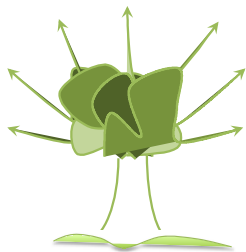


# National Climate Change Adaptation Policy

## Framework, Policy, Strategy and Action Plan

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Port Louis, 23 -26 October 2012



**KnowlEdge** Srl



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# 1. Introduction

This work requires the creation and elaboration of the following knowledge:

- An analysis of current and projected impacts of climate change for time horizon of 2012-2100, also assessing and quantifying the impacts of climate change on key sectors in monetary terms to better inform decision making;
- To identify key gaps and needs for mainstreaming climate change adaptation in key sectors;
- To propose and recommend climate change adaptation policy options/measures for the key sectors under consideration under AAP in light of socio-economic evidence produced.

# 1. Introduction

**Stock taking report:** this study serves to review historical climate change impacts in Mauritius, as well as existing legislation. Knowledge on future climate events is also considered.

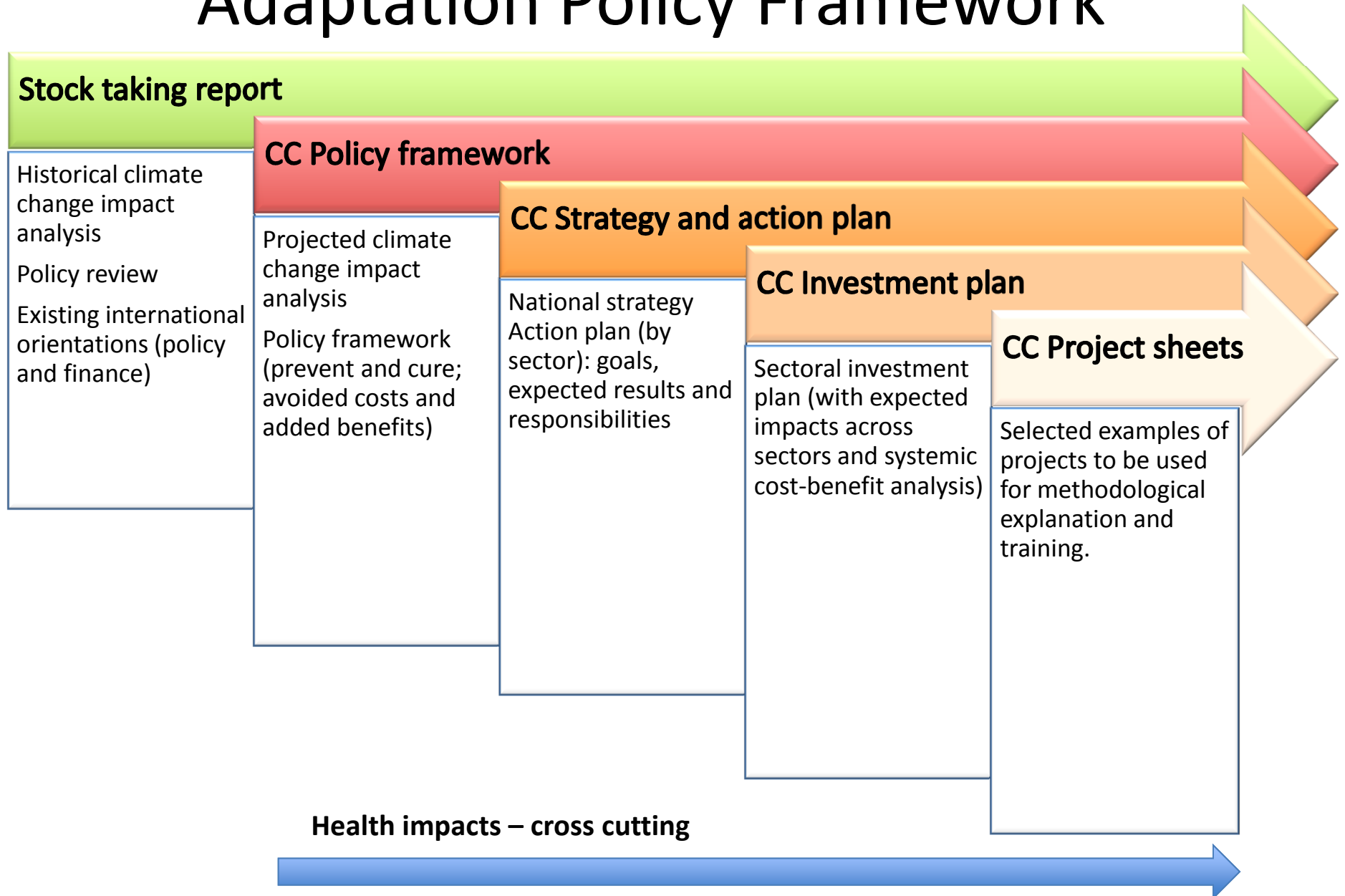
Climate impacts:

- Water: lowered water availability
- Agriculture: reduced yields
- Fisheries: lowered productivity and availability
- Tourism: need for coastal adaptation

