2	1	0	3	0	1	0	2	0	0	0	0	0	5	
Extraction/Mining	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	
Oil and gas	0	2	2	0	0	0	2	1	0	0	0	1	0	0	0	0	0	0	
Energy	1	2	1	0	0	0	1	0	0	0	0	0	1	0	0	0	1	1	
Businesses	0	16	6	0	1	0	5	4	0	2	0	2	0	0	0	0	0	2	
Society	4	13	7	0	2	0	5	0	0	0	0	0	0	0	0	0	0	6	
Environment	20	13	3	0	1	0	2	1	0	0	1	1	1	0	0	0	1	15	
Total count	36	83	45	5	12	2	26	20	3	5	1	11	3	0	0	0	3	51	
Percentage	37%	85%	46%	5%	12%	2%	27%	20%	3%	5%	1%	11%	3%	0%	0%	0%	3%	52%	

Source: Hartmann et al (forthcoming): *A conceptual framework for a post-COVID-19 green recovery of the Blue Economy.*

# Heatmap showing prevalence of implementation and financing of response measures and recovery strategies in the reviewed literature

	Number of publications with...																
	Implementing entity named						Source of financing addressed				Scale of financing addressed						
	Businesses	National governments	Regional governments	Local governments	Others	No statement made	Public	Private	PPP/mixed	No statement made	Local	Regional	National	Supranational	Global	No spatial focus	No statement made
Fishery	9	14	3	3	7	2	9	1	1	14	3	2	5	0	0	0	1
Aquaculture	3	8	3	2	0	1	6	0	0	5	1	0	4	0	0	0	1
Shipping	1	3	1	1	2	0	1	0	1	1	0	1	1	1	0	0	0
Ship building	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Transportation	2	8	5	2	4	2	3	0	3	5	3	1	3	1	1	0	0
Tourism	4	12	2	2	3	2	3	0	2	7	2	1	4	1	1	0	0
Port	2	3	0	0	1	1	1	0	0	5	0	0	0	0	0	0	0
Extraction/Mining	0	1	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0
Oil and gas	0	3	0	0	0	0	2	0	0	1	0	0	2	0	0	0	0
Energy	0	2	0	0	0	0	1	0	0	1	0	0	1	0	0	0	0
Businesses	4	6	2	3	4	1	5	1	3	1	5	2	4	1	1	0	0
Society	5	7	3	4	5	1	4	0	3	4	4	2	3	1	1	0	1
Environment	4	7	0	0	3	0	3	0	0	5	0	0	2	0	0	0	1
<b>Total count</b>	<b>16</b>	<b>24</b>	<b>6</b>	<b>4</b>	<b>11</b>	<b>4</b>	<b>10</b>	<b>1</b>	<b>3</b>	<b>25</b>	<b>6</b>	<b>3</b>	<b>9</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>1</b>
<b>Percentage</b>	<b>16%</b>	<b>24%</b>	<b>6%</b>	<b>4%</b>	<b>11%</b>	<b>4%</b>	<b>10%</b>	<b>1%</b>	<b>3%</b>	<b>26%</b>	<b>6%</b>	<b>3%</b>	<b>9%</b>	<b>1%</b>	<b>1%</b>	<b>0%</b>	<b>1%</b>

Source: Hartmann et al (forthcoming): *A conceptual framework for a post-COVID-19 green recovery of the Blue Economy.*

