

# Open NAP Master

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## Authors

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- **Paul V. Desanker**

 [XXXX-XXXX-XXXX-XXXX](#) ·  [desanker](#) ·  [XX](#)

- **Jane Roe**

 [XXXX-XXXX-XXXX-XXXX](#) ·  [janeroe](#)

Department of Something, University of Whatever; Department of Whatever, University of Something

## Abstract

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The Open NAP master is a general NAP developed based on best available IPCC science and other high quality science products covering sectors and systems typically encountered in development countries when developing National Adaptation Plans. One thing that is obvious from the extensive IPCC 5AR is the immense knowledge of how climate change impacts different systems and sectors, and how similar those impacts are between countries. It is unlikely we will discover new impacts or improve our basic understanding of climate change in order to develop improved adaptation plans. It is also clear that doing more and more generic impact or vulnerability assessments will have limited value - we can now take as known and accepted that things like droughts, floods etc will have negative impacts, and will get worse as climate continues to change, and that any given system will be impacted by multiple hazards, climate-related and others.

The next frontier seems to be how to use the knowledge we have to design effective adaptation responses. In this exercise, we build on the collective knowledge that exists now, to design a general NAP that can be applied as an entry point for any country.

## Introduction

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### List of Papers

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1. The NAP-SDG iFrame
2. The risk continuum between drr, adaptation and loss and damage
3. Developing a collection of systems for adaptation taking into account SDGs, Sendai Framework, urban systems and other relevant frameworks
4. A general Open NAP applicable to any country
5. Case study: Country x
6. Adaptation Solutions Database

##Introduction {.page\_break\_before}

The IPCC assessment reports are a good synthesis of studies that have documented the adverse impacts of climate change. The IPCC 5AR has further developed the concept of Reasons for Concern into five categories, within which key risks can be aggregated into graphic measures of risk in the form of amber diagrams.

The IPCC reasons for concern are the relations between global mean temperature increase and:

**1. Unique and threatened systems:** Some unique and threatened systems, including ecosystems and cultures, are already at risk from climate change (high confidence). The number of such systems at risk of severe consequences is higher with additional warming of around 1°C. Many species and systems with limited adaptive capacity are subject to very high risks with additional warming of 2°C, particularly Arctic sea-ice and coral-reef systems.

**2. Extreme weather events:** Climate-change-related risks from extreme events, such as heat waves, extreme precipitation, and coastal flooding, are already moderate (high confidence) and high with 1°C

additional warming (medium confidence). Risks associated with some types of extreme events (e.g., extreme heat) increase further at higher temperatures (high confidence).

**3. Distribution of impacts:** Risks are unevenly distributed and are generally greater for disadvantaged people and communities in countries at all levels of development. Risks are already moderate because of regionally differentiated climate-change impacts on crop production in particular (medium to high confidence). Based on projected decreases in regional crop yields and water availability, risks of unevenly distributed impacts are high for additional warming above 2°C (medium confidence).

**4. Global aggregate impacts:** Risks of global aggregate impacts are moderate for additional warming between 1-2°C, reflecting impacts to both Earth's biodiversity and the overall global economy (medium confidence). Extensive biodiversity loss with associated loss of ecosystem goods and services results in high risks around 3°C additional warming (high confidence). Aggregate economic damages accelerate with increasing temperature (limited evidence, high agreement), but few quantitative estimates have been completed for additional warming around 3°C or above.

**5. Large-scale singular events:** With increasing warming, some physical systems or ecosystems may be at risk of abrupt and irreversible changes. Risks associated with such tipping points become moderate between 0-1°C additional warming, due to early warning signs that both warm-water coral reef and Arctic ecosystems are already experiencing irreversible regime shifts (medium confidence). Risks increase disproportionately as temperature increases between 1-2°C additional warming and become high above 3°C, due to the potential for a large and irreversible sea level rise from ice sheet loss. For sustained warming greater than some threshold, near-complete loss of the Greenland ice sheet would occur over a millennium or more, contributing up to 7 m of global mean sea level rise.