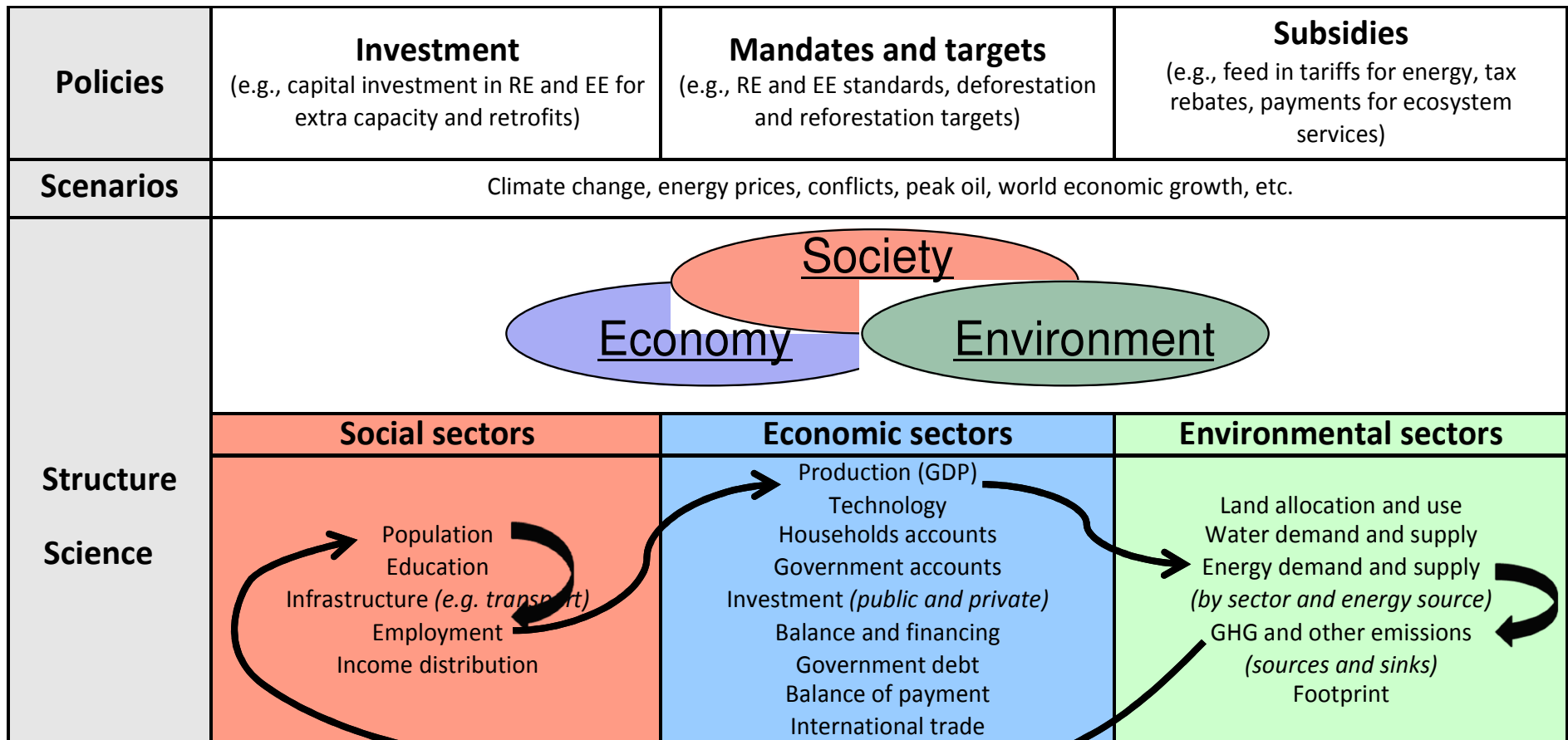
## 2. Integrated Climate Change Adaptation Policy Framework

- **Climate Change Adaptation Policy Framework:** provides the framework of analysis for creating a climate change adaptation policy.
- **Climate Change Adaptation Policy:** identifies and lists the key policy principles and responsibilities from a national and sectoral perspective. Time frame: 20 years (2030).
- **Climate Change Adaptation Strategy and Action Plan:** defines the main elements of a climate change adaptation strategy at the national level. Time frame: 10 years (2020).
- **Climate Change Adaptation Investment Plan:** provides a cross-sectoral cost benefit analysis of the most relevant investment options that would be triggered by the strategy and action plan. Time frame: 3 years (2015).
- **Climate Change Adaptation Project Sheets:** the project briefs provide more detailed information on the cross-sectoral pros and cons of selected sectoral interventions. Time frame: 3 years (2015).

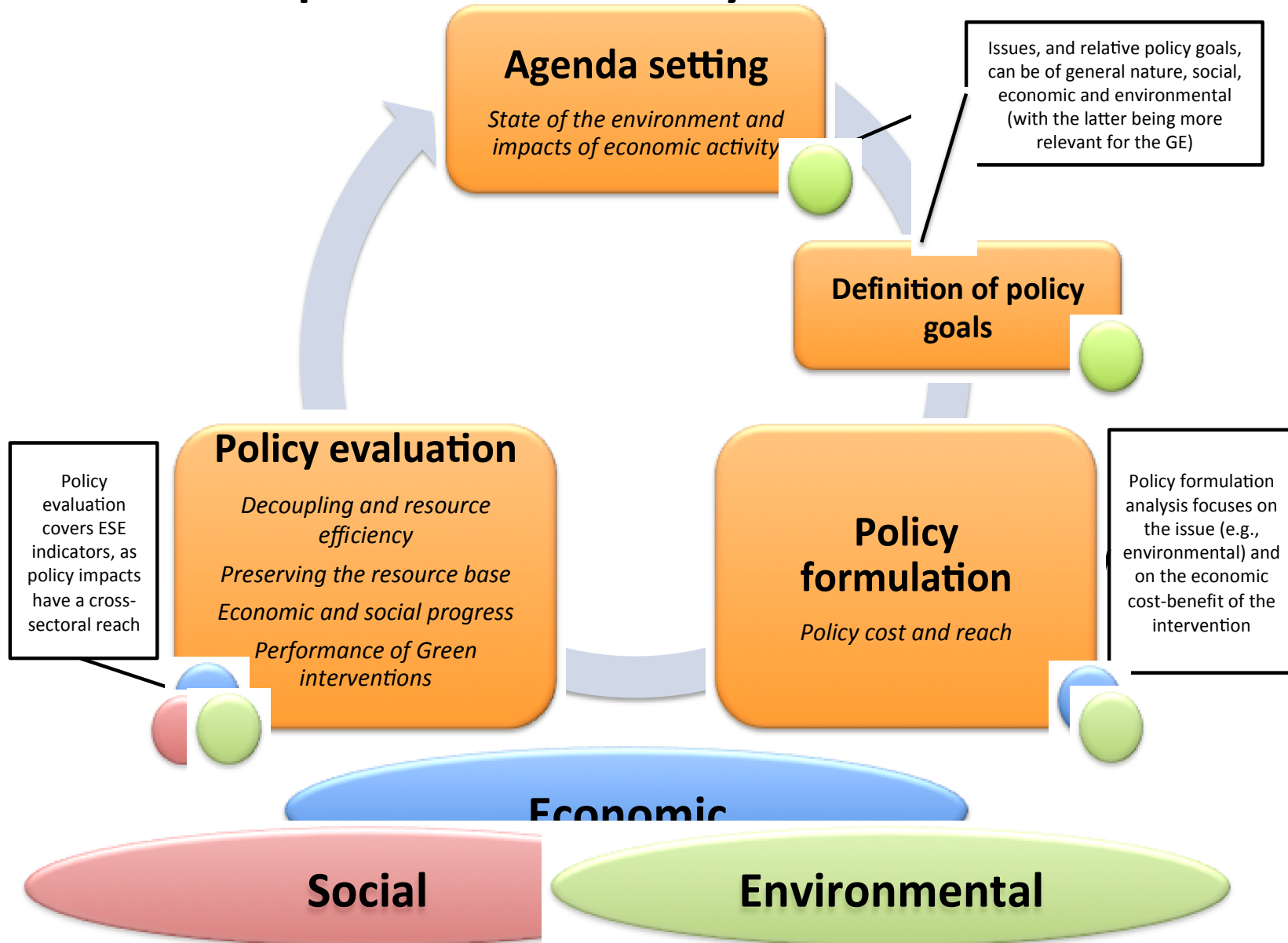
# 2. Integrated Climate Change Adaptation Policy Framework