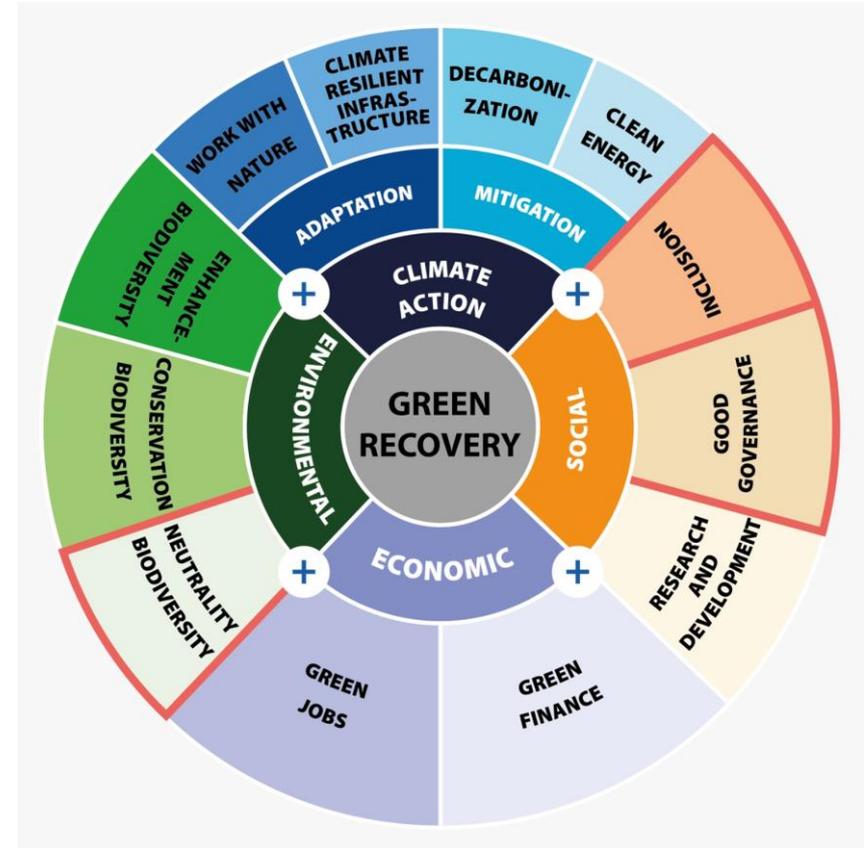
# Green recovery elements addressed by selected publications

	Intergovernmental organizations				National governments and others						
	WHO (2020b)	OECD (2020c)	UNEP (2021a)	UNEP (2021b)	The World Bank (2022)	UNDP/ Groves et al. (2022)	IMF (n.d.)	The Scottish Government (2020)	GIZ (2020)	GIZ (n.d.)	C40 Cities (2020)
<b>High agreement (8 or 9 publications)</b>											
Green finance	x	x		x	x		x	x	x	x	
Climate-resilient infrastructure	x		x	x			x	x	x		x
Research and development		x	x	x			x	x		x	x
<b>Medium agreement (6 or 7 publications)</b>											
Work with nature	x	x	x	x				x	x		x
Decarbonization			x		x	x		x		x	
Inclusion	x					x	x	x	x		x
<b>Low agreement (5 or less publications)</b>											
Clean energy	x		x	x				x			x
Good governance		x			x	x		x	x		
Green Jobs		x						x		x	

Source: Hartmann et al (forthcoming): *A conceptual framework for a post-COVID-19 green recovery of the Blue Economy.*

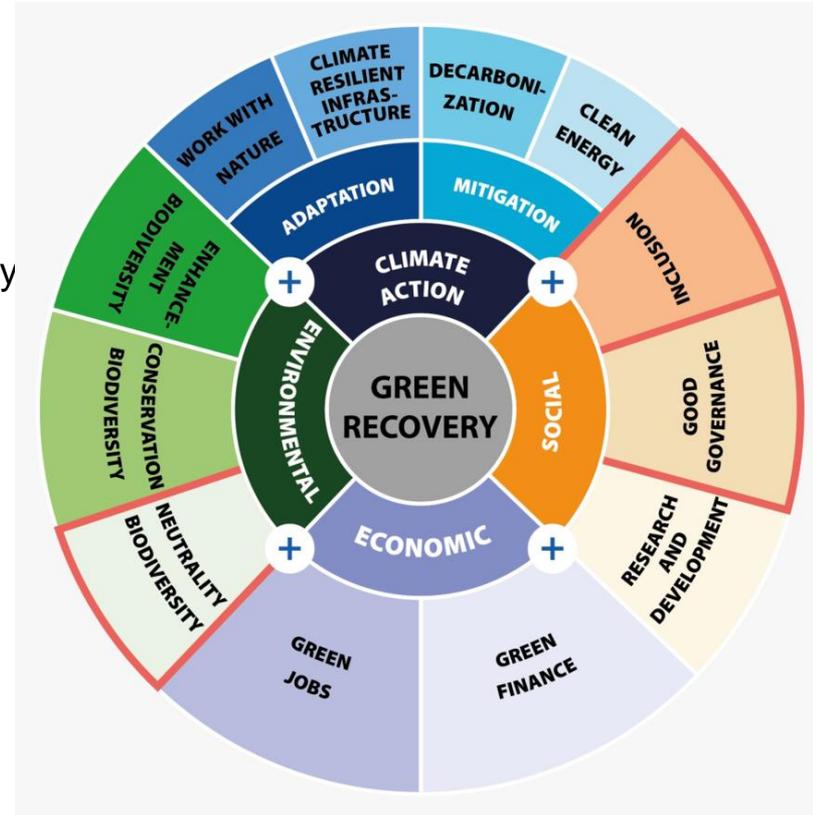
# A conceptual framework for the green recovery

