島嶼国
気候変動政策情報収集支援業務

最終報告書

平成 27 年 3 月
（2015 年）

独立行政法人
国際協力機構（JICA）

有限会社クライメート・エキスパーツ
日　本　工　営　株　式　会　社

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第 1 章　調査の背景と目的

1.1　調査の背景

地球温暖化の対応が世界で求められる昨今、途上国における気候変動緩和策は、気候変動枠組条約（UNFCCC）第 15 回締約国会議（COP15）におけるコペンハーゲン合意以降、COP16 カンクン合意、COP17 ダーバン決定を経て、国別緩和行動計画（NAMA）の策定や温室効果ガスインベントリの作成、及び国別報告書に加えてそれらを国際的に報告する隔年更新報告（BUR）の作成を行うことなどが決定されている。そして COP17 では、2020 年以降にすべての国が参加する気候変動対策の法的枠組みについて 2015 年までを目途に議論を進めることが合意され、カンクン合意・ダーバン決定の実施のための作業計画が COP18 において合意された。他方、途上国における気候変動適応策は、マラケシュ合意に基づき後発開発途上国（LDC）において緊急性の高い適応ニーズに対応するための国家適応行動計画（NAPAs）が策定されてきたが、カンクン合意、ダーバン決定を経て、すべての国において中長期的な適応ニーズへの対応を国家開発計画等に主流化していくことを目的とした国家適応計画(NAPs)の検討が進められようとしている。

途上国における NAMA、NAPs 等の様式・内容は定まったものはなく、各国が個々の能力に応じた自主的な取り組みを行い、先進国が必要な支援を行うことが求められている。現在島嶼国地域等において、国別報告書（National Communications）や NAMA の基礎となる国家気候変動計画/戦略の策定が進められている。

かかる状況を踏まえ、島嶼国地域の開発途上国を対象として、国家開発計画/戦略と整合した NAMA や NAPs の策定及び実施に向けて、島嶼国開発途上国の能力強化を目的とした基礎情報収集・確認調査を行った。

1.2　調査の目的

本業務では、気候変動に関する国際交渉の状況を踏まえて、島嶼国開発途上国を対象として、各国における NAMA、NAPs の策定・検討および実施に関する情報を取りまとめ、各国における気候変動対策の推進にあたって必要な課題や能力強化について調査し、提言をまとめる。

調査の主な内容は、文献調査に加えて、対象国から気候変動対策の計画・実施に携わる担当官等を招聘し、セミナーを開催した。また、第 20 回気候変動対策枠組条約締約国会議（COP20）に参加し、島嶼国の関係者との対話・情報収集を行うと同時に、最新の気候変動国際交渉の状況を踏まえた提言を行った。

1.3　調査対象地域

太平洋地域、カリブ海地域、その他地域のうち、対象国は以下 21 ヶ国と 2 地域機関である。地域的な内訳として、太平洋地域 12 カ国、カリブ海地域 8 カ国、アフリカ地域 1 カ国を対象とした。

地域	国名
太平洋	クック諸島、フィジー、キリバス、マーシャル諸島、ナウル、パラオ、パプアニューギニア、サモア、ソロモン諸島、ツバル、バヌアツ、モルディブ
カリブ海	アンティグア・バーブーダ、バルバドス、ベリーズ、ドミニカ共和国、グレナダ、ガイアナ、セントルシア、トリニダード・トバゴ
アフリカ	カーボヴェルデ
その他	カリブ共同体気候変動センター（5Cs）、太平洋地域環境計画（SPREP）

1.4　調査内容

本調査は、国内調査として文献調査及びセミナーの開催、現地調査として COP20 での情報収集・意見交換等を実施した。調査の詳細は下記のとおりである。

(1)　文献調査

各国が UNFCCC に提出している国別報告書や、国家開発計画、国際機関・ドナーの資料・データ等をもとに、各国における気候変動対策（NAMA、NAPs の計画および実施状況を含む）についての現状を取りまとめた。

また、文献調査の結果は、セミナーにおける資料として、セミナー参加者に配布した。

(2)　セミナーの開催

セミナーについて対象国の政府関係者の招聘、セミナー開催に係る準備を貴機構と協議の上、実施した。対象国の政府関係者を招聘し、日本の有識者等を招き、気候変動対策の計画・実施に関するセミナーを開催、参加者間の意見交換や日本の知見の共有等を踏まえ、課題を整理し、能力向上策を検討した。

セミナー概要

日時：2014 年 7 月 2 日～4 日　3 日間（2 日間：会議、1 日間：現場見学）

場所：ホテル椿山荘

参加者：21 ヶ国から 21 名、2 地域機関から 2 名

(3)　COP20 への参加

COP20 に参加し、サイドイベント等の場において、島嶼国開発途上国の関係者との対話・情報収集を行った。本件業務の成果の結果概要をとりまとめ、国際交渉関係者、開発途上国政府関係者に対する情報発信等を行った。また、気候変動国際交渉・国際制度にかかる最新の情報を収集した。

第 2 章　文献調査

2.1　文献調査の目的

文献調査は下記の 2 テーマについて、情報を整理し、結果をとりまとめた。

1)　島嶼国の気候変動対策

各国が UNFCCC に提出している国別報告書や、国家開発計画、国際機関・ドナーの資料・データ等をもとに、各国における気候変動対策（NAMA、NAPs の計画および実施状況を含む）についての現状を取りまとめた。また、文献調査の結果は、セミナーにおける資料として参加者に配布した。

本調査の対象国である 21 カ国について、各国の LEDS、NAMA、NAPA 策定及び実施に関する文献分析及び関連用語の整理を行い、各国における LEDS、NAMA、NAPA の計画および実施についての現状を、下記に示す項目ごとに英語にて取りまとめた。

表 2-1　文献調査対象国及び主な調査項目

対象国	アンティグア・バーブーダ、バルバドス、ベリーズ、カーボヴェルデ、クック諸島、ドミニカ共和国、フィジー、グレナダ、ガイアナ、キリバス、モルディブ、マーシャル諸島、ナウル、パラオ、パプアニューギニア、セントルシア、サモア、ソロモン諸島、トリニダード・トバゴ、ツバル、バヌアツ
主な調査項目	- 国家開発計画 - 気候変動分野に関する制度及び組織概要 - 適応策及び緩和策に関する施策 - 気候変動に関する施策及び制度の整備状況 - GHG インベントリー - 緩和策に関する主要施策 - 適応策に関する主要施策 - 気候変動に関する主要プロジェクト

2)　日本の自治体の低炭素／持続可能な都市づくり

日本の地方自治体の低炭素／持続可能な都市づくりに向けた取組をレビューし、優良事例の抽出と知見の整理を行った。さらに、各国援助機関、国際機関、NGO 等が導入している適応能力評価手法、評価指標の事例、及び気候変動対策におけるジェンダー配慮の考え方・具体的事例を調査し、結果をとりまとめた。

文献調査の結果は添付資料 1 に整理している。

第 3 章　セミナーの開催

3.1　セミナー概要

2014 年 7 月 2 日から 3 日間、東京において「島嶼国向け気候変動政策対話」と題した国際会議を開催、太平洋・カリブ海地域の 21 ヵ国と 2 地域機関の気候変動交渉官及び日本政府関係者が、気候変動対策について議論を交わす場として実施した。本セミナーは、外務省及び国際協力機構（JICA）のほか、経済産業省，外務省，環境省から島嶼国に対し、日本の気候変動対策や支援について紹介するとともに，第 20 回国連気候変動枠組条約締約国会議（COP20）に向けた気候変動交渉に関する意見交換を行うことを目的として開催した。

セミナー参加国は、アンティグア・バーブーダ、バルバドス、ベリーズ、カーボヴェルデ、クック諸島、ドミニカ共和国、フィジー、グレナダ、ガイアナ、キリバス、モルディブ、マーシャル諸島、ナウル、パラオ、パプアニューギニア、セントルシア、サモア、ソロモン諸島、トリニダード・トバゴ、ツバル、バヌアツの 21 カ国と 5 Cs と SPREP の 2 地域機関である。

下記にセミナーの参加者を一覧に整理する。

表 3-1　島嶼国セミナー参加者

Antigua and Barbuda	
H.E. Ms. Diann Christine Black-Layne	Ambassador for Climate change
Barbados	
Mr. Mohammed Iqbal Degia	Senior Foreign Service officer, Ministry of Foreign Affairs and foreign Trade
Belize	
Ms. Ann Josephine Gordon	National Climate Change Coordinator, Ministry of Forestry, Fisheries and Sustainable Development
Republic of Cape Verde	
Mr. Carlos Fernandes Semedo	Director General
Cook Islands	
Ms. Anna Tiraa	Director, Climate Change Cook Islands, Office of the Prime Minister
Dominican Republic	
Mr. Omar Bolivar Ramirez Tejada	Executive Vice President of the National Council on Climate Change and the Clean Development Mechanism
Republic of Fiji	
Dr. Mahendra Kumar	Director for Climate Change, Ministry of Foreign Affairs and International Co-operation
Grenada	
Dr. Spencer Linus Joseph Thomas	Senior Negotiator
Republic of Guyana	
Mr. Andrew Ranji Bishop	Chief Negotiator
Republic of Kiribati	
Mr. Tutu Tekanene	Senior Assistant Secretary of the Office of the Beretitenti
Republic of Maldives	
Mr. Husny Mareer Mohamed	Assistant Director, Department of Climate Change and Energy, Ministry of Environment and Energy
Republic of the Marshall Islands	
Mr. Bruce Kijiner	Director, Office of Environmental Planning and Policy

	Coordination
Republic of Nauru	
Mr. Rennier Stanislaus Gadabu	AOSIS Attache, Mission of the Republic of Nauru to the United Nations
Republic of Palau	
Ms. Charlene Takako Mersai	National Environmental Planner/ Climate Change Coordinator, Office of Environmental Response& Coordination, Office of the President
Independent State of Papua New Guinea	
Ms. Rensie Xhira Bado Panda	Senior Policy Analyst and Focal Point International Climate Change Negotiations
Saint Lucia	
Ms. Annette Areatha Rattigan-Leo	Senior Officer
Independent State of Samoa	
Ms. Anne Rasmussen	Assistant Chief Executive Officer, GEF Negotiator for Climate Change
Solomon Islands	
Mr. Hudson Ata Kauhiona	Deputy Director, Climate Change Division, Ministry of Environment, Climate Change, Disaster Management and Meteorology
Republic of Trinidad and Tobago	
Ms. Rueanna Haynes	Second Secretary
Tuvalu	
Mr. Kiali Molu	Chief of Protocol, Ministry of Foreign Affiars, Trade, Tourism, Environment and Labour
Republic of Vanuatu	
Mr. Noel Lango	Political Advisor to the Minister for Climate Change Adaptation
Caribbean Community Climate Change Center(5Cs)	
Dr. Kenrick Redford Leslie	Executive Director,
Secretariat of the Pacific Regional Environment Programme(SPREP)	
Mr. David Albert Sheppard	Director General

また，セミナーの 2 日目には日本の先端的な環境技術を活用したスマートビルディング（緩和技術）や沿岸地域の防災設備である津波等の防波実験施設（適応技術）の視察等を行った。

3.2　セミナー報告

セミナーのアジェンダは下表に示すとおりである。セミナーは 1 日目及び 3 日目に島嶼国の気候変動交渉官と日本政府関係者等の協議を行い、2 日目に日本の最新省エネ技術を導入した事例と津波の実験施設見学を行った。

表 3-1　島嶼国政策対話アジェンダ

7 月 2 日（1 日目）	
Session 1	Climate Change - Preparation of national contributions of SIDS Adaptation in the new framework loss and damage -
Session 2	Current situation of Joint Crediting Mechanism (JCM) and future vision
Session 3	Japan’s development policy and activities on climate change in SIDS
7 月 3 日（2 日目）	
	Presentation on climate change by private companies: *Nihon Genryo Co.,Ltd, Blest.Co.Ltd., Komai Haltec Inc. and Hitachi, Ltd.*

Site visit 1	Visit to Central Research Institute of Electric Power Industry (CRIEPI)
Site visit 2	Visit to Mayekawa MFG. Co., Ltd.
Site visit 3	Visit to Tokyo Skytree
7 月 4 日（3 日目）	
Session 4	Open discussion with local government, private companies, NGO on cooperation approach between Japan and the SIDS in international negotiation
Session 5	NAMA workshop

3.3　セミナーまとめ

「島嶼国気候変動政策対話」における議事内容をセッション毎にまとめる。

1. 1 日目　（2014 年 7 月 2 日）
- オープニングリマーク：外務省　地球規模課題審議官　香川剛廣
- 挨拶：JICA 地球環境部　部長　不破雅実

プログラム	Session1: Climate Change - Preparation of national contributions of SIDS Adaptation in the new framework loss and damage -
議長	外務省　国際協力局参事官 南 博
発表者	1. Ambassador for Climate Change, Antigua and Barbuda, H.E. Ms. Diann Chiristine Black-Layne 2. Director, Office of Environmental Planning and Policy Coordination, Republic of the Marshall Islands, Mr. Bruce Kijiner 3. Senior Policy Analyst and Focal Point International Climate Change Negotiations, Independent States of Papua New Guinea, Ms. Rensie Xhira Bado Panda
発表内容	
1. アンティグア・バーブーダ - 気候変動の影響と求められる適応策 2. マーシャル諸島 - マーシャル諸島の約束草案(Intended Nationally Determined Contribution: INDC)への取り組み - INDC に適応策を取り入れる必要性 3. パプアニューギニア - パプアニューギニアにおける気候変動対策 (Vision 2050, the Development Strategic Plan 2010-2030, and the Medium Term Development Plan 2011-2015) - 気候変動対策として今後注力したい分野と日本の支援の必要性	
意見交換	
事前に招聘者に提示されていた Session1 の論点は以下のとおりである。 ✓ 小島嶼開発途上国（Small Island Developing States: SIDS）における INDC の国内準備はどのように始め、強化することができるか。それに対して先進国はどう支援できるか。 ✓ 2015 年合意において適応策はどう位置づけられるべきか。 ✓ UNFCCC の交渉において、「損失と被害」をどう扱うべきか。 上記論点及び 1~3 の発表をふまえ、各国参加者よりコメントが寄せられた。主要な意見を下記に記載する。 1. カリブ共同体気候変動センター（Caribbean Community Climate Change Center: 5Cs） - ハリケーンを含む異常気象の頻度は年々増加傾向であり、加えてアンティグア・バーブーダが指摘した損害保険の問題（現状では保険料は先進国と比較しても高い）は重要課題で	

ある。

2. ガイアナ
- INDC では緩和策が必須要素であるが､発展途上国に対して緩和策が望まれるのであれば、先進国からの支援が不可欠である。また、INDC には緩和策だけでなく適応策やそのために必要な技術移転等も含まれるべきである。
- 「損失と被害」に対してはアンティグア・バーブーダが主張するように、損害保険へのアクセスの改善が必要。
- 森林は CO2 吸収源という緩和策の側面、及び洪水対策等の適応策の側面（マングローブが適応策の好例）双方に貢献できる分野である。それゆえ 2015 年合意での REDD+の進展を望んでいる。
- 人口が少なく面積も狭い SIDS にとっては、地域協力によりクリティカルマスを達成することが重要である。

3. トリニダード・トバゴ
- 現在の INDC の定義には疑問（特に適応策の扱い）があるが、島嶼国は NAMA の背景のなかで INDC の準備をしている。日本の INDC への取り組みと気候変動サミットにおける声明発表の予定があるかどうかを教えてほしい。
  →【外務省】: 2014 年 9 月の気候変動サミットへの出席者やどのような声明を出せるかは現在議論中。なお、首相は 2014 年 7 月にカリブ海諸国を訪問予定であり、加えて 9 月にはサモアでの SIDS 会議に外務大臣が参加予定である。

4. 太平洋地域環境計画 (Secretariat of the Pacific Regional Environment Programme: SPREP)
- 異常気象は頻度だけでなく、その激しさも増していることは IPCC レポートでも強調されている
- 行政機関の能力向上（特に資金を受領し管理していく能力）が必要。クック諸島の財務制度改革が興味深い事例。
- SIDS 国際会議は 10 年に一度全ての島嶼国が参加するという点でユニークな機会である（第三回 SIDS 国際会議が 2014 年 9 月にサモアで開催予定)。それゆえ、これをどう戦略的に活用していくか、2015 年合意のことも含め議論すべきだろう。

5. グレナダ
- SIDS における適応策の実施手段は、SIDS の財政、能力向上、技術の観点から十分な検討が行われるべきである。特に財政面に関して言えば、ローンは既に負債を多く抱えているこの地域には不向きであると考える。

6. フィジー
- 島嶼国は国家規模が小さいことから保険等の問題でも誰も支援をしようとしない。資金の獲得を可能にするためにも国毎ではなく、島嶼国として結束することが必要。日本にも継続的な支援をお願いしたい。

7. サモア
- 2015 年合意に適応策を入れることを期待している。研究調査・政策策定・報告書作成だけでなく、適応策をプロジェクトとして現場で実施することが重要だと考える。

8. クック諸島
- 2012 年以降の近況を報告する。

I. Climate and disaster policy compatible development policy 2013-2016 を策定
II. NAMA の再生可能エネルギー分野については日本の PEC 基金の支援を受けて策定
III. INDC については限られた人的リソースを理由に 2016 年 3 月までの策定はかなり困難

IV. UNFCCC の第三次報告書は現在作成中

9. セントルシア
- INDC についてはまだ特に決定していないが、交通におけるエネルギー分野は記載されるだろう。中国からエネルギー分野への支援を受けており、複数のプロジェクトが現在も進行中である。

10. ソロモン諸島
- 電化率は 20%のため、再生可能エネルギー導入に可能性を感じている。

【JICA】：JICA としては災害リスク削減（Disaster Risk Reduction: DRR）への投資について話したい。現在 JICA では頻発する異常気象による長期的な経済成長への影響を考慮した経済予測モデルを作成している。既にパキスタンとホンジュラスのデータを活用しており、このモデルを島嶼国にも広げたいと考えている。そのためこの分野への投資の重要性について理解をしてほしい。

【議長】：全体の要約ではないが、下記の点に関していくつか私見を述べる。

INDC：SIDS が INDC に取り組むには限られた能力が制約となるため、先進国の支援が必要である。また、緩和策以外にも考えていく必要があると感じている。
適応策：2015 年合意に適応策をどう組み込みかはさらに議論が必要である。
資金：途上国が必要とする金額と先進国が支払える金額には大きなギャップがある。そこは依然として大きな課題である。
技術開発：個人的な考えとして、UNFCCC だけが気候変動問題の解決策だとは捉えていない。高効率石炭火力発電や CO2 回収貯留(Carbon Capture and Storage: CCS)のような先進技術を開発し、それを島嶼国含む途上国に輸出することもひとつの策になるはずである。
パリでの COP21 までの期間が気候変動対策にとって非常に重要であり、今回の政策対話を将来の交渉に向けた有意義なインプットの場にして頂きたい。

プログラム	Session2: Current situation of Joint Crediting Mechanism (JCM) and future vision
議長	外務省　国際協力局気候変動課　課長　田村 政美
発表者	1. 外務省　国際協力局気候変動課　課長　田村 政美 2. 経済産業省 地球環境連携・技術室 課長補佐　蓮沼 佳和 3. 環境省 市場メカニズム室　伊藤 貴輝 4. National Environmental Planner/ Climate Change Coordinator, Office of Environmental Response& Coordination, Office of the President, Republic of Palau, Ms. Charlene Takako Mersai 5. Assistant Director, Department of Climate Change and Energy, Ministry of Environment and Energy, Republic of Maldives, Mr. Husny Mareer Mohamed
発表内容	
1. 外務省 - JCM の概要 - JCM の今後の見通し（ロードマップ） 2. 経済産業省 - 経済産業省による具体的な JCM への取り組み 3. 環境省 - 環境省による具体的な JCM への取り組み 4. モルディブ - モルディブにおける JCM への取り組み 5. パラオ	

- パラオにおける JCM の進捗状況と今後の期待

意見交換

上記論点及び 1~5 の発表をふまえ、各国参加者より以下のコメントが寄せられた。主要な意見を下記に記載する。

1. ナウル
- JCM には期待しているが、一方で温暖化対策には世界全体の CO_2 排出量削減が必要であるため、日本国内での削減についてどう考えているのかを教えてほしい。
  →【外務省】: CO_2 削減コストを考えると日本国内よりも途上国の方が効率的に温暖化対策に貢献できる。一方で当然、日本国内においても固定価格買い取り制度や炭素税など様々なツールがあり、引き続き努力をしていく。

2. ガイアナ
- JCM によって認められた炭素クレジットの分配はどうなるのか。
  →【環境省】: MRV を経て認められた炭素クレジットは日本政府と相手国政府で構成されるプロジェクト参加者に発行されるが、その分配比率は当事者間で自由に決められる。環境省の事例では、事業の半分を環境省が補助金として支援しているため、炭素クレジットの少なくとも半分は日本政府側に、残りの分配はプロジェクト参加者に任せるという形式をとっている。
- 世界全体の CO_2 排出量削減の観点から、JCM における追加性の設計について伺いたい。
  →【環境省】: JCM の方法論では、「リファレンス排出量とプロジェクト排出量の差」が炭素クレジットになる。CDM では「BAU 排出量とプロジェクト排出量の差」であったが、JCM におけるレファレンス排出量は BAU 排出量よりも保守的に算定するため、JCM の方がより保守的な手法で算出しており、追加性の考えが制度の中に既に含まれているといえる。

3. カーボヴェルデ
- カーボヴェルデは 2015 年に 50%（現在 25%程度）、2030 年に 80%を再生可能エネルギーで賄うという野心的な目標を掲げており、その達成のためにも JCM には期待している。
  →【外務省】: カーボヴェルデでのビジネスに興味を持つ本邦企業を見つける必要があり、そのためにも本邦企業への情報発信が重要と考える。支援メニューは JCM に限らず様々あり、状況に応じて適切な支援方法を検討すべきである。

4. SPREP
- JCM の検証について説明してほしい。
  →【外務省】: 検証は指定運営組織 (Designated Operational Entity: DOE)もしくは ISO14065 認証機関の第三者機関が実施する。
- 2020 年以降の JCM の見通しを教えてほしい。
  →【外務省】そこについてはわからないというのが正直な回答。UNFCCC で合意されたことに基づき、それに矛盾しないかたちに JCM を適応させていく必要はあると考えている。

5. アンティグア・バーブーダ
- CDM は登録が複雑であることに加えて島嶼国は CO_2 排出量が少なく、それが登録の障害になっている。それゆえ JCM には高い関心があるが、締結国になるにはどのようなプロセスが必要なのか。
  →【外務省】: JCM の署名に至るまでには、二国間での協議、さらには COP や SB 開催期間中に複数の議論を持つこともある。一般的に署名までには複数の省庁が関わるため時間がかかることもある。しかし、日本政府はどの国とも簡単に署名できるわけではないことは認識してほしい。適切な低炭素技術を所有する本邦企業が当該国で事業を行うことによ

り、確実な CO2 排出量の削減を達成することが必要。

6. フィジー
- アジア開発銀行と日本政府との間で設置された信託基金「二国間クレジット制度日本基金」が島嶼国で活用される可能性を教えてほしい。
  →【環境省】: この基金は既存の ADB の融資プロジェクトに加え、低炭素技術導入に必要な追加融資を可能にする。現在このスキーム活用に関する技術ガイドラインが作成中であり、2014 年 7 月か 8 月に公開される予定であるため、それを参照されたい。

7. ソロモン諸島
- JCM の報告やモニタリングのガイドラインと UNFCCC や IPCC のガイドラインとの整合性はどうなっているのか。CDM は過去にひとつも登録できなかったが、社会経済的便益から JCM に期待している。
  →【環境省】: 日本は JCM の活用に関して、決定 19/CP18 に基づく共通様式を含む隔年報告書に記入して、国連に報告していく。

8. マーシャル諸島
- JCM による排出削減の長期的な予測モデルは存在するか。
  →【外務省】: JCM による成果（クレジット創出）はまだ明らかになっていないが、有望なプロジェクトがインドネシアやベトナムを中心に生まれてきている。特に省エネルギー分野は CDM では注目されていなかったが、本邦企業の強みであるため JCM では押し出したいと考えている。

【議長】：JCM は地球温暖化対策として可能性のあるオプションのひとつということは認識してほしい。

プログラム	Session3: Japan’s development policy and activities on climate change in SIDS
議長	国際協力機構(JICA)地球環境部　技術審議役　気候変動対策室長　森 尚樹
発表者	1. 外務省　国際協力局気候変動課　課長　田村 政美 2. JICA　地球環境部気候変動対策室 副室長　佐藤 一朗

発表内容

1. 外務省
- 地球温暖化対策への外務省の方針（ACE: Actions for Cool Earth）

2. JICA
- 島嶼国の気候変動適応策における JICA の役割
- 島嶼国における適応策に関連するプロジェクト

意見交換

JICA の佐藤氏から以下の論点が提示された。
✓ どのような支援が自国で必要か
✓ 適応策のプロジェクト実施にあたっての困難は何か
✓ 地域協力のメリットとデメリットは何か
✓ 援助機関協調の問題点は何かあるか

上記論点及び 1,2 の発表をふまえ、各国参加者よりコメントが寄せられた。主要な意見を下記に記載する。

1. サモア
- 直面した困難としては維持管理の問題が挙げられる。先進国から導入した高い技術レベルの機器/施設はプロジェクト終了後の維持管理で問題になることが多い。
  →【JICA】: 技術を選択する際、維持管理や操作が容易なものにすることを意識している。

また、JICA の支援メニューにある「フォローアップスキーム」では問題のある施設や機器を修理するサービスも提供している。

2. アンティグア・バーブーダ
- 適応策実施には資金が重要で、かつその資金提供先が信頼でき、期間が予測できる必要がある。島嶼国は過去の自然災害からの復旧に国家予算が費やされているのが現状であり、自国だけで適応策を実施する能力は限られている。

3. SPREP
- 全てとは言わないが、いくつかの分野において、地域協力は必要不可欠である（例えば廃棄物の国境を超える移動等）。JICA の J-PRISM はその好例である。
  →【JICA】: J-PRISM は太洋州 11 カ国で 13 年間に渡り廃棄物分野への支援が行われた。そこで得られた教訓を他の国と共有するため、講義やスタディーツアーを地域協力にて実施することが効率的かつ効果的であると考える。

また、以下の国からは日本に支援を望む具体的分野について言及があった。
アンティグア・バーブーダ：自然災害に強い配電網整備
モルディブ：食糧安全保障と海岸管理
パラオ：浸水による高台への住民移転（東日本大震災の経験の共有）
フィジー：自然災害リスク管理
ベリーズ：洪水のリスク評価やハザードマップの作成、それに基づく詳細な解決策の策定

その他、ソロモン諸島や 5Cs からは、援助機関の協調により相乗効果が生まれた事例も紹介され、地域協力とともに援助機関の協調の必要性も確認された。

【議長】: 計画に従った予測可能なアプローチ(Programmatic and Predictable approach)が重要であり、このアプローチに必要な 3 つの点を挙げる。

I. 気候変動の視点を開発政策に組み込むこと
国別適応計画(National Adaptation Plan: NAP)のような基礎となる政策が重要。
II. 制度設計
特に財務省が重要であり、ここに JICA の支援も可能であると考える。
III. 地域協力
島嶼国において地域協力は気候変動対策において効果的であり、今後のさらなる強化が必要。

2. 2 日目　（2014 年 7 月 3 日）

プログラム	Presentation on climate change by private companies
発表者 1	日本原料株式会社　海外事業部　係長　神田 修
発表内容	
- ろ過浄水装置製品（シフォンタンク、移動式シフォンタンク、シフォン無電源ろ過装置等）の紹介 - フィリピン（JICA：民間提案型普及・実証事業）、ラオス（JICA：環境プログラム無償 ODA プロジェクト、環境プログラム無償アイテム）、モザンビーク（外務省：平成 25 年度政府開発援助海外経済協力事業委託費による案件化調査）、ベトナム（JICA : ODA ノンプロジェクト無償アイテム）での導入実績	
発表者 2	株式会社　ブレスト　専務取締役　中島 清
発表内容	
- 廃プラスチック油化装置製品の紹介	

- パラオ、フィジー、サモアへの導入実績（外務省：平成２５年度外務省政府開発援助海外経済協力事業委託費による案件化調査）	
発表者 3	株式会社　駒井ハルテック　　環境事業部　企画マネージャー　豊田 玲子
発表内容	
- 中規模（300kW）風力発電システムの紹介 - 島嶼国への風力発電導入の可能性	
発表者 4	株式会社　日立製作所　インフラシステム社　産業プラント・ソリューション事業部　産業設備プロジェクト本部　産業設備プロジェクト推進部　課長 鈴木 浩二
発表内容	
- モルディブでの JCM 実現を見据えた海洋深層水多段利用システムの紹介 - リミックスウォーター（高効率水処理技術）の紹介 - ソーラー逆浸透膜(Reverse Osmosis: RO)システムの紹介とツバル、ナウル、パラオ、バヌアツへの太平洋環境共同体基金（Pacific Environment Community fund: PEC 基金）を通じた導入実績の紹介 - スマートグリッドプロジェクト	
意見交換	
上記 1~4 の発表をふまえ、各国参加者より以下のコメントが寄せられた。主要な意見を下記に記載する。 1. フィジー - 海洋温度差発電と海洋深層水多段利用システムは同様のコンセプトと技術であると考えるが、後者の強みは何か。 →【日立】: 海洋温度差発電の自社技術は保有していないが、この技術は途上段階であり、膨大な投資が求められるのが現状。現段階では海洋深層水を電力インフラとしてではなく冷房システムとして活用した方が現実的である。 - 輸送費等を考慮すると島嶼国への設置コストはどうなるか。 →【駒井ハルテック】：島嶼国への導入は日本より設置コストが 30-40%高くなる可能性がある。 2. マーシャル諸島 - 経済規模が小さく、地理的に孤立している島嶼国に導入可能な技術設計は行われているか。 →【日本原料】: 日本原料の製品は無電化地域に対応した装置や小規模な装置も提供している。また、飲料水を容器に入れて販売を行えば自国の経済に貢献できると考える。 →【日立】: ソーラーRO システムは小規模な国での導入に最適であり、強く推奨する。 3. パラオ - ある特定の本邦技術を JCM スキームを活用して導入したい場合、F/S 調査等を日本政府に依頼することは可能か。 →【外務省】: 基本的に国内で公募を行うが、もし特定の本邦企業に関心があるのであればその旨を日本大使館に伝えてほしい。その要望を経済産業省、環境省や外務省で協議することになる。 4. パプアニューギニア - 持続性の観点から、地元政府や中央政府から資金面の支援が何かあったかどうか、また、人的資源についてもお話を頂きたい。 →【日立】: 島嶼国では PEC 基金の支援を得てプロジェクトを実施したが、プロジェクトの中では技術者へのトレーニングを提供した。	

→【JICA】: JICA の持つ「技術協力プロジェクト」のスキームを活用し、現地技術者の人材育成にも取り組んでいる。

5. ナウル
- ナウルでは下水処理や廃棄物処理(難民キャンプがあるため)が大きな問題となっており、ブレストや日立のビジネスの大きな関心がある。

6. ソロモン諸島
- 100kW の風力発電などはあるか。300kW だと運搬面で問題が生じる可能性がある。
  →【駒井ハルテック】: 現在は 300kW しか存在しないが、3 つの 100kW よりも 300kW の方が高い発電効率になることは知ってもらいたい。

また、駒井ハルテックからは、島嶼国のようなアクセスが難しい地域に一度に営業ができるこのような場をより多く設けてほしい、という日本政府への要望が挙げられた。

【外務省】：紹介された本邦技術は実践的であり、既に多くの島嶼国で導入されていることに感銘を受けた。その背景にはいくつかの本邦企業が島嶼国の特殊な環境を理解していること、かつ、JCM 等の支援メニューを活用していることがあるのだろう。

プログラム	電力中央研究所　見学
発表者	一般財団法人電力中央研究所　副研究参事　筒井 國雄
見学内容	
- 5 m/s を超える高流速の流れや、2 m を超える高さの流れを作ることができ、陸上氾濫した津波を、実現象に近い規模で精緻にコントロールできる津波氾濫流水路施設の見学 - 長さ 200m、幅 3.4 m、深さ最大 6 m ある世界最大級の水路で、造波板と呼ばれる壁を動かして最大 2m の高さの波や津波を発生させる大型造波水路の見学	
プログラム	前川製作所　守谷工場見学
発表者	前川製作所　取締役　工場長　大喜多 昭夫 マネージャー　濱中 國雄
見学内容	
- 水産加工センターに導入された高効率冷凍機（省エネ、省電力、ノンフロン）の見学 - 冷凍機専門の最新機器で圧縮、熱交換、制御において最新の技術を結集した高効率の冷凍機の見学	
プログラム	東京スカイツリー見学
発表者	東武エネルギーマネジメント　取締役　技術部長　吉田 一夫
見学内容	
- 東京スカイツリーや東京スカイツリータウン、東京ソラマチなどの複合施設、周辺地域への熱供給を行う地域冷暖房の見学	

7. 3 日目（2014 年 7 月 4 日）

プログラム	Session 4: Open discussion with local government, private companies, NGO on cooperation approach between Japan and the SIDS in international negotiation
発表者	1. Executive Director, Caribbean Community Climate Change Centre, Mr. Kenrick R. Leslie 2. Director General, SPREP , Mr. David Sheppard
議長	外務省　国際協力局気候変動課　課長　田村 政美
参加者	UNDP 駐日代表事務所　次席代表　北川 洋 公益財団法人オイスカ　海外事業部　調査研究担当部長　長 宏行

	WWF ジャパン　気候変動・エネルギーグループ　リーダー　山岸 尚之 琉球大学　理学部海洋自然科学科講師　中村 崇 パシフィックコンサルタンツ株式会社　国際事業本部地球環境研究所所長　藤森 眞理子 日本原料株式会社　海外事業部　副部長　青島 幸紀 荏原冷熱システム株式会社　海外事業統括部　海外事業担当 GM　奥田 敏宏 株式会社前川製作所　グローバルコンボ販売センター　菅野 道孝

発表内容

1. 5Cs
- 5Cs の概要
- 今後の 5Cs の方向性

2. SPREP
- 気候変動と自然災害に対する SPREP の役割

意見交換

事前に招聘者に提示されていた論点は以下のとおりである。

✓ 国際機関、地域機関、NGO、シンクタンク、民間企業などのステークホルダーに期待されている役割は何か。どのようにしてこれらのネットワーク強化や連携促進をできるのか。
✓ 日本は SIDS への技術移転や技術開発、能力向上にどう貢献できるか。
✓ SIDS 支援のための官民連携を今後どう促進できるか。

上記論点及び 1, 2 の発表をふまえ、各国参加者よりコメントが寄せられた。主要な意見を下記に記載する。

1. グレナダ
- 地域協力を今後どう発展させられるかという視点は、民間企業の誘致を行う上で重要である。地域協力は規模の経済の実現に欠かせないと考える。

2. サモア
- SPREP は他の機関とも連携して気候変動に関する情報を一元管理/公開している。このような取り組みは、国際的な議論を加速させる上で重要である。
- 気候変動対策に関して様々なファイナンススキームが用意されているが、課題はその情報に直接アクセスできるように国の能力を高めることである。それにより間接費等を節約することができる。

3. WWF
- 島嶼国地域では、コミュニケーションが重要かつ大きな課題である。そしてコミュニケーションによって何か連携を生み出すには、お互いのニーズを共有することが必要である。
- 観光業について、SPREP から言及があったが、気候変動は観光業にただ悪影響であると考えるのではなく、観光業を通して気候変動の深刻さを訴えかけることと考える。そして問題意識を持った観光客が帰国後に気候変動に関する情報発信を行い、政府へ働きかけることが、ひとつの戦略になるのではと考える。

4. 5Cs
- 地域か国かという視点ではなく、その国のために何が最適なのかを考える必要がある。両者はトレードオフの関係ではない。

5. パシフィックコンサルタンツ
- 緩和策と適応策には民間企業の技術が活用できる可能性は高いが、現状として補助金等、現地政府の支援制度が十分とは言えない（パラオでの太陽光発電導入支援業務で経験）。

島嶼国の政府には民間企業が進出しやすい環境（法律、資金等）整備をお願いしたい。

6. パラオ
- 気候変動のトピックでは適応策や緩和策等が議論されているが、本質的なポイントは「どうやって自分たちが生き残っていくか」ということである。そのためには地域協力も重要だが、島嶼国においても財政や技術面等のレベルは様々であるため、二国間のレベルでその国の状況に合わせて議論を進める必要がある。
- 【パラオ大使館】: コミュニケーションの重要性がひとつのテーマになっているが、大使館もうまく活用してほしい。日本政府と相手国政府、日本政府と現地企業、NGO との間で情報共有する際に大使館も役に立てることがある。

7. SPREP
- 本邦企業による島嶼国への進出策として、各国が掲げる再生可能エネルギーロードマップから重要な箇所を抜き出し、本邦企業が関心を持つために公開したらよいのではないかと考える。

8. フィジー
- 2030 年までに再生可能エネルギーで 80%を賄うという国家目標を掲げており、JCM はその実現への有力な手法として捉えている。しかし、フィジーに進出している本邦企業はまだ限られており、さらなる官民連携及び政府・NGO 間の連携に期待したい。また、東日本大震災からの復興では島嶼国が学ぶことは多くあるはずであり、そうした経験もぜひ共有してもらいたい。
  →【外務省】: 第三回国連防災世界会議が 2015 年の 3 月に東北で行われる。ぜひそちらにも足を運んで頂きたい。

9. 琉球大学
- 島嶼国が気候変動対策に取り組む障害として「高い交通費」と「コミュニケーションインフラの不足」が挙げられる。後者はよりよい教育の機会にもつながるため、これらへの適切な解決策を見つける必要がある。

10. オイスカ
- 技術ではなくテクニックの重要性を紹介する。オイスカが指導する植林テクニックは低コストかつ導入が容易である。マングローブ植林と管理によって災害の被害を抑えたフィリピンの事例もある。適地選定や植林の初期段階では複雑な手順も確かにあるが、一度正しい手法が確立されるとその拡大手法はシンプルである。島嶼国地域のネットワークによってテクニックが広がることを望んでいる。

11. UNDP
- UNDP と SIDS の将来可能性のある協力分野を紹介する。

I. 適応策、緩和策の技術移転とそのための能力強化
II. 気候変動リスクに対応できる低炭素型社会構築による化石燃料への依存からの脱却
III. 気候変動関連分野（水、エネルギー、農林業、交通等）の開発計画に気候変動リスクの要素を組み込むこと
IV. 低炭素技術導入を促進する地域基盤の形成と、この分野へ投資する際の障壁を取り除くこと

プログラム	Session5: Nationally Appropriate Mitigation Action (NAMA) workshop
発表者	有限会社クライメート・エキスパーツ　代表　松尾 直樹
議長	国際協力機構(JICA)地球環境部　技術審議役　気候変動対策室長　森 尚樹
発表内容	

- NAMA の概要 - NAMA 活動の事例 - ワークショップでの論点、流れ
意見交換
松尾氏により、上記の説明がなされた後、各国の経済レベルによって分けられた 4 つのグループで NAMA に関する議論を行った。その後、最終的に各グループの代表者が発表を行った。以下に松尾氏から事前に提示された論点と大まかな議論の内容について記述する。 【論点】 1. NAMA として実施したい気候変動緩和策の分野 2. 想定されるステークホルダーと彼らを動機づける手法 3. NAMA 活動実施のためにあなたができること 4. NAMA 活動実施における障壁 5. 先進国に求める支援 ワークショップで議論された内容は以下の点に集約された。 1. 再生可能エネルギー（太陽光/水力/風力/バイオマス/地熱等）、省エネルギー、土地利用/土地利用変化及び林業部門等 2. 政府、民間企業、研究機関、援助機関、NGO、地域住民等 インセンティブを与える手法：税金、補助金、規制等 3. 制度設計や法律の制定（例：税制度、固定価格買い取り制度）、啓発活動 4. 資金の不足、技術と技術力の不足、省庁間連携の不足、民間企業にとってのインセンティブ欠如、物流網未整備 5. 財政的支援、適用可能な技術移転支援、民間企業を呼び込むための支援、JCM 方法論開発に関する支援（MRV 構築、ベースライン設定等）等

7 月 4 日午後：NAMA ワークショップ議事概要

プログラム	Session5: Nationally Appropriate Mitigation Action (NAMA) workshop
発表者	有限会社クライメート・エキスパーツ　代表　松尾 直樹
議長	国際協力機構(JICA)地球環境部　技術審議役　気候変動対策室長　森 尚樹
発表内容	
- NAMA の概要 - NAMA 活動の事例 - ワークショップでの論点、流れ	
意見交換	
松尾氏により、上記の説明がなされた後、各国の経済レベルによって分けられた 4 つのグループで NAMA に関する議論を行った。その後、最終的に各グループの代表者が発表を行った。以下に松尾氏から事前に提示された論点と大まかな議論の内容について記述する。 【ディスカッションの論点】 1. NAMA として自国で実施したい気候変動緩和策の分野 2. 想定されるステークホルダーと彼らを動機づける手法 3. NAMA 活動実施のためにあなたが（政策担当者として）できること 4. NAMA 活動実施における障壁 5. 先進国に求める支援とそのあり方	

23 参加国（太平洋・カリブ諸国 21 カ国及び地域団体 2 団体）を 4 グループに分け、各グループで上記の 5 つの論点に沿って協議を行い、グループ内の意見を取りまとめ、最後にグループ発表を行った。各グループの協議概要を下記にまとめる。

Group A	**カーボヴェルデ、フィジー（2 名）、ガイアナ、モルディブ、SPREP**
1. What type of climate mitigation action(s) you want to implement as a NAMA?	✓ 再生可能エネルギー（太陽光発電、風力発電、バイオマス発電、水力発電） ✓ 省エネルギー ✓ 政策・法律・ガバナンス構築・組織強化
2. Who is (are) the player(s)? How to incentivize the player(s)?	✓ 公共セクター ✓ 民間セクター ✓ 市民社会・地域住民 ✓ 研究機関 ✓ 援助機関 ✓ インセンティブを与える手法：税金、補助金、規制
3. What you can do for implementation/realization of the action?	✓ （援助機関など外部パートナー含め）官民連携を促すための法的手段 ✓ 政策立案、制度設計、法律制定
4. What barrier you are facing at?	✓ NAMA の活動は何なのかを政府レベル、住民レベルで十分明らかにできていない ✓ 技術的能力の不足 ✓ 財政的能力の不足 ✓ 省庁間連携の不足
5. What you expect developed countries to support and how?	✓ 財政的支援 ✓ 適用可能な技術導入支援 ✓ 技術的支援（特に MRV やそれに関するデータベース構築支援） ✓ 民間セクターを巻き込む（呼び込む）ための支援
グループ総括	気候変動分野として重要視されているセクターは再生可能エネルギーや省エネルギーに関するもので、NAMA プロジェクト実施の為に必要としていることは、MRV に関する技術支援（外部からのサポートが必要不可欠）や島嶼国でも導入可能な技術の導入支援という意見が主に挙げられた。

Group B	**アンティグア・バーブーダ、バルバドス、ドミニカ共和国、グレナダ、セントルシア、トリニダード・トバゴ**
1. What type of climate mitigation action(s) you want to implement as a NAMA?	✓ 再生可能エネルギー: 風力、太陽光、地熱等 ✓ 交通：電気、バイオ燃料、天然ガス ✓ 観光：省エネ、廃熱利用、バイオマス
2. Who is (are) the player(s)? How to incentivize the player(s)?	✓ 政府：資金の確保(補助金や税優遇制度の削減)、収入の増加 ✓ 民間：補助金、低金利資金調達、税優遇制度 ✓ ユーザー： 税控除、低金利資金調達、品質管理 ✓ NGOs：資金
3. What you can do for implementation/realization of the action?	✓ 環境整備： 基準、制度、政策 ✓ 目標設定 ✓ 教育、普及活動
4. What barrier you are facing at?	✓ 資金調達 ✓ 能力 ✓ 技術 ✓ 政治的な決定 ✓ 国家的な環境整備
5. What you expect developed countries to support and how?	✓ 資金調達：補助金、低金利貸付（0–1%）、資金援助を活用する為の環境整備 ✓ 調査支援： 事業計画を含む FS 調査、国家スマートグリッドの検討、ベースライン調査 ✓ 能力強化：研究機関の設立、NGO 職員の訓練、普及啓発

	✓　技術支援：持続可能な低コスト技術、小規模対応技術 ✓　技術開発を支援する連携促進（民民）
グループ総括	NAMA プロジェクトとして再生可能エネルギーが主要なテーマとして挙げられ、交通や観光セクターにおける再生エネ活用が議論された。求められる支援策として、資金援助や技術協力等が挙げられたが、制度構築等の国家的な環境整備についても必要であるとの意見があった。

Group C	**マーシャル諸島、パプアニューギニア（2 名）、サモア、ソロモン諸島、バヌアツ**
1. What type of climate mitigation action(s) you want to implement as a NAMA?	✓　海洋温度差発電及び水供給（マーシャル諸島） ✓　再生可能エネルギー技術（ソロモン、サモア） ✓　土地利用／REDD+（PNG）
2. Who is (are) the player(s)? How to incentivize the player(s)?	✓　官民連携 ✓　利用者 ✓　政府、民間、コミュニティ
3. What you can do for implementation/realization of the action?	✓　国家政策及び制度の改善 例：免税、長期金利　等
4. What barrier you are facing at?	✓　資金不足 ✓　民間に対するインセンティブ不足 ✓　事業規模が小さいこと ✓　適用技術が実証段階
5. What you expect developed countries to support and how?	✓　資金援助 ✓　技術協力 ✓　JCM に関する能力強化
グループ総括	エネルギーに関する課題が主なテーマとして挙げられており、事業化するための支援策としては資金援助、民間に対するインセンティブの付与に加え、小規模である島嶼国に適用可能技術の開発及び導入が主な課題として挙げられた。

Group D	**ベリーズ、クック諸島、ナウル、パラオ、ツバル、5Cs**
1. What type of climate mitigation action(s) you want to implement as a NAMA?	✓　再生可能エネルギー：水力、太陽光発電、バイオマス、地熱、風力 ✓　上記計画は国家開発計画と連動する必要がある
2. Who is (are) the player(s)? How to incentivize the player(s)?	✓　政府、事業主、民間、NAMA 担当部局、コミュニティ
3. What you can do for implementation/realization of the action?	✓　開発計画及びアクションプログラムの策定
4. What barrier you are facing at?	✓　NAMA と連携することへの能力不足 ✓　資金確保 ✓　政策
5. What you expect developed countries to support and how?	✓　資金援助 ✓　専門家の能力強化
グループ総括	再生可能エネルギーが主なテーマとして挙げられたが、どの分野を事業化するにしてもまずは国家開発計画でその必要性が定められ、事業が開発計画と連動するものでなければスムーズな事業化はなし得ないとの意見があった。求められる支援策としては資金援助、専門家の能力開発に加え、事業化を後押しする政策があげられた。

1 日目にオープニングリマークを行う外務省 地球規模課題審議官 香川剛廣氏

1 日目に挨拶を行う JICA 地球環境部部長 不破雅実氏

1 日目に行われた全体での集合写真

1 日目には 3 つのセッションを行い、気候変動対策における日本の支援と招聘国の取り組みについて情報交換を行った

1 日目に島嶼国における気候変動への適応策とそのための資金の重要性を訴える、アンティグア・バーブーダ気候変動大使　ダイアン・ブラック・レイン氏

2 日目の島嶼国の気候変動対策に資する技術を有する本邦企業 4 社による技術紹介（登壇者は株式会社ブレスト　専務取締役　中島清氏）

2 日目に訪れた電力中央研究所では、津波実験施設を視察した後、気候変動予測に関する研究成果紹介と意見交換が行われた

2 日目に訪れた東京スカイツリーでは、周辺地域への熱供給を行う地域冷暖房設備（DHC）を視察

3 日目に行われたセッション 5 で NAMA の概要を説明する、有限会社クライメート・エキスパーツ代表　松尾直樹氏

参加者は 4 つのグループにわかれて 5 つの課題について話し合い、グループで発表内容をとりまとめた

3 日目に行われたセッション 5 の NAMA ワークショップで議論した内容をグループ毎に発表した

3 日目に行われたセッション 5 でワークショップ後にコメントする JICA 地球環境部　技術審議役　気候変動対策室長　森尚樹氏（写真右）と副室長　佐藤一朗氏（写真左）

第 4 章　COP20 への参加

気候変動対策の国際枠組みなどについて話し合う「国連気候変動枠組条約 第 20 回締約国会議(COP20)」が、12 月 11～23 日に、ペルーのリマで開催された。

気候変動枠組条約締約国会議（COP）は、1992 年にブラジルのリオ・デ・ジャネイロで開催された国連地球サミットで採択された「気候変動枠組条約」の締約国が、温室効果ガスの排出量削減策を協議する会議である。

今回のリマ会議で、2020 年以降の新しい枠組み等につき参加国間で議論が交わされた。

4.1　COP20 参加対応

COP20 会議において、JICA はサイドイベント等や関係機関との会合への参加を通じて、気候変動分野の途上国支援の取り組みを紹介し、各国の関係者と意見交換を行った。

JICA が参加した主なイベント等を下記にまとめる。

Japan's Cooperation toward Forest Conservation in Peru

日　時：　2014 年 12 月 5 日（水）13:00-14:30
場　所：　日本パビリオン
主　催：　Japan International Cooperation Agency (JICA), Japan Aerospace Exploration Agency (JAXA), and International Tropical Timber Organization (ITTO)
目　的：　本イベントでは、ペルー国が制定した気候変動の緩和に向けた国家森林保全プログラム（PNCB）の概要が紹介されると共に、同国において長年、森林保全事業等で貢献するプレーヤー（JICA や ITTO 等）の活動が発表された。

本イベントでは、ペルー森林保全事業に係る JICA や ITTO の活動報告、ペルー環境省による森林保全プログラムの紹介が以下の通り行われた。

- 国際熱帯木材機関(ITTO) Dr. Ma Hwan Ok より、ITTO によるこれまでのペルーでの森林保全活動（REDD+）が紹介されると共に、REDD+実施における 4 つの戦略（①共有部の適切な環境利用、②自然資源管理のキャパビル、③持続的な住民生活の支援、④地域社会と国との間での戦略的な提携構築）の必要性が解説された。
- 国際協力機構(JICA) 五関氏より、JICA によるペルーでの森林保全での貢献。特に、技術協力の解説とその活動進捗が紹介された。
- 続いて、宇宙航空研究開発機構(JAXA) 塩見氏より、JAXA が有する陸域観測技術衛星 2 号だいち 2 号(ALOS-2)の紹介、ペルー森林域での ALOS-2 での利用事例として、森林・非森林部や地上バイオマスの識別等の分析結果が紹介された。
- JICA中南米部　竹内課長からは、コミュニティ森林資源の持続的な利用を通した経済活動支援の成果を適切に評価するために策定された、持続的な森林管理のための小規模ビジネスプロジェクト選定のためのガイドラインの紹介があった。
- 最後に、ペルー環境省のMr. Gustavo Suarez de Treitas Calmetより、気候変動の緩和に向けた国家森林保全プログラムPrograma Nacional de Conservación de Bosques para la Mitigación del Cambio Climático (PNCB)の概要等が紹介された。

JICAの今後における戦略資料としての所感

- ペルーではまだまだ森林保全支援が必要とされ、それを同政府も適切に認識し、それを実現させるための政策支援に着手している。このため、今後、ペルーにおける森林保全支援は有効であると共に、実施による効果の発現も期待される。
- JICA による支援として、ALOS-2 を活用した支援から、地域住民を巻き込んだ REDD+事業等、そしてこれら支援を適切に選定するためのガイドライン等、多岐にわたる支援が期待される。

【イベントスナップ】

The Latin American and Caribbean (LAC) Climate Finance Day
Session 3 : Mobilizing Private Capital: a Conversation with Development and Private Sector Banks

日　時：　2014 年 12 月 6 日（金）　13:00 ～ 14:00
場　所：　Swissotel Hotel
主　催：　World Resources Institute (WRI)
目　的：　World Resources Institute が主催するラテンアメリカ及びカリブ海諸国（LAC）における気候変動ファイナンス・デイのうち、セッション 3 では開発と民間セクター資本に係る有識者が民間資本投入の在り方につき個人の経験や議論が行われた。

本イベントでは、LAC での気候変動ファイナンスに係る有識者からのコメントや知見が発表された。以下に参加パネリストの発言の一部を示す。

- バンコロンビア銀行 Ms. Ocampo より、所属する同銀行はコロンビア最大手の商業銀行であり、その役割として民間企業支援を考慮すること等を常に考えているとの発言があった。また、気候変動という事象を詳しく理解することから投資検討を行い、リスクマネジメントを行っているというアプローチの紹介があった。
- COFIDE Mr. Carlos より、これまでに担当した天然ガス開発に係る投資事例の紹介に加え、COFIDE の実績として、技術革新を促すファイナンス、投資案件の最終形（天然ガスであればユーザーまでの配給等）をイメージするような全体工程の把握が重要であるとのコメントがあった。また、society inclusion を考慮することが必要であるとも。
- IDB Ms. Maria より、民間資本の支援に関して、リスクマネジメント、アソシエーション等について、プロジェクト関係者間で共有すると共に、具体的なビジネスの詳しく調べ、

事業実施すべきであるとのコメントがあった。

JICA の今後における戦略資料としての所感

本イベントへの参加に伴い、次のコメントが貴機構の今後の活動に係り有用と判断している。

- ファイナンスにリスクは付き物であるが、民間資本は特にリスクに敏感である。そのため、ダメージを最小限にすることが重要であり、その点を国際協力の視点で補うことが有効である。
- ファイナンスに係るポリシーや基本原理を明確にしておくことが重要である。
- ファイナンスを成功させるために資本投資に対するインパクトを正確に認識すること。

LAC における開発支援を目指すドナーや銀行では、不確定要素の多い気候変動関連事業へのファイナンスに対し、明確な方針や方向性を有している点を強く感じた。そして、このような姿勢が成功する第一歩になると感じた。また、各自が組織の立場や役割を明確に認識し、開発のために尽力している姿勢が印象的であった。

【参考】セッション 3 の講談者は、以下の通り。

[モデレータ]

Mr. Aman Srivastava : Research Analyst, World Resources Institute

[パネリスト]

Ms. Maria Netto : Project Team Leader, Inter-American Development Bank

Mr. Carlos Paredes : Chief of Corporate Business, Infrastructure, and Environment, COFIDE

Ms. Ursula Sola de Hinestrosa : Presidential Adiviser, Findeter

Ms. Beatriz Ocampo : Manager, Environmental Sustainability, Bancolombia

Geothermal Development Facility (GDF) for Latin America – Launch at COP20 in Lima

日　時：　2014 年 12 月 8 日（月）　10:30 ～ 12:30
場　所：　EU パビリオン
主　催：　KfW Development Bank
目　的：　本イベントは、中南米における地熱発電に係る支援をどのように行って行くべきかと題したセミナーであると共に、Geothermal Development Facility (GDF)の発足イベントでもあった。当該セミナーを通じ、今後、中南米における地熱発電事業の実施拡大を目指す。

- マルチドナーによる再生可能エネルギーとしての地熱開発を促進させるための Geothermal Development Facility (GDF)の発足イベントとして、JICA, IDB, KfW 等といったドナーからのステートメントの発表等が行われた。発表者リスト等は後述プログラムを参照のこと。
- GDF は地熱開発に係るリスク軽減手段として 7,500 万 USD（無償ベース）、LAC において 10 件の地熱事業資金として 10 億 USD のファイナンスを準備するとのこと。これらにより GDF は 200 万人規模へ 350MW の地熱による電力供給を目指す。
- GDF の活動スキームイメージは下図のようにまとめられる。

JICA の今後における戦略資料としての所感

- GDF の発足は、地中エネルギーを利用する、言い換えれば開発リスクの高い地熱発電事業を民間レベルでも比較的実行し易くさせる土台作りに大きく貢献するものと期待される。今後、地熱発電の需要の増加と共に、このような官民をつなぐ組織の存在は重要であり、ここでのプレゼンスが地熱発電開発セクターのプレゼンスと一致することも期待されるため、今後も持続的なウォッチが必要と感じている。

【イベントスナップ】

イベント風景

NAP Global Network – Launch of the NAP Global Network -

日　時：　2014 年 12 月 8 日（月）　15:00 ～ 16:00
場　所：　ペルーパビリオン
主　催：　Peruvian Pavilion
目　的：　本イベントは、途上国の国レベルの適応に関する情報の交換や学習の促進、リーダーシップの強化、二国間開発機関間の調整・協力の改善を通じて、NAP プロセスの二国間支援を強化することにある、NAP Global Network の発足式として開催された。

広報資料として

- 日本、ペルー、米国、ドイツ、フィリピン、トーゴ、英国、ジャマイカの参加にて設立される NAP グローバルネットワークの発足に関して、各国代表者の挨拶等が行われた。COP20 開催国ペルーの Manuel Pulgar-Vidal 環境大臣が参加するということもあり、イベント会場には多くの報道関係者が押し寄せていた。
- 日本からは関環境省地球環境審議官が参加。本ネットワークへの参加を歓迎すると共に、インドネシアにて GIZ 及び ADB と実施している NAP 活動を紹介した。
- フィリピン・Sering 気候変動委員会委員長より、昨年フィリピンが受けた台風被害を教訓とし、同国内において適応策の重要性を認識し、法制度に盛り込んでいる実情が紹介された。

JICA の今後における戦略資料としての所感

- 適応策に係る国際的なネットワークは、従来型のインフラ開発との橋渡しという役割を担う意味からも、今後、増えて行くものと考えられる。そして、それらネットワークをどのように利用、活用するのかということ、ドナーの立場からすればそのようなネットワークを介して、ドナーとしてのプレゼンスをどのように示すのかが重要と感じている。
- フィリピン代表者の発言にもある通り、昨年度の台風被害を迅速に対処するようなことが、適応策として今後求められると考えられる。そのため、従来の ODA スキームでは追いつかないスピード感を持った対応を求められることが予想されるため、その点への適切な方針や対応支援を検討しておくことが必要であると感じている。

【参考】本イベントの講談者は、以下の通り。

Mr. Manuel Pulgar-Vidal, Minister of Environment, Peru

Special Envoy Todd Stern, Special Envoy for Climate Change, United States

Mr. Robert Pickergill, Minister of Water, Land, Environment and Climate Change, Jamaica

Dr. Gerd Muller, Federal Minister of Economic Cooperation and Development, German

Mr. Boundjouw Sama, Secretary General of the Ministry of the Environment and Forest Resources, Togo

Mr. Soichiro Seki, Vice Minister for Global Environment, Ministry of the Environment, Japan

Ms. Lucile Sering, Secretary of the Climate Change commission, Philippines

【イベントスナップ】

パネリスト

イベント風景

Integrated Climate Risk Management - A climate resilience documentary followed by country success stories -

日　時：　2014 年 12 月 9 日（月）　20:00 ～ 22:00
場　所：　Mountain and Water Pavilion , at the public area of the COP20 Jockey Club
主　催：　World Resources institute
目　的：　本イベントは、気候変動リスク管理に係る各国の成功事例を情報共有する目的で開催された。

広報資料として

気候変動リスク管理に係る各組織の活動や研究成果が発表された。

- 冒頭、Delta Electronics Foundation が行っている、台湾の山岳地域におけるゼロエミッションスクールへの活動をビデオにて紹介された。その後、Ms. Angela Yeh より、同スクールが災害用シェルターとしての機能を有していることや、同活動が環境教育の拠点として貢献していること等が追加説明された。
- WRI より、洪水分析に関して同組織が開発した Aqueduct Global Map 2.0 の紹介、4 年間に及ぶプロジェクトの成果等が紹介された。
- JICA 大槻参事役より、Making a Case for Investments in Disaster Risk Reduction の説明が行われた。災害リスクの軽減として、JICA では予測や事前投資による対応が重要であることが指摘され、JICA にて開発された分析モデル（DR^2AD model）の紹介、キルギスタンやタジキスタンでのケーススタディの結果が紹介された。
-

JICA の今後における戦略資料としての所感

- 気候変動リスク管理は、これまで分析や調査研究が目立っていた。しかしながら、第三者へのアピールや波及効果を考慮すると、本イベントにおける Delta Electronics Foundation のような民間企業による支援は効果的であると感じている。今後、このような取り組みを行う枠組み作りも一つの適応策の在り方として考えられるものと期待される。
- 今回、JICA 大槻参事役が発表された、気候変動リスクに対する予測や事前投資分析の知見は有用であると感じている。そして、このような成果を上記 Delta 社の活動のように効果的に実現させることが今後の課題であると感じている。

【イベントスナップ】

イベント風景

Sharing Experience and Knowledge on Adaptation – Pre-Forum on Global Adaptation Network

日　時：　2014 年 12 月 10 日（水）　13:00 ～ 14:30
場　所：　日本パビリオン
主　催：　日本・環境省
目　的：　本イベントは、GAN 発足を前提とした適応策に対する JICA、GIZ、UNDP、コロンビア環境省、ANP 関係者等のこれまでにおける適応策での実績や情報共有を目的として開催された。

■　アジェンダ（講演者名を含む。敬称略）

- Ms. Ermira Fida, GEF [Moderator]
- Mr. Soichiro Seki, Ministry of the Environment, Japan
- Mr. Naoki Mori, JICA
- Mr. Christoph Feldotter, GIZ
- Dreep Kurukulasuriya, UNEP-GEF
- Ms. Mariana Rojas-Laserna, Ministry of Environment and Sustainable Development, Colombia
- Dr. Saleemul Huq ICCCAD and Asia-Pacific Adaptation Network

■　発表・議事の概要

■　オープニングリマークスとして、環境省・関地球環境審議官より、日本の適応計画、アジア太平洋地球変動研究ネットワーク（APN）、GAN に係る説明等が行われた。

■　その後、JICA・森気候変動室長より、JICA が手掛けているインドネシアでの適応策キャパシティデベロップメント事業の紹介が行われ、ガバナンス、利害関係者の参加、地域特性等を踏まえた柔軟な対応等が重要である旨の報告があった。

■　その後、GIZ、UNDP、コロンビア環境省、ANP 関係者等のこれまでにおける適応策での実績や情報共有が行われた。

■　イベント風景

パネリスト

関地球環境審議官

JICA 森室長

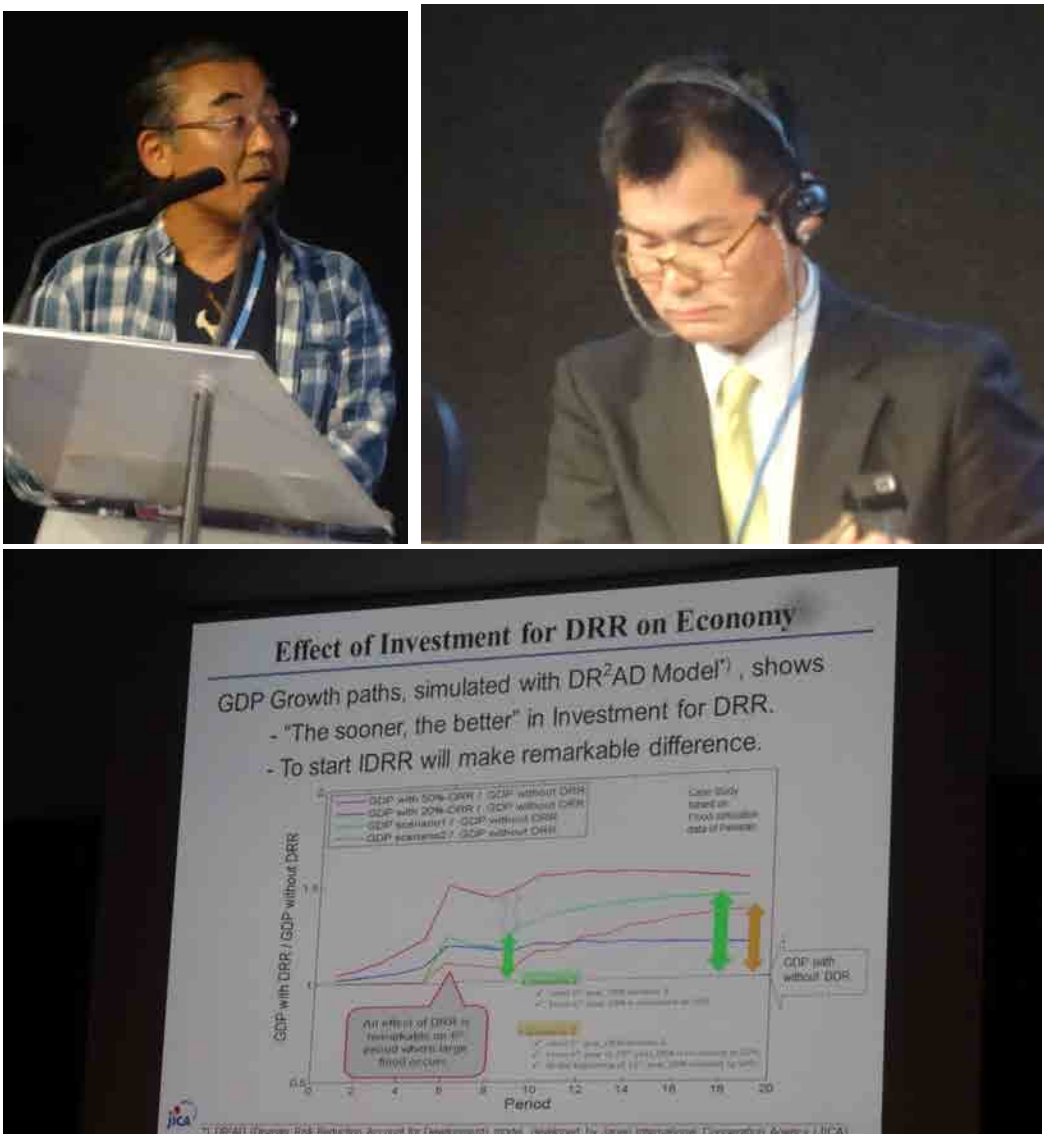
GIZ Mr. Christoph Feldotter

Integrated Climate Risk Management for a Resilient World

日　時：　2014 年 12 月 11 日（木）　11:30–13:00
場　所：　Sipan 300
主　催：　Delta Electronics Foundation, Taiwan; the Governments of the Netherlands, Tuvalu, Germany, Switzerland and Japan; Mountain and Glacier Protection Organization (MGPO), Pakistan; Munich Re; the World Bank Group; the World Resources Institute (WRI); and ZOI Environment, Switzerland
テーマ：　Integrated Climate Risk Management for a Resilient World
目　的：　本イベントは、気候変動リスクに係る脆弱性を議論するため、各国の知見やこれまでの支援状況を共有する目的で開催された。

資料として

- Integrated Climate Risk Management (ICRM)に関するサイドイベント．官，民，NGO，調査機関によるそれぞれの活動などが紹介された．
- オランダ（と WRI）はその水との長い闘いの歴史に裏打ちされた取組と，そのひとつの成果としての洪水リスク評価ツール Aqueduct Flood Analyzer の紹介を行い，それが政策担当者が適応対策を行う上でかなり強力な評価ツールとなることを示した．
- 民間企業である Delta Electronics は，台湾での気象災害に対処する災害シェルターの取組を土着の人たちの学校の再建という形で紹介した．
- JICA の支援を受けた NGO Tuvalu Overview の遠藤氏は，ツバルでのマングローブ植林活動を通じた取組を紹介した．
- ボリビアは，自国の legally-binding resilience frameworks としての ICRM の経験について語り，国の計画に内包させることの重要性を説いた．
- JICA の大槻氏は，Disaster Risk Reduction の投資の考え方として，できるだけ早く... というアプローチが望ましく，早期に始めることによってその効果に明確な差異が出ることを，DR^2AD モデルを使って，データが語っていると紹介した．
- プレゼンテーションの後，パネルディスカッションが行われ，大槻氏などが，災害が起きる前の「備え」の重要性を強調し，そのための知識やデータ収集，人的資源開発の重要性がシェアされた．



JICA の今後における戦略資料としての所感

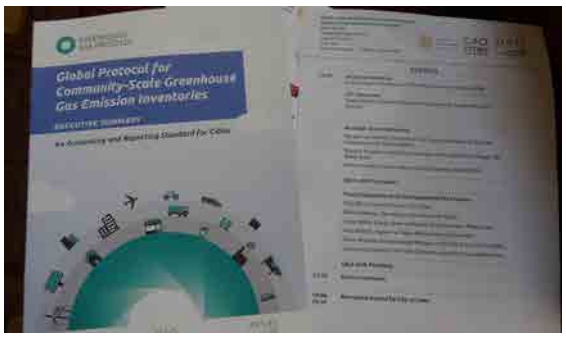
- 国際交渉において，また気候ファイナンス面で，ますます適応やロス＆ダメージの重要性の比率が高まってくる中，災害が起きる前に，それに備える... という点を重視することは，コスト効果性という点でも重要である．
- JICA はペルーやフィリピンでの取組においても，効果的な取組のエッセンスをホスト国とシェアする形で蓄積している．3 月の仙台での会議に続き，来年のパリ COP21 会議に向けて，いっしょにやってきた途上国と一緒に，その経験を活かすグローバルな仕組みの提案ができると，日本にとっても非常に大きな貢献と交渉のアドバンテージを得ることができよう．

Launch of the Global Protocol for Community-Scale Greenhouse Gas Emission Inventories (GPC)

日　時：　2014 年 12 月 8 日（月）　16:00–17:30
場　所：　Lima City Hall
主　催：　WRI, C40 Cities, ICLEI
目　的：　本イベントは、企業の GHG 排出インベントリーを標準化する GHP Protocol の都市バージョンに係るキックオフイベントとして開催された。

資料として

- 企業の GHG 排出インベントリーを標準化する GHP Protocol の都市バージョンのローンチイベント.
- 気候変動緩和の世界は，まずどこからどれだけの GHG が出ているかを把握するというところから始まることが多い．国レベルは IPCC がガイドラインを整備し，京都議定書で先進国は厳しい MRV システムが整備された. 企業に関しても早い段階から WRI が WBCSD などと協同して，概念整理や標準化を進めてきた．今回は，その都市バージョン GPC が整備されたということになる.
- WRI の会長 Steer 氏は，都市は効率化を進めるべきで，GHG はそのプロキシとしての意味があると述べ，イベントの開会を宣言した.
-



- 担当した WRI の Bhatia 氏は，GPC の説明を行った．途上国での都市への人口や経済活動の集中といった背景を踏まえ，標準化された GHG インベントリーガイドラインの必要性，プロトタイプに対する 35 都市の試用などによる改良などを踏まえた整備の経緯が説明された.
- そして都市の首長のイニシアティブを背景に，このツールが有効に活用されることを期待した.
- その後，東京都を含めた関係者たちによるパネルディスカッションが行われた.
-

JICA の今後における戦略資料としての所感

- 都市のこのような試みは，キックオフとして歓迎されるものであり，首長のイニシアティブがあれば，ある程度，動いてくると想定される.
- ただ，「効率化のプロキシ」に本当になるか？正確に言うとどう GHG インベントリーを活用するか？という点が，現段階ではまだ不十分であり，うまく次のプロセスを立ち上げなければ，結局数字を作っただけで，「役に立たない」ツールに終わる可能性がある．通常の都市自治体の業務において，GHG 排出量を把握したところで，それが次に繋がる必然性はない.