### **Eight overarching key risks**

- i. Risk of death, injury, ill-health, or disrupted livelihoods in low-lying coastal zones and small island developing states and other small islands due to storm surges, coastal flooding, and sea-level rise
- ii. Risk of severe ill-health and disrupted livelihoods for large urban populations due to inland flooding in some regions
- iii. Systemic risks due to extreme weather events leading to breakdown of infrastructure networks and critical services such as electricity, water supply, and health and emergency services
- iv. Risk of mortality and morbidity during periods of extreme heat, particularly for vulnerable urban populations and those working outdoors in urban or rural areas
- v. Risk of food insecurity and the breakdown of food systems linked to warming, drought, flooding, and precipitation variability and extremes, particularly for poorer populations in urban and rural settings
- vi. Risk of loss of rural livelihoods and income due to insufficient access to drinking and irrigation water and reduced agricultural productivity, particularly for farmers and pastoralists with minimal capital in semi-arid regions
- vii. Risk of loss of marine and coastal ecosystems, biodiversity, and the ecosystem goods, functions, and services they provide for coastal livelihoods, especially for fishing communities in the tropics and the Arctic

- iii. Risk of loss of terrestrial and inland water ecosystems, biodiversity, and the ecosystem goods, functions, and services they provide for livelihoods

This manuscript is a template (aka “rootstock”) for [Manubot](#), a tool for writing scholarly manuscripts. Use this template as a starting point for your manuscript.

The rest of this document is a full list of formatting elements/features supported by Manubot. Compare the input ( `.md` files in the `/content` directory) to the output you see below.

## Basic formatting

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### Bold text

### Semi-bold text

Centered text

Right-aligned text

*Italic text*

Combined *italics* and **bold**

### ~~Strikethrough~~

1. Ordered list item
2. Ordered list item
  - a. Sub-item
  - b. Sub-item
    - i. Sub-sub-item
3. Ordered list item
  - a. Sub-item

- List item
- List item
- List item

subscript: H<sub>2</sub>O is a liquid

superscript: 2<sup>10</sup> is 1024.

[unicode superscripts](#)<sup>0123456789</sup>

[unicode subscripts](#)<sub>0123456789</sub>

A long paragraph of text. Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

Putting each sentence on its own line has numerous benefits with regard to [editing](#) and [version control](#).

Line break without starting a new paragraph by putting two spaces at end of line.

## **Document organization**

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Document section headings:

# **Heading 1**

## **Heading 2**

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### **Heading 3**

#### **Heading 4**

**A heading centered on its own printed page**

Horizontal rule:

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Heading 1's are recommended to be reserved for the title of the manuscript.

Heading 2's are recommended for broad sections such as *Abstract*, *Methods*, *Conclusion*, etc.

Heading 3's and Heading 4's are recommended for sub-sections.

## Links

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Bare URL link: <https://manubot.org>

[Long link with lots of words and stuff and junk and bleep and blah and stuff and other stuff and more stuff yeah](#)

[Link with text](#)

[Link with hover text](#)

[Link by reference](#)

## Citations

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Citation by DOI [[1](#)].

Citation by PubMed Central ID [[2](#)].

Citation by PubMed ID [[3](#)].

Citation by Wikidata ID [[4](#)].

Citation by ISBN [[5](#)].

Citation by URL [[6](#)].

Citation by tag [[7](#)].

Multiple citations can be put inside the same set of brackets [[1](#),[5](#),[7](#)]. Manubot plugins provide easier, more convenient visualization of and navigation between citations [[2](#),[3](#),[7](#),[8](#)].

Citation tags (i.e. aliases) can be defined in their own paragraphs using Markdown's reference link syntax:

## Referencing figures, tables, equations

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Figure [1](#)

Figure [2](#)

Figure [3](#)

Figure [4](#)

Table [1](#)

Equation [1](#)

Equation [2](#)

## Quotes and code

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Quoted text

Quoted block of text

Two roads diverged in a wood, and I—  
I took the one less traveled by,  
And that has made all the difference.

Code `in the middle` of normal text, aka `inline code`.