- Definition: “Post-pandemic green recovery describes strategies and measures that combat the social, economic and environmental impacts of the global COVID-19 pandemic. It facilitates long-term transformative change towards sustainability, biodiversity protection, resilience and climate neutrality” (adapted from GIZ n.d., 2020; UNEP 2021; OECD 2020)
- Starting questions:
  - when is a recovery strategy actually a green recovery strategy?
  - are there any requirements that need to be fulfilled in order to consider a recovery strategy as being green?
- Follows the dimensions of the definition: sustainability (3 dimensions); biodiversity protection; climate neutrality; Resilience



# Link between the framework and resilience

Diversity	Explicitly addressed through e.g. biodiversity and inclusion
Inclusivity & Equity	Explicitly addressed as a standalone, key element
Adaptive Learning	Implicitly addressed through e.g., governance and research
Connectivity	Implicitly addressed through consideration of interconnectedness of all dimensions
Redundancy	Implicitly addressed through the combination of diversity and connectivity



## Sources:

Dimensions of resilience: Rockström, J.; Norstam, A.; Matthews, N.; Biggs, R.; Folke, C.; Harikishun, A. et al. (2023): Shaping a resilient future in response to COVID-19. In Nature Sustainability (6), pp. 897–907.

Framework and links to resilience: Hartmann et al (forthcoming): A conceptual framework for a post-COVID-19 green recovery of the Blue Economy.

### 3. Preliminary results of the survey

Covid impacts

Covid recovery progress

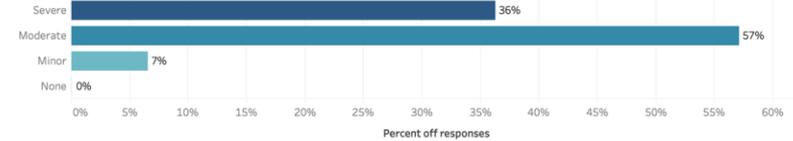
Green recovery initiatives

# Covid Impacts

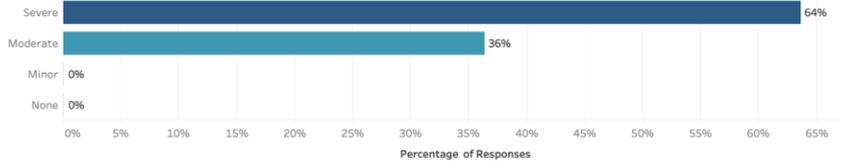
Costa Rica: How would you describe the impacts of COVID-19 on the local economy within your municipality or planning agency region between the 1st quarter of 2020 (when COVID-19 appeared in New England) and the 2nd quarter of 2021? (n=19)



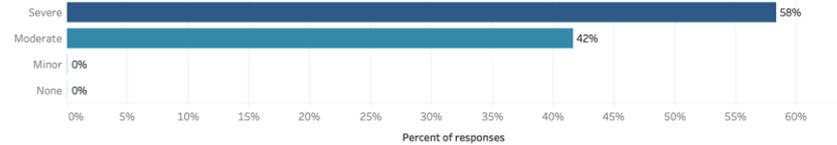
USA: How would you describe the impacts of COVID-19 on the local economy within your municipality or planning agency region between the 1st quarter of 2020 (when COVID-19 appeared in New England) and the 2nd quarter of 2021? (n = 91)