- 下のスライドは，Low Carbon Planning Process として説明されたもので，GHG インベントリーはその最初のステップに過ぎない．それをいかにして第 2 ステップ以降につなげ，PDCA サイクルを回すようにできるか？この点の「ツール」を用意し，パッケージにしてはじめて，意味が出てくる．
- JICA も，この点を（国や都市といったカテゴリーに関係なく）GHG インベントリー作成サポート技術協力において，組み込むことをすべきであろう．逆に，そのための「ツール」開発や，Good Practices の経験シェアが本当に望まれているものと思われる．

NAMA Day

日　時：　2014 年 12 月 6 日（土）　10:00–12:00
場　所：　Room Chivan
主　催：　UNFCCC Secretariat
目　的：　本イベントでは、近年途上国において議論が進められている NAMA に係る各国政策決定者、研究者、その他ステークホルダーとの意見交換の場として実施された。

資料として

- UNFCCC 事務局の行った最初の NAMA に関する大きなイベント
- UNFCCC 事務局長 Cristiana Figueres, COP 議長 Manual Pulgar-Vidal，コロンビア環境省気候変動局長の Rodrigo Suárez Castaño が最初の議論を行った．
- COP 議長は，NAMA のポイントとして，包括的なプランニングの必要性，その国の振る舞いがよくなっていくことに関する信頼性構築，ガバナンスに関する多部門・多利害関係者・多層的計画アプローチを可能とすること，実際のアクションに結びつけるメカニズムであることを強調した．そして，環境部門以外の参加（そのための分かりやすい言葉）が重要であると述べた．
- UNFCCC 事務局長は，フィリピンの Typhoon Hagupit を挙げ，緩和，適応・災害リスク対策の喫緊性を主張した．NAMA に関しては，オーバーオールな開発計画策定・実行プロセスへ埋め込むことが大切であると述べた．そして，いまわれわれは，CDM PoAs→NAMAs→INDCs と，着実に，スケーリングアッププロセスの中にいることを強調した．
- コロンビア気候変動局長は，まず現状と将来の排出量について知ることが重要で，コロンビアの低炭素開発戦略が都市と生産の持続可能性，そしてエネルギーへの公平なアクセスに立脚していると述べた．
- その後，パネルディスカッションとして，KfW, Climate Change Capital (CCC), AfDB, CAF による NAMA ファイナンシングの議論があった. その中で特に CCC の Martin Schoenberg は，民間資金のてこ入れに関して，気候変動ファイナンスで用いられてきたプロジェクトファイナンスは，ボンドや equity finance といった中心的なファイナンスシステムにとって魅力的でなかったと述べ，小さい活動を集め工業スケールにまで拡大することの必要性を説いた．

- その他，NAMA Facility, エクアドル，チリ，ペルー，タイ，ウガンダ，ウルグアイ，ルワンダ，コスタリカ，レバノンによるパネルディスカッションが続いた．UK とドイツの NAMA Facility は, 最初の NAMA 専用の実施のためのファンドとしての, transfor- mational change をもたらすような活動のための選択クライテリアを紹介した．
- 会場では，多くの国の NAMA に関連する活動（支援する側，される側の双方）のポスターが貼られ，興味深いものもいくつか散見された．

JICA の今後における戦略資料としての所感

- コロンビアは，おそらく NAMA に関してもっとも進んだ取組を行っており，Good Practice として他国の参考になる．逆に，JICA としても，その調査を行って，NAMA サポートのレッスンとすべきであろう．
- COP プレジデントの「気候変動以外の部署の参画の方法論」，フィゲーレス事務局長の「CDM PoAs→NAMAs→INDCs」の指摘は，重要である．そのような戦略性を持って，JICA も NAMA 支援を考えるべきであろう．
- 最後のラウンドテーブルで，議長の Sudhir Sharma (UNEP DTU Partnership)が，JICA スタッフを探していた．おそらく壇上で議論に参加することを求めたかったものと想定される．JICA が何をやっているか，だけでなく，どうすればより有効に NAMA を形成できるか？という「議論」に積極的に参加することが望ましい．

第 5 章　島嶼国における気候変動対策の推進に係る提言

本業務では、島嶼国向け気候変動政策対話の際、貴機構主催による NAMA ワークショップを開催した。

通常、気候変動問題に関して、島嶼国は、被害者側の視点から、脆弱性や適応策が前面に出された議論を展開することが多い。そのため、今回の NAMA ワークショップでは、緩和策が、「GHG 削減以外の」ローカルな便益をもたらす開発政策･活動であることを強調し、どのようにそれを自国のイニシアティブとして有効に実施していけるか？そして不足している点につきどのように先進国から支援してもらうか？という視点のディスカッションを行った。

これにより、ワークショップが将来への対応や協調という方向性を持ち、有意義な議論や意見発表の場となると共に、島嶼国側の考え方やニーズを把握する上で貴重な機会となった。また、ワークショップで確認した島嶼国の関心分野として、資源がないことを反映した再生可能エネルギーや省エネルギー、主要収入源を反映した観光などが関心の高い分野として挙げられた。

そして、貴機構に対するニーズとして、特に技術協力分野で、これまでの気候変動業務以外の知見を活かしながら、NAMA 実施に向けた支援の必要性が確認された。これについて、今後、具体的な支援内容に応じて、貴機構地域部や課題部への参加要請等が必要とも考えられる。今後、NAMA の在り方やデザインの方法に対して、当事者間にて議論することが必要である。加えて、今後、本ワークショップに類似した活動を行うにあたり、以下の点につき検討することが有効であると考えている。

- 参加者各自の立場や知見を踏まえた上での NAMA アイデアの策定：
  気候変動緩和策は、実施される国や制度、立場により、実施内容や MRV 方法、利用するデータ等が大きく異なる。そのため、様々な立場や考えの存在、理論構築を事前に把握することは、今後、NAMA 構築を行う上で有用であると考えられる。勿論、NAMA は色々な分野で実施できることから、時間の許す限り、複数のテーマを持ち、参加者が色々と議論に参加することが必要である。

- NAMA 支援案に係る協議の実施：
  効果的に NAMA を実施するため、現在、当該国で利用できるもの（再生可能エネルギーの FIT 等）を広く確認するためのアプローチにつき、ワークショップ参加者の知見を持ちより議論、情報交換する。これにより、各国、各分野における様々な NAMA のアプローチや計画策定に対するノウハウを吸収する機会とする。また、NAMA における MRV 方法について、政府から民間企業までどのように対応しているのかという点についても情報交換する。

- NAMA 実施に係る国際機関等との協議の実施：
  NAMA の計画立案から実施までに係る各種作業や調査に対する先進国からのサポートの具体策（たとえば技術協力のやり方）につき、議論する。議論内容は島嶼国側の一方的な要請とするのではなく、国際機関側の立場や支援方針を踏まえることに着目し、NAMA 実施に向けた実際的な対応を体得する機会とする。そのため、ドナー側の反応や考え方を理解するため、貴機構や外務省等のスタッフにも議論に参加頂くことを想定する。

以上、上記ポイントを今後の NAMA に係る支援や準備において実施することは、その後の大きな軌道修正等を未然に防ぐ機会になるものと思われるため、検討、実施することが望ましいと考えている。

添付資料 1

文献調査

01 ; Antigua and Barbuda

1 : Basic Information and Key Indicators

Capital	St. John's
Area :	442 [km^2]
Population	91,000 (2012)
GNI, per capita	USD 12,480 (2012)

Source: Basic data. Regional affairs, Ministry of Foreign Affairs of Japan

2 : Summary on climate change related issues in the country

1) Climate change policy and national efforts/measures against climate change

Antigua and Barbuda ratified the United Nations Framework Convention on Climate Change (UNFCCC) on 2nd February 1993 and the Kyoto Protocol on 28th October 1998. It submitted its Initial National Communications (INC) on 10th September 2001 and Second National Communications (SNC) on 29th September 2011.
Policies, regulations and plans related climate changes in Antigua and Barbnda are shown in below.

Table 1. Policies, regulations and plans related climate change

Day	Relevant Policies and Decrees	Contents
September 2001	Antigua and Barbuda's Initial National Communications on Climate Change (INC)	INC constitutes one output of the programme of Enabling Activities being implemented by the Government of Antigua and Barbuda through the Office of the Prime Minister.
May 2010	Nationally appropriate mitigation actions (NAMA)	NAMA presented mitigation actions of Antigua and Barbuda in its document.
September 2011	Antigua and Barbuda's Second National Communications (SNC)	SNC reflects the current climate change situation impacting Antigua and Barbuda and its projected impact in the future. It also details the impact climate change will have on climate dependent and climate sensitive economic sectors.

Source : JICA Study Team prepared based on the SNC.

2) Institutional Arrangements

Institutional Arrangements for the climate change are no information in any other documents.

3 :Sustainable Development and Mitigation

1) National inventory of Greenhouse Gas (GHG)

Antigua and Barbuda has completely prepared its initial national greenhouse gas inventory and presented in its Second National Commnnication on Climate Change to the UNFCCC in 2011. GHG inventory by sector in 2000 is in Table 2.

Table 2. GHG emission by sector (2000)

Sector	$CO_{2\ emission}$	CH_4	N_2O
Energy (Reference Approach)	412		
Energy (Sectoral Approach)	371	0	0.003
Energy (Fuel Combustion)	371	0	0.003
Energy (Fugitive Emissions from fuels)	0	0	
Industrial Processes	0	0.0	0.000
Solvent and Other Product Use	0		0.000
Agriculture		1.1	0.152
Land-Use change and forestry	11	0.0	0.000
Waste		5.4	0.004
International Bunkers	199	0.0	0.000
Aviation	199	0	0.006
Total	**383**	**6.6**	**0.159**

Unit: (Gg / year)
Source: Second National Communication

2) Summary of Nationally Appropriate Mitigation Action (NAMA) plan

National Appropriate Mitigation Action (NAMA) is provided 31st May, 2010. GHG emission reduction goal is set as 25% below 1990 levels by 2020.
Antigua and Barbuda's mitigation measnres include both demand and transformation initiatives that is identified in SNC. Successful implementation of the mitigation measures will depend on several factors including the following;

- Implementing a public edncation programme to increase awareness and encourage energy conservation in the public and private sectors and in the general public.
- Stronger institutional capacities in the energy and environment sectors
- Legislative changes to allow net metering and electricity pricing mechanisms to promote alternate energy source.
- Development of programmes designed to influence market behavior towards more efficient use in energy across all sector.
- Development of mechanisms to efficiently share energy related information and for public and private sector entities to collaborate on energy related projects.
- Promotion of strategic partnerships between the public and private sectors to finance and develop energy diversification projects.
- Systematic and aggressive means to take advantage of carbon trading, international grants and other assistance to implement alternate energy system.

- Provision of incentives and other measures to promote the switch to energy efficient vehicles, domestic appliances and commercial and indnstrial eqnipment.
- Implementation of other energy related policies that will snpport the achievement of the goals of the national energy policy – namely the biofuel policy, waste-to-energy policy and the carbon emissions trading policy.
- Creating relevant legislation to support required investments in efficiency.
- Providing adeqnate infrastructure for transition to alternative energy vehicles
- Increasing mass transit opportunities and utilization.
- Introducing financial incentives for solar technologies (solar hot water heating and cooling, PV systems) in the domestic, public and private sectors and in communities.

Especially the highest GHG emissions occur in the transport and transformation (electricity generation) sectors and so focns initially will be on the institutions directly associated with these sectors. The greatest demands for electricity are from commercial and domestic customers so it will be necessary to focns on these customers. Mitigation measures to climate change on energy related are summarized as follows.

Table 3. Mitigation measures on climate change

Sector	Measurements
Energy cost reduction	- Energy audits - Public education - Utilisation of regional natural resources, inter island connections
Diversification and efficient use of energy	- Renewable energy (wind, sustainable biomass (agricnltural waste), municipal solid waste, solar (grid and distributed PV, solar thermal concentrators) and a target share for renewable. - Demand side management, increased solar water heating, energy efficient electrical equipment (lighting, appliances, motors, air conditioners etc.) - More efficient transport (fuel efficiency), lower emission standards, support for hybrid, flex fuel or electric vehicles - Use of regional biofuels, cleaner fuels (LNG)
Electricity reliability	- National grid upgrades - Increased operational efficiency
Environmental protection	- Environmental standards
Stimulation of new economic/business opportunities	- Self generation, cogeneration, net metering - Transparency in the electricity generation market

Source: Second National Communication

4 : Adaptation and Vulnerability

1) Vulnerability to Climate Change

Impacts and vulnerabilities to climate change in Antigua and Barbuda's are summarized in SNC. Depending on local conditions, climate change will have varying effects on the coastal areas that are summarized as follows.

- Destruction of /damage to critical habitats (beaches, mangroves, seagrass beds, coral

reefs).
- Climate change impacts may contribute directly to overfishing, pollution, and loss of wetlands and nurseries.
- Increased coral bleaching as a result of a 2°C increase sea surface temperature by 2099.
- Sea - level change can cause loss of coastal wetlands and land area in general.
- Destruction to coastal infrastructure, loss of lives and property.
- Changes in coastal pollutants will occur with changes in precipitation and runoff.
- In extreme conditions, the possible loss of a livelihood.
- General economic losses to the country.

2) Summery of National Adaptation Programme of Action (NAPA)

Antigua and Barbuda has not submitted its NAPA. However, SNC contains potential adaptation options for the action plan. Overall goal of the plan is shown in below.

[Adopting to coastal land loss and crosion]
- The application of beach setbacks for construction and changing land - uses in the coastal zone.
- Vnlnerability assessment of the coastal zone
- Restore damaged or destroyed coastal ecosystems where technically feasible

[Some sustainable devclopment practices which would constitute responding to climate change]
- The development of coastal hazard maps
- The development of stricter building codes and land use plans and policies
- The establishment of marine protected areas (MPAs)
- The development and utilisation of alternative fresh water sources.

[Other options might include]
- Pnblic education and awareness.

References

1 Ministry of Foreign Affairs of Japan (Antigua and Barbuda)
http://www.mofa.go.jp/mofaj/area/antigua/
2 Second National Commnnication
http://unfccc.int/resource/docs/natc/antnc2.pdf
3 National Appropriate Mitigation Action
https://unfccc.int/files/meetings/cop_15/copenhagen_accord/application/pdf/antignabarbndacphaccord.pdf

02 : Barbados

1 : Basic Information and Key Indicators

Capital	Bridgetown
Area :	431 [km^2]
Population	275,000 (2012)
GNI, per capita	USD 15,080 (2012)

Source: Basic data, Regional affairs, Ministry of Foreign Affairs of Japan

2 : Summary on climate change related issues in the country

1) Climate change policy and national efforts/ measures against climate change

Barbados ratified the United Nations Framework Convention on Climate Change (UNFCCC) in March 1994 and Kyoto Protocol in August 2007. Barbados submitted its initial national communication under the UNFCCC in October 2001.

As a low-lying developing Small Island Sate. the Government of Barbados (GOB) recognizes the importance to improve the national capacity for the adaptation of the impacts associated with the climate change phenomenon, such as sea-level rise (and its associated phenomena such as coastal erosion. inundation, and saline intrusion of fresh water aquifers) and increased variability in climate (inclusive of rainfall and storm frequency).

At the same time, as mitigation policies, GOB has taken an initiative to overhaul its energy sector. It is aimed at reduction of the emissions of greenhouse gases (GHGs) from the combustion of fossil fuels, moving away from its reliance on fossil fuels as the sole energy source, and improving energy efficiency across all sectors. Especially, the government has experimented with wind turbines and photovoltaic to make a siguificant contributiou to the energy grid of the country. However, in 2010, it was revealed that the country had no utility scale renewable generation capacity. It is limited to a few small solar photovoltaic and wind systems installed by households, and experimental systems located at Government facilities. In the case of the instalment of wind systems. for example, issues related to the leasing of the land have remained as an impediment and still negotiations are undertaken.

2) Institutional Arrangement

Ministry of Family, Youth, Sports and Enviroument of Barbados is the designated national authority for CDM. Barbados is involved in one of multiple countries Programmatic CDM projects under validation. Moreover, the Ministry of Finance, Economic Affairs and Energy (MFIE) is responsible for decisions regarding natural resources, public utilities, the National

Petroleum Corporation and the Barbados National Oil Company. Besides that, the Miuistry is gearing toward "promoting energy conservation practices and the use of renewable energy technologies, where possible, and becoming self-sufficient in oil and gas production; plans to develop renewable sources of energy are focused on wind energy, solar photovoltaic, solar thermal. fuel cell and biogas/biomass".

3 :Sustainable Development and Mitigation

1) National inventory of greenhouse gas

In its initial national communications. Barbados has calculated anthropogenic GHG emissions and removals by sink for the years 1990, 1994 and 1997. Analysis of the national GHG inventory for the years 1990. 1994 and 1997 as follows.

CO2 emissions make up 94% of total GHG emissions in 1990, 96% in 1994 and 96% in 1997. And as Table 1 shows, a comparison of the three years investigated shows a progressive increase in total CO2 emissions from 1990 to 1997. CO2 emissions in the years 1990, 1994 and 1997 were calculated at 1,564.23 Gg, 1,913.81 Gg and 2.198.40 Gg respectively. Also for the three years investigated, 74% of the CO2 emissiou is from the combustion of fuel used for the gencration of elcctricity and 14% is from combustion of fuel for road transportation. This is due to heavy dependence in Barbados on the imported fossil fuel for energy and transportation requirements.

Table 1. Total CO2 Emissions by Sector in Barbados

Sector	1990	1994	1997
Energy Industries	1032.20	1402.69	1627.51
Manufacturing Industries and Construction	95.50	41.79	39.88
Road Transport	225.12	257.44	251.66
Commercial/Institutional	13.42	150.99	53.43
Residential	15.95	13.47	53.18
Agriculture	5.03	2.00	1.66
Other	0.00	0.00	0.00
Total	1564.23	1913.81	2198.4

Unit: (Gg / year)
Source: Barbados' Initial National Communications

Consideration of total emissions of non- CO2 GHGs reveals that the gas of greatest concern is methane (CH4). Methane emissions show a progressive increase from 1990 (78.66 Gg) to 1994 (85.07 Gg) to 1997 (86.36 Gg), however. the percentage of total emissions remained constant for the three years at 4%.

Land Use changes and forestry. which is characterised by the regrowth of natural biomass on abandoned agricultural lands. removed some 11 Gg of CO2 anuually for all years iuvestigated.

2) Mitigation Options

Barbados' GHG mitigations options are focused on the following areas.

Table 2. Objects of GHG emissions and Mitigation Options in Barbados

Objects of GHG emissions	Mitigation Option
CO2 emissions	➢ Fuel combustion for electricity generation - Efficient use of energy and promotion of renewable alternatives - Options considered include wind power, recovery of landfill gas, use of liquefied natural gas imported from Trinidad, cogeneration using bagasse and solar energy generation - Energy efficiency measures in the industrial, commercial and residential sectors - Reduction of CO2 emissions from the cement industry
	➢ Road transportation - Introduction of electric vehicles and hybrids
CH4 emissions	➢ Waste management activities - Reducing the disposal of organic materials in landfills - Recovery of methane gas from the mangrove pond landfill
	➢ Agricultural activities

Source: Barbados' Initial National Communications

4 : Adaptation and Vulnerability

Barbados' vulnerability to climate change, and adaptation measures/options to the vulnerability have been analyzed in its initial national communications. Also, "Review of current and planned adaptation action; the Caribbean" describes proposed response to the impact of climate change based on its initial national communications. They are summarized in Table 3, described as below.

Table 3. Climate change vulnerability and adaptation options in Barbados

Priority Sector	Vulnerability	Adaptation Option
Agriculture	- Less rain and more drought may cause low crop yields, lack of feed for livestock, and an increase in the numbers and generation of pest - Temperature increase may affect local plant and animal species	- Development of a food security strategy - Suitable research on climatic conditions in the future and the selection of appropriate varieties such as drought resistant crops and crops with shorter growing seasons - Inventory and monitoring of resources - Wider application of Integrated Pest Management - Integrated water resource management
Coral reef and fisheries	- Less rain may cause reduced influx of nutrients into the near-shore - Increased flooding may increase near-shore salinity and sediment load - Increased temperature may cause heat-induced mortality of fish and an increase in coral bleaching event	- Implementation of coastal zone management such as setbacks and zones for coastal buildings - A building code for coastal buildings - Beach nourishment in order to enhance resilience of a particular beach - Construction of groynes, revetments and breakwaters

Priority Sector	Vulnerability	Adaptation Option
	- Damage to coral reefs may affect fisheries, tourism and ultimately the livelihood of the country*	- Conduct monitoring and research activities - Implementation of comprehensive watershed management systems
Freshwater resources	- Less rain and more drought may reduce water availability and encourage saline intrusion along the coast - Temperature increase may cause increased evapotranspiration - Sea level rise may increase salt-water intrusion within freshwater aquifers	- Improved water resource management (correcting good quality data with well trained staff to analyze the data) - Leakage detection and Control - Technological Options such as wastewater reuse or desalination - Public Education - Metering and pricing policy - Water conservation and water conservation devices such as a system of collecting rain water - Physical options to mitigate the negative impact by sea level rise (e.g. adjustment of the level of pumps to maintain the same distance between the saltwater interface and the bottom of the pump)
Human settlement/ infrastructure	- Less rain and more drought may increase demand for water, have an adverse effect on food supply, and cause structural damage - Increased flooding may require additional costs for insurance or flood prevention activities	- Relocation and redesign of wells - Integrated water resource management - Public awareness campaigns - Incorporation of climate change considerations into building codes and coastal

Source: Barbados' Initial National Communications

In addition to the description above, the fisheries industry is extremely important in Barbados. The bleaching of coral reefs will obviously have a negative effect on fisheries stocks, as the coral reefs are a nursery for many fish species. Further research is needed in order to understand the change, which could occur with regards to fish species under a changing climate.

References

1. Ministry of Foreign Affairs of Japan, "Regional affairs" http://www.mofa.go.jp/mofaj/area/index.html
2. "Barbados. Barbados' first national communications to the United Nations Framework Convention on Climate Change (UNFCCC)" http://unfccc.int/essential_background/library/items/3599.php?rec=j&priref=3229#beg
3. "Review of current and planned adaptation action; the Caribbean" http://www.preventionweb.net/english/professional/publications/v.php?id=25341
4. Renewable energy and energy efficiency partnership (REEP), "Policy database" http://www.reeep.org/policy-database

03 : Belize

1 : Basic Information and Key Indicators

Capital	Belmopan
Area :	22.963[km^2]
Population	340.000 (2014)
GNI. per capita	USD 4.490 (2011)

Source: Basic data. Regional affairs. Ministry of Foreign Affairs of Japan

2 : Summary on climate change related issues in the country

1) Climate change policy and national efforts/ measures against climate change

Belize ratified the United Nations Framework Convention on Climate Change (UNFCCC) in October 1994 and Kyoto Protocol in September 2003. Belize submitted its initial national communication under the UNFCCC in September 2002 and second national communications in October 2011 (it was updated in May 2012). Belize places its priority on the adaptation to climate change in terms of promoting sustainable economic and social development and the reduction of poverty because of the probable devastating impacts on the country. Therefore, the emphasis is on building climate resilience and effective implementation of Global Climate Observing System (GCOS) and securing its quality.

2) Institutional Arrangement

The National Meteorological Service (NMS) is the principal advisor and negotiator for the government of Belize on climate change matters. The Chief Meteorologist is the Focal Point for the UNFCCC. In the process of preparing the second national communications (SNC). the National Climate Change Committee (NCCC), first established in 1995, was reactivated to provide oversight function for the formulation of SNC. NCCC is also responsible for assisting the government with managing climate change in Belize. Also. Climate Change Office in Ministry of Forestry, Fisheries and Sustainable Development is designated national authority for CDM. Belize is involved in one of multiple countries programmatic CDM projects under validation.

3 :Sustainable Development and Mitigation

1) National inventory of greenhouse gas

The Greenhouse Gas (GHG) Inventory was conducted in 1994, 1997 and 2000 in the following sectors: Energy, Industrial Processes & Solvents, Agriculture, Land Use, Land-Use Change & Forestry and Waste. As seen in the table 1, total GHG emissions as well as emissions in sector are on a rapidly increasing trend. However. Belize's contribution to GHG emission on a global scale still remains extremely small.

Table 1. Total GHG Emissions by Sector in Belize

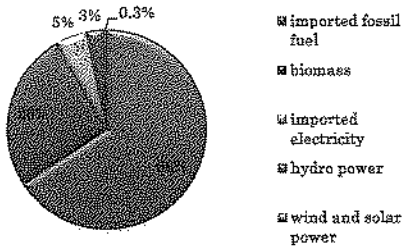
Sector	1994	% of total	1997	% of total	2000	% of total
Energy	617.5280	21.846	1,026.7511	12.600	1,127.2995	8.361
Industrial Processes & Solvents	1.7350	0.061	1.8001	0.022	2.1972	0.016
Agriculture	46.414	1.642	1.5846	0.019	2.0825	0.016
Land-Use Change & Forestry	2,056.3650	72.747	7,117.1762	87.340	12,349.2819	91.593
Waste	104.7000	3.704	1.5141	0.019	1.9158	0.014
Total	**2,826.7426**	**100.000**	**8,148.8261**	**100**	**13,482.7769**	**100.000**

Unit: (Gg / year)

Source: Belize' Second National Communication

With regard to the Land Use Change and Forestry sector. it drastically increased from 2056 Gg in 1994 to 12,349 Gg in 2000 while the percentage in total also increased from 72.7% to 92% respectively. This transition is mainly from deforestation and soil carbon from agriculturally impacted soils. Activities within the Industrial Processes and Solvents Sectors occurred in only two areas: the Mineral Products. and the Food Production and Drink sub-sectors. Lime production and road paving with asphalt are the principal activities in the Mineral Products sub-sector. Beer. wine. and spirits; meat, fish, poultry, bread, and animal feed are the products of the Food and Drink production sub-sector. The source of the energy is described in Figure 1. The largest emission is from imported fossil fuel in Mexico and it accounts for 66%. followed by 26% from biomass. 5% from imported electricity. 3% from hydro power, and 0.3% from wind and solar power. Fossil fuels are imported by two companies: Esso Standard Oil S.A. Limited, the only private company in Belize authorized to import fuel. and Belize Electricity Limited (BEL). which also imports diesel fuel from Mexico.

Figure 1. Primary Energy Sources in Belize (2009)



Source: JICA Study Team prepared based on the Renewable energy and energy efficiency partnership (REEP)

2) Mitigation Options

Due to its low-level emissions on the global scale, Belize has not actively designed and implemented projects to mitigate climate change. However, some energy sector projects implemented or underway have the potential to result in reduction of GHG emissions. Such projects are also required in terms of meeting demanding electricity or creating job opportunities and the building of skills and expertise. In particular, some assessment of mitigation impact has been carried out on the following projects.

- Hydro-dams
- Co-generation in sugar industry
- Solid waste management
- Solar panel application

Currently, Belize does not have a dedicated Government agency for the promotion of sustainable energy. The Public Utilities Commission (PUC), under the National Energy Plan project, advised the Belizean Government to promote sustainable energy use and renewable energy source uptake. The absence of one single authority responsible for formulating and coordinating energy sector policy pose major obstacles.

4 : Adaptation and Vulnerability

The first assessment of Belize's vulnerability to climate change was conducted by Belize Centre for Environmental Studies (BCES) in 1994 to determine the vulnerability of the coastline to sea level rise done by. This area had been prioritized because of its low-lying nature, the concentrations of populations in this zone, the level of infrastructural development, and the range of economic activities occurring. For the preparation of the Second National Communication, it was decided that vulnerability assessments would be conducted in different but very relevant and important sectors in the Belizean development.

Table 2. Climate change vulnerability and adaptation options in Belize

Priority Sector	Vulnerability	Adaptation Options
Agriculture	- The effects of climate change, such as temperature increase or precipitation increase, on crop production would differ depending on the crop involved. (e.g. while an increase in temperature might be detrimental particularly for certain crops, it could have a positive effect on some summer crops such as rice.	- Altering inputs, varieties, and species for increased resistance to heat shock and drought, flooding and salinization; - Altering fertilizer rates to maintain grain or fruit quality - Altering amounts and timing of irrigation and other water management - Altering the timing or location of cropping activities - Managing river basins for more efficient delivery of irrigation services and prevent water logging, erosion and nutrient leaching - Making wider use of technologies to "harvest" water and conserve soil moisture - Using and transporting water more effectively - Making wider use of integrated pest and pathogen management, developing and using varieties and species resistant to pests and diseases - Increasing use of climate forecasting to reduce production risk - Introducing forest conservation, agro-forestry and forest-based enterprises for diversification of rural incomes.
Coastal Zone	- Coral reefs, sea grass beds, mangroves, and littoral forest are all vulnerable to the impacts resulting from severe weather events, including sea level rise and increases in temperature	- Establish and activate the National Climate Change Committee - Revitalize and strengthen the Coastal Zone Management Authority - Reintroduce a periodic forum to address the issues surrounding the state of the Coastal Zone - Conduct a series of country-wide Baseline Assessments within the major habitats - Revise and streamline the current legislations and policies that relate to the management of the coastal zone to eliminate overlaps and close existing gaps - Improve the coordination of interagency cooperation and exchange of information on matters related to climate change - Develop strategies to increase compliance particularly with regard to coastal department - Develop a Public Awareness and Education Strategy - Consolidate and Strengthen the Marine Protected Area (MPA) system. - Expand and Streamline the Ecosystem Monitoring Programme.
Fisheries and Aquaculture Industries	- The link between climate change and fisheries is still unsure and their ability to overcome changes in weather patterns, including increased frequency and severity of extreme events, such as hurricanes, are also uncertain. - Increased sea surface temperatures, changes in pH and loss of habitat would be the primary threats to the fishing industry - Increased sea-surface temperatures has potential to induce (a) the increase of harmful algal blooms;	[Fisheries] - The preparation of a National Fisheries Management Plan to enable fisheries managers to adequately deal with the impact of climate change - Changes in stock distribution, recruitment levels and variability and adult biomass and production can be achieved by adjusting fishing efforts to levels that are consistent with yield levels that can be sustained by the changed populations [Aquaculture] - Measures range from technical prescriptions, such as the development and deployment of more heavily engineered cage designs for Cobia Culture and decrease in water exchange rates for inland pond systems, to policy interventions, such as the development and implementation of site selection

Priority Sector	Vulnerability	Adaptation Options
	(b) increased metabolic rate and growth due to the same cause; and (c) changes in migration and spawning	criteria for cage culture, and the definition of a zoning scheme
Health	- Increase the risk and incidences of vector-borne diseases and illness because of increased frequency of warm spells/heat waves, intense droughts, and heavy rainfall events	N/A
Tourism	- Economic vulnerability to climate change, including the risks to coastal land and infrastructure, exposure to resource damages such as coral bleaching would affect the tourism sector	- Diversification of the portfolio of tourism offerings to emphasize inland attractions - Planning for coastal development with greater caution - Considering the feasibility of artificial reefs as underwater attractions to alleviate some of the existing pressures on Marine Protected Areas
Water resources	- A combination of decreased water runoff, agricultural pollution and increased urbanization are likely to cause a continued deterioration in water quality - Increase treatment costs for potable water and greater competition for the use could be the genesis of water conflicts - Any reduction in availability of water especially for agriculture is likely to have an impact on food security - Sea level rises will increase frequency of salt water intrusion	- Improvement of the efficiency by the commercial water suppliers, in extraction from the sources, storage, and delivery to customers - Conservation of the country's water resources, providing incentives to encourage the use of more efficient irrigation equipment to minimize water losses and encourage conservation of the resource

Source: Belize' Second National Communication

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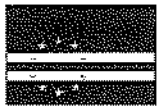
04 : Republic of Cape Verde



1 : Basic Information and Key Indicators

Capital	Cape Verde
Area :	4,033 [km^2]
Population	527,000 (2011)
GNI, per capita	USD 3,370 (2010)

Source: Basic data, Regional affairs, Ministry of Foreign Affairs of Japan

2 : Summary on climate change related issues in the country

1) Climate change policy and national efforts/measures against climate change

Cape Verde ratified the United Nations Framework Convention on Climate Change (UNFCCC) on 29th March 1995 and the Kyoto Protocol on 5th December 2005. It submitted its Initial National Communications (INC) on 13th November 2000 and Second National Communications (SNC) on 21st October 2011. Policies, regulations and plans related climate changes in Tonga are shown in below.

Table 1. Policies, regulations and plans related climate change

Day	Relevant Policies and Decrees	Contents
November 2000	Initial National Communications on Climate Change (INC)	INC constitutes its National Strategy and Action Plan on Climate Change. To develop these tools, several studies prepared by the different sectors relating to greenhouse gas (GHGs) inventories, vulnerability assessment, adaptation and mitigation measures were taken into account.
December 2007	National Adaptation Programme of Action on Climate Change (NAPA)	NAPA articulated around policies an measures for the short and medium terms, in compliance with the temporal horizon of the Growth and Poverty Reduction Strategy and through priority projects, with indicators for progress monitoring and evaluation of the success and difficulties of adaptation strategies.
October 2011	Second National Communications on Climate Change of Cape Verde (SNC)	SNC takes stock of the national circumstances with regard to greenhouse gas emissions, ability to mitigate such emissions, vulnerability to climate change, mitigation measures and programs, past and future strategic adaptation actions, transfer of clean technologies at sector level, the state organization on climate change related issues aiming at meeting the objectives of the Convention, as well as the

Day	Relevant Policies and Decrees	Contents
		constraints and challenges encountered.

Source : JICA Study Team prepared based on the SNC.

2) Institutional Arrangements

The Institutional arrangements for Climate Change are made of the following institutions.

- Directorate General for Environment, under the Ministry of Environment, Rural Development and Marine Resources
- Directorate General for Planning and Management the Ministry of Environment, Rural Development and Marine Resources
- National Institute of Meteorology and Geophysics
- Directorate General for Industry and Energy under the Ministry of Economy, Growth and Competitiveness
- Directorate General for Infrastructure, Transport and Telecommunication;
- Directorate General for Road Transport under the Ministry of Home Administration
- Directorate General for International Relations under the Ministry of Foreign Affairs. Cooperation and Communities.

3 :Sustainable Development and Mitigation

1) National inventory of Greenhouse Gas (GHG)

Cape Verde has completely prepared its initial national greenhouse gas inventory and presented in its Second National Communication on Climate Change to the UNFCCC in 2010.
GHG inventory by sector in 2000 is in Table 2.

Table 2. GHG emission by sector (2000)

Sector	CO_2 emission	CH_4	N_2O
Energy	284.953	0.297	0.008
Industrial Processes	0.000	0.000	0.000
Solvent and Other Product Use	0.000		0.000
Agriculture		1.921	0.293
Land-Use change and forestry	21.843	0.000	0.000
Waste		1.061	0.000
Other (please specify)	0.000	0.000	0.000
Total	**306.796**	**3.279**	**0.301**

Unit: (Gg / year)
Source: Second National Communication

2) Summary of Nationally Appropriate Mitigation Action (NAMA) plan

Cape Verde has not yet submitted its NAMA to the UNFCCC. However some of the programs and activities for sustainable development in Cape Verde are related to renewable energy and conservation and/or energy efficiency. Cape Verde's strategic plan for the next 10 years includes a series of actions that are shown in below.

- Achieving a renewable energy penetration rate of 50% by 2020 and having at least one of the islands 100% renewable energy.

- Promoting energy conservation and efficiency in the energy sector.
- Increasing electrical energy production capacity by establishing single plants, increasing production and distribution efficiency, increasing the response capacity to energy needs.
- Ensuring an electrical energy coverage rate of 100% by 2015 and ensuring increased energy quality and reliability.
- Strengthening institutional and legal capacity.

4 : Adaptation and Vulnerability

1) Vulnerability to Climate Change

Impacts and vulnerabilities to climate change in Cape Verde are summarized in "National Adaptation Programme of Action (NAPA)" NAPA was published in December 2007 by Ministry of Environment and Agriculture.
Cape Verde is highly vulnerable to climate change, with low capacity to adapt. Models of future climate change suggest that temperature increases of up to 4°C and decreases in rainfall by up to 20% can be expected by 2100. In the more immediate planning horizon (next 10-20 years), climate induced changes include seasonal water shortages at an increasing number of economically important sites and year round shortages at other sites. In addition, climate variability is predicted to increase, with more storms, floods and droughts and a shorter rainy season. Vulnerability and impact of the Climate Change is summarized as follows.

Category	Vulnerability
Floods	Increasingly frequent phenomenon such as lead to great loss of agricultural soils, human lives, animals, and infrastructures
Droughts	Increased local and general droughts contribute to the reduction of plant cover and the degradation of the ecosystem, thereby affecting livelihoods and agriculture.
Agro-silvo-pastoral	Persistent rainfall deficits have led to droughts and food insecurity, mainly for small vulnerable farmers. In addition, causing direct economic impacts and increased prices for agricultural products
Coastal zones	Examples of impacts seen more frequently include: - Strong winds provoking dust storms and increasing coastal erosion; - Strong waves and high tides contributing to the degradation and even total destruction of coastal protection structures; - Saline intrusion leading to salinization of water sources and agricultural fields near beaches and in low lying river beds
Socio-economic	Negative socio-economic impacts on the lives of small vulnerable farmers.

Source: National Adaptation Programme of Action

2) Summery of National Adaptation Programme of Action (NAPA)

According to NAPA, priority interventions are set that shown in below.

- Construct infrastructures for collection, supply and storage of water and recharge of Aquifers.
- Reinforce actions to protect watersheds in order to improve food security.
- Diversify income-generating activities in rural areas
- Modernize and diffuse localized irrigation technologies.
- Invest strongly in environmentally sustainable production techniques
- Use varieties and species that are adaptable to changing climatic conditions.

- Diversify activities and measures to support the populations that live off the exploitation of coastal resources.
- Support diversification of alternative activities to artisanal fishing (e.g. training equipment, micro-credit)
- Continue the actions of preservation and management of protected areas.
- Rehabilitate and/or construct infrastructures for protection of coastal zones.
- Strengthen equipment and modernization of artisanal fishing
- Support implementation of initiatives to use renewable energies (solar and wind) in particular at the level of rural communities
- Modernize the network of climate and maritime monitoring stations
- Stimulate production and establishment of endemic plants
- Conserve and sustainably use medicinal species
- Promote research on species that are threatened and vulnerable to the climate change

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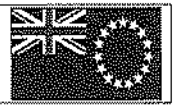
05 : Cook Islands



1 : Basic Information and Key Indicators

Capital	Avarua
Area :	240 [km^2]
Population	19,569 (2006)
GNI, per capita	USD 9,100 (2005)

Source: Basic data, Regional affairs, Ministry of Foreign Affairs of Japan

2 : Summary on climate change related issues in the country

1) Climate change policy and national efforts/measures against climate change

The Cook Islands ratified the United Nations Framework Convention on Climate Change (UNFCCC) on 12 June 1992 and the Kyoto Protocol on 16 September 1998. The Cook Islands submitted their first Nation Communications Report in 1999, and have just recently submitted their second report (2NC) as of 12 April 2012. The Cook Islands' Joint National Action Plan for Disaster Risk Management and Climate Change Adaptation (JNAP) 2011- 2015 was completed in 2012. The Joint National Action Plan (JNAP) for Disaster Risk Management and Climate Change Adaptation is a roadmap for building a resilient Cook Islands. The JNAP also helps to provide a more coordinated approach to dealing with disaster risk reduction and climate change issues by all agencies. The National Sustainable Development Plan (NSDP) strategies are national priorities and all sector and government agencies planning is aligned to these strategies. While none of the Strategic Goals explicitly reference climate change; several references are cross cutting across the goals. The National Environment Strategic Action Framework 2005–2009 (NESAF), referenced in the NSDP, provides guidance and direction for achieving the sustainable social and economic progress for the Cook Islands, utilising its natural resources and environment wisely. One of its goals envisages to increase resilience by strengthening national capacities for climate change, variability, adaptation and mitigation.

The Cook Islands has not set up its designated national authority and does not have any CDM projects, but is included in one of the multiple countries in PoAs (water purification) under validation.

2) Institutional arrangement

Currently, the implementation of climate change activities has been carried out by a number of different organisations. Current efforts by the Climate Change Division of the Office of the Prime Minister are developing a climate change and disaster risk management policy. The Ministry of Foreign Affairs and Immigration is the official political focal point, and the National Environment Service (NES) is the operational focal point of the UNFCCC and the Global Environment Facility. NES has until recently co-ordinated all climate change activities in the

country. This role is shared with other ministries and agencies that are mostly represented on the National Climate Change Country Team.(Pacific Climate Change Portal)

3 :Sustainable Development and Mitigation

1) National inventory of greenhouse gas

The Cook Islands Inventory for Greenhouse Gases has been calculated for the year 2000–2006 using the 2006 IPCC Guidelines. The Cook Islands currently emits 69,574 t CO2-e. This is a 34% increase from the first inventory which was published in 1999 and covered emissions for 1994. This increase reflects the growth in the economy with the main drivers such as tourism and transport sectors leading to an increase in demand on energy use. Emissions in the energy sector increased more than other sectors. The Cook Islands Industrial Sector has changed little since the INC, as the Cook Islands is a service oriented economy rather than industrial. There were some significant reductions in the land use emissions sector due to the introduction of the Rarotonga and Aitutaki managed landfills in 2003 which replaced open burning. Since the 2006 inventory overall emissions are likely to have continued to increase, however there are capacity limitations to collecting the data and conducting the GHG analyses more regularly.

Table 1: GHG Emissions by Sector (Gg)

GHG Source and Sinks Categories	CO2 Emissions (Gg)	CO2 Removals (Gg)	CH4 (Gg)	N2O (Gg)	CO (Gg)	NOX (Gg)	NMVOC (Gg)	SOG (Gg)
Total National Emissions and Removals	55.18	−166.97	0.33	0.0016	1.65	0.32	0.33	0.0742
1 Energy	54.45		0.0078	0.0015	1.65	0.32	0.31	0.074
2 Industrial Process and Product Use	0.59		NE	NE	NE	NE	0.0113	NE
3 Agriculture, Forestry and Other Land Use	0.00425	−166.97	0.17	0.01118	NE	NE	NE	NE
4 Waste	0.1383	0.0000	0.1516	0.0033	0.0002	0.0003		0.0002
5 Other	NE		NE	NE	NE	NE	NE	NE

2) Summary of Nationally Appropriate Mitigation Action (NAMA) plan

The Cook Islands has not submitted its NAMA plan. However, as presented below and in the "Mitigation/Adaptation Options" sections below, the National Communication of the country raises several mitigation measures for the country.
An effective greenhouse gas emissions mitigation strategy has to confront a number of institutional barriers. There is a need for some policy changes in order to improve the enabling framework for renewable energy and energy efficiency investments and for improved management of municipal and agricultural wastes.

Policies needed include:
Inclusiveness of major stakeholders in relevant strategic discussions and implementation committees;
Definition of role of private sector as provider of technology and of financing services;
Establishment of regulatory framework and standards for energy technologies and grid assess

(net metering and IPP grid assess codes);
Institutional framework and unambiguous mandate for certification of technologies and technology providers/installers; and creation of independent, external advisory panel for assessment of new technologies to be introduced;
Minimum efficiency standards for buildings designs, and important equipment such as household appliances, air conditioners, lights and vehicles.

While the need to develop renewable energy has been clearly stated in a host of national policy documents and enjoys widespread public support, few renewable energy projects are currently moving toward implementation. It has proved difficult to put policies in place regarding imports of only energy efficient appliances, as the private sector has often countered that this should be left to consumer choice.
A report by SPREP in 2004 found that "public and private sector capacity limitations in renewable energy expertise and knowledge are barriers to the widespread use of energy efficiency measures in the Cook Islands. An increased capacity and understanding of renewable energy alternatives is needed to prevent the adoption of policies based on 'crisis management' and the continued reliance on fossil fuel energy and technology as a business as usual solution.

3) Mitigation Options

There are now emissions mitigation measures in development for the Cook Islands, some of which are captured in the Renewable Energy Chart. The Mitigation Technology Needs Assessment conducted under the 2NC found it is important the Cook Islands adopt technologies that are proven in regions with similar climatic and economic conditions. Such technologies can be demonstrated, promoted and disseminated through the private sector, i.e. GHG mitigation needs to achieve lower carbon growth and be supportive of national development priorities and local business opportunities.
It is estimated that 2MW of renewable energy replacing 2MW of diesel on Rarotonga would reduce 10,005 t CO2-e per year. This would provide the additional benefit of increasing security of energy supply and reducing dependence on imported fossil fuels. This is consistent with the long-term objective of the Cook Islands Government of self-sufficiency of energy resources. Hence there is a lot of political will manifested in the 2010 Government's targets of 50% renewable energy by 2015.
Work undertaken for sustainable land management can also contribute to emissions reduction and waste emissions management strategies such as the introduction of properly designed landfills could be extended to the other Pa Enua for further reductions in the land use sector.
An effective mitigation strategy needs to address a number of institutional barriers. There is a need for some policy changes in order to improve the enabling framework for renewable energy and energy efficiency investments and for improved management of municipal and agricultural wastes. In the energy sector, institutional arrangements have been in flux over the past decade.

4 : Adaptation and Vulnerability

1) Vulnerability to climate change

Cook Islands life and culture are interdependent and related to land, ocean and environment. The changes in climate parameters and adverse impacts related to climate variability and change is significant threat to the biodiversity and ecosystems, the lives of its people and the economic viability of the islands. There is strong evidence that indicates that long-term weather patterns are shifting, although there is some uncertainty about specific parameters and the rate of future trends. Climate trends and projections analysed through the 2NC indicate cause for even more

concern with increasing temperatures, rainfall and winds, rising sea levels, and in the frequency, intensity and duration of extreme events. There is comparatively higher risk and more is now known about the likely impacts as well as emerging issues such as ocean acidification than was reflected in the INC. Key vulnerabilities to climate change have not changed significantly since the INC however as part of a comprehensive approach toward understanding and documenting fully its vulnerabilities, the Government along with a wide range of relevant and interested stakeholders has begun to prepare vulnerability assessments for each of the islands in the country. In combination with the analyses of climate trends a clearer picture of both the impacts and the adaptation options to cope with these is emerging.
The vulnerability of the coastal zone, coral reefs and marine resources is significant given it is where most people live and work. The ocean and subsistence agriculture are sources that Cook Islanders have always relied on for food. Other sectors such as water supply and quality, and liquid and solid waste are increasingly vulnerable to changes in climate parameters such as rainfall, storm events, droughts, and sea level rise. These effects in turn will impact upon the lifestyles and conditions of the people in the Cook Islands both socially and economically.
Some adaptation measures across vulnerable sectors have been identified and are increasingly being mainstreamed in external development partners' activities in the Cook Islands as well as domestically by the Government and Non-Government sectors. However, existing national development priorities and resource constraints have limited wide scale implementation of climate change adaptation to date.
Climate change adaptation is an additional burden to the Cook Islands existing development priorities which would be minimised if the international community takes more action to reduce emissions. The costs of dealing with extreme events have increased significantly in the past decade and slower-onset events are generating alarming land tenure and security implications for parts of the Cook Islands. Therefore the Government is seeking external support and innovative risk management mechanisms for adaptation.

2) Summary of National Adaptation Programme of Action (NAPA)

The Cook Islands has not submitted its NAPA to the UNFCCC.

3) Adaptation Options

A number of adaptation priorities have been identified to reduce vulnerability to the anticipated impacts from climate change in the 2NC. Some adaptation measures across vulnerable sectors have been identified and are increasingly being mainstreamed in external development partners' activities in the Cook Islands as well as domestically by the Government and Non-Government sectors. However, existing national development priorities and resource constraints have limited wide scale implementation of climate change adaptation to date. Climate change adaptation is an additional burden to the Cook Islands existing development emissions. The costs of dealing with extreme events have increased significantly in the past decade and slower-onset events are generating alarming land tenure and security implications for parts of the Cook Islands. Therefore the Government is seeking external support and innovative risk management mechanisms for adaptation.

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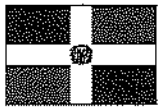
06 : Dominican Republic



1 : Basic Information and Key Indicators

Capital	Santo Domingo
Area :	48.442 [km^2]
Population	10,280.000 (2012)
GNI. per capita	USD 5,470 (2012)

Source: Basic data. Regional affairs. Ministry of Foreign Affairs of Japan/ Data, The World Bank

2 : Summary on climate change related issues in the country

1) Climate change policy and national efforts/ measures against climate change

The Dominican Republic signed the United Nations Framework Convention on Climate Change (UNFCCC) during the Earth Summit held in Rio de Janeiro in June 1992 and ratified it in October 1998. Subsequently, it ratified the Kyoto Protocol in February 2002. With this, the country undertook the preparation of the First and Second National Communications in accordance with Article 12, with the help of the Global Environment Facility (GEF).

The Dominican Republic, as a small developing island-state, is vulnerable to the effects of climate change. Recent economic strides made due to the burgeoning tourism sector is under threat from changing climatic conditions affecting water sources, and financial losses and catastrophe owing to extreme weather events. Therefore, the country has taken the subject of climate change very seriously.

The country has prepared its own National Adaptation Plan of Action (NAPA) – despite it not being a least developed country – to include within the country's development policies (therefore, it has not submitted). NAPA's conceptual framework is supported by the vision for adaptation based on extreme climatic events and the climatic variability. The sectors pertaining to water, agriculture and coast zones, prioritized in the NAPA, should be the main focus in the country's readiness for climate change induced adversities.

In regards to financing needs, the country has dedicated few resources to climate change because available resources are usually appropriated for the fight against poverty and remedy the impacts of extreme climatic events that frequently affect the country. Therefore. financial support is dispensable to implement mitigation, adaptation and technology transfer activities.

2) Institutional Arrangement

The Secretariat for the Environment and Natural Resources (SEMARENA. acronym in Spanish)

is responsible, since its creation through Dominican law 64-00. for carrying out the environmental policies related to the "green and brown agenda" of the Dominican Republic.

SEMARENA had a Clean Development Mechanism (CDM) office, created by decree 786 in 2004. which was abolished in order to create decree 601-08, which in turn created the "National Council for Climate Change and the CDM". This CDM office is tasked with promoting and enabling CDM project development in the country. It coordinates, promotes and organizes local and international meetings in collaboration with the Foreign Affairs Secretariat. Moreover, in order to comply with the mandate of the UNFCCC in relation to drawing up mitigation and adaptation plans. the country has carried out studies and structured projects with the aid of external resources (FMAM. CIDA and UNDP) and, in most cases, with very little local resources.

3 :Sustainable Development and Mitigation

1) National inventory of greenhouse gas

Carbon dioxide gas has the largest share, accounting for between 93 to 95% of the national totals. Regarding the energy consumption structure. the transportation sector makes up for more than 47%, which are met exclusively by fossil fuel sources. Under the San Jose Accord. the Dominican Republic receives crude oil and refined petroleum products from Mexico and Venezuela (75% of oil imports) at favourable prices. Also. the residential sector (urban and rural) is responsible for around 25% of total consumption, with a very different structure in urban and rural areas. In the former, fossil fuel is predominant, directly and indirectly (generation of electricity). while in the latter. renewable energies prevail, such as the use of firewood, to cook food. Although the industry has a balanced structure between fossil fuels, renewable energies and electricity, the predominant sources in the generation of the latter imply a preponderance of fossil sources.

As a whole, fossil fuel sources exceed 80% of final consumption: and the total consumption of energy in the country tripled in the past 30 years so that the dependency on imported sources has increased in recent years. Liquid petroleum gas is the predominant fuel used by the most deprived sectors in many countries in the region.

Table 1 shows total CO2 and GHG emissions. removals and changes in the country. It indicates that while CO2 emissions increased more than two times from 1990 to 2000, CO2 net emissions removals by LUCF also increased which cover the amount of CO2 emission in 2000.

Table 1. Total CO2 emissions, removals & changes, Dominican Republic

CO2 emissions & removals	1990	1994	1998	2000
CO2 emissions without LUCF	8,762.9	15,003.1	16,423.9	18,416.8
CO2 net emissions/ removals by LUFC	-5,667.1	-6,633.2	-13,767.1	-18,808.6
CO2 net emissions/removals with LUCF	3,095.8	8,369.9	2,656.8	-391.8
GHG emissions without LUCF	12,640.9	20,441.8	23,749.48	26,433.2
GHG net emissions/removals by LUCF	-5556.0	-6,504.2	19,076.1	-18,794.1
GHG net emissions/removals with LUCF	7,084.9	13,937.6	4,673.36	7,639.1

Unit: (Gg / year)
Source: JICA Study Team prepared based on the UNFCCC

2) Mitigation Options

Reduction of emissions through the energy sector was considered, but in 2009, 86% of its generation depends on imported fossil fuels, and the remaining 14% coming from hydroelectric generators. The energy sector plays a decisive role in the mitigation of GHGs.

Table 2. Climate change mitigation options in Dominican Republic

Sector	Option
Energy	- Setup massive solar collectors, replacing LPG for boilers, and replacing incandescent lamps in the following sectors: Urban Residential, Hotels, Restaurants, Commerce, Services and Government - Guidelines for a program of more efficient air conditioner consumption through better eqnipment and insulation and changes in practices - Establish guidelines for a program of efficiency in food preservation, by substituting equipment and changes in use patterns - Encourage cogeneration as a way to efficiently use the residual heat of processes industry. In particular, bagasse cogeneration in the sugar industry - Develop programs for captive fleets to facilitate the switching to new fuels - Reducing emissions from energy efficiency measures in commercial facilities and services - Replacement of boilers using bunker in thermal power generation by biomass, among others
House, Building	- Design guidelines for a program of standardization, certification and labelling of appliances, specifying residential sector energy consumption and allow for comparison between commercially available alternatives - For rural households, a program designed to promote the use of LP, with the aim of replacing fire wood in cooking
Agriculture	- Management of swine manure on pig farms for methane capture and subsequent use in generating energy and cooking food - Avoidance of methane through the composting of solid waste facility agribusiness - New crops of sugar cane with specific focus on supplying raw materials to autonomous distilleries - Creation of strategies for the export of biofuels - Articulate agro-industrial development programs that create multiple benefits (energy, social, economic and environmental).
Transport	- Policy and institutional and financial mechanisms to promote mass transit - Tax incentives for the introduction of more efficient vehicles - Using ethanol and biodiesel for automotive - Replacement of vehicular fuel in public transport through the use of ethanol and biodiesel

Source: Dominican Republic's Second National Communication

4 : Adaptation and Vulnerability

The NAPA identifies several sectors as being vulnerable ones. Reflecting the relative importance of extreme weather events in comparison to incremental changes among past and current climatic risks, the Dominican Republic hosts a wide range of disaster risk management projects, ranging from preventive measures to post-disaster management.