# 2. Integrated Climate Change Adaptation Policy Framework



## 2. Integrated Climate Change Adaptation Policy Framework





# 3. National Climate Change Adaptation Policy

The objectives of the climate change adaptation policy are to:

- **Foster the development of strategies, plans and processes to:**
  - Avoid, minimise or adapt to the negative impacts of climate change on key assets of Mauritius, namely agriculture, water, fisheries and ecosystems.
  - Avoid or reduce damage to human settlements and infrastructure caused by climate change.
  - To build capacity to understand, analyse and react in a timely manner in the wake of future climate change impacts within the ROM.
- **Integrate and mainstream climate change adaptation into core development policies, strategies and plans of the ROM.**

# 3. National Climate Change Adaptation Policy (2a)

## Policy Principles:

- **Concerning the definition and introduction of long term planning mechanisms:**
  - Ensure that adequate planning (physical, socio-economic etc.) is undertaken on a continual basis to address the impacts of climate change. Such planning should be undertaken, not in isolation but in the wider context of sustainable development, and using an integrated, cross-sectoral and trans-disciplinary approach (i.e. systems approach).

# 3. National Climate Change Adaptation Policy (2b)

## Policy Principles:

- **Concerning improving climate resilience:**
  - Recognizing that the resilience of the natural environment is key to coping with climate change, do all possible to enhance and maintain environmental quality;
  - Recognizing that economic resilience is key to coping with climate change, do all possible to promote the development of a strong and diversified economy;
  - Create an enabling environment for the adoption of appropriate technologies and practices that will assist in meeting national and international commitments with respect to the causes and effects of climate change.

# 3. National Climate Change Adaptation Policy (2c)

## Policy Principles:

- **Concerning financing options to meet national adaptation financial needs:**
  - Procure and allocate financial and other resources, as appropriate and feasible, to ensure that climate change is addressed in the manner required.

# 3. National Climate Change Adaptation Policy (2d)

## Policy Principles:

- **Concerning strengthening capacities and institutional frameworks:**
  - Endeavour, to the extent possible and necessary, to develop national human and institutional capacity in all aspects of climate change research, response, planning, etc.;
  - Endeavour to foster or create an institutional, administrative and legislative environment which engenders/ supports the effective implementation of climate change adaptation activities;
  - Collaborate as appropriate and feasible, with other regional and international states and organisations which pursue confluent agendas in climate change;
  - Promote and support research and information gathering at the national, regional and international levels on aspects of climate and its impacts as they pertain to Mauritius;
  - Endeavour to ensure that society, at all levels and in all sectors is adequately informed on climate change and its implications for the nation and the role that it must play in this respect;
  - Endeavour to obtain, to the extent feasible, the involvement and participation of all stakeholders at the national level in addressing issues related to climate change;
  - Endeavour to ensure that such involvement and participation occurs on an appropriately coordinated basis which minimises duplication of effort and conflict and which ensures efficient use of resources and the creation of positive synergies.

# 3. National Climate Change Adaptation Policy (3a)

## **Sectoral Policy Principles: Water**

- Develop a long-term national water management plan which incorporates and addresses climate change concerns including catchment and watershed protection and saltwater intrusion;
- Incorporate the national adaptation strategy for the water sector into the land use planning and management processes;
- Promote the strengthening of national water management agencies to ensure the sound management of water resources;
- Assess and address needs for water storage and distribution infrastructure to ensure water availability during drought periods;
- Undertake measures to increase the resilience of aquifers and rivers to maximise water availability and reduce degradation of water quality;
- Promote initiatives to identify and, where necessary, exploit non-traditional water resources such as sea-water through desalination.