How would you describe the impacts of COVID-19 on your area's local economy between the 1st quarter of 2020 and the 2nd quarter of 2021? (n=11)



Germany: How would you describe the impacts of COVID-19 on the local economy within your municipality or planning agency region between the 1st quarter of 2020 (when COVID-19 appeared in Germany) and the 2nd quarter of 2021? (n = 12)



## Fishing

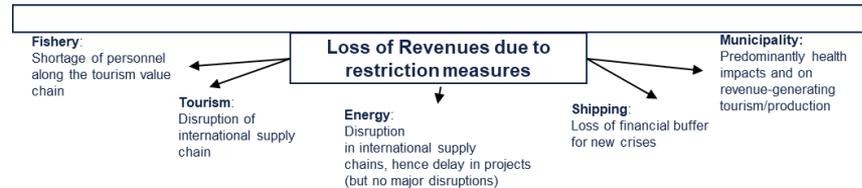
- Impact of restrictions on fishing activities
- Collapse of prices in national and international seafood markets

## Tourism

- Cessation of activity during period of initial restrictions
- Large increase in domestic visitors as restrictions eased
- Longer-term fall in international visitors

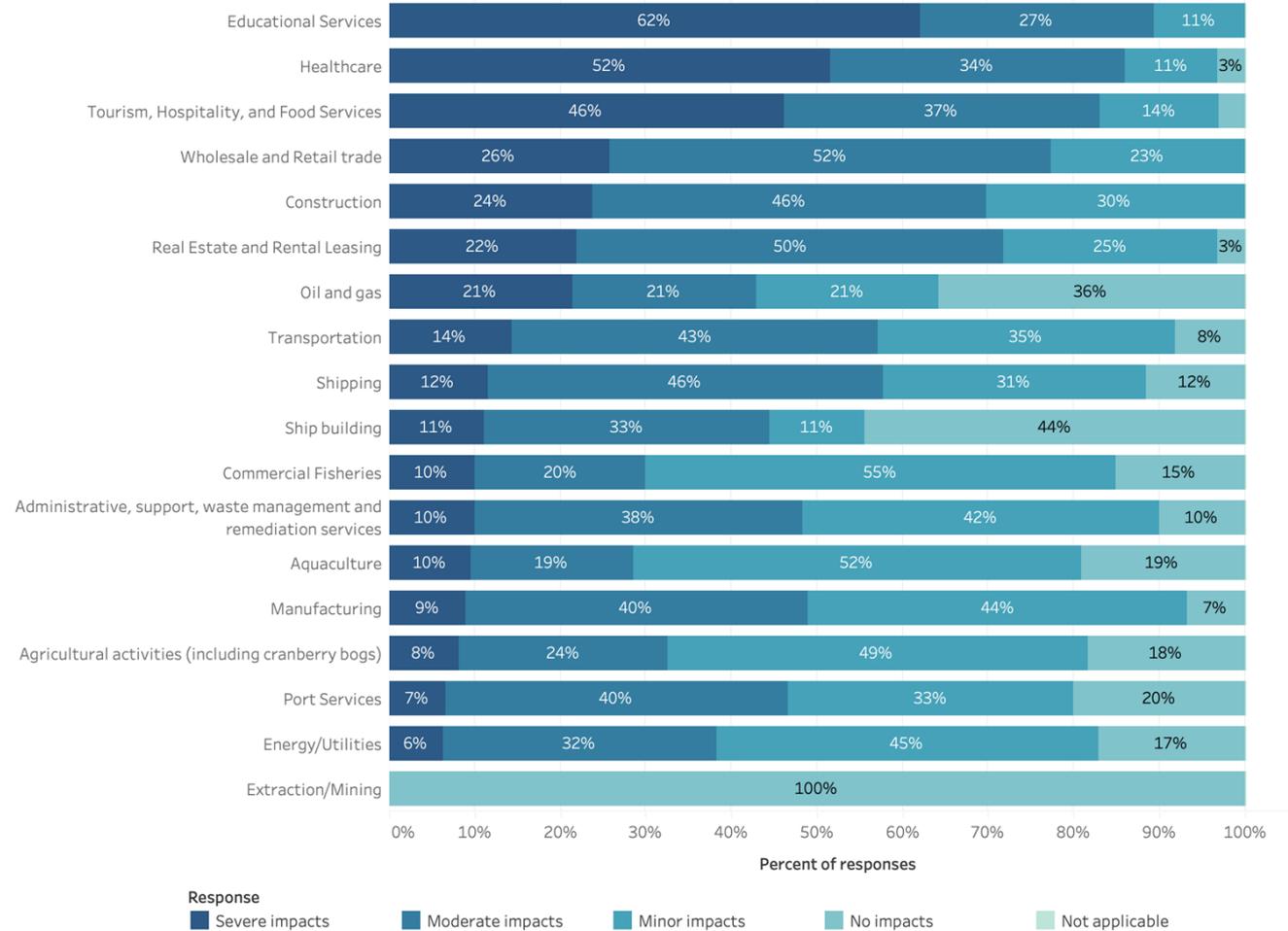
## Energy

- Increased costs for offshore business e.g. testing
- Disruption to travel and supply chains
- Global fall in oil prices



