Climate Change Mitigation Finance and Technology

Key findings for the Pacific from the United Nations **Intergovernmental Panel on Climate Change's** (IPCC) Sixth Assessment Report (AR6) on Mitigation* of Climate Change

*actions that reduce the rate of climate change

Mitigation investment falls short

across all sectors particularly for developing countries

SUPPORTING MITIGATION

Increased financing for:

- climate-related losses
- nature-based solutions
- low emissions infrastructure

can have important long-term benefits for Pacific Island nations

Pacific Island nations require

finance **technology** **capacity building**

support from developed countries to reduce their greenhouse gas emissions

Training local people in new technologies provides jobs and helps long-term success

CO-BENEFITS OF MITIGATION

Agrivoltaics

(co-developing land for agriculture and solar) can have social, economic and mitigation benefits

Local renewable and decentralised energy systems create more prosperous and resilient communities

Using less fossil fuels in shipping can help counter rising fuel costs and contribute to mitigation

Trade-offs of new technologies need to be considered when assessing benefits and can be minimised through

- Local capacity building activities
- Use of 'Responsible Innovation' approach
- Use of SDGs as a framework
- External support for capacity building in policy and governance

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Nationally Determined Contributions (NDCs) to reduce greenhouse gas (GHG) emissions are a key instrument of the Paris Agreement. All Pacific Island nations' NDCs have conditional elements which require finance, technology and capacity building support from developed countries.[1]

FINANCE AND TECHNOLOGY

Global financial flows need to be stepped up for Pacific Island nations to decarbonise and achieve their mitigation goals while developing sustainably.[2] Stepping up financing for climate-related losses, nature-based solutions and low-emissions infrastructure can have important long-term benefits for Pacific Island nations.[3] Refocusing finance efforts towards this region is important given their vulnerability and their minor contribution to climate change.[4]

Financial support can help Pacific Island nations to access new carbon markets and maximise benefits from mitigation projects. A lack of funding for agriculture, forestry and other land uses (AFOLU) projects is a significant barrier for their implementation.[6] In agriculture, innovation and technology based on nature can provide social and economic benefits while also delivering mitigation. For example, agrivoltaics which is the co-development of land for agriculture and solar with water conservation benefits.[7] These projects are best when tailored to the local setting and can be improved by combining technologies with traditional knowledge to create new ways of farming.[8] New mitigation practices are likely to be adopted faster if they are shown to improve crop yields, reduce costs, or otherwise improve livelihoods.[9]

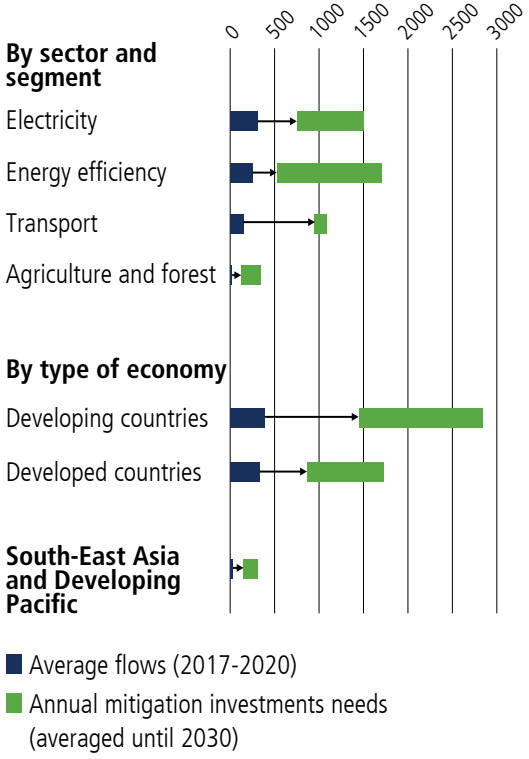
Further transfer of mitigation technologies is needed, with technological innovation being a key enabler of both mitigation and adaptation actions in Pacific Island nations.[10] This includes the flow of expertise, experience and equipment for mitigating and adapting to climate change, for example, energy infrastructure, building designs and digitalisation technologies.[11]

Local renewable-based and decentralised energy systems can improve resilience to energy shocks and help nations to be less reliant on importing energy inputs. Distributed energy sources can make the overall system less likely to be disrupted by extreme weather events such as floods and cyclones.[12]

Mitigation investment flows fall short of investment needs across all sectors and particularly in developing countries.[5]

Recent average mitigation investment flows showing investment needs until 2030 (USD billion).