Table 3. Climate change vulnerability in Dominican Republic

Sector	Vulnerability
*Freshwater, Coastal and Marine resources (Haina Basin)	- The intrusion of sea waters into underground water - The impact on the subterranean waters in the basin due to its physical chemical deterioration and the decrease of the water potential as a result of poor rainfall [Current environmental problems identified by the Environment and Natural Resources] - Scarcity and water pollution from various sources - Soil erosion of upstream Rio Haina, sedimentation in downstream and the coast of Rio Haina - No local land use planning - Weak community organization lacking a board or authority of the basin - Irrational use of natural resources and the environment - Contamination with solid and liquid wastes - Conflicts of land use.
Health (Malaria and Dengue)	- Extreme climatic events cause diseases such as dengue, leptospirosis, malaria and yellow fever, which are transmitted by insects and rodents and diseases such as schistosomiasis, cryptosporidium, and cholera which are transmitted by aquatic vectors
Tourism	- Deep sea-diving ecotourism could be affected due to erosion of coral reefs - The coastline could become unprotected due to loss of reefs and a decrease in the carbonated material contributed by the reefs, which will imply a decrease or loss of sandy beaches - The coastal landscape will change due to an increment of erosion, emergence of rocks and loss of natural vegetation and sandy beaches, thereby reducing the beach's load capability (square meters available/tourist.) - The expected rise in sea levels will trigger flooding of the basin mangroves, impacting forest zoning - An increment of erosion will affect the tourist infrastructures closest to the coastal edge - Changes in the rainfall pattern could decrease the volume of drinking water in the basins - The saline water intrusion due to a combination of rising sea levels and decreasing rainfall could imply the loss of quality in the potable water reservoirs - Losses of capital for the investors, loss of jobs, both indirect and direct employment, and losses could extend to other economic sectors that supply goods and services to the tourist sector, such as agriculture, fishing, construction and suppliers of cleaning chemical products
*Agriculture and food security	- Yields limited by water shortage; and yields and lack of nutrients - The shortened crop cycle due to water shortage (The main vulnerability to agriculture) - In most crops taken into consideration, yield of the dry area will fall to half their present value between 2020 and 2050, while by 2080 productivity will be significantly less, and will eventually disappear in the case of some crops

The sectors of freshwater, coastal and marine systems, and agriculture and food security were prioritized due their high vulnerability and importance in human and economic development.
Source: Dominican Republic's Second National Communication

Table 4. Climate change adaption options in Dominican Republic

Sector	Options
*Freshwater. Coastal and Marine resources (Haina Basin)	- Improvement of the living conditions and environment of communities in the watershed of Haina, with the establishment of woodlots. agro-forestry, conserving soils. reducing sedimentation of existing water works to increase lifespan and reduce solids and liquid pollution - Elimination of slash and burn in the forests in the upper basin. to enable planting of annual crops - Improvement of the level of income for farmers, promoting productive alternatives without degrading the soil - Elimination of extensive livestock on hillside soils and the river - Improvement of the infrastructure for community services (roads and local roads, schools, community. health centers, latrines) - Involvement of public and private institutions in the implementation of this management plan - Implementation of an ongoing program of environmental education, extended to the entire population - Implementatiou of a program of water and soil conservation
Health (Malaria and Dengue)	- The management plan of the dengue and malaria includes the following: - Strengthening of an integral system of observation of all relevant variables in order to characterize the malaria and dengue situations - Carrying out studies to determine malaria and dengue epidemiologic pattern in the face of potential impacts of climate change - Establishing an effective educational program through measures such as education. transferring of technologies and financial assistance
Tourism	- The rehabilitation of the basin mangroves - Monitoring present levels of erosion in the beaches, whether due to natural causes or due to anthropogenic ones - Protection of coral reefs and protection of marine biota
Biodiversity	- Put into practice a public awareness and dissemination strategy nationwide - Carry out an adequate economic estimate or evaluation on goods and services of the main ecosystems that might be affected by projected climate change. with emphasis on the coastal-marine ecosystems - Carry out basic biology and species behaviour studies that are most vulnerable to the projected climate change, including population and invasive species studies - Establish a vigilance and evaluation network regarding the impact of climate change on the nesting areas for marine turtles - Egg incubation and subsequent liberation of marine turtles - Reduce and/or eliminate of threats and barriers that prevent an effective management of the National System for Protected Areas, as a form of protecting a larger amount of genetic groups. from which new genotypes, capable of adapting to the projected climate change could arise
*Agriculture and food security	- Climate scientific studies in agricultural production - Regionalization of crops - Introduction of varieties resistant to unfavorable climatic conditions - Improvement of technologies and technological discipline in agricultural production - Redistribution of sowing areas between different crops - New techniques in agricultural production - Adapting to new methods and practices in the fight against pests and diseases in agricultural crops.

The sectors of freshwater, coastal and marine systems, and agriculture and food security were prioritized due their high vulnerability and importance in human and economic development.
Source: Dominican Republic's Second National Communication

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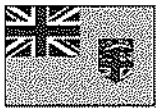
07 : Republic of Fiji



1 : Basic Information and Key Indicators

Capital	Suva
Area :	18,270 [km^2]
Population	883,125 (2011)
GNI, per capita	USD 3,840 (2009)

Source: Basic data, Regional affairs, Ministry of Foreign Affairs of Japan

2 : Summary on climate change related issues in the country

1) Climate change policy and national efforts/measures against climate change

Fiji ratified the United Nations Framework Convention on Climate Change (UNFCCC) on 25 February 1993 and the Kyoto Protocol on 17 September 1998, and submitted their first National Communications Report on 18 May 2006. The national framework is outlined in the People's charter for change, peace and progress (December 2008), which serves as the umbrella framework for national development. The Roadmap for democracy and sustainable socio-economic development 2009–2014 defines the implementation framework for the charter. The National Climate Change Policy will serve as an implementing tool for many of the strategies outlined in the charter, such as:

- environmental protection, sustainable management and utilisation of natural resources;
- strengthening institutional capacity for environmental management; and
- strengthening food security

The Ministry of Foreign Affairs and International Cooperation is the designated national authority of Fiji. Fiji has two hydropower projects and one sewage treatment project submitted to UNFCCC, all of which have been registered as CDM. Fiji also is included in one of the multiple countries in PoAs (water purification and LED distribution) under validation.

2) Institutional arrangement

The Climate Change Unit is responsible for delivering the National Climate Change Policy and co-ordinating climate change programmes and projects in Fiji. The Unit was established in the Department of Environment in 2009. (Pacific Climate Change Portal) On 11 November 2011, the Climate Change Unit was moved from the Ministry of Local Government, Urban Development, Housing and Environment to the Division of Political and Treaties in the Ministry of Foreign Affairs and International Cooperation. The designated national focal point for the UNFCCC made the same move, from the Permanent Secretary of the one ministry to the other. The Director of the Political and Treaties Division has overall responsibility for the unit.

In 1997, the National Climate Change Country Team (NCCCT) was established with representatives from a range of government agencies, non-governmental organisations and academic institutions. The team was established primarily to facilitate the development of the Fiji Initial National Communication (INC) to the UNFCCC Secretariat. The NCCCT was revived in 2010, and now serves as the main platform for information sharing and climate change project progress reporting. The NCCCT also provides direction and guidance to the Climate Change Unit on climate change-related matters. (Pacific Climate Change Portal)
In 2010, the country re-established its National Climate Change Country Team, which was given responsibility for preparation of a Climate Change Policy. Linked to this initiative are ongoing efforts to establish a National Climate Change Adaptation Strategy. It is expected that this strategy will support the integration of adaptation into core functional activities, include an action plan to address adaptation needs and be aligned with existing strategies, policies and action plans (Hay, 2011).

3 :Sustainable Development and Mitigation

1) National inventory of greenhouse gas

For the purposes of reporting and future monitoring and as is required by the UNFCCC guidelines, 1994 was used as the base year for the Greenhouse Gas Inventory for their national communication to the COP. Based on the six major greenhouse gases covered in the Kyoto Protocol, namely carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride, the main sources of major greenhouse gases in Fiji were found to be:

- Carbon dioxide from burning of fossil fuel and biomass
- Methane – emission from animal and human wastes and flooded rice fields
- Nitrous oxide from burning of biomass and incomplete combustion of fossil fuels

Table 1: GHG Emissions by Sector (Gg)

	GHG Source and Sinks Categories	CO2 Emissions (Gg)	CO2 Removals (Gg)	CH4 (Gg)	N2O (Gg)	CO (Gg)	NOX (Gg)	NMVOC (Gg)	SOG (Gg)
	Total National Emissions and Removals		7019	31.7	0.13	110	4.8	5.5	0.03
1	Energy								
	A Fuel Combustion Activities	776							
	Energy Industries	36	Nil	NE	NE	NE	NE	NE	NE
	Manufacturing and Construction	125	Nil	NE	NE	NE	NE	NE	NE
	Transport	528	Nil	NE	NE	NE	NE	NE	NE
	Other Sectors	87	Nil	NE	NE	NE	NE	NE	NE
	Other	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
2	Industrial Processes	45	Nil	Nil	Nil	Nil	Nil	5.5	0.03
3	Solvent and Other Product Use	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
4	Agriculture	Nil	Nil	22	0.09	58	3.3	Nil	Nil
5	LULUCF	Nil	7019	6	0.04	52	1.5	Nil	Nil
6	Waste	Nil	Nil	3.7	Nil	Nil	Nil	Nil	Nil
7	Other	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil

NE: Not Estimated
Use the IPCC notations provided in the revised 1996 IPCC Guidelines

2) Summary of Nationally Appropriate Mitigation Action (NAMA) plan

Fiji has not submitted its NAMA plan. However, as presented in the "Mitigation/Adaptation Options" sections below, the National Communication of the country raises several mitigation measures.

3) Mitigation Options

The energy sector is the major source of GHG emissions in Fiji, with emissions dominated by the transport and energy industries. Therefore, to have a significant reduction in the national emissions of GHG gases, mitigation measures will need to target the release of carbon dioxide from this sector. Objective 6 of the Republic of Fiji, National Climate Change Policy, 2012, is Mitigation. The overarching objective is to reduce Fiji's greenhouse gas emissions and implement initiatives to increase the sequestration and storage of greenhouse gases. It's mitigation strategies are as follows:

- Develop joint programmes and cooperation agreements between relevant sectors to reduce and avoid greenhouse gas (GHG) emissions.
- Develop and implement national, industrial, commercial (such as the tourism, agriculture and mining sectors) and household energy efficiency programmes, including provision of rebates, incentives and disincentives.
- Assess and utilise appropriate renewable energy sources, such as wave, tidal, solar, wind, hydro, geothermal, biofuel and biomass.
- Support the implementation of the Fiji REDD-Plus Policy, the Fiji Biodiversity Strategy and Action Plan, the National Air Pollution Control Strategy, the Ozone Depleting Substances Decree, the National Energy Policy, the Clean Development Mechanism Policy Guideline and other relevant national polices and strategies on the reduction of GHG emissions, deforestation, forest degradation and the enhancement of forest carbon stocks.
- Access international financing instruments to support renewable energy, energy efficiency, waste management and carbon trading initiatives.
- Control and reduce emissions from existing private and public vehicles.
- Control the ages of imported and second-hand vehicles and introduce alternative fuel powered vehicles.
- Develop activities and infrastructure that promote the reduction and avoidance of fossil fuel consumption (for example, construct proper walking and cycling lanes).
- Support the enforcement of legislation on open burning in residential and commercial locations, as stated by the Environment Management Act (2005).

Formalise collaboration arrangements and commitments of members of committees working in the area of climate change mitigation, such as the Carbon Trading Technical Team, and the Fiji REDD-Plus Steering Committee.In Fiji, the various government departments (Energy, Environment and Forestry) have collaborated closely with the other regional organisations and the private sector, in setting policies that encompass the above policy options available for the mitigation of greenhouse gases.

4 : Adaptation and Vulnerability

1) Vulnerability to climate change

Over 90% of the population, both rural and urban, can be considered coastal dwellers, where the vast majority of services, infrastructure, agricultural production and social centres are located.

With climate change in Fiji, temperatures have increased, sea level has risen and ocean acidification has been increasing. Climate change is expected to affect the country's coastal resources through sea level rise, and ocean acidification continues to increase and threaten coral reef ecosystems. There are anticipated impacts on infrastructure caused by the projected increase in the frequency and intensity of cyclones and other tropical storms. Additionally, temperature will continue to increase, rainfall patterns will change, there will be less frequent (but more intense) tropical cyclones, sea levels will continue to rise and ocean acidification will continue. Projections for all emissions scenarios indicate that the annual average air temperature and sea surface temperature will increase in the future in Fiji. By 2030, under a high emissions scenario, this increase in temperature is projected to be in the range of 0.4–1.0°C. Increases in the average temperature will also result in a rise in the number of hot days and warm nights and a decline in cooler weather.

Coastal Resources

Climate change is likely to affect the coastal resources of Fiji in a variety of ways.

- Sea-level rise (SLR) may lead to increases in coastal erosion and coastal inundation, increased exposure of beaches to wave action (as coral growth lags behind sea-level rise), and in some cases the retreat of mangroves.
- Increased sea surface temperatures may lead to an increase in coral bleaching. This, together with the lag in coral growth, may lead to a reduction in reefal sediment production necessary for maintaining shoreline stability. Coral bleaching is also likely to have adverse effects on coastal biological diversity and fisheries.
- Changes in the patterns of storminess, such as an increase in the frequency or intensity of tropical cyclones, may cause greater incidence of coastal inundation and erosion events. These processes may be exacerbated by reduced reef protection.

Fiji, especially Viti Levu, already suffers from human-generated effects on the coastal zone. Highpopulation growth rates, intensive urban development, deforestation of catchments, pollution and increased exploitation of biological and physical coastal resources have exposed large areas of coast to erosion and inundation events.

Water Resources

Impacts on the Suva Peninsula and Rewa Delta are likely to include:

- Raised water tables in low-lying areas,
- Reduced efficacy of in-ground septic systems and inundation of sewer pumping systems,
- Overtopping of the shore protection in downtown Suva during the more extreme wave events under a 25 cm SLR scenario,
- Serious flooding in large parts of Suva Point and downtown Suva even during moderate tropical cyclones under a 100 cm SLR scenario,
- Shoreward retreat of mangroves in the Rewa Delta, and
- Increased sedimentation in the channels of the Rewa Delta and increased flood susceptibility.

On Viti Levu it is important to distinguish between the southeast of the island, which is exposed to the prevailing tradewinds and is characterised by a moist climate, and the northwest which is the leeward, rain-shadow side and much drier. Usually, droughts have much greater impact on the drier, western side of the island.

Agriculture

Sugar cane

Using the period from 1992 to 1999, when Fiji was subjected to two El Niño events and an unusually high number of tropical cyclones; as an analogue for future conditions under climate change it might be assumed that over the next 50 years:

- 47% of the years will have the expected production of 4 million tonnes,
- 33% of the years will have half of the expected production.
- 20% of the years will have three-quarters of the expected production.

The outcome under this scenario would be an overall shortfall in excess of one quarter of expected production. It implies economic difficulties for the large sector of the population in the agricultural sector dependent on sugar production and associated industries.

Root crops

Using the PLANTGRO model the following patterns were projected for dalo (Colocassia esculenta) and yams (Dioscorea sp.):

- Projected changes in mean conditions would have little effect on dalo production, with the exception of the extreme low-rainfall scenario using the DKRZ GCM which would result in a halving of the land area providing high yields. It is likely that yam production will also remain unaffected, although if rainfall increases significantly, yam yields may fall slightly.
- When El Niño conditions are factored in, reductions in, production of 30-40% might be recorded in one out of three years, with a further one in five years affected by the residual effects of the ENSO events.
- Using the same ENSO assumptions we find a converse response for yam production. In one out of three years yam production might be expected to remain the same or increase. On the other hand, yields may decrease in around half of the remaining years, especially when La Niña conditions prevail.

Health

The study concluded that the afflictions for which a clear link to climate change can be established are:

- Dengue fever.
- Diarrhoeal diseases,
- Nutrition-related illness.

Changes in dengue-fever epidemics were modelled using PACCLIM. It was found that climate change, through increasing temperature, would lead to increases in the risk of dengue-fever epidemics. These findings suggest that climate change could result in:

- An increase in the frequency of epidemics
- A change in the timing (seasonality) of epidemics so they may occur in any month
- A larger number of people being affected by each epidemic. Under the B2 scenario numbers affected may increase by 40% by 2100, while under the A2 scenario the increase may be in the order of 100%.
- Increased number of fatalities
- Dengue becoming endemic (occurring all the time) rather than occurring in epidemics

Diarrhoeal disease may become more common if Fiji becomes warmer and wetter (as under the CSIRO scenario) and if droughts and tropical cyclones occur more frequently, disrupting water supplies and sanitation systems. Nutrition-related illnesses are most likely to be affected by increases in frequency and/or magnitude of tropical cyclone and drought events. Further, it is also likely that if climate change leads to economic and social disruption and environmental degradation, disadvantageous effects on health may be serious.

2) Summary of National Adaptation Programme of Action (NAPA)

Fiji has not submitted its NAPA to the UNFCCC.

3) Adaptation Options

A number of adaptation priorities have been identified to reduce vulnerability to the anticipated impacts from climate change in the National Communications Report. The following were identified as various adaptation options for the four sectors evaluated in the assessment:

Coastal resources

Adaptation needs are identified as being:

- An improved understanding of the coastal system, examination and evaluation of coastal protection options;
- Land use policies that encourage settlement away from low-lying coastal areas;
- Mangrove and reef protection, including exploration of the use of artificial reefs to enhance coastal protection; alternative sources of construction aggregate (not coral); reducing use and cutting of mangrove areas; and mangrove rehabilitation;
- Controls on pollution from residential, tourism, commercial and industrial areas: and
- Water-catchment management and soil-conservation measures to reduce erosion and sedimentation.

Freshwater Resources

Needs in this sector have been identified as follows:

- Flood Control--Construction of diversion channels, weirs, cut-off channels, retarding basins and dams; and river-improvement activities such as channel widening, dyke construction or river-bed excavation.
- Drought alleviation--Management of water resources: water legislation: development of alternative water resources such as groundwater and the use of roof catchments; and consumer charges for water use.
- Catchment Management--Reforestation, land-use controls, protection of wetlands and soil conservation; reducing flood damage potential by regulating development on flood plains and promoting flood-proof building design; community level activities to improve awareness of water conservation and emergency response; and institutional development such as the creation of catchment and water authorities would help build capacity to improve the management of water resources.

Agriculture

Adaptation needs identified include:

- Researching flexible farming systems that are tolerant to climatic variability, development of sustainable production systems, and melding of traditional and modern systems.
- Establishment of an Agricultural Diversification Scheme (under the Commodity Development Framework).
- Cessation of sugarcane production of marginal sloping lands and coastal lands, and intensified irrigation of sugar cane production on better lands.
- Strengthening of land use planning in order to identify most suitable areas for adaptation commercial and subsistence based crops.
- Root crop breeding program and development of improved irrigation systems

Human Health

The needs for human health adaptation are:

- Dengue Fever control: encourage prevention, improve quarantine, epidemic preparedness response and implement proper development policies.
- Diarrheal Disease: improve reliability, safety and sanitation of water, refrigeration practices, emergency strategies and health care access.

Disaster Management

Reduction of the vulnerability of rural communities to disasters, such as cyclones and tsunamis, is undertaken through the Disaster Management Office under the National Disaster Management Act of 1998. The priorities for the sector are:

- Mainstreaming Disaster Management into the national development decision making process;
- Ensuring the establishment of a comprehensive hazard and risk management plan;
- Improve community awareness of risk, preparedness and response; and
- Investing in infrastructure to mitigate the impact of disasters

Protection of the Environment

The proper management of the environment and sustainable use of its natural resources is critical for sustainable development of Fiji's largely natural-resource based economy. The Department of Environment is responsible for better coordination, effective formulation and implementation of national environmental policies.

Policies for the sustainable management of the environment include:

- Minimizing degradation of natural resources and protecting Fiji's biodiversity;
- Promoting and supporting sustainable waste management;
- Mitigating the effects of climate change;
- Enactment of the Sustainable Bill; and
- Public Awareness and Education

Fiji is actively engaged in addressing climate change at both the policy and project level. Relative to other Pacific Island countries, Fiji's involvement with international projects is sizable, including its unique participation in the World Health Organization's "Piloting Climate Change Adaptation to Protect Human Health" project. This project helps Fiji address one of its four priority areas of adaptation, with human health being the least represented within on-going initiatives. Additionally there is a new project funded by the Adaptation Fund entitled: "Enhancing Resilience to Flood- and Drought-Related Risks in Fiji".

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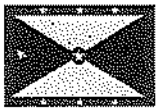
08 : Grenada



1 : Basic Information and Key Indicators

Capital	St. George's
Area :	345 [km^2]
Population	105,000 (2013)
GNI, per capita	USD 7.220 (2012)

Source: Basic data. Regional affairs. Ministry of Foreign Affairs of Japan

2 : Summary on climate change related issues in the country

1) Climate change policy and national efforts/ measures against climate change

Grenada ratified the United Nations Framework Convention on Climate Change (UNFCCC) on 11 August 1994 and the Kyoto Protocol on 6 August 2002. and snbmitted their first National Communications Report on 21 November 2000. Current adaptation projects in Grenada focus on the areas of agricnlture. disaster risk management, coastal zone management, freshwater snpply, gender and tourism: several are focused on enhancing the capacity of government to create an enabling environment for adaptation. Most projects support capacity building, knowledge communication and fostering policy formation and implementation.

2) Institutional Arrangement

No information available.

3 :Snstainable Development and Mitigation

1) National inventory of greenhouse gas

Table 1. Total GHG Emissions by Sector in Grenada

Greenhouse Gas Source and Sink Categories	CO2	CH4	N2O
Total (Net) National Emission (Gigagram per year)			
1. All Energy			
Fuel combustion	135	0.02	0.002
Energy and transformation industries	62		
Industry	4		
Transport	52		
Commercial-institutional	6		

Greenhouse Gas Source and Sink Categories	CO2	CH4	N2O
Residential	10		
Other (Agriculture, Forestry and Fisheries)	1		
Biomass bnrned for energy	n.e.		
Fugitive Fuel Emission			
Oil and natural gas systems	n.a		
Coal mining	n.a		
2. Industrial Processes			
3. Agriculture			
Enteric Fermentation		0.00324	
Manure Management		0.00106	
Solid Waste Disposal		70	
4. Land Use Change and Forestry			
Changes in Forest and other woody biomass stock	(92)		
Forest and Grassland Conversion			
Abandonment of Managed Lands			
5. Other Sources as appropriate and to the extent possible			

Unit: (Gg / year)
Notes: n.a. – not applicable; n.e – not estimated
Source: Grenada's Initial National Communication

2) Mitigation Options

Table 2: Mitigation measures on climate change

Sector	Measures
Energy	- Setup massive solar collectors, replacing LPG for boilers, and replacing incandescent lamps in the following sectors: Urban Residential, Hotels, Restanrants, Commerce, Services and Government - Gnidelines fer a program of more efficient air conditioner consnmption through better eqnipment and insnlation and changes in practices - Establish guidelines for a program of efficiency in food preservation. by snbstituting eqnipment and changes in use patterns - Encourage cogeneration as a way to efficiently use the residual heat of processes industry. In particnlar. bagasse cogeneration in the sngar industry - Develop programs for captive fleets to facilitate the switching to new fuels - Redncing emissions from energy efficiency measures in commercial facilities and services - Replacement of boilers using bunker in thermal power generation by biomass, among others
House. Bnilding	- Design guidelines for a program of standardization. certification and labelling of appliances, specifying residential sector energy consumption and allow for comparison between commercially available alternatives - For rural honseholds, a program designed to promote the use of LP, with the aim of replacing fire wood in cooking
Agricnlture	- Management of swine mannre on pig farms for methane capture and subsequent use in generating energy and cooking food - Avoidance of methane through the composting of solid waste facility agribnsiness

Sector	Measures
	- New crops of sugar cane with specific focus on supplying raw materials to autonomous distilleries - Creation of strategies for the export of biofuels - Articulate agro-industrial development programs that create multiple benefits (energy, social, economic and environmental).
Transport	- Policy and institutional and financial mechanisms to promote mass transit - Tax incentives for the introduction of more efficient vehicles - Using ethanol and biodiesel for automotive - Replacement of vehicular fuel in public transport through the use of ethanol and biodiesel

Source: Dominican Republic's Second National Communication

4 : Adaptation and Vulnerability

Table 3: Climate change vulnerability in Dominican Republic's National Communication

Sector	Vulnerability
*Freshwater, Coastal and Marine resources (Haina Basin)	- The intrusion of sea waters into underground water - The impact on the subterranean waters in the basin due to its physical chemical deterioration and the decrease of the water potential as a result of poor rainfall [Current environmental problems identified by the Environment and Natural Resources] - Scarcity and water pollution from various sources - Soil erosion of upstream Rio Haina, sedimentation in downstream and the coast of Rio Haina - No local land use planning - Weak community organization lacking a board or authority of the basin - Irrational use of natural resources and the environment - Contamination with solid and liquid wastes - Conflicts of land use.
Health (Malaria and Dengue)	- Extreme climatic events cause diseases such as dengue, leptospirosis, malaria and yellow fever, which are transmitted by insects and rodents and diseases such as schistosomiasis, cryptosporidium, and cholera which are transmitted by aquatic vectors
Tourism	- Deep sea-diving ecotourism could be affected due to erosion of coral reefs - The coastline could become unprotected due to loss of reefs and a decrease in the carbonated material contributed by the reefs, which will imply a decrease or loss of sandy beaches - The coastal landscape will change due to an increment of erosion, emergence of rocks and loss of natural vegetation and sandy beaches, thereby reducing the beach's load capability (square meters available/tourist.) - The expected rise in sea levels will trigger flooding of the basin mangroves, impacting forest zoning - An increment of erosion will affect the tourist infrastructures closest to the coastal edge - Changes in the rainfall pattern could decrease the volume of drinking water in the basins - The saline water intrusion due to a combination of rising sea levels and decreasing rainfall could imply the loss of quality in the potable water reservoirs - Losses of capital for the investors, loss of jobs, both indirect and direct

	employment, and losses could extend to other economic sectors that supply goods and services to the tourist sector, such as agriculture, fishing, construction and suppliers of cleaning chemical products
*Agriculture and food security	- Yields limited by water shortage; and yields and lack of nutrients - The shortened crop cycle due to water shortage (The main vulnerability to agriculture) - In most crops taken into consideration, yield of the dry area will fall to half their present value between 2020 and 2050, while by 2080 productivity will be significantly less, and will eventually disappear in the case of some crops

The sectors of freshwater, coastal and marine systems, and agriculture and food security were prioritized due their high vulnerability and importance in human and economic development.
Source: Dominican Republic's Second National Communication

Table 4: Adaption Measures to Climate Change in Dominican Republic's National Communication

Sector	Measures
Freshwater, Coastal and Marine resources (Haina Basin)	- Improvement of the living conditions and environment of communities in the watershed of Haina, with the establishment of woodlots, agro-forestry, conserving soils, reducing sedimentation of existing water works to increase lifespan and reduce solids and liquid pollution - Elimination of slash and burn in the forests in the upper basin, to enable planting of annual crops - Improvement of the level of income for farmers, promoting productive alternatives without degrading the soil - Elimination of extensive livestock on hillside soils and the river - Improvement of the infrastructure for community services (roads and local roads, schools, community, health centers, latrines) - Involvement of public and private institutions in the implementation of this management plan - Implementation of an ongoing program of environmental education, extended to the entire population - Implementation of a program of water and soil conservation
Health (Malaria and Dengue)	- The management plan of the dengue and malaria includes the following: - Strengthening of an integral system of observation of all relevant variables in order to characterize the malaria and dengue situations - Carrying out studies to determine malaria and dengue epidemiologic pattern in the face of potential impacts of climate change - Establishing an effective educational program through measures such as education, transferring of technologies and financial assistance
Tourism	- The rehabilitation of the basin mangroves - Monitoring present levels of erosion in the beaches, whether due to natural causes or due to anthropogenic ones - Protection of coral reefs and protection of marine biota
Biodiversity	- Put into practice a public awareness and dissemination strategy nationwide - Carry out an adequate economic estimate or evaluation on goods and services of the main ecosystems that might be affected by projected climate change, with emphasis on the coastal-marine ecosystems - Carry out basic biology and species behaviour studies that are most vulnerable to the projected climate change, including population and invasive species studies - Establish a vigilance and evaluation network regarding the impact of climate change on the nesting areas for marine turtles - Egg incubation and subsequent liberation of marine turtles

	- Reduce and/or eliminate of threats and barriers that prevent an effective management of the National System for Protected Areas, as a form of protecting a larger amount of genetic groups, from which new genotypes, capable of adapting to the projected climate change could arise
Agriculture and food security	- Climate scientific studies in agricultural production - Regionalization of crops - Introduction of varieties resistant to unfavourable climatic conditions - Improvement of technologies and technological discipline in agricultural production - Redistribution of sowing areas between different crops - New techniques in agricultural production - Adapting to new methods and practices in the fight against pests and diseases in agricultural crops.

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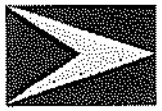
1. Ministry of Foreign Affairs of Japan, "Regional affairs" http://www.mofa.go.jp/mofaj/area/index.html
2. United Nations Framework Convention on Climate Change "Grenada's Initial National Communication" http://unfccc.int/resource/docs/natc/grnnc1.pdf
3. Renewable energy and energy efficiency partnership (REEP). "Policy database" http://www.reegle.info/policy-and-regulatory-overviews/GD

09 : Republic of Guyana



1 : Basic Information and Key Indicators

Capital	Georgetown
Area :	21.5 [km^2]
Population	80,400 (2014)
GNI, per capita	USD 3.140 (2012)

Sonrce: Basic data, Regional affairs, Ministry of Foreign Affairs of Japan

2 : Summary on climate change related issues in the country

1) Climate change policy and national efforts/measures against climate change

Gnyana signed the United Nations Framework Convention on Climate Change (UNFCCC) in June 1992 and agreed the Kyoto Protocol in August 2003. It submitted its Initial National Communications (INC) in May 2002 and Second National Communications (SNC)[2] in September 2012. Policies, regnlations and plans related climate changes in Guyana are shown in below.

Table 1. Policies, regulations and plans related climate change

Year	Relevant Policies and Decrees
1994	National Environmental Action plan
1996	Environmental Protection Act
1993	Establishment of the Environmental Protection Agency
2001	Guyana Climate Change Action Plan
2002	Guyana Climate Change Adaptation Policy and Implementation Strategy for Coastal and Low-lying Areas
2006-2011	National Biosafety Action Plan
2006	Guyana National Action Programme to Combat Land Degradation
2007	National Biosafety Framework for Guyana
2009	Guyana Readiness Preparation Proposal
2009	Guyana Low Carbon Development Strategy (LCDS)

Source : Second National Communication.

2) Institutional Arrangements

Several institutions were set up in light of the growing need for actions to be taken nationally to address the potential impacts of Climate Change for Guyana. Five main institutions are prioritized for strengthening Low Carbon Development. Role of each institutions are shown in below.

Table 2. Role of institutions

Institutions	Role
Office of Climate Change (OCC)	Coordinating work on climate adaptation, mitigation and forest conservation, as well as national consultations of the "Low Carbon Development Strategy" (LCDS).
Project Management Office (PMO)	Accelerating implementation of key projects identified in the LCDS
Guyana REDD+ Investment Fund (GRIF)	Channel REDD-plus financial support from Norway and other contributors to implement Guyana's LCDS.
REDD Secretariat	Implement monitoring, reporting and verification (MRV) for the forest payments in accordance with international guidelines for estimating and reporting carbon emissions and removals.
Environmental Protection Agency (EPA)	Ensuring that national and international social and environmental standards are met in all GRIF investments.

Source : Second National Communication.

3 :Sustainable Development and Mitigation

1) National inventory of Greenhouse Gas (GHG)

Guyana has completely prepared its national greenhouse gas inventory and presented in its Second National Communication on Climate Change to the UNFCCC in 2012. GHG inventory by sector in 2004 is in Table 3.

Table 3. GHG emission by sector

Sector	CO_2 emissions	CO_2 removals	CH_4	N_2O
Energy	1,657	I/NO	I/NO	I/NO
Industrial Process	I/NO	I/NO	I/NO	I/NO
Agriculture	I/NO	I/NO	45	5
Land use change and forestry	I/NO	-59,333	7	I/NO
Waste	NE	NE	3	0.5
Total	**1.657**	**-61,533**	**55**	**5.5**
International Bunkers	21	NE	NE	NE
Biomass	716	NE	NE	NE

Unit: (Gg / year)
Note: "I/NO": Insignificantly Small or Not Occurring, NE: Not Estimated (by IPCC Methodology)
Source: Second National Communication

2) Summary of Nationally Appropriate Mitigation Action (NAMA) plan

Guyana has not yet submitted its NAMA to the UNFCCC. However Second National Commnnication shows following mitigation options.

Table 4. Mitigation options on climate change

Sector	Mitigation Options
Industry	- Retrofit existing power plans with energy efficient technologies/and switch to more efficient fuel use. - Reduce transmission losses

Sector	Mitigation Options
	- Implement demand side management strategies such as pricing and subsidization of new technologies - Replace existing oil-fired plants with new natural gas-fired stations and resources - Energy conservation in commercial/residential / public buildings - Mandatory installation of pollution removal devices - Design and introduction of incentives (e.g. using pricing controls) to encourage the use of alternative, less polluting fuels.
Transportation	- Energy conservation in transportation - Improvements in energy efficiency of vehicles - Shift to less carbon-emitting fuels and in the longer term to hybrid vehicles - Stricter import controls e.g. so that only vehicles meeting minimum environmental standards are brought into the country - Measures to encourage modal shifts (e.g. from road to rail transportation) - Research and Development in vehicle and transport system technologies
Buildings	- Using energy efficient cooking systems, more efficient lighting, cooking appliances, updating building codes - Improve insulation/reduce cooking losses, update building codes, use sustainable materials - Mandatory energy efficiency standards, incentives
Forestry	- Management of forests specifically for carbon conservation, including via introduction of stricter controls on harvesting, deforestation, fires and pest outbreaks - Management of forest resources specifically for the purposes of carbon sequestration, e.g. through measures to expand the area of carbon sequestration, e.g. through measures to expand the area of forest ecosystems and the density of forest biomass, and increasing the absorption capacity of forest soils - Policy and other measures for promoting afforestation, reforestation and forest regeneration
Water	- Reduce the volume of waste produced at source (e.g. demand management techniques including regulatory and incentive measures) - Improve waste management techniques (waste segregation, waste recovery, and waste recycling) to reduce the volume of waste sent to landfill - Installation of transfer stations and centralized sanitary landfills in each of the major population centres (Georgetown, Linden, and New Amsterdam) - Landfill gas capture (and flaring)
Agriculture	- Modifications to cultivation regimes (particularly for rice) - More controlled use of fertilizers - Development and use of hybrid varieties - Investigate feasibility of introducing new or alternative crops that emit less methane - Upgrade livestock fodder to reduce emissions from enteric fermentation - Modernization of agriculture

Source: Second National Communication

4 : Adaptation and Vulnerability

1) Vulnerability to Climate Change

Vulnerabilities to climate change in Guyana are summarized in "Second National Communication". Vulnerabilities to climate change on each sector related are summarized in

below.

Table 5. Summary of climate change impacts, derived effects for sectors

Possible Climate Change Impacts Affecting Guyana	Some Derived Effects Affecting Sector
Increase in storm surges, sea-level rise and/or increased rainfall leading to flooding	- Coastal protection infrastructure affected (causing impacts on all the systems the coastal plain holds) - Houses in human settlements damaged by soil erosion - Pollution of freshwater for aquaculture - Change in patterns of agricultural yields due to agricultural soil erosion - Saline intrusion affecting water resources- surface and ground water
More intense and frequent El Nino Southern Oscillation (ENSO) events, change in rainfall and temperature patterns leading to droughts	- Migration of human settlements from the hinterland, increasing the pressure on the coastal zone. - Increase in pests and diseases - Increase in infectious vector-transmitted diseases due to temperature rise - Reduction in productivity of crops, especially sugarcane and rice, leading to effects on exports - Risk to energy security in the future due to water deficit for hydropower stations (possible source to diversify energy matrix currently dependent on fossil fuels). - Increase of forest fires due to temperature rise

Source: Second National Communication

2) Summery of National Adaptation Programme of Action (NAPA)

Guyana has not submitted its NAPA. However, Second National Communications contains the measurements for adaptation. Key adaptation measures are shown in below.

Sea-level rise

1. Developing climate change scenarios and impacts using more accurate data, smaller scales and methodologies.
2. Strengthening institutional capacity of the GoG to manage water levels in the East Demerara Water Conservancy (EDWC) and to guide interventions aimed at reducing Guyana's vulnerability to floods
3. Mainstreaming adaptation measures into the integrated coastal zone management plans (ICZM) and urban planning; developing new building codes that include risk assessment; implementation of an emergency response plan and upgrading early warning systems
4. Construction, maintenance and reinforcement of sea defence and water infrastructure: seawalls, drainage, upgrading of the East Demerara Water Conservancy
5. Developing indexed insurance products to minimize the risk of crop yield losses, and a project to be financed by the Adaptation Fund
6. Developing financial and risk/insurance measures to boost resiliency post-flooding

Droughts

1. Developing an integrated system for the development of water availability information and projections
2. Education, training, and participatory processes where dialogue and communication between stakeholders is required to design and implement effective relocation measures
3. Expanding the early warning system and building an emergency response system for droughts

4. Monitoring-systems for infectious diseases developing drought-resistant crops and efficient technologies and practices for water use in different sectors
5. Economic incentives to redirect new coastal settlements to better-protected locations, promoting investments in appropriate infrastructure and effective use of water
6. Developing financial and risk/insurance measures to boost post-flooding resiliency

References

1. Ministry of Foreign Affairs of Japan (Republic of Guyana)
   http://www.mofa.go.jp/mofaj/area/guyana/data.html#section1
2. Second National Communication
   http://unfccc.int/resource/docs/natc/guync2.pdf

10 : Kiribati

1 : Basic Information and Key Indicators

Capital	Bairiki
Area :	811 [km^2]
Population	100,743 (2011)
GNI, per capita	USD 1,830 (2009)

Source: Basic data, Regional affairs, Ministry of Foreign Affairs of Japan

2 : Summary on climate change related issues in the country

1) Climate change policy and national efforts/measures against climate change

Kiribati ratified the United Nations Framework Convention on Climate Change (UNFCCC) on 7 Feb 1995 and the Kyoto Protocol as of 7 Sep 2000, and submitted their first National Communications Report 24 November 2000. The Kiribati government's climate change strategies focus on two objectives: firstly, adapting to and, secondly, relocating from climate change. The National Climate Change Adaptation Strategy 2005 aims to implement the government's policy on adaptation to climate change, which states that:

- Kiribati people should be mentally, physically and financially well prepared to deal with whatever climatic trends and events the future may hold.
- This should be achieved through a nationally co-ordinated, participation-based adaptation programme carried out by official and private agencies.
- External financial assistance should be obtained to meet the costs of the national adaptation programme.

The recent National Climate Change and Climate Change Adaptation 2012 aims also to better coordinate adaptation responses based on the 2005 CCA Strategy taking into account new science and issues, and have the following priorities areas:

1) Mitigation
2) Integration of Climate Change and Climate Change Adaptation into national planning and institutional capacity
3) Population and resettlement
4) Governance and services
5) Survivability and self-reliance

These goals are to be achieved through:

- The Government of Kiribati developing the Joint Implementation Plan on Climate Change Adaptation and Disaster Risk Management, and to integrate Climate change into the KDP (2012–15).
- Securing future assistance to support implementation of the Joint Action Plan.

- GoK (through KAP III) to improve community engagement processes to improve community ownership of climate change infrastructure.
- Mainstreaming climate change adaptation into national planning and budgeting.

Kiribati does not have any CDM projects, but is included in one of the multiple countries in a PoA (water purification) under validation.

2) Institutional arrangement

The overall effective implementation of responsibilities under the UNFCCC including preparation of the Second National Communication Report and the Climate Change National Implementation Strategy was undertaken by the Environment and Conservation Division of the Ministry of Environment, Lands and Agriculture Development (MELAD). At the national level, Secretary to the MELAD was the designated Focal point for the UNFCCC.
The Climate Change Study Team, one of the key committees for climate change in Kiribati was a body originally established to undertake operations and activities of the UNFCCC and Focal Point. Being multi-disciplinary inclusive of NGOs and other inter-governmental and non-governmental organizations: it serves as a port of channel and working team for the implementation of the UNFCCC. Over time as Climate change caught the attention of policy makers, and in 2012, the same team was destined to provide technical advice to the newly established oversight committee on adaptation called – National Adaptation Steering Committee (NASC) under the Office of President.

The Climate Change Unit (CCU) is a technical unit through which the Ministry (MELAD) has been implementing local climate change initiatives and programmes as well as externally funded projects. The aim of the CCU is to strengthen national capacity for effective response and adaptation to climate change, with a particular focus on environmental protection and management.

CCU Objectives

- To improve knowledge, information and national adaptive capacity for responding and adapting to climate change
- To build on existing adaptation measures and continue with implementation of concrete and practical adaptation measures aimed at protecting and sustaining environment services
- To implement mitigation measures and strengthen synergies between climate change mitigation and environment sustainability
- To facilitate long-term planning and preparations to respond to the impacts of global climate change in order to build the resilience of the environment through coherent climate change programs undertaken at national level through MELAD

CCU Responsibilities

- Monitor information and data on climate change produced by international bodies such as the IPCC and the UNFCCC.
- Preparation of National Communications to the UNFCCC.
- Monitoring and participating in climate change studies and research.
- Dissemination of climate change information and data to CCST, Government, media and researchers.
- Climate change awareness raising and education, particularly regarding adaptation measures.
- Securing climate change related training.
- Monitoring of extreme weather events.

Climate Change Study Team (CCST)
Coordinated by the CCU, the CCST is composed of national experts in fields and sectors relevant to the proper implementation of climate change policy. The CCST serves as a national technical advisory committee to the Government. It is also a vehicle to coordinate national climate change programs, snch as the US In-Country Climate Change Study Programme, Pacific Island Climate Change Assistance Program and the Second National Communication (SNC) to the UNFCCC. Furthermore, the CCST serves as the technical arm of the National Adaptation Steering Committee.

3 :Sustainable Development and Mitigation

1) National inventory of greenhouse gas

Kiribati's inventory of greenhouse gases is regularly npdated, but there are recognized gaps in data, and there is not a centralized database with regular updating procedures.

Table 1: GHG emissions by Sector (Gg)

Sector	Year	Emissions [Gg]		
		CO2	CH4	N2O
Energy	2008	63.7841		
Industrial process	2008	0		
Agriculture and forest	2008	0	0.0108	0.3368
Total	2008	63.7841	0.0108	0.3368

The inventory for the Second National Communication for Kiribati is based on two sectors only: Energy, and Agriculture and Forestry. Energy is the key sector for emissions, and Agriculture and Forestry which inclnde Fisheries which are also a high source of emissions. All imported fossil fuels are used in the Energy sector under the various purposes of public electricity, transport, and other sectors. Transport category includes subcategory of road transport, marine navigation, and civil aviation. Other sectors inclnde the subcategory of residential and agriculture/forestry/fishing nses of fossil fuels.

2) Summary of Nationally Appropriate Mitigation Action (NAMA) plan

Kiribati has not submitted its NAMA plan. However, as presented in the "Mitigation/Adaptation Options" sections below, the National Commnication of the conntry raises several mitigation measures.

3) Mitigation Options

Although Kiribati emits an extremely low level of CO2 it still experiences first-hand the impacts of climate change, and is therefore taking mitigation actions. The Pacific Islands Greenhouse Gas Abatement through Renewable Energy Project (PIGGAREP) is the main mitigation activity for participating countries. This project is aimed at reducing the growth rate of GHG emissions from fossil fuel use in the Pacific Island Countries (PICs) through the widespread and cost effective use of their renewable energy (RE) resonrces. It consists of various activities whose outputs will contribute to the removal of the major barriers to the widespread utilization of RE technologies (RETs). The PIGGAREP activities identified for Kiribati will bnild on 4 key initiatives: (1) Government of Italy and PIC Cooperation Programme, (2) EU EDF 10, (3) Solar Energy Company Ltd and (4) the UNDP Mnlti-country Office in Suva, Fiji. (Pacific Climate Change Portal)

4 : Adaptation and Vulnerability

1) Vulnerability to climate change

Based on these scientific undertakings, there is consensus that i) both ambient and sea surface temperatures will increase in the coming future i.e. from 2025 up to 2100 with a range of28oC to 32oC; ii) precipitation will also increase on average bnt this is highly variable spatially and there should be caution on possibility of prolonged devastating drought events; iii) Sea level is also expected to rise in the future by several centimetres (range from 15cm to 70cm at different time scales). This confirms the notion that climate change in the future could dangerously damage or harm Kiribati's various systems. Kiribati is comprised mostly of coral atolls and therefore the environment systems that provide sustenance to living population are sensitive to any drastic or slow onset climatic conditions. Urban centres/settlements are among the many vulnerable sectors due to socio-economic activities and that climate change could further exacerbate the impacts. Several sectors and systems have also been examined in past vulnerability assessments and consensually concluded that Kiribati has already been exposed to risks and impacts of climate change coupled with additional layers of stress already existed over these systems. The projections of climate change and existing national fragile circumstances will only add up to compounded and probably unthinkable level of impacts which may be extremely difficult to neither cope with, nor reverse it in the longer term future.

2) Summary of National Adaptation Programme of Action (NAPA)

In its National Adaptation Programme of Action (NAPA) 2007, Kiribati builds upon these observations to identify nine key areas in which adaptation action is required. These nine key areas (as detailed in the 2007 NAPA) include implementation in the areas of:

- Freshwater–A water resources adaptation project, and a well improvement project to improve pnblic health
- Coastal zones–A coastal zone management program for adaptation;
- Risk reduction and monitoring–A strengthening of climate change information and monitoring program; upgrading of coastal defences and causeways; and npgrading of meteorological services;
- Marine resources–Coral monitoring, restoration and stock enhancement; and
- Agriculture–Agricnltural food crops development.

References

1 "Kiribati. Kiribati Government second communication under the United Nations Convention on Climate Change."
http://unfccc.int/resource/docs/natc/kirnc2.pdf
2 "Appendix II - Nationally appropriate mitigation actions of developing country Parties"
http://unfccc.int/meetings/cop_15/copenhagen_accord/items/5265.php
3 NAPAs received by the secretariat, "REPUBLIC OF KIRIBATI, NATIONAL ADAPTATION PROGRAM OF ACTION (NAPA)"
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4 "Pacific Climate Change Portal -- Kiribati"
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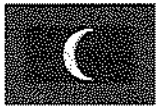
11 : Maldives



1 : Basic Information and Key Indicators

Capital	Male
Area :	300 [km^2]
Population	394,999 (2011)
GNI. per capita	USD 3,970 (2009)

Source: Basic data, Regional affairs, Ministry of Foreign Affairs of Japan

2 : Summary on climate change related issues in the country

1) Climate change policy and national efforts/measures against climate change

Maldives ratified the United Nations Framework Convention on Climate Change (UNFCCC) on 9 November 1992 and the Kyoto Protocol on 30 December 1998, and submitted their first National Communications Report on 5 November 2001. In addition to local environmental concerns, the Maldives Government has continued to work in the wider international context because of the potential threats posed by externally generated problems and the collective responsibility for sustainable development at the global level. Current national environmental policies are based on the need to take an integrated approach to environmental management and to work towards the goal of sustainable development. This is reflected in the NEAP3(2009-2013), which is the main guiding document for developing national environmental polices. The strategic results of NEAP3 that are expected are: resilient islands; rich ecosystems; healthy communities; safe water; environmental stewardship; and a carbon neutral nation. NEAP3 provides the basis for environmental planning, budgeting, performance measurement, and accountability and associated sea level rise as a primary concern of the Maldives. Under each Result, specific goals are provided to achieve the result as follows:

Results	Specific Goals
1) Resilient Islands	Protect critical infrastructure Protect human settlement Increase the resilience of coral reef system to climate change Reduce climate-related risks to tourism sector Protect human health from climate change-related vector-borne diseases Build resilience of fisheries and food production to climate change Natural disaster preparedness and mitigation
2) Rich Ecosystems	Improve scientific knowledge and access to information for biodiversity conservation Bring institutional and legislative reforms to enable biodiversity conservation Protect and restore coral reefs

Results	Specific Goals
	Protect and restore vegetation, terrestrial ecosystems and islands Protect and restore wetlands and mangrove ecosystems Control invasive species
3) Healthy Community	Solid waste management Hazardous waste management Safe use and disposal of chemicals Clean air
4) Safe Water	Provide safe drinking water Protect groundwater Operationalize wastewater treatment to maintain resilience of water resources and coral reef biodiversity in the face of climate hazards Protect the seas
5) Environmental Stewardship	Efficient Environmental Administration - Build, strengthen and coordinate cooperation among all partners and improve performance of organizations Environmental legislation - support the development of effective policies and systems and ensure comprehensive enforcement Strengthen Environmental Impact Assessment to ensure that all significant impacts associated with new developments is understood and accounted for Strengthen the capacity to plan and manage environmental education and public awareness programmes Environmental research Environmental information
6) Carbon Neutral Nation	All Maldivians know what carbon neutral is and the importance and advantages of becoming carbon neutral Advance Energy Security Establish an Efficient Transport Network

Maldives does not have any CDM projects, but is part of two multiple countries Programmatic CDM projects (water purification and LED introduction) under validation.

3 :Sustainable Development and Mitigation

1) National inventory of greenhouse gas

The Maldives inventory of GHG emissions has been calculated for year 1994 and is limited to the best information available for that year. It was not possible to report on emissions of all three major GHGs; carbon dioxide (CO2), methane (CH4) and nitrous oxide (N2O). The inventory was developed mainly for the energy sector using the IPCC Reference Approach.
In the Maldives, diesel is the main fuel consumed and is used to generate electricity and for transportation. It was estimated that 129 Gg of carbon dioxide was emitted from the energy sector (0.54 tonnes of CO2 per capita) and 1.1 Gg of methane was emitted from the waste sector.

Table 1: GHG emissions from various sectors in the Maldives

GHG source and sinks [Gg]	CO2	CH4	N2O
Energy	129.0	-	-
Indnstrial process	-	-	-
Agriculture	-	-	-
Land use change and forestry	-	-	-
Landfills	-	1.1	-
Total (Net) national emission [Gg]	129.0	1.1	

Source: First National Communication from the Republic of Maldives

Land use, land use changes and forestry and the existence of natural and managed GHG sinks, were not accounted for in the GHG inventory due to lack of sufficient data.

2) Summary of Nationally Appropriate Mitigation Action (NAMA) plan

Maldives snbmitted their NAMA on 29 January 2010 with the goal of achicving carbon neutrality as a country by 2020. The Government stated that it was undertaking detailed work on implementation of this action and that it would register a request for technological, financial and capacity building support for implementation. However, it also stated that the submission of the mitigation action was voluntary and unconditional.

3) Mitigation Options

Maldives is a non-annex 1 party to the UNFCCC and is not obliged to implement GHG mitigation measures. However, mitigation measures have been developed not only to reduce the Maldives emission of GHGs, but as a step towards achievng greater energy independence for sustainable development.
The mitigation of GHG emissions is possible by lowering the demand on the imported fossil fuel. This can be achieved by increasing the efficiency in generating and utilising electricity and improving the efficiency of the transportation mechanisms.
Reducing methane (CH4), the main source of emission of GHGs from landfills and sewage discharges, is another possibility. This can be achieved throngh improving the solid waste disposal methods, management practices and providing treatment of sewage discharges.
The enhancement of the Maldives natural GHG sinks by increasing the vegetation cover and improving the health of the coral reef have been considered as possible mitigation options.

4 : Adaptation and Vulnerability

1) Vulnerability to climate change

Even thongh the Maldives contributes less than 0.01% to global emissions of GHGs, the Maldives is in fact one of the most vulnerable conntries to climate change and sea level rise. The National Vulnerability & Adaptation (V&A) assessment team identified seven main areas of vulnerability:

Land loss and beach erosion
Over 80% of the land area in the Maldives is less than 1 m above mean sea level. Being so low-lying, the islands of the Maldives are very vulnerable to inundation and beach erosion. Presently, 50% of all inhabited islands and 45% of tourist resorts face varying degrees of beach erosion, which will be aggravated by climate change and projected sea level rise. It is expected that even a 1 m rise in sea level would cause the loss of the entire land area of Maldives.

Infrastructure damage
All the human settlement, industry and vital infrastructure in the Maldives lie very close to the shoreline. Therefore, the projected rise in sea level poses a grave threat to the existence of these structures. According to research, Malé International Airport on Hulhulé island needs to be given priority, as this is the only gateway to the Maldives. The height of the runway is only 1.2 m above mean sea level and is extremely vulnerable to climate change related sea level rise. Other important vulnerable structures include the investments on tourist islands.

Damage to coral reefs
The low-lying islands of the Maldives are surrounded by coral reefs. These coral reefs not only provide protection for the islands, but are related to success of the main economic activities: Tourism and fisheries. Studies show that the corals are very sensitive to changes in sea surface temperature. Unusually high sea surface temperatures in 1998 caused mass bleaching on coral reefs in the central regions of the Maldives. If the observed global temperature trend continues, there would be a threat to the survival of the coral reefs in the Maldives.

Impacts on the economy
The threats posed by climate change to the beaches, reefs and infrastructure on resort islands makes the tourism industry very vulnerable to climate change. This greatly affects the economy as tourism contributes to about a third of the GDP of the country. Fisheries in the Maldives is another economic activity which relies on the health of the reefs. Although no conclusive links have been established between tuna fishery and climate change, it has been found that seasonal monsoon changes do in fact affect the tuna fishery in the Maldives. It has been found that in El Niño years catches of certain types of tuna increase while the others decrease, and the reverse catch pattern is seen with regard to other types of tuna during La Niña periods.

Food security
Due to the poor soil quality in the Maldives, agriculture is a minor industry. The lack of locally grown food items creates a high dependency on imported food, except for tuna and coconut. Therefore the Maldives is vulnerable to changes in productivity of agricultural lands beyond our borders. The imported food items are first brought to the capital and later distributed to other islands by sea transport. The distribution of food to these islands is very vulnerable to changes in weather. Extreme storm events have led to food running scarce in certain islands. These events have been noted to last for a period of 1-30 days. With climate change and the rise in sea levels, it is expected that more storm events would occur, thereby threatening food security in this island nation.

Water resources
The population of the Maldives mainly depends on groundwater and rainwater as a source of freshwater. Both of these sources of water are vulnerable to changes in the climate and sea level rise. With the islands of the Maldives being so low-lying, the rise in sea levels would force saltwater intrusion into the freshwater lens. The groundwater is replenished by bursts of rain and although there is a predicted increase in the amount of rainfall to the region, the spatial and temporal change in rainfall pattern is uncertain. Therefore, for the Maldives, climate change poses a threat to water availability.

Human Health
The effects of climate change and sea level rise on the health sector need to be studied further. Notable relations to changes in climate have been seen for dengue and dengue hemorrhagic fever in the country. Although malaria has been eradicated from the Maldives, with climate

change there might be a threat of malaria ontbreaks occurring in the country. The poor sanitation in the islands of the Maldives, combined with any future increase in rainfall, would cause more outbreaks of waterborne diseases, such as diarrhoea. Access to health services and facilities during severe weather is a major concern for rural island communities of the Maldives. Other major concerns from climate change are poor human health due to heat stresses, and poor urban air quality. Based on the IPCC regional climate change scenarios, it is estimated that air temperatures in the region may rise by 2 - 3.8 °C by the year 2100.

2) Summary of National Adaptation Programme of Action (NAPA)

The Maldives' NAPA was snbmitted to the UNFCCC in March 2008. The adaptation needs presented were identified through wide stakeholder consultations.

Land, Beach and Human Settlements
- Consolidate popnlation and development.
- Acquire support for the speedy and efficient implementation of Safer Island Strategy.
- Strengthen land-use planning as a tool for protection of human settlements.
- Build capacity for coastal protection, coastal zone management and flood control.
- Protect beaches through soft and hard-engineering solntions.
- Protect house reef to maintain natural defence of islands.
- Improve bnilding designs and regulations to increase resilience.
- Integrate climate change adaptation into national disaster management framework.

Critical Infrastructure
- Develop coastal protection for airports and development focns islands.
- Strengthen capacity for planning and design of infrastructure to ensure development of resilient infrastructure.
- Protect powerhonses and utilities.
- Protect telecommunication infrastructure

Tourism
- Protect beaches and tourist infrastructure.
- Develop climate change adaptation policy and strategy for tourism.
- Diversify the tonrism product to reduce over-dependency on marine environment.
- Strengthen tourism institutions to coordinate climate response in the tourism sector.
- Incorporate climate change adaptation measures to upcoming resorts.

Fisheries
- Improve fish finding and fish harvesting.
- Establish aquaculture/mariculture as an alternative to natural breeding to reduce the economic and social impacts of changing tuna abundance.
- Undertake research and disseminate information on fisheries and climate change.
- Experiment new and alternative species and breeding methods for livebait.
- Integrated reef fishery management.
- Exploit new species and promote ponltry farming as alternative sources of protein to reduce over dependency on tuna for protein.

Hnman Health
- Strengthen regulatory and institutional capacity for vector control.
- Streamline the planning of healthcare services and strengthen medical emergency response.

- Promote healthy lifestyles, healthy islands and healthy buildings.
- Streugthen the capacity for healthcare delivery.
- Undertake research and disseminate information on climate chauge related diseases.
- Increase nutrition promotion campaigns.

Water Resources
- Acquire appropriate sewage treatment and disposal technologies to protect water resources.
- Increase safe rainwater harvesting.
- Acqnire desalination technologies appropriate for small islands.
- Undertake recharging of aquifers to redtice saliuisation from saltwater intrusion andstorm snrge flooding.
- Protect and preserve natural water catchment areas.

Agriculture and Food Security
- Develop a national food security strategy.
- Secure trade agreements with foreign tradie partners to ensure food security.
- Establish capacity for emergeucy food storage in development focus islands at regional level
- Introduce new technologies to increase local food production.
- Strengthen marketing and sale of local food items.
- Improve allocation of land for agriculture.
- Promote traditional food preservation and storage practices for local food.
- Enforce and strengthen quarantine and integrated pest control to prevent pests and diseases.
- Introdnce new irrigation technologies.

Coral Reef Biodiversity
- Provide alternatives to coral and sand as construction materials and enforce the ban on coral mining.
- Enhance the capacity for waste management to prevent pollntion of marine enviroument
- Formulate and implement an oil pollntion contingency plan.
- Acquire appropriate sewage treatment technologies.
- Establish marine protected areas.
- Establish an information base on coral reefs and climate change.
- Undertake monitoring and research to prevent coral diseases and rehabilitate coral reefs.
- Develop measnres to protect coral reefs from development activities.

3) Adaptation Options

Adaptation options in low-lying islands of the Maldives, which have been identified as especially vulnerable, are limited and response measnres to climate change or its adverse impacts are potentially very costly. Adaptation covers two main types of activities. The first being actual physical adaptive measures targeted at the sectors identified in the "Vnlnerability to climate change" chapter above. High importance is given to protecting the islands by building appropriate structures for coastal protection. Several other projects have also been identified for the varions sectors. The second activity is to eubance the capacity to adapt in the Maldives. The Maldives lacks the capacity both technically, and financially to undertake actual adaptive measures. The main areas identified are human resource development, institutional strengthening, research and systematic observation and public awareness and education.

References

1 "Maldives. First national communication of the Repnblic of Maldives to the United Nations Framework Convention on Climate Change." http://unfccc.int/essential_background/library/items/3599.php?rec=j&priref=3194#beg

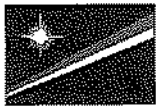
2 Appendix II - Nationally appropriate mitigation actions of developing country Parties, "Letter including nationally appropriate mitigation actions of developing country Parties," http://unfccc.int/meetings/cop_15/copenhagen_accord/items/5265.php

3 NAPAs received by the secretariat, "National Adaptation Programme of Action (NAPA), Republic of Maldives" http://unfccc.int/cooperation_support/least_developed_countries_portal/submitted_napas/items/4585.php

4 "Review of Current and Planned Adaptation Action: The Pacific" http://www.pacificdisaster.net/pdnadmin/data/original/IISD_2011_planned_adaptaction_PAC.pdf

5 "Third National Environment Action Plan" by Ministry of Housing, Transport and Environment, Government of Maldives www.environment.gov.mv/v1/download/161

12 : Marshall Islands



1 : Basic Information and Key Indicators

Capital	Majuro
Area :	181.30 [km^2]
Population	67.182 (2011)
GNI, per capita	USD 3.060 (2009)

Source: Basic data. Regional affairs, Ministry of Foreign Affairs of Japan

2 : Summary on climate change related issues in the country

1) Climate change policy and national efforts/measures against climate change

RMI ratified the United Nations Framework Convention on Climate Change (UNFCCC) on 8 October 1992 and the Kyoto Protocol on 11 August 2003. and submitted their first National Communications Report on 24 November 2000. RMI has several policies and plans relating to climate change. In addition to Vision 2018, there is the Climate Change Roadmap 2010 and the 2011 National Climate Change Policy Framework (NCCPF), as well as implementation documents and climate change activity concepts in formulation. The NCCPF presents five strategic goals that aim to provide a pathway to an integrated, whole-of-RMI response. Objectives and outcomes are identified for each goal:

- Strengthening of the enabling environment for climate change adaptation and mitigation, including sustainable financing.
- Adaptation and reducing risks for a climate resilient future.
- Energy security and low-carbon future.
- Disaster preparedness, response and recovery.
- Building education and awareness, community mobilisation, whilst being mindful of culture, gender and youth.

The National Climate Change Committee has been overseeing the development of a draft joint climate change and disaster risk management national action plan for RMI. This plan identifies priority actions needed under each strategic goal, and aligns these with actions already identified under the National Action Plan for Disaster Risk Management 2008-2018. The outcome should be a comprehensive response to improve the resilience of the people of the Marshall Islands.
The purpose of RMI National Climate Change and Health Action Plan 2011 is to define and describe the health impacts of climate change that pertain to the RMI and, through a process of statistical analysis and stakeholder consultation, to consider the relative risk that each of these issues poses to communities throughout the country. The Marshal Islands has not set up a designated national authority and does not have any CDM projects. but is included in one of the multiple countries in a PoA (water purification) under validation.

2) Institutional arrangement

As a response to the priorities under Vision 2018, RMI has bolstered its national capacity to address climate change impacts through the creation of the Office of Environmental Planning and Policy Coordination, which acts as the chair and secretariat to the National Climate Change Committee. Other relevant agencies have also been strengthened and national coordination between planning and implementing partners has been improved. The National Climate Change Committee has representatives from the following agencies:

- Environmental Protection Authority: (The representative was the former national focal point for climate change activities, and is the facilitator/chairperson of the Committee. The Authority continues work as a line agency. Human resources include water resource and environmental education specialists.)
- Ministry of Foreign Affairs
- Marshall Islands Visitors Authority
- Ministry of Resources and Development
- Department of Agriculture and the Marshall Islands Marine Resources Authority
- Marshall's Energy Company
- RMI Weather Station.

Efforts to address climate-related impacts include public awareness-raising, participation in regional climate change adaptation projects (addressing capacity building as well as developing strategies for food and water security) and renewable energy strategies. In addition, RMI is part of the Micronesia Challenge implementation plan.

3 :Sustainable Development and Mitigation

1) National inventory of greenhouse gas

Prior to the report prepared by Magruder and Meier (1996) a national inventory of greenhouse gas (GHG) emissions for the RMI did not exist. The IPCC guidelines provided in the Workbook (Volume 2) were used in planning and conducting the inventory. The step-by-step instructions provided for calculating emissions of carbon dioxide and methane from three major source categories: energy, agriculture, and waste were calculated; and land use change addressed. The IPCC computer software provided by the PICCAP National Global Climate Change Inventory Programme was used with limited success. The tables from Magruder and Meier (1996). which summarize the tabulated results of the inventory. were not made available in their National Communications Report.

Energy
Only liquid fossil fuels are used in the RMI. All fuel is imported, and almost all liquid fossil fuels are imported by two companies: Marshall Energy Company and Mobil Oil. All data in fuel consumption worksheets were provided directly by these companies and found to be reasonably consistent with imported data found in the Marshall Islands. Statistical Abstract 1993 and 1994, published by the Office of Planning and Statistics. All calculations are based on the year 1994. as good data were available for this time period. With the exception of LPG. all commerce in fossil fuels is measured in US gallons as the sale and reporting unit. Because no conversion factors were given in the IPCC Guidelines. all data expressed in US gallons were first converted to pounds using a default weight of 7.2 lbs/US gallon and then converted to Kilotonnes for datasheet entry.

Industrial Processes

There are no data available for activities in the RMI which fall into the industrial processes category for the data year 1994.

Agriculture

Methane from livestock- Methane production from herbivores as a by-product enteric fermentation, a digestive process by which carbohydrates are broken down by microorganisms into simple molecules for absorption into the bloodstream. Both pigs and chicken produce methane. As with nearly all agriculture (with the exception of copra), livestock in the Marshall Islands is raised mainly by families for personal consumption. Most livestock consists of pigs or chickens. Estimated of animal numbers are subjective assessments published in the Statistical Abstract (OPS 1994). Some of these figures were provided in pounds produced yearly and were converted to numbers of individuals at the ratio of 3 pounds weight (lbs) per chicken and 200 lbs per pig.

Land Use

No estimates for land use and forest change are available at the present time. Most of the land area in the RMI is cultivated or partially cultivated in coconut, banana, breadfruit and pandanus. There has been some clearing of forested areas for taro and vegetable production, but it is primarily subsistence agriculture. The RMI Government currently has no system of agricultural surveys.