USA: To the best of your knowledge, how strong have been the negative impacts of COVID-19 on the following industries in your municipality or planning region?

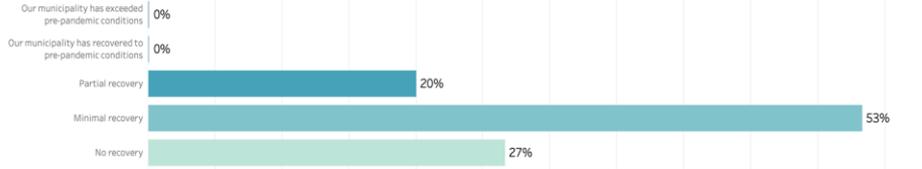
(n = 69)



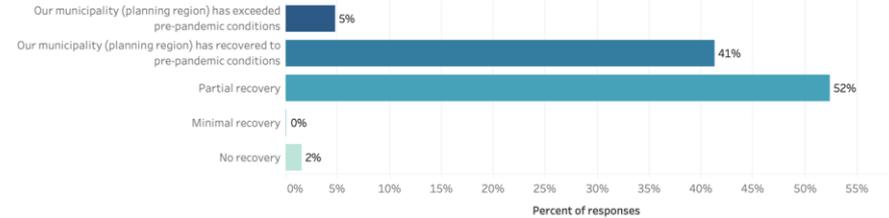
# Covid Impacts on specific industries

# Post-Covid-19 recovery

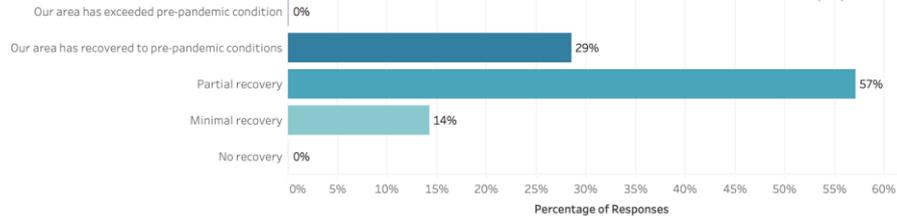
Costa Rica: How would you describe your municipality's post-COVID-19 recovery status at this time? (n=15)



USA : Overall how would you describe the post-COVID-19 socio-economic recovery status of your municipality or planning region at the moment? (n = 63)



Scotland: How would you describe the post-COVID-19 recovery status of your area at the moment? (n=7)



## Fishing

- Driven by recovering demand as restrictions in hospitality etc. eased
- Ongoing disruptions to international markets including impacts of Brexit