Actual yearly flows compared to average annual needs (billion USD 2015 yr^{-1})



1 Chapter 4.2.1; See Pacific NDC Hub for detailed information https://pacificndc.org/
2 Summary for Policymakers (SPM) E.5; Chapter 15.2.2
3 Chapter 15, Executive Summary
4 Chapter 15.6.7
5 SPM.E.5; Figure adapted from Technical Summary, Figure TS.25
6 Chapter 7.6.4.1
7 Chapter 16.6.1
8 Chapter 16, Box 16.1
9 Chapter 7.6.4.1
10 Chapter 16.6.4
11 Chapter 16.5
12 Chapter 6, Box 6.6

The social and cultural acceptance of mitigation technologies is a key determinant of their success. It is important that technology is adapted to local needs and preferences to ensure adoption.[13] Improving social awareness of upcoming changes and boosting trust in service providers before the roll out of a new technology can help in future uptake.[14]

Shipping plays a key role in delivering goods to Pacific Island nations and currently has a strong dependency on fossil fuels. Greenhouse gas (GHG) emissions from shipping have grown over recent decades.[15] Reducing the use of fossil fuels in shipping can help counter rising fuel costs and contribute to mitigation. Opportunities to lower GHG emissions from shipping include using fuels based on renewable energy, more efficient port operations, operational changes such as reducing the speed or 'slow steaming' which improves energy efficiency of vessels and using wind and solar to help propel ships.[16]

Local Pacific capacity building activities should support the deployment of new technologies. For example, training local people in new technologies can provide job opportunities and facilitate long-term success.[17] Regional institutions such as the Pacific NDC Hub, the Pacific Climate Change Centre and universities can facilitate capacity building activities and support the implementation of NDCs and mitigation technologies.[18]

Pacific Island nations will need support for capacity building activities to ensure mitigation projects minimise trade-offs and achieve intended emissions benefits. For example, effective nature-based mitigation requires estimation, modelling, monitoring, reporting and verifying GHG inventories, as well as their implications for sustainable development goals, climate change impacts and adaptation.[19] Many coastal blue carbon[20] projects have failed due to lack of assessment/knowledge and require improved frameworks for future effective restoration and mitigation.[21]

There are trade-offs associated with mitigation efforts which can be minimised through effective governance and policies. For example, land-based mitigation actions can reduce biodiversity and food security.[22] Actions to ensure marginalised and poor communities have access to new technologies can help reduce some social trade-offs. 'Responsible Innovation' is a framework that can guide the equitable distribution of new technologies and ensure they don't worsen existing inequalities.[23] The SDGs are also a framework which can be used to assess the long-term impacts of mitigation actions in the context of sustainable development.[24] Regional frameworks can also be used to assess the interaction of mitigation actions with other development outcomes, for example the Framework for Resilient Development in the Pacific and the Pacific Resilience Partnership.[25]

Benefits and trade-offs of mitigation actions need to be considered when implementing projects.[26]

New mitigation technologies can help to achieve Sustainable Development Goals, however, it is important they are managed well to ensure they don't worsen existing inequalities. For example, low-carbon electricity technologies can worsen food security and life on land if not managed well. External support for capacity building in policy and governance can help minimise these trade-offs.

	Synergy																	Both synergy and trade-offs				
Mitigation options	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17					
Urban land use and spatial planning	***		***	**	**	***	***	***	***		***		***			**		2 ***+ ***−	10 ***+ **−	12 ***+ **−	14 **+ **−	15 ***+ **−
Electrification of the urban energy system	**		***	***	**	**	***	***	***	***	***		**	**		**		2 **+ **−	12 ***+ **−	15 ***+ **−		

1 No Poverty
2 Zero Hunger
3 Good Health and Well-being
4 Quality Education
5 Gender Equality
6 Clean Water and Sanitation
7 Affordable and Clean Energy
8 Decent Work and Economic Growth
9 Industry, Innovation and Infrastructure
10 Reduced Inequality
11 Sustainable Cities and Communities
12 Responsible Consumption and Production
13 Climate Action
14 Life Below Water
15 Life on Land
16 Peace and Justice Strong Institutions
17 Partnerships to achieve the Goal

* = medium confidence
** = high confidence
*** = very high confidence
+ = synergy
− = trade-off

13 FAQ 16.3
14 Chapter 5.4.2
15 Chapter 10.6.2
16 Chapter 10.6
17 Chapter 8.2.2
18 Chapter 16.5.4; See https://pacificndc.org/ for more information
19 Chapter 7.6.4.2
20 'Blue carbon' refers to the enhancement of biological carbon removal and storage in marine systems. Examples include storing carbon in the vegetation and soil of tidal marshes, mangroves and seagrasses
21 Chapter 7.4.2.9
22 Chapter 17.4
23 Chapter 16.6.3
24 SPM.D.1
25 See https://www.forumsec.org/frdp/; https://www.resilientpacific.org/en
26 Adapted from Chapter 8, Figure 8.4

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SPREP Secretariat of the Pacific Regional Environment Programme
PCCC pacific climate change centre