Waste Management

Landfills The data used is based on population estimates of the densely populated urban areas of Majuro and the island of Ebeye. Solid waste is managed only in these two areas. Landfills in the Marshall Islands are about 80ft wide on reef flats.

Domestic and commercial wastewater The data used is based on population estimates of the densely populated urban areas of Majuro and the island of Ebeye. Wastewater is managed only in these two areas. After primary treatment, wastewater is discharged into the deep ocean on the outer reef slope.

2) Summary of Nationally Appropriate Mitigation Action (NAMA) plan

RMI submitted their NAMA on 27 January 2010 stating the goal of achieving a 40% reduction of CO2 emissions below the 2009 levels by 2020. This is pursuant to the 2009 National Energy Policy and Energy Action Plan, and with subject to the provision of adequate international support.

3) Mitigation Options

RMI's involvement in the Pacific Islands Climate Change Assistance Programme (PICCAP) concluded that the individual national programmes should cover:

- demand side: education on air conditioner and refrigerator installation and operation, and in-country assessment of ground transport; and
- supply side: wind energy assessment, sustainable photovoltaic (PV) management, and options for efficiency increase in power supply.

The recommendations from the PICCAP's Regional Mitigation Meeting in 1998 set out two major initiatives following on from the initial study. These are to:

- develop feasible management structures for renewable energy implementation; and
- design a package of mitigation options for submission to financial institutions.

4 : Adaptation and Vulnerability

1) Vulnerability to climate change

The major impacts that climate change is projected to have in the Marshall Islands are sea level rise and associated shoreline erosion (EPA, 2000). This observation reflects the low-lying nature of the atolls the form the country; its highest point of land is found on the island of Likiep and extends 10 meters above sea level (CIA, 2011). In its Initial National Communication to the UNFCCC, the Marshall Islands identified the following sectors as being particularly vulnerable to climate change: water resources, coastal resources, agriculture resources, marine resources (including fisheries) and human health (EPA, 2000).

Socio economic sector	Examples of Effects of Climate induced Changes
Water Resources	Changes in freshwater lenses and other groundwater resources Salt intrusion of groundwater resources Changes in surface water resources Changes in surface run-off, flooding and erosion
Coastal Resources	Inundation and flooding of low-lying areas Coastal erosion Possible increase in cyclone related effects Changes in sediment production due to changes in coral reef systems Coral bleaching and coral degradation (also possible increased upward coral growth) Changes in mangrove health and distribution Degradation of sea grass meadows
Agricultural Resources	Changes in commercial crop yields Changes in subsistence crop yields Changes in plant pest populations Possible changes in associated with changes in ENSO, drought and cyclone patterns Changes in soil quality
Marine Resources	Changes in distribution and abundance of offshore fish species Changes in productivity of inshore fisheries Changes in fish breeding sites
Human Health	Increased incidence of vector bone diseases such as dengue fever Increased heat stress and heat related illnesses Indirect effects on nutrition and well-being secondary to effects in other sectors such as agriculture and water resources Death, injuries and disease outbreaks related to possible increases in extreme events such as cyclones, floods and droughts

2) Summary of National Adaptation Programme of Action (NAPA)

RMI has not submitted its NAPA to the UNFCCC.

3) Adaptation Options

A number of adaptation priorities have been identified to reduce vulnerability to the anticipated impacts from climate change in the National Communications Report. The following were identified as various adaptation options for the five sectors evaluated in the vulnerability

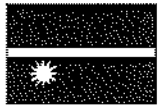
assessment above particularly vulnerable to climate change: water resources, coastal resources, agriculture resources, marine resources (including fisheries) and human health (EPA, 2000).

- Micronesia Challenge (MC):2006 – ongoing
- Micronesia Conservation Trust (MCT): 2002 – ongoing
- Pacific Islands Climate Education Partnership (PCEP)
- Pacific-Australia Climate Change Science and Adaptation Planning Program (PACCSAP):2011–2013
- Implementing Sustainable Water Resources and Wastewater Management in Pacific Island Countries (Pacific IWRM)
- Coastal and marine resources management in the Coral Triangle of the Pacific: 2008 – 2013
- Global Climate Change Alliance: Pacific Small Island State (GCCA:PSIS): 2011–2014
- Coastal and marine resources management in the Coral Triangle of the Pacific: 2008 – 2013
- USP-EU GCCA Project: 2011– 2014
- North Pacific ACP Renewable Energy and Energy Efficiency Project (North-REP): 2010 –2014
- Coping with Climate Change in the Pacific Island Region (CCCPIR): 2009 – 2015
- Bilateral Programme Budget of the British Embassy in the Philippines: Ongoing
- Schools of the Pacific Rainfall Climate Experiment (SPaRCE): 1995 – ongoing
- European Union B-Envelope water supply
- Rongelap Atoll local government, conservation, and sustainable development project
- Pacific Adaptation to Climate Change Project (PACC)

References

1 "Marshall Islands. Initial communication under the United Nations Framework Convention on Climate Change."
http://unfccc.int/essential_background/library/items/3599.php?rec=j&priref=3433#beg
2 "Appendix II - Nationally appropriate mitigation actions of developing country Parties"
http://unfccc.int/meetings/cop_15/copenhagen_accord/items/5265.php
3 "NAPAs received by the secretariat"
http://unfccc.int/cooperation_support/least_developed_countries_portal/submitted_napas/items/4585.php
4 "Review of Current and Planned Adaptation Action: The Pacific"
http://www.pacificdisaster.net/pdnadmin/data/original/IISD_2011_planned_adaptaction_PAC.pdf
5 "Pacific Climate Change Portal – Marshall Islands"
http://www.pacificclimatechange.net/index.php/country-profiles/marshall-islands

13 : Republic of Nauru



1 : Basic Information and Key Indicators

Capital	Nauru (Yaren)
Area :	21 [km^2]
Population	9,322 (2011)
GNI, per capita	USD 5,000 (2005)

Source: Basic data, Regional affairs, Ministry of Foreign Affairs of Japan

2 : Summary on climate change related issues in the country

1) Climate change policy and national efforts/measures against climate change

Nanru ratified the United Nations Framework Convention on Climate Change (UNFCCC) on 11 November 1993 and the Kyoto Protocol on 16 August 2001, and snbmitted their first National Communications Report on 30 October 1999. Although Nauru has not yet established a specific environmental policy. a no-regrets approach has been adopted to adaptation accommodating climate and sea-level change considerations and implementation of the National Environmental Action Plan and the Rehabilitation Master Land-use Plan. The Republic of Nauru adopted its National Environmental Management Strategy (NEMS) and National Environmental Action Plan in September 1997. The NEMS was initiated under the United Nations Capacity 21 Programme and fnnded by the United Nations Development Programme (UNDP) and the South Pacific Regional Environmental Programme (SPREP). The NEMS maps a return to the idea of stewardship, of looking after the surrounding environment for future generations and provides a mechanism for developing a change of attitude, of caring and nnrturing an environmental credo. The Department of Island Development and Industry (IDI) has participated in training provided through PICCAP in the Vnlnerability and Assessment (V&A) programme established as part of the overall climate-change programme. The initial Vulnerability and Assessment training was carried out at the Waikato University in New Zealand dnring 1998. In 1999 the course was transferred to the University of the South Pacific (USP). Lacaula Bay Campns, Suva, Fiji. Two Nauruans participated in the initial New Zealand conrse and another two have participated in the Fiji course. Nauru has not set up a designated national authority and does not have any CDM projects. but is included in one of the multiple countries in a PoA (water purification) under validation.

2) Institutional arrangement

Primary responsibility for operational oversight of Nauru's climate change program has been with the Department of Commerce, Indnstry and Environment (DCIE), with other agencies responsible for implementation of climate change related activities in their areas of

responsibility.(Pacific Islands Forum Secretariat (PIFS) (2011).Options Paper. Improving Access to and Management of Climate Change Resources)
The Ministry is also the national focal point for the United Nations Framework Convention on Climate Change (UNFCCC) and serves as the Global Environment Facility (GEF) operational focal point. The United Nations Development Programme (UNDP) is the main implementingagency of the GEF for Nauru. All climate change and climate change-related programmes, projects and activities implemented nationally and through bilateral, regional and international support and assistance are managed and coordinated through the DCIE. (Ibid)
In addition to its responsibility for developing and monitoring key policy and planning documents related to climate change, etc., DCIE also has responsibility for implementation of climate change related activities in the water, energy and environment sectors.
Additionally, a Climate Change Unit (CCU) made up of three staff. was established within DCIE in late 2011 to coordinate and drive action on climate change in Nauru from a technical perspective. Formally, the CCU reports to the Secretary for Commerce, Industry and Environment through the Director for Environment.(Ibid)
The Department of Foreign Affairs (DFA) is the political focal point for climate change in Nauru. with responsibility for coordination and reporting on relevant international agreements, including the UNFCCC. While DFA is the focal point for international agreements, reports are prepared by DCIE. (Ibid)

3 :Sustainable Development and Mitigation

1) National inventory of greenhouse gas

Greenhouse gas emissions in Nauru in 1994 totalled 19.265 Gg of carbon dioxide. As this is Nauru's first Greenhouse Gas Inventory a comparison of emission trends has not been possible. However, as the once predominant phosphate mining activity has been gradually decreasing since 1993 it can be expected that the levels of greenhouse gas emissions for Nauru will also have been decreasing over recent years.

2) Summary of nationally appropriate mitigation action (NAMA) plan

Federated States of Micronesia has not submitted its NAMA plan. However. as presented in the "Mitigation/Adaptation Options" sections below. the National Commnnication of the country raises several mitigation measures for the country. It is acknowledged that in the future there are likely to be modifications to the inventory, once the process of determining greenhouse gas emissions is better understood, in particnlar, appropriate conversion figures for industrial processes such as phosphate extraction and processing which are particularly relevant to Nauru's situation. Due to Nauru's relatively uncomplicated situation the greenhouse gas emissions have focused predominantly around activities associated with the phosphate mining operation and the transport sector.
The Greenhouse Gas Inventory, prepared as a separate report, elaborates on the assumptions made and the constraints enconntered in the preparation of this first Greenhonse Gas Inventory for Nauru.

Table 1: GHG Emissions by Sector (Gg)

National Greenhouse Gas Inventory						
Greenhouse gas source and sink categories	CO_2		CH_4		N_2O	
	Gg	%	Gg	%	Gg	%
1. All Energy (incl. transport)	41.416					
A. Fuel Combustion	28.318	68.37				
B. International bunkers[1]	13.098	31.63				
2. Industrial processes	NE		NE		NE	
3. Solvents	NE		NE		NE	
4. Agriculture			0.234	67.56		
A. Enteric Fermentation			0.011	3.18		
B. Animal Wastes			0.223	64.38		
5. Land Use Change & Forestry[2]	-8.053					
6. Waste			0.1124	32.45	0.001	100

1. Not included in Net National Total

2. Uptake (sink) not deducted from "All Energy" and taken as a percentage of All Energy"

NE=Not Estimated

The volumes of greenhouse gas emissions calculated for Nauru using the reference approach are limited to carbon dioxide, methane and nitrous oxide. The percentages of these gasses are 98.22%, 1.77% and 0.01% respectively.

3) Summary of Nationally Appropriate Mitigation Action (NAMA) plan

Nauru has not submitted its NAMA plan.

4) Mitigation Options

Nauru's Energy Efficiency Action Plan (EEAP) was finalized in December 2008 and the activities contained within were implemented until June 2010 by two new Energy Efficiency Officers hired in July 2009. The Nauru Energy Efficiency Community Awareness Programme was launched in August 2009. The objective of Nauru's national energy policy is to increase the share of renewable energy in its energy mix by 10% by year 2020. The addition of renewable energy and energy effieiency measures has an estimated potential of reduction of 35% of Nauru's 2013 GHG predicted valnes. In order to achieve Nauru's ambitious goal of redncing the country's high reliance on imported fossil fuel by meeting 50% of its energy needs from renewable sources by 2015, the Nauru Government requested technical support from GIZ, SPC and IRENA in the development of a Nauru Energy Road Map in early 2012.(SPC, GIZ, Irena, Nauru Energy Sector Overview, June 2013)

The Nauru Energy Policy Framework (NEPF) was endorsed in 2009 and lays out broad aims and strategies for the energy sector, inclnding power, renewable and energy efficiency. With regard to the institutional framework for energy policy-making, planning and regulation within government, there have been very limited resources dedicated to the energy sector to date with responsibility for energy being given to the Environment Division in the Department of Commerce, Industry and Environment (CIE).(Ibid)

Nauru has very good potential for utilising solar as a viable and renewable resource. Currently approximately 1% of Nauru's electricity is generated from renewable resources with all of this

contribution coming from solar PV systems of an estimated installed capacity of 230 kWp (kilowatts-peak). (SPC, GIZ, Irena, Nauru Energy Sector Overview, June 2013)
The Pacific Islands Greenhouse Gas Abatement through Renewable Energy Project (PIGGAREP) is one mitigation project for Nauru. This project is aimed at reducing the growth rate of GHG emissions from fossil fuel nse in the Pacific Island Countries (PICs) through the widespread and cost effective use of their renewable energy (RE) resources. It consists of varions activities whose outpnts will contribute to the removal of the major barriers to the widespread utilization of RE technologies (RETs). The PIGGAREP activities identified for Nauru are based largely on two key on-going projects: (1) the EU-funded Support to the Energy Sector in five ACP Pacific Islands (REP-5), and (2) the European Union's 10th EDF Renewable Energy Programme. (PIGGAREP website)

The REP- 5 in Nauru
The overall objective of the REP-5 programme is poverty alleviation by improving the access to electricity and thus the living conditions of the Pacific Island States. The specific objectives for the programme are to improve the overall efficiency of the energy sector and, where justified, increase prodnction through renewable energy sources to allow a better allocation of limited resources for sustainable development, reducing local pollution and environmental risks associated with current energy generation practices. Examples of the REP-5 projects in Nauru are Grid-connected PV system on roof of Nauru College and Supply and installation of prepayment meters. (Pacific Climate Change Portal)

4 : Adaptation and Vulnerability

1) Vulnerability to climate change

The vulnerability of Nauru to climate and sea-level change will be determined by four main factors:

(1) The magnitude and rate of global climate and sea-level change and how they manifest in Nauru;
(2) The effectiveness with which popnlation is stabilised at a sustainable level within the next fifty years;
(3) The effective implementation of the Rehabilitation Master Land-use Plan over the next 50-100 years;
(4) The effective implementation of the National Environmental Aotion Plan (NEAP), in particular those objectives that are directly related to a no-regrets adaptation approach as outlined above.

In the physical environment of Nauru, the coastal zone and groundwater resources in particular are likely to be those most vulnerable. Adaptation measures, snch as an Integral Coastal Zone Management (ICZM) plan and a water resource management plan, could significantly reduce the vulnerability. However other measures, such as phase out of settlement and important infrastructure on the coastal plain, may become necessary over the next 50-100 years. This possibility highlights the importanee of the rehabilitation programme in reducing vulnerability.

2) Summary of National Adaptation Programme of Action (NAPA)

Nauru has not submitted its NAPA to the UNFCCC.

3) Adaptation Options

Nauru identified education and information activities that have been or should be implemented to support is efforts to adapt to the impacts of climate change. This adaptation strategy should be founded on the NEAP in conjunction with the Rehabilitation Master Land-use Plan, with particular emphasis on, but not limited to, the following NEAP objectives:

- Objective 1: Land rehabilitation and protection
- Objective 2: Strengthening environmental education
- Objective 3: Strengthening environmental institutions and legislation
- Objective 4: Conservation of biodiversity
- Objective 5: Promotion of the snstainable nse of marine resources
- Objective 7: Pollution and waste management
- Objective 8: Control of population and urban growth
- Objective 11: Appropriate infrastructural development

The NEAP presently contains an Objective 12 aimed at addressing and preparing for global climate change and sea-level rise, incorporating programmes on integrated coastal-zone management (ICZM) and coastal protection (Programme 12.2) and coastal forest protection and reforestation (Programme 12.3). However. it is suggested that all of the above objectives, and in particular these two programmes of Objective 12. are integral to effective implementation of a no-regrets adaptation approach in Nauru. A summary appraisal of these NEAP objectives in terms of adaptation to climate and sea-level change is presented in the table below.

Table 2: NEAP Objectives in terms of adaptation to climate and sea-level change

NEAP Objective	Key priorities and benefits in terms of adaptation to effects of climate and sea-level change
Objective 1: Land rehabilitation and protection	Rehabilitation and re-settlement of mined areas will decrease pressure on the coastal plain and facilitate development of infrastructure in a less vulnerable location.
Objective 2: Strengthening environmental education	For the NEAP to successfully achieve adaptation goals, there needs to be an increase in public awareness and local expertise interms of climate and sea-level change and its possible effects in Nauru.
Objective 3: Strengthening environmental institutions and legislation	Climate and sea-level change considerations should be directly incorporated into the proposed Environmental Impact Assessment (EIA) process, land-use planning process, environmental baseline studies and new environmental legislation.
Objective 4: Conservation of biodiversity	Biodiversity plays a key role in increasing the resilience of natural systems to environmental stresses. Biodiversity objectives should include the coastal forest protection and re-forestation programme from Objective 12. This programme could be re-named as the 'Re-forestation and conservationof terrestial biodiversity programme.'
Objective 5: Promotion of the sustainable use of marine resources	The marine resources objective needs to be enhanced by a programme on protection of Nauru's coral reef systems which are vital for the island. This objective could be renamed 'Promotion of the sustainable management of coral reefs and marine resources.'
Objective 7: Pollution and waste management	Achieving the goals of this objective is vital to the health of the coral reef and marine system and groundwater and would therefore decrease the vulnerability of these systems, the coast and associated infrastructure and communities.
Objective 8: Control of population and urban growth	It is clear that the key to both a sustainable future and reducing vulnerability of Nauru to climate and sea-level change would be an early stabilisation of the Nauruan population. In addition the shift of urban growth from the coast to Tobside would reduce vulnerability.
Objective 11: Appropriate infrastructural development	Implementation of the programme for the integrated water conservation and supply management and also the programme for the development of storm-water collection and disposal system for re-use, are critical in terms of adaptation. Objective 11 could be revised to incorporate the possible effects of climate and sea-level change on the infrastructure itself, he effects of infrastructure on sonsitive systems and potential modifications of specific value for adaptation.

References

1 "Nauru. Republic of Nauru: First national commnnication 1999 nnder the United Nations Framework Convention on Climate Change" http://unfccc.int/essential_backgronnd/library/items/3599.php?rec=j&priref=2441#beg

2 "Appendix II - Nationally appropriate mitigation actions of developing country Parties" http://unfccc.int/meetings/cop_15/copenhagen_accord/items/5265.php

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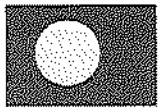
5 "Pacific Climate Change Portal – Nauru" http://www.pacificclimatechange.net/index.php/country-profiles/nauru

14 : Republic of Palau



1 : Basic Information and Key Indicators

Capital	Melkeok
Area :	458 [km^2]
Population	20,956 (2011)
GNI, per capita	USD 6,220 (2009)

Source: Basic data, Regional affairs, Ministry of Foreign Affairs of Japan

2 : Summary on climate change related issues in the country

1) Climate change policy and national efforts/measures against climate change

Palau ratified both the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol in December 1992. Palau submitted their first Nation Communications Report in December 2002. One of the most important components of national initiative for effective implementation of no -regrets adaptation options, is the development of a national policy framework for adaptation. Such a framework should be explicitly designed to ensure that implementation of no-regrets adaptation measures are incorporated in development planning. Some of the key priorities for inclusion in a national policy framework and as mechanisms through which adaptation options could be implemented would be:

(1) An integrated watershed management plan.
(2) An integrated coastal zone management (ICZM) plan.
(3) A complementary land use plan to support both of the above.
(4) A Disaster Management and Preparedness program which includes climate change adaptation.
(5) Effective environmental and social impact assessments for all development policies, projects and plans.
(6) Establishing a National Climate Change Vulnerability and Assessment group with clearly defined roles.
(7) Establishing an effective monitoring mechanism to coordinate national resource surveys, develop indicators and monitoring programs, and consolidate the involvement of stakeholders in terms of data collection and information dissemination.

Palau's First National Communication to the UNFCCC was developed with the assistance of the Global Environment Facility (GEF) Enabling Activity project. The project was initiated in January 2001 and entailed a series of community workshops and a national symposium to: 1) create public awareness regarding the causes of climate change and its impacts on Palau; 2) conduct a greenhouse gas inventory for the period of 1994 to 2000; 3) execute a vulnerability and adaptation assessment to determine the affects of climate change on Palau, identify high areas of vulnerability, and develop a mitigation and adaptation framework to address projected

climate change trends; and 4) prepare the Republic of Palau First National Communication to the UNFCCC.
Palau has not set up a designated national authority and does not have any CDM projects but is included in one of the multiple countries in a PoA (water purification) under validation..

2) Institutional arrangement

The Office of the President established a working group or National Climate Change Country Team (NCCCT), comprising 16 state focal points, national government offices, non-governmental organisations, the private sector, and traditional leaders, to engage stakeholders on climate change and environmental matters. Energy (under the responsibility of the Ministry of Public Infrastructure, Industries and Commerce) is one sector that does not appear to be included in the team in the published documentation. The following organisations are members of the Palau NCCCT:

- Office of Environmental Response and Coordination (OERC).
- Palau Community College-Cooperative Research Extension (PCC-CRE)
- Palau Community Action Agency (PCAA).
- Bureau of Agriculture, Ministry of Natural Resources, Environment & Tourism (BOA-MNRET).
- Bureau of Marine Resources, Ministry of Natural Resources, Environment & Tourism (BMR-MNRET).
- Palau Environmental Quality Protection Board (EQPB).
- Palau Automated Land and Resource Information System, Ministry of Public Infrastructure, Industries and Commerce (PALARIS-MPIIC).
- State Government and Community representatives.

The OERC is the National Focal Point for the United Nations Framework Convention on Climate Change in Palau. OERC is established under the Office of the President to coordinate climate change activities in Palau.

3 :Sustainable Development and Mitigation

1) National inventory of greenhouse gas

Table below shows the estimated emissions of GHGs by Palau in 1994. Emissions of CO2 by the energy, agriculture, and land-use sectors were substantially offset by removals associated with changes in stocks of forests and other woody biomass.

Table 1: GHG Emissions by Sector (Gg)

		Carbon Dioxide (Gg CO2)	Methane (Gg)	Nitrous Oxide (Gg)	Nitrogen (Gg)	NMVOC (Gg)
Energy		82.11				
Industrial Processes				0.02	180.6	0.195
Agriculture		3.48				0.046
Land-Use	Removals	-424.03				
	Emissions	6.84				
Waste			0.55	<0.01		
Total		-331.6	0.55	0.02	180.6	0.241

Palau's Greenhouse Gas Inventory shows that Palau was a carbon sink in 1994, meaning that Palau retained more carbon in its forests and vegetatiou than it emitted during that year. The National Greenhonse Gas Inventory also illustrates that Palau is a minor emitter of greenhouse gases, in both a relative and absolute sense. Conseqnently, any steps taken to reduce its greenhouse gas emissions, and enhance its carbon sinks, will have a negligible effect on the enhanced greenhouse effect and global warming.

2) Summary of Nationally Appropriate Mitigation Action (NAMA) plan

Palau has not snbmitted its NAMA plan.

3) Mitigation Options

GHG mitigation options for Palau are described below.

Energy Demand Use
As Palan imports all its energy supplies from overseas, and due to Palau's growth combined with its economic isolation makes large-scale mitigation options difficnlt at best. However, mitigation measures related to energy consumption in Palau can be snbdivided into demand side and supply side options.

Demand side:
- Energy efficient products
- Training programs
- Building codes

Snpply side:
- Alternative energy options (wind energy, PV, fuel substitution, energy from waste, biomass ocean thermal energy)
- Reconditioned vehicles

Promotion of Carbon Sinks
New (i.e. incremental) tree growth has the potential to provide greenhonse gas mitigation throngh the use of wood as a cooking and indnstrial fuel and through increases in the standing biomass. The inventory data collected and analyzed over time should provide an opportunity to quantify the extent to which land nse changes and changing nse of fuels for Custom in Palau are contributing to net increases or decreases in atmospheric greenhonse gas concentrations. Though the magnitude of the resnlting changes will inevitably be small from a global perspective, the findings may well be instrumental in setting national policies, and implementing plans that achieve larger reductions in global net emissions.

Solid Waste Management
Developing an integrated waste management system incorporating CH4 recovery from landfills is an option that may be used to mitigate GHG emissions. Not only will the development of an integrated waste management system aid the Repnblic in the redncton of solid waste and facilitate the recovery of CH4, but will also aid in alleviating undne stress to the natural environment, decrease pollution, and decrease health related problems derived from improper waste management.
Coral Reefs
Palau's coral reefs supply an abundance of food, building materials, and protect the islands from wave action. Palau's coral reefs are also known as same of the most biologically diverse marine

habitats in the world and are a major component in its tonrism product mix. In addition, studies have shown that healthy reefs are also a natural sink for carbon dioxide.
In order to reduce the anthropogenic and natural stresses on the reefs of Palau, measures need to be taken to reduce fishing and recreational diver impacts, diminish or ban coral dredging, ensure untreated solid waste is not discharged onto the reefs, and most importantly, reduce the amonnt of sediment/runoff produced from poor land-use practices.

Capacity Building
Analysis conducted during the first National Greenhouse Gas Inventory suggest that the priority areas relate to ensuring that the necessary information is readily available and there is the required expertise to process and analyze it is limited. A close second would be improved methodologies, especially with respect to their applicability to the circumstances, needs, and capacities of Palau. Improved information acquisition and management systems must be an integral part of the national information gathering procedures, operating under that anthority and in a way that ensnres consistency and completeness in the records.

4 : Adaptation and Vulnerability

1) Vulnerability to climate change

The Pacific Islands region is already experiencing disruptive changes, consistent with many of the anticipated conseqnences of global climate change, including:
- extensive coastal erosion;
- coral bleaching;
- persistent alternation of regional weather patterns;
- decreased productivity in fisheries and agriculture - higher sea levels are making some soils too saline for cultivation of crops such as taro and yams;
- coastal roads, bridges, foreshores and plantations suffer increased erosion, even on islands that have not experienced inappropriate coastal development;
- recent devastating dronghts have cansed severe crop damage and serious water shortages in many pacific island countries; and
- more widespread and frequent occurrence of mosquito-borne diseases.

Palan is already experiencing the adverse effects of the current, large inter-annual variations in oceanic and atmospheric conditions and also encountering impacts that are consistent with the anticipated effects of climate change and sea-level rise. The following sectors are identified as being particularly sensitive to climate change.
- Coastal margins, inclnding lagoons, reefs, marine ecosystems and fisheries;
- Freshwater and terrestrial ecosystems;
- Water resources;
- Agricnlture and forestry;
- Tonrism;
- Communities and human health; and
- Infrastructure.

2) Summary of National Adaptation Programme of Action (NAPA)

Palan has not snbmitted its NAPA.

3) Adaptation Options

Palan has not submitted its NAPA. bnt the following adaptation options which strongly overlap with best practice in sustainable development are snggested, in the National Commnnications Report.

Agricnlture
The nses, potential uses, and the preferred growing environment of tree and plant species shonld be identified and docnmented. An effective adaptation strategy wonld be to develop a format plan related to thc use of plants and trees, and to selectively plant species that are best snited to a particular physical environment. and which have a particnlar nse. Where agriculture is practiced in vulnerable, low-lying areas. the breeding and introdnction of salt-tolerant root crops is seen as an effective measure. Alternatively, different cnltivation practices might have to be considered, snch as the use of irrigated, raised-bed systems.

Coastal Systems
Enhanced protection and reducing anthropogenic stresses on mangrove areas and sensitive coral reef systems is an effective means to ensnre these systems can better cope with impacts arising from climate change and sea level rise. Such progress would help maintain the natural storm and crosion protection these systems offer and also help sustain their productivity. Integrated catchment and coastal management planning would produce a variety of ontcomes that collectively increase thc resilience of coastal systems.

Living Marine Resonrees
The development and extension of marine breeding and restocking programs, for both fish and corals, are an effective means of increasing thc resilience and snsta:nability of inshore marine resonrces. Similarly, fnrther expansion of marine reserves and other conservation instruments wonld help protect snbsistencc fish stocks and coastal marine resources. Creating new and expanding cnrrently existing reserves wonld enhance the ability of marine resources to withstand the added stresses arising from climate chaugc. Snch measure will increase the resilience of the marinc ecosystem and can reduce overall anthropegenic impacts on marine resonrces.

Biodiversity
Conservation of biodiversity is considered to be viable, no-regrets adaptation measure. It should be associated with a sharpened recognition of the values of both marine and terrestrial flora and fauna. Emphasis shonld be given to further the development of the Marine Protected Areas Network as well as the National Protected Areas. In light of the uncertainties associated with climate change, community based forest conservation projects can improve the resilience of managed and natural forest systems. Forest management shonld place a high priority on land and soil conservation, water conservation. nature conservation, wood prodnction, and the quantity of the human living experience. in this way there will be added resilience to the effects of global warming. The introduction and enforcement of appropriate legislation and policies for the conservation and sustainable nse of living resources will also enhance the ability to adapt to climate change.

Water Resonrces
Improved management and maintenance of existing water snpply systems is a high priority response measure, due to the relatively low costs associated with reducing system losses and improving water quality. Centralized water treatment to improve water qnality is considered viable for most urban centres, but at the villagc level it is argued that more cost effective

measures need to be developed. User pay systems may have to be morc widespread. Catchment protection and conservation arc relatively low cost measures that would help ensure that supplies are maintained dnring adverse conditions. Snch measures wonld also have wider environmental benefits, such as reduced erosion and soil loss and maintenance of biodiversity and land prodnctivity. Dronght and flood preparedness strategies should be developed and strengthened, as appropriate, including identification of responsibilities for predefined actions.

Human Health
Pnblic awareness programs related to malaria, dengne fever. and other diseases are an essential, low-cost method for reducing the public health risk. Such programs have already been initiated and are considered to be relatively effective. as is the use of bed nets and mosquito screens.

Housing
Measnres to "typhoon-proof" houses and other bnildings have been identified as desirable. This wonld include consideration being given to both structural design and the materials used in construction. Reductions in heat stress and discomfort may be achieved through the planting of shade tress and by building honses with improved insnlation and ventilation. Air-conditioning is not considered to be viable, cost-effective response, in general.

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3 PALAU 2020 NATIONAL MASTER DEVELOPMENT PLAN
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15 : Papua New Guinea

1 : Basic Information and Key Indicators

Capital	Port Moresby
Area :	462,840 [km^2]
Population	6,187,591 (2011)
GNI. per capita	USD 1,180 (2009)

Source: Basic data, Regional affairs, Ministry of Foreign Affairs of Japan

2 : Summary on climate change related issues in the country

1) Climate change policy and national efforts/measures against climate change

Papua New Guinea (PNG) ratified the United Nations Framework Convention on Climate Change (UNFCCC) in April 1993, and ratified the Kyoto Protocol in March 2002. PNG submitted its initial national communication under the UNFCCC in November 2000. The Government of Papua New Guinea has developed and adopted a Climate-Compatible Development Strategy (CCDS). In March 2010 the Cabinet created the necessary organizational and governance structure to implement PNG's CCDS. This included the establishment of the Office of Climate Change and Development as well as the National Climate Change Committee, who take full and exclusive responsibility of climate change and environmental sustainability. PNG has ten registered CDM projects, including those related to renewable energy and methane capture from palm oil mill effluent. PNG also has one registered Programmatic CDM project for renewable energy power generation, and also is included in four other PoAs (incl. water purification and LED distribution, etc.) under validation.

2) Institutional arrangement

The Office of Climate Change and Development (OCCD) is the lead coordinating institution in the area of climate change and as such has strong cross-sectoral mechanisms. The OCCD reports directly to PNG's Prime Minister and through the National Climate Change Committee (NCCC). The Office of Climate Change and Development is the designated national authority of PNG. Since September 2010 OCCD has been fully staffed. In addition, NCCC meets on a monthly basis to guide the country's climate change work. The NCCC includes departmental heads of all government departments and authorities most concerned with climate change issues including but not limited to Forestry, Agriculture, Environment and Conservation Finance, National Planning and Monitoring.(Pacific Climate Change Portal)

At a working level, the country has created multi-stakeholder Technical Working Groups (TWG) and sub-working groups. These TWGs include stakeholders from different backgrounds and focus on specific areas such as adaptation and REDD+, and have already undertaken

significant efforts to identify, analyse, prioritize and develop appropriate adaptation solution such as a Coastal Earl Warning System and community based mangrove planting projects. At the same time, it is essential that this support is extended to line agencies and departments including the National Disaster Centre (NDC), Department of Environment and Conservation (DEC), Department of Agriculture and Livestock (DAL) and other research and academic institutions in order to effectively coordinate and implement climate and disaster risk reduction measures.

3 :Sustainable Development and Mitigation

1) National inventory of greenhouse gas

The Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories was used and a "reference approach" was taken to develop the inventory. It is based on the information sought from a number of sources from government, non-government and private sectors. The inventory covers emissions of carbon dioxide (CO2), Methane (CH4) and oxides of nitrogen (N2O), and the reference year for these inventories is 1994. For PNG the inventory only covers four of the six categories of emission sources and sinks, namely, energy, industrial processes, land use and agriculture. Limited data are available for emissions and removals from land use change and forestry and waste and thus being left out of the inventory. The reported emission figures thus should be taken as "work in progress" since only three categories of emissions are reported here. Table below provides a summary of the results of the GHG inventory on the four sources of GHG emissions.

Table 1: Greenhouse gas inventory summary for 1994
, All data are presented in gigagrams (Gg)

Greenhouse Gas Source/sink categories	CO2	CH4	N2O
All Energy	947.57	X	X
Industrial Processes	193,00	X	X
Agriculture		4.27	12.20
Land Use Change & Forestry	413,00	X	X
Totals	1.553.57	4.27	12.20

The results reflect an underestimation of the emissions of GHGs, as there exists serious data gaps in emissions inventory and not all energy sources have been accounted for in this inventory. Emissions from waste, land-use change and forestry and solvents, as well as soil cultivation and from burning of forests and grasslands for agriculture need to be included in the inventory so that comprehensive emissions total can be obtained. In future, the estimation of emissions and removals from land use change and forestry will be critical due to its potential for offsetting GHG emissions from other categories of sources. The main source of fuel combustion is derived from energy and transformation industries, transport, and residential sectors.

2) Summary of Nationally Appropriate Mitigation Action (NAMA) plan

Subject to the certain conditions, PNG seeks to:
(1) Increase GDP per capita more than 3 times by 2030;
(2) Decrease GHG emissions at least 50% before 2030 while becoming carbon neutral before 2050;

(3) Increase adaptation investments per annum by $80 to $90 million to reduce expected losses by $230 to $250 million.

Preliminary and Conditional Nationally Appropriate Mitigation Actions and Adaptation Investments is shown in the table below.

Table 2: Preliminary Climate Compatible Development Plan: Actions and Objectives

High-Level Policy Objectives	Est. 2010*	BAU 2030*	Objectives of Policy or Action
1. Sustainable Growth	$1,000	$3,000	Increase GDP/capita by more than 3 times by 2030
2. Emission Reductions	82–99	99–141	Decrease GHG emission by at least 50% by 2030 (75% technically possible subject to enabling finance)
			Carbon Neutral before 2050
3. Adaptation Investments			$80–90m investment required to reduce expected loss by $230–250m
Appropriate Mitigation Actions			
1. Forestry	50–52	53–64	26–32
2. Agriculture	25–38	31–58	15–27
3. Oil and Gas	0.4–0.6	5.3–7.5	5.1–7.3
4. Transportation	1.6–2.4	3.3–4.5	2.9–3.8
5. Power Generation	0.3–0.5	1.4–2.0	0.2–0.8
6. Mining & Fire	5	5	2.5
Total	82–99	99–141	51–73
Adaptation Investments	Expected annual loss		Costs and benefits of counter-measures
1. Coastal Sea Level Rise	$20m	$80–100m	$35–40m p.a. to reduce expected loss by $80m
2. Inland Flooding	$10–15m	Tbd	Tbd
3. Malaria	$130m	$210–250m	45–50m p.a. to reduce expected loss by $150–170m
4. Agricultural Yield Change	N.a.	Tbd**	Tbd
5. Coral Reef Damage	N.a.	Tbd***	Tbd

*Mt CO2e/year, unless otherwise noted.

**A 10% reduction in agricultural yields would reduce agricultural output by $120–150m; research is needs into the expected loss.

*** Coral reefs contribute approxi $170m to the economy now and this could increase to $700–800m by 2030. expected loss tbd.

3) Mitigation Options

In Papua New Guinea, the options to use forests as a major sink is quite obvious, with large tracts of forests still intact and the potential for establishing reforestation and afforestation needs to be explored. Similarly, the options for use of biomass, biogas, hydro-power, etc., from the available resources in the country needs to be considered, while a large PV or wind energy programme would provide only modest GHG reductions. Presented in the below list are some important mitigation options in the energy, forestry, transport and waste that have been identified. However, no analysis of mitigation option measures were not done due to lack of data. Some activities/programmes are currently being implemented to reduce GHG emissions and to cope with the climate change and extreme variability signals.

Energy

- Promote the widespread use of renewable energy and the efficient use of conventional energy.
- Encourage agencies involved in agriculture, fisheries, trade and indnstry to develop programmes that address fuel import replacement.
- Incentives such as duty free privileges, tariffs and tax exemptions for pioneering industries
- Facilitate the development of emission GHG factors lowering energy consumption through demand-side management energy efficiency and conservation programmes
- Policy/regulations to incorporate climate change and variability
- Data centralized for future GHG Inventories
- Eqnipment and/ technology supply

Transport

- Introduce Tax incentives to all petroleum and size of vehicles
- Need to create subsidies for public transport systems
- New policies/regulations must be introduced for engine sizes and ban vehicles with high emission levels
- Technology and Equipment Transfer
- Training and education and awareness

Forestry

- Introduction of Tax incentives
- Subsidies for Forestry sectors
- Policy and Regulation on forestry
- Research and Development
- Integrated Forestry Management Approach (Agro-forest Management)
- Carbon Sequestration Initiatives

Waste

- Raise priority of waste management
- Revise waste management legislation and guidelines, particularly for hazardous waste
- Strengthen environmental monitoring and enforcement
- Improve waste conservation infrastructure
- Initiate education on recycling, composting and waste reduction programs
- Identify waste site areas
- Education, Training and awareness
- Integrated Waste Management

The Pacific Islands Greenhouse Gas Abatement Through Renewable Energy Project (PIGGAREP) is the main mitigation activity for participating countries. This project is aimed at reducing the growth rate of GHG emissions from fossil fuel use in the Pacific Island Countries (PICs) through the widespread and cost effective use of their renewable energy (RE) resources. It consists of varions activities whose outputs will contribute to the removal of the major barriers to the widespread utilization of RE technologies (RETs). The project is expected to bring about in the PICs: (1) Increased number of successful commercial RE applications; (2) Expanded market for RET applications; (3) Enhanced institutional capacity to design, implement and monitor RE projects; (4) Availability and accessibility of financing to existing and new RE projects; (5) Strengthened legal and regulatory structures in the energy and environmental sectors; and, (6) Increased awareness and knowledge on RE and RETs among

key stakeholders. The PIGGAREP activities identified for PNG will build on 2 key initiatives: (1) the Govt of Italy and PIC cooperation programme, and (2) the PNG Sustainable Energy Ltd's renewable energy developments.

4 : Adaptation and Vulnerability

1) Vulnerability to climate change

Coastal and marine environments
PNG coastline, coastal villages and rural coastal population are vulnerable to sea level rise and other weather-related manifestations of climate change. The main impacts will be inundation of coastal wetlands and foreshore areas, bleaching of corals, which will weaken the coral reefs as barrier protection systems. Loss of wetlands, freshwater sources due to seawater intrusion, and lands may eventually lead to displacement of communities, resulting in aggravated future social problems.

Fisheries
The levels of fishing effort and fish behaviour are directly affected by the weather and sea surface temperatures. However, the impacts will be complicated by the presence of anthropogenic factors. Climate change will have the greatest effect on fisheries that are already stressed, for example, through overexploitation and over capacity. Most of these impacts can be identified, but not readily quantified or predicted.

Biodiversity
Any changes to the natural systems will greatly affect the country's unique and very rich biodiversity. For example, aspects of the life histories such as length of hibernation, preferred niches, etc. of various biota may be different from that in the absence of climate change, but to what extent is unclear.

Water Resources
Vulnerability to water resources is induced by changes in climatic conditions such as increases in temperature, rises in sea level and depletion in carbon dioxide gas. For example, increased CO2 concentration would reduce stomatal conductance in many plants, implying a reduction in transpiration although the effects vary considerable between species. These changes are likely to upset the overall normal water availability, water balance and hydrological cycle.

Health
The impacts of climate change on health can be classified into three categories:

- Direct impacts on human safety: where storms can damage and destroy health centres and related infrastructure, thereby disrupting essential health services. For example, severe cyclones have destroyed services in the areas of Milne Bay province with marginal areas of Northern and Central Provinces also affected to some degree.
- Nutritional related disease arising from malnutrition and food shortages, especially where subsistence crops and fisheries are affected. For example, prolonged heavy rains and flooding in low-lying areas or wetlands of the Western and Sepik provinces as well as many parts of the country has resulted in mass migration inland, or away from the affected areas.
- Indirect effects such as increases in the incidence of vector borne and other diseases where intense droughts and cyclones disrupt water supplies and sanitation systems. Malaria is associated with a broad range of habitat, an optimum temperature above 22C and an altitude

of less than 670 meters. Vulnerable areas are the Kikori and Sepik plains, Star Mountains and some parts of New Britain.

Land Use Change
Although forestry is of major economic value to the country, excessive logging in agricultural areas has a major environmental impact and has the potential to affect agriculture. Should this happen, there would be increased danger of erosion of fertile land, lowering of the water table in underground reserves, and exposure of river banks to flooding/overflowing during monsoonal rains.

Agriculture
The vulnerability of crops to climate change may either be increased or diminished by future technological changes. If technological advances narrow the optimal range of input conditions for agricultural production (e.g. used for high levels of fertilizer), and if climate change results in increased variability such as increases in frequency of droughts as well, production risks may also be expected to increase.

Forestry
Changes in temperature may affect the formation of cloud forests, which occupy a very narrow geographical and climatological niche. A slight shift in temperature or precipitation patterns could cause this zone to shift upwards enough to be eliminated.

2) Summary of National Adaptation Programme of Action (NAPA)

PNG has not submitted its NAPA.

3) Adaptation Options

PNG has not submitted its NAPA. However, a number of adaptation priorities have been identified to reduce vulnerability to the anticipated impacts from climate change in the National Communication Report.

Sectors	Mechanism
Coastal and Marine Environments	✓ Coastal management policy and planning ✓ Integrated Coastal Management ✓ Community based monitoring and management ✓ Integrated research ✓ Building capacity in provincial and national government agencies ✓ Hard and soft measures
Fisheries	✓ Adaptive management ✓ Develop aquaculture ✓ Reduce post harvest losses ✓ Stronger regional collaboration for management and research ✓ Data collection systems ✓ Fish and marine reserves

Agriculture, Land Use Change and Forestry	✓ Micro-credit and small business expansion. ✓ Research into new plant varieties, crop rotation, use of irrigation, altered nutrient levels and plantation forestry alternatives. ✓ Sustainable natural forest management ✓ New technologies ✓ Capacity Building ✓ Woodlot establishment, agroforestry and tree planting supported by active forestry extension.
Biodiversity	✓ Slow biological invasions ✓ Strengthen and enforce policies that protect critical habitats ✓ Research into the local effects of climate variability and change on species ✓ Increase awareness of visitors and the public concerning the value of species and biodiversity ✓ Maintain gene pools through a system of connected protected areas ✓ Strategic policy
Water Resources	✓ Invest in new water technologies, particularly for recycled water. ✓ Encourage integrated water management approaches ✓ Incorporate climate change into water management legislation ✓ Transfer of new technology to assist with water projects/ activities ✓ Improve resources information and monitoring ✓ Develop alternative water sources such as rainfall catchment devices as well as saltwater and brackish water desalination plants ✓ Water conservation measures including leakage control ✓ Water carting ✓ Runoff and precipitation retention ✓ Training ✓ Redistribution of water resources
Health	✓ Control vector borne diseases ✓ Reduction in heat stress through infrastructure improvement including adoption and enforcement of more stringent building codes ✓ Comprehensive disaster management programmes ✓ Preventative health care through public awareness programmes Improve medical services Improve quarantine services

There are is a high number of adaptation projects and programs underway in Papua New Guinea relative to other countries in the region. While most of these projects involve multiple countries, a current initiative being executed exclusively within Papua New Guinea focuses on disaster risk management in the agriculture and transport sectors. These projects are addressing needs related to a variety of sectors, with a greater number of projects focusing on agriculture, disaster risk reduction, and coastal zone management; most have a clear focus on capacity building. The majority current projects in Papua New Guinea are funded by the Asian Development Bank (ADB), the Australian Agency for International Development (AusAID) and the United States.

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16 : Saint Lucia

1 : Basic Information and Key Indicators

Capital	Castries
Area :	616 [km^2]
Population	178,000 (2012)
GNI, per capita	USD 6,890 (2012)

Source: Basic data, Regional affairs, Ministry of Foreign Affairs of Japan

2 : Summary on climate change related issues in the country

1) Climate change policy and national efforts/measures against climate change

Saint Lucia ratified the United Nations Framework Convention on Climate Change (UNFCCC) on 1993. It submitted its Initial National Communications (INC) on 30th November 2001 and Second National Communications (SNC) on 19th April 2012.
Policies, regulations and plans related climate changes in Saint Lucia are shown in below.

Table 1. Policies, regulations and plans related climate change

Day	Relevant Policies and Decrees	Contents
November 2001	Saint Lucia's Initial National Communication on Climate Change (INC)	INC is arranged as National Circumstances, National Inventory of Greenhouse Gases, Greenhouse Gas Abatement Analysis, Vulnerability and Adaptation Assessment, General Description of Steps Taken, Financial & Technological needs.
April 2012	Second National Communications (SNC) on Climate Change for Saint Lucia	SNC are integrated vulnerability and adaptation assessments; identification of national circumstances that affect the assessments; conduct of green house inventory; mitigation exercises; and identification of challenges experienced by various sectors, and lessons learned.

Source : JICA Study Team prepared based on the SNC.

2) Institutional Arrangements

Whereas the Ministerial Portfolios and configurations of the Ministries undergo changes based on decisions of the Prime Minister, certain key portfolios of relevance to climate change include:

The Ministry of Agriculture, Forestry and Fisheries, The Ministry of Communications, Works Transport and Public Utilities, the Ministry of Health, the Ministry of Physical Development, Environment and Housing, the Ministry of Social Transformation, The Ministry of Tourism and The Office of the Prime Minister (National Emergency Management Office).

3 :Sustainable Development and Mitigation

1) National inventory of Greenhouse Gas (GHG)

Saint Lucia has completely prepared its initial national greenhouse gas inventory and presented in its Second National Communication on Climate Change to the UNFCCC in 2012.
The emission trend is provided by sector in 2000. The following table summarized Saint Lucia's GHG emission.

Table 2. GHG emission by sector (2000)

Sector	CO_2 emission	CH_4	N_2O
Energy	347.7	0.07	0.003
Industrial process	0.0	-	-
Solvent and Product Use	0.0	-	0.002
Agriculture	0.0	0.46	0.100
Land-Use Change and Forestry	21.0	0.07	0.000
Waste	0.0	7.26	0.021
Total	**368.8**	**7.86**	**0.125**

Unit: (Gg / year)
Source: Second National Communication

2) Summary of Nationally Appropriate Mitigation Action (NAMA) plan

Saint Lucia has not yet submitted its NAMA to the UNFCCC. However SNC is guided by the following key measures.

- Fiscal Measure For Industrial Energy Efficiency
- Reforestation
- Programme To Promote Use Of Alternative Energy Sources
- Regulations For Purchase Of Higher Fuel Efficiency Vehicles
- Transportation Demand Management
- Legislation For Auto-Generation And Co-Generation
- Establish Wind Farm For Power Generation
- Establish Minimum Energy Efficiency Standards For Lighting And Appliances
- Energy Efficiency Building Code
- Audit Programme For Small Hotels
- Solar Water Heating
- Energy Service Companies (ESCOs)

4 : Adaptation and Vulnerability

1) Vulnerability to Climate Change

Impacts and vulnerabilities to climate change in Saint Lucia's are summarized in SNC. Impacts and vulnerabilities are summarized as follows.

- Deforestation and developments in disaster prone areas have exacerbated vulnerabilities while the absence of approved building codes and standards has resulted in a housing stock prone to damage by floods, landslides and high winds.
- Coral bleaching, physical damage from anchors, suffocation from silt carried in river runoffs and storm damage have reduced the area of coral reefs, with associated increased vulnerability of the coastline to storm activity. This condition is exacerbated by the significant loss of mangals to tourism development and charcoal production.

2) Summery of National Adaptation Programme of Action (NAPA)

Saint Lucia has not submitted its NAPA. However, National Climate Change Policy and SNC contain potential adaptation actions. The actions recommended for adaptation to climate change impacts, can be summarised into following five components.

- Adaptation interventions in economic, social and environment/ecosystems dimensions, paying particular attention to vulnerable communities, vulnerable groups and the private sector, in order to begin building resilience and demonstrating results
- Enabling framework for implementation of interventions for resilience building to include multi-level governance approach: regional, national and community; to provide clear direction on how adaptation programmes can be incorporated into institutional frameworks, ministry operational plans and policies, supported by appropriate legislation and fiscal regimes.
- Provision for multi level research and systematic observation, at a regional level, with national level linkages, to develop baselines and scenarios for future impacts, as well adaptation options to address them, including the requisite technical and financial resources required for effective national level adaptation.
- Addressing information and data gaps that constrain capable practitioners in regional agencies, government departments and civil society from addressing vulnerabilities.
- Increasing education and awareness of publics on issues related to climate change and improving capacities to facilitate climate change adaptation.
- Monitoring and evaluation of programme activities for assessing, results for ongoing modifications and adjustments as needed.

Following table shows priority activities for adaptation in Saint Lucia.

Table .3 Priority Activities per Sector for Implementation

Sector	Activity / Strategy
Coastal and Marine Resources	Undertake review of existing coastal monitoring and data collection systems
Human Settlements	Develop adaptation plan for human settlements including zoning, defences, building codes etc.
Terrestrial Resources, Terrestrial Biodiversity and Agrienlture	Establish a system for improved monitoring and research of key terrestrial and agricultural process and resources.
Freshwater resources	Undertake inventory of freshwater resources and develop and implement a Natural Water Resources Management Plan
Tourism	Improve/develop regulatory framework with emphasis on enforcement.
Cross-cutting	Development and implementation of an integrated, coordinated and sustained climate change awareness programme targeting all sectors and relevant interest groups

Source: Second National Communication

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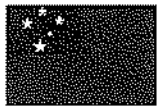
2 Saint Lucia's Initial National Communication on Climate Change http://unfccc.int/resource/docs/natc/lucnc1.pdf
3 Second National Communications (SNC) on Climate Change for Saint Lucia http://unfccc.int/resource/docs/natc/lcanc2.pdf

17 : Samoa



1 : Basic Information and Key Indicators

Capital	Apia
Area :	2,944 [km^2]
Population	193,161 (2011)
GNI, per capita	USD 2,840 (2011)

Source: Basic data, Regional affairs, Ministry of Foreign Affairs of Japan

2 : Summary on climate change related issues in the country

1) Climate change policy and national efforts/measures against climate change

Samoa ratified the United Nations Framework Convention on Climate Change (UNFCCC) in November 1994, and ratified the Kyoto Protocol in November 2000. Samoa submitted its initial national communication under the UNFCCC in October 1999, and its second national communication in June 2010. National adaptation programme of action was submitted in December 2005. The Samoan Cabinet approved the National Climate Change Policy in early 2008, providing "a national framework to mitigate the effects of climate change and adapt to its impacts in an effective and sustainable manner." With respect to mitigation, the policy includes a general commitment to promote mitigation in all sectors. Other highlighted mitigation strategies include Samoa's becoming involved in carbon trading and clean development mechanism projects promoting energy efficiency and renewable energy and providing financial incentives for mitigation. Samoa does not have any registered CDM projects, but is included in one of the multiple countries in PoAs (water purification, LED distribution, and stoves) under validation.

2) Institutional arrangement

The Ministry of Natural Resources and Environment (MNRE) is the agency responsible for the overall implementation of Samoa's adaptation and mitigation activities. The MNRE also plays a major role in developing strategies, policies and coordinating adaptation measures. The National Climate Change Country Team (NCCCT), which was established in 1995, provides more direct coordination of climate-related activities. This covers initiatives funded by donors as well as through the national budget. Key members of the NCCCT are the Chief Executive Officers of relevant government ministries and representatives of civil society and the private sector. (Pacific Climate Change Portal)
MNRE is the ministry responsible for developing the key policy and planning documents that guide climate change programmes in Samoa. This includes the National Policy Statement on Climate Change (2007) and the NAPA. The Ministry serves as the secretariat for the NCCCT. The MNRE is the agency responsible for the overall oversight of the implementation of

Samoa's adaptation activities. The MNRE also plays a major role in developing strategies, policies and coordinating adaptation measures. Other key Government agencies include the Ministry of Health, the Ministry of Agriculture and Fisheries, the Samoa Water Authority (SWA), Ministry of Works and Infrastructure (MWI) and the Electric Power Corporation (EPC).(Pacific Climate Change Portal)

3 :Sustainable Development and Mitigation

1) National inventory of greenhouse gas

In 2007 Samoa's GHG emissions totalled approximately 352,034 tonnes of CO2-equivalent (tCO2-e). The GHG inventory also estimated CO2 removals in forests and on croplands, which totalled -785,067 tonnes in 2007.

Table 1: Samoa's overall GHG emissions and removals (2007)

Sector	CO2 tonnes	CH4 tonnes	N2O tonnes	HFCs tCO2-e	Equiv.CO2 Emissions tCO2-e	CO2 Removals tonnes
Energy	170,981	50	7.5	-	174,350	-
Industrial Processes and Product Use	4,138	-	0.4	5,253	9,507	-
Agriculture, Forestry & Other Land Use	4.55	4,207	152	-	135,366	-785,067
Waste	2,409	1,422	2	-	32,811	-
Total	177,533	5,679	161	5,253	352,034	-785,067

2) Summary of Nationally Appropriate Mitigation Action (NAMA) plan

Samoa has not submitted its NAMA plan.

3) Mitigation Options

The table below contains a summary of the mitigation opportunities that are available to Samoa. Thus far, Samoa's most promising mitigation option is to expand its hydropower generation capacity, while vehicle fuel-efficiency improvements and demand-side energy efficiency also hold significant potential.

Table 2: Summary of Additional Mitigation Opportunities and Associated GHG Savings

Additional Mitigation Opportunities	Potential GHG Savings in 2020 (tCO2-e pa)
Energy Efficiency – Demand-side management	230–1,380
Renewable Energy:	
Expanded hydropower capacity	33,050
Wind power	992
Transport –Fuel Efficiency Improvements	6,617
Forests:	
Avoided deforestation	Not quantified
Reforestation	Not qunantified
Waste:	
Organic waste recycling	Not quantified
Phase out of open burning	Not quantified

4 : Adaptation and Vulnerability

1) Vulnerability to climate change

Samoa's GHG Inventory indicates that its GHG emissions are relatively very small. This, however, does not imply that it will not be adversely affected by the impact of climate change.

Water supply and quality
Water resources and water supply systems are extremely vulnerable to current climatic patterns. Periodic droughts associated with El Niño-Southern Oscillation events meant that Samoa's water supply was rationed and water reservoirs were depleted. Extreme heavy rainfall causes immediate flooding, which in turns causes extensive erosion, loss of terrestrial habitats, damage to agro-forestry and destruction to vital infrastructure. The influx of flood-mobilised sediments into reservoirs and hydropower schemes damages the water supply as it compromises the generation of electricity. An increase in diesel power generation is recognised as a result of faltering or unsuitable supplies for hydropower. Incidents of underground water becoming saline have been reported in parts of northern and eastern Savai'i. Although the current rate of sea level rise has a slight effect on watershed and aquifers, several coastal springs are becoming inundated by what communities view as rising sea levels.

Health
The effect of climate change upon the health sector is evidenced in the growth of vector-and water-borne diseases. Other projected health issues are the result of changes in ecological and social systems, namely changes in local food production, potential malnutrition from successive agricultural under-production, population displacement and stresses caused by economic disruption. Samoa is susceptible to extreme climate events such as cyclones, flooding and droughts and water and food-borne diseases such as typhoid, diarrhoea and gastroenteritis remain highly prevalent. Vector-borne diseases including dengue and filariasis continue to receive highest priority in terms of control and prevention programmes.

Agriculture and food production
The numerous effects of climate change and variability: cyclones, flash floods, high rainfall, high temperature and long dry periods have made agricultural production increasingly challenging. Climatic changes have meant greater incidence of pests and pestilence, which meant a loss of quality and quantity in production.

Fisheries
All components of fisheries (oceanic fisheries, coastal fisheries and aquaculture) show very high vulnerability to climate change. Because it can alter environmental conditions relevant to productivity and habitats for pelagic species, sea surface temperature (SST) is critical to both the coastal and oceanic sectors in the immediate to long-term. For aquaculture, rising SST threatens broad stock like giant claims, as water temperatures exceed normal tolerance levels. Extreme winds affect all components of fisheries. For oceanic and aquaculture fisheries, infrastructure becomes more vulnerable as fishing vessels smash into each other at berth and alongside the wharf and the hatchery required for spawning is damaged or destroyed by flying objects and fallen trees. The Coastal and Aquaculture component of Fisheries is also vulnerable to extreme rainfall as run-off from land affects the coastal marine environment. Extreme wave action is projected to have a devastating effect on coastal fishery and aquaculture. Wave action is also important for the oceanic component of fishery, as it can significantly reduce catches.

Biodiversity

Many changes are anticipated for the biodiversity sector as a result of climate change, not only in terms of species population but also in terms of the health of entire ecosystems. The health of the biodiversity sector has direct consequences for inter-related sectors, namely fisheries, forestry, agriculture, tourism, infrastructure, health and water.

Infrastructure
Samoa's coastline is highly susceptible to erosion and flooding. More than three quarters of Samoa's population resides along the coastal plains, which indicates to some degree Samoans' strong reliance upon marine resources for subsistence and commerce. Infrastructure and utility services are also located in these coastal zones and are thus extremely vulnerable to extreme climate events. Tourism is a major economic sector in Samoa, and most tourism spots are located within coastal areas. The effects of climate change and climate variability have been widely acknowledged as both direct and indirect. Direct effects include the loss of beaches, inundation and degradation of coastal ecosystems, saline intrusion and damage to critical infrastructures. Indirect consequences include the diminished beauty of natural resources, for example bleached coral or destroyed forests.

2) Summary of National Adaptation Programme of Action (NAPA)

More recently, Samoa's National Adaptation Programme of Action (NAPA) of 2005 identifies urgent and immediate needs with respect to adaptation, with its top three being:
- Water resources;
- Reforestation programs and activities; and
- Education and awareness programs.

The main priority criteria for implementation of programs in these areas was identified as being ensuring that they are country-driven, local and community-based (MNREM, 2005). The NAPA aims to communicate urgent and immediate adaptation needs and the activities to address these needs to deal with the adverse impacts of climate change; and to develop the strategies for capacity building amongst stakeholders and village communities.

The main objectives of Samoa's NAPA are:
1. To develop and implement immediate and urgent project based activities to adapt to climate change and climate variability;
2. To protect life and livelihoods of the people, infrastructure and environment;
3. To incorporate adaptation measures and goals into national and sectoral policies, and development goals; and
4. To increase awareness of climate change impacts and adaptation activities in communities, civil society and government.

3) Adaptation Options

Table 3: Immediate & Urgent Adaptation Activities in Ranking Order

Rank	Project Profile Name	Activities
1	Securing Community Water Resource	Develop water purification programmes for community Develop watershed management programme for (other) communities Alternative water storage programs Restoration of coastal springs in communities
2	Reforestation, Rehabilitation &	Reforestation & Rehabilitation (sustainable forest

Rank	Project Profile Name	Activities
	Community Forest Fire Prevention	management) Forest Fire Prevention Program
3	Climate Health Cooperation Program	Establish Climate-Health Cooperation Program
4	Climate Early Warning System	Develop Climate Early Warning System and Emergency Measures
5	Agriculture & Food Security Sustainability	Investment on annual crops and home vegetable farming Alternative Farming Systems
6	Zoning & Strategic Management Planning	Zoning, Disaster Planning & Urban Planning Strengthening building codes resilient to cyclones
7	Implement Coastal Infrastructure Management Plans for Highly Vulnerable District	Implement Coastal Zone Management Coastal infrastructure protection (seawall) Construction of seawalls (subject to existing plans and code) Assistance for relocation of roads further inland Assistance for relocation of communities inland
8	Establishing Conservation Programs in Highly Vulnerable Marine & Terrestrial Areas of Communities	Conservation Areas Establish Marine Reserves Marine & Terrestrial Conservation Areas (e.g. MPAs)
9	Sustainable Tourism Adaptation	Snstainable Tonrism ~ to develop Tourism Environmental Policy

In terms of current adaptation action, and relative to other Pacific Island countries, a very high number of climate change adaptation projects—national, regional and global—are presently underway in Samoa. Most of these projects focus on forestry and agriculture, but also address coastal zone management, human health, meteorological capacity, infrastructure, water and policy and planning. There are a variety of funding agencies active in the country, with the most common being the Asian Development Bank (ADB), the World Bank and the governments of Australia and Germany. Samoa also has received funding for two projects through the Least Developed Countries Fund (LDCF) that address priority actions identified in its NAPA. Samoa identified a number of projects in its NAPA to address many of its capacity building needs. All of the adaptation projects suggested have a strong community component. Support for implementation of these priority actions has been received from the LCDF through the projects "Integrating Climate Change Risks in the Agriculture and Health Sectors" and "Integration of Climate Change Risk and Resilience into Forestry Management."[3] Resilience to the adverse impacts of climate change will be addressed through continuation of work on coastal management and adaptation programs for vulnerable villages and other coastal locations and through such activities as promotion of energy efficient building design.

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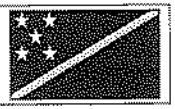
3 "NATIONAL ADAPTATION PROGRAMME OF ACTION" http://unfccc.iut/resource/docs/napa/sam01.pdf

4 "STRATEGY FOR THE DEVELOPMENT OF SAMOA 2008-2012" http://www.sprep.org/att/IRC/eCOPIES/Countries/Samoa/104.pd

5 "Pacific Climate Change Portal ~ Samoa" http://www.pacificclimatechange.net/index.php/country-profiles/samoa

18 : Solomon Islands



1 : Basic Information and Key Indicators

Capital	Honiara
Area :	28,450 [km^2]
Population	571,890 (2011)
GNI, per capita	USD 910 (2009)

Source: Basic data, Regional affairs, Ministry of Foreign Affairs of Japan

2 : Summary on climate change related issues in the country

1) Climate change policy and national efforts/measnres against climate change

The Solomon Islands ratified the United Nations Framework Convention on Climate Change (UNFCCC) in December 1994 and then become a party to the Kyoto Protocol, which it ratified in March 2003. The Solomon Islands submitted its initial national communications under the UNFCCC in September 2004. Solomon Islands has no policy that deals directly with issues relating to mitigation of climate change. The recently formed National Coalition for Reform and Advancement (NCRA) Government has established nine Policy Actions (NCRA Policy Statement, 2010) in October 2010 which includes actions addressing adaption to climate change, strengthening capacity of Meteorological Services and National Disaster Management Office. The National Agriculture and Livestock Sector Policy (2009-2014) addresses climate change in various sections including: Promoting risk management and climate change mitigation, and shielding farmers from impacts of natural disasters and climate change. It also outlines several policy options for cross sectoral services on climate change, disaster risk reduction and disaster management. (Pacific Climate Change Portal) Solomon Islands do not have any CDM project but have three Programmatic CDM projects under validation including water purification, LED distribution and regional biogas recovery.

2) Institutional arrangement

The Sikua-led Government newly established the Ministry for Environment, Conservation and Meteorology (MECM) in 2008, whose main functions are concerned with Environment and Conservation; National Park sand Wildlife; Ecological Studies; Global Warming and Rising Sea Level; and Meteorological Services. The MECM serves as a National Focal Point for all international, regional Conventions, Treaties and Protocols relating to Environment, Conservation, Global Warming, Climate Change and Meteorology. The MECM also established a Climate Change Division (CCD) to deal with all climate change issues and concerns and also to translate national policies into actions. The national institution charged with environmental management and monitoring is the Environment and Conservation Division (ECD) in the MECM. The ECD coordinates with other national-level departments and authorities, such as,

the departments of National Planning and Aid Coordination, Fisheries and Marine Resources, Agriculture and Livestock, Infrastructure, Mines and Energy, Health, and Forestry.

3 :Sustainable Development and Mitigation

1) National inventory of greenhouse gas

Due to unavailability of sourced information, data, time constraints and apathy on the part of some of the stakeholders, the baseline for this inventory was confined to 1994. Some of the presumed major sources of data and information, including government departments do not have records or proper recording systems in place. Top Down and Bottom Up approaches were the basis of this inventory. The Top Down approach basically refers to producers and in the case of Solomon Islands it would refer to the importers whilst the Bottom Up approach refers to users or the consumers.

Table 1: Summary of CO2 Emissions from Fossil Fuel in Top Down Approach

Fuel Type	Total Fuel Imported (kilotons)	Apparent Consumption (kilotons)	Apparent Consumption Terajoules (TJ)	Actual CO2 Emissions (Gg CO2)	Percentage (%)
Gasoline	16.25	16.25	728	49.95	15.48
Jet Kirosene	4.8	3.3	147.15	10.42	3.23
Other Kerosene	3.62	3.62	162	11.53	3.57
Diesel oil	76	76	3293.08	241.47	74.86
Lubricants	2.2	2.2	88.42	6.45	2
LPG Gas	0.94	0.94	44.47	2.78	0.86
Total CO2 Emissions from Top Down Approach (Gg CO2)				322.58	100

Note: There was no assmumption used in the Top Down Approach as the information and data provided were from reliable sources and therefore indicate true representation of total fossil fuel imported.

Table 2: Summary of CO2 Emissions from Fossil Fuel Combustion using Bottom Up Approach

Fuel Usage by Sector	Consumption and Emissions		
	Apparent Consumption (kilotons)	Apparent Consumption Terajoules (TJ)	Actual Emissions (Gg CO2)
Energy Sector			
Diesel Oil	16.68	722.74	53
Lubricants	0.18	7.23	0.26
Transport: Sea, Air, Land			
Gasoline	14.84	14.84	45.61
Jet Kerosene	0.8	0.8	2.53
Diesel Oil	44.84	44.84	142.47
Lubricants	1.5	1.5	2.18
International Bunkiers: Marine and Aviation			
Jet Kerosene	1.5	66.89	4.73
Diesel Oil	0	0	0
Lubricants	0	0	0
Commercial Institutions			
LPG gas	0.33	15.61	0.97
Other Fuel	0	0	0
Agriculture, Forestry and Fisheries			
Gasoline	1.46	65.41	4.49
Diesel Oil	9.2	398.64	29.23
Lubricants	0.21	8.44	0.31
Residential			
Other Kerosene	3.62	162	11.53
LPG gas	0.61	28.86	1.8
Total (excluding international bunkers)			294.38

Notes:
1. Total CO2 emissions exclude emissions from international bunkers inline with IPCC reporting Guidelines
2. Avgas and Petrol are included as Gasoline

The total carbon dioxide emissions from the bottom up approach is less than that from the top down approach because diesel oil is also used in various ways which were not accounted for in this inventory. These include its use in rural areas and some educational institutions for lighting, farming and other general uses.

2) Summary of Nationally Appropriate Mitigation Action (NAMA) plan

Solomon Islands has not submitted its NAMA plan.

3) Mitigation Options

Mitigation options by the Solomon Islands are measures to limit and reduce emissions from the supply and utilization of energy, and enhancing sinks of carbon dioxide.

Energy Efficiency and Conservation

a) Lighting
Lighting is a major energy consumer in buildings and there is potential for making energy savings and reducing CO2 emissions. This may be achieved by replacing inefficient lamps with high efficiency alternatives.

b) Air Conditioning
Air conditioning in government offices and business houses can be a major source of energy consumption in Solomon Islands. It is possible to reduce the amount of energy consumed in air conditioning by proper maintenance and introducing more efficient air conditioners with controls that allow the system to shut down when the system is not needed.

c) Refrigerators
Refrigerators are common source of energy consumption in residential and government buildings. New refrigerator efficiency has been improved dramatically in the major markets and energy savings can be made by the diffusion of this technology into Solomon Islands.

Renewable Energy Technologies

a) Hydro-electricity
Small-scale hydro-electricity generation had been introduced into the rural areas of Solomon Islands and there is potential for its development in other suitable areas. On a larger scale, there is also potential for hydro-electricity generated in the urban areas of Solomon Islands, and this would substantially reduce the dependence on fossil fuel generated electricity, particularly in the Capital.

b) Solar Thermal
Solar thermal is in use in the Solomon Islands mainly for water heating in residential buildings and some government offices in the urban areas.

c) Solar PV Technology
This technology has been introduced to several villages for lighting and powering radios and refrigerators. This technology has the potential for adoption as a major energy source for the rural communities in the Solomon Islands.

d) Biomass
Oil palm and copra industries in the Solomon Islands are using limited biomass generated electricity in their operations and the technology could be adopted to other similar industries.

Enhancing Greenhouse Gas Sinks and Sustainable Land Management

The Solomon Islands Government has policy actions to:
a) reduce current levels of harvest to a sustainable level through current moratorium now in effect on the issuing and renewal of licenses, revise existing law on forestry, and establishment of a National Conservation Trust Fund for funding protection, conservation, replenishment and development of exploited natural forest resources;

b) achieve higher levels of efficiency in forestry harvest and reducing adverse environmental impact to a minimum;

c) privatise plantation estates in order to improve their management; and

d) continne to encourage and facilitate reforestation projects.

Grounrl Transport Sector
It is realized that appropriate policies and measures be put in place to control and regulate the importation of automobiles and vehicles meeting certain specifications and standards with preferences for efficiency and environmentally friendly vehicles.

4 : Adaptation and Vulnerability

1) Vnlnerability to climate change

While there is a wide diversity of social and biophysical environments within Solomon Islands, there are some partienlar systems thronghout the country that are likely to be sensitive to climate and sea-level change. Those identified as being of greatest importance are: 1) Subsistence and Commercial Agriculture, 2) Human Health, 3) Coastal Environments and Systems, 4) Water Resources, 5) Marine Resonrces.

1) Subsistence and commercial agriculture
Subsistence food crops are already adversely affected by extreme events like droughts and cyclones. Any increase in frequency or intensity of extremes due to climate change, in the future could lead to lower crop yields.

2) Human Health
Temperature influences the rate of parasite multiplication in carrier mosqnitoes as well as mosquito biting rates. Thns, overall temperature strongly influences epidemic potential. Higher humidity increases mosquito longevity. It is anticipated that the projected increases in temperature will increase the incidence of malaria in areas already affected. Extreme events such as cyclones and flooding have several direct negative effects on pnblic health including loss of life, injury and ontbreaks of cholera and other diarrhoeal diseases.

3) Coastal Environments and Systems
The effect of sea level change combined with storms and cyclones could pose an even higher risk of flooding and inundation. Coastal erosion is already evident in many parts of the country. Protective works along the shoreline have been eroded and the situation now is that parts of the road passing through it have been washed out. This process has been observed over a nnmber of years but at a faster rate in recent years. Coral reefs are important in Solomon Islands as they are the main source of sediment for beach formation, provide protection from storm events and are prodnctive habitats and ecosystems. During the recent El Nino there were lower sea levels. which resulted in warmed coral habitats and coral bleaching in some parts of the country.

4) Water resources
Climate change is likely to affect both water quantity and quality in sensitive areas of Solomon Islands. In the past, events snch as El Nino have had significant impacts on water sources in some part of the conntry. Thns, any decrease in average future rainfall or increase in dronght frequency or length would adversely affect water supply. Sea level change may result in salt-water intrusion of the important fresh water lenses of the low-lying islands and atolls. This wonld be worsened by flooding and inundation.

5) Marine resources
There is presently little knowledge about the effects of climate and sea level variations on marine resources. What is known presently is that the distribution of tuna stocks is affected by

sea surface temperature variations. The changes in sea snrface temperature and ocean currents associated with the 1997/98 El Nino redneed the Solomon Islands tuna catches. If average sea surface temperatures change in the future diminished catches might occur more often.

2) Summary of National Adaptation Programme of Action (NAPA)

NAPA will communicate priority activities addressing the nrgent and immediate needs an concerns of Solomon Islands, relating to adaptation to the adverse effects of climate change NAPA was prepared throngh a consultative process using a country team approach, a national synthesis of information covering the various sectors of the economy, a vulnerability analysis and commnnity and/or village consultations. Based on the high ranking of the priority sectors and the greater likelihood of accessing funding support from the Least Developed Countries Fnnd for the implementation thereof, a total of seven project profiles were developed, as shown in the next section.

3) Adaptation Options

The prioritization and ranking of key sectors which require urgent and immediate adaptation actions are inclnded in the following seven project profiles:

(1) Managing the impacts of, and enhancing resilience to, climate change and sea-level rise, on agriculture and food security, water supply and sanitation, human settlements, human health and education, awareness and information
Goal: To increase the adaptive capacity and resilience of key vulnerable sectors
Component 1 : Agriculture and Food Security
The main objective of this component is to increase the resilience of food prodnction enhance food security to the impacts of climate change and sea-level rise.
Component 2 : Water Snpply and Sanitation
The main objective is to increase the resilience of water resources management to impacts of climate change and sea-level rise.
Component 3 : Human Settlement
The main objective of this component is to improve the capacity for managing impacts of climate change and sea-level rise.
Component 4 : Human Health
The main objective of this component is to increase the capacity of health professionals to address adverse impacts of climate change on human health.
Component 5 : Education, awareness and information on climate change
The main objective of this component is to promote climate change edncation, awareness and information dissemination.
(2) Climate change adaptation on low-lying and artificially built-up islands in Malaita and Temotu provinces
Goal: The main goal is to facilitate adequate adaptation to climate change and sea-level rise
Objective: To develop and implement plans to relocate as an adaptation measure.

(3) Waste management
Goal: Main goal of this project is to better manage impacts of climate change on waste management
Objective: To develop a national integrated snstainable Waste Management Plan and Strategy for incorporating impacts of climate change.

(4) Coastal protection

Goal: The main goal of this project is to increase the resilience and enhance adaptive capacity of coastal communities, socio-economic activities and infrastructure.
Objective: Integrate climate change adaptation (climate proofing) into construction of a roads and other infrastructure.

(5) Fisheries and marine resources
Goal: To improve the nnderstanding of the effects of climate change and climate variability including El Nino-Southern Oscillation on the inshore and tuna fishery resources.
Objective: To improve the capacity to protect inshore fisheries and marine resources.

(6) Infrastructure development
Goal: To improve the resilience of key infrastructure to climate change and sea-level rise.
Objective: Integration of climate change risk proofing into infrastructure design and development.

(7) Tourism
Goal: To integrate climate change adaptation strategies and measures into tourism planning and development.
Objective: To build capacity in managing impacts of climate change on tourism.

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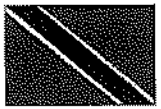

1 : Basic Information and Key Indicators

Capital	Port-of-Spain
Area :	5,128 [km^2]
Population	1,351,000 (2012)
GNI, per capita	USD 14.710 (2012)

Source: Basic data, Regional affairs, Ministry of Foreign Affairs of Japan

2 : Summary on climate change related issues in the country

1) Climate change policy and national efforts/measures against climate change

Trinidad and Tobago (TT) ratified the United Nations Framework Convention on Climate Change (UNFCCC) on 1994. It submitted its Initial National Communications (INC) on 30th November 2001 and Second National Communications (SNC) on 7th November 2013. Policies, regulations and plans related climate changes in TT are shown in below.

Table 1. Policies, regulations and plans related climate change

Day	Relevant Policies and Decrees	Contents
November 2001	Initial National Communications on Climate Change (INC)	INC reports details the national greenhouse gas inventory. statements on vulnerability and adaptation. as well as identification of technology needs. capacity building and research.
September 2009	National Environmental Policy (NEP)	The NEP sets the overarching policy framework for environmental management in Trinidad and Tobago and addresses the key sectors relevant to climate change including reduction and management of greenhouse gas emissions through the application of clean technology and the enhancement of natural sinks for carbon sequestration. It also provides a holistic approach to adaptation issues including conservation and protection of natural resources and the attendant socio-economic considerations.
July 2011	National Climate Change Policy	The purpose of this Policy is to establish a multifaceted framework for dealing with climate change and encompasses the effects of global warming and climate change issues relating to Trinidad and Tobago.

Day	Relevant Policies and Decrees	Contents
November 2013	Second National Communications (SNC) of the Republic of Trinidad and Tobago	SNC focuses on the compilation and analysis of the National Inventory of greenhouse gases (GHGs), vulnerability and adaptation studies. mitigation options as well as on recommendations with respect to proper data collection and sharing. technology needs. capacity building, research and development constraints and challenges.

Source : JICA Study Team prepared based on the SNC.

2) Institutional Arrangements

The implementation of the policy in Trinidad and Tobago shall be coordinated by the Multilateral Environmental Agreements Unit of the Ministry of Housing and the Environment, which has primary responsibility for the implementation of the UNFCCC and the Kyoto Protocol as well as other multilateral environmental agreements to which Trinidad and Tobago is a signatory, and for which the Ministry is the National Focal Point.

3 :Sustainable Development and Mitigation

1) National inventory of Greenhouse Gas (GHG)

Trinidad and Tobago has completely prepared its initial national greenhouse gas inventory and presented in its Initial National Communication on Climate Change to the UNFCCC in 2001. The emission trend is provided by sector in 1990. The following table summarized Trinidad and Tobago's GHG emission.

Table 2. GHG emission by sector (1990)

Sector	$CO_{2\ emission}$	$CO_{2\ removals}$	CH_4	N_2O
Energy	9,887.0	0.0	1.4	0.0
Industrial process and reproduct use	5,100.0	0.0	0.8	0.0
Agriculture, Forestry and Other land use	0.0	152.3	1.2	0.0
Waste	0.0	0.0	24.2	0.4
Total	**14,988.0**	**1,524.0**	**33.9**	**1.1**

Unit: (Gg / year)
Source: Initial National Communication

2) Summary of Nationally Appropriate Mitigation Action (NAMA) plan

Trinidad and Tobago has not yet submitted its NAMA to the UNFCCC. However National Climate Change Policy is guided by the following mutually interactive objectives;

- Reducing or avoiding greenhouse gas emissions from all emitting sectors;
- Enhancing carbon sinks;
- Conserving and building resilience of human and natural systems to adapt to the adverse impacts of climate change, including through capacity building and the application of cleaner and energy efficient technologies;
- Protection of the natural environment and human health; and
- Enhanced agricultural production and food security.

4 : Adaptation and Vulnerability

1) Vulnerability to Climate Change

Impacts and vulnerabilities to climate change in TT are summarized in National Climate Change Policy. Specific sectors of vulnerability to climate change are summarized as follows.

Table. 3 Vulnerability to Climate Change in TT

Sector	Vulnerability
Agriculture	- Projected increases in ambient air temperature is likely to result in increased aridity of soils and decreased crop yields due to intolerance of crop varieties. - Projected decreased precipitation is likely to result in increased aridity of soils and decreased crop yields due to less irrigation water availability. - Projected increase in sea level is likely to result in inundation of coastal areas and salinisation of productive soils, leading to decreased crop yields and available areas for agricultural production. - Projected increases in the incidence of invasive species, pests and diseases.
Human Health	- Projected increases in ambient air temperature are likely to result in the increased spread of vector borne diseases due to increased humidity, while also giving rise to favourable conditions for increased vector populations. - Projected decreased precipitation is likely to result in reduced availability of potable water. Additionally, reduced rainfall will indirectly affect food availability due to inability to water crops. - Projected increased sea level and precipitation intensity is likely to result in an increase in the incidences of water borne diseases in permanently or often flooded areas.
Human Settlements and Infrastructure	- Projected increases in intensity or heavy precipitation events10 in concert with deforestation can result in increased incidences of flooding in flood plains which can have adverse impacts on human settlements and human health. This may result in disruption of settlements, commerce, transport and towns and villages due to flooding which can add further pressures on urban and rural infrastructure and loss of property.
Coastal Zones	- Sea level rise: Increased inundation, increased erosion and loss of coastline and coastal amenities such as human settlements; natural resources such as wetlands and associated ecosystem goods and services; and loss of coastal agricultural lands due to soil salinisation. - Temperature increase: Increase in sea surface temperature will lead to loss of natural coastal defenses such as coral reefs, further leading to loss of fisheries and increased erosion and inundation as a result of increased wave energy reaching the coast. - Ocean Acidification: Increased carbon dioxide in the atmosphere dissolves in the ocean resulting in a lower seawater pH which can be detrimental to the fishery.
Water Resources	- Temperature increase: Loss of available surface water as a result of increased evapotranspiration. - Decreased precipitation: Reduced percolation and recharge of groundwater reserves in aquifers; reduced availability of surface water and potable water.

Sector	Vulnerability
	- Salt Water Intrusion: Saline water entering freshwater aquifers reducing available freshwater.

Source: National Climate Change Policy

2) Summery of National Adaptation Programme of Action (NAPA)

TT has not submitted its NAPA. However, National Climate Change Policy and SNC contain potential adaptation options for the action plan. The Government recognises the inter-sectoral and cross-sectoral nature of climate change vulnerability and the need for a commensurate approach to adaption and adaption planning. Further, the Government also recognises that adaptation to current climate variability and building climate resilience in potentially affected sectors can serve long term adaptation needs under a changed climate. Following table shows outlines some approaches that are consistent with existing policy.

Table .4 Outlines of some approaches to Adaptation of Climate Change

Major Concerns	Actions at Local Level
Climate change	
- Change in the Earth's Climate and its adverse effects are common concern of humankind. - Developing countries and particularly Small Island Developing States, face increased risks of the negative impacts of change and therefore most vulnerable to these impacts. - The United Nations Framework Convention on Climate change (UNFCCC), to which Trinidad and Tobago is a signatory, is the key instrument addressing climate change. - Climate change is expected to increase the vulnerability of these countries in the context of poverty, land degradation, accesses to water and food, and human health	- Meet all the commitments and obligations under the UNFCC. - Build and enhance scientific and technological capabilities, *inter alia*, through continuing support to the Intergovernmental Panel on Climate Change (IPCC) for the exchange of scientific data and information especially in developing countries. - Develop and transfer technological solutions. - Enhance the implementations of national, regional and international strategies to monitor the earth's atmosphere, land and oceans by improving monitoring stations. - Improve techniques and methodologies for assessing the effects of climate change, and encourage the continuing assessment of those adverse effects by the IPCC. - Reduce the risks of floods and droughts by, inter alia, promoting wetland and watershed protection and restoration, improved land-use planning, improving and apply more widely techniques and methodologies for assessing the potential adverse effects of climate change on wetlands.
Biodiversity	
- Biodiversity plays a critical role in overall sustainable development and poverty eradication, and is essential to human well-being and livelihood. - Biodiversity is currently being lost at unprecedented rates due to human activities. - The convention is the key instrument for the conservation	- Implement the Convention (CBD) and its provisions, including active follow-up of its work programmes and decisions through national, regional and international action programmes, in particular the national biodiversity strategies and action plans, and strengthen them into relevant cross-sectional strategies, and programmes and policies. - Integrate the objectives of the Convention into global, regional and national sectoral and crosssectoral programmes and policies. - Promote the ongoing work under the Convention on the sustainable use on biological diversity, including on

Major Concerns	Actions at Local Level
and sustainable use of biological diversity and the fair and equitable sharing of benefits arising from the use of genetic resources.	sustainable tourism, as a cross-cutting issue relevant to different ecosystems and sectors. - Encourage effective synergies between the Convention and other multilateral environmental agreements, *inter alia*, through the development of joint plans and programmes, with regard to their respective mandates, regarding common responsibilities and concerns. - Strengthen national, regional and international effects to control invasive alien species, which are one of the main causes of biodiversity loss, and encourage the development of effective work programmes on invasive alien species at all levels. - Promote practical measures for access to results and benefits arising out of biotechnologies based upon genetic resources, in accordance with Articles 15 and 19 of the Convention including through enhanced scientific and technical co-operation on biotechnology and biosafety, including the exchange of experts, training human resources and developing research-oriented institutional capacities. - Implement actions recommended in the National Biodiversity Strategy and Action Plan.
Deforestation/Land Degradation	
- Sustainable forest management of both natural and planted forests and timber and non-timber products is essential to achieving sustainable development and is a critical means to eradicate poverty. - Land degradation through unsuitable land use planning and development has given rise to decreased land use potential, agricultural viability and desertification.	- Take immediate action on domestic forest law enforcement and illegal international trade in forest products, including forest biological resources, and provide human and institutional capacity building related to the enforcement of national legislation in those areas. - Take immediate action to promote and facilitate the means to achieve sustainable timber harvesting (prevent illegal logging). - Support the United Nations Forum on Forests, the assistance of the Collaborate Partnership on Forests, as key intergovernmental mechanisms to facilitate and co-ordinate the implementation of sustainable forest management at the national, regional and international levels, thus contributing to, inter alia, the conservation and sustainable use of forest biodiversity. - Implement the CBD's expanded action-oriented work programme on all types of forest biodiversity, within the involvement of all relevant stakeholders. - Develop and implement integrated land management and water-use plans that are based on suitable use of renewable resources and on integrated assessments of socio-economic and environmental potentials. - Promote programmes to enhance in a sustainable manner the productivity of land and the efficient use of water resources in agriculture, forestry, wetlands, and aquaculture. - Strengthen the implementation of the United Nations Convention to Combat Desertification (to which Trinidad and Tobago is a signatory) to address causes of land degradation in order to maintain and restore land. - Formulate national action programmes to ensure the timely and effective implementation of the Convention and its

Major Concerns	Actions at Local Level
	related projects. - Explore and enhance synergies between the United Nations Framework Convention on Climate Change, the Convention on Biological Diversity and the Convention to Combat Desertification, with due regard to their respective mandates, in the implementation of plans and strategies under the respective Conventions. - Integrate measures to prevent and combat desertification as well as mitigate the effects of drought through relevant policies and programmes, such as land, water and forest management, improved use of climate and weather information and forecasts, early warning systems, land and natural resource management, agricultural and ecosystem conservation.
Marine and Coastal Resources	
- Oceans, seas, islands and coastal areas form an integrated and essential component of the earth's ecosystem and are critical for global food security and for sustaining economic prosperity and the well-being of the national economics of most developing countries.	- Promote the implementation of Chapter 17 of agenda 21 which provides the programme of action for achieving the sustainable development of oceans, coastal areas and seas through its programme areas of integrated management and sustainable development of coastal areas, including Exclusive Economic Zones, marine environmental protection, sustainable use and conservation of marine living resources, addressing critical uncertainties for the management of the marine environment and climate change, strengthening international and regional co-operation and coordination and sustainable development of small islands. - Promote integrated, multidisciplinary and multisectoral coastal and ocean management at the national level. - Develop ocean and coastal zone policies and mechanisms on integrated coastal zone management. - Implement the work programme arising from the Jakarta Mandate on the Conservation and Sustainable use of Marine and Coastal Biological Diversity of the Convention on Biodiversity. - Implement the RAMSAR Convention, including its joint work programme with the Convention on Biodiversity, and the programme of action called for by the International Coral Reef initiative to strengthen joint management plans and international networking for wetland ecosystems in costal zones, including coral reefs, mangroves, seaweed beds and tidal mud flats - Enhance protection of the marine environment from pollution by actions at all levels to *inter alia*, implement the conventions and protocols and other relevant instruments of the International Marine Organization (IMO) relating to protection of the marine environment from marine pollution and environmental damage caused by ships, including the use of toxic anti-fouling paints. - Improve the scientific understanding and assessment of marine and coastal ecosystems as a fundamental basis for sound decision marking, through actions at all levels to, *inter alia*, increase scientific and technical collaboration, including integrated assessment at the global and regional levels, for the

Major Concerns	Actions at Local Level
	conservation and management of living and non living marine resources, and expanding ocean-observing capabilities for the timely prediction and assessment of the state of the marine environment. - Build capacity in marine science, information and management through *inter alia*, promoting the use of environmental impact assessments and environment evaluation and reporting techniques, for projects or activities that are potentially harmful to the coastal and marine environments and their living and non-living resources.
Waste Management	
- The prevention and minimization of waste as well as the maximization of reuse and recycling are key elements towards the sustainable use of the natural resources, along with the use of environmentally friendly alternative materials.	- Develop waste management systems, with highest priorities placed on waste prevention and minimization, reuse and recycling, environmentally sound disposal facilities, including technology to recapture the energy contained in waste, and encourage small-scale waste-recycling initiatives that support urban and rural waste management and provide income-generating opportunities. - Promote waste prevention and minimization by encouraging production of reusable consumer goods and biodegradable products and developing the infrastructure required. - Implementation of obligations under the Basel Convention, to which Trinidad and Tobago is a signatory, to provide a useful and effective framework for dealing with waste management at the national level.

Source: Second National Communication

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2 Initial National Communication of the Republic of Trinidad and Tobago
http://unfccc.int/resource/docs/natc/ttonc1.pdf
3 Second National Communication of the Republic of Trinidad and Tobago
http://unfccc.int/resource/docs/natc/ttonc2.pdf
4 National Climate Change Policy
http://www.ema.co.tt/new/images/policies/climate_change_2011.pdf

20 : Tuvalu

1 : Basic Information and Key Indicators

Capital	Funafuti
Area :	25.9 [km^2]
Popnlation	9,800 (2012)
GNI. per capita	USD 5,650 (2012)

Source: Basic data, Regional affairs. Ministry of Foreign Affairs of Japan

2 : Summary on climate change related issues in the country

1) Climate change policy and national efforts/measures against climate change

Tuvalu ratified the United Nations Framework Convention on Climate Change (UNFCCC) in March 1994 and the Kyoto Protocol in November 1998. "Tuvaln Initial National Communications (INC) " is prepared by Minister for Natural Resources and Environment in October 1999. Policies, regulations and plans related climate changes in Tuvaln are shown in below.

Table 1. Policies, regulations and plans related climate change

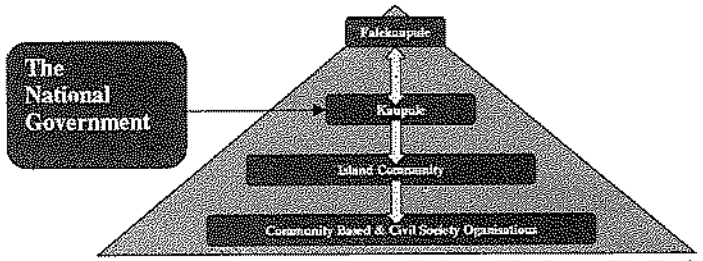
Day	Relevant Policies and Decrees	Contents
October 1999	Tuvalu Initial National Communications (INC)	The INC describes the steps being taken within the country and in relation to the international commnuity to address the problems expected.
June 2008	National Strategy for Sustainable Development 2005-2015 (Te Kaleega II (TKII))	Te Kaleega II is framed around the Millennium Development Goals (MDGs). the national sustainable development goals embodied in the Malefatuga Declaration. sector plans. other multilaterai environmental agreements. the challenges Tuvalu is facing at present. and those that the nation will face in the coming future.
May 2007	Tuvalu's National Adaptation Programme of Action (NAPA)	The Tuvalu NAPA is mindful that in addressing future adverse effects of sea level rise is a complex issue for Tuvalu. A system approach acceptable to the community concerned is snggested.
September 2011	Tuvalu National Climate Change Policy 2012 -2021 (Te Kaniva)	Te Kaniva sets out a framework for adaptation actions.together with strategies such as increasing capacity and improving information and communications, ensuring adequate infrastructure, integrating climate change into development processes. improving energy security. better disaster

Day	Relevant Policies and Decrees	Contents
		planning and response, and ensuring Tuvalu's future security in the event that redefinition of boundaries or relocation is required.

Source : "Review of mainstreaming of climate change into national plans and policies. Tuvalu" summarized by Pacific Small Island States project funded by European Union in November 2013

2) Institutional Arrangements

Tuvalu's NAPA is mentioned the structure of governance. The governance (Falekaupnle Act of 1997) was established for all Island communities in Tuvalu on December 1997. The governance (Falekaupule Act of 1997), passed by the Parliament of Tuvalu, devolved the authority to the Falekaupule and Kaupule (two separate bodies) to work together in addressiug community affairs in order to promote decentralization to decrease domestic urban drift. Falekaupule administration system merged together the traditional and the new governance systems. It also deals with island and community affairs. Figure 1 shows the structure of community governance. The Falekaupule is the prodnct of the fusion of the traditional leadership and the introduced governing system. It functions as the decision making body on the island. The Kaupule is the executive arm of the Falekaupule. The central Government links directly to the Kaupule.



Note : Falekaupule : The Falekaupule is the traditional assembly (local government) on each island.
Kanpule: The executives arm of the Falekaupule.
Source : Tuval's National Adaptation Programme of Action (NAPA)

Figure 1 Structure of Community Governance

3 :Sustainable Development and Mitigation

1) National inventory of Greenhouse Gas (GHG)

Tnvalu presented its national GHG inventory in Initial National Communication on Climate Change to the UNFCCC in 1999. GHG inveutory by sector in 1994 is in Table 2.

Table 2. GHG emission by sector (1994)

Sector	CO_2	CH_4	N_2O
Energy	4.650	2.3×10^{-7}	1.93×10^{-9}
Industrial Process	0	0	0
Agriculture	0	4.32×10^{-2}	1.56923×10^{-5}

Land use change and forestry	0	0	0

Unit: (Gg / year)
Source: Initial National Communication

1) Summary of Nationally Appropriate Mitigation Action (NAMA) plan

Tuvalu has not yet submitted its NAMA to the UNFCCC. Tuvalu's GHG emissions are nil in a global context. However Tuvalu remains committed to a mitigation agenda to transition to a low-carbon future. Tuvalu developed its "National Energy Policy and Action Plan" in 2009. Tuvalu's National Energy Policy and Action Plan seek to improve energy efficiency and reduce GHG emissions through affordable renewable energy. Strategies and expected outcomes are shown in below.

Table 3. Strategies and expected outcome of Mitigation

Strategies	Expected outcomes
Reduce reliance on fossil fuels by providing opportunities for renewable energy	- Realize the target of 100% of electricity generation through renewable energy technologies (Tuvalu National Energy Policy, 2009) - Enhanced access to safe, secure, clean, efficient, and affordable energy supplies
Promote energy efficiency and conservation programmes.	
Energy legislation and regulations promoting and supporting energy efficiency and renewable energy.	
Mitigation plans for the agriculture and waste management sectors to reduce green house gas emissions.	- Improving waste management to reduce emissions and promote the development of renewable energy sources derived from waste gases sources

Source: Tuvalu National Climate Change Policy 2012-2021

4 : Adaptation and Vulnerability

1) Vulnerability to Climate Change

Tuvalu developed " Tuval's National Adaptation Programme of Action (NAPA)" is published in May 2007 by Ministry of Natural Resources, Environment, Agriculture and Lands. Impacts and vulnerabilities by climate change are shown in below.

Table 4. Impacts and vulnerabilities of climate change on each sector

Sector	Impact / vulnerabilities
Agriculture	- Sea level rise, overland flooding, storm surges tropical cyclones and major hurricanes destruct on coastal coconut tree plantations. - Respect to crops, the current increasing occurrence of new diseases and pest, including fruit-fly infestation.
Health	- Water shortage enhances skin diseases and other health problems.
Fisheries	- Overland erosion due to heavy rainfall also resulted in sedimentation in central and coastal areas, affecting coastal and lagoon fisheries - Coastal fisheries are affected by the sea surface temperature changes, human intrusion and increasing frequency of extreme events.
Life, resident	- Since the majority (more than 90%) of the communities live close to the cost, coastal erosion will result in house and land loss. - Lack of household water storage facilities and changes to rainfall

Sector	Impact / vulnerabilities
	patterns.

Source: Tuval's National Adaptation Programme of Action (NAPA)

2) Summery of National Adaptation Programme of Action (NAPA)

According to NAPA, there are seven priority project shown in below.

Table 5. Priority project of NAPA

#	Sector	Title	Goal	Objectives
1	Coastal	Increasing resilience of Coastal Areas and Settlement to climate change.	Increasing resilience of Coastal Areas and Community Settlement to climate change	- Increased protection of Coastal Areas from Erosion - Increased protection of Coastal Communities from natural phenomenon.
2	Agricultural	Increasing subsistence pit grown pulaka productivity through introduction of a salt-tolerant pulaka species.	Increasing Pulaka Productivity in Tuvalu.	- Increase number of abandoned pulaka pit re-planted. - People's preference for fish nutritious pulaka increased.
3	Water	Adaptation to frequent water shortages through increasing household water capacity, water collection accessories, and water conservation techniques.	Adaptation to frequent water shortages through increasing household water capacity, water collection accessories, and water conservation technologies.	- Increased household water storage capacity and water collecting accessories - Increased use of water conservation technologies.
4	Health	Strengthening of Community health through control of vector borne/climate sensitive diseases and promotion access to quality potable water.	To protect Community health through control of vector borne / climate sensitive diseases and promotion community access to quality potable water.	- Increasing community access to clean water. - Controlling Climate sensitive and water-borne diseases.
5	Fisheries	Strengthening of Community Based Conservation Programmes on Highly Vulnerable near-shore Marine Ecosystems.	To Develop and Strengthen Community Based Conservation Programmes on Highly Vulnerable Marine Ecosystems.	- Increased protection of Coastal Marine Biological Diversity. - Develop and Strengthen Community Sustainable biodiversity conservation programme. - Increased productivity of Coastal Marine

#	Sector	Title	Goal	Objectives
				Biological Communities. - Develop a Stakeholders awareness programme that will enhance traditional and modern conservation practices.
6	Fisheries	Adaptation to Near-Shore Coastal Shellfish Fisheries Resources and Coral Reef Ecosystem Productivity.	Adaptation to Near-Shore Coastal Shellfish Resources and Coral Reef Ecosystem Productivity.	- Increased protection of Shellfish population. - Increased protection of Coral Reef Ecosystems Productivity. - Increased Public Awareness and Livelihood.
7	Disaster	Strengthening Community Disaster Preparedness and Response Potential.	Strengthening of Community Disaster preparedness and response capability.	- To ensure community preparedness and effective response to disasters. - To ensure that climate hazard risks on island communities reduced.

Source: Tuval's National Adaptation Programme of Action (NAPA)

"Tuvalu National Climate Change Policy 2012 -2021 (Te Kaniva)" shows seven goals that underpin sustainable development in Tuvalu. Adaptation policy in the term 2012-2021 are summarized in Te Kaniva that shown in below.

Table 6. Adaptation policy (2012 – 2021)

Strategies	Expected outcomes
Health and socio-economic implications (inclusive of gender) of climate change and disaster risks informing appropriate health and socio-economic adaptation programmes for each island.	- Resilience and livelihoods strengthened. - Increased awareness of the costs and implications of climate change and disaster risks. - Gender disaggregated data and information are available for development planning.
Assessment and analysis of salt and/or heat tolerant food crops (e.g. pulaka) and tree species for coastal protection.	- Improved food security. - Coastal protection through re-planting programmes and other appropriate schemes.
Integrated and coordinated water resources (including desalination) planning and management including preparedness and response plans for each island	- Water security (adequate water quality and quantity). - Preparedness for droughts and other extreme events.
Coordinated planning and management of marine, coastal and land resources and systems (Whole Island Systems Management/ecosystem base management).	- Recognition of inter-linkages of systems and adaptations and disaster risk reduction activities strengthened resilience and adaptability of these inter-linkages (ecosystem based management) - Marine and coastal resources are sustainably managed in the context of climate change to minimize the impact on the people of Tuvalu.
Capitalising on recent studies on predicted migratory species movement due to climate change.	- Economic security, food and species diversity (biodiversity and ecosystems) for Tuvalu. - Appropriate technology transfer and capacity building to support economic diversity initiatives.
Awareness and empowerment programmes for each island on climate change impacts and disaster risks in each sector.	- Climate change adaptation integrated into planning and development decision making including household daily activities.
Legislation and policies to govern sustainable resource management. (marine. coastal and land) in the context of climate change impacts.	- Improved coordination driven by relevant policies. - Threats and impacts of climate change and disaster risks on biodiversity minimised and avoided (refer NBSAP. NAPA. NAP etc).
Appropriate insurance arrangements to address loss and damage from the impacts of climate change.	- Cost of re-building from the impacts of climate change are primarily borne by major GHG producing countries.

Source Tuvalu National Climate Change Policy 2012 -2021 (Te Kaniva)

References

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2 "Review of mainstreaming of climate change into national plans and policies, Tuvalu" summarized by Pacific Small Island States project funded by European Union in November 2013
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3 National Strategy for Sustainable Development 2005-2015 (Te Kaleega II (TKII))
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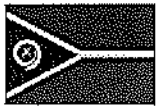
4 Tuvalu's National Adaptation Programme of Action (NAPA)
http://unfccc.int/resource/docs/napa/tuv01.pdf

5 Tuvalu National Climate Change Policy 2012 -2021 (Te Kaniva)
http://www.pacificclimatechange.net/components/com_booklibrary/ebooks/TCCP%20Te%20Kaniva%20English%20final%20web%20new.pdf

21 : Republic of Vanuatu



1 : Basic Information and Key Indicators

Capital	Port Vila
Area :	12,190 [km^2]
Population	250,000 (2012)
GNI, per capita	USD 3,000 (2012)

Source: Basic data, Regional affairs, Ministry of Foreign Affairs of Japan

2 : Summary on climate change related issues in the country

1) Climate change policy and national efforts/measures against climate change

Vanuatu ratified the United Nations Framework Convention on Climate Change (UNFCCC) in March 1993 and the Kyoto Protocol in July 2001. It submitted its Initial National Communications (INC) in October 1999. Policies, regulations and plans related climate changes in Vanuatu are shown in below.

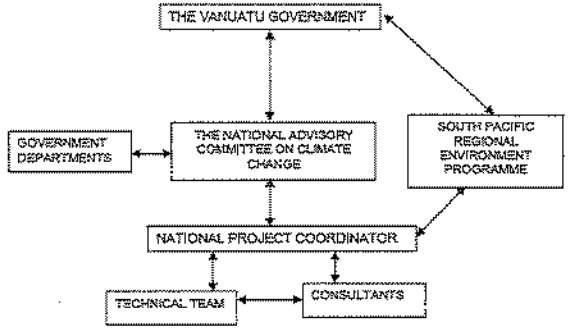
Table 1. Policies, regulations and plans related climate change

Day	Relevant policies and decrees	Contents
July 1999	Initial National Communications (INC)	INC is the primary mechanism through which our international commitments will be met. The Communication has been developed by the national government in consultation with the six provincial councils and the two municipalities of Port Vila and Luganville. Therefore, it maintains a comprehensive approach toward tackling Climate and Sea Level Change issues. The range of actions it encompasses reflects the wide-ranging causes of the enhanced Climate Change and Sea Level Rise effect and the pervasive nature of its potential impacts on all aspects of ni-Vanuatu life and economy.
December 2007	National Adaptation Programme of Action (NAPA)	The objective of the NAPA project for Vanuatu was to develop a country-wide programme of immediate and urgent project-based adaptation activities in priority sectors, in order to address the current and anticipated adverse effects of climate change, including extreme events.

Source : JICA Study Team prepared based on NAPA

2) Institutional Arrangements

Institutional arrangements are mentioned in INC. The National Advisory Committee on Climate Change (NACCC) was first established in 1989 to advise the government on matters relating to climate change during the UNFCCC process and draws on expertise within key government departments. The committee facilitates the work of a technical team comprised of a National Pacific Islands Climate Change Assistance Programme (PICCAP) Coordinator and technical staff drawn from relevant sectors to participate in the training programme. The project coordinator is based with the Vanuatu Meteorology Department. Structure for implementing Climate Change activities in Vanuatu is shown in below.



Source: Initial National Communication

Figure 1. National Organisational Structure for Implementing Climate Change Activities

3 :Sustainable Development and Mitigation

1) National inventory of Greenhouse Gas (GHG)

The below table summarises the volumes of GHGs identified by the National GHG Inventory that is presented in its Initial National Communication on Climate Change to the UNFCCC in 1999. GHG inventory by sector in 1994 is in Table 2.

Table 2. GHG emission by sector

Sector	CO_2 emissions	CO_2 removals	CH_4	N_2O
Energy	55.1532		0.0026	0.0291
Industrial Process	Nr		Nr	
Solvents and other Product Use	Nr		Nr	
Agriculture	Nr	Nr	11.1981	
Land Use and Forestry	net	-1.1534		
Waste	Nr		Nr	
International Bunkers Total	4.6001			0.0031
Total	**56.7078**	**-1.1534**	**11.1996**	**0.0291**

Unit: (Gg / year)
Source: Initial National Communication

2) Summary of Nationally Appropriate Mitigation Action (NAMA) plan

Vanuatu has not yet submitted its NAMA to the UNFCCC. However, INC contains the mitigation options for each sector. Overall option of the mitigation is shown in below.

Table 3. Mitigation Options in each sector.

Sector	Options
Energy	- Encourage public energy awareness to reduce use of high power consuming appliances. - Ban low efficiency appliances - Improve operating efficiency of vehicles and appliances - Decrease dependency on fossil fuels / increase use of renewable energy alternatives - Impose strict operating conditions on public electricity utilities - Further documentation of GHG emissions to enable better projection and mitigation analysis. - Promote use of fuel wood
land, sea and air transport	- Improve efficiency of vehicles, ships and planes - Reduce demand for transport - Land transport - Promote use of public transport - Promote bicycle use and walking
Forest conversion	- Promotion of agro-forestry regimes that enable maintenance of standing biomass

Source: Initial National Communication

4 : Adaptation and Vulnerability

1) Summery of National Adaptation Programme of Action (NAPA)

Impacts and vulnerabilities to climate change in Vanuatu are summarized in "National Adaptation Programme of Action (NAPA)" NAPA was published in December 2007 by National Advisory Committee on Climate Change (NACCC). According to NAPA, there are three priority project shown in below.

Table 4. Priority project for Adaptation

#	Outcome	Output
1	Implemented pilot activities to increase the adaptive capacity of coastal communities in the participating countries	- Pilot projects implemented on identified sites on particular islands. - Communities embark on sustainable livelihood activities.
2	Mainstreaming of adaptation into policies and programmes	- Coastal management activities integrated across sectors, programmes and at various levels of society in the programme sites.
3	Building capacity to increase the ability to plan for and respond to climate and coastal change.	- Coastal management activities integrated across sectors, programmesand at various levels of society in the programme sites.

Source: National Adaptation Programme for Action (NAPA)

References

1. Ministry of Foreign Affairs of Japan (Republic of Vanuatu) http://www.mofa.go.jp/mofaj/area/vanuatu/index.html
2. Vanuatu National Communication to the Conference of the Parties to the UNFCCC http://unfccc.int/resource/docs/natc/tuvnc1.pdf
3. National Adaptation Programme for Action (NAPA) http://unfccc.int/resource/docs/napa/vut01.pdf

添付資料 1-1

気候変動とジェンダーに関する考察

気候変動とジェンダーに関する考察

0. 各機関における気候変動とジェンダー（一覧）

機関	共通の認識	独自の取り組みや論点
UNFCCC	ベースは： ✧ ミレニアム開発目標(MDG) ✧ Human Development Report ✧ リオ会議及びリオ＋20 ● 女性は気候変動において男性よりも脆弱な立場にあり、被害者になりやすい。 ● しかし被害者であるばかりでなく、環境や生態系に対する知識が豊富であることから、効果的な対応策を有し、変化の担い手となりうる。 ● 男女に対して異なる気候変動の影響やそれぞれのニーズに対応した、ジェンダー配慮型の政策が必要。 ● 意思決定の場におけるジェンダー・バランスの向上が必要。 ● 持続可能な開発というゴールには女性の参加が必須。 など	● COP/CMP関連機関におけるジェンダー・バランスの促進と、進捗に関するレビューと報告メカニズム ● ジェンダー配慮型気候政策の必要性 ● ジェンダー関連ワークショップやトレーニングの組織 ● ジェンダー問題にも対応するCDMプロジェクトの奨励とe-learningの促進 ● 世界の活動例の紹介など
世銀		● ジェンダー指標を融資決定に必要な分析に利用（世銀のみならず、気候変動関連基金は概ね同様の分析を導入） ● 課題としては、女性組織に対する資金割当と政府機関に対するキャパシティー・ビルディングの必要性、及び融資決定のステークホルダー協議におけるジェンダー・バランスの向上など
UNDP		● 気候変動対処という限定的な目的よりは、広く持続可能な開発の観点からジェンダー配慮及びジェンダー公平性を追求したプロジェクトを多く展開
OECD		● 指標開発や統計・分析、レポート作成、政策対話促進などで貢献
JICA		● ジェンダーの視点に立ったODAの取り組みという観点から、各種プロジェクトを実施。ジェンダー配慮型の気候変動プロジェクトも数件有する。

1. UNFCCCの枠組内における気候変動とジェンダー

経緯

リオ地球サミットから20年、リオで誕生した3つの会議（CBD, UNCCD, UNFCCC）において、生物多様性の損失、砂漠化、地球温暖化とジェンダーの深い関わりと重要性が徐々に注目されるようになり、これら3会議の目的達成にジェンダー問題を考慮していく必要があることが強調されるようになってきた。

リオの3会議の中でも唯一、条約原文にジェンダーへの言及の無かったUNFCCCでも、ジェンダーへの言及が徐々に増え、2011年のダーバン会議(COP 17)ではジェンダーに関する言及が16件、重要文書に盛り込まれるに至っている。また多くの締約国がジェンダー配慮型の政策やプログラムの必要性に気づき始めている。

ダーバン及び前年のカンクン合意(COP 16)では、以下のように解決策にジェンダー・ベースなものが含まれるようになってきていることが認められる。

- 適応では、適応計画ツールにジェンダー配慮が含まれるようになっており、他の適応関連作業においてもジェンダー配慮型のツールやアプローチが勧められるようになっている。
- 緩和と適応に対する国際技術協力を促進すべく新規に立ち上げられた技術メカニズムでは、各国政府がその執行委員会においてジェンダー・バランスを達成することを目指している。
- 資金についても、気候ファイナンスの提供をコーディネートする新規の運営委員会のメンバーに関して同様のことが言える。キャパシティー・ビルディング活動の中でも、ジェンダー問題は徐々に認識されるようになってきている。

(CBD, UNCCD, UNFCCC, 2012)

ダーバン及びカンクンでの決定を通して、UNFCCCは以下のとおりジェンダー関連の問題を引き続き支援していくことを明らかにした。

- 脆弱なコミュニティに関するジェンダー関連問題についての報告書を作成することで、LDC諸国を支援
- ジェンダー関連のトレーニング・ワークショップの開発と提供
- ジェンダー関連問題をステークホルダー間の協力にも反映
- ジェンダーとCDMの重要な点について扱ったe-learningコースの実施

(CBD, UNCCD, UNFCCC, 2012)

COP18における決定採択

このようなCOP16、COP17における重要なジェンダー公平性に関する規定にもとづき、またさらに10年前のCOP7における女性参加に関する決定が再認識され、2012年12月、ドーハで行われたCOP18では、UNFCCC交渉及びCOPとCMP関連機関におけるジェンダー・バランスを促進し、締約国代表女性の参加を高める決定が採択された。(Decision 23/CP.18) この報告の中で、女性の参加を高め、女性と男性のニーズを平等に扱う、より効果的な気候変動政策のための情報とすべく、条約及び京都議定書関連機関においてジェンダー・バランスを取るようにする目標を推進するための選択肢及び方法について事務局に意見提出をすることが、締約国及びオブザーバー機関に求められた。

上記決定23/CP.18では、他の国際協定を補完する形で、以下のことが求められている。

- 女性の参加向上と、男性と女性のニーズに等しく対処するより効果的な気候変動政策を確実にすべく、条約及び京都議定書により設立された諸機関においてジェンダー・バランスを取ること
- ジェンダー・バランスの目標に向けた進展を追跡するためのレビュー及び報告メカニズム
- COP各セッションのアジェンダにおいて、ジェンダー公平性と気候変動の問題を定例項目として位置づけること
- UNFCCCプロセスにおける女性参加向上促進のため、UNFCCCプロセスにおけるジェンダー・バランス、ジェンダー配慮型気候政策、キャパシティー・ビルディング活動に関してCOP19会期中にワークショップを組織すること
- 締約国及びオブザーバー機関が、女性の参加向上と男性と女性のニーズに等しく対処する、より効果的な気候変動政策を確実にするためのオプション及び方法に関する意見を提出すること

UNFCCC事務局は同時に、気候変動対処における女性の重要なリーダーシップと参加を実証する活動を紹介するためのMomentum for Change: Women for Resultsを立ち上げた。これらの活動は定量的な結果を出しており、現地・国・国際レベルに模倣と展開が可能なものとなっている。

Momentum for Change: Women for Results (2013) 活動例

活動名	内容及び成果
1 Million WomenによるSAVEプログラム	オーストラリアの100万人の女性が、日々の生活の中で小さなことから、省エネ、ゴミの減容、汚染削減などを進めて行こうという運動。 ● キャンペーン参加女性数：約83,000人 ● 10万トンCO_2の削減にコミット ● 豪州最大の女性環境団体 ● 今後3年間で世界展開を目指す
バングラデシュにおける気候変動適応及び災害リスク削減	ActionAid Bangladeshによる気候変動適応を目的とした地域女性のエンパワーメント活動。地域女性が自ら気候リスクに対する脆弱性を評価し、行動計画を立て、それを実行することで、彼女達が自らのニーズを訴え、気候変動に対する耐性を高められるようになる。 ● 110件の世帯に高効率かまどの導入で40%のCO_2削減 ● 淡水維持のため10基のダムを建設 ● 多目的果樹を街路樹とし、世帯への追加収入に
FTFAによる南アフリカの女性エンパワーメント活動	Food & Trees for Africa (FTFA)によるTrees for All, Trees for Homes, EduPlant, Food Gardens for Africa, Bamboo for All and FEEDの6プログラムを通じた気候変動に対する女性のリーダーシップ育成活動。炭素隔離目的の植樹、気候変動に対する人々の意識向上の他、食料安全保障の強化、貧困撲滅、女性のスキル向上、衛生的で持続可能な環境の創成にも貢献。 ● 420万本の植樹で、150万トン以上のCO_2を隔離 ● 100件のパーマカルチャー食料収集プロジェクト ● メキシコでもFTFAのブックレット使用
ガーナの竹製自転車イニシアティブ	上質の竹性自転車製造を通して、特に若い女性の雇用を創出することにより、気候変動、貧困、地方の過疎化、若年者の失業に対処するプロジェクト。GEF Small Grants Programmeの支援を得て、UNDPが実施する。 ● 30件の雇用創出（自転車組み立て20件、農業10件）

	● 自転車製造用に切られなかった竹によるCO_2隔離 ● 竹の育成により土壌劣化を防ぎ、水質・大気質の向上に役立つ ● 他2カ所のコミュニティに波及、25件の雇用創出
BOMAプロジェクト	ケニアの脆弱な女性を対象に、村内で小規模事業を開始させることによって、気候変動への対応力を高める。REAPプログラムでは、女性が収入を得られるようにすることによって、干ばつの脅威に晒される地に縛られることのないようにして、気候変動への耐性を高めることを目指している。 ● 32,000人の女性と子どもが極度の貧困から脱出 ● 世帯の月間支出が向上：食料で71%、学費で921%、医療費で97%、蚊帳などの家庭容認で189% ● REAPビジネスの99%が、１年後も操業中。女性の収入と貯金を可能にしている。
グアテマラの女性農業従事者：アグロフォレストリー実施	グアテマラの女性農業従事者がAIRES (Alianza Internacional de Reforestacion)とパートナーシップを組み、炭素隔離目的の植樹と農業技術の向上をはかる。 ● グアテマラで400万本植樹、イツァパで15万本植樹 ● 800基の煙突つき高効率かまどを導入、健康被害と木材の燃料利用の削減 ● 国内の130の共同体及び学校に波及

注：これらのプロジェクトは、世界中からの数十件の応募の中からMomentum for Change Advisory Panelによって選出された。

上記23/CP.18を受けて2013年8月にUNFCCC事務局がまとめたUNFCCC関連機関の女性比率は、最低でCompliance Committee, Facilitative BranchとTechnology Executive Committeeの11%から、最高では非附属書I締約国国別通報に関する専門家諮問グループの52%となっている。条約、議定書のBureauxでは概ね3分の1程度、COP、CMP、ADP、SBI/SBSTAの締約国代表における女性比率も概ね3分の1程度となっている。

また、「女性の参加向上と男性と女性のニーズに等しく対処するより効果的な気候変動政策を確実にするためのオプション及び方法に関する意見提出」の内容については、UNFCCCにおけるジェンダー・バランスとジェンダー公平性の強化のための8つのニーズが以下のとおり明らかにされた。

【UNFCCCプロセスにおけるジェンダー・バランスについて】(GGCA及びWEDO事務局まとめ)

1. *女性交渉担当者のための組織的トレーニングとキャパシティー・ビルディング*

   女性の能力強化、女性の能力支援を目的とした交渉関連人的資源のデータベース作成、ジェンダー及び気候変動など様々な問題を取り扱うUNFCCC派遣代表者のための国別トレーニングコースの設置のため、資金源を確保することが提案されている。

2. *参加及びトレーニングのニーズを支えるための資金割当*

   ほぼ全ての意見提出で、派遣代表団に置けるジェンダー・バランスの向上と、ジェンダー公平性及び気候変動政策・実施に関して必要とされるトレーニングとキャパシティー・ビルディングの実施において、資金源が主なバリアであるとされている。

3. *ジェンダー・バランス確保のための割当枠とインセンティブの設置*

   COP18のジェンダー関連決定実施のためとして、COP19で特定の目標を採択することを提案する締約国意見提出が2件あったが、締約国、オブザーバーともに、国別派遣代表団における女性の最低必要数を確保すべくCEDAWの暫定特別措置を参考にすることを提案している。

   【ジェンダー配慮型政策とその実施に関するキャパシティー・ビルディングについて】

4. *(1) ジェンダー配慮型のアプローチの開発・実施方法と（2）そのようなアプローチが貢献しうる便益ついて、全ての気候関連意思決定者のためのトレーニングとキャパシティー・ビルディングを組織すること*

   ジェンダー・バランスの強化と、気候政策及び実施におけるジェンダー公平性に向けた作業の中で、トレーニングとキャパシティー・ビルディングが主要なニーズの一つであることが、全締約国及びオブザーバーにより認められた。意

見提出では、UNFCCC代表団、事務局スタッフ、国内の市民社会代表者、まだジェンダー問題と気候変動の関連に注目していない関連の国内実施機関に対し、キャパシティー・ビルディングとトレーニングが必要であるということに焦点が当てられた。

5. *全てのレベルのステークホルダーのための気候ソリューションに対するジェンダー配慮型アプローチに対する意識向上を支援すること*

ジェンダー配慮型の気候政策とUNFCCC機関におけるジェンダー・バランスの向上に向けた進展のために貢献できるよう、市民社会がもっと情報を得ることの重要性が複数の締約国により強調された。

6. *気候関連及びジェンダー関連の国内機関同士のコラボレーションを促進すること*

ジェンダー問題及び気候問題について働く国内機関同士、そしてUNFCCCの国別代表団と関連の国内機関との間でコーディネーションとコラボレーションの強化が必要であることを強調。このような結びつきは、気候変動分野におけるジェンダー・バランスとジェンダー考慮についての国内・国際的コミットメントを実施する既存の国内機関の重要な役割を強調するものである。

【ジェンダー配慮型気候政策について】

7. *NWPなど、既存の研究プログラムをベースに、ジェンダー問題と特に関わりのある気候的脆弱性と、ジェンダー配慮型の気候政策の影響に関する研究に貢献すること*

(1)女性の脆弱性と気候変動の影響についてジェンダーに特化した統計的分析と、(2)気候政策及び実践に対するジェンダー配慮型のアプローチのメリットについての実証という二つの分野における研究の必要性が、締約国及びオブザーバーにより認められた。

8. *ジェンダー配慮型実施に対する指針と、進展の測定及び追跡のためのツール及び方法論を開発すること*

女性の組織的な組み入れとジェンダー配慮型の気候政策を実施・モニタリングし、それに向けたプロセスを見直すためのツールと方法論の早急な開発が、締約国及びオブザーバーにより認められた。

上記8つの主要ポイントは、GGCA及びWEDO事務局が多くの意見提出からの分析・提案・活動項目をまとめたものであるが、これらのポイントについて、COP19のジェンダー・ワークショップでさらなる話し合いが行われた。

2013年6月のSB38では、 UN Women, MRFCJ, GGCA, UNFCCC 事務局が、UNFCCCプロセスにおけるジェンダー・バランスの促進と女性のエンパワーメントに関するサイド・イベントを実施した。

COP19における進展

2013年ワルシャワのCOP19では、事務局による性別構成のレポート（上記）とジェンダー・バランスに関する締約国からの意見提出がSBIでの検討に供され、以下の議長決定案が出された。

SBI議長決定案（FCCC/SBI/2013/L.16）抜粋

8. SBIは、その他の国連機関及び他国間、政府間、その他の国際・地域機関に対し、UNFCCCプロセスにおける女性代表団の参加に対し資金提供を行ってそれをさらに奨励する革新的な方法を通じて決定23/CP.18を実施し、ジェンダー及び気候の適応・緩和・融資・技術・キャパシティー・ビルディングの各分野に関して現在行われているいかなる作業においてもジェンダーに対する配慮を強化することにおいて、条約締約国の努力を補完していくよう呼びかけた。

9. SBIは、UNFCCCプロセスにおける参加のための信託基金(Trust Fund for Participation in the UNFCCC Process)から資金提供に対し適格とされる締約国に対し、国別派遣団内のジェンダー・バランスを促進するために、そのような基金に対して両性の派遣代表者を指名するよう奨励した。

10. SBIは、締約国に対し、女性参加の段階的だが大幅な向上を目的とした決定23/CP.18を実施する努力を高めていくよう促した。

11. SBIは、国連機関及び多国間、政府間、その他の国際・地域機関に対し、国際的、地域的、そして国内レベルでは国家主導型のアプローチで、ジェンダー配慮型でニーズ対応型の気候政策実施のための、追加的なツール、知識、研究、戦略をさらに開発していくことを奨励した。

12. SBIはまた、UNFCCC事務局、その他の国連機関、及び多国間、政府間、その他の国際・地域機関に対し、キャパシティー・ビルディング活動を行う際は、ジェンダー・バランスを考慮し、UNFCCCプロセスに参加する女性代表者の参加を奨励するよう奨励した。

また、COP18で決められたとおり（決定23/CP.18パラ10）で決められたとおり、COP19会期中にUNFCCCプロセス、ジェンダー配慮型気候変動政策、UNFCCCプロセスにおける女性参加向上を促進するためのキャパシティー・ビルディング活動のテーマで、ワークショップが行われた。

UNFCCCの定義する気候変動の諸問題とジェンダーの関係

UNFCCCは、そのウェブサイト上で、ジェンダーと気候変動の諸問題との関係について、以下のように説明している。

ジェンダーと適応

中・長期の適応においてジェンダーを考慮することで、適応を効果的で現実に実施可能なものにすることができる。適応活動の実施が不平等やその脆弱生を助長することがないように担保することができ、これらの行動の意思決定や実施フェーズにおいて男女の平等な参加を確実にすることができる。女性は適応プロセス　の様々な段階において変化の担い手となることができる。

ジェンダーと資金援助

特にローカル・レベルでの、資金結集戦略の開発、気候資金調達手段の適用、資金の展開における公平な参加を確保する際に、ジェンダーの視点を取り入れる必要がある。

ジェンダーと緩和

気候変動緩和行動は、現地のジェンダー問題に対してもポジティブな影響をもたらす可能性がある。家庭の照明や調理用のクリーン・エネルギーなどの緩和プロジェクト・プログラムの一般的な特性や、収入がどこに流れるのかを考えたりすることで、プロジェクト計画段階で早期にジェンダー公平性に対する影響を考えることによりそうなる。CDM and JIのプロジェクトは、女性の生活に対しポジティブな影響を与えて来た。生活や健康の向上、他のことをする時間ができるなど。

ジェンダーと技術支援

環境配慮型技術の開発と移転は、技術へのアクセス及び情報、そして適切な技術の使用訓練について、ジェンダー配慮の組み込みを強める機会となる。

ジェンダーとキャパシティー・ビルディング支援

制度的・組織的な人的資源のキャパシティー・ビルディングを作り出し、開発し、強化するためのジェンダー配慮型アプローチは、緩和・適応行動実施手段及びツールに関する意思決定・提供・アクセスにおけるジェンダー・バランスを向上させることができる。

ジェンダーとCDM

UNDPでは、気候問題が環境と開発の問題の一分野として捉えられていることから、気候変動におけるジェンダー問題への注目はUNFCCCのそれに先んじており、これまでも既に直接・間接的にジェンダーに配慮した気候変動対策プロジェクトを多く行ってきた。気候変動とジェンダーの問題は、環境・開発問題と切り離して考えることが難しい側面があるため、UNFCCC独自の取り組みというよりは、他機関主催、あるいは他機関と協働の取り組みが多くみられるが、UNFCCC独自のもとしてはクリーン開発メカニズム（CDM）プロジェクトが挙げられる。

CDMの方法論は、当初はそれを目的として作られた方法論では無かったにせよ、女性のエンパワーメントに貢献しうるものがある。CDMは、生活及び健康の向上と、他の活動をするための時間をもたらすことにより、女性と子どもの生活にポジティブの影響を与える可能性があることが徐々に証明されてきた。

実際問題として、途上国の農村部で貧困生活を送っている人口の大半は女性と子どもであり、そのような場所では生活の基盤として農業に依存している場合が多い。そして、途上国における農業労働人口の43%が女性であり、干ばつや洪水の度合いの悪化等、気候変動はこのように土地に依存して生活している女性達に深刻な影響を与える。そのため、農業系のCDMプロジェクトやコミュニティ開発系のCDMプロジェクトは、二酸化

炭素排出量削減に貢献するばかりでなく、女性のエンパワーメントにも寄与するというコベネフィットを持つのである。

持続可能な開発はCDMにおいて第一義的な目的ではないが、それによりジェンダー公平性と女性のエンパワーメントや生活向上のための強力なツールとなっているのは確かである。ジェンダー公平性と持続可能な開発の結びつきは、CDMプロジェクト・サイクルにおける女性への重点と彼女達の活発な参加に、強力な正当性を与えていると言えよう。

CDM方法論のガイドブックであるCDM Methodology Bookletでは、以下の条件を満たし、ジェンダー問題にポジティブな影響を与えるとされる方法論には、「女性と子ども」というアイコンがつけられている。

- コミュニティベースの参加型アプローチを使用しており、女性や子どもにプロジェクトについて学んだり、意思決定プロセスに貢献する機会が与えられるもの
- 女性や子どもの生活環境の向上につながるもの（大気浄化、暖房・照明の向上）
- 女性や子どもが通常行う作業の最適化（薪拾い、調理、水質浄化）につながるもの
- 手頃な生活用品へのアクセス向上につながるもの（冷蔵庫）

また、植林・再植林CDMでは、多くは女性が担い手となることから、現地の新規雇用を生むことが条件となっているものがあり、これらのプロジェクトもジェンダー問題に配慮したものとなっている。

上記の「女性と子ども」方法論は、以下のとおり、①世帯レベルでの生活向上に貢献するものと、②より広範な生活向上に貢献するものの2種類に大別される：

①世帯レベルでの生活向上に貢献する方法論例

Fuel Efficient Cook Stoves (AMS I.E./II.G.)

調理用の薪や木炭・ケロシンといった燃料使用代替として、世帯に高効率かまどを導入するプロジェクト用の方法論である。この方法論を使用したプロジェクトによって女性や子どもが得られる便益としては、以下のようなものが挙げられている。

- 薪拾いの時間が減って、教育や収入機会が増える
- 森林保全
- 室内の空気清浄化
- 呼吸器系トラブルの減少
- 現金の節約

②より広範な生活向上に貢献するもの

Rural Electrification (AMS-III.AW/AMS-I.L. AMS-I.A., AMS-III.BB)

無電化コミュニティに対し、照明などの家電利用のため、ソーラーパワーやマイクロ水力などによるクリーン電力を提供するプロジェクト用の方法論である。この方法論を使用したプロジェクトによって女性や子どもが得られる便益としては、以下のようなものが挙げられている。

- 電気が定期的に利用できるようになると、教育や収入機会が増える
- 燃料費の低減により、節約可能になり、他の機器についても省エネ型のものにアップグレードできる

UNFCCC事務局とCDM理事会では、CDMプロセスへのジェンダー問題取り込みを強化するため、下記の一連の行動を計画している。

- CDMの地理的な拡大を向上させ、女性と子どもを含む社会的弱者の参加を増やす
- CDMローンスキームの運用を確実にする
- 最低開発国と小島嶼国におけるプロジェクト開発を支援する
- 社会的弱者の生活に利するトップダウン型基準及び標準化排出ベースラインを開発する
- ジェンダーとCDMの重要な点について学ぶe-learningコースの実施

上述のとおり、CDMによる女性のエンパワーメントは、CDMはあくまでもGHG削減がその第一義的目的であることから、「プロジェクト実施の結果」としてもたらされるも

のでしかない。つまり、「受益者の多くが女性である」というプロジェクトの実施によってしか、CDMプロジェクトが女性参加の向上や女性のエンパワーメントに貢献しえないという弱点がある。そもそも、CDMではベースラインを設定する必要性があるため、「ジェンダー配慮型の政策が不在の場合」という状況を定量的に表現することが難しいことから、ジェンダー配慮型政策の効果を削減量にカウントすることが認められにくいというのもその一因であろう。UNDPその他のプロジェクトのようにジェンダー配慮を積極的にプロジェクトやプログラムに取り込んでいくには、ジェンダー配慮型政策の効果について何らかの標準的ベースラインのようなものを導入して便宜的な定量化を試みるか、あるいは一部のREDD方法論のように適用条件のところで女性の活用やジェンダー配慮型政策の導入を条件として縛りをかけるなどの方法が考えられよう。プロジェクトの形で政策を通じ女性のエンパワーメントを促進するためには、持続可能な開発に関わる政策を重視し、削減量を副次的効果として捉えることが可能なNAMAなどの制度の方が、有益なツールになると考えられる。

2. 気候変動関連基金等におけるジェンダー配慮

気候変動関連の問題を取り扱う各種基金では、COP18決定に先んじて、規定にジェンダー配慮を盛り込む動きが見られている。Carbon Investment Funds (CIF) と Forest Investment Program (FIP) はいずれも、ジェンダー配慮ガイダンスを作成しており、地球環境ファシリティーは2011年にジェンダー配慮を取り入れたセーフガード枠組の草案を作成している。また、United States Agency for International Development (USAID)も、ファンディング・バリューチェーンにおける全ての要素にむすびついたジェンダー規制であるAutomated Directives Systemを設けており、Inter-American Development Bank (IADB)も2010年にジェンダー・ポリシーを改訂した。Green Climate Fund (GCF)がCOP 17で検討と承認のために提出した管理文書草案には、指針、運営方法、ステークホルダーへの情報提供、参加などにおいてジェンダー関連の言及が記され、理事会や事務局におけるジェンダー・バランスについても求められている。全体的に、今後のGCFにおいて、ジェンダー公平性がREDD+へのファイナンスなど、あらゆる局面で対応されるべき部門横断的原則とすることが意図されたものとなっている。2014年2月に行われたGreen Climate Fund理事会でなされた決定では、同基金がジェンダー考慮において主導的立場を取り、2014年10月にジェンダー行動計画を定めることを決定した。

3. 世銀における「気候変動とジェンダー」

上記気候変動関連基金の他に、世銀もジェンダー分析を開発政策融資（DPL）やプロジェクト融資(IL)を決めるにあたって必要な社会分析の重要な要素であると考えており、気候変動対応関連プロジェクトに対してジェンダー配慮型のアプローチを取り始めている。世銀がジェンダー分析を気候変動という文脈の中で重要と考える理由は以下の三つである。

① 権利や社会経済面で男性と同等でない場合、自然災害や変動影響に対し、女性が著しく脆弱となるから

② 気候への耐性を構築する上で、女性のエンパワーメントは重要な要素であるから

③ 低炭素型開発への道は、ジェンダー配慮型アプローチでもって設計された方が、より効果的で公平なものになるから

IDA16（第16次増資）では、気候変動とジェンダーの双方が優先的な重点分野となっており、2010年度は、国別援助/パートナーシップ戦略(CAS/CPS)の88%が気候変動対策関連であり、世銀のポリシーとして、CAS/CPSにはジェンダー分析が取り入れられることになっている。

ジェンダー配慮は、気候変動系融資と気候配慮型ODAの双方で必要とされており、世銀では地域開発銀行と共同でClimate Investment Funds (CIFs)や、IBRD/IDAなどのODAに融資を行っている。

プログラムの設計・実行・結果の評価などにもジェンダー配慮型のアプローチが取られるようになってきているが、現在の気候関連融資が女性のニーズ、能力、希望にどれだけ沿えるようになるかについて、以下のような課題が残ると考えられている。

1) 草の根レベルの女性組織、NGO、ネットワークに対し、女性が自分自身の気候関連行動を考え、実施するためのキャパシティー・ビルディングに割り当てた資金が必要。国レベル、コミュニティレベルで、ジェンダー問題を対象としたプログラムへの資金割当が適切な場合もあろう。

2) NAPAやNAMAの対策の中で、気候変動におけるジェンダー側面によりよく配慮できるよう、中央・地方政府機関及び省庁内の国内制度的能力育成が必要。性別データが無いことにより、モニタリングや結果の分析が制約されることが多い。

3) 気候変動融資に関するステークホルダー協議への参加において、ジェンダー・バランスを促進することが必須。それにより、融資手段を気候変動において男女で異なる経験や異なる対応能力に合わせたものにすることができる。

4. UNDPによる「気候変動とジェンダー」

国連機関の中では、UNDPが、早い時期から環境とエネルギー及び持続可能な開発の中でフォーカス・エリアとしてジェンダー問題を取り上げてきており、2011年発表のUNDPアジア太平洋Human Development Reportでも、女性の環境問題への参加の重要性とMillennium Development Goalsの達成には女性の参加が欠かせないものであることをうたっている。

女性に対する気候変動の影響

UNDPでは、気候変動の影響を受ける度合いを決めるものの一つとして、貧しさや資源の入手可能性とならんで「ジェンダー」を挙げており、女性が経済的・政治的・法的に弱いことから、気候変動の影響を受け易いとしている。そのため、　緩和・適応でジェンダー問題を考慮する必要性を指摘しており、そうすることで女性や子どもを守り、気候変動への対処をより効率的にできる可能性があるとしている。

途上国の女性は、生活のために現地の自然資源への依存度が高いことから、気候変動とその悪影響により、日々の飲料水・食料・熱源の獲得が困難になるなど、気候変動に対し特に脆弱であると言える。また、資源や意思決定プロセスへの参加が限られており、移動の自由も少ない。したがって、このような女性特有の危機に対応できるようなジェンダー配慮型の戦略を考えることが重要であるとしている。

女性と男性の気候変動リスクに対する曝露と脆弱性に差のある理由として、UNDPは以下を挙げている：

１）性別による時間の使い方の違い、資産へのアクセス、市場や制度の扱いで、女性の機会が制約されている。貧困、社会的・経済的・政治的バリアの累積的効果により、女性が気候変動の悪影響の対処において不利になることが多い。

２）男性と比べ、女性があらゆる段階の政策・意思決定プロセスに参加することが非常に難しい。女性に影響のある政策・プログラム・決定に影響力を及ぼすことが難しい。

３）社会・文化的規範により、女性が危機を避けるのに必要な情報やスキルを得ることが難しい。服装や子どもの世話などの理由により、避難時に制約が出る。

４）防災、環境保護、衛生などあらゆる分野において性別によるデータが無いために、女性の貢献や役割が見えにくく、結果的に性別による違い（男女それぞれのニーズや優先事項など）を無視した気候変動政策やプログラムが策定されることになってしまい、かえってジェンダー問題に起因した制約を強めてしまう結果となる。

気候問題における女性ならではの役割

UNDPでは、変化する環境に適応してきた彼女達の生活の知恵・知識が緩和、災害防止、適応戦略に役立つ可能性を指摘し、女性が気候変動の被害者であるばかりではなく、変化の効果的な担い手になるとしている。

自然災害時において、早期警告や再建において女性が主導的役割を担った方が、コミュニティが災害を上手く乗り切れるという例が多く見られる。女性は、コミュニティの福祉に関して情報交換を行ったり、汚染の少ないエネルギー源を選ぼうとし、また、家族の生存がかかった場合の環境変化への適応に優れている。女性の参加が増えることで、気候変動プロジェクト・政策の効果や持続可能性が高まる可能性が強い。女性は、災害・災害リスク管理及び低減においてコミュニティを効果的に動員することが可能で、どのような戦略が必要かについてよく理解している。

UNDPの示す行動案

上述の分析にもとづき、2013年発行のOverview of linkages between gender and climate change (UNDP)では、以下の提案がなされている。

１）　気候変動の影響を受けるセクターでの男女の役割と、彼らの気候変動対応策について、詳細なエビデンス・ベースの分析を行う。

２）　男女それぞれのニーズと優先事項に効果的に対処するために、全ての気候変動プログラムにおいてジェンダーの視点を盛り込み、女性の完全かつ有意義な参加を確実にし、ジェンダー的に公平な結果を達成する。

３）　緩和・適応努力が、ジェンダーをベースとした脆弱性、男女不平等、貧困にも対処するものとなるようにする

４）　国別・国際的気候変動資金メカニズム・戦略に、ジェンダーの視点を盛り込む

UNDPプロジェクト例：　UN-REDD

上記のとおり、UNDPでは早くから環境と開発に関わるジェンダー配慮型のプロジェクトで気候変動問題とも関わりのあるものを手がけてきているが、特に森林は気候変動問題と（セーフガードなどの側面から）ジェンダー問題を結びつけやすい分野として注目されている。REDD+がUNFCCCに最初に導入された2005年当初はジェンダーへの言及は無かったが、その後REDD+にジェンダー問題を盛り込もうというNGOらの運動が功を奏し、早くもCOP13のバリ会議ではREDDにジェンダー問題を取り込む正式な協議が行われ、その後数々の成功例が各地で見られるようになった。現在では、環境持続可能性や能力開発など、プログラムが指針とすべき5つのUNDG原則の一つとしてジェンダー公平性が含まれている。UNDPもFAO、UNEPとの協同的取り組みとしてUN-REDDを行っており、現在、アフリカ、アジア太平洋、ラテンアメリカの56パートナー国との間で展開している。その支援の内容には、(i)UN-REDD国内プログラムの設計・実施における直接支援と、(ii)一般的アプローチ、分析、方法論、ツール、データ、ベストプラクティスを通じた国内REDD+活動に対する補完的支援がある。UN REDDプログラムでは、当該政府が自国で有意義なREDD+を実施するためにはセーフガードとして政府のガバナンスが重要との観点から、政府のガバナンスについてもサポートを行っている。UNDPはこれらのプロジェクトを通して、貧困低減、民主的統治、危機防止、復興、環境及び持続可能な開発といった諸問題にジェンダー公平性と女性のエンパワーメントを組み入れて行く国際的・国内的取り組みのコーディネーションを行うことを目指している。

UN-REDDは、森林に対して男女で異なるニーズ・使用・知識を政策やプログラムに取り入れて行くことが長期的なREDD+の成功には必要であるという観点に立つものである。REDD+の政策・計画・実施にジェンダー配慮を取り入れることは人権の観点からも正当性を有するが、ビジネスの観点からも、取引コストの削減などの効率向上、温室効果ガス排出削減などの有効性向上、緩和メリットの永続性などの持続可能性向上といったメリットがある。

REDD+の成功には、（１）ステークホルダーの関与、参加、意志決定、（２）所有権及び土地資源の保有権、（３）森林生態系から得られるメリットの強化、（４）REDD+ファンドの透明性があり公平で計測可能な管理、（５）包括的成長と環境配慮型開発の早期の関係性作りが重要であるとされている。このそれぞれにジェンダー配慮が必要である理由として、以下が挙げられている。

① ステークホルダーの関与、参加、意思決定

REDD+政策の結果として森林資源の利用に変化が表れるのには時間がかかり、様々な森林資源を使う、あるいは使わないことの機会費用やニーズ・知識の変化も時とともに変化するため、両性を効果的にREDD+に参加させることで、こうした継続的な変化にも対応できる可能性が高くなる。女性を意思決定にフルに参加させるためには、追加的なトレーニングが必要である。

② 所有権及び土地資源の保有権

自らが関わる土地に自分の所有権が無ければ、その場所にREDD+がもたらす各種便益に関心が薄くなる。政府は、投資家及び現地コミュニティのインセンティブと合致するような明確な保有権システムを用意する必要があり、女性に対しても同様の権利を認めることで、そのようなインセンティブとの一致に対する信頼度が高まる。

③ 森林生態系から得られるメリットの強化

森林製品に対する知識には男女で違いがあり、女性の生活行動や森林知識が、種のモニタリング、土壌管理、森林回復機能など、コミュニティの森林活動に付加価値を与え、森林の持続可能な管理や森林カーボンストックの向上に好影響を与える。

④ REDD+ファンドの透明性があり公平で説明可能な管理

REDD+では、資源へのアクセス、知識、意思決定構造、便益の配分などについて男女で差が出て来ることがある。これらの差異は便益配分メカニズムの考案において配慮されるべきである。また、不正があった際の影響は男女で異なり、弱者である女性が不利となるケースが多い。

⑤ 包括的成長と環境配慮型開発の早期の関係性作り

森林管理などにおいて女性の雇用を高めることが、REDD+の持続性において重要。

5. OECDにおける「気候変動とジェンダー」

OECDでは、ジェンダー不平等について全体的視点で捉えており、ジェンダーと気候変動については、「女性の教育」、「女性の経済におけるエンパワーメント」など、Post-2015枠組でMDGを補完する7つの優先分野の一つである「環境的持続可能性に対する女性の貢献」の中で取り上げている。そして、女性の生活に根ざした資源との関わりから気候変動の影響を受け易いこと、また女性が効果的な対応策を持っていることから女性を変化の担い手として認識しており、ポスト2015年のエネルギー・環境持続可能性目標には、ジェンダーに関する具体的目標と男女それぞれに対して異なる環境劣化と気候変動の影響と効果的対応における女性の貢献を表す指標が取り入れられるべきとしている。また、女性が土地、農業技術、金融資本を手に入れにくいことが、彼女達の生活様式の多様化や気候変動への耐性を妨げているとし、社会的・経済的資源から女性を遠ざけている社会的規範に対処することが、ジェンダー配慮型気候変動措置を実施するカギであるとしている。

ジェンダーと気候変動に関するOECDの貢献としては、国際・国内議論の支援、政策対話やグッドプラクティスに関する意見交換の場の提供などがある。

6. JICAによる取り組み

女性の開発への参加を重視した「開発と女性(WID)」というアプローチに端を発した国際協力におけるジェンダーの取り組みは、最近では不平等の制度や仕組みを変革しようとする「ジェンダーと開発(GAD)」というアプローチが主流になってきている。2015年までに達成すべき国際開発目標である国連ミレニアム開発目標（MDG）の1つに「ジェンダー平等の推進と女性のエンパワーメント」が掲げられているが、教育や保健、貧困削減、環境といったMDGのほかの目標の達成に向けても、ジェンダー視点に立った取り組みが必要であることが認識されている。日本政府も、2005年、「ジェンダーと開発（GAD）イニシアティブ」を策定し、援助のあらゆる段階で、ジェンダーの視点に立った政府開発援助（ODA）を行うことを表明した。JICAはこの視点に沿う形で、**ジェンダー平等と女性のエンパワーメントを国の経済や社会発展にとって不可欠な課題として認識し、特定の地域社会において男女それぞれが担っている多様な役割や責任の違いから生じる異なる問題、ニーズを把握するというジェンダー視点を組み込んだ支援を様々な分野で実施している。**JICAでは、近年、女性や子どもの人身取引（トラフィッキング）、女性への暴力、HIV／エイズの女性に偏った被害など、女性や子どもの社会的な脆弱性により引き起こされている諸問題に関し、開発とジェンダーにかかわる新たな課題として、支援を実施する他、ジェンダーとのかかわりが見えにくい課題や地球規
模の課題、例えば気候変動、平和構築、災害復興、ガバナンス、インフラ整備などといった分野においてもジェンダー視点に立った国際協力を目指している。
ジェンダーに対するJICAの取り組みには大きく分けて三種あり、①ジェンダー平等を実現するための政策・制度・組織の強化を目指す「ジェンダー平等政策制度支援案件」、②女性のエンパワーメント推進を目指す「女性を主な裨益対象とする案件」、③開発援助事業におけるジェンダー主流化推進を目指す「ジェンダー活動統合案件」があるが、気候変動との関わりの中でジェンダーの問題を取り扱ったプロジェクトは、③にカテゴライズされている。

JICAの取り組みで気候変動とジェンダーを扱ったもの

分野	プロジェクト名	内容
ジェンダー活動統合案件	セネガルにおける安全な水とコミュニティ活動支援計画プロジェクト	セネガルの村落で安全な水が得られるように、30年以上にわたって地方給水の施設の整備を行ってきたほか、コミュニティの人々が給水施設を自らの手で、持続的に維持管理するための支援も実施。特に、給水施設の主たる利用者である女性の参加が、施設の運営維持管理の面でプラスの効果が期待されるのではないかと考え、地域の男女が置かれた状況を確認・分析する一方、実施の段階では女性が果たす役割の重要性を地域の有力者に説明するなど地道な活動を継続。 その結果、施設の維持管理を行う組織の役員の女性の割合が3割を超え、運営維持管理の収支状況に透明性が増して健全な運営が行われ、収支に関する関心・責任が高まり料金徴収も向上した。 日本の支援を通じて30万人以上の人たちが安全な水にアクセス、また多くの女性や子どもたちがこれまでの水汲み労働から解放され、村落住民はより衛生的な生活を送ることができるようになった。
	インドにおけるタルミナド州植林事業	国有林の30%が荒廃するインド南東部のタミルナド州で、持続可能な植林事業を展開し、①森林を再生するための植林、②森林依存者への収入源の多様化支援、③森林管理能力強化〔トレーニング、

		モニタリングと評価、地理情報システム（GIS）の拡大等〕等の活動を実施、森林の再生、地域住民の生活水準の向上、さらには地域の貧困削減を目指した。 また、森林資源の利用が多い女性の積極的な参加を促すために、森林管理組合に各世帯から男女各1名の参加を求めるなど、ジェンダー視点に立った取り組みも実施し、植林の実施に際した女性の雇用とマイクロファイナンスの導入で、生計向上活動支援を実施した。女性たちは森林ベースの小規模ビジネスで、約6割が他の収入源を獲得。森林資源への依存が減り、森林への負荷も減るなどの成果を挙げた。 これらの一連の活動により世帯所得が増加し、女性や女子が薪の収集労働から解放され、集会での発言の増加や女子の就学率が向上するなど好影響がもたらされた。
	JICA/UNDP連携による「気候変動とジェンダー」に関する研修実施	JICAの気候変動とジェンダーに対するアプローチだけでなくUNDPから防災とジェンダーの専門家を招き、実際のプロジェクトを用いた講義とグループワークを2010年12月に実施。連携により更に幅広い視点が参加者間に共有され、気候変動という新たな分野でのジェンダーの取り組みについて活発な議論が交わされた。

7. 総括

元来ジェンダーの問題は、環境とエネルギー及び持続可能な開発の中のコンテクストで語られることが多かったことから、環境問題の一部である気候変動についても、早い時期からUNDPが気候変動の影響度合いを決めるファクターとして「ジェンダー」を挙げていた。女性が気候変動の影響を受けやすい理由として挙げられているのが、女性の経済的・政治的・法的な弱さや、日常生活における天然資源への依存度の高さ、その割には資源や意思決定プロセスへのアクセスが限定的で移動の自由も制限されることなどであるが、これらの問題は環境・開発問題の全般にわたって言えることであり、特に気候変動問題に特有のものではない。したがって、気候変動とジェンダーの問題を考える場合、環境・開発と気候変動の密接な関わりを避けて通ることはできず、そのコンテクストの中でジェンダー問題を考えるという形にならざるをえないのである。

ジェンダー関係の政策としては、地域レベル、国家レベル、地方レベルと様々なレベルで意思決定におけるジェンダー平等をうたった政策が取り入れられているが、そのほとんどが気候変動という狭い枠ではなくもっと広い枠組（開発全体など）の中でとらえられているのが普通である。その成果はと言うと、男尊女卑の文化や女性のトレーニング不足、女性をめぐる様々な制約から、女性が十分に意思決定に参加できるレベルには達していない。UNFCCCも同様に、ジェンダー平等政策の一環として、意思決定における女性のエンパワーメントを達成すべく、関係機関・組織における女性代表数の向上をうたっているが、それを確実に実現するには、女性代表数に対するクリティカル・マスを設けたり、事務局がその進捗をモニタリングしてデータを公開したり、アファーマティブ・アクションを設けるなどの措置が必要になってくるだろう。しかし、気候変動にかかわらず、いかなる分野においても、ジェンダー平等や女性の意思決定参加向上という政策を真に実現するには、女性代表の頭数さえ揃えばよいというものではない。女性を取り巻く社会・文化的な慣習や人々の意識への働きかけ、能力開発の機会向上などを積極的に行っていって、ジェンダー平等は初めて実現するのである。

気候変動という枠組の中でジェンダー平等を考える場合、それをプロジェクト・レベルで実現しようとすると、森林を含む土地セクターや農業部門での適応・緩和が対象分野となる。（民生部門もやり方によっては対象となるだろう。）これらの分野は、エネルギー・産業部門と違って、気候変動など自然現象の影響を受けやすく、生活に直結しており、コンセンサスやインセンティブの構築といったコミュニティによる対応が不可欠な分野だからである。特に途上国では、生活資源の採取や水・食料調達において女性に頼る部分が多く、何か自然災害が起これば真っ先に被害を被るのは女性や子どもである。同時に、女性達は長年の経験と立場から、環境保護や資源の持続可能性に関心が高く、またそのためのノウハウも蓄積しており、女性ならではのネットワーク力による情報収集にも長けている。この特質を活かし、女性を適応・緩和における重要な「変化の担い手」と積極的に活用していくことは、気候変動分野における女性のエンパワーメントや地位向上の実現に貢献するのみならず、環境・開発分野全体、さらにその枠組を超えての全体的な女性の地位向上につながっていくのではないだろうか。「女性の代表数向上」など、トップダウン的政策の施行は社会・文化的制約に阻まれて行き詰まりがちになるのに対し、プロジェクト・レベルでの実施というボトムアップ的アプローチだと、土地・農業部門という本来女性の「土俵」である部門でのプロジェクトということもあって、女性の積極活用による効果も高く、女性の意思決定参加に対する制約が他の環境よりも少ないことは評価できると考える。

参考

Decision 23/CP.18

UNFCCC交渉及び条約ないし京都議定書に則り設立された諸機関の締約国代表におけるジェンダー・バランスの促進と女性の参加向上

締約国は、

条約ないし京都議定書のもとに設立された諸機関の締約国代表における女性参加向上に関する決定36/CP.7を*想起し*、

決定1/CP.13 (バリ行動計画)のガイダンスと第16回及び17回会合でなされた決定にもとづき、また条約のもとでの様々な機関やプログラムにおいて、国際気候変動政策におけるジェンダー・バランスと女性のエンパワーメントの進展に関し、条約及び京都議定書のもとでなされた近年の進歩について*認識し*、

決定36/CP.7を実施すべく締約国が行った努力にも関わらず、条約及び京都議定書のもとで設立された諸機関において女性代表者の数が引き続き少ないことに*留意し*、

ジェンダー配慮型の気候変動政策について情報提供すべく、国別代表団のメンバーシップや公式・非公式の交渉グループにおける議長役やファシリテーター役の実施を通してなど、UNFCCCプロセスの全ての面において女性の代表を立てる必要性を*認識し*、

国や現地という枠組の中で、ジェンダー配慮型の気候政策が男性と女性の異なるニーズに応えられるよう、UNFCCCの開発途上締約国と先進締約国からの女性代表数のバランスを取ることの重要性も*認識し*、

UNFCCCプロセスにおける女性参加が、意思決定プロセス及び権力へのアクセスなど、社会のあらゆる局面における女性のエンパワーメントと男性と等しい条件での完全な参加の重要性を認識した、「女子に対するあらゆる形態の差別の撤廃に関する条約」(Convention on the Elimination of All Forms of Discrimination against Women) や「北京宣言及び行動綱領」(Beijing Declaration and Platform for Action) など、国際的措置及び関連の多国間プロセスの原則と目標に、確実に合致するようにすることの重要性を*考慮し*、

国連持続可能な開発会議(United Nations Conference on Sustainable Development)の成果、とくに持続可能な開発の達成における女性のリーダーシップとその重要な役割に対する認識と、ジェンダー公平性の達成を目的とした指導的立場における女性数の大幅増加のため、必要に応じ特定の目標をもうけ、一時的措置を実施することの影響力への重点を*認識し*、

ジェンダー・バランス及び女性のエンパワーメントの促進において締約国が行った進展を*認め*、

1. 決定36/CP.7にて想定されたとおり、条約及び京都議定書に則り設立された諸機関における女性参加の向上のために全締約国が追加的な努力を行う必要があることに*同意する*。

2. 女性の参加を高め、女性と男性のニーズに平等に対処する、より効果的な気候変動政策について情報提供するために、条約及び京都議定書に則り設立された諸機関においてジェンダー・バランスを取るという目標を採択することにより、決定36/CP.7を強化することを*決定する*。

3. そのような機関の現議長及び将来の議長に対し、コンタクト・グループ、スピンオフ・グループ、パネルといった非公式交渉グループや諮問メカニズムを設置し、そのファシリテーターや議長を指名する際に、ジェンダー・バランスの目標を指針とするよう*呼びかける*。

4. *また*、条約及び京都議定書に則り設立されたその他の機関に対し、この目標の達成に向けて女性の参加を段階的に、しかし大幅に増加させることを目的として、ジェンダー・バランスの目標を指針とし、なされた進展について第２２回締約国会合でレビューするよう*呼びかける*。

5. *さらに*、各締約国に対し、この目標の達成に向けて女性の参加を段階的に、しかし大幅に増加させることを目的に、条約及び京都議定書に則り設立された諸機関に女性を指名するなどによってジェンダー・バランスの目標を達成することを固く決意し、なされた進展について第２２回締約国会合でレビューするよう*呼びかける*。

6. 各締約国に対し、条約及び京都議定書に則り設立された諸機関内部におけるポジションについて、より多くの女性を候補者とするよう奨励し、これらの機関に女性の代表者を指名するよう適切な配慮をするよう*呼びかける*

7. *また*、各締約国に対し、条約及び京都議定書にもとづく各セッションへの代表派遣においてジェンダー・バランスを取ることを努力するよう*呼びかける*。

8. 事務局に対し、地域グループの女性代表数に関する情報など、条約及び京都議定書のもとで設立された諸機関における性別構成についての情報を整備し、条約及び京都議定書の下での各セッション参加者の性別構成に関する情報を集め、ジェンダー配慮型の気候政策の推進という

ジェンダー・バランスの目標に向けた進展を追うことができるよう、年次ベースで検討に供すべく締約国会議にこの情報を報告することを*求める*。

9. 上記パラグラフ8に示される情報を検討できるよう、締約国会議セッションのアジェンダにおける定期項目として、ジェンダーと気候変動の問題を追加することを*決定する*。

10. 事務局に対し、第19回締約国会議会合に合わせて、UNFCCCプロセスにおけるジェンダー・バランス、ジェンダー配慮型の気候政策、UNFCCCプロセスにおける女性参加向上促進のためのキャパシティー・ビルディング活動に関する会期中ワークショップを組織するよう*求める*。

11. *また*、締約国及びオブザーバー機関に対し、2013年9月2日までに、上記パラグラフ2に示される目標推進のためのオプションと方法に関する意見を、事務局に提出するよう*求める*。

12. *さらに*、事務局に対し、第19回会合において締約国会議による検討に供すべく、これらの意見提出をミスク文書にまとめるよう*求める*。

13. 上記パラグラフ8・10・12に盛り込まれた規定に則り、事務局が行うべき活動の推定予算額に*留意する*。

14. 本決定において事務局が実施するよう求められる行動が、資金源を得られるようにすることを*求める*。

FCCC/CP/2012/8/Add.3

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添付資料 1-2

日本の地方自治体における気候変動対策

第 1 章　　日本の地方自治体における気候変動対策

1.1　目的及び業務概要

(1)　目的

本章では、日本の地方自治体における低炭素政策・低炭素施策の現状について理解するため、関連する情報収集と分析を行い、その概要と現状について取り纏めた。

(2)　調査対象及び業務概要

主な調査対象は、「地球温暖化対策の推進に関する法律（平成 10 年法律第 117 号）」に基づいて地方公共団体（都道府県・市町村）で策定されている温暖化対策実行計画や、環境モデル都市・環境未来都市が実施する気候変動対策とする。これら地方公共団体等の都市で定められる目標、具体的な対策・施策（義務的措置、経済的措置など）についての情報整理とタイプ分析を行った。加えて、各分野におけるグッドプラクティスを抽出し、それらの詳細な情報を取り纏めた。

なお、地球温暖化対策の推進に関する法律では、地方公共団体は以下に示す 2 種類の実行計画（事務事業編及び区域施策編）を策定する義務がある。

実行計画（事務事業編）	実行計画（事務事業編）は、地方公共団体自らの事務・事業に伴い発生する温室効果ガスの排出削減等の計画を策定し、計画期間に達成すべき目標を設定し、その目標を達成するために実施する措置の内容を定めるよう求めたもので、すべての地方公共団体が策定義務を有する（地球温暖化対策の推進に関する法律第 20 条の 3 第 1 項）
実行計画（区域施策編）	実行計画（区域施策編）は、その区域の自然的社会的条件に応じて温室効果ガスの排出の抑制等を行うための施策についての計画を策定するものである。都道府県、政令指定都市、中核市、特例市において策定義務があり、都市計画や農業振興地域整備計画等は、本計画との連携に配意することとされている（地球温暖化対策の促進に関する法律第 20 条の 3 第 3 項、第 4 項）。その他の地方公共団体については、策定の努力義務となっている。（同第 20 条の 3 第 1 項）

図 1　地球温暖化対策地方公共団体実行計画の定義

このため、環境省では、本法律に基づく「実行計画（事務事業編）」「実行計画（区域施策編）」の策定状況等を毎年度調査・取り纏めしており、平成 26 年 12 月時点では、平成 25 年 10 月 1 日現在の調査結果を取り纏めた「地方公共団体における地球温暖化対策の推進に関する法律　施行状況調査結果報告書（平成 26 年 3 月）[1]」が公開されている。そのため、本章では、本報告書を主要な文献として引用・整理している。

[1]地方公共団体における地球温暖化対策の推進に関する法律　施行状況調査結果報告書（平成 26 年 3 月）

加えて、環境モデル都市・環境未来都市については、内閣官房地域活性化統合事務局内閣府地域活性化推進室地域活性化統合本部会合サイト掲載の事例 [2]から引用した。

(3)　本章の構成

本章は以下の構成としている。なお、3.地方自治体における地球温暖化対策の推進に関する法律施行内容及び施策紹介においては、施行内容の整理（情報整理）を行ったあと、施策について地方自治体タイプ毎の紹介（タイプ分析）を行っている。

1. 目的及び業務概要
2. 地方自治体における地球温暖化対策の推進に関する法律施行状況
3. 地方自治体における地球温暖化対策の推進に関する法律に基づく温暖化対策・施策事例
4. 環境モデル都市・環境未来都市を含むグッドプラクティス事例
5. 気候変動実行計画事例

1.2　地方自治体における地球温暖化対策の推進に関する法律施行状況

(1)　地方公共団体の種類及び調査対象数

本節では、以下の分類に基づき法律の施行状況を整理している。主に対象とする地方自治体の種類は、①都道府県、②指定都市、③中核市、④特例市、及び⑤その他（特例市未満）の市区町村とする。

表 1　地方公共団体の種類について

地方自治法§1－3、§8、§252－19、§252－22、§252－26－3			調査対象数
普通地方公共団体（本調査の対象となる“地方自治体”とする） ※その組織、事務、権能等が一般的、普遍的なもの。	①都道府県		47 団体
	市町村	②指定都市 要件：人口 50 万以上の市のうちから政令で指定	20 団体
		③中核市 要件：人口 30 万以上の市の申出に基づき政令で指定	42 団体[注]
		④特例市 要件：人口 20 万以上の市の申出に基づき政令で指定	40 団体[注]
		⑤その他（特例市未満）の市区町村 ○その他の市 要件：人口 5 万以上ほか ○町村	1,640 団体
特別地方公共団体 一部事務組合（特別区、地方公共団体の組合、財産区、地方開発事業団）			1,314 団体

注 1）平成 26 年 4 月に移行市した市は、平成 26 年 3 月までの分類として数えられている。牧方市（平成 26 年 4 月から中核市（以前は特例市））、佐賀市（平成 26 年 4 月から特例市（以前はその他の市））

[2] 環境モデル都市・環境未来都市：URL http://www.kantei.go.jp/jp/singi/tiiki/kankyo/

なお、言葉の定義として、地方自治法に定める「普通地方公共団体」を本調査の対象となる「地方自治体」としている。

(2) 実行計画（区域施策編）の策定状況

地方自治体における地球温暖化対策の推進に関する法律に基づく実行計画（区域施策編）の策定状況を以下の表に示す。また、①都道府県、②指定都市、③中核市、④特例市、及び⑤その他（特例市未満）の市区町村における策定状況構成比を以下の図に示す。加えて、策定状況の経年変化を次ページに示す。

表 2 実行計画（区域施策編）の策定状況

項目	団体区分	人口規模	実行計画（区域施策編）を策定済み	実行計画（区域施策編）未策定				合計
				平成 25 年度中に策定予定	平成 26 年度以降に策定予定	策定時期未定	計	
団体数	都道府県		45	2	-	-	2	47
	政令指定都市		16	1	3	-	4	20
	中核市		40	1	1	-	2	42
	特例市		36	1	1	2	4	40
	特例市以上 計		137	5	5	2	12	149
	特例市未満の市区町村	100,000 人以上	84	4	17	82	103	187
		30,000～99,999	78	20	55	363	438	516
		10,000～29,999	27	10	85	335	430	457
		10,000 人未満	13	12	130	325	467	480
		計	202	46	287	1,105	1,438	1,640
	市区町村 計		294	49	292	1,107	1,448	1,742
	都道府県・市区町村 計		339	51	292	1,107	1,450	1,789
構成比	都道府県		95.7%	4.3%	-	-	4.3%	100.0%
	政令指定都市		80.0%	5.0%	15.0%	-	20.0%	100.0%
	中核市		95.2%	2.4%	2.4%	-	4.8%	100.0%
	特例市		90.0%	2.5%	2.5%	5.0%	10.0%	100.0%
	特例市以上 計		91.9%	3.4%	3.4%	1.3%	8.1%	100.0%
	特例市未満の市区町村	100,000 人以上	44.9%	2.1%	9.1%	43.9%	55.1%	100.0%
		30,000～99,999	15.1%	3.9%	10.7%	70.3%	84.9%	100.0%
		10,000～29,999	5.9%	2.2%	18.6%	73.3%	94.1%	100.0%
		10,000 人未満	2.7%	2.5%	27.1%	67.7%	97.3%	100.0%
		計	12.3%	2.8%	17.5%	67.4%	87.7%	100.0%
	市区町村 計		16.9%	2.8%	16.8%	63.5%	83.1%	100.0%
	都道府県・市区町村 計		18.9%	2.9%	16.3%	61.9%	81.1%	100.0%

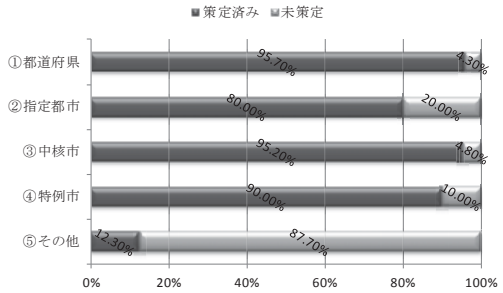


図 2 実行計画（区域施策編）の策定状況構成比

表 3 実行計画（区域施策編）の策定状況の経年変化

項目	団体区分	人口規模	平成 21 年度	平成 22 年度	平成 23 年度	平成 24 年度	平成 25 年度
団体数	都道府県		5	8	26	37	45
	政令指定都市		1	1	8	15	16
	中核市		7	10	31	36	40
	特例市		1	3	17	33	36
	特例市以上 計		14	22	82	121	137
	特例市未満の市区町村	100,000 人以上				49	84
		30,000～99,999				47	78
		10,000～29,999				15	27
		10,000 人未満				5	13
		計	8	37	83	116	202
	市区町村 計		17	51	139	200	294
	都道府県・市区町村 計		22	59	165	237	339
割合	都道府県		10.6%	17.0%	55.3%	78.7%	95.7%
	政令指定都市		5.6%	5.3%	42.1%	75.0%	80.0%
	中核市		17.1%	25.0%	75.6%	87.8%	95.2%
	特例市		2.4%	7.3%	42.5%	82.5%	90.0%
	特例市以上 計		9.5%	15.0%	55.8%	81.8%	91.9%
	特例市未満の市区町村	100,000 人以上				26.1%	44.9%
		30,000～99,999				9.1%	15.1%
		10,000～29,999				3.3%	5.9%
		10,000 人未満				1.0%	2.7%
		計	0.5%	2.2%	5.1%	7.1%	12.3%
	市区町村 計		1.0%	2.9%	8.0%	11.5%	16.9%
	都道府県・市区町村 計		1.2%	3.3%	9.2%	13.2%	18.9%

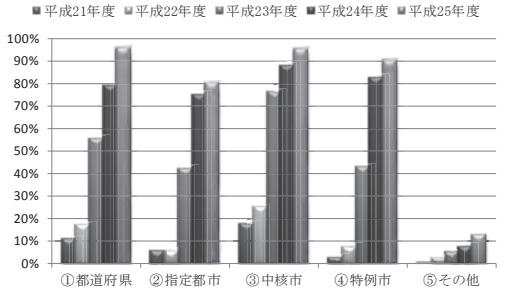


図 3 実行計画（区域施策編）の策定状況の経年変化（構成比比較）

地方自治体（都道府県、市区町村）全団体（1,789 団体）のうち、339 団体（18.9%）が実行計画（区域施策編）を策定済みであり、平成 24 年度の 237 団体（13.2%）に比べ、102 団体（5.7 ポイント）増加した。なお、実行計画（区域施策編）は、特例市以上の団体に対して策定義務がある一方、その他の地方自治体に対しては努力義務として定められている。そのため、特例市以上の地方自治体は、80%～95%程度が策定していることに対して、その他の地方自治体は 12%程度の策定割合に留まっている。その他の都市の中では、人口の多い地方自治体の方が実行計画（区域施策編）を策定している傾向にある。例えば、人口規模 100,000 人以上の地方自治体の約 45%が策定している一方で、人口規模 10,000 人以下の地方自治体については約 3%に留まっている。

(3)　実行計画（事務事業編）の策定状況

地方自治体における地球温暖化対策の推進に関する法律に基づく実行計画（事務事業編）の策定状況を以下の表に示す。また、①都道府県、②指定都市、③中核市、④特例市、及び⑤その他（特例市未満）の市区町村における策定状況構成比を以下の図に示す。①都道府県、②指定都市、③中核市、④特例市における実行計画（事務事業編）については、平成 25 年度の時点で既に 100%策定済みである。

実行計画（事務事業編）については、全ての地方公共団体が策定義務を有する。そのため、中核都市以上の人口規模である地方自治体は 100%策定している。一部、その他の地区町村では、策定していな自治体も見受けられるが、中核都市以上の人口規模は策定義務となっている実行計画（地域施策編）と比較しても多くの地方自治体が策定していることが分かる。

表 4　実行計画（事務事業編）の策定状況

項目	団体区分	人口規模	策定済み	未策定			未策定・策定時期未定	合計
				平成 25 年度中に策定予定	平成 26 年度以降に策定予定	計		
団体数	都道府県		47	-	-	-	-	47
	政令指定都市		20	-	-	-	-	20
	中核市		42	-	-	-	-	42
	特例市		40	-	-	-	-	40
	特例市以上　計		149	-	-	-	-	149
	その他の市区町村	100,000 人以上	180	3	4	7	-	187
		30,000～99,999	460	18	38	56	-	516
		10,000～29,999	344	10	103	113	-	457
		10,000 人未満	287	19	174	193	-	480
		計	1,271	50	319	369	-	1,640
	市区町村　計		1,373	50	319	369	-	1,742
	都道府県・市区町村　計		1,420	50	319	369	-	1,789
	一部事務組合等		360	23	838	861	93	1,314
構成比	都道府県		100.0%	-	-	-	-	100.0%
	政令指定都市		100.0%	-	-	-	-	100.0%
	中核市		100.0%	-	-	-	-	100.0%
	特例市		100.0%	-	-	-	-	100.0%
	特例市以上　計		100.0%	-	-	-	-	100.0%
	その他の市区町村	100,000 人以上	96.3%	1.6%	2.1%	3.7%	-	100.0%
		30,000～99,999	89.1%	3.5%	7.4%	10.9%	-	100.0%
		10,000～29,999	75.3%	2.2%	22.5%	24.7%	-	100.0%
		10,000 人未満	59.8%	4.0%	36.3%	40.2%	-	100.0%
		計	77.5%	3.0%	19.5%	22.5%	-	100.0%
	市区町村　計		78.8%	2.9%	18.3%	21.2%	-	100.0%
	都道府県・市区町村　計		79.4%	2.8%	17.8%	20.6%	-	100.0%
	一部事務組合等		27.4%	1.8%	63.8%	65.5%	7.1%	100.0%

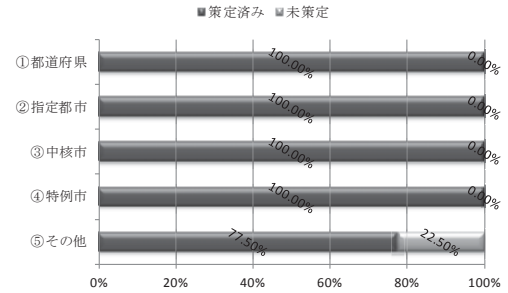


図 4　実行計画（事務事業編）の策定状況構成比

1.3　地方自治体における地球温暖化対策の推進に関する法律に基づく温暖化対策・施策事例

本節では、前節で纏めた各地方自治体における地球温暖化対策の推進に関する法律に係る施行状況の中から、既に実施されている温暖化対策・施行内容を地方自治体のタイプごとに整理を行った。なお、「既に実施されている温暖化対策」として分野別に環境省は整理を行っており、「実行計画（区域施策編）」及び「実行計画（事務事業編）」の計画区分での整理は行っていない。

(1)　施行内容の整理

1)　現在、各地方自治体が最も力を入れている温暖化対策・施策

施行内容の整理には、目標（数値目標等）具体的な対策・施策（義務的措置、経済的措置など）について、環境省が取り纏めた分野を基本として整理を行った。各地方自治体が、現在、最も力を入れている温暖化対策・施策を以下の対象分野にて纏めた。それぞれの分野について集計した結果を以下の表に示す。また、地方自治体毎の具体的な対策・施策割合について次ページに示す。

i) 太陽光、風力その他の自然エネルギー導入の促進

ii) 地域の事業者、住民による省エネその他の排出抑制活動の促進

iii) 公共交通機関、緑地その他の地域環境の整備・改善

iv) 循環型社会の形成

v) その他

表 5　各地方自治体の最も力を入れている温暖化対策・施策

項目	団体区分	人口規模	太陽光、風力その他の自然エネルギー導入の促進	地域の事業者、住民による省エネその他の排出抑制活動の促進	公共交通機関、緑地その他の地域環境の整備・改善	循環型社会の形成	その他	n
団体数	都道府県		18	25	1	-	3	47
	政令指定都市		14	4	-	1	2	20
	中核市		28	14	4	1	2	42
	特例市		32	8	-	-	1	40
	特例市以上　計		92	51	5	2	8	149
	その他の市区町村	100,000 人以上	118	49	5	8	7	187
		30,000～99,999	297	65	7	34	6	516
		10,000～29,999	224	42	7	48	9	457
		10,000 人未満	145	27	9	36	7	480
		計	784	183	28	126	29	1,640
	市区町村　計		858	209	32	128	34	1,742
	都道府県・市区町村　計		876	234	33	128	37	1,789
割合	都道府県		38.3%	53.2%	2.1%	-	6.4%	
	政令指定都市		70.0%	20.0%	-	5.0%	10.0%	
	中核市		66.7%	33.3%	9.5%	2.4%	4.8%	
	特例市		80.0%	20.0%	-	-	2.5%	
	特例市以上　計		61.7%	34.2%	3.4%	1.3%	5.4%	
	その他の市区町村	100,000 人以上	63.1%	26.2%	2.7%	4.3%	3.7%	
		30,000～99,999	57.6%	12.6%	1.4%	6.6%	1.2%	
		10,000～29,999	49.0%	9.2%	1.5%	10.5%	2.0%	
		10,000 人未満	30.2%	5.6%	1.9%	7.5%	1.5%	
		計	47.8%	11.2%	1.7%	7.7%	1.8%	
	市区町村　計		49.3%	12.0%	1.8%	7.3%	2.0%	
	都道府県・市区町村　計		49.0%	13.1%	1.8%	7.2%	2.1%	

注）1 つの対策・施策で、分野が重複する対策・施策がある。1 団体につき 1 対策・施策としている。n は回答された政策・政策の数

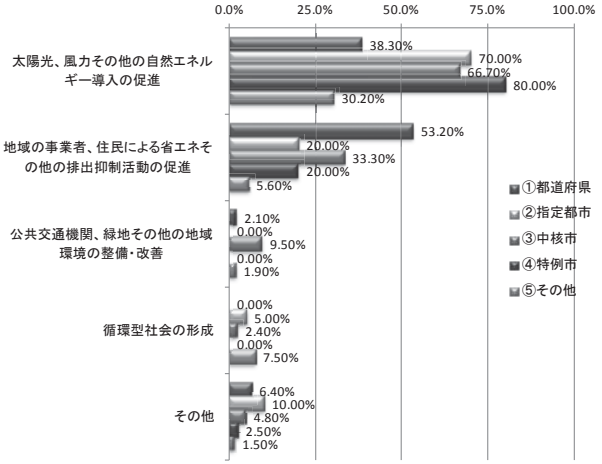


図 5　各地方自治体の最も力を入れている温暖化対策・施策（割合別）

多くの地方自治体は、太陽光・風力その他の自然エネルギー導入の促進について力をいれていることが分かる。特に指定都市・中核市・特例市の 3 つは 65%以上の対策・政策が自然エネルギー導入に関わっている。次いで、地域の事業者、住民による省エネその他の排出抑制活動が多くを占めており、都道府県では対策の 50%以上を占めている。

2)　　対策・施策（規制、財政、経済、自主的手法など）の種類

各地方自治体における温暖化対策・施策の種類を以下の分類にて整理した。また、各地方自治体における対策・施策の割合を下図に示す。

表 6　分類した各地方自治体における温暖化対策・施策の種類

No.	手法	内容
1	規制的手法	「環境基本条例」、「環境保全条例」、「地球温暖化防止条例」などの強制力を有する手法
2	財政的手法	税、税制優遇、補助金、融資、インフラ支援など
3	経済的手法	基金・公債、グリーン証書、カーボン・オフセット、エコアクションポイントなど
4	自主的手法	地方公共団体と域内の住民・事業者の紳士協定や、事業者の自主行動計画の策定など、住民・事業 者の自主的な取組を促す制度
5	情報発信・普及啓発	広報、PR、キャンペーン、シンポジウムなどによる情報発信・普及啓発
6	その他	-

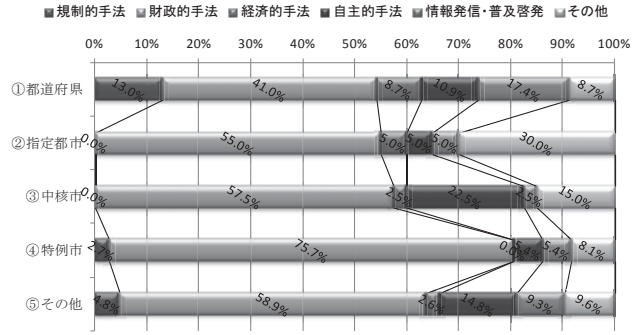


図 6　対策・施策の種類（規制的手法、財政的手法等）

対策・施策の種類として、政令指定都市及び中核市では、規制的手法を用いておらず、多くの地方自治体は、財政的手法を用いていることが分かる。また、情報発信・普及啓発に力を入れている自治体も多く中核都市では 22.5%となっている。

(2)　　対策・施策例（対策・施策名）

本項までに、特例市（人口 20 万人以上）以上の地方自治体が実施している温暖化対策・施策の分野ごとの対応割合や、それら対策・施策の種類が、どのような手法（規制的手法、財政的手法、経済的手法、自主的手法、情報発信・普及啓発、その他）に基づくものであるか整理を行った。本項では、それら対策・施策例（対策・施策名）を分野ごとに示すこととした。なお、1 つの対策・施策においても、複数の分野にまたがることがあるため、環境省の取り纏めに沿った形での記載とし、複数分野にまたがる対策・施策は複数回記載することとしている。各地方自治体の主な対策・施策（対策・施策名）を表 7 に示す。全体として、『i) 太陽光、風力その他の

自然エネルギー導入の促進』に関する対策・施策が最も多く、多くの地方自治体により実施されている。

表 7　各地方自治体の主な対策・施策（対策・施策名）

分野	対策・施策例（対策・施策名）
i) 太陽光、風力その他の自然エネルギー導入の促進	➢ 防災拠点や住宅、事業所等への再生可能エネルギー導入促進 ➢ 住宅用太陽光発電普及促進事業 ➢ 再生可能エネルギー導入促進事業 ➢ 太陽光発電利用プロジェクト（「とちぎサンシャイン」プロジェクト） ➢ 住宅用太陽光発電設備導入促進事業 ➢ 住宅用太陽光発電システム導入促進事業 ➢ エネルギーの地産地消 ➢ 地域主導型自然エネルギー創出支援事業 ➢ 愛知県住宅用太陽光発電施設導入促進費補助金 ➢ 家庭用太陽光発電設備設置補助 ➢ 和歌山県地域グリーンニューディール基金活用事業 ➢ エネルギーシフト加速化事業 ➢ 岡山県太陽光発電利用高度化促進事業 ➢ 地域還元型再生可能エネルギー導入事業 ➢ 再生可能エネルギー関連設備導入支援制度 ➢ 香川県住宅用太陽光発電設備導入促進事業補助金 ➢ 住宅用太陽光発電導入促進事業 ➢ ナガサキ・グリーンニューディール ➢ 札幌・サンサンプロジェクト ➢ 避難所等への防災対応型太陽光発電システム導入事業 ➢ 市立学校 152 校への太陽光発電設備と蓄電池の導入 ➢ 住宅用再生可能エネルギー等設備設置費助成事業 ➢ 再生可能エネルギー（太陽エネルギー）の導入の促進 ➢ 住宅用太陽光発電システム設置事業費補助金 ➢ 新エネルギー推進事業 ➢ 再生可能エネルギーの導入促進 ➢ 市民協働発電制度 ➢ 咲洲地区スマートコミュニティ実証事業 ➢ まちなかソーラー発電所推進事業 ➢ 再生可能エネルギー（太陽光発電）の導入促進 ➢ 住宅用太陽発電システム設置等補助事業 ➢ 広島市住宅環境性能向上補助金 ➢ 個人住宅用太陽光発電設備設置補助金制度及び補助金制度を活用した国内クレジットの取組 ➢ 新・省エネルギー設備導入推進事業 ➢ 資源を大切にし地球環境の保全に貢献するまち ➢ あきたスマートシティ・プロジェクト ➢ 再生可能エネルギー導入等による防災拠点支援事業 ➢ 太陽光発電向け市有財産貸出事業 ➢ 住宅用太陽光発電システム設置費補助金 ➢ 公共施設及び住宅への太陽光発電システムの積極的導入 ➢ 住宅用太陽光発電システム設備設置促進事業 ➢ 柏市カーボンオフセット事業 ➢ 市有地における太陽光発電事業 ➢ 防災拠点等太陽光パネル設置事業 ➢ 太陽光発電システム設置補助金事業 ➢ スマートシティ岐阜実証事業 ➢ 太陽光発電システム設置整備事業補助金 ➢ 豊田市低炭素社会システム実証プログラム ➢ 大津市再生可能エネルギー等関連機器設置補助金 ➢ 住宅用太陽光発電設備普及促進事業 ➢ 姫路市住宅用太陽光発電普及促進事業 ➢ 再生可能エネルギーの利用促進・自然エネルギーの利用促進 ➢ 住宅用太陽光発電システム導入促進事業 ➢ 公共施設の屋根貸しによる太陽光発電事業 ➢ 新エネルギー普及促進事業 ➢ 松山サンシャインプロジェクト ➢ ながさきソーラーネットプロジェクト ➢ 住宅用太陽光発電設備設置費補助 ➢ 再生可能エネルギー導入促進事業

分野	対策・施策例（対策・施策名）
	➢ 住宅用太陽光発電システム導入促進助成事業 ➢ 木質ペレット利活用推進事業 ➢ 山形市太陽光発電設置事業費補助金 ➢ 住宅用太陽光発電システム設置補助事業 ➢ つくば市クリーンエネルギー機器等購入補助事業 ➢ 太陽光発電推進のまち都市宣言（太陽光発電システム導入報奨金事業、メガソーラー事業） ➢ 屋根貸し・土地貸し太陽光発電事業 ➢ 川口市地球高温化対策活動支援金事業 ➢ おひさまエネルギー利用促進事業補助金 ➢ 平成 25 年度住宅用太陽光発電設備設置補助金制度 ➢ 資源・エネルギー有効活用推進事業 ➢ 越谷市住宅用太陽光発電設備設置費補助金 ➢ ＥＣＯＳ補助金制度 ➢ 小田原市地球温暖化対策推進事業費補助金 ➢ 太陽光発電設備の導入支援 ➢ 太陽光発電等スマートハウス導入支援 ➢ 太陽光発電等推進事業 ➢ 長岡市省エネ・新エネ設備等導入事業補助金 ➢ 省エネルギー・新エネルギー普及推進事業 ➢ 住宅用太陽光発電設備設置補助事業 ➢ 沼津市住宅用新エネルギー及び省エネルギー機器設置費補助事業 ➢ 富士市中小企業者温暖化対策事業費補助金 ➢ 住宅用太陽光発電システム設置補助金 ➢ 家庭用新エネルギー等普及支援事業 ➢ 太陽光発電システム設置補助 ➢ 大型太陽光発電システムの設置・運用 ➢ 太陽光発電システム設置事業補助制度 ➢ 公共施設への太陽光発電設備設置方針の策定 ➢ 太陽光発電システム設置費補助金 ➢ 再生可能エネルギーの活用 ➢ 鳥取市自然エネルギー等導入促進事業 ➢ 住宅用太陽光発電導入促進事業費補助金交付制度 ➢ 呉市住宅用太陽光発電システム設置費補助金交付制度 ➢ 佐賀市住宅用太陽光発電システム設置支援事業
ii) 地域の事業者、住民による省エネその他の排出抑制活動の促進	➢ 道民省エネ実践見える化事業 ➢ 中小企業等の省エネ緊急対策事業 ➢ 地球温暖化対策の推進（地球温暖化総合対策事業） ➢ 地球温暖化防止県民運動（笑顔で省エネ県民運動） ➢ ふくしまから発信！「福島議定書」事業 ➢ 次世代自動車充電インフラ整備促進 ➢ 目標設定型排出量取引制度 ➢ 総量削減義務と排出量取引制度 ➢ 事業活動温暖化対策計画書制度 ➢ いしかわ版環境ＩＳＯの普及促進事業 ➢ 地球温暖化ストップ県民運動「LOVE・アース・ふくい」 ➢ エネルギーの地産地消 ➢ 岐阜県地球温暖化防止基本条例に基づく「温室効果ガス排出削減計画」等作成・提出制度 ➢ 県民運動「ふじのくにエコチャレンジ」 ➢ 製品等を通じた貢献量評価手法の検討・普及 ➢ 京都版 CO2 排出量取引制度 ➢ うちエコ診断推進事業 ➢ 「スマート社会づくり」徳島モデル事業 ➢ 「みんなで出かけまシェアキャンペーン」開催事業 ➢ ふくおか省エネ・節電県民運動 ➢ くまもとらしいエコライフ普及促進事業 ➢ 地球温暖化対策推進事業 ➢ 「みやざき県民の住みよい環境の保全等に関する条例」に基づく温室効果ガス排出状況報告書の提出 ➢ かごしま低炭素社会モデル創造事業（屋久島） ➢ 観光施設等の総合的エコ化促進事業 ➢ 札幌・サンサンプロジェクト ➢ 北九州スマートコミュニティ創造事業 ➢ 事業所省エネ技術導入サポート事業 ➢ ライフステージ別環境教育の推進 ➢ 新・省エネルギー設備導入推進事業 ➢ あきたスマートシティ・プロジェクト

分野	対策・施策例（対策・施策名）
	➢ エコ・オフィス認定事業 ➢ 電気自動車用急速充電器設置工事 ➢ 岡崎版エコポイント抽選制度 ➢ 豊田市低炭素社会システム実証プログラム ➢ 市民向け地球温暖化対策省エネ推進事業 ➢ 尼崎版グリーンニューディール ➢ 公共施設の屋根貸しによる太陽光発電事業 ➢ ふくやまエコトライスロン ➢ LED 防犯灯設置費補助事業 ➢ 松山サンシャインプロジェクト ➢ よさこいＥＣＯライフ ➢ みやざきエコアクション認証制度事業 ➢ つくば市クリーンエネルギー機器等購入補助事業 ➢ 住宅用太陽光発電システム設置費補助事業 ➢ 太陽光発電等スマートハウス導入支援 ➢ 長岡市省エネ・新エネ設備等導入事業補助金 ➢ 富士市中小企業者温暖化対策事業費補助金 ➢ 住宅用地球温暖化対策機器設置費の補助制度 ➢ アジェンダ２１すいた推進事業 ➢ 地球温暖化防止普及啓発事業
iii) 公共交通機関、緑地その他の地域環境の整備・改善	➢ 新潟県カーボン・オフセット制度の普及 ➢ あきたスマートシティ・プロジェクト ➢ 豊田市低炭素社会システム実証プログラム ➢ 再生可能エネルギーの導入と推進 ➢ 公共交通機関のエコ化
iv) 循環型社会の形成	➢ バイオマス利活用の推進 ➢ 新・省エネルギー設備導入推進事業
v) その他	➢ 地域と共に創る電気自動車等を活用した低炭素社会モデル事業 ➢ 「大阪府温暖化の防止等に関する条例」に基づく届出指導 ➢ 高知県地球温暖化防止県民会議における協働 ➢ 横浜スマートシティプロジェクト（YSCP） ➢ 「創エネ」「省エネ」「蓄エネ」の推進 ➢ 函館市地球温暖化対策地域推進協議会活動 ➢ あきたスマートシティ・プロジェクト

(3) 地理的な特徴（島嶼、内陸など）や主要産業による対策・施策事例

1) 都道府県・市町村の地理的な特徴による分類（内陸、島嶼）

i) 対象となる地方自治体の選定

地理的な特徴を持つ地方自治体として、日本の地方・都道府県の中で内陸に属する地方、及び島嶼に属する地方を対象とする。なお、対象とする地方自治体規模を、特例市（20 万人以上）以上とした場合、島嶼に位置する地方自治体は存在しないため、表 8 に示す通り、内陸に位置する地方自治体については前節同様特例市以上、島嶼に位置する地方自治体については、環境省の施行状況調査に報告した全ての地方自治体を対象とする。

表 8 地理的な特徴分類の定義及び対象とする地方自治体

地理的な特徴	定義	対象
内陸に位置する地方自治体：	埼玉県、栃木県、群馬県、山梨県、長野県、岐阜県、滋賀県、奈良県及びこれら県に属する自治体のうち、気候変動対策実行計画を策定している自治体を対象とする。	特例市（20 万人以上）以上
島嶼に位置する地方自治体：	日本の島嶼群の集まり若しくは大規模な島嶼群である「諸島」、諸島のうち列状に並ぶ「列島」、塊状の形状をなす「群島」を主とする自治体のうち、気候変動対策実行計画を策定している自治体を対象とする。具体的に、東京都・長崎県・鹿児島県の以下に属する地方自体及び沖縄県を対象とする。 東京都：伊豆諸島と小笠原諸島（南方諸島） 長崎県：長崎県島嶼部（壱岐・対馬・五島列島）、西彼諸島、平戸島など 鹿児島県：鹿児島県島嶼部（種子島・屋久島・口永良部島・奄美群島など） 沖縄県：全地方自治体	施行状況調査に報告した全ての地方自治体

ii) 対象地方自治体の温暖化対策実行計画

a. 内陸に位置する地方自治体

前述の内陸に位置する地方自治体が、最も力を入れている温暖化対策・施策を表 9 に示す。1.3 (2) に示す通り、地方自治体全体の傾向として『i) 太陽光、風力その他の自然エネルギー導入の促進』に関する対策・施策が最も多く、多くの地方自治体により実施されており、内陸地方に位置する地方自治体についても、同様である。対策施・策名を確認すると、特に太陽光発電に係る内容が多く見受けられる。なお、公共交通機関に関する対策・施策は奈良市のみが実施しており、その他の地方自治体は公共交通機関に関する対策よりも他の対策・施策を重視していることが考えられる。

表 9 内陸に位置する地方自治体の最も力を入れている温暖化対策・施策一覧

分野（詳細）	都道府県	団体名（都市名）	地方自治体の種類	対策・施策名
i) 太陽光、風力その他の自然エネルギー導入の促進	栃木県	栃木県	①都道府県	太陽光発電利用プロジェクト（「とちぎサンシャイン」プロジェクト）
	栃木県	宇都宮市	③中核市	太陽光発電向け市有財産貸出事業
	埼玉県	さいたま市	②指定都市	市立学校 152 校への太陽光発電設備と蓄電池の導入
	埼玉県	川越市	③中核市	公共施設及び住宅への太陽光発電システムの積極的導入
	埼玉県	熊谷市	④特例市	屋根貸し・土地貸し太陽光発電事業
	埼玉県	川口市	④特例市	川口市地球高温化対策活動支援金事業
	埼玉県	所沢市	④特例市	おひさまエネルギー利用促進事業補助金
	埼玉県	春日部市	④特例市	平成 25 年度住宅用太陽光発電設備設置補助金制度
	埼玉県	草加市	④特例市	資源・エネルギー有効活用推進事業
	埼玉県	越谷市	④特例市	越谷市住宅用太陽光発電設備設置費補助金
	群馬県	前橋市	③中核市	住宅用太陽光発電システム設置費補助金
	群馬県	太田市	④特例市	太陽光発電推進のまち都市宣言（太陽光発電システム導入報奨金事業、メガソーラー事業）
	長野県	長野県	①都道府県	地域主導型自然エネルギー創出支援事業
	長野県	長野市	③中核市	太陽光発電システム設置補助金事業
	長野県	松本市	④特例市	住宅用太陽光発電設備設置補助事業
	岐阜県	岐阜市	③中核市	スマートシティ岐阜実証事業
	滋賀県	大津市	③中核市	大津市再生可能エネルギー等関連機器設置補助金
	奈良県	奈良県	①都道府県	家庭用太陽光発電設備設置補助
上記 i) 及び下記 ii)の併用となる分野	長野県	松本市	④特例市	住宅用太陽光発電設備設置補助事業
ii) 地域の事業者、住民による省エネその他の排出抑制活動の促進	群馬県	群馬県	①都道府県	次世代自動車充電インフラ整備促進
	埼玉県	埼玉県	①都道府県	目標設定型排出量取引制度
	岐阜県	岐阜県	①都道府県	岐阜県地球温暖化防止基本条例に基づく「温室効果ガス排出削減計画」等作成・提出制度
	滋賀県	滋賀県	①都道府県	製品等を通じた貢献量評価手法の検討・普及
	群馬県	高崎市	③中核市	電気自動車用急速充電器設置工事
	群馬県	伊勢崎市	④特例市	住宅用太陽光発電システム設置費補助事業

分野 （詳細）	都道 府県	団体名 (都市名)	地方自治体 の種類	対策・施策名
iii) 公共交通機関、緑地その他の地域環境の整備・改善	奈良県	奈良市	③中核市	公共交通機関のエコ化

b.　島嶼に位置する地方自治体

前述の島嶼に位置する地方自治体が、最も力を入れている温暖化対策・施策を表 10 に示す。なお、全て特例市（20 万人）未満である「その他の市区町村」に属する。1.3 (2) に示す通り、地方自治体全体の傾向として『i) 太陽光、風力その他の自然エネルギー導入の促進』に関する対策・施策が最も多く、多くの地方自治体により実施されており、島嶼地方に位置する地方自治体についても、同様である。一方、特筆すべきこととして、に示した中核都市（20 万人以上）以上の地方自治体が、『iv) 循環型社会の形成』に対して、2 自治体のみ最も力を入れている対策・施策と答えたにも関わらず、島嶼に位置する地方自治体は、その地方自治体で完結するように循環型社会の形成に力を入れていることが分かる。

表 10　島嶼に位置する地方自治体の最も力を入れている温暖化対策・施策一覧

分野 （詳細）	都道 府県	団体名 (都市名)	対策・施策名
i) 太陽光、風力その他の自然エネルギー導入の促進	東京都	大島町	大島町低炭素
	東京都	御蔵島村	御蔵島村太陽エネルギーシステム導入促進補助金交付要綱
	長崎県	島原市	太陽光発電設備設置費補助金
	長崎県	五島市	五島市住宅用太陽光発電設備設置費補助金
	長崎県	新上五島町	住宅用太陽光発電設備設置補助金
	鹿児島県	中種子町	新地域新エネルギー導入促進事業
	沖縄県	那覇市	住宅用太陽光発電システム導入促進助成事業
	沖縄県	沖縄市	太陽光発電設置補助金
	沖縄県	宜野湾市	住宅用太陽光発電システム設置補助金
	沖縄県	石垣市	石垣市住宅用太陽光発電システム設置補助金交付金
	沖縄県	名護市	名護市住宅用太陽光発電システム設置補助事業
	沖縄県	豊見城市	住宅用太陽光発電システム導入補助金
	沖縄県	宮古島市	島嶼型エネルギーマネジメントシステム実証事業（全島 EMS 実証、来間島自活実証）
	沖縄県	与那原町	住宅用太陽光発電システム設置補助事業
ii) 地域の事業者、住民による省エネその他の排出抑制活動の促進	長崎県	対馬市	事業用低炭素機器等導入事業
	長崎県	壱岐市	いきのしま地球温暖化防止キャンペーンによる民生部門への啓発活動
	沖縄県	沖縄県	観光施設等の総合的エコ化促進事業
iv) 循環型社会の形成	鹿児島県	屋久島町	屋久島クリーンサポートセンターで排出される炭化物の燃料化
	鹿児島県	十島村	ゴミリサイクル事業
	沖縄県	南風原町	はえばるリサイクルループ
	沖縄県	嘉手納町	草木のチップ化
	沖縄県	北中城村	植物ごみ資源化ヤード整備事業
	沖縄県	中城村	中城村廃棄物の減量化の推進及び適正化に関する条例
	沖縄県	粟国村	一般廃棄物の排出抑制について
	沖縄県	伊是名村	循環型社会の形成
v) その他	沖縄県	金武町	町の行う全ての事務・事業に係るＣＯ２の削減

2)　主要産業による分類

i)　対象となる地方自治体の選定

経済産業省によると、現代の日本では「製造業」、「IT産業」、「エネルギー産業」が主要産業にあてはまる。さらに、製造業には、次の 11 の分類があり、経済産業省は、これらの主要産業が日本経済を牽引しているとして、今後の発展のための方向性を示している[3]。

製造業：①産業機械産業、②航空機産業、③宇宙産業、④自動車産業、⑤素形材産業、⑥鉄鋼産業、⑦アルミ産業、電線産業、⑧化学産業、⑨セメント産業、ガラス産業、⑩紙・パルプ産業、⑪繊維産業

一方で、地方における主要産業については、上記の 3 産業以外にも、農林水産業を主要産業として活動する地域等多種多様な地方自治体が存在する。このように、どのような産業及び地域を対象とするか、多くの考え方が存在するが、本報告書では、首相官邸が発表している国家戦略特別区域に指定された地域における地方自治体を対象とすることとする。国家戦略特別区域は、経済社会の構造改革を重点的に推進することにより、産業の国際競争力を強化するとともに、国際的な経済活動の拠点の形成を促進する観点から、国が定めている[4]。そこで、2014 年 3 月 28 日に発表された以下の国家戦略特別区域に指定された地域の地方自治体かつ、その内容に沿った地球温暖化実行計画を定めている地方自治体を対象とすることとした。

- 東京圏（東京都・神奈川県の全部または一部、および千葉県成田市）：国際ビジネス・イノベーションの拠点
- 関西圏（京都府・大阪府・兵庫県の全部または一部）：医療等イノベーション拠点、およびチャレンジ人材支援
- 沖縄県：国際観光拠点
- 新潟県新潟市 - 大規模農業の改革拠点
- 兵庫県養父市 - 中山間地農業の改革拠点
- 福岡県福岡市 - 創業のための雇用改革拠点

ii)　国家戦略特別区域に指定された地域における地球温暖化実行計画策定状況

前述の対象地方自治体のうち国家戦略特別区域に位置する地方自治体が、最も力を入れている温暖化対策・施策について、戦略特別区として定義された理由と繋がるもののみ抽出し、表 9 に示す。特別戦略特区は、2014 年 3 月に発表されたため、2013 年 10 月時点の環境省施行状況調査結果後であることも影響していると考えられるが、多くの対象自治体では戦略特区として選出された理由とは異なった施策・対策に力を入れていた。中山間地農業の改革拠

[3] 経済産業省：http://www.meti.go.jp/committee/materials2/downloadfiles/g100601a06j.pdf

[4]国家戦略特別区域特集ページ（首相官邸）URL:
http://www.kantei.go.jp/jp/headline/kokkasenryaku_tokku2013.html

点として選出された養父市（兵庫県）においても、『住宅太陽光発電システム設置事業補助』を最も力を入れている施策・対策として挙げていた。今後、国の政策に沿った形になると考えられる。一方で、沖縄県・福岡市・新潟市は、主要産業による国家戦略特別区域に合致する気候変動対策・施策が実施されていた。

表 11　国家戦略特別区域に指定された地域に属する地方自治体の最も力を入れている温暖化対策・施策一覧（選出理由と沿うもののみ抽出）

分野（詳細）	都道府県	団体名（都市名）	地方自治体の種類	対策・施策名
ii) 地域の事業者、住民による省エネその他の排出抑制活動の促進	沖縄県	沖縄県	①都道府県	観光施設等の総合的エコ化促進事業
	福岡県	福岡市	②指定都市	事業所省エネ技術導入サポート事業
iv) 循環型社会の形成	新潟県	新潟市	②指定都市	バイオマス利活用の推進

1.4　環境モデル都市・環境未来都市を含むグッドプラクティス事例

本節では、環境モデル都市及び環境未来都市である都市を含む、気候変動対策各分野におけるグッドプラクティスの抽出と詳細な情報収集・取り纏めを記載した。

(1)　環境モデル都市・環境未来都市

環境モデル都市・環境未来都市とは、次のように定義されており、指定されている環境モデル都市及び未来都市をに示す[5]。

世界的に進む都市化を見据え、持続可能な経済社会システムを実現する都市・地域づくりを目指す「環境未来都市」構想を進めています。

環境モデル都市：持続可能な低炭素社会の実現に向け高い目標を掲げて先駆的な取組にチャレンジする都市で、目指すべき低炭素社会の姿を具体的に示し、「環境未来都市」構想の基盤を支えています。

環境未来都市：環境や高齢化など人類共通の課題に対応し、環境、社会、経済の三つの価値を創造することで「誰もが暮らしたいまち」「誰もが活力あるまち」の実現を目指す、先導的プロジェクトに取り組んでいる都市・地域です。

これらの環境モデル都市と環境未来都市を一体的に推進することで、「環境未来都市」構想の理想とする都市・地域の早期実現を目指しています。

（内閣官房地域活性化統合事務局内閣府地域活性化推進室、地域活性化統合本部会合HP[6]より抜粋）

表 12　環境モデル都市及び環境未来都市

分類	都市名	都道府県	地方自治体種類
環境モデル都市	下川町	北海道	その他（特例市未満）の市区町村

[5]環境モデル都市・環境未来都市：URL http://www.kantei.go.jp/jp/singi/tiiki/kankyo/
[6]内閣官房地域活性化統合事務局内閣府地域活性化推進室、地域活性化統合本部会合 HP
URL: http://www.kantei.go.jp/jp/singi/tiiki/kankyo/

分類	都市名	都道府県	地方自治体種類
	帯広市	北海道	その他（特例市未満）の市区町村
	つくば市	茨城県	特例市
	千代田区	東京都	特別区
	横浜市	神奈川県	指定都市
	新潟市	新潟県	指定都市
	富山市	富山県	中核市
	飯田市	長野県	その他（特例市未満）の市区町村
	尼崎市	兵庫県	中核市
	神戸市	兵庫県	指定都市
	西栗倉市	兵庫県	その他（特例市未満）の市区町村
	松山市	愛媛県	中核市
	椿原町	高知県	その他（特例市未満）の市区町村
	北九州市	福岡県	指定都市
	水俣市	熊本県	その他（特例市未満）の市区町村
	宮古島市	沖縄県	その他（特例市未満）の市区町村
	小国町	山形県	その他（特例市未満）の市区町村
	ニセコ町	北海道	その他（特例市未満）の市区町村
	生駒市	奈良県	その他（特例市未満）の市区町村
環境未来都市	下川町	北海道	その他（特例市未満）の市区町村
	柏市	千葉県	中核市
	横浜市	神奈川県	指定都市
	富山市	富山県	中核市
	北九州市	福岡県	指定都市
	気仙沼市	宮城県	その他（特例市未満）の市区町村
	釜石市	岩手県	その他（特例市未満）の市区町村
	岩沼市	宮城県	その他（特例市未満）の市区町村
	東松島市	宮城県	その他（特例市未満）の市区町村
	南相馬市	福島県	その他（特例市未満）の市区町村
	新地町	福島県	その他（特例市未満）の市区町村

(2)　気候変動対策実行計画グッドプラクティス

環境省は、『参考にされている他自治体の対策・政策』として、グッドプラクティスを取り纏めている。中核都市以上の規模もしくは環境未来都市・環境モデル都市に指定されている都市におけるグッドプラクティスを抽出し、対象分野及び対策・政策名を表にまとめた。

表 13　参考にされている他自治体の対策・施策（中核都市以上、環境モデル/未来都市を対象）

都道府県	団体名（都市名）	地方自治体の種類	環境モデル/未来都市	分野（詳細）	対策・施策名
北海道	下川町	その他（特例市未満）の市区町村	環境モデル/未来都市	太陽光、風力その他の自然エネルギー導入の促進（小水力）	- 木質バイオマス事業の取組について
北海道	旭川市	中核市	-	地域の事業者、住民による省エネその他の排出抑制活動の促進（省エネルギー）	- おうちの Ene-Eco プロジェクト - 個人住宅用新エネ省エネ設備等導入促進補助金
北海道	札幌市	指定都市	-	地域の事業者、住民による省エネその他の排出抑制活動の促進（省エネルギー）	- エネルギーeco 資金補助
茨城県	つくば市	特例市	環境モデル都市	太陽光、風力その他の自然エネルギー導入の促進（クリーンエネルギー）	- クリーンエネルギー機器等購入補助事業
宮城県	仙台市	指定都市	-	太陽光、風力その他の自然エネルギー導入の促進（太陽光）	- 避難場所等への防災対応型太陽光発電システム導入事業

都道府県	団体名(都市名)	地方自治体の種類	環境モデル/未来都市	分野（詳細）	対策・施策名
栃木県	栃木県	都道府県	-	太陽光、風力その他の自然エネルギー導入の促進（太陽光）	- 屋根貸し太陽光発電事業
群馬県	群馬県	都道府県	-	太陽光、風力その他の自然エネルギー導入の促進（太陽光）	- 住宅用太陽光発電補助金
群馬県	太田市	特例市	-	太陽光、風力その他の自然エネルギー導入の促進（太陽光）（省エネルギー）	- 大型地陽光発電設備のリース方式での導入・メガソーラー - メガソーラー事業 - ＬＥＤ事業
埼玉県	熊谷市	特例市	-	地域の事業者、住民による省エネその他の排出抑制活動の促進（省エネルギー）	- クールシェア
埼玉県	川口市	特例市	-	地域の事業者、住民による省エネその他の排出抑制活動の促進（省エネルギー）	- エコライフ DAY!
東京都	東京都	都道府県	-	その他	- 総量削減義務と排出量取引制度
神奈川県	神奈川県	都道府県	-	太陽光、風力その他の自然エネルギー導入の促進（クリーンエネルギー）（再生可能エネルギー）	- ＥＶ、ＰＨＶタウン事業 - 神奈川県住宅用スマートエネルギー設備導入費補助
神奈川県	横浜市	指定都市	環境モデル/未来都市	太陽光、風力その他の自然エネルギー導入の促進（太陽光）（小水力）（クリーンエネルギー）（再生可能エネルギー）	- 住宅用太陽光・太陽熱利用システム設置費補助事業 - バイオマス燃料の利用促進事業 - 電気自動車（ＥＶ）・プラグインハイブリッド自動車（ＰＨＶ）の導入補助事業 - 家庭用燃料電池システム設置費補助事業
				公共交通機関、緑地その他の地域環境の整備・改善/循環型社会の形成（スマートコミュニティ）	- 横浜スマートシティプロジェクト（YSCP）
新潟県	長岡市	特例市	-	その他	- 生ごみの分別収集
富山県	富山県	都道府県	環境モデル都市（富山市）	太陽光、風力その他の自然エネルギー導入の促進（太陽光）	- 富山市舟倉地区メガソーラー事業 住宅用太陽光発電導入支援対策費補助金
長野県	長野県	都道府県	-	その他	- 環境フェア - 地域におけるエネルギーの活用に関する協議会運営費支援
長野県	長野市	中核市	-	太陽光、風力その他の自然エネルギー導入の促進（小水力）	- 長野市森のエネルギー推進事業
長野県	飯田市	その他(特例市未満)の市区町村	環境モデル都市	太陽光、風力その他の自然エネルギー導入の促進（太陽光）（小水力）（小水力）	- 再生可能エネルギー導入による持続可能な地域づくり - 初期費用負担ゼロによる住宅用太陽光発電の普及 おひさま太陽光市民共同発電 - 小水力の取組（金融手法を取り入れた再エネの普及施策） - バイオマスの取組（金融手法を取り入れた再エネの普及施策）
				公共交通機関、緑地その他の地域環境の整備・改善/循環型社会の形成（スマートコミュニティ）	- 飯田市環境モデル都市行動計画
岐阜県	岐阜県	都道府県	-	公共交通機関、緑地その他の地域環境の整備・改善/循環型社会の形成（スマートコミュニティ）	- ＥＶ、ＰＨＶタウン事業
岐阜県	岐阜市	中核市	-	太陽光、風力その他の自然エネルギー導入の促進（太陽光）（省エネルギー）	- 岐阜市住宅用太陽光設置事業発電システム設置設備事業補助金 - ぎふ減ＣＯ２ポイント制度
静岡県	静岡県	都道府県	-	太陽光、風力その他の自然エネルギー導入の促進（太陽光）	- 住宅用太陽光発電設備導入支援事業
				公共交通機関、緑地その他の地域環境の整備・改善/循環型社会の形成（スマートコミュニティ）	- ＥＶ、ＰＨＶタウン事業

都道府県	団体名(都市名)	地方自治体の種類	環境モデル/未来都市	分野（詳細）	対策・施策名
愛知県	豊田市	中核市	-	太陽光、風力その他の自然エネルギー導入の促進（太陽光）	- 太陽光発電システム設置補助金制度を参考
三重県	三重県	都道府県	-	その他	- 三重県地球温暖化対策実行計画
滋賀県	滋賀県	都道府県	-	地域の事業者、住民による省エネその他の排出抑制活動の促進（省エネルギー）	- 滋賀県民間事業者省エネ設備モデル事業補助金 温室効果ガスの排出抑制等に資する設備を整備する事業 補助率：１／３（上限２００万円）
奈良県	生駒市	その他(特例市未満)の市区町村	環境モデル都市	太陽光、風力その他の自然エネルギー導入の促進（小水力）（小水力）（スマートコミュニティ）	- 小水力発電の導入 - 水道事業での小水力発電事業 - 生駒市スマートコミュニティ推進奨励金交付要綱
和歌山県	和歌山県	都道府県	-	その他（その他補助金関係）	- 補助単価
島根県	大田市	その他(特例市未満)の市区町村	-	その他（その他補助金関係）	- 補助単価、補助要件、手続方法等
岡山県	倉敷市	中核市	-	太陽光、風力その他の自然エネルギー導入の促進（太陽光）（太陽光）	- くらしきサンサン倶楽部 倉敷市太陽光発電型プログラム型排出削減事業 - 次世代エコハウス認定・補助金制度
広島県	広島市	指定都市	-	太陽光、風力その他の自然エネルギー導入の促進（太陽光）	- 住宅環境性能向上補助金制度
愛媛県	松山市	中核市	環境モデル都市	その他	- 道後温泉周辺の宿泊施設の取組
福岡県	福岡県	都道府県	-	太陽光、風力その他の自然エネルギー導入の促進（太陽光）（再生可能エネルギー）	- 屋根貸し太陽光発電事業 - 福岡県再生可能エネルギー導入支援システム
福岡県	福岡市	指定都市	-	太陽光、風力その他の自然エネルギー導入の促進（太陽光）	- メガソーラー
				その他	- ＪＣＢと連携したエコポイント制度 - クールシェア
福岡県	北九州市	指定都市	環境モデル都市	公共交通機関、緑地その他の地域環境の整備・改善/循環型社会の形成（スマートコミュニティ）	- スマートシティ、ＮＰＯの活用など
宮崎県	宮崎県	都道府県	-	太陽光、風力その他の自然エネルギー導入の促進（太陽光）	- ＪーＰＥＣの受理決定を受けた住宅用太陽光発電システムを宮崎県内において 住居として使用、又は使用される予定である住宅に設置する者に対し補助金を交付
沖縄県	那覇市	中核市	-	その他（その他補助金関係）	- 補助金額について参考とした

1.5　気候変動実行計画事例

(1)　気候変動実行計画事例紹介

ここまで記載した内容から、以下の 5 つの観点を踏まえて今回事例として紹介する地方自治体を選定した。各事例説明表中に記載した『対象とした観点』では、○（該当）及び×（該当せず）という形で記載している。

① 中核都市（人口 20 万人以上）以上の地方自治体事例の紹介

② 地理的な特徴（島嶼、内陸）を持つ地方自治体事例の紹介

③ 産業に特徴のある地方自治体（国家戦略特別区域に指定）事例の紹介

④ 環境モデル都市・環境未来都市に指定されている地方自治体事例の紹介

⑤ 他の自治体から参考とされている実行計画を実施している地方自治体事例の紹介

下記に示す各テーマに関する事例をそれぞれ 1～2 例程度紹介する。

i) 太陽光、風力その他の自然エネルギー導入の促進

ii) 地域の事業者、住民による省エネその他の排出抑制活動の促進

iii) 公共交通機関、緑地その他の地域環境の整備・改善

iv) 循環型社会の形成

v) その他

1)　太陽光、風力その他の自然エネルギー導入の促進

長野県飯田市は、人口規模は 20 万人以下であるものの、環境モデル都市に選定されている内陸の地域である。加えて、太陽光、風力その他の自然エネルギー導入の促進に対する実行計画（区域施策編）は、他の自治体から参考とされているため事例として紹介する[7]。

都道府県	団体名(都市名)	地方自治体の種類	環境モデル/未来都市	対策・施策名
長野県	飯田市	その他（特例市未満）の市区町村	環境モデル都市	- 再生可能エネルギー導入による持続可能な地域づくり

対象とした観点		
	×	① 中核都市（人口 20 万人以上）以上の地方自治体事例の紹介
	○	② 地理的な特徴（島嶼、内陸）を持つ地方自治体事例の紹介
	×	③ 産業に特徴のある地方自治体（国家戦略特別区域に指定）事例の紹介
	○	④ 環境モデル都市・環境未来都市に指定されている地方自治体事例の紹介
	○	⑤ 他の自治体から参考とされている実行計画を実施している地方自治体事例の紹介

担当部署名	地球温暖化対策課	
開始年度	平成 24 年度・（NPO 法人南信州おひさま進歩設立は、平成 16 年）	
概要	市民と行政が役割分担しながら、協働して太陽光発電を普及させている事例。地域への面的な展開の事例として他の地方自治体が参考としている。 再生可能エネルギービジネスの収益を地域課題解決へと再投資することで持続可能な地域づくりを目指す。市は、平成 25 年に制定した条例に基づき、この趣旨の事業へと各種支援を実施していく。 (対策・施策イメージ：表外　図 7 を参照)	
GHG 削減量等、対策施策の把握	基準値	―
	内容	―
	目標値	―
	内容	―
	最新値	―
	内容	―
アピールポイント	専門家を集めた 1 年間の議論を踏まえ、平成 25 年度に条例が制定された。ポイントは、①地域環境権を市民に賦与、②公民協働のルール化、③市の支援と再エネ事業の公共品質の確保、飯田市再生可能エネルギー導入支援審査会の設置、運営、④支援組織による審査内容等があげられる。条例の内容について多くの問い合わせ、反響を得ている。現在は、条例に基づき、取組みを開始している段階にある。	

図 7　飯田市の取組（再生可能エネルギー導入による持続可能な地域づくり等）概要[8]

[7] 八王子市第 4 回再生可能エネルギー導入検討会資料 URL: http://www.city.hachioji.tokyo.jp/dbps_data/_material_/_files/000/000/036/993/dai4kai_siryou5.pdf

[8]環境モデル都市・飯田パンフレット URL: http://www.city.iida.lg.jp/uploaded/attachment/14682.pdf

2)　地域の事業者、住民による省エネその他の排出抑制活動の促進

沖縄県は、地理的な特徴（島嶼）を持っており、国家戦略特別区域にも指定されている。国家戦略特別区に指定されている理由である“観光”に関連した実行計画（区域施策編）を策定しているため、地域の事業者・住民による省エネその他の排出抑制活動の促進事例として紹介する[9]。

都道府県	団体名(都市名)	地方自治体の種類	環境モデル/未来都市	対策・施策名
沖縄県	沖縄県	都道府県	-	- 観光施設等の総合的エコ化促進事業
対象とした観点		○	① 中核都市（人口 20 万人以上）以上の地方自治体事例の紹介	
		○	② 地理的な特徴（島嶼、内陸）を持つ地方自治体事例の紹介	
		○	③ 産業に特徴のある地方自治体（国家戦略特別区域に指定）事例の紹介	
		×	④ 環境モデル都市・環境未来都市に指定されている地方自治体事例の紹介	
		×	⑤ 他の自治体から参考とされている実行計画を実施している地方自治体事例の紹介	
担当部署名		環境政策課		
開始年度		平成 24 年度		
概要		観光施設等における省エネルギー等の環境対策を促進するため、観光事業者が行う環境対策に要する経費を補助することにより、地球温暖化対策を推進する。(対策・施策イメージ：表外　図 8 を参照)		
GHG 削減量等、対策施策の把握		基準値	―	
		内容	―	
		目標値	―	
		内容	―	
		最新値	―	
		内容	―	
アピールポイント		・観光産業は沖縄の基幹産業であり、さらなる成長に向けて振興を図る必要があるが、一方で環境負荷の増大についても対策を講じなければならない。・豊かな自然環境は沖縄観光の最大の魅力であり、環境保全の対策は貴重な観光資源の保護につながるため、観光関連事業者が行う環境対策に対し補助を行い、地球温暖化対策を推進している。		

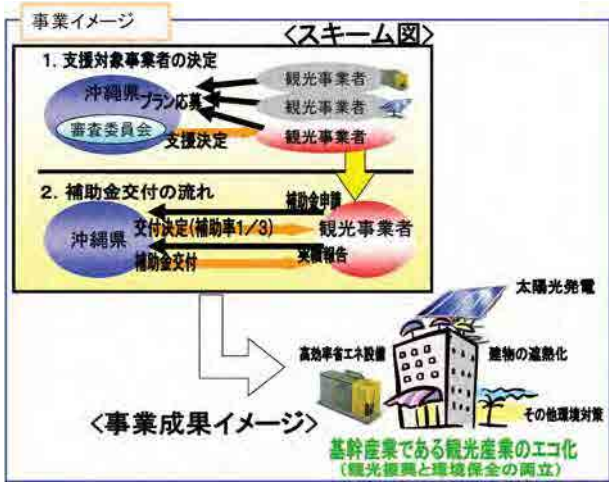


図 8　沖縄県の対策・施工（観光施設等の総合的エコ化促進事業）概要[10]

[9]沖縄県環境部環境政策課 URL:
http://www.pref.okinawa.lg.jp/site/kankyo/seisaku/kikaku/documents/h26kouhukettei_2.pdf

[10]平成 26 年度観光施設等の総合的エコ化促進事業補助金の交付決定について（平成 26 年 10 月）　URL:
http://www.pref.okinawa.jp/site/kankyo/seisaku/kikaku/documents/h26kouhukettei_2.pdf

また、同県宮古島市においては、島嶼地方の特性を活かし、島嶼型低炭素社会システムの構築を計画している。下記に島嶼型低炭素社会システムの構築にかかる施策内容を紹介する。

都道府県	団体名(都市名)	地方自治体の種類	環境モデル/未来都市	対策・施策名
沖縄県	宮古島市	指定都市	-	- 島嶼型低炭素社会システムの構築
対象とした観点		×	① 中核都市（人口 20 万人以上）以上の地方自治体事例の紹介	
		○	② 地理的な特徴（島嶼、内陸）を持つ地方自治体事例の紹介	
		×	③ 産業に特徴のある地方自治体（国家戦略特別区域に指定）事例の紹介	
		×	④ 環境モデル都市・環境未来都市に指定されている地方自治体事例の紹介	
		×	⑤ 他の自治体から参考とされている実行計画を実施している地方自治体事例の紹介	
担当部署名		エコアイランド推進課		
開始年度		平成 23 年度		
概要		低炭素社会システムの構築として、基盤形成、産業部門、業務部門、家庭部門、運輸部門、エネルギー部門別に対策を策定し、島内全域において低炭素化社会の形成を促進するアクションプランとしている。		
GHG 削減量等、対策施策の把握		基準値	平成 15 年	
		内容	―	
		目標値	目標年度：平成 32 年	
		内容	部門毎に削減目標を設定。	
		最新値	―	
		内容	―	
アピールポイント		・島嶼型低炭素社会システムの構築を促進することにより、地域力向上への足掛かりや宮古島を国内外にアピールする機会として島全体の活性化を図ることを目的としている。実現すべき目標として、島内資源循環型社会の確立、自然環境の保全、地域産業振興、人口減少抑制を掲げている。		

図 9 宮古島市島嶼型低炭素社会システム概要[11]

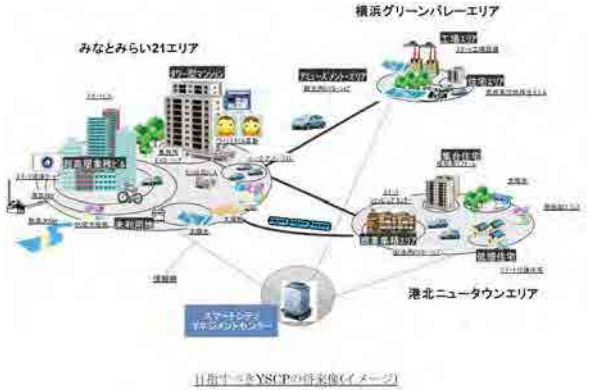
[11]宮古島市島嶼型低炭素社会システム構築委員会報告書概要版
URL: http://www.city.miyakojima.lg.jp/gyosei/ecoisland/modeltoshi/files/gaiyou_tousyo.pdf

3)　公共交通機関、緑地その他の地域環境の整備・改善

横浜市は、400 万人近い人口を保有する政令都市であり、環境モデル都市にも環境未来都市にも指定されている。また、他の自治体から参加されている実行計画（区域施策編）を策定しているため、公共交通機関、緑地その他の地域環境の整備・改善の事例として紹介する。

都道府県	団体名(都市名)	地方自治体の種類	環境モデル/未来都市	対策・施策名
神奈川県	横浜市	指定都市	環境モデル/未来都市	- 横浜スマートシティプロジェクト（YSCP）

対象とした観点	○	① 中核都市（人口 20 万人以上）以上の地方自治体事例の紹介
	×	② 地理的な特徴（島嶼、内陸）を持つ地方自治体事例の紹介
	×	③ 産業に特徴のある地方自治体（国家戦略特別区域に指定）事例の紹介
	○	④ 環境モデル都市・環境未来都市に指定されている地方自治体事例の紹介
	○	⑤ 他の自治体から参考とされている実行計画を実施している地方自治体事例の紹介
担当部署名	温暖化対策統括本部　プロジェクト推進課	
開始年度	平成 22 年度	
概要	経済産業省の「次世代エネルギー・社会システム実証地域」といて、平成 22 年 4 月に選定されたプロジェクト。市民・事業者・行政が一体となって、再生可能エネルギーの導入、家庭・ビル・地域でのエネルギーマネジメント、次世代交通システムの構築によって、横浜型の持続可能な低炭素都市（横浜スマートシティ）を目指す。(対策・施策イメージ：表外　図 9 を参照)	
GHG 削減量等、対策施策の把握	基準値	―
	内容	―
	目標値	目標年度 ： 平成 26 年度
	内容	太陽光発電 27MW、HEMS4,000 台
	最新値	確認年度 ： 平成 24 年度
	内容	太陽光発電 33MW、HEMS 約 2,600 台
アピールポイント	YSCP では、企業の英知を結集させ、横浜でスマートシティを構築し、さらにその知見を生かして都市としてのパッケージ型インフラを海外に展開することを目指している。　その中で様々な実証実験を行っており、昨冬は、統合 BEMS によるデマンドレスポンス実証を実施し、22%のピークカットを達成した。平成 25 年度夏は、HEMS を導入している 2,500 世帯のうち、CEMS と連携している約 1,900 世帯を対象に日本最大規模の省エネ行動実験を実施した。加えて、低炭素都市を目指した次世代交通の推進に向け、国内初となる超小型モビリティを活用した大規模カーシェアリングの実証実験「チョイモビ　ヨコハマ」を実施している。	



目指すべきYSCPの将来像(イメージ)

図 9　横浜市の対策・施工（横浜スマートシティプロジェクト）概要 [12]

[12] 横浜スマートシティプロジェクト　マスタープラン（平成 22 年 8 月）URL:
http://www.city.yokohama.lg.jp/ondan/press/h22/100811/100811m.pdf

4)　循環型社会の形成

新潟市は、環境モデル都市に選定されており、また、国家戦略特区には“大規模農業の改革拠点”として選定されている。その新潟市がバイオマス利活用に係る実行計画（区域施策編）を策定しているため、循環型社会の形成に関する事例として紹介する。

都道府県	団体名(都市名)	地方自治体の種類	環境モデル/未来都市	対策・施策名
新潟県	新潟市	指定都市	環境モデル都市	バイオマス利活用の推進

対象とした観点	○	① 中核都市（人口 20 万人以上）以上の地方自治体事例の紹介
	×	② 地理的な特徴（島嶼、内陸）を持つ地方自治体事例の紹介
	○	③ 産業に特徴のある地方自治体（国家戦略特別区域に指定）事例の紹介
	○	④ 環境モデル都市・環境未来都市に指定されている地方自治体事例の紹介
	×	⑤ 他の自治体から参考とされている実行計画を実施している地方自治体事例の紹介
担当部署名	環境部環境政策課	
開始年度	平成 24 年度	
概要	広大な田園から排出される果樹選定枝、稲わら・もみ殻など農業系バイオマスに加え、里山の間伐材、都市部から排出される食品残さや下水道汚泥、刈り草など未利用バイオマスの活用を促進する。(対策・施策イメージ：表外　図 10 を参照)	
実行計画内容	○ 地域資源循環ｼｽﾃﾑを形成し、稲作により発生する稲わらやもみ殻、果樹栽培により発生する果樹剪定枝、畜産により発生する家畜排泄物などを収集・堆肥化し、それを活用する環境重視の農業の推進。 ○ 食品事業者と畜産農家などが連携する、食品加工残渣の飼料化の取り組みの推進。 ○ 木質ﾊﾞｲﾏｽについて、既存の民間施設の利活用促進を図るｼｽﾃﾑづくり（利活用業者のＰＲ支援や再生利用品の利用促進、木くず排出事業者と再生利用事業者間の情報交換などのコーディネート等）。 ○ 「新潟菜の花プラン」を推進し、地域循環エネルギーであるＢＤＦの普及拡大の検討。	
GHG 削減量等、対策施策の把握	基準値	基準年度 ： 平成 19 年度
	内容	廃棄物系バイオマスの仕向量：972,808t-CO2 未利用系バイオマスの仕向量： 40,658t-CO2
	目標値	目標年度 ： 平成 30 年度
	内容	廃棄物系バイオマスの仕向量：1,101,260t-CO2 未利用系バイオマスの仕向量： 74,150t-CO2
	最新値	―
	内容	―
アピールポイント	―	

図 10　新潟市の対策・施工（バイオマス利活用の推進）概要 [13]

[13] 新潟バイオマスタウン構想　（構想書）（平成 20 年 2 月）URL:
http://www.city.niigata.lg.jp/shisei/seisaku/keikaku/norinsuisan/biomass/index.files/biokoso.pdf

循環型社会の形成に関する事例として、横浜市の『ごみ減量から始めよう脱温暖化』の施策を下記に紹介する。

都道府県	団体名（都市名）	地方自治体の種類	環境モデル/未来都市	対策・施策名
神奈川県	横浜市	指定都市	環境モデル/未来都市	ごみ減量から始めよう脱温暖化

対象とした観点	○	① 中核都市（人口 20 万人以上）以上の地方自治体事例の紹介
	×	② 地理的な特徴（島嶼、内陸）を持つ地方自治体事例の紹介
	×	③ 産業に特徴のある地方自治体（国家戦略特別区域に指定）事例の紹介
	○	④ 環境モデル都市・環境未来都市に指定されている地方自治体事例の紹介
	○	⑤ 他の自治体から参考とされている実行計画を実施している地方自治体事例の紹介
担当部署名	環境部環境政策課	
開始年度	平成 23 年度	
概要	平成 23 年 1 月に策定した「ヨコハマ３Ｒ夢プラン（横浜市一般廃棄物処理基本計画）」では、総排出量（ごみと資源の総量）を平成 37 年度までに平成 21 年度比で 10%以上削減すると共にごみ処理に伴い排出される温室効果ガスを平成 37 年度までに平成 21 年度比で 50%以上削減することを目標とし、脱温暖化に向けた取組を推進する。	
実行計画内容	○燃やすゴミ全体を減らすことによって温室効果ガスを削減⇒リデュース ○資源の分別を促進することによって焼却するゴミの量を削減⇒分別 ○生ゴミの水切りを行うことによって効率的な焼却を促進	
GHG 削減量等、対策施策の把握	基準値	基準年度 ： 平成 21 年度
	内容	28.2 万 t-CO2
	目標値	目標年度 ： 平成 37 年度
	内容	基準年比で 50%以上の削減を目標とする
	最新値	―
	内容	―
アピールポイント	―	

図 11　ごみ減量から始めよう脱温暖化の取組み例 [14]

[14] 横浜市　『ごみ減量から始めよう脱温暖化』概要
URL: http://www.city.yokohama.lg.jp/shigen/sub-data/data/tyosa/ghg/

5)　その他各地方自治体による気候変動対策事例

その他各地方自治体による気候変動対策事例は、各地方自治体のホームページに掲載されているが、加えて、以下に各自治体の取り組み事例が報告されている。

- 環境省地球温暖化対策地方公共団体実行計画（区域政策編）策定支援サイト、地域の最新取組状況
  （https://www.env.go.jp/policy/local_keikaku/kuiki/torikumi2013/）
- 平成 25 年度 温暖化対策事業 推進事例集【前編】
  （http://www.env.go.jp/policy/local_keikaku/kuiki/data/download/h25-cases1.pdf）
- 平成 25 年度 温暖化対策事業 推進事例集【後篇】
  （http://www.env.go.jp/policy/local_keikaku/kuiki/data/download/h25-cases2.pdf）
- 平成 24 年度 温室効果ガス排出量、削減量算定及び目標設定事例調査業務報告書
  （http://www.env.go.jp/policy/local_keikaku/kuiki/data/download/h24-cases.pdf）
- 平成 22 年度 地方公共団体優良事例等調査業務報告書
  （http://www.env.go.jp/policy/local_keikaku/kuiki/data/manual/jirei_houkokusyo_h22.pdf）
- 平成 22 年度【地方公共団体取組事例】地球温暖化対策に取り組むためのアイデア・ノウハウ集
  （http://www.env.go.jp/policy/local_keikaku/kuiki/data/manual/jirei_h22.pdf）
- 地方公共団体による地球温暖化対策関連施策～施策実施状況と施策紹介～
  （http://www.env.go.jp/earth/ondanka/measures_local/index.html）
- 大規模事業所に対する計画書制度の運用状況と今後のあり方（東京都、他）
  https://www.kankyo.metro.tokyo.jp/climate/other/cat7320.html

添付資料 1-3

日本の都市における都市レベルの気候変動対策計画（GHG インベントリ含む）作成の現状

日本の都市における都市レベルの
気候変動対策計画（GHG インベントリ含む）作成の現状

注釈：『地球温暖化対策地方公共団体実行計画』策定に関する少数の自治体の事例のヒアリング結果を主に参照し、自治体の気候変動対策計画策定に関する事例をまとめたものである。

1）実行計画策定の背景・現状

各自治体 [1]は、「地球温暖化対策の推進に関する法律」第二十条の三の規定により、所管区域全体の実行計画（GHGインベントリを含む）の策定を義務付けられている（政令指定都市、中核市、特例市以外の市町村については努力義務のみ）。各自治体は、一部の例外を除き、環境省が作成した『地球温暖化対策地方公共団体実行計画（区域施策編）』策定マニュアルをもとに実行計画を策定している。策定マニュアルには、参照するデータ一覧及び入手元、策定フロー、計画のフォローアップが記載されており、丁寧なものとなっている。別添１に同マニュアルの構成、及び実行計画の全体の策定フローとマニュアルとの対応を示した図を添付する。

実行計画は、多くの自治体では内部の人員に限りがあることから、計画策定業務に関し公募をかけ、入札で応札したコンサルタントがマニュアルを参照し、計画作成を支援する体制をとっている。自治体の担当部署は、通常、環境関連の部署が担い、自治体内部で関連する部署（都市計画、交通、廃棄物等の部署）とワーキンググループを設立し、必要に応じ関連部署からのデータ提供を受ける。外部コンサルタントが準備した実行計画案をもとに WG 内で協議し、自治体の意向を目標及び施策に反映させる。実行計画の作成は、多くの場合、環境関連部の主担当が１名（必要に応じ他の職員のサポートを受ける）、これをサポートするコンサルタントが 3～5 名の体制で作成することが多い。実行計画策定時の体制（参加した関係者の構成）を自治体の規模別に示したものを別添２の図１に示す。多くの自治体が内外の関係者と連携して計画を策定したことが分かる。

策定期間は自治体によって異なるものの半年程度であるケースが一般的で、実行計画案作成後、パブリックコメントのための供覧に 2～3 ヶ月を要し、最終的に審議会で協議の上、実行計画の策定となる例が多い。下記に各担当の役割を整理する。

自治体	各担当の役割
主担当（環境関連部署）	関連部署との WG 設立、調整及び実行計画の取りまとめ役を担う。実行計画支援業務を公募、発注し、コンサルタントの作業を管理・監督する。
WG（都市計画、交通計画、廃棄物等の部署）	実行計画の政策に関連する部署の担当者で WG を設立し、実行計画策定にあたり定期的な協議を行う
コンサルタント	実行計画作成支援業務の委託を受け、実行計画案の作成、WG との協議、審議会対応等を行う

実行計画の策定状況は別添２の図２のとおり、2013 年時点で、80%の政令指定都市、90%を超える中核都市・特例市で実行計画が策定されている。

2）GHG インベントリーに係るデータ収集

GHGインベントリー作成作業は、背景となる各種統計資料をベースにGHG排出量を項目毎、GHG毎に計算する作業である [2]。作成に必要となるデータに関して、環境省マニュアルにデータ収集先等の情報が公開されているが、自治体によって必要となるデータは異なり、自治体に応じたデータの収集が求められる。都道府県レベルではデータが比較的揃っており入手しやすいが、その他都市レベルではそのまま使える統計データの収集が困難であり、都道府県のデータを人口で按分して割り出す等の手法でデータを作成している。

別添２の図３に部門別排出量（エネルギー起源CO_2）の算定方法 [3]を示す。人口１万人未満の自治体では簡易版マニュアルに記載の簡易な算定方法が主に活用されていること、実行計画策定が義務化されている特例市以上の市では、積上法、及び積上法と按分法の組合せの割合が増えており、排出量推計の精度や要因分析を重視している傾向がうかがわれる。

3）実行計画のフォローアップ

実行計画は、5 年毎に改訂を行い、進捗確認を行う例が多い。必要に応じ、5 年未満で改訂を行う自治体もある。

GHG インベントリーは、毎年モニタリングを実施し（＝統計資料を参照し）、活動量実績に基づく再計算を行っている。インベントリー計算はエクセルシートに実績値を入力して再計算できる形式となっており、市の担当もしくはコンサルタントが行う。

4）実行計画作成に係る課題

・ <u>データ収集が自治体によっては困難な場合がある</u>

人口規模の大きい都道府県等ではデータが整備されており、インベントリー計算を実施することに大きな問題は生じないが、都市レベルの自治体では、実整備のデータに関して、都道府県のデータを人口按分する等の手法に頼らざるを得ないケースが都道府県と比較して多い。

[1] 日本の自治体には、都道府県、政令指定都市（人口 50 万以上の市のうちから政令で指定）、中核市（人口 30 万以上の市の申出に基づき政令で指定）、特例市（人口 20 万以上の市の申出に基づき政令で指定）、その他の市町村がある。本資料では、これらのうち、都道府県を除く市町村を対象とする。

[2] 統計資料自体の精度はここでは問わない。また、適切な統計資料が存在しない場合、その推計方法（例えば、カバレージが合致しない場合の排出量の按分など）はガイドラインに示されている。インベントリー作成に関し、基本的に GHG 量や活動量の「実測」によるデータ収集は行わない。

[3] 算定方法には、大別して按分法、積上法があり、それぞれ按分方法は都道府県のデータを当該自治体の割合で按分して算出する。積上法は可能な限り地方の現状を反映させる為の手法であり、例えば産業部門のデータ算出方式は、業種別エネルギー消費量÷業種別生産量×当該自治体の業種別生産額により算出した業種別エネルギー消費量を当該自治体の電力・ガスの製造業向販売量で補正して算出する。

また、インベントリー計算に際し、複数部署にまたがって入手する必要があり、主担当である環境部署だけではデータを揃えきれない問題がある。そのため、自治体によってはデータ収集に関して、ワーキンググループを設置する等により関連部署と連携の上対応している。

・ 人員体制に制約がある

自治体で実行計画策定を担当する環境部署の担当者は通常 1 名であるケースが多い。しかも実行計画策定以外にも複数の案件を 1 人で担当していることが多いため、他部署との連携及び連絡、協議の取りまとめ等を独力で実施するのが困難な状況である。その場合、外部コンサルタントに委託し、実行計画策定への支援を受けるケースが多い。

・ 実行計画策定の主担当部署が計画に含まれる施策の実施を担う部署ではない

実行計画は低炭素化に向けた政策・施策であるが、そこに盛り込まれる政策・施策は産業部門、運輸部門、民生（家庭・業務）部門等、様々な部門に関わるものがある。しかし、実行計画策定の主担当部署は多くの場合環境部であり、これらの政策・施策の大半について実施を担う部署ではないため、政策・施策の確実な実施及び他の実施担当部署とのスムーズな連携に困難を抱えるケースもある。また、産業や民生の業務部門の活動に依存する排出量の場合、自治体として排出削減のための施策を打つことが難しいケースが多い。このため、計画策定の際に他部署や自治体外の関係者と政策・施策を検討する協議の場を設け、他部署や外部関係者からのインプットを計画に反映するようにしている自治体もある。

・ 排出目標設定と PDCA サイクル

実行計画に自治体としての排出目標を設定しているケースがあるが、主に按分法を用いて GHG インベントリを作成している場合は、低炭素化の政策・施策を実施した効果を検証することが困難であり、排出目標の達成に向けて PDCA サイクルを回していくことができず、目標自体もあまり意味を持たない。排出目標を掲げ、その達成に向けて PDCA サイクルを回していくためには、積上法をより多く採用していく必要がある。

別添１

『地球温暖化対策地方公共団体実行計画（区域施策編）』策定マニュアルの構成

マニュアル利用の手引き

第1章 実行計画策定の背景、意義
1.1 地方公共団体実行計画策定の背景
1.2 新実行計画（区域施策）の意義

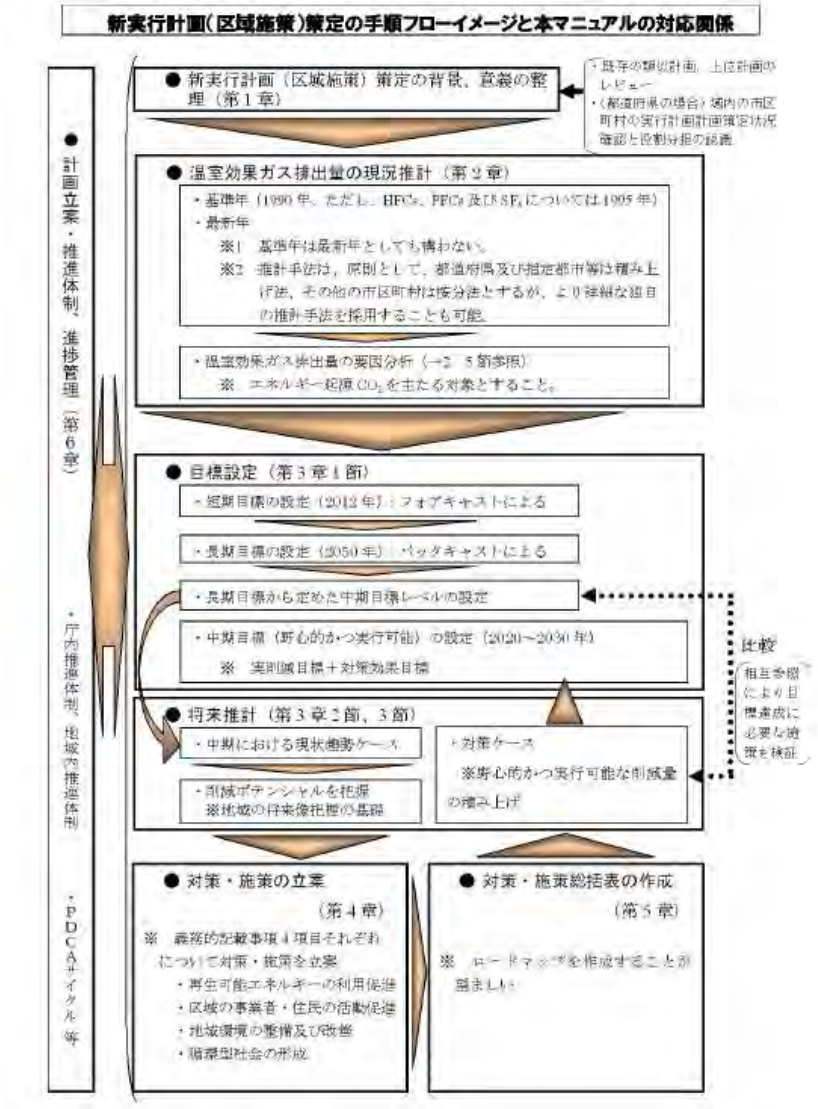
第2章 温室効果ガス排出量及び吸収量の現況推計2- 1
2.1 新実行計画（区域施策）における現況推計の位置付け
2.2 把握対象の整理と既往の温室効果ガスの現況推計方法
2.3 エネルギー起源CO2排出量の算定
2.4 エネルギー起源CO2以外の温室効果ガス排出量の算定
2.5 排出増減要因分析方法
2.6 温室効果ガス排出量算定に必要なデータの整理

第3章 温室効果ガス排出量及び吸収量の将来推計（目標設定）
3.1 新実行計画（区域施策）における目標設定の方法
3.2 現状趨勢ケースの温室効果ガス排出量の推計方法
3.3 対策ケースの温室効果ガス排出量の推計方法

第4章 温室効果ガス排出抑制等に関する施策について
4.1 太陽光、風力その他の化石燃料以外のエネルギーであって、その区域の自然的条件に適したものの利用の促進に関する施策
4.2 その区域の事業者又は住民が温室効果ガスの排出の抑制等に関して行う活動の促進に関する施策
4.3 公共交通機関の利用者の利便の増進、都市における緑地の保全及び緑化の推進その他の温室効果ガスの排出抑制等に資する地域環境の整備及び改善に関する施策
4.4 その区域内における廃棄物等の発生の抑制その他の循環型社会の形成に関する施策

第5章 対策・施策総括表
5.1 対策・施策総括表
5.2 ロードマップの作成
5.3 ロードマップ作成の手順

第6章 計画立案・推進体制・進捗管理（PDCA）
6.1 庁内推進体制、地域内推進体制
6.2 施策進捗状況把握、評価方法（PDCAサイクルの考え方）



以下の図表の出典はいずれも環境省作成の「地方公共団体における 地球温暖化対策の推進に関する法律 施行状況調査結果報告書（2014 年３月）

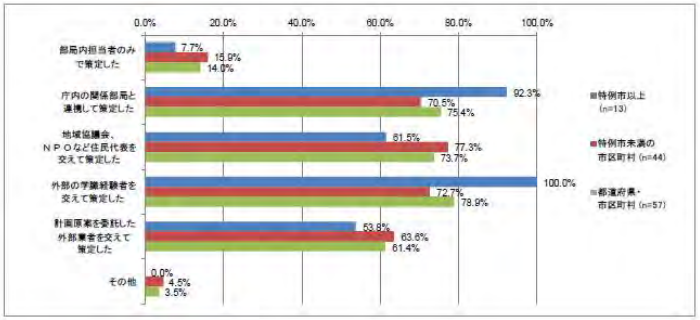


図１　実行計画（区域施策編）策定時の体制（参加した関係者の構成）

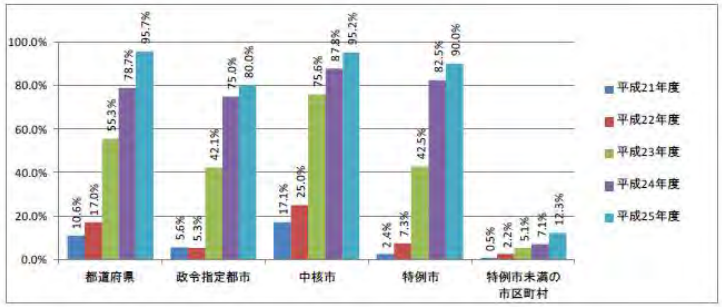
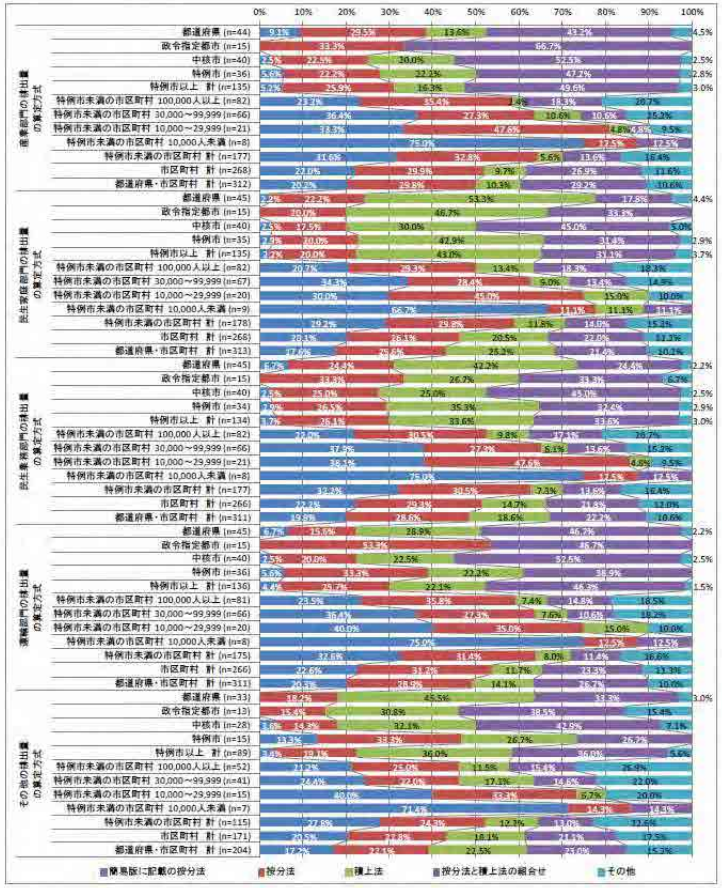


図２　カテゴリー別実行計画策定済み自治体数の割合



注）対象は「実行計画（区域施策編）を策定済み」と回答した団体のうち本設問を回答した団体

図３　部門別排出量（エネルギー起源 CO_2）の算定方式

Progress in the Formulation of Action Plans on Global Warming (including GHG inventory) in Japanese Cities

Note: This report is prepared based on the information contained in the survey report of the Ministry of Environment of Japan on the progress in the formulation of action plans on global warming by local governments as well as information on cases of several cities of their actual planning process.

1) Background and Current State of the Action Plan Formulation

Certain local governments in Japan[1] are obliged to formulate their action plans including GHG inventory by the provision of the Article 20-3 of the Law on Promotion of Global Warming Countermeasures. Local governments of small cities (those not categorized as ordinance-designated cities, core cities and special cities (see the foot note)) are exempted from the obligation but are required to make the best efforts to formulate it. Most local governments have formulated their action plans using a manual for formulation of the action plans on global warming (for area-wide measures) of local governments prepared by the Ministry of Environment. The manual describes the workflow of the formulation, follow-up of the action plan in detail, and list of reference data and its sources. The Figure in Attachment 1 shows the contents of the manual and corresponding overall workflow of formulation of the action plan.

Since most local governments have constraints on the number of staff, they tend to use consultant services for formulating the draft action plan. The responsible department in the local government is usually environmental department. It will establish a working group with the relevant departments (in charge of city planning, transportation, waste management etc.) and receive their data as needed. The working group will hold discussions based on the draft action plan prepared by the consultants and reflect their ideas of the objectives and the measures on the plan. In many cases, the structure to formulation the action plans consists of one staff from the environmental department as the main staff in charge (receiving support from other staff when necessary) and 3-5 consultants to support the staff in charge. Figure 1 in Attachment 2 shows the structure to formulate the action plans (composition of the relevant people who have participated) by size of the municipalities. It shows that many municipalities have formulated the plan in collaboration with the relevant staff inside and outside the local government.

Although the length of time required for plan formulation varies by municipality, it is common to require about six months. In general, the period for receiving public comment requires 2-3 months after the formulation of the draft action plan. The action plan is finally discussed and finalized at the specialized city council. The roles of related persons are summarized below.

Municipality	Role of person/group
Staff in charge (Department in charge of environmental issues)	Staff in charge sets up the working group (WG) with the relevant departments, and plays a coordinating role to compile the plan. In addition, they procure and supervise consultant services to support the formulation of the action plan.
WG (Department in charge of City planning, Transport planning, waste management, etc)	WG is to be set up by the staff of the relevant departments of the action plan. WG meets periodically to discuss the action plan.
Consultants	The consultants support the staff in charge in the preparation of the draft action plan, discussions with WG, and responding to the specialized city council.

As shown in Figure 2 in Attachment 2 indicating current progress on formulation of the action plans, 80% of ordinance-designated cities and more than 90% of core cities and special cities formulated the action plans as of 2013.

2) Data Collection for GHG Inventory

To develop the GHG inventory, it is necessary to calculate the GHG emission for each item and each gas based on various kinds of background statistical data[2]. The sources of data necessary for this work are shown in the manual formulated by the Ministry of Environment, but each municipality needs to collect different kinds of data. While the data of prefectural level are usually easily available, it is often difficult for municipal level local governments to collect the statistical data that can be used directly for the calculation. In such cases, they have to process the prefectural level data by, for example, pro rata allocation according to population of each municipality.

Figure 3 in attachment 2 shows calculation methods of GHG emission[3] (CO_2 from

[1] In Japan, there are prefectures, ordinance-designated cities with a population of 500,000 and over, core cities with a population of 300,000 and over designated by government ordinance, special cities with a population of 200,000 over designated by government ordinance, and other municipalities. Among these, this report targets at the municipalities except prefectures.

[2] Accuracy of the statistical data is not questioned at this stage. Also, if there is no adequate statistical data, estimate method described in the guideline, such as proportional division of emission when coverage doesn't fit, can be applied. GHG emission or activity data won't be collected by actual measurement for inventory calculation.

[3] There are two kinds of calculation method: proportional division method and summation method. Proportional division method is to proportionally allocate the prefectural data in population of each municipality. On the other hand, summation method is the method for reflecting the regional

energy-related sources) used in different sectors and types of cities. It shows that municipalities with a population of less than 10,000 tend to use the simple calculation method described in the simplified version of the manual. On the other hand, the percentage of the summation method and the combination of summation and pro rata methods is increasing for the special cities and larger cities, which are obligated to formulate the action plan. This indicates that they seem to have a tendency to focus on the accuracy of estimation of emission and analysis of the factors of emissions.

3) Follow-Up on the Action Plan

Most municipalities revise the action plan every five years to check the progress of the plan. Some municipalities revise more frequently according to their needs.

GHG inventory is monitored and recalculated in reference to the statistical data on actual activity performance data. The inventory is easily recalculated by inputting the activity performance data into an Excel spreadsheet by the municipal staff in charge or the consultants.

4) Challenges for Formulation of the Action Plan

・ Some municipalities face difficulties in collecting the data

Prefectures generally have no major problems in inventory calculation, since adequate data are maintained and available. On the other hand, municipalities in many cases have to rely on the data of the prefectural level and process them for their own uses.

Moreover, the environmental department responsible for the formulation of the action plan often needs to acquire the data from several other departments. To address this issue, many municipalities establish a working group in order to have good relations with the relevant departments and collect the needed data from them.

・ Constraints on the number of staff

It is not rare that there is only one person in charge of the formulation of the action plan in the environmental department. Moreover, the person in charge tends to take charge of more than one project beside formulation of the action plan. Therefore, the staff in charge often faces difficulties in undertaking all the tasks alone. Thus, most municipalities use consultant services to receive support for the formulation of the action plan.

・ The department responsible for the formulation of the action plan may not be the department that will carry out the measures included in the plan.

The action plan aims for low carbon society that includes policies and measures related to industrial sector, transportation sector, consumer (household, business) sectors, and so on. In many cases, the environmental department is the responsible department to formulate the action plan, but is not responsible for implemention of many of the measures included in the plan. Therefore, some municipalities face difficulties in ensuring the implementation of the measures included in the plan. In addition, when GHG emission depends heavily on the activities of industry or operation of consumer sector, municipalities may experience difficulties in taking effective measures to reduce GHG emission in those sectors. Therefore some municipalities hold consultation regarding the policies and measures with other departments and wider stakeholders outside the municipalities in the process of formulation of the action plan, and ensure that inputs from other departments and other stakeholders are reflected in the action plan.

・ Setting of emission target and PDCA cycle

Some municipalities have set the municipal target for GHG emission in the action plan. However, the achievement of the target may not be verifiable in case the municipality heavily depends on the pro rata method to compile the GHG inventory. This is because it is difficult to verify the impacts of the measures for low-carbon society and also difficult to make the PDCA cycle (Plan, Do, Check, Adjust) function towards the achievement of the target. Therefore, it is desirable for the municipalities to apply the summation method as much as possible so that they can apply the PDCA cycle towards the achievement of the low-carbon society.

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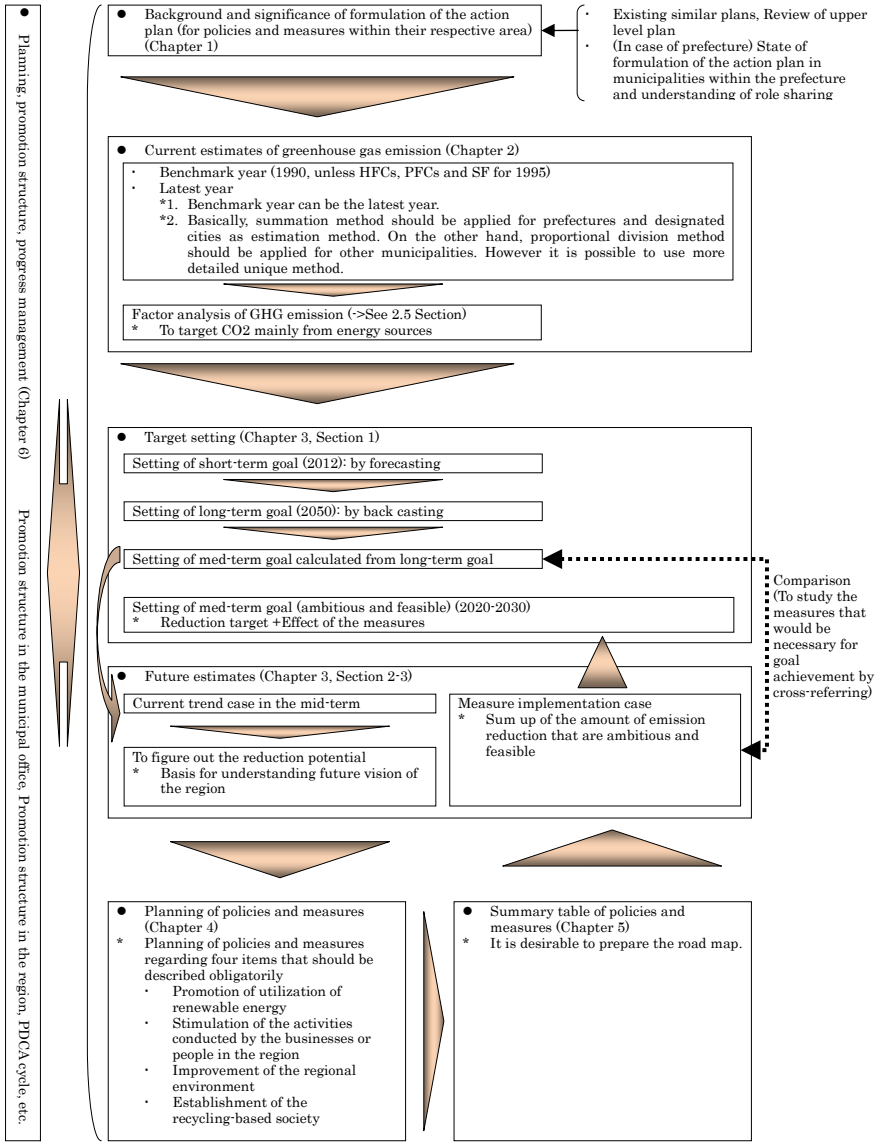
situation as much as possible. For example, the method to calculate data of industrial sector is that industry-classified energy consumption, which is calculated from the following formula; industry-classified energy consumption/ industry-classified production volume*industry-classified production value in the municipality, is corrected by the volume of sales of electricity and gas to the manufacturing industry within the municipality.

Attachment 1

Contents of "Manual for formulation of the action plans of local governments on global warming (for area-wide measures)"

Guidance for Use of the Manual

Flow image of formulation of the new action plan and its correspond to the manual



Attachment 2

The following figures were excerpted from "Survey results on the state of enforcement of the Act on Promotion of Global Warming Countermeasures by local government (March 2014)" prepared by the Ministry of the Environment.

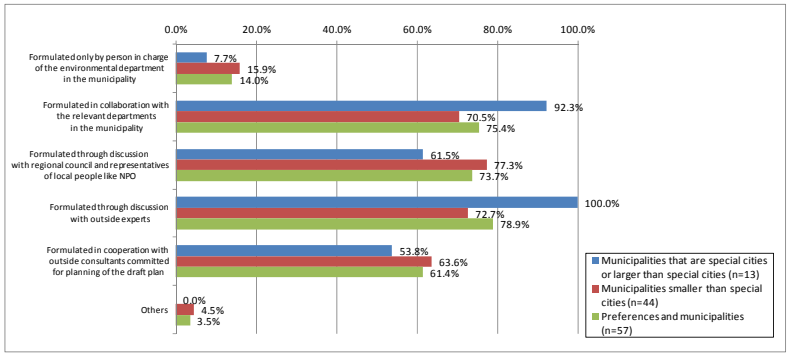


Figure 1 Implementation structure of formulation of the action plans (for area-wide measures)

(Composition of the relevant people who have participated)

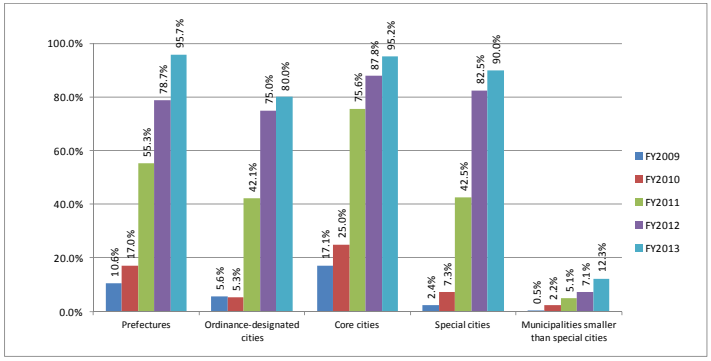


Figure 2 Number of municipalities that have formulated the action plan by category

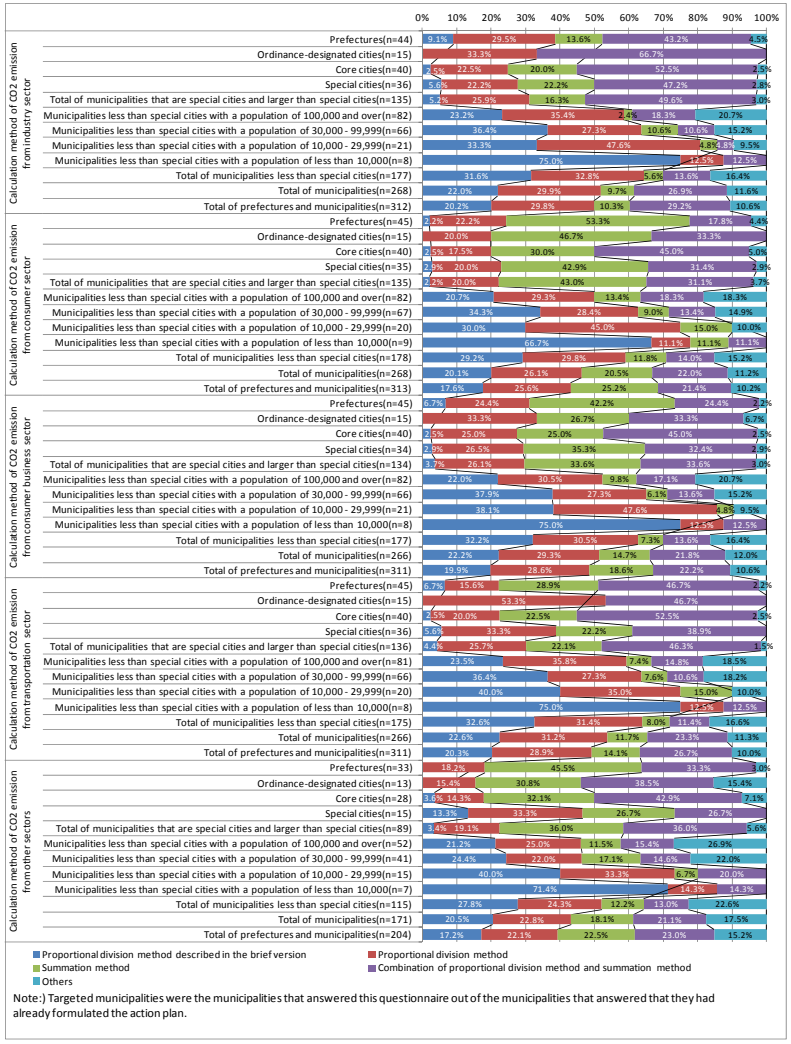


Figure 3 Calculation method of CO_2 emission from energy sources by sector

添付資料 2

セミナー資料

Agenda ／List of Participants

Policy Dialogue on Climate Change in SIDS
2-4 July 2014, Tokyo Japan

Participant's List in Alphabetical Order

#	Countries	Name	Position
1	Antigua and Barbuda	H.E. Ms. Diann Christine Black-Layne	Ambassador for Climate Change
2	Barbados	Mr. Mohammed Iqbal Degia	Senior Foreign Service officer, Ministry of Foreign Affairs and Foreign Trade
3	Belize	Ms. Ann Josephine Gordon	National Climate Change Coordinator, Climate Change Office, Ministry of Fisheries, Forest and Sustainable Development
4	Republic of Cape Verde	Mr. Carlos Fernandes Semedo	Director General
5	Cook Islands	Ms. Anna Elizabeth Tiraa	Director, Climate Change Cook Islands, Office of the Prime Minister
6	Dominican Republic	Mr. Omar Bolivar Ramirez Tejada	Executive Vice President of the National Council on Climate Change and the Clean Development Mechanism
7	Republic of Fiji	Dr. Mahendra Kumar	Director for Climate Change, Ministry of Foreign Affairs and International Co-operation
8	Grenada	Dr. Spencer Linus Joseph Thomas	Senior Negotiator
9	Republic of Guyana	Mr. Andrew Ranji Bishop	Chief Negotiator
10	Republic of Kiribati	Mr. Tutu Tekanene	Senior Assistant Secretary of the Office of the Beretitenti
11	Republic of Maldives	Mr. Husny Mareer Mohamed	Assistant Director, Department of Climate Change and Energy, Ministry of Environment and Energy
12	Republic of the Marshall Islands	Mr. Bruce Kijiner	Director, Office of Environmental Planning and Policy Coordination
13	Republic of Nauru	Mr. Rennier Stanislaus Gadabu	AOSIS Attache, Mission of the Republic of Nauru to the United Nations
14	Republic of Palau	Ms. Charlene Takako Mersai	National Environmental Planner/Climate Change Coordinator, Office of Environmental Response & Coordination, Office of the President
15	Independent State of Papua New Guinea	Ms. Rensie Xhira Bado Panda	Senior Policy Analyst and Focal Point International Climate Change Negotiations
16	Saint Lucia	Ms. Annette Areatha Rattigan-Leo	Deputy Chief Sustainable and Environmental Officer
17	Independent State of Samoa	Ms. Anne Rasmussen	Senior Negotiator
18	Solomon Islands	Mr. Hudson Ata Kauhiona	Deputy Director, Climate Change Division, Ministry of Environment, Climate Change, Disaster Management and Meteorology
19	Republic of Trinidad and Tobago	Ms. Rueanna Haynes	Second Secretary
20	Tuvalu	Mr. Kiali Molu	Chief of Protocol HOD for DFA & Member of the Advisory Committee on Climate Change to cabinet

#	Countries	Name	Position
21	Republic of Vanuatu	Mr. Noel Lango	Political Advisor to the Minister for Climate Change Adaptation
22	Caribbean Community Climate Change Center(5Cs)	Dr. Kenrick Rodford Leslie	Executive Director, Caribbean Community Climate Change Centre
23	Secretariat of the Pacific Regional Environment Programme(SPREP)	Mr. David Albert Sheppard	Director General

Program for Policy Dialogue

Day 1 : July 2nd			
Time	Program	Chairs	Venue
9:45～10:00	Registration	---	Hotel Chinzanso Tokyo, Wisteria room (1st floor)
10:00～10:30	Opening remarks, general guidance about the dialogue program	MOFA	
10:30～12:00	Session1: Climate Change - Preparation of national contributions of SIDS - Adaptation in the new framework loss and damage	MOFA	
12:00～13:30	Lunch	---	Maple room (1st floor)
13:30～14:30	Session2: Current situation of Joint Crediting Mechanism (JCM) and future vision	MOFA	Wisteria room (1st floor)
14:30～14:45	Coffee break	---	
14:45～15:45	Session3: Japan's development policy and activities on climate change in SIDS	JICA	
19:00～	Welcome dinner	MOFA	Popular room
Day 2 : July 3rd			
9:15～ 9:30	Registration and briefing	---	Hotel Chinzanso Tokyo, Wisteria room (1st floor)
9:30～11:30	Presentation on climate change by private companies: *Nihon Genryo Co.,Ltd, Blest.Co.Ltd., Komai Haltec Inc. and Hitachi, Ltd.* ** During this session, lunch will be provided.*	---	
11:30～13:00	Travel to Abiko city (CRIEPI)	---	---
13:00～14：30	Visit to Central Research Institute of Electric Power Industry (CRIEPI)	---	Abiko city, Chiba pref.
15:00～16:00	Visit to Mayekawa MFG. Co., Ltd.	---	Moriya city, Ibaraki pref.
17:30～19:00	Vist to Tokyo skytree	---	Sumida city, Tokyo Met.
19:00～19:30	Travel to Hotel	---	---
Day 3 : July 4th			
9:45～10:00	Registration and briefing	---	Hotel Chinzanso Tokyo, Ginkgo room (4th floor)
10:00～12:00	Session4: Open discussion with local government, private companies, NGO on cooperation approach between Japan and the SIDS in international negotiation	MOFA	
12:00～14:00	Lunch	---	Bamboo room (2nd floor)
14:00～16:00	Session5: NAMA workshop	JICA	Ginkgo room (4th floor)
16:00～16:30	Closing remarks	MOFA	

添付資料 3

セミナー資料

セッション 2

Recent Development of The Joint Crediting Mechanism (JCM)
外務省

Recent Development of The Joint Crediting Mechanism (JCM)

July 2014
Government of Japan

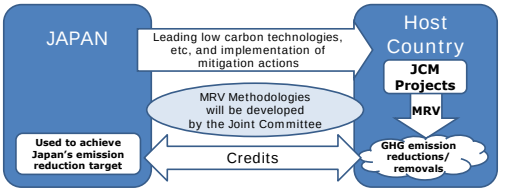
All ideas are subject to further consideration and discussion with host countries

Low-Carbon Growth

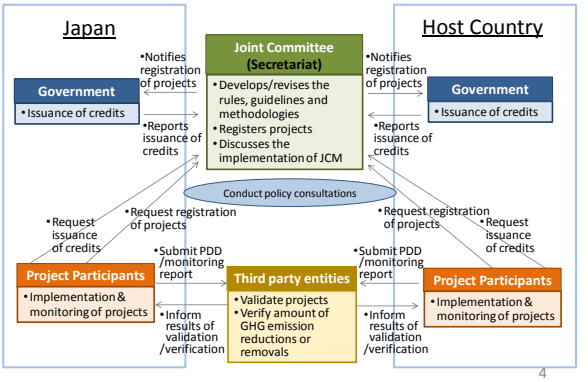
- In order to effectively address the issue of climate change, it is necessary for both developed and developing countries to achieve low-carbon growth all around the world by fully mobilizing technology, markets and finance.
- Widespread use of advanced low-carbon technologies and products in various fields including renewable energy, highly efficient power generation, home electronics, low-emission vehicles, and energy-savings in factories must be accelerated.
- Realizing a low carbon society by combining these technologies and products with appropriate systems, services, and infrastructure is also crucial.

Basic Concept of the JCM

- Facilitating diffusion of leading low carbon technologies, products, systems, services, and infrastructure as well as implementation of mitigation actions, and contributing to sustainable development of developing countries.
- Appropriately evaluating contributions to GHG emission reductions or removals from Japan in a quantitative manner, by applying measurement, reporting and verification (MRV) methodologies, and use them to achieve Japan's emission reduction target.
- Contributing to the ultimate objective of the UNFCCC by facilitating global actions for GHG emission reductions or removals, complementing the CDM.



Scheme of the JCM



The role of the Joint Committee and each Government

- The Joint Committee (JC) consists of representatives from both Governments.
- The JC develops rules and guidelines necessary for the implementation of the JCM.
- The JC determines either to approve or reject the proposed methodologies, as well as develops JCM methodologies.
- The JC designates the third-party entities (TPEs).
- The JC decides on whether to register JCM projects which have been validated by the TPEs.
- Each Government establishes and maintains a registry.
- On the basis of notification for issuance of credits by the JC, each Government issues the notified amount of credits to its registry.

Approaches of the JCM

- The JCM should be designed and implemented, taking into account the followings:

(1) Ensuring the robust methodologies, transparency and the environmental integrity;

(2) Maintaining simplicity and practicality based on the rules and guidelines;

(3) Promoting concrete actions for global GHG emission reductions or removals;

(4) Preventing uses of any mitigation projects registered under the JCM for the purpose of any other international climate mitigation mechanisms to avoid double counting on GHG emission reductions or removals.

Features of the JCM

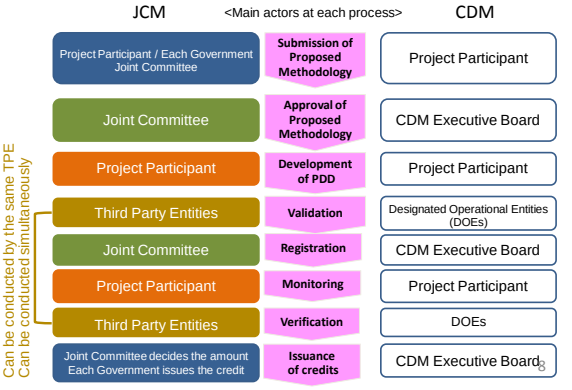
(1) The JCM starts its operation as the non-tradable credit type mechanism.

(2) Both Governments continue consultation for the transition to the tradable credit type mechanism and reach a conclusion at the earliest possible timing, taking account of implementation of the JCM.

(3) The JCM aims for concrete contributions to assisting adaptation efforts of developing countries after the JCM is converted to the tradable credit type mechanism.

(4) The JCM covers the period until a possible coming into effect of a new international framework under the UNFCCC.

Project Cycle of the JCM and the CDM

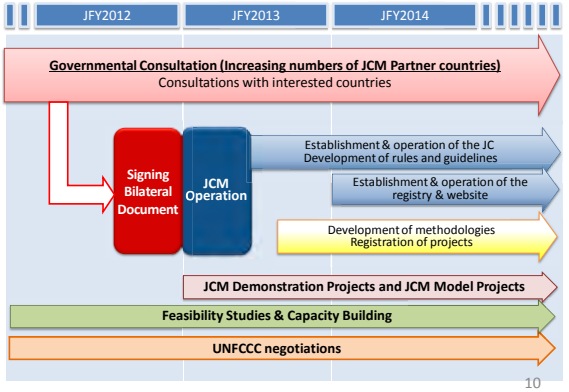


Key features of the JCM in comparison with the CDM

(Subject to further consideration and discussion with host countries)

	JCM	CDM
Governance	- "de-centralized" structure (Each Government, Joint Committee)	- "centralized" structure (CMP, CDM Executive Board)
Sector/project Coverage	- Broader coverage	- Specific projects are difficult to implement in practice (e.g. USC coal-fired power generation)
Validation of projects	- In addition to DOEs, ISO14065 certification bodies can conduct - Checking whether a proposed project fits eligibility criteria which can be examined objectively	- Only DOEs can conduct - Assessment of additionality of each proposed project against hypothetical scenarios
Calculation of Emission Reductions	- Spreadsheets are provided - Default values can be used in conservative manner when monitored parameters are limited.	- Various formulas are listed - Strict requirements for measurement of parameters
Verification of projects	- The entity which validated the project can conduct verification - Validation & verification can be conducted simultaneously	- In principle, the entity which validated the project can not conduct verification - Validation & verification must be conducted separately

Roadmap for the JCM



Countries with which Japan has signed on bilateral documents

- Japan has held consultations for the JCM with developing countries since 2011 and signed the bilateral document for the JCM with Mongolia, Bangladesh, Ethiopia, Kenya, Maldives, Viet Nam, Lao PDR, Indonesia, Costa Rica, Palau and Cambodia.


Mongolia
On Jan. 8, 2013
(Ulaanbaatar)


Bangladesh
On Mar. 19, 2013
(Dhaka)


Ethiopia
On May 27, 2013
(Addis Ababa)


Kenya
On Jun. 12,2013
(Nairobi)


Maldives
On Jun. 29, 2013
(Okinawa)


Viet Nam
On Jul. 2, 2013
(Hanoi)


Lao PDR
On Aug. 7, 2013
(Vientiane)


Indonesia
On Aug. 26, 2013
(Jakarta)


Costa Rica
On Dec. 9, 2013
(Tokyo)


Palau
On Jan. 13, 2014
(Ngerulmud)


Cambodia
On Apr. 11, 2014
(Phnom Penh)

- Japan held the Joint Committee with Mongolia, Bangladesh, Ethiopia, Kenya, Maldives, Viet Nam, Indonesia and Palau respectively.

The current status of UNFCCC negotiation (1/2)

Decision 1/CP18

41. *Acknowledges* that **Parties, individually or jointly, may develop and implement various approaches, including opportunities for using markets** and non-markets, to enhance the cost-effectiveness of, and to promote, mitigation actions, bearing in mind different circumstances of developed and developing countries;
42. *Re-emphasizes* that, as set out in decision 2/CP.17, paragraph 79, all such approaches must meet standards that deliver real, permanent, additional and verified mitigation outcomes, avoid double counting of effort and achieve a net decrease and/or avoidance of GHG emissions;
44. *Requests* the SBSTA to conduct a work programme to elaborate a framework for such approaches, drawing on the work of the AWG-LCA on this matter, including the relevant workshop reports and technical paper, and experience of existing mechanisms, with a view to recommending a draft decision to the COP for adoption at its 19th session;
45. *Considers* that any such framework will be developed under the authority and guidance of the Conference of the Parties;

The current status of UNFCCC negotiation (2/2)

Decision 1/CP18

46. *Decides* that the work programme referred to in paragraph 44 above shall address the following elements, inter alia:
   (a) The purposes of the framework;
   (b) The scope of approaches to be included under the framework;
   (c) A set of criteria and procedures to ensure the environmental integrity of approaches in accordance with decision 2/CP.17, paragraph 79;
   (d) Technical specifications to avoid double counting through the accurate and consistent recording and tracking of mitigation outcomes;
   (e) The institutional arrangements for the framework;

- The JCM is one of various approaches Japan and partner countries are jointly developing and implementing , and Japan intends to contribute to elaborating the framework for such approaches under the UNFCCC.
- Japan also intends to report to the COP regarding the use of the JCM in Biennial Reports including the Common Tabular in line with Decision 19/CP18.

Technical Details Currently Considered for the JCM

(Subject to further consideration and discussion with host countries)

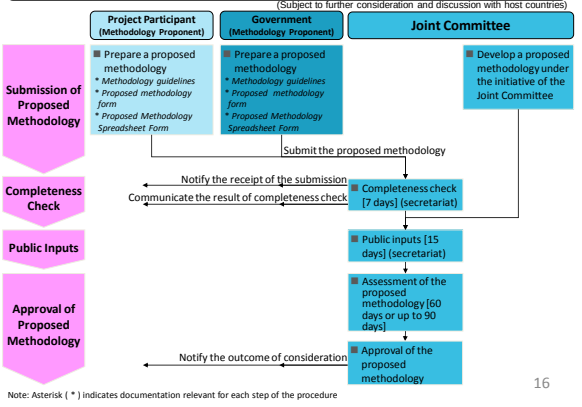
Necessary documents for the JCM

(Subject to further consideration and discussion with host countries)

		Rules and Guidelines
Overall		✓ Rules of Implementation ✓ Project Cycle Procedure ✓ Glossary of Terms ✓ Guidelines for Designation as a Third-Party Entity (TPE guidelines)
Joint Committee		✓ Rules of Procedures for the Joint Committee (JC rules)
Methodology		✓ Guidelines for Developing Proposed Methodology (methodology guidelines)
Project Procedures	**Developing a PDD** **Monitoring**	✓ Guidelines for Developing Project Design Document and Monitoring Report (PDD and monitoring guidelines)
	Validation **Verification**	✓ Guidelines for Validation and Verification (VV guidelines)

Methodology Development Procedure of the JCM

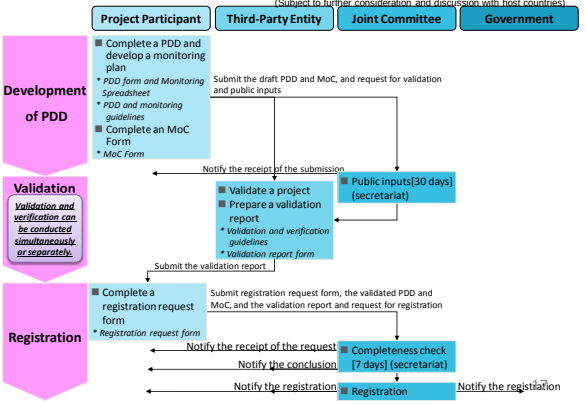
(Subject to further consideration and discussion with host countries)



Note: Asterisk (*) indicates documentation relevant for each step of the procedure

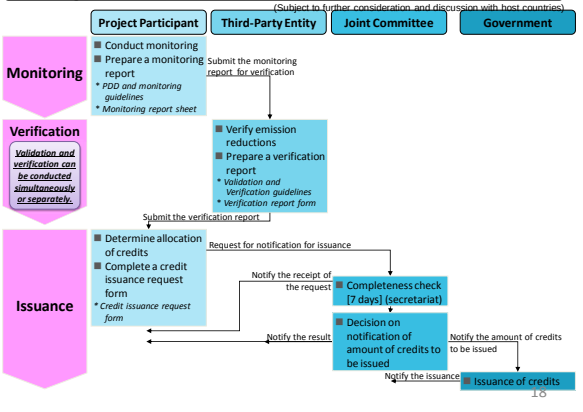
Registration & Issuance Procedure of the JCM (1/2)

(Subject to further consideration and discussion with host countries)



Registration & Issuance Procedure of the JCM (2/2)

(Subject to further consideration and discussion with host countries)



Rules of Procedures for the Joint Committee

(Subject to further consideration and discussion with host countries)

Members

- The Joint Committee (JC) consists of representatives from both Governments.
- Each Government designates members, which may not exceed [10].
- The JC has two Co-chairs to be appointed by each government (one from the host country and the other from Japan). Each Co-Chair can designate an alternate from members of the JC.

Decision making in the JC

- The JC meets no less than once a year and decision by the JC is adopted by consensus.
- The JC may adopt decisions by electronic means in the following procedure:
  (a) The proposed decisions are distributed by the Co-Chairs to all members of the JC.
  (b) The proposed decision is deemed as adopted when,
    i) no member of the JC has provided negative assertion within [20] calendar days after distribution and both Co-Chairs have made affirmative assertion, or
    ii) all members of the JC have made affirmative assertion.
- If a negative assertion is made by one of the JC members, the Co-Chairs take into account the opinion of the member and take appropriate actions.
- The JC may hold conference calls to assist making decisions by electronic means.

External assistance

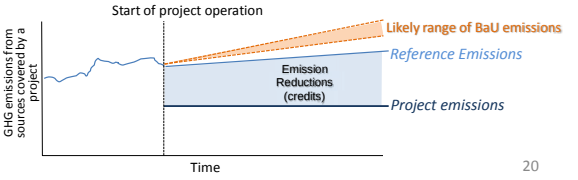
- The JC may establish panels and appoint external experts to assist part of its work.

Languages: English **Secretariat:** The secretariat services the JC.
Confidentiality: Members of the JC, Secretariat, etc. respect confidentiality.
Record of the meeting: The full text of all decisions of the JC is made publicly available.

Basic Concept for Crediting under the JCM

(Subject to further consideration and discussion with host countries)

- In the JCM, emission reductions to be credited are defined as the difference between "reference emissions" and project emissions.
- The reference emissions are calculated below business-as-usual (BaU) emissions which represent plausible emissions in providing the same outputs or service level of the proposed JCM project in the host country.
- This approach will ensure a net decrease and/or avoidance of GHG emissions.



Crediting Threshold

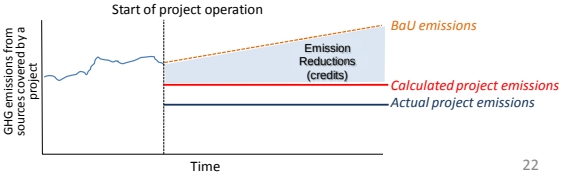
(Subject to further consideration and discussion with host countries)

- Reference emissions are calculated by multiplying a "crediting threshold" which is typically expressed as GHG emissions per unit of output by total outputs.
- A crediting threshold should be established *ex ante* in the methodology applicable for the same project type in the host country. It should also be established conservatively in order to calculate reference emissions below BaU emissions.
- This standardized approach will greatly reduce the burden of analyzing many hypothetical scenarios for demonstrating additionality of the proposed project such as under the CDM, whereas increase transparency for calculating GHG emission reductions.

Addendum: ways to realize net reduction

(Subject to further consideration and discussion with host countries)

- A net decrease and/or avoidance of GHG emissions can be realized in alternative way, instead of calculating the reference emissions below BaU emissions.
- Using conservative default values in parameters to calculate project emissions instead of measuring actual values, will lead calculated project emissions larger than actual project emissions.
- This approach will also ensure a net decrease and/or avoidance of GHG emissions, as well as reduce burdens of monitoring.



JCM Methodology

- Key Features of the JCM methodology
  - The JCM methodologies are designed in such a way that project participants can use them easily and verifiers can verify the data easily.
  - In order to reduce monitoring burden, default values are widely used in a conservative manner.
  - Eligibility criteria clearly defined in the methodology can reduce the risks of rejection of the projects proposed by project participants.

Eligibility criteria	• A "check list" will allow easy determination of eligibility of a proposed project under the JCM and applicability of JCM methodologies to the project.
Data (parameter)	• List of parameters will inform project participants of what data is necessary to calculate GHG emission reductions/removals with JCM methodologies. • Default values for specific country and sector are provided beforehand.
Calculation	• Premade spreadsheets will help calculate GHG emission reductions/removals automatically by inputting relevant values for parameters, in accordance with methodologies.

Basic concept of Eligibility criteria in JCM methodology

(Subject to further consideration and discussion with host countries)

The eligibility criteria in each JCM methodology should be established, in order to reduce emissions by:

- accelerating the deployment of low carbon technologies, products and services, which will contribute to achieving net emission reductions;
- facilitating the nationally appropriate mitigation actions (NAMAs) in host countries.

1. Both Governments determine what technologies, products, etc should be included in the eligibility criteria through the approval process of the JCM methodologies by the Joint Committee.

2. Project participants can use the list of approved JCM methodologies, similar to positive list, when applying for the JCM project registration.

Eligibility Criteria of the JCM

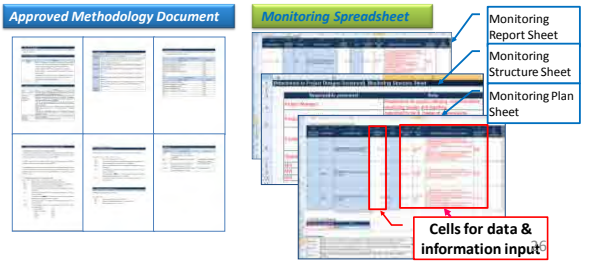
(Subject to further consideration and discussion with host countries)

- Eligibility criteria in JCM methodologies shall contain the following:
  1. The requirements for the project in order to be registered as a JCM project. *<Basis for the assessment of validation and registration of a proposed project>*
  2. The requirements for the project to be able to apply the JCM methodology. *<same as "applicability condition of the methodology" under the CDM>*
- Examples of eligibility criteria 1.
  - Introduction of *xx* (products/technologies) whose design efficiency is above *xx* (e.g. output/kWh) *<Benchmark Approach>*
  - Introduction of *xx* (specific high efficient products/technologies, such as air conditioner with inverter, electric vehicles, or PV combined with battery) *<Positive List Approach>*
- Examples of eligibility criteria 2.
  - Existence of historical data for *x* year(s)
  - Electricity generation by *xx* (e.g. PV, wind turbine) connected to the grid
  - Retrofit of the existing boiler

Overview of JCM Methodology, Monitoring Plan and Monitoring Report

(Subject to further consideration and discussion with host countries)

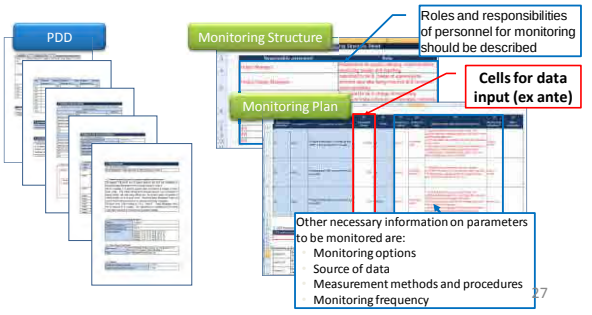
- JCM methodology consists of the followings.
  - Approved Methodology Document
  - Monitoring Spreadsheet
    - Monitoring Plan Sheet (including Input Sheet & Calculation Process Sheet)
    - Monitoring Structure Sheet
    - Monitoring Report Sheet (including Input Sheet & Calculation Process Sheet)



PDD and Monitoring Plan

(Subject to further consideration and discussion with host countries)

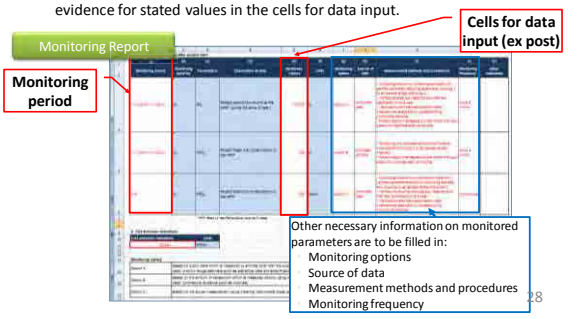
- Developing a Project Design Document (PDD) and a Monitoring Plan
  - A PDD form should be filled in with information of the proposed project.
  - A Monitoring Plan consists of Monitoring Plan Sheet and Monitoring Structure Sheet, and it should be filled in as well.



Monitoring Report

(Subject to further consideration and discussion with host countries)

- Making a Monitoring Report
  - A Monitoring Report should be made by filling cells for data input (ex post) in the Monitoring Report Sheet with monitored values.
  - Project participants prepare supporting documents which include evidence for stated values in the cells for data input.



Possible Contents of the JCM PDD

(Subject to further consideration and discussion with host countries)

A. Project description
- A.1. Title of the JCM project
- A.2. General description of project and applied technologies and/or measures
- A.3. Location of project, including coordinates
- A.4. Name of project participants
- A.5. Duration
- A.6. Contribution from developed countries

B. Application of an approved JCM methodology(ies)
- B.1. Selection of JCM methodology(ies)
- B.2. Explanation of how the project meets eligibility criteria of the approved methodology

C. Calculation of emission reductions
- C.1. All emission sources and their associated greenhouse gases relevant to the JCM project
- C.2. Figure of all emission sources and monitoring points relevant to the JCM project
- C.3. Estimated emissions reductions in each year

D. Environmental impact assessment

E. Local Stakeholder consultation
- E.1. Solicitation of comments from local stakeholders
- E.2. Summary of comments received and their consideration

F. References

Annex

Approved Methodology Spreadsheet consists of Monitoring Plan Sheet, Monitoring Structure Sheet and Monitoring Report Sheet, and it shall be attached to the PDD.

References

- JCM Demonstration Projects and JCM Model Projects
- Feasibility Studies
- Capacity Building

JCM Promotion Scheme by METI

JCM Demonstration Projects

■JCM Demonstration Projects are implemented by NEDO (New Energy and Industrial Technology Development Organization), which supports the project costs necessary to verify the amount of GHG emission reduction in line with JCM rules and guidelines.
■The budget for FY 2014: 6billion JPY (approximately $61million)
■Coverage of project cost: Cost of the JCM Demonstration Projects necessary for MRV
e.g. Cost of design, machines, materials, labor, travel, etc.
■Eligibility for the JCM Demonstration Projects:
- Concrete Projects to demonstrate the effectiveness of leading Japanese technologies and/or products installed and operated in the projects, and the amount of their GHG emission reduction with MRV methodology by actual operation
- Project Participants consist of entities from both countries, only the Japanese entities can apply for the JCM Demonstration projects. The projects shall be completed within 3 years.

JCM Feasibility Study (FS)

■The study to promote potential JCM projects and to survey their feasibility as well as to check the practicality of the MRV methodology.

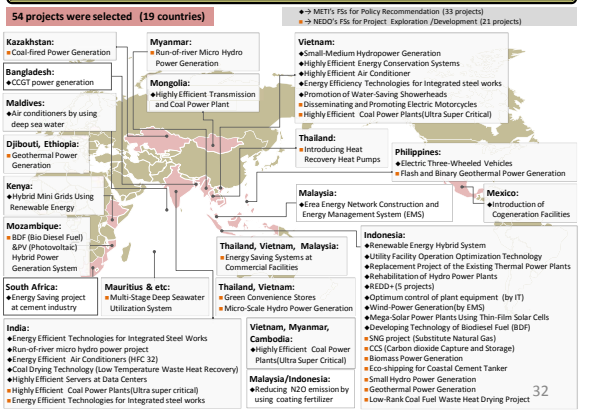
Capacity Building Programmes

■Variety of capacity building activities to increase technical experts
e.g.,) Experts on measuring amount of emission reductions by introducing low carbon technologies and products in the host country.

JCM Feasibility Studies (FSs) by METI & NEDO in FY2012

54 projects were selected (19 countries)

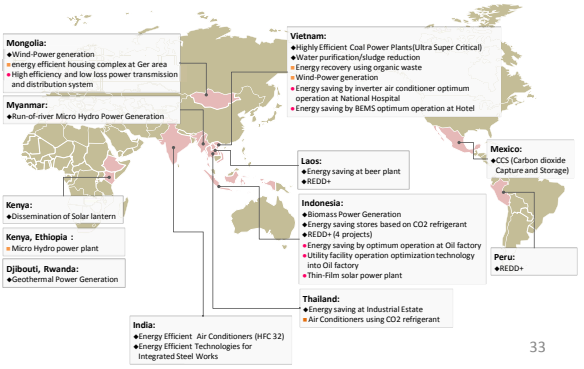
◆→ METI's FSs for Policy Recommendation (33 projects)
■→ NEDO's FSs for Project Exploration /Development (21 projects)



JCM Feasibility Studies (FSs) by METI & NEDO in FY2013

30 projects were selected (13countries)

◆→ METI's FSs for Policy Recommendation (19 projects)
■→ NEDO's FSs for Project Exploration /Development (5 projects)
●→ NRDO's Demonstration Project (6 project)



Capacity Building Programmes & Feasibility Studies by MOE

Capacity Building Programmes

Region
Asia, Africa, Latin America, and Small Island countries

Activities
Consultations, workshops, seminars, training courses and study tours, etc.

Scope
Facilitating understanding on the JCM rules and guidelines, enhancing capacities for implementing MRV

Target
Government officials, private sectors, candidate for validation & verification entities, local institutes and NGOs

Feasibility Studies

Objective
Elaborating investment plan on JCM projects, developing MRV methodologies and investigating feasibility on potential JCM projects,

Type of studies

JCM Project Planning Study (PS)	To develop a JCM Project in the next fiscal year
JCM Feasibility Study (FS)	To survey feasibility of potential JCM projects
Large Scale JCM Feasibility Study	To survey feasibility of potential large scale JCM projects including city level cooperation

Reports
Available at GEC (Global Environment Centre Foundation) website <URL: http://gec.jp >

Outreach

New Mechanisms Information Platform website provides the latest information on the JCM <URL: http://www.mmechanisms.org/e/index.html>

Financing Programme for JCM Model Projects by MOE

The budget for FY 2014
*1.2 billion JPY (approx. **USD12 million**) per year by FY2016*
(total 3.6 billion JPY)

Government of Japan

Finance part of an investment cost (**up to the half**)

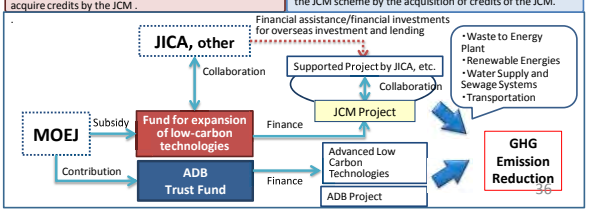
Conduct MRV and expected to deliver at least half of JCM credits issued

International consortiums
(which include Japanese entities)

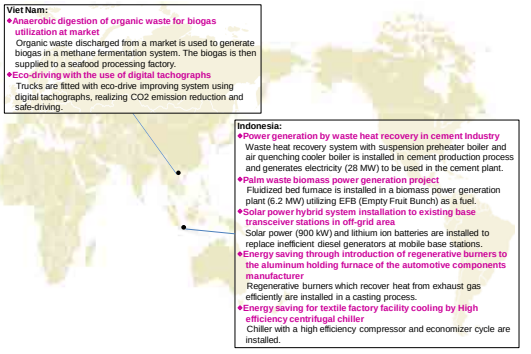
➢ Scope of the financing: facilities, equipment, vehicles, etc. which reduce CO_2 from fossil fuel combustion as well as construction cost for installing those facilities, etc.
➢ Eligible Projects : starting installation after the adoption of the financing and finishing installation within three years.

New Support Program Enabling "Leapfrog" Development (Fund/ADB) by MOE

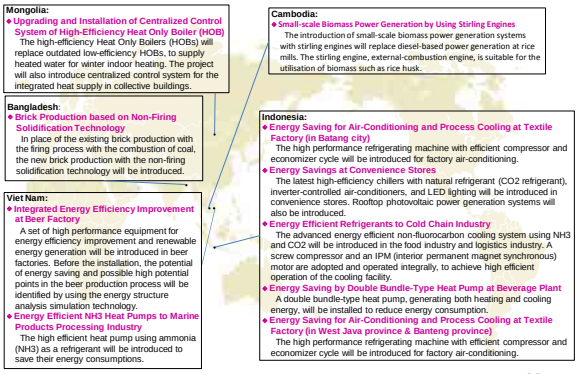
Fund for expansion of low-carbon technologies	ADB Trust Fund
Budget for FY 2014 *4.2 billion JPY (approx. USD42 million)*	**Budget for FY 2014** *1.8 billion JPY (approx. USD18 million)*
Scheme To finance the projects which have the better efficiency of reducing GHG emission in collaboration with other projects supported by JICA and other national organizations	**Scheme** To provide the financial incentives for the adoption of the advanced low-carbon technologies which are superior in GHG emission reduction but expensive in ADB- financed projects
Purpose To expand superior and advanced low-carbon technologies for building the low carbon society as the whole city wise and area wise in the wider fields, and to acquire credits by the JCM .	**Purpose** To develop ADB projects as the "Leapfrog" developments by the advanced technologies and to show the effectiveness of the JCM scheme by the acquisition of credits of the JCM.



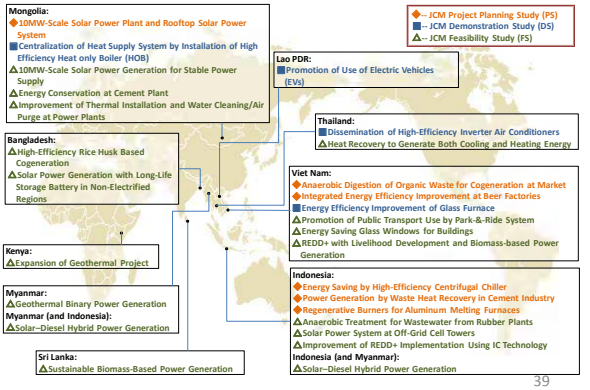
JCM Model Projects in 2014 by MOEJ



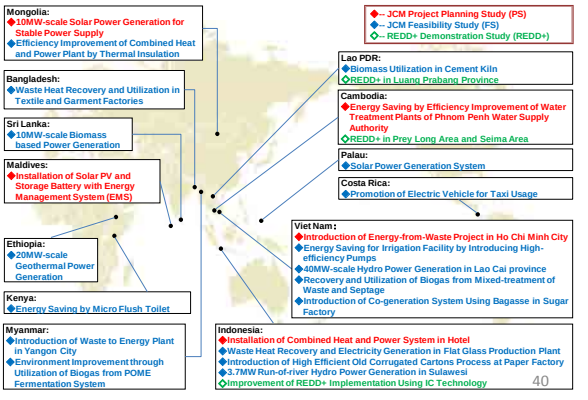
JCM Model Projects in 2013 by MOEJ



Overview of JCM Planning/Demonstration/Feasibility Studies in 2013 by MOEJ



Overview of JCM Planning/Feasibility/REDD+ Studies in 2014 by MOEJ(tentative)



添付資料 4

セミナー資料

セッション 3

Japan’s development assistance policy and activities on climate change in SIDS
外務省

Policy Dialogue on Climate Change in SIDS
2-4 July 2014, Tokyo Japan

Session 3
Japan's development assistance policy and activities on climate change in SIDS

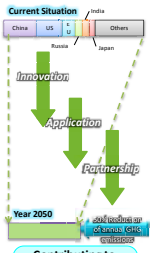
Masami Tamura
Director, Climate Change Division, Ministry of Foreign Affairs
July 4, 2014

Ministry of Foreign Affairs of Japan
Japan International Cooperation Agency

ACE: Actions for Cool Earth
Japan's Diplomatic Strategy for Countering Global Warming

Basic Concept

- Warming of the climate system is unequivocal. (IPCC Fifth Assessment Report)
- Concrete actions are needed for:
  - **50% reduction of global GHG emissions**
  - **80% reduction for developed countries by 2050**
- Actions for "Cool Earth" are:
  - Innovation of Low Carbon Technologies
  - Application of existing technologies
  - Partnership with various stakeholders
- Overcoming the aftermath of the Great East Japan Earthquake and the nuclear accident.



OVERVIEW: November 2013, Ministry of Foreign Affairs, Ministry of Economy, Trade and Industry, Ministry of Environment, JAPAN

Action1 : Innovation


Carbon Fiber Filament and its application

Innovative technology development is indispensable. Japan will lead the technological breakthrough.

- **Endeavor to invest USD110 billion of both public and private finance over five years for research and development in energy and environment.**
- **Implement the Low Carbon Technology Plan.**
  → approx. 80% cover of the reduction to halve global GHG emissions by 2050.
  (e.g., CCS, innovative structural materials, locally appropriate technology)
- **Host "Global Energy and Environment Innovation Forum" annually with the participation of leading persons.**

Action2: Application


Exterior view of GOSAT (@JAXA)

Low carbon technologies
→ produce immediate effect on GHG emission reduction

- **Double the number of partner countries to the Joint Crediting Mechanisms (JCM) over the next three years.**
  ✓Support project formulation through JCM Special Financing Scheme (JSF) and "Leapfrog" fund.
- **Build basis for international diffusion of technologies.**
  ✓Promote international standardization (e.g., LED lighting)
- **Launch a new satellite to observe GHGs in FY2017.**
  ✓Monitor nation-by-nation or megacity-by-megacity GHG emission levels
  → verify and propose countermeasures.

Action3: Partnership

Support developing countries and establish a win-win relations.

- **1,600 billion yen (approx. USD 16 billion) of both public and private finance to developing countries over the 3 years since 2013**
  ✓Focus on disaster risk reduction and utilize new schemes
  e.g., Stand-By Emergency Credit for Urgent Recovery (SECURE) etc.
  ✓Promote the substantial scale-up of private climate finance by utilizing public financial instruments.
- **Japan will lead the discussion to develop a new international framework for climate change beyond 2020.**

Assistance to Developing Countries in the field of Climate Change

Mobilizing ODA, OOF and private finance, Japan will provide total 1,600 billion yen (approx. 16 billion dollars) for mitigation and adaptation measures in developing countries over 3 years from 2013 to 2015. Among them, public finance amounts to 1,300 billion yen (approx. 13 billion dollars).*

ODA	• Concessional loan, Grant aid, Technical assistance etc.
OOF(other public finance)	• Public finance in JBIC co-financing etc.
Private Finance	• Private finance mobilized by the utilization of JBIC and NEXI etc.

Main Features

➢ Expansion of assistance in the field of disaster prevention and adaptation
- Utilizing new schemes such as stand-by loan for disaster recovery (Stand-By Emergency Credit for Urgent Recovery (SECURE)) and preferential terms for concessional loan
- Leading assistance to developing countries by multilateral cooperation toward the 3rd UN World Conference on Disaster Prevention

➢ Consideration for vulnerable countries
- Implementing well-thought assistance to developing countries vulnerable to the effects of climate change such as small island states, focusing on disaster prevention by using various schemes

➢ Public-Private partnership
- Scaling-up of private finance substantially by utilizing public financial instruments, and thus, encouraging private sectors to participate in the climate change projects

➢ Promotion of the diffusion of low carbon technologies
- Establishing a win-win relations between Japan and developing countries through overseas expansion of low carbon technologies and infrastructures in which Japan has strong competitiveness

*The assumed exchange rate is 98 yen to the dollar.

The Third World Conference on Disaster Risk Reduction (WCDRR)

Date

◆ 14 (Sat.) – 18 (Wed.) March 2015

Venue

◆ Sendai, Japan

Background

◆ The WCDRR is a UN-hosted conference to discuss international strategy on disaster risk reduction.
◆ Japan hosted the first conference (Yokohama, 1994) and the second (Hyogo, 2005). The second conference adopted the Hyogo Framework for Action, an international guiding principle on disaster risk reduction from 2005 to 2015.
◆ It was decided by the UN General Assembly Resolution (A/RES/67/209, December 2012) at its 67th session that Japan would host the third conference in early 2015.
◆ Details on the conference such as schedule and venue were decided by the UN General Assembly Resolution (A/RES/68/211, December 2013) at its 68th session. It was also decided that the third conference would be convened at the highest possible level and would include a high-level segment.

Purposes

◆ To complete assessment and review of the implementation of the Hyogo Framework for Action;
◆ To consider the experience gained through the regional and national strategies/institutions and plans for disaster risk reduction and their recommendations as well as relevant regional agreements under the implementation of the Hyogo Framework for Acton;
◆ To adopt a post-2015 framework for disaster risk reduction;
◆ To identify modalities of cooperation based on commitments to implement a post-2015 framework for disaster risk reduction;
◆ To determine modalities for periodic review of the implementation of a post-2015 framework for disaster risk reduction.

添付資料 5

セミナー資料

セッション 3

JICA Assistance for Climate Compatible Development in Small Island Developing States (SIDS)
JICA

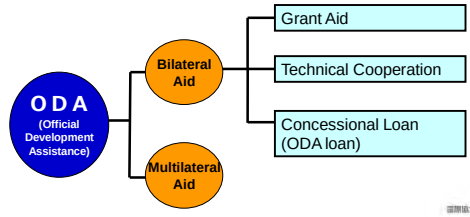
Policy Dialogue on Climate Change in SIDS
July 2-4, 2012
Tokyo, Japan

JICA Assistance for Climate Compatible Development in Small Island Developing States (SIDS)

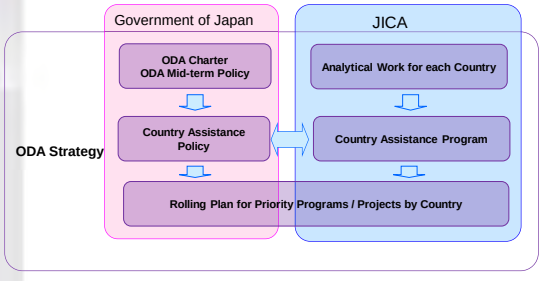
Office for Climate Change, Global Environment Department,
Japan International Cooperation Agency (JICA)

About JICA

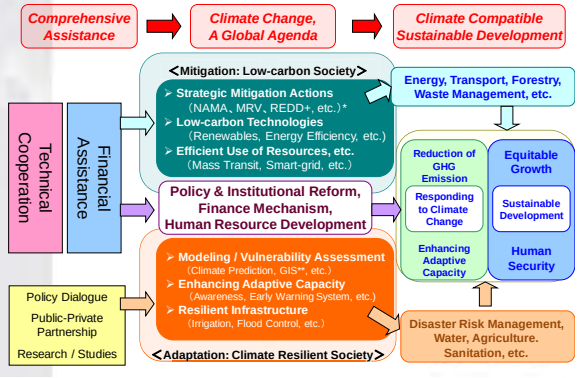
JICA extends Japanese ODA (Official Development Assistance) through integrated implementation of grant aid, technical cooperation and concessional loan.
Annual commitment was over US$15 billion in 2013.



ODA strategy and formulation of Program/Project



JICA's Approach: Development Cooperation for Climate Compatible Sustainable Development



JICA's Cooperation for Climate Change Adaptation

- **The great majority of JICA's cooperation for climate change adaptation is not intended exclusively for climate change adaptation.**
- **It addresses both ①climate change risks, and ②non-climate-change risks at the same time (→creating co-benefits).**
- **JICA is promoting to pursue such co-benefits.**

Typology of JICA Adaptation Projects for SIDS

Project Category	Current and future risks to be addressed	Potential supports
Disaster Risk Reduction /Hydro-meteorological administration	Extreme events (tropical depression, floods, tidal surges, landslides, etc.)	- Community disaster risk management - Early warning system - Mainstreaming of DRM into national development plan - Infrastructure
Water	Droughts, groundwater contamination (by salt and/or other pollutants)	- Water supply - Desalination - Wastewater treatment
Terrestrial and marine ecosystem management	Coastal erosion, ecosystem disruption and subsequent losses in biological resources	- Ecosystem conservation - Research
Forest	Forest loss/degradation and subsequent losses in biological resources	- Forest management - Satellite monitoring
Fisheries	Sea surface temperature rise, decline of fish catch	- Aquafarming - Fisheries management

Project examples: Disaster Risk Reduction /Hydro-meteorological administration

Approach to Disaster Risk Management

(1)Prevention
- Formulation of disaster risk management plans
- Preparation of hazard map, evacuation training
- Early warning system in place

Disaster

(2) Emergency Response
- Dispatch of Japan Disaster Relief Team
- Provision of aid supply

(3) Rehabilitation and recovery
- Rehabilitation of damaged infrastructure
- Mental care

Fiji and Solomon: Strengthening Capacity of Community Disaster Risk Management in the Pacific Region

Technical Cooperation

2010-2013

➢ **Expected Outputs**

(1) A flood warning system is in place and appropriately managed by the agency, and the target community residents understood and respond it accordingly.
(2) Management capacity of National Disaster Management Office is strengthened.
(3) The community's awareness on disaster preparedness is enhanced

➢ **Disaster Risk Management at various levels**

Public Help	National Disaster management plan, Improvement of evacuation system, Early warning system
Mutual Help	River bank maintenance by community, Community flood monitoring , Hazard mapping
Self Help	Protection of own property, Family evacuation plan, Learning disaster and risk management

Caribbean Disaster Management Project Phase 2

Technical Cooperation

Barbados, Guyana, Grenada, Saint Lucia, Dominica, Belize

2009-2012

- Cooperation with CDEMA (Caribbean Disaster Emergency Management Agency) since 2002
- Capacity development at community/institutional levels for protection against floods
- 'Regional Approach' and enhanced partnership among related organizations/institutions

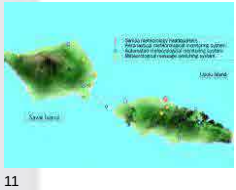
Samoa: Program for Improving the Weather Forecasting System and Meteorological Warning Facilities

Grant

Enhancing weather forecasting capacity and reducing vulnerability to natural disasters through improvement of hydro-met system and facilities

"Program Grant Aid for Environment and Climate Change"
(2010～2013, about 8 mil USD)

Grant aid offering a combination of facilities and equipment and technical support for their O&M



- Expected outcomes include:
- Improving nation-wide meteorological monitoring system with early warning
- Improving local scientific knowledge of weather impacts and global climate change research

Stand-by Emergency Credit for Urgent Recovery (SECURE)

ODA Loan

- SECURE will provide quick disbursement for recovering from natural disasters when it occurs, as stand-by credit, by signing Loan Agreement in advance.
- Prerequisite conditions are as follows;
  - Sound macroeconomic and public financial management
  - To have action plans for disaster prevention by utilizing Japan's technical cooperation
- Ceiling amount is USD100 million or 0.25% of GDP, whichever is less.
- Project period is 3 years in principle and will be extended up to a maximum of 15 years.
- The terms and conditions of 0.01% with 40-year repayment period regardless of income level.
- Commitments made: Philippines, Peru, (El Salvador - pledged)

Project examples: Water, Ecosystem Management, Forest

Cape Verde: Water Supply Development Project in Santiago Island

ODA Loan

Loan Agreement: December 2013
Amount: 15,292 million JPY
Completion of the Project: 2019


Signing ceremony

Purpose: Construction of desalination and water transmission facilities

Application of Japanese technologies:
- Energy-saving and efficient membrane desalination technology
- High-pressure water transmission technology

Water supply capacity : 40,000 m3/day

Improvement of water supplied population:
151,000 (2012) → 274,000 (2020)

Improvement of water supply connection rate:
54.6% → 95.0%

http://www.jica.go.jp/english/news/press/2013/20131224_02.html

Water supply network plan

Tuvalu: Eco-Technological Management of Tuvalu against Sea Level Rise

SATREPS

Period: 2009-2014
Purpose:
- Development of a sand production-transportation-sedimentation model and eco-engineering technology to create/ restore sandy beach
- Capacity building to conserve/ restore the coastal environment and ecosystem

Research areas:
- Environmental conditions for increasing star sand
- Relationship between ocean current and star sand transport
- Monitoring of changes of geographical formation, ecosystem using satellite images



SATREPS: JICA/JST co-funded Science and Technology Research Partnership
http://www.jst.go.jp/global/english/case/environment_energy_3.html

Palau: Protection of Coral Reef

Grant/ Technical Cooperation/ SATREPS

2000: Japanese Grant Aid
Palau International Coral Reef Center established



2000-2012: JICA Technical Cooperation
- Institutional and Human resources Development
- Monitoring Scheme for Marine Protected Areas Network

2013-2018: SATREPS
- Ryukyu University (Okinawa)
- Protection and management of coral reef in Micronesia region
- Policy proposals on adaptive reef management, based on responses studies against multiple stresses

Papua New Guinea : Capacity Development on Forest Resource Monitoring for Addressing Climate Change

Technical Cooperation

Background:
- One of the largest rainforest in the world
- Significant forest loss and degradation due to unsustainable logging and land conversion to farm land

Purpose:
-Sustainable preservation and management of forest


PNG has 29 million m² of forest

Capacity building:
- Utilization of satellite images and GIS system to develop nation-wide forest map


Satellite image and GIS system was provided by Japanese Grant

Vanuatu: Rich Foreshore Project

Technical Cooperation

Problem: Decrease of marine resources

Purpose: Implementation of effective community based coastal resource management


Sea water aquafarming facility (introduced in Phase 1)

Phase 1: 2006-2009
- Targets Department of Fisheries
- Introduction of aquafarming of shellfish
- Community based coastal resource management


Fish processed for sale at Branch Office of Department of Fisheries

Phase 2: 2012-2014
- Expand the target area
- Encourage Department of Fisheries to promote effective community based coastal resource management

Concluding remarks

- JICA promotes creation of co-benefits through cooperation for climate change adaptation.
- Mainstreaming climate change adaptation in development activities in different sectors is an effective and efficient approach to create co-benefits and mobilizing financial resources for climate change adaptation.
- Climate change adaptation is a challenging task that requires a broad range of expertise and experience. Hence, partnership is the key.
- Japan/JICA is always an active and reliable partner for SIDS.

Discussion Points

- What kind of support is needed in your country?
- What are the challenges in implementing adaptation projects?
- What is merit and/or demerit of regional cooperation?
- Do you find any problems in coordination among donors?

Thank you for your attention.

Office for Climate Change, Global Environment Department
Japan International Cooperation Agency (JICA)
http://www.jica.go.jp/english/our_work/climate_change/
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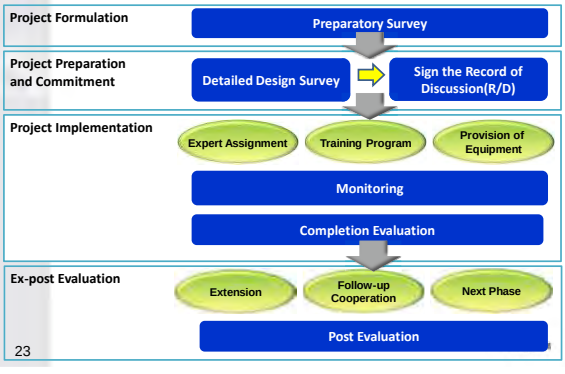
Supplementary Material

Operational flow of Technical Cooperation



Operational Flow of ODA Loan

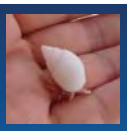
- Feasibility Study
- Official request to GOJ
- Appraisal by JICA
- Inter-governmental Agreement
- Loan Agreement with JICA
- Project Implementation
- Post evaluation

添付資料 6

セミナー資料

セッション 5

Workshop
有限会社　クライメート・エキスパーツ



How to Make Use of NAMAs by Small Island States?

Climate Experts, Ltd.
Naoki Matsuo
n_matsuo@climate-experts.info

Essence of NAMA

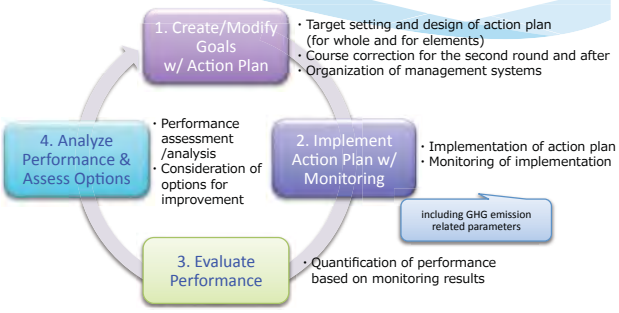
- At a glance…
  - Support by developed countries for "carrot"
  - MRV for "stick"
- MRV for what?
  - For reliable amount of emission reductions
    - Transparency and Liability (to obtain support…)
  - For "better performance" of the action
    - PDCA; KAIZEN practice

If such MRV hampers the actions, no meaning at all!

Japan has strong and proven experiences

Without monitoring, we cannot check the performance and change the course accordingly…

PDCA; KAIZEN Practice



NAMA and the Government

- Types of NAMAs ('Nationally' Appropriate Mitigation Actions)
  - Macroeconomic target setting
    - e.g., 25% reduction from 1990 level in 2020
  - Specific action(s) – Governmental action(s) (?!)
    - Government 'promoted' actions
      - Government funded actions (specific project (supported by donors), …)
      - Government coordinated actions (LED promotion program, SHS program,)
      - Government incentivized actions (feed-in tariff, (de-)regulation, …)
      - Government informed actions (campaign, PR, …)
    - Easier and necessary to track/check the status/performance ("MRV")

Designing NAMAs

- Characteristics of small island states
  - Small population (10K–1M)
  - Little natural resources and High commodity prices
- Targeted area of actions
  - Highly energy consuming activities (e.g., power supply, fishery, …)
  - Economically important activities (e.g., tourism, telecom, …)
  - Highly effective technology is available (e.g., refrigeration, LED, …)
- How to incentivize/realize the actions?

Example of NAMAs (1)

- Energy supply ('quality' of power is a key parameter)
  - PV(/wind/wave)-Diesel hybrid system (w/ or w/o storage)
    - for utilities, for companies, for communities, for telecom companies
- Energy auditing by experts
  - Capacity building program for energy auditing company/experts
    - For hotels, fishery industry, commercial buildings, other factories, …
  - Capacity building program for operator/engineer of the factories
- Tourism (highly reliable power needed)
  - Energy auditing for hotels (energy saving and/or PV integration)
  - Rating system for environment (as a marketing tool)
- Fishery (lower quality power is sufficient)
  - Refrigeration/freezing system energy saving
  - Energy storage business (?)

Example of NAMAs (2)

- Telecom (highly reliable power needed)
  - PV-diesel hybrid system w/ storage
- Desalination (lower quality power is sufficient)
- Transportation
  - Electrical motorbike
  - High efficient commuting boat
  - PV-LED street light
- Commercial and Residential Buildings
  - Energy auditing for lighting (LED) and air conditioning (inverter)
- Waste sector
  - Biogas / composting of organic wastes with segregation
  - Plastic waste treatment (incl. make it as fuel)

Application and Essence of Actions

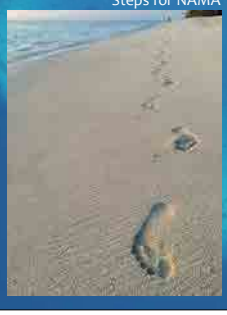
- Cross-cutting areas
  - Energy storage by refrigerator/freezer
  - Energy serving business for inhabitant island and resort island
  - Waste to energy
- Essential elements
  - System (NOT element technologies)
  - Experts and capacity building
  - PDCA/KAIZEN practice for O&M
  - How to incentivize the players

Abandoned street light system

What you need for support?

- JICA's Tools
  - Technical cooperation
    - Capacity building
      - For policy makers
      - Training for trainers
      - Textbook, manuals preparation
    - Surveys, Feasibility studies
    - Master plan / Policy-making
    - Specific governmental program
    - Follow-up
  - Financial support
    - Pilot activities with studies
    - Full activities (grant)
    - Full activities (loan)
- Areas
  - NAMA Specific
    - MRV design, …
  - Energy auditing
    - Factory energy saving
    - PV integration
    - Buildings energy saving
  - Energy/power system
  - Waste technologies
  - Policy instruments and institutional design
  - …

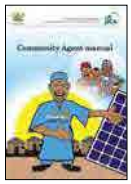
Steps for NAMA



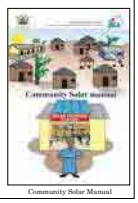
Group Discussion Theme

1. What type of climate mitigation action(s) you want to implement as a NAMA?
2. Who is(are) the player(s)? How to incentivize the player(s)?
3. What you can do for implementation/realization of the action?
4. What barrier you are facing at?
5. What you expect developed countries to support and how?

JICA needs "hints"…



Community Agent Manual



Community Solar Manual