## Tourism

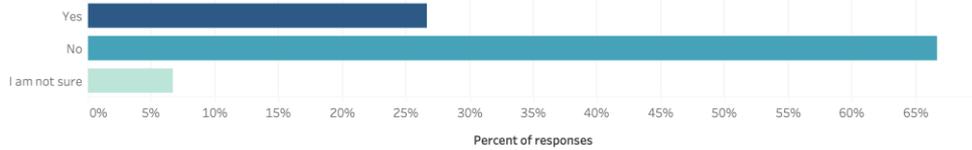
- Recruitment and skills shortages, particularly for smaller firms
- Increase in domestic tourism; high numbers of motorhomes in some places; pressure on infrastructure
- Slower recovery in international visits, business tourism not at pre-pandemic levels

## Energy

- Recovery from 2021 with rising energy prices
- Most firms increased employment and plan to expand further
- Strategic investments to help transition towards green energy

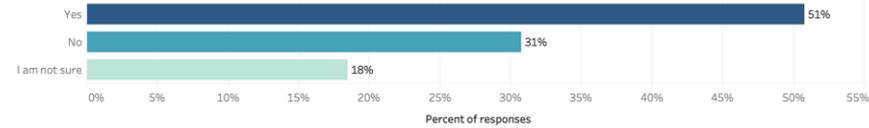
# Green recovery

Costa Rica: Costa Rica's municipalities have begun to explore possible economic recovery pathways from COVID-19. The term green recovery has emerged to describe policies that drive low-carbon economic growth, prioritizing renewable energy, energy efficiency, green transport, climate resilience and other environmentally beneficial projects. According to your knowledge, has the concept of green recovery been discussed in your municipality?" n=15

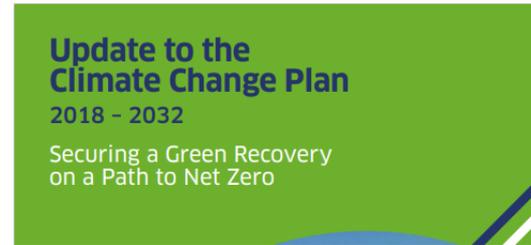
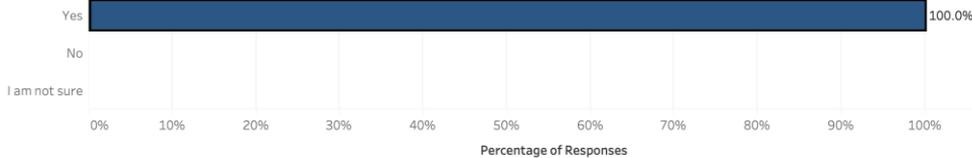


USA: States and municipalities around the US have started exploring possible COVID-19 economic recovery pathways. The expression green recovery has emerged to describe policies that push for low-carbon economic growth, prioritizing renewable energy, energy efficiency, green transport, climate resilience and other environmentally beneficial projects.

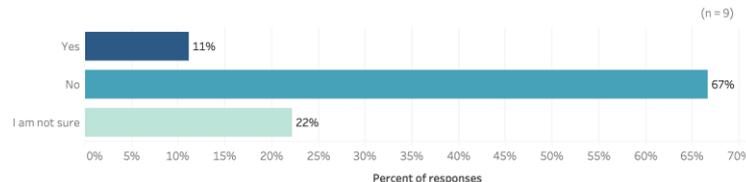
To your knowledge, has the concept of green recovery been discussed in your municipality or planning agency?" (n = 65)



Scotland: The term green recovery has emerged to describe policies that push for low-carbon economic growth, prioritizing renewable energy, energy efficiency, green transport, climate resilience and other environmentally beneficial projects. To your knowledge, has the concept of green recovery been discussed in your organisation?" (n=8)



Germany: To your knowledge, has the concept of green recovery been discussed in your municipality?" (n = 9)