# 3. National Climate Change Adaptation Policy (3b)

## **Sectoral Policy Principles: Agriculture**

- Develop a national adaptation strategy for the agriculture sector, as part of the national climate change adaptation strategy, to address impacts over the short, medium and long term;
- Include adaptation policies into the national policy formulation process;
- Formulate and implement any other such strategies and measures which may help to ensure food security and sustainable food production;
- Endeavour to transform the food crisis into an opportunity for farmers and to build resilience in order to reduce the country's food dependency on imports.
- Ensure the maintenance of a Food Security Fund to sustain the implementation of adaptation measures.

# 3. National Climate Change Adaptation Policy (3c)

## **Sectoral Policy Principles: Fisheries**

- Promote and facilitate the undertaking of ongoing multi-disciplinary assessment of coastal and marine ecosystems, to ensure that needs of marine life are understood and taken into account for fisheries and coastal zone management;
- Strengthen fisheries governance at national and regional levels;
- Ensure the continuation, expansion and strengthening of capacity for artisanal fishermen;
- Identify and promote alternative fishery and resource use activities (e.g. aquaculture) where impacts on ecosystems and natural resources preclude the continuation of traditional activities;
- Endeavour to create and maintain appropriate infrastructure for storm forecasting, signalling systems and safe refuges for dealing with rising sea level and increased storminess.



# 3. National Climate Change Adaptation Policy (3d)

## **Sectoral Policy Principles: Tourism**

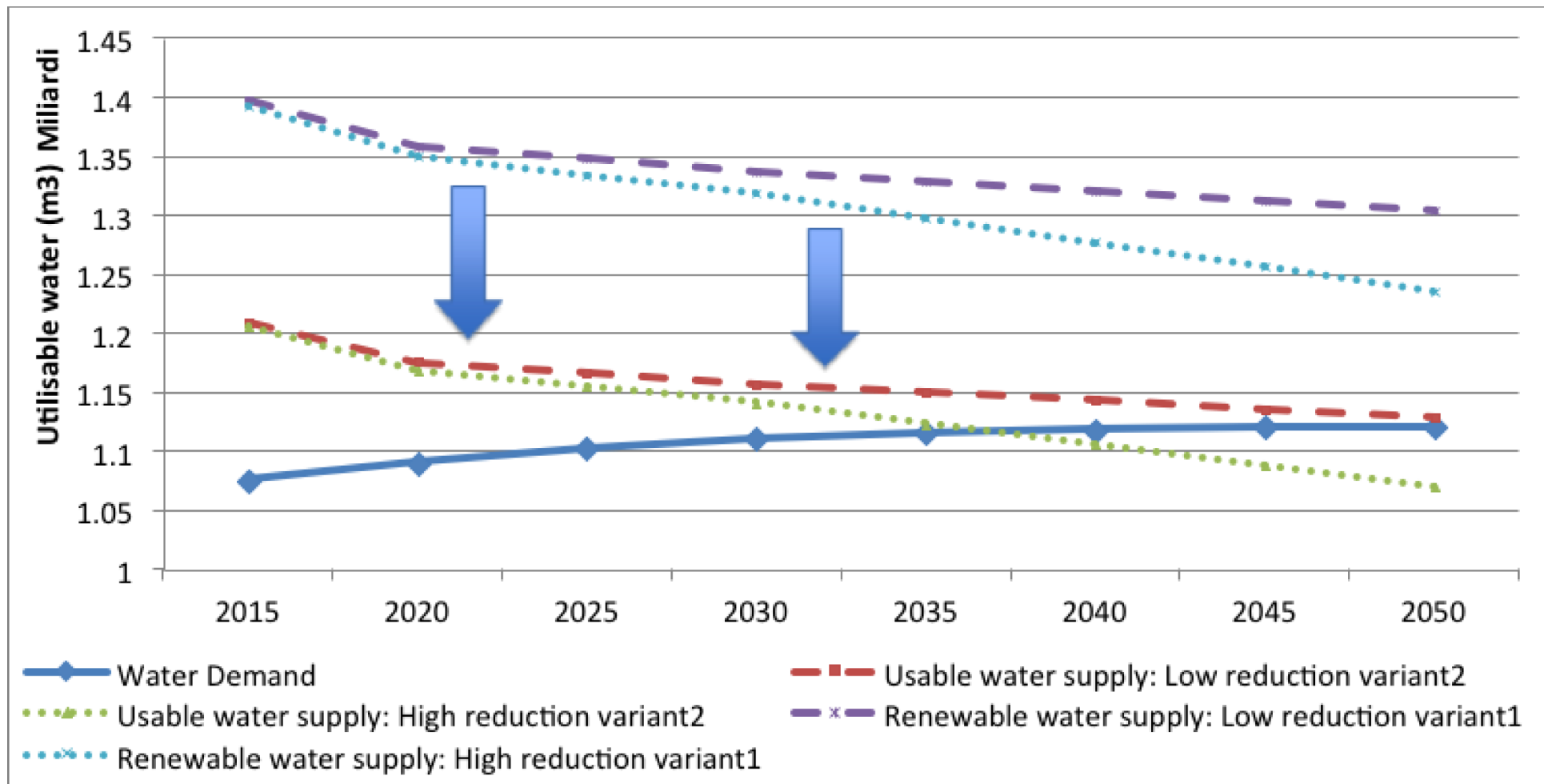
- Ensure that appropriate physical planning guideline such as coastal setbacks are enforced for new tourism developments;
- Undertake measures to incorporate tourism development with natural resources management such as Integrated Coastal Zone Management (ICZM) to preserve ecosystem services;
- Facilitate the protection and rehabilitation of tourism resources, including natural resources such as beaches, and man-made resources (infrastructure);
- Work with stakeholders in the tourism sector to develop a strategic plan that incorporates climate change considerations and appropriate measures such as water conservation programmes as well as general safety and sustainability concerns.

# 4. Strategy and Action Plan for Climate Change Adaptation

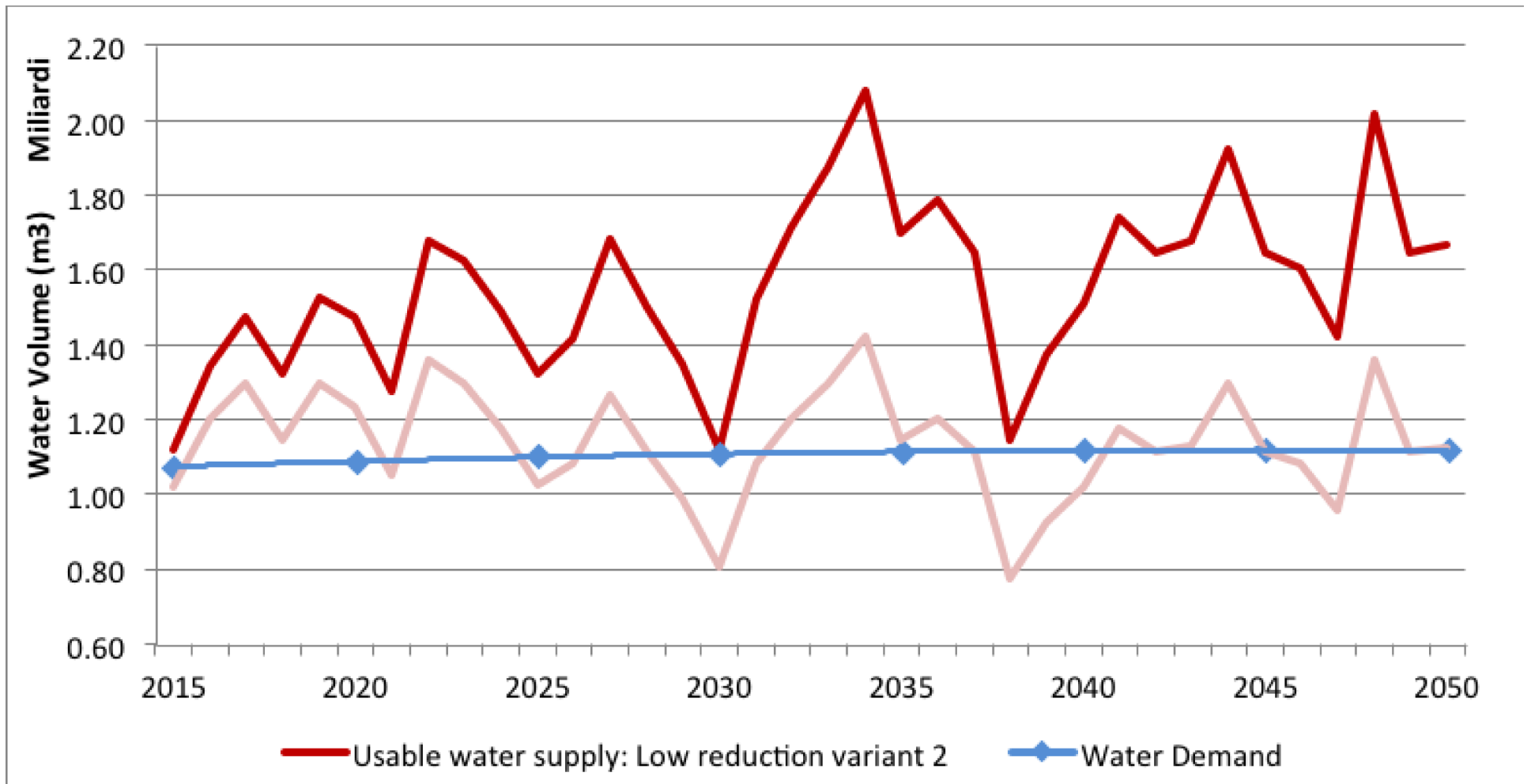
- Cross sectoral and sectoral assessments

Climate change effect	Confidence	Additional economic costs due to climate change (million USD PPP) - yearly average		Additional persons affected/in need of emergency assistance due to climate change - yearly average		Affected groups
		2010	2030	2010	2030	
<b>Environmental Disasters</b>						
Drought	Indicative	5	25	-	-	Arid regions, farmers
Floods & landslides	Indicative	-	-	1,500	1,500	Small children, pregnant women, elderly, river basins, small islands, mountainous communities
Storms	Speculative	25	150	500	400	Small islands, cyclone belt countries
<b>Habitat Change</b>						
Biodiversity	Indicative	5	20	-	-	Deforestation zones, farmers
Desertification	Indicative	-5	-40	-55,000	-150,000	Outdoor workers, farmers
Heating and cooling	Robust	1	20	-	-	Small children, elderly, pregnant women, humid tropical countries, Africa
Labour productivity	Robust	550	3,500	-	-	Humid tropical countries, outdoor occupations, subsistence farmers, pregnant women, elderly, heavily labouring workers
Sea-level rise	Robust	20	100	-	-	Small islands, low elevation coastal communities, coastal cities, farmers
Water	Speculative	-10	-65	-	-	Water intensive industries, outdoor workers, subsistence farmers
<b>Industry Stress</b>						
Agriculture	Indicative	25	200	-	-	Farmers, Subsistence farmers
Fisheries	Robust	5	55	-	-	Livelihoods derived from fishing, tropical countries

