

# UCRMP

## URBAN CLIMATE RISK MANAGEMENT PLAN

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# CITY OF KUPANG

AUGUST 2015



**KOTA  
KITA**  
A CITY FOR ALL



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**CITY OF KUPANG**

AUGUST 2015

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Kupang, Indonesia: Urban Climate Risk Management Plan (UCRMP).

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Figure 1:

*Due to its coastal location, the city of Kupang is vulnerable to the impacts of climate change. The people, economy, and infrastructure of the city will be impacted by rising sea-levels, changes in weather patterns, and coastal erosion.*



# 1. INTRODUCTION

## 1.1. Introduction

Kupang is an Indonesian city with a strategic position; it is a link to other cities in eastern Indonesia. Kupang is the capital of the East Nusa Tenggara province, and is also at the heart of development on the island of Timor. The city has a current population of 378,435, which is expected to grow as the urbanization trend continues. It is estimated that in fifteen years, the population of Kupang will grow to over 750,000 inhabitants. Thus, Kupang is soon to be a medium-sized city, with the potential to become a major city in the eastern region.

However, the trend of urbanization and growth is also at risk, due to vulnerabilities created by climate change. An understanding of the condition of the city, especially the vulnerability of its population, physical spaces, and urban systems, is very important in preparing the city to be resilient in the face of climate change. In many cases, unplanned urban growth actually increases the risk of systemic failure in the city, which consequently causes more severe direct and indirect impacts.

The Kupang Municipal Government, with the support of UNDP through the program of *Safer Communities through Disaster Risk Reduction* (SCDRR), has collected and analysed data related to the city's vulnerability to climate change. The Climate Change Vulnerability Assessment (CCVA) was carried out from November to June 2015, and involved various interest groups

(stakeholders) related directly or indirectly to climate change. The analysis presented here is shared knowledge built on participatory principles in order to build the capacity of the local government and society. In summation, the CCVA presents a profile of Kupang's vulnerabilities to climate change, and concludes with some recommendations and policy considerations for building the Climate Change Adaptation and Resilience.

As a follow up to the CCVA, the necessity of efforts to encourage the mainstreaming of various aspects of climate change adaptation in development policies and plans in Kupang have been taken into account. One step to be taken is to prepare the Urban Climate Risk Management Plan (UCRMP). This includes several objectives:

1. Develop the city's vision and strategy related to climate change adaptation and disaster risk reduction (CCA - DRR)
2. Align the various programs from the government, NGOs and private sectors to the framework of climate change adaptation and disaster risk reduction.
3. Create guidelines for communication between departments and stakeholders in the city. Coordinate across programs related to climate change and disaster risk reduction in order to synchronize efforts.



## STEPS IN THE FORMULATION OF THE CCVA AND UCRMP KUPANG

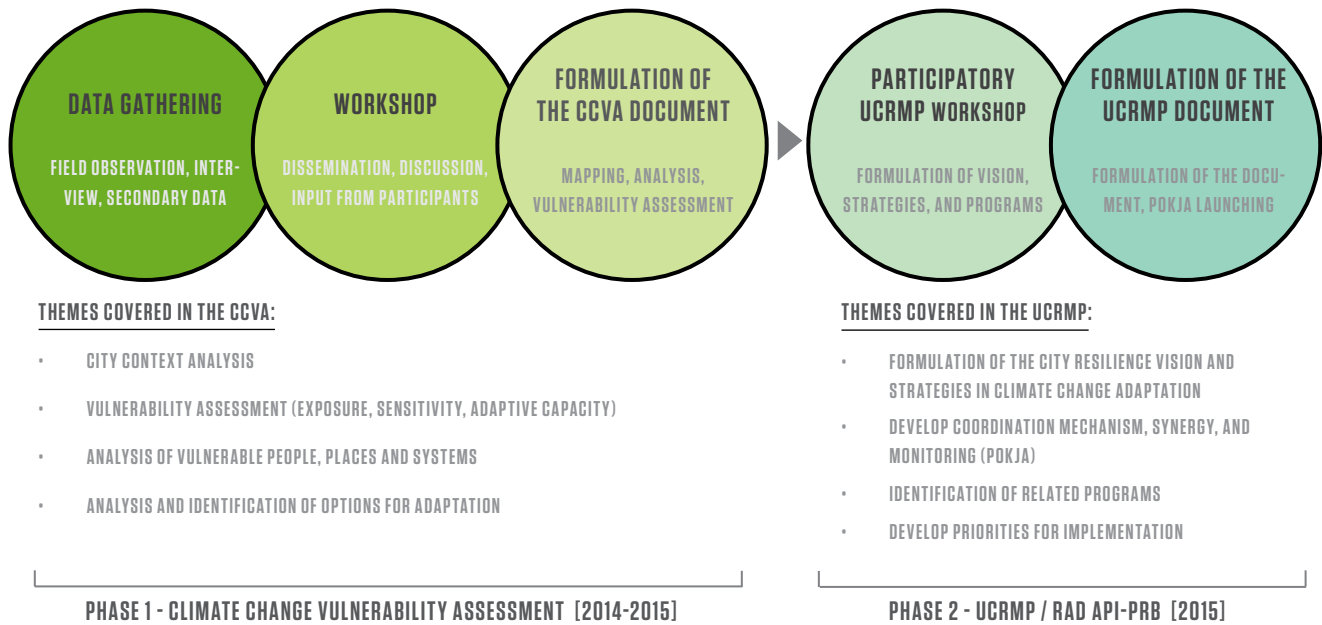


Figure 2: CCVA document was created in November 2014 - May 2015 then followed-up with the formulation Urban Climate Risk Management Plan (UCRMP) document as the framework for implementation and action plan.

The UCRMP was established in Kupang through a participatory workshop on 5-6 May 2015 at Hotel On the Rock, involving government, academia, NGOs, and local media. This workshop was conducted to present and analyse various CCVA findings and recommendations, followed by an analysis of the city's vision (RPJMD) with the goal of aligning the vision with the framework of climate change adaptation and disaster risk reduction. The workshop produced an adaptation and resilience vision, which was a synthesis of the city's vision and an adaptation and resilience framework / consideration. Then various programs at the government level and other stakeholders in the city were channelled to the resilience vision and its strategy.

In making the document, the results from CCVA were reviewed to help ground a fundamental understanding about the vulnerability of Kupang. The analysis was also updated with the current conditions of the city. The CCVA and URMP are both interconnected -- the information can be updated according to the dynamics of the city, especially in terms of levels of vulnerability that may change over time. Collect data and updating

information needed for the CCVA and UCRMP require coordination mechanism to allow collaboration amongst city stakeholder. Thus, the UCRMP also puts forward the critical importance of establishing a climate resilience working group (POKJA-Perubahan Iklim) to follow up and push forward the implementation of the strategy and action plan.

### 1.2. What are Kupang's Vulnerabilities?

Based on precedents and historical trajectory, the four primary vulnerabilities that threaten the urban and environmental sustainability of Kupang are:

#### Drought

- KUPANG IS PRIMARILY COVERED IN ROCKY GROUND, AND IS OFTEN REFERRED TO AS "ROCK WITH LITTLE DIRT", SO IT IS VERY ARID IN THE DRY SEASON. THIS ROCKY LAND CAN NOT ABSORB RAINWATER PROPERLY DURING THE MONSOON SEASON.
- IF THE DRY SEASON IS EXTENDED AS A RESULT OF CLIMATE CHANGE, KUPANG'S VULNERABILITY IS QUITE HIGH IN



TERMS OF DROUGHT AND ACCESS TO CLEAN WATER.

- SOME VULNERABLE GROUPS IDENTIFIED IN THE STUDY ARE FARMERS, FISHERMEN, AND INFORMAL LABOURERS WHO WOULD HAVE DIFFICULTY ACCESSING CLEAN WATER IN THE CITY.
- CURRENTLY, DROUGHT HAS IMPACTED SEVERAL NEIGHBOURHOODS SUCH AS ALAK, NAIONI, FUTUKOA, KOLHUA, NIAMATA, LASIANA AND OELATA PENKASE.

## Erosion in Coastal Areas

- COASTAL AREAS IN KOTA KUPANG ARE THREATENED BY THE INCREASING INTENSITY OF COASTAL STORMS AND SEA LEVEL RISES.
- THIS IS COMPOUNDED BY THE REDUCTION IN MANGROVE VEGETATION ALONG THE COAST OF KUPANG.
- EROSION SEVERELY THREATENS HUMAN SETTLEMENTS AND CAN CAUSE INFRASTRUCTURE DAMAGE ALONG THE COAST.
- FISHERIES AND BUSINESSES ALONG THE COASTLINE, SUCH AS HOTELS AND TRADITIONAL MARKETS, ARE LIKELY TO BE MOSTLY AFFECTED.

## Landslide

- KUPANG ALSO HAS A HILLY TOPOGRAPHY WITH SPARSE VEGETATION. ALONG THE RIVERBANKS MANY INFORMAL SETTLERS RESIDE IN LOCATIONS THAT ARE VULNERABLE TO LANDSLIDES.
- BUILDINGS ARE LOCATED ON FRAGILE LAND THAT ERODES DURING HEAVY RAINS. THIS CAN BE SEEN IN SOME VILLAGES SUCH AS MANTASI AND BELLO.

## Strong Winds / Storms

- STRONG COASTAL STORMS OFTEN HIT THE OESAPA REGION (OESAPA WEST AND FATUBESI), WHILE INTENSE WINDS SUCH AS TYPHOONS OFTEN THREATEN THE HILLY REGIONS LIKE BELLO, FUTUKOA AND NAINONI.
- HOMES, BUILDINGS, AND FISHING BOATS ARE DAMAGED, AND MANY FISHERMEN ARE UNABLE TO WORK DURING THE STORMY SEASON.

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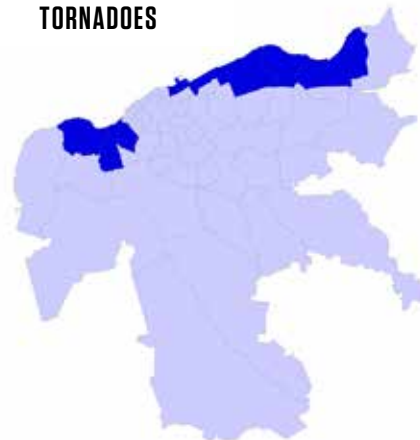
## LOCATIONS OF CLIMATE HAZARDS IN KUPANG

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### STRONG WINDS / STORMS



### TORNADOES



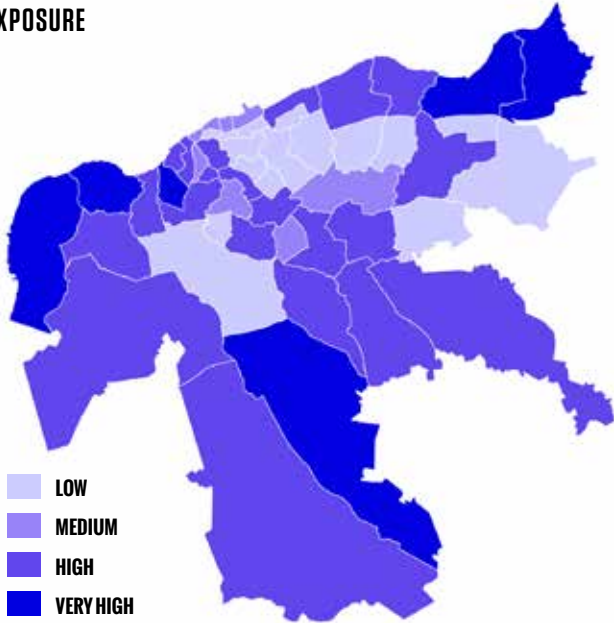
### RISING SEA-LEVEL AND COASTAL EROSION



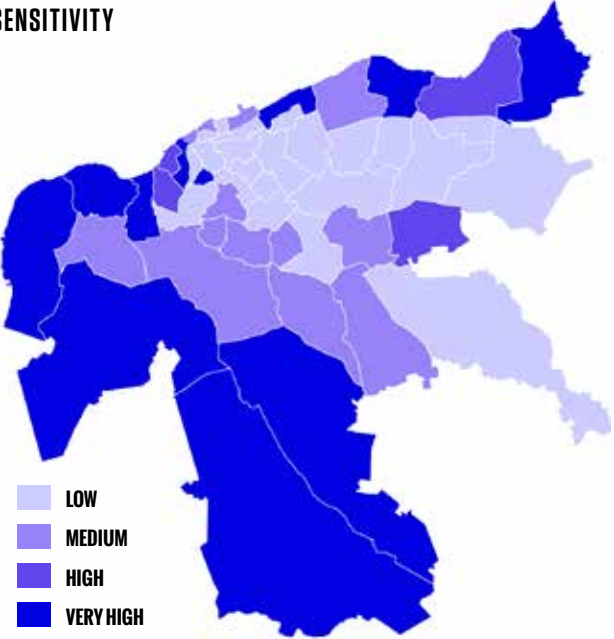
### DROUGHT



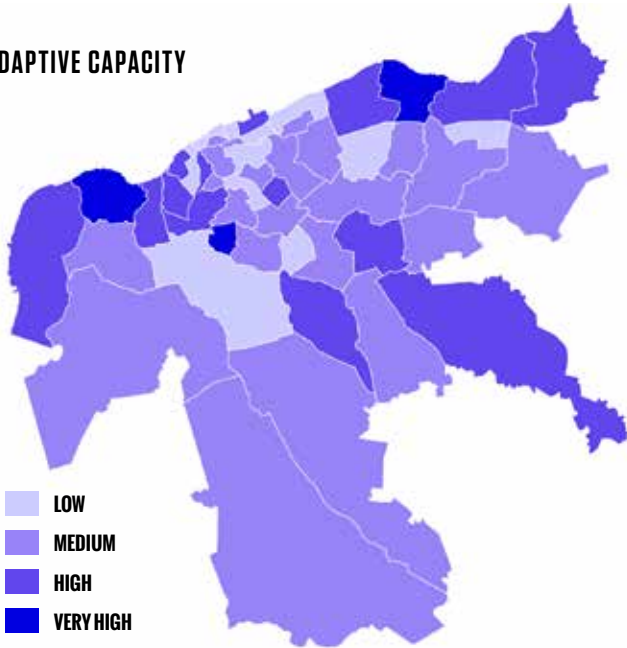
**EXPOSURE**



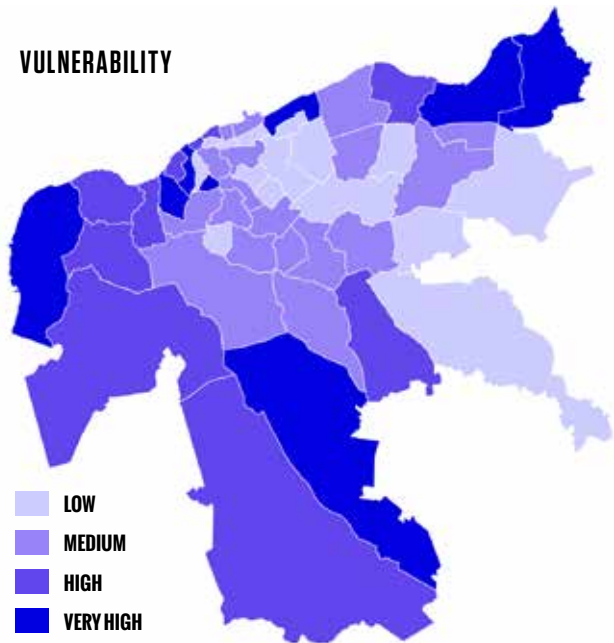
**SENSITIVITY**



**ADAPTIVE CAPACITY**



**VULNERABILITY**



Kupang also has several sub-populations with heightened vulnerability due to factors including poverty and inaccessibility to urban public services.

**a. Traditional / Poor Fishing Community**

Fishermen who rely on traditional fishing, or those who work on fishing boats belonging to others have a higher vulnerability than those who have modern fishing equipment or larger ship owners. Although

the entire fishing industry will be impacted by climate changes such as sea level rises and coastal storms, the poor are disproportionately impacted. They are more prone to losing or damaging their boats or damages, and it is more difficult for them to recover from these losses due to a lack of financial resources.

The types of exposure and its impact on fishing communities can be seen in the following table:

CLIMATE CHANGE ASPECTS	EXPOSURE	IMPACTS ON FISHERMEN
Sea level rise	<ul style="list-style-type: none"> <li>• High tidal waves</li> <li>• Coastal erosion</li> </ul>	<ul style="list-style-type: none"> <li>• Boat damage</li> <li>• Erosion threatened housings of coastal communities</li> </ul>
Increased sea surface temperature	<ul style="list-style-type: none"> <li>• Coral bleaching</li> <li>• Coastal storms</li> </ul>	<ul style="list-style-type: none"> <li>• Fish species extinct</li> <li>• Reduced fish hauls by fishermen</li> <li>• Reduced fishermen's income</li> </ul>
Unpredictable climatic conditions	<ul style="list-style-type: none"> <li>• Uncertain stormy season</li> </ul>	<ul style="list-style-type: none"> <li>• Fisherman do not go fishing</li> <li>• Reduced fishermen's income</li> </ul>

## b. Small Farmers

Agriculture is not a major livelihood source in Kupang, but there are some farmers who supply the local market with rice and vegetables, and many of them are highly dependent on rainwater. When climate change takes effect, unpredictable weather often means farmers cannot predict the exact planting season. Farmers are also facing the possibility of prolonged drought that can threaten the annual harvest season.

CLIMATE CHANGE ASPECTS	EXPOSURE	IMPACTS FOR FARMERS
Prolonged dry season	<ul style="list-style-type: none"> <li>• Drought</li> </ul>	<ul style="list-style-type: none"> <li>• Crop failure</li> <li>• Reduced income of the farmers</li> </ul>
Intense rainfall	<ul style="list-style-type: none"> <li>• Flooding</li> <li>• Landslide</li> </ul>	<ul style="list-style-type: none"> <li>• Destruction of crops</li> <li>• Crop failure</li> <li>• Reduced income of the farmers</li> </ul>
Changing climatic pattern and unpredictable season	<ul style="list-style-type: none"> <li>• Rainy season late and shorter</li> </ul>	<ul style="list-style-type: none"> <li>• The emergence of new pests</li> <li>• Planting schedule disrupted</li> <li>• Crop failure</li> <li>• Reduced income of the farmers</li> </ul>

## c. Informal Workers

An increase in informal workers is a direct impact of urbanization; people with limited skills will take on less profitable jobs such as informal traders in traditional markets, porters, construction workers, motorcycle taxi drivers, public transportation drivers, scavengers or other roles in the informal sector. These informal groups have limited access to public services because of a lack of income. They usually occupy less formal settlements because they seek the cheapest locations such as riverbanks, coastal areas, or areas near marketplaces.

CLIMATE CHANGE ASPECTS	EXPOSURE	IMPACTS ON INFORMAL GROUPS
Prolonged dry season	<ul style="list-style-type: none"> <li>• Drought</li> </ul>	<ul style="list-style-type: none"> <li>• Increased health risk</li> <li>• Increased family spending for health care</li> <li>• Limited access to water</li> <li>• Increased family spending on water provision</li> </ul>
Intense rainfall	<ul style="list-style-type: none"> <li>• Flooding</li> <li>• Landslide</li> </ul>	<ul style="list-style-type: none"> <li>• Damage to informal houses due to flooding or landslide</li> <li>• Damage to infrastructure affecting the transport system</li> <li>• Flooded marketplaces reduce the opportunity to get income</li> </ul>



#### **d. Women (female-headed households or widows), the disabled, and children**

People with disabilities are particularly vulnerable because of their limited access to the infrastructure and services of the city. Many facilities are not friendly to the disabled, which heightens the vulnerability of this group.

Women, especially widows, also have specific vulnerabilities based on their on their economic positions. Women who work in informal sector are often paid less than men in the same sector. The result is that women are likely to be more vulnerable when facing climate change hazards. Pregnant women and the elderly are also more vulnerable and need special attention.

Children are also particularly vulnerable; they often do not have the capacity to adapt to the challenges posed by climate change. They require additional support in order to survive or adapt to threats / disasters.

The aforementioned vulnerabilities in Kupang were central to considerations when drafting the UCRMP document, and efforts were made to consider the cascading impact of climate change on urban populations. Development trends in Kota Kupang such as increasing development in coastal areas, for example, could lead to the displacement of poor, vulnerable groups living along the coastal area. The government should also consider rural-urban migration, and should prepare adequate infrastructure and public service that can help protecting vulnerable groups from severe impacts. Thus, employment is a crucial issue, since as more and more people arrive to the urban areas, more jobs are needed.

### **1.3. Next Step: UCRMP**

The UCRMP was designed to include and adjust to the existing development plans, especially the City's vision (RPJMD and RTRW). The UCRMP is not an entirely separate document, because the resilience vision created fits with the vision of RPJMD, which reflects the political and development visions of the elected leader. The UCRMP also looks to and adopts other planning documents such the departmental action plan, departmental strategic plan, and annual budget plan document. The UCRMP did not create new programs, but rather an amalgamation of government programs and other elements (like NGOs and private programs) that deal with climate change adaptation and disaster risk reduction.

This UCRMP document should be updated regularly (yearly) to realise changes based on an evaluation of program implementation every year. These updates are intended to look further the achievement from each strategy, and to further draw up priorities for the next year based on annual evaluations. The CCVA must inform policy improvements in the UCRMP, therefore the CCVA must be regularly updated with climate trends and changing types of vulnerabilities. Armed with this information, the UCRMP can better prioritize the action plan.

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**Figure 5:**

*The lack of access to clean water is one of the main problems in Kupang. Clean water is not provided uniformly throughout the city, with some residents of suburban areas struggling to access this basic necessity. This problem is exacerbated during the dry season, when the river dries up and the price of (bottled? privatized?) water increases significantly.*





## 2 CITY RESILIENCE VISION AND STRATEGIES

### VISION:

#### “Towards a Just, Livable, and Sustainable Kupang, Proactively Planning for Climate Change to Protect the Welfare of Every Citizen”

The vision set out in this document is a result of a participatory discussion in the UCRMP Workshop held 5-6 May 2015 in the city of Kupang. The mandate of the workshop was to understand the city vision in RPJMD within a climate change adaptation framework. The city vision is “*Toward Kupang as a Cultural City, Modern, Productive, Livable and Sustainable*” by featuring five priorities including economic growth, improving the quality of human resources, improving the quality of public services, and sustainable spatial and social welfare.

The workshop participants were able to formulate the resilience vision as follow: “*Towards a Just, Livable, and Sustainable Kupang, Proactively Planning for Climate Change to Protect the Welfare of Every Citizen.*”

- The concept of the **Welfare City**, as outlined in the vision, refers to a city that seeks to assure citizens’ economic, social and cultural prosperity. Here, welfare has a broad meaning, not only pertaining to economic growth in the city, but also balancing that growth with the provision of accessible and comfortable spaces for social and cultural activities. Public services in the city must be well-maintained so that people can enjoy affordable education and health care, as well as

access to clean water.

- **Livable** refers to a condition in which people live without fear and have complete freedom to engage in activities related to their political, social, and religious affairs. The city should protect its citizens through legal and constitutional frameworks from any insecurity, threats, and/or vulnerabilities. When the city is able to maintain cleanliness and hygiene, its population will not worry about public health; when the city has a strong and reliable police force, its population will not fear crime.
- The last concept, **Justice**, is a fundamental principle for city development processes. Justice is a state in which all citizens, without differentiation of citizenship by race, ethnicity, or religion, have access to government services without boundaries, pressure, or intimidation. The government should deliver public services with transparency, participation, and accountability.
- The Resilience Vision of Kupang City is particularly focused on crucial aspects of urban governance, especially urban spatial management, the utilisation of natural resources, and principles of sustainability.

That vision is translated into five main strategies: (1) Environmental conservation and public awareness, (2) Improving infrastructure and public services that more responsive to vulnerable groups, (3) Eco-friendly community empowerment, (4) Strengthening communications and coordination mechanisms and improving access to climate information, and (5) Policy and Regulation Enforcement.

## 2.1.Environmental Conservation and Public Awareness

Because Kupang’s vulnerability is greatly influenced by environmental factors, the government and local stakeholders feel that they need, concrete strategies to protect the environment, especially forests, mangroves, rivers, and the watershed. These ecosystems play important roles in shaping the city’s resilience to climate change.

- **FORESTS AND PROTECTED AREAS** PROVIDE SHADE, GENERATE DRINKING WATER AND PRODUCE OXYGEN FOR US TO BREATHE. WHEN ADEQUATELY MAINTAINED, THESE CAN ALSO PREVENT LANDSLIDES.

- **MANGROVES** NOT ONLY PROTECT AGAINST HIGH WINDS, WAVES AND EROSION, THEY ALSO PROVIDE REFUGE FOR WILDLIFE AND EMPLOYMENT FOR COASTAL COMMUNITIES.
- **RIVERS** ARE A CRUCIAL SOURCE OF DRINKING WATER FOR MANY PEOPLE BECAUSE KUPANG’S GROUND WATER IS DIFFICULT TO ACCESS, DUE THE CITY’S GEOLOGICAL MAKE UP.

Two important aspects of this strategy are:

- (I). TO **ENCOURAGE ENVIRONMENTAL CONSERVATION** EFFORTS TO PROTECT IMPORTANT ECOSYSTEMS IN KUPANG,
- (II) ENCOURAGE **PUBLIC EDUCATION** ABOUT THE IMPORTANCE OF THE ENVIRONMENT.

The first aspect includes any efforts at the judicial level to establish a legal platform for the protection of conservation areas such as protected forests and

### ECOSYSTEM MAP OF KUPANG

Conservation programs should focus on critical elements of the ecosystem that play a role in shaping the city's resilience to the impacts of climate change

- Forests and protected areas
- Mangroves
- Rivers and watershed

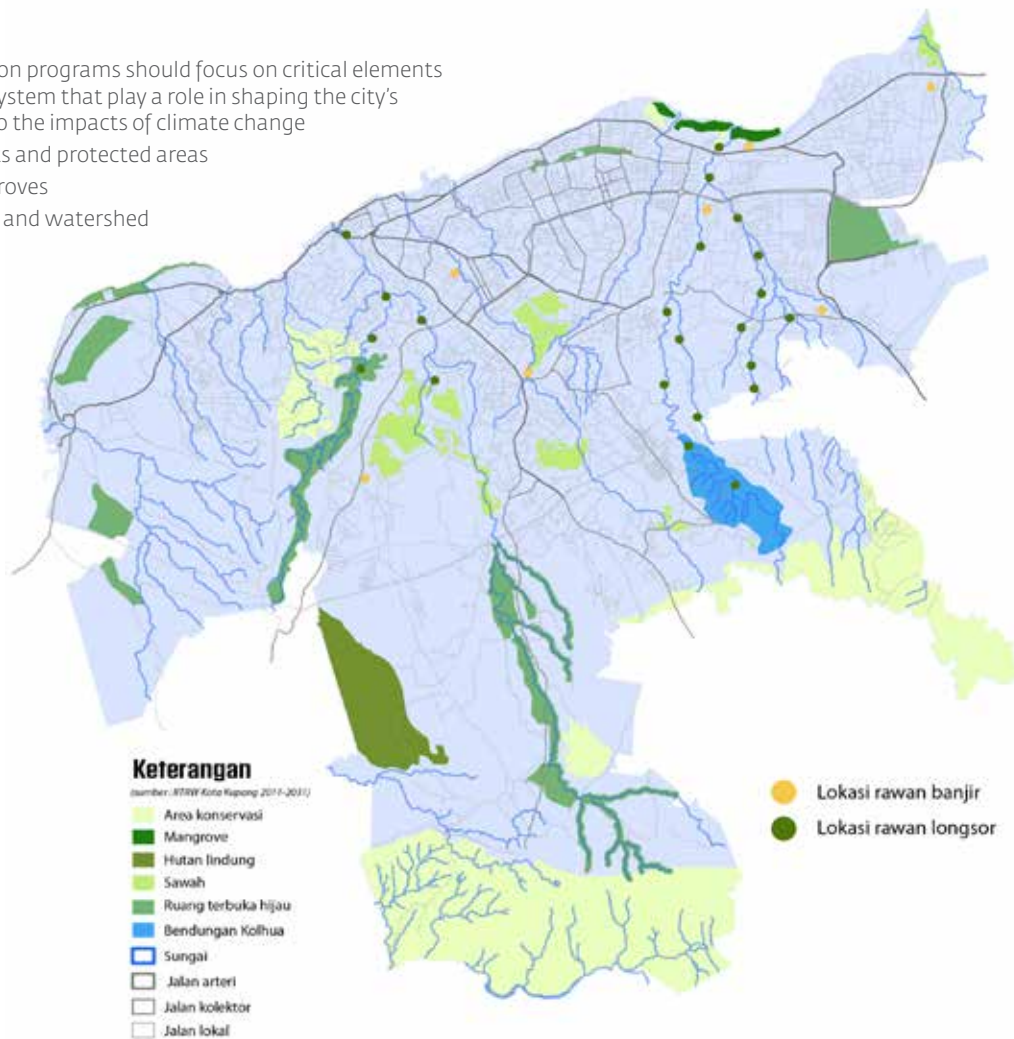


Figure 6: Some of the critical ecosystems in Kupang are open space, mangroves, forests and protected areas, paddy fields, and the watershed.

## STRATEGY 1 - ENVIRONMENTAL CONSERVATION

ISSUES	RELATED PROGRAM	VULNERABILITY REDUCTION
Destruction of mangrove ecosystems on Kupang's coastline	<ul style="list-style-type: none"> <li>Management and revitalization of mangrove vegetation</li> </ul>	<ul style="list-style-type: none"> <li>Reduce the risk of erosion along the coastline</li> <li>Protect the livelihoods of local fisherman</li> <li>Reduce the risk of infrastructure and building failures.</li> </ul>
	<ul style="list-style-type: none"> <li>Program of green space management and mangrove replanting.</li> </ul>	<ul style="list-style-type: none"> <li>Reduce erosion</li> <li>Support the creation of local livelihoods in processing mangrove seeds</li> <li>Recover the city mangrove habitat</li> </ul>
Decreasing water sources due to low absorption of the land.	<ul style="list-style-type: none"> <li>Research for new water sources and conservation of existing water sources</li> </ul>	<ul style="list-style-type: none"> <li>Reduce the impact of severe drought</li> <li>Help to maintain city public water delivery and increase public health.</li> </ul>
Destruction of protected forest and its natural resources	<ul style="list-style-type: none"> <li>Forest rehabilitation, and conserve the protected forest.</li> </ul>	<ul style="list-style-type: none"> <li>Reduce hot temperatures, and reduce air pollution</li> <li>Preserve protected forest and water catchment area</li> <li>Preserve the function of conservation area.</li> <li>Provide more public green space</li> </ul>

mangroves. Additionally, the government also encourages planting empty land / areas with more trees to improve the environmental quality of the city.

The second aspect, public education about the important of environment, thus far has been done through a program called “Kupang Green and Clean” which also involves media, the private sector, NGOs, and

community-based organisations. The campaign and continued efforts at spreading awareness are expected to contribute to the increasing participation in protecting ecosystems and urban environments from the adverse effects of non-organic waste.



**Figure 7:** Mangrove cultivation is one strategy to increase green open spaces and encourage environmental conservation. This would also play a strategic role in protecting the coastal area from erosion and rising sea-levels.



## 2.2.Improving Infrastructure and Public Services, which are more Responsive to Vulnerable Groups

Infrastructure and public service are both very important city systems in ensuring the success of a climate change adaptation strategy. Failure of these systems could lead to failure of the entire city if not well handled. The system is defined as a component of a city that has linkages with other components so that it runs as a single connected pattern. Clearly stated in the RPJMD 2013-2017 is the importance of establishing a systematic structure of the road network, constructing

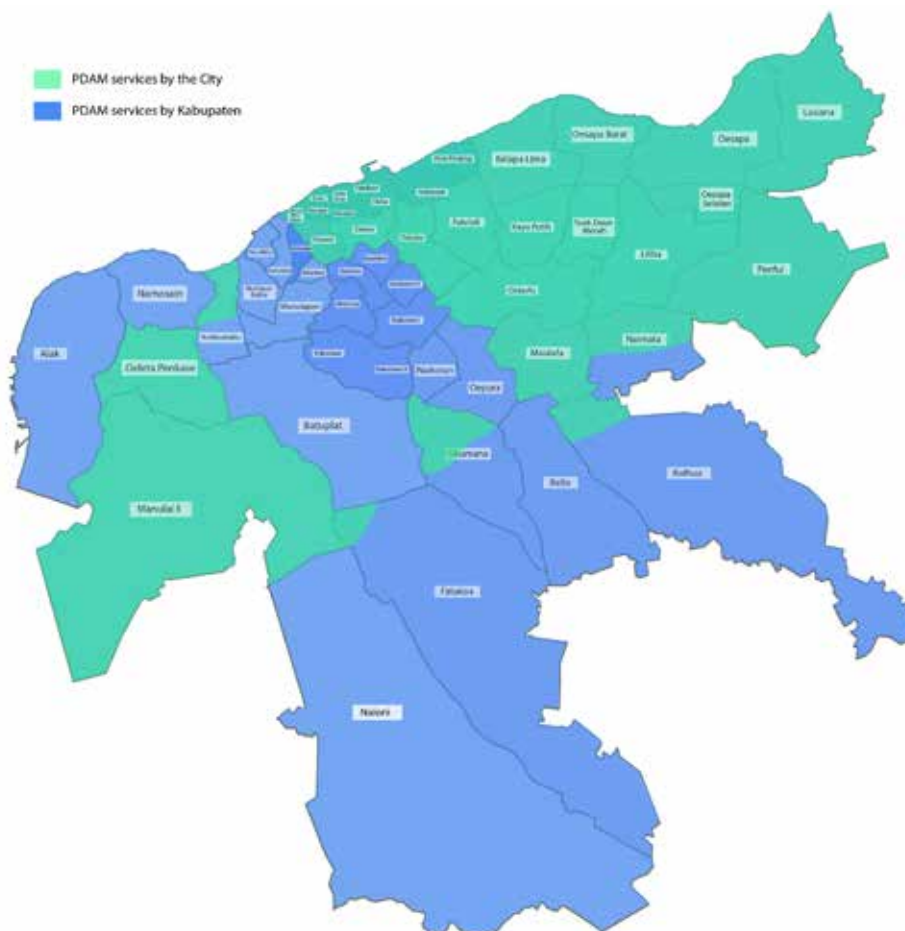
drainage systems to cope with stagnant water, and developing facilities for raw water supply, housing, and energy.

Poor drainage systems in Kupang can make the city vulnerable place because it contributes to flooding, and the household waste that pollutes public water sources can cause a derivative impact on public health.

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### THE PROVISION OF WATER IN KUPANG

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**Figure 8:** Water supply in the city is distributed either by the District of Kupang PDAM or the City of Kupang PDAM; there is no indication why certain neighborhoods may be under the jurisdiction of one rather than the other. The government need to do a better collaboration to provide better service for the citizen, especially for those lives in remote area with limited access to water.

## STRATEGY 2 - IMPROVING INFRASTRUCTURE AND PUBLIC SERVICES

ISSUES	RELATED PROGRAMS	VULNERABILITY REDUCTION
Decreasing supply of clean water in Kupang	<ul style="list-style-type: none"> <li>Development of new water sources</li> </ul>	<ul style="list-style-type: none"> <li>Reduce risk of lack of clean water supply in Kupang.</li> <li>Reduce vulnerability of poor groups who cannot access water during drought</li> </ul>
	<ul style="list-style-type: none"> <li>Improve coordination with other municipalities on inter-territory water supply.</li> </ul>	<ul style="list-style-type: none"> <li>Increase water supply to the city</li> <li>Reduce the vulnerability of poor people in dry season</li> </ul>
	<ul style="list-style-type: none"> <li>Management of community water sources</li> </ul>	<ul style="list-style-type: none"> <li>Improve communal capacity to cope with climate change impacts.</li> </ul>
Abrasion and high tides damage the settlement area in the coast.	<ul style="list-style-type: none"> <li>Build sea wall</li> </ul>	<ul style="list-style-type: none"> <li>Reduce the impact of flooding and erosion</li> <li>Protect vulnerable groups from coastal erosion</li> </ul>
	<ul style="list-style-type: none"> <li>Mangrove replanting in the coastal</li> </ul>	<ul style="list-style-type: none"> <li>Improve the quality of the coastal ecosystem</li> <li>Reduce the risk of coastal erosion</li> </ul>
Flooding in the coastal areas due to broken drainage systems and decreasing number of mangrove ecosystems	<ul style="list-style-type: none"> <li>Construction and normalization of canal and drainage</li> </ul>	<ul style="list-style-type: none"> <li>Reduce the impact of floods</li> <li>Reduce water pollution in the city</li> <li>Improve public health</li> </ul>
	<ul style="list-style-type: none"> <li>Development of polder and reservoir</li> </ul>	<ul style="list-style-type: none"> <li>Reduce flooding</li> </ul>



**Figure 9:** (Left) The destruction of this sea wall indicates the failure of this strategy in protecting coastal settlements. Mangroves, cultivated with the cooperation of the coastal community, offer an environmentally sound alternative. (Right) Retaining walls are one of the effective methods of overcoming the problem of landslides in Kupang's hilly topography.

## 2.3. Eco-friendly Community Empowerment

Poor fishermen in coastal areas, informal groups or informal traders, and fishermen are the groups that are most vulnerable to climate change. They exposed directly and/or indirectly. The most significant impact is the destruction of the livelihoods of members of these vulnerable groups, such as declining fish hauls due to unpredictable weather and dangerous waters. Similarly, farmers suffer from disrupted planting and harvesting cycles, which reduce their productivity and consequently reduce their income. The urban informal groups also experience vulnerability, often occupying vulnerable

locations such as riverbank and coastal areas, where flooding and landslide may affect their houses and belongings.

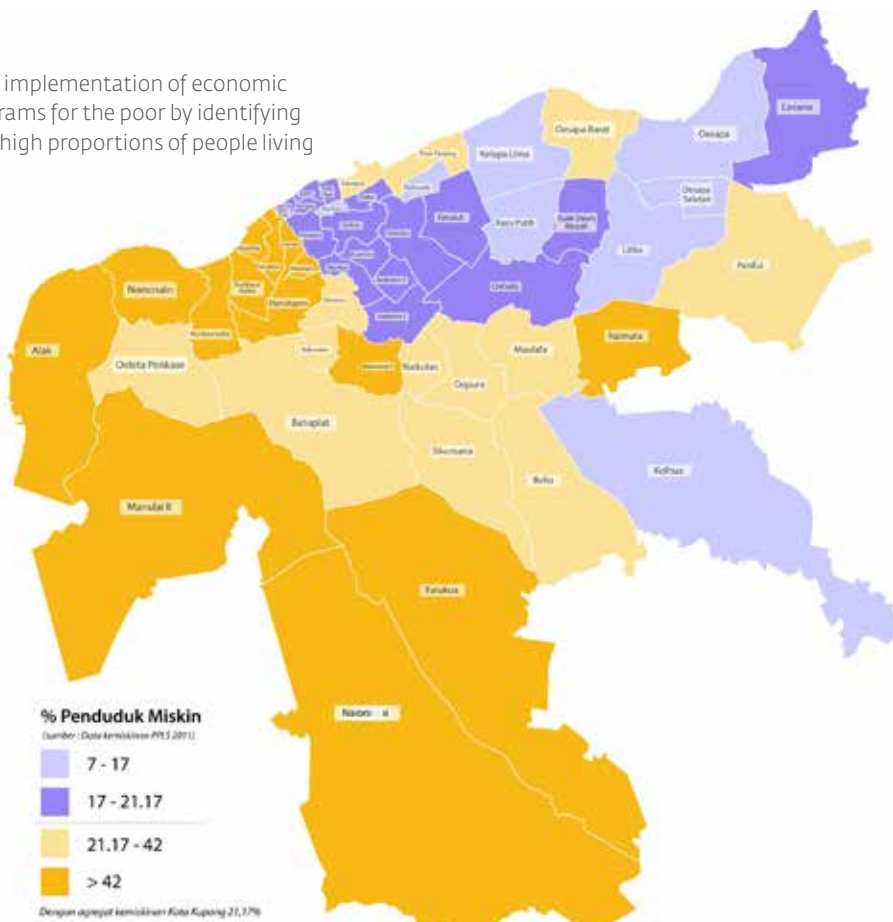
Community economic empowerment programs are a strategy of reducing vulnerability by increasing the local community's capacity to access economic resources. Aligned with the policy direction in RPJMD 2013-2017, this strategy is targeting programs related to economic empowerment but it also have to consider about the sustainability of the environment. This is important since developing economic condition without considering the environmental condition is not sustainable for the future.

Main focus of this strategy is to:

- PROVIDE **ACCESS TO CREDIT** FOR VULNERABLE GROUPS.

### THE CONCENTRATION OF POVERTY IN KUPANG

This map can aid the implementation of economic empowerment programs for the poor by identifying areas with relatively high proportions of people living in poverty.



**Figure 10:** The overall poverty rate in Kupang is 21.7%, though the rates are much higher than this in some areas, particularly in the west. In some neighborhoods, more than 42% of the population is living in poverty; these areas are particularly vulnerable to climate hazards. Dark yellow indicates the areas with the highest concentration of poverty.



- PROMOTE THE FORMATION OF **COOPERATION AND WORKING GROUPS**, SUCH AS THE VILLAGE WORKING GROUP, TO ENCOURAGE COOPERATION AMONGST INDIVIDUALS FROM VARIOUS SECTORS
- **PROVIDE TECHNICAL SUPPORT** FOR LOCAL BUSINESSES, ESPECIALLY FISHERMEN, FARMERS, AND SMALL MEDIUM ENTERPRISES (SMEs).
- PROMOTE THE USE OF **APPLIED TECHNOLOGY** FOR FARMERS AND FISHERMEN FACING UNPREDICTABLE CLIMATE CONDITIONS TO INCREASE YIELDS.
- **REVITALIZE TRADITIONAL MARKETS** TO SUPPORT VULNERABLE GROUPS.

### STRATEGY 3 - ECO-FRIENDLY COMMUNITY EMPOWERMENT

ISSUES	RELATED PROGRAMS	VULNERABILITY REDUCTION
High poverty level in Kupang	<ul style="list-style-type: none"> <li>• Improve access to credit for poor communities</li> </ul>	<ul style="list-style-type: none"> <li>• Increase access to credit to support the growth of small and medium scale business.</li> <li>• Increase capacity of vulnerable groups</li> </ul>
High poverty level in Kupang: <ul style="list-style-type: none"> <li>• Coastal communities and fishermen</li> </ul>	<ul style="list-style-type: none"> <li>• Economic Empowerment of coastal communities: Technical support and assistance.</li> <li>• Formulation of the <i>Village Working Group</i> which works in the coastal communities.</li> </ul>	<ul style="list-style-type: none"> <li>• Increase the economic capacity of vulnerable groups</li> <li>• Increased capacity of local institutions to support the collective work of the fishermen</li> <li>• Increase the economic capacity of vulnerable groups</li> </ul>
High poverty level in Kupang: <ul style="list-style-type: none"> <li>• Farmers</li> </ul>	<ul style="list-style-type: none"> <li>• Promote the use of applied technology for farmers to increase production.</li> </ul>	<ul style="list-style-type: none"> <li>• Increased of harvest</li> <li>• Reduce vulnerability in the dry season.</li> <li>• Increase the economic capacity of vulnerable groups.</li> </ul>



**Figure 11:** Vulnerable groups in Kupang need programs that empower them economically. Their economic welfare could be supported by the establishment of business cooperatives and financial support for small industry.

## 2.4. Strengthening Communications and Coordination Mechanisms and Improving Access to Climate Change Information

One important factor in successful adaptive capacity is ensuring that the information flow is up-to-date and provides reliable data related to climate change and disaster. Regular climate information can help cities do projections on climate change on a regular

basis and develop better mitigation, preparedness, response and adaptation efforts. Two key points within this strategy are the existence of information systems related to climate change and disasters, and the coordination (synergy) between the government and the community in climate change adaptation and disaster risk reduction.

The UCRMP workshop has proposed the establishment of working groups for Climate Change Adaptation and Disaster Risk Reduction (CCV - DRR). One of the key roles and functions of these working groups is to facilitate the regular consolidation of data and information on climate change.

### STRATEGY STRENGTHENING COMMUNICATION AND COORDINATION MECHANISM

ISSUES	RELATED PROGRAMS	VULNERABILITY REDUCTION
Lack of data and information in the city related to climate change	<ul style="list-style-type: none"> <li>SMS gateway to spread climate information to the fishermen and community</li> </ul>	<ul style="list-style-type: none"> <li>Spread information about climate conditions to the fishermen.</li> <li>Increase disaster preparedness, especially for those who live in coastal areas.</li> </ul>
	<ul style="list-style-type: none"> <li>Mapping of vulnerable areas in the city</li> </ul>	<ul style="list-style-type: none"> <li>Spread information about vulnerable places in the city</li> <li>Help to improve disaster preparedness</li> </ul>
	<ul style="list-style-type: none"> <li>Formulation of development monitoring document</li> </ul>	<ul style="list-style-type: none"> <li>Open access to information about development in the city.</li> <li>Help to improve disaster preparedness</li> </ul>
	<ul style="list-style-type: none"> <li>Assessment of land use changes for green spaces, watershed and coastal land in Kupang.</li> </ul>	<ul style="list-style-type: none"> <li>Spread information to the public related to the trends of land use change in Kupang.</li> <li>Provide information to the public about things that can increase the vulnerability of the city.</li> </ul>
Weakness in coordination and communication between stakeholders in the implementation of climate adaptation program.	<ul style="list-style-type: none"> <li>Formulation of a Working Group for climate change adaptation and disaster risk reduction (POKJA API-PRB)</li> </ul>	<ul style="list-style-type: none"> <li>Build inter-sectoral communication mechanisms between stakeholders for the planning and implementation of climate change adaptation program / activities.</li> <li>Increase the efficiency of the implementation of climate change adaptation programs.</li> </ul>



**Figure 12:** POKJA