**Tourism:** Sustainability awareness weakened

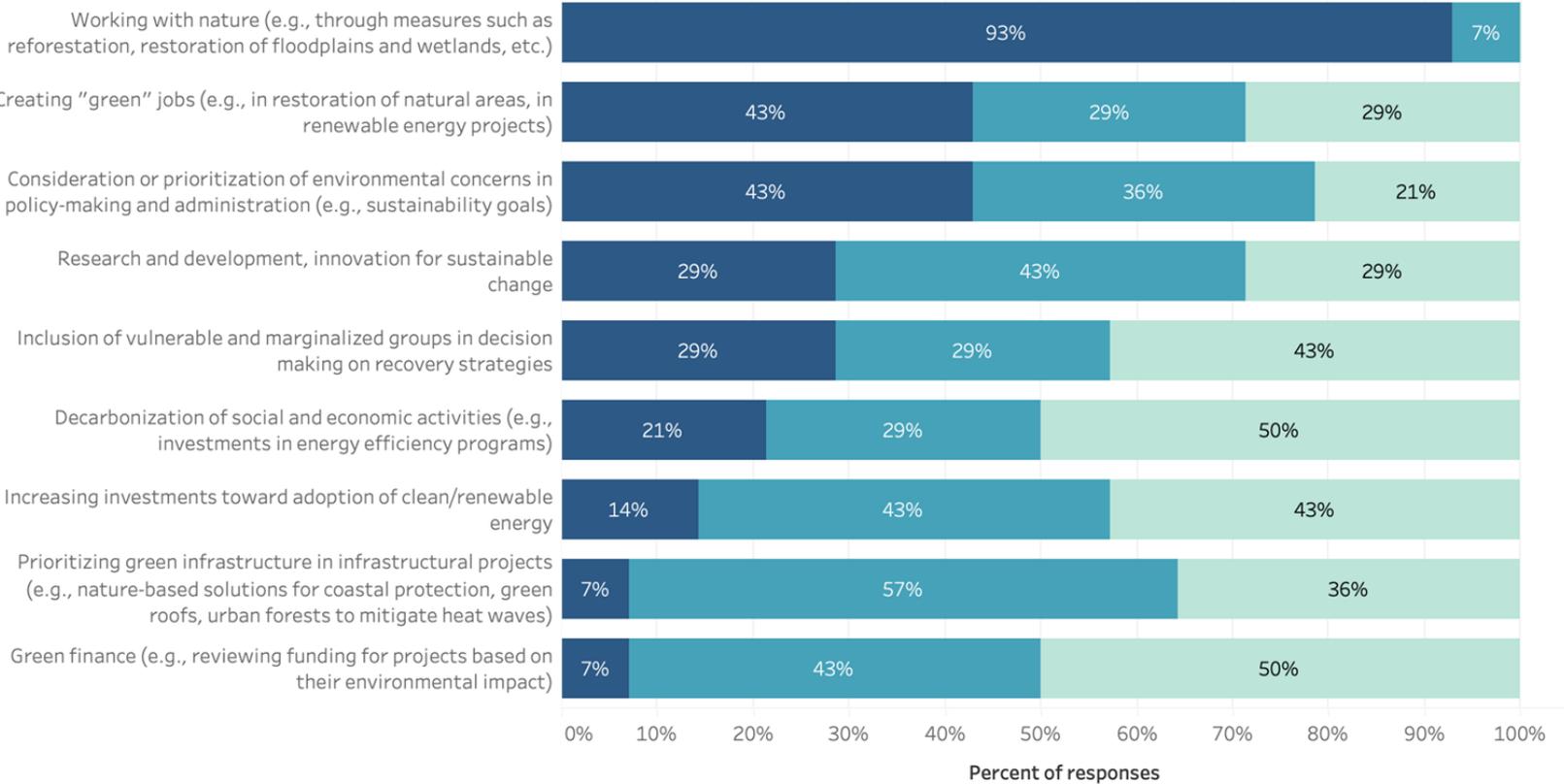
**Fishery:** Sustainability efforts weakened (e.g., decarbonization of fleet)

**Economic concerns** due to challenges such as Russo-Ukrainian war and Energy Crisis

Increasing tendency towards **renewable Energy**

# Costa Rica : Has your municipality or planning agency started implementing any of the following recovery and growth strategies since the pandemic?