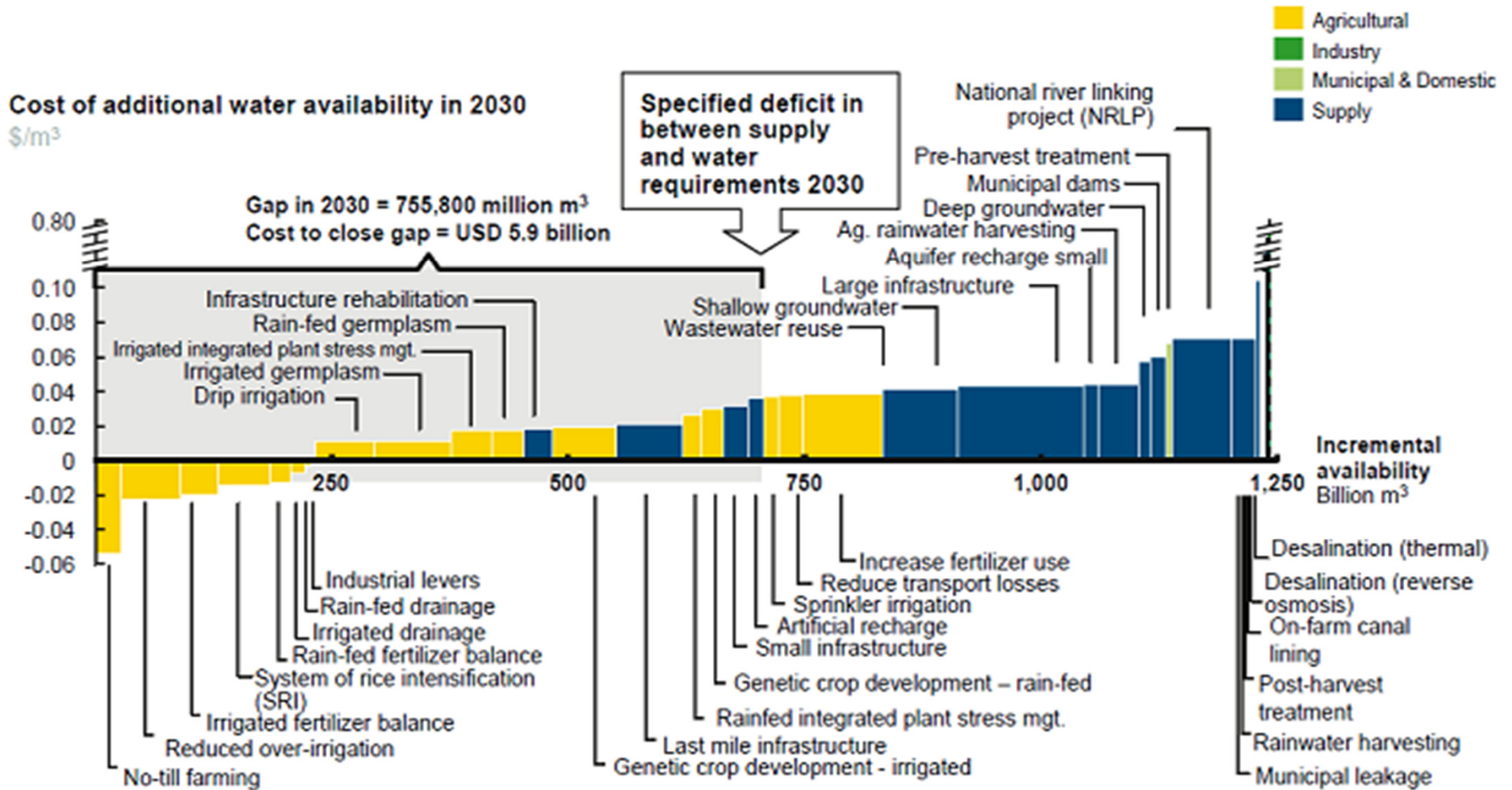
# 4. Strategy and Action Plan for Climate Change Adaptation (2a)



# 4. Strategy and Action Plan for Climate Change Adaptation (2b)



# 4. Strategy and Action Plan for Climate Change Adaptation (2c)



# 4. Strategy and Action Plan for Climate Change Adaptation (2c)

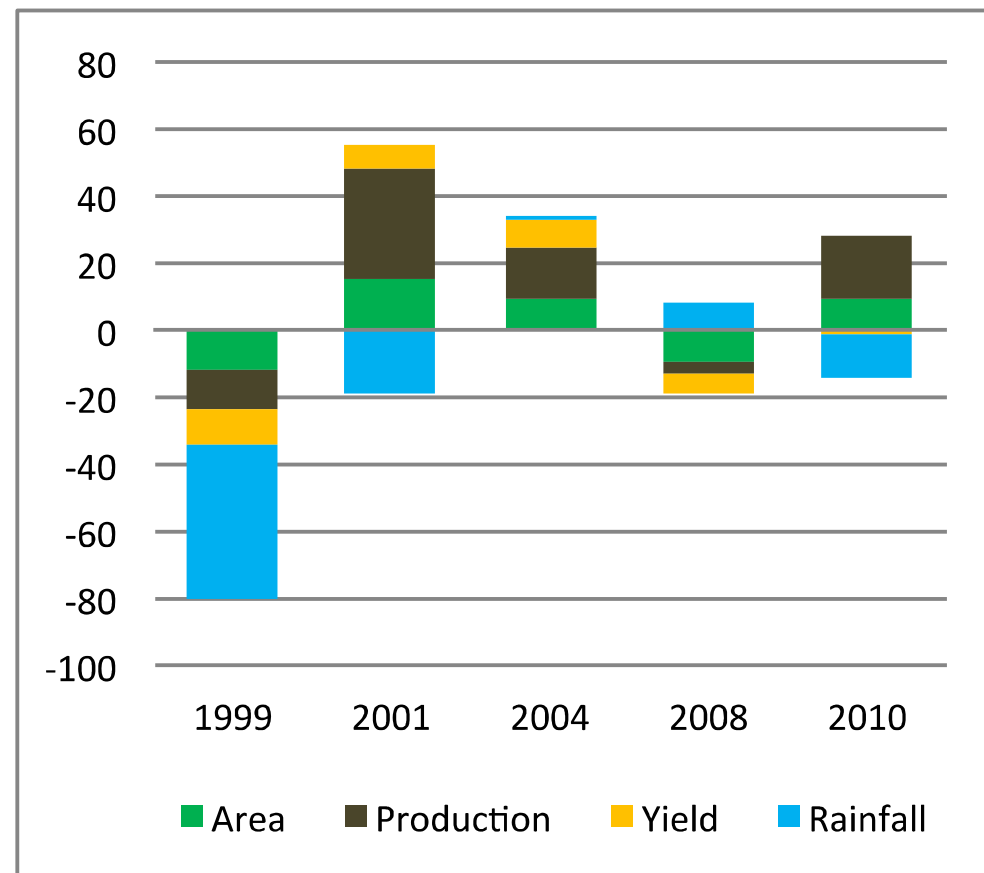
**Table 1: Investment and operational costs for selected adaptation technologies in the water sector**

<b>Technology</b>	<b>Cost (Rs/m<sup>3</sup>)</b>
Stormwater harvesting	38.75
Desalination (brackish water)	33.79
Rainwater harvesting (households)	30.00
Water efficient fixtures	7.83

# 4. Strategy and Action Plan for Climate Change Adaptation (3a)

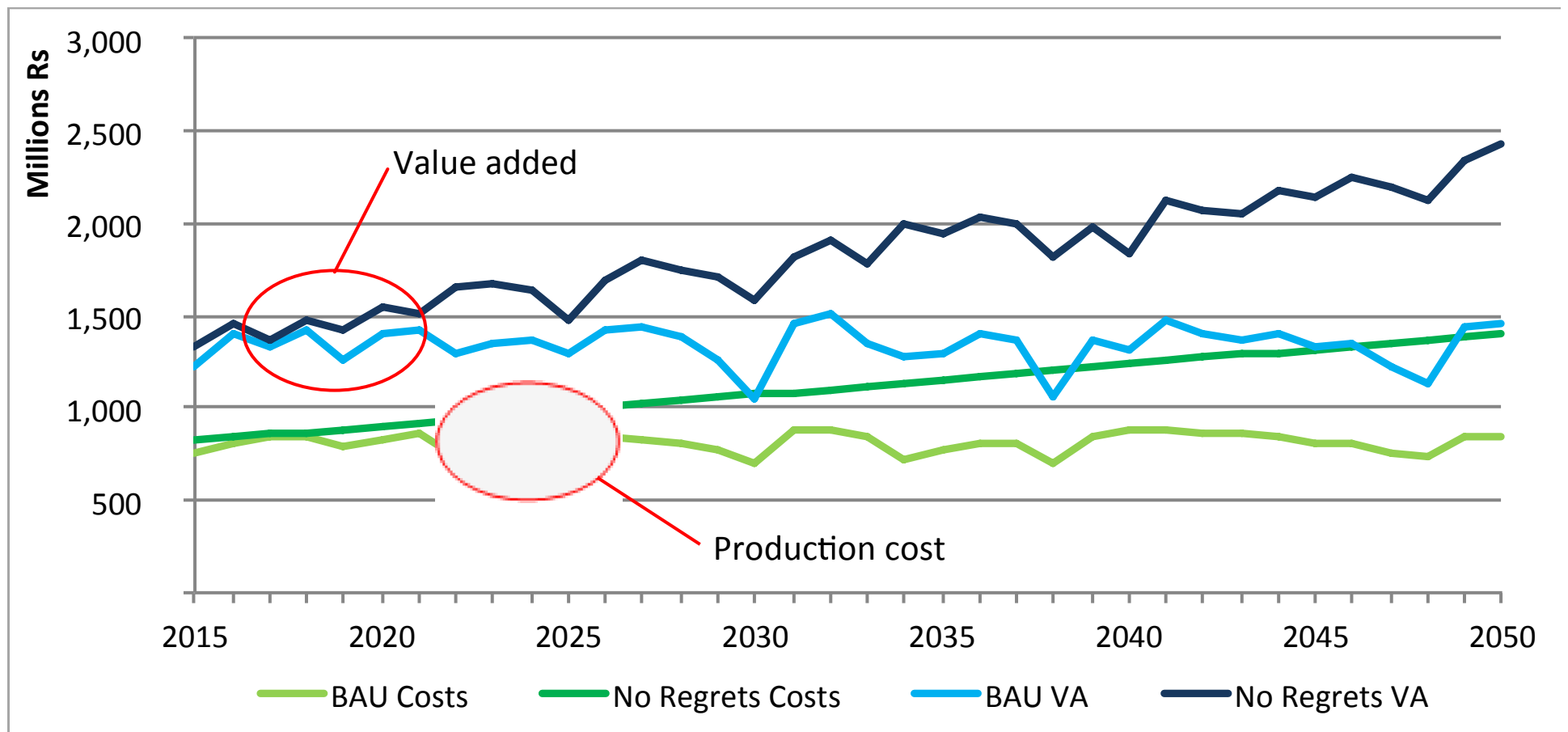
Figure 1: Rainfall, food-crops harvested area, production and yield for selected years with respect to 2005.

	Area (Ha)	Production (t)	Yield (t/Ha)	Rainfall (mm)
2005	6901	96782	12.6	2027.9
1999	6059	86083	11.2	1102.4
2001	7918	129119	13.4	1653.4
2004	7553	111633	13.6	2054.6
2008	6266	93021	11.8	2192.1
2010	7570	114844	12.4	1753.3
% Change relative to 2005				
1999	-12.2	-11.1	-11	-45.6
2001	14.7	33.4	6.9	-18.5
2004	9.4	15.3	8.1	1.3
2008	-9.2	-3.9	-5.9	8.1
2010	9.7	18.7	-1	-13.5



# 4. Strategy and Action Plan for Climate Change Adaptation (3b)

Figure 1: Value added and costs under BAU, No-regrets and Best-case scenarios





## 4. Strategy and Action Plan for Climate Change Adaptation (4)

### **Sectoral strategy and action plan:**

- Based on the sectoral policy principles.
- Strategies are coupled with specific actions, for water, agriculture, fisheries and tourism.
- DRR is also considered, and specific recommendations are added for Rodrigues when information is available.

# 5. Integrated Policymaking for Climate Change Adaptation

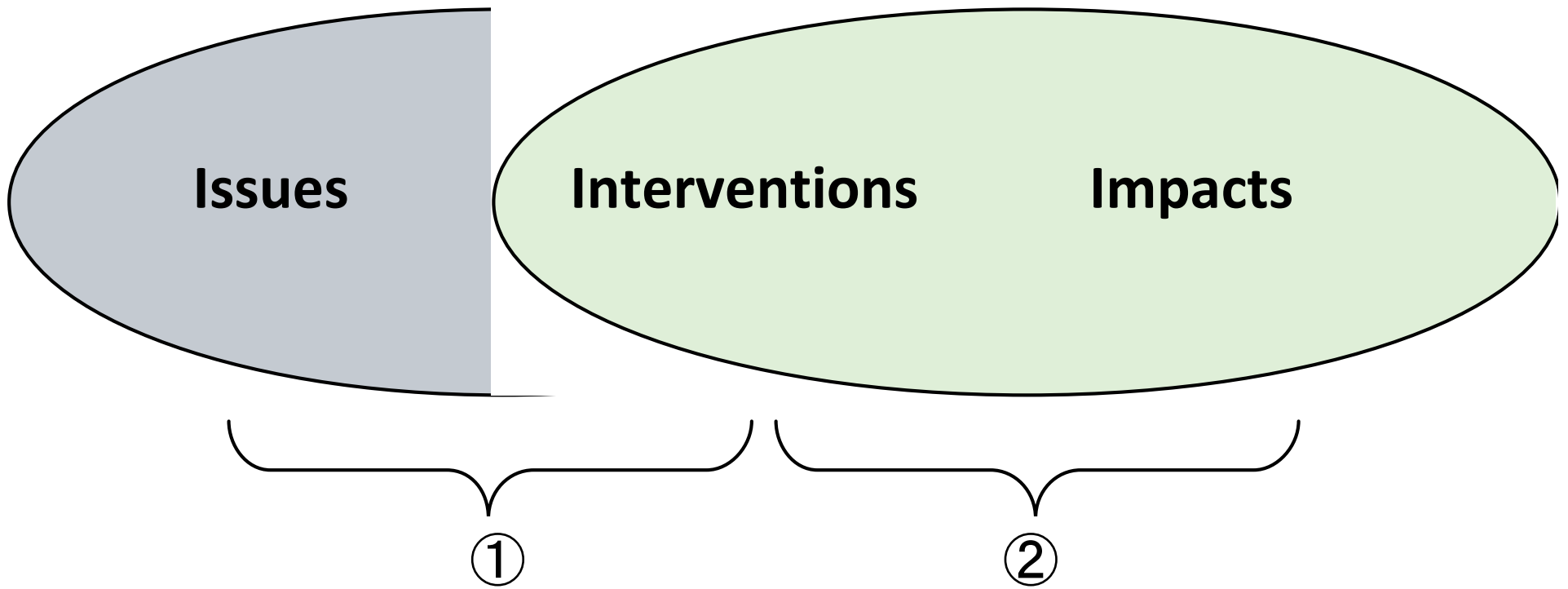
- Review of existing policy efforts, with the identification of gaps and definition of needs and responsibilities for the implementation of the strategy and action plan presented in earlier sections.

## 6. Indicators for agenda setting, policy formulation and evaluation

Framework proposed:

- Agenda setting indicators
- Policy formulation indicators
  - Policy objectives indicators
  - Intervention options and cost indicators
  - Policy formulation indicators
- Policy Monitoring and Evaluation indicators
  - Green, investment, jobs, and sectors
  - Decoupling impacts and resource efficiency
  - Indicators of progress and well-being

## 6. Indicators for agenda setting, policy formulation and evaluation (2)



# 6. Indicators for agenda setting, policy formulation and evaluation (3)

Water				
Issues	Interventions	Indicator subset 1	Impacts	Indicator subset 2
Anticipated water scarcity	Expand water storage and conjunctive management of surface and groundwater resources	Renewable internal freshwater resources per capita (m3)	Increased capacity of storage system and increased buffer of resources	Importance of national expenditure for water supply and sanitation
		Annual freshwater withdrawals, total and by sector (% of internal resources)		Change in hydropower productivity
		Groundwater depletion		
Water use inefficiency	Aggressively increase water use efficiency	Water Footprint (FT) for domestic consumption, considering the regionally varying water stress by adequate contextualization	Reduced waste of water resources	Water productivity, total (constant 2000 US\$ per m3 of total freshwater withdrawal)
			All of the above	Percentage of population using improved sanitation facilities
Water contamination, ecosystem degradation	Review of water management laws, regarding contaminants release in the environment	Organic water pollutant (BOD) emissions (kg per day)	Improved ecosystems health and productivity	Change in aquifers quality status (quality/salinity)
	Protection of wetlands	Inland and coastal wetland ecosystem condition	Improved aquifer quality, protection from storm damage	Value of land and infrastructure protected by wetlands

# 7. Investment Plan for Climate Change Adaptation

- Cross sectoral investments:
  - Based on the DRR report, these investments affect several sectors simultaneously. They include:
    - Implement a sound (spatial) data infrastructure
    - Preserve a healthy natural environment
    - Flood management plans
    - Coastline management plans for inundation
- Sectoral investments:
  - Based on the TNA report, for water, agriculture and fisheries.
  - Each investment is linked to a specific action in the strategy/action plan.

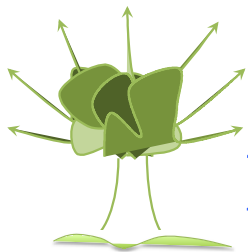
# 8. Selected Project Prospects

*To be developed.*

# Thank you!

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