Code block with Python syntax highlighting:

```
from manubot.cite.doi import expand_short_doi

def test_expand_short_doi():
    doi = expand_short_doi("10/c3bp")
    # a string too long to fit within page:
    assert doi == "10.25313/2524-2695-2018-3-vliyanie-enhansera-copia-i-
insulyatora-gypsy-na-sintez-ernk-modifikatsii-hromatina-i-
svyazyvanie-insulyatornyh-belkov-vtransfetsirovannyh-geneticheskikh-
konstruktsiyah"
```

Code block with no syntax highlighting:

```
Exporting HTML manuscript
Exporting DOCX manuscript
Exporting PDF manuscript
```

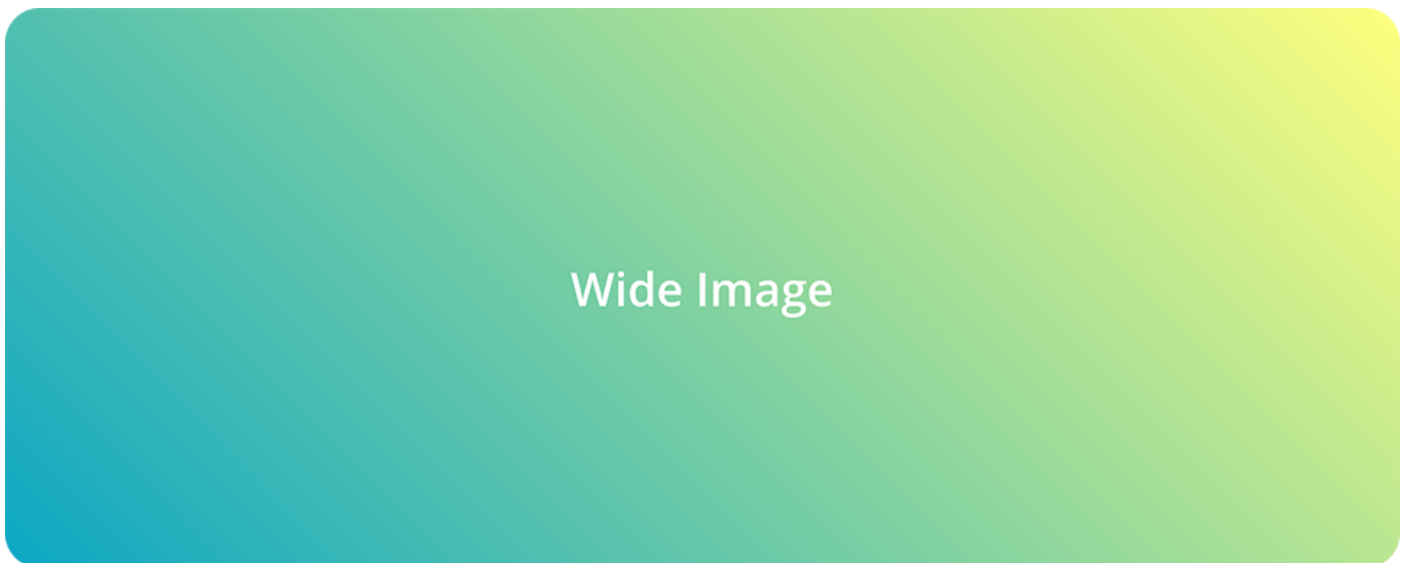
## Figures

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**Figure 1: A square image at actual size and with a bottom caption.** Loaded from the latest version of image on GitHub.



**Figure 2: An image too wide to fit within page at full size.** Loaded from a specific (hashed) version of the image on GitHub.



**Figure 3: A tall image with a specified height.** Loaded from a specific (hashed) version of the image on GitHub.



**Figure 4: A vector `.svg` image loaded from GitHub.** The parameter `sanitize=true` is necessary to properly load SVGs hosted via GitHub URLs. White background specified to serve as a backdrop for transparent sections of the image.

## Tables

**Table 1:** A table with a top caption and specified relative column widths.

<i>Bowling Scores</i>	Jane	John	Alice	Bob
Game 1	150	187	210	105
Game 2	98	202	197	102
Game 3	123	180	238	134

**Table 2:** A table too wide to fit within page.

	Digits 1-33	Digits 34-66	Digits 67-99	Ref.
pi	3.14159265358979323 846264338327950	28841971693993751 0582097494459230	78164062862089986 2803482534211706	<a href="#">piday.org</a>
e	2.71828182845904523 536028747135266	24977572470936999 5957496696762772	40766303535475945 7138217852516642	<a href="#">nasa.gov</a>

**Table 3:** A table with merged cells using the `attributes` plugin.

	Colors	
Size	Text Color	Background Color
big	blue	orange
small	black	white

## Equations

A LaTeX equation:

$$\int_0^\infty e^{-x^2} dx = \frac{\sqrt{\pi}}{2} \tag{1}$$

An equation too long to fit within page:

$$x = a + b + c + d + e + f + g + h + i + j + k + l + m + n + o + p + q + r + s + t + u + v + w + x + y + z + 1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 \tag{2}$$

## Special

**⚠ WARNING** *The following features are only supported and intended for `.html` and `.pdf` exports. Journals are not likely to support them, and they may not display correctly when converted to other formats such as `.docx`.*

LINK STYLED AS A BUTTON

Adding arbitrary HTML attributes to an element using Pandoc’s attribute syntax:

Manubot Manubot Manubot Manubot Manubot. Manubot Manubot Manubot Manubot. Manubot Manubot Manubot. Manubot Manubot. Manubot.

Adding arbitrary HTML attributes to an element with the Manubot `attributes` plugin (more flexible than Pandoc’s method in terms of which elements you can add attributes to):

Manubot Manubot Manubot Manubot Manubot. Manubot Manubot Manubot Manubot. Manubot Manubot Manubot. Manubot Manubot. Manubot.

Available background colors for text, images, code, banners, etc:

white lightgrey grey darkgrey black lightred lightyellow lightgreen lightblue lightpurple red orange yellow green blue purple

Using the [Font Awesome](#) icon set:

✓ ? ★ 🔔 ✖ …



### Light Grey Banner

useful for *general information* - [manubot.org](http://manubot.org)



### Blue Banner

useful for *important information* - [manubot.org](http://manubot.org)



### Light Red Banner

useful for *warnings* - [manubot.org](http://manubot.org)

## Risk Continuum between drr, adaptation and L&D

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### Developing a collection of systems for adaptation taking into account SDGs, Sendai Framework, urban systems and other relevant frameworks

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#### Introduction to a systems approach

xxx xxxx

#### A master collection of systems

#### Mapping systems to the SDGs

#### Collection of systems for cities and other scopes

#### Table of systems and annotations: LIST OF MAIN SYSTEMS: Results of Nairobi Workshop, 2-6 Sept 2019

#### MEGASYSTEM: Disaster Risk - Human safety and well-being

SYSTEM: River bank flooding as a planning system

SYSTEM: Urban flooding as a planning system

SYSTEM: Major storms (cyclones) as a planning system

SYSTEM: Lightning as a planning system

SYSTEM: Heat waves as a planning system

SYSTEM: Landslides as a planning system

#### MEGASYSTEM: Food Security

Food Availability

General Food Crop Production

SYSTEM: Crop production (species, inputs, crop pests and disease (locust, army worm, others))

SYSTEM: Post-harvest food processing

SYSTEM: Post-harvest food storage

SYSTEM Individual Crop Production – subsistence: maize, rice

SYSTEM: National Strategic Grain Reserve

Food Access

SYSTEM: Access to food on sale

SYSTEM: Food commodity trade: local, national and international

SYSTEM: Urban food supply chains

Food Utilization

SYSTEM: Food affordability

Food stability

SYSTEM: Food availability contingency measures

MEGASYSTEM: Commercial Agriculture

SYSTEM: Crop commodities

SYSTEM: Crop commodity: Maize supply chain – Production, Processing, packaging, storage, Distribution, Retail

SYSTEM: Crop commodity: Coffee supply chain; Tea; tobacco; banana

SYSTEM: Meat supply chain: Beef supply chain – Production, Processing, packaging, storage, Distribution, Retail

SYSTEM: Eggs supply chain – Production, Processing, packaging, storage, Distribution, Retail

SYSTEM: Milk supply chain – Production, Processing, packaging, storage, Distribution, Retail

SYSTEM: Commercial fisheries

SYSTEM: Small scale and artesian inland freshwater fisheries (lakes, dams, rivers)

SYSTEM: Commercial lake and dam fisheries

SYSTEM: Individual Fish Species; Tilapia, Cichlids

MEGASYSTEM: Land use

SYSTEM: National physical/spatial master plans

MEGASYSTEM: Water Resources

Available water resources

SYSTEM: Riven basin water balance system

SYSTEM: National underground aquifer systems

SYSTEM: National water resources use management policies: different uses

SYSTEM: Shared basin water resources governance

SYSTEM: Urban water system for city X (water source point dynamics, distribution infrastructure (clean water, recycling, waste), city water system demand management, water processing facilities, water supply contingency plans)

SYSTEM: Rural drinking water supply system

MEGASYSTEM: Waste and sanitation

SYSTEM: Urban waste management system/Sewage

SYSTEM: Urban waste management system/Landfill

SYSTEM: Urban waste management system/Medical

MEGASYSTEM: Energy

SYSTEM: Hydroelectric generation

SYSTEM: Electricity distribution infrastructure (grid system)

SYSTEM: Electricity power demand management (domestic and business)

SYSTEM: National energy mix/balance

SYSTEM: Emergency plans/provisions for power supply disruption

SYSTEM: Regional power pooling

SYSTEM: Biomass energy - wood/charcoal

MEGASYSTEM: Ecosystems

Special Ecosystems

SYSTEM: Center of endemism: Lake Malawi ecosystem

SYSTEM: Lake ecosystem: Lake Chilwa

SYSTEM: Specific ecoregions for unique flora and fauna: Mulanje cedar

SYSTEM: Wetlands ecosystem

SYSTEM: Mountain system

SYSTEM: Conservation areas: wildlife, forest, etc

SYSTEM: Managed forest plantation

SYSTEM: Transboundary migration system

MEGASYSTEM: Health Services

SYSTEM: Air quality and health

SYSTEM: Extreme temperatures and human well-being

SYSTEM: Contagious disease management system

SYSTEM: Health infrastructure: hospitals and clinics

SYSTEM: Emergency shelters

SYSTEM: Medicine supply network

SYSTEM: Access routes to hospitals

SYSTEM: Vulnerable groups (elderly, homeless, slums, schools/children)

MEGASYSTEM: Tourism

SYSTEM: Tourism infrastructure

SYSTEM: Nature-based tourism (parks & wildlife)

SYSTEM: Specific tourism attractions e.g. Lake Malawi, Nyika Plateau

MEGASYSTEM: Transportation

SYSTEM: Urban mass transit system

SYSTEM: Critical transportation infrastructure: key bridges, key access routes and corridors

SYSTEM: Distribution/access network: fuel, food, etc

SYSTEM: National transport infrastructure (rail, roads, etc)

SYSTEM: Airports

SYSTEM: Rail transport

SYSTEM: Regional transport networks and corridors

SYSTEM: Global transportation chokepoints (canals, etc) useful in import/export

MEGASYSTEM: Physical assets

SYSTEM: Industrial installations

SYSTEM: Business installations

SYSTEM: Human settlements/Living spaces

SYSTEM: Telecomm infrastructure

SYSTEM: Urban natural and planned drainage system

MEGASYSTEM: Governance

SYSTEM: Disaster Management/Disaster Response Governance

SYSTEM: Adaptation planning governance

SYSTEM: National government budget, tax and policies

SYSTEM: Business and economic operations

## **Table LIST OF MAIN SYSTEMS: Results of Nairobi Workshop, 2-6 Sept 2019**

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SYSTEM: Business and economic operations

## **General Open NAP**

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Cotents

## **Country NAP: Case study for country X**

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## **Adaptation Solutions Database**

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