(n = 12)



Response

Yes

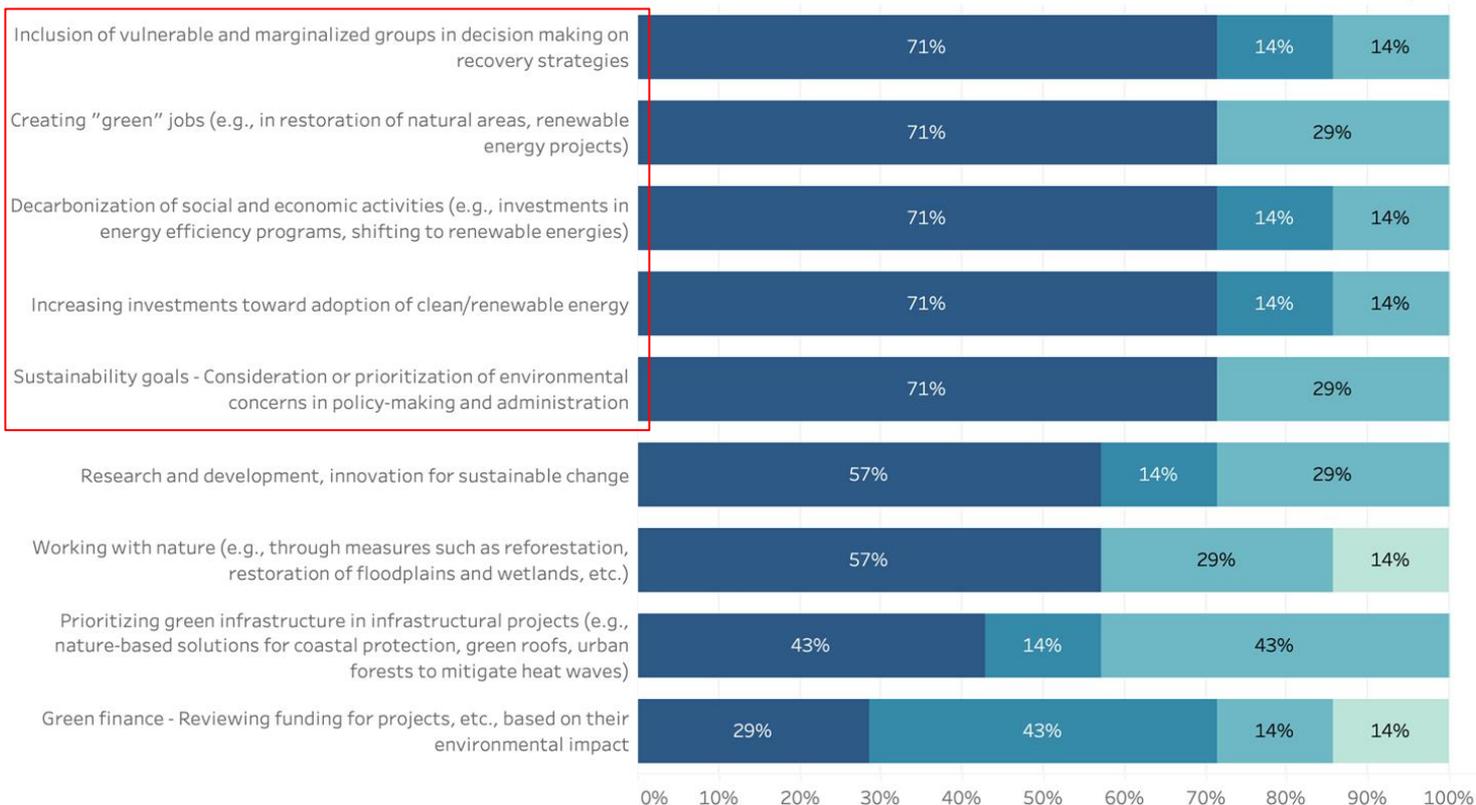
No but we are interested in this

No

# What green recovery strategies do you think are most important for your region's sustainable development?

Scotland

(n=7)



## Responses

- Very Important
- Important
- Somewhat important
- Not Important

Percentage of responses

## 4. Outlook

# Transatlantic Partnership

- Great interactions across partners
- Kick-off and first year meetings in Scotland and Germany held
- Constant and effective communication
- Productive interaction with partner organizations
- Survey time extended → need to adapt the second survey
- DCE component next
- Not all about COVID anymore some need to think/analyse carefully

## Dumfries, Scotland



## Wadden Sea, Germany

Fabrice Renaud (July  
2023)

**Thank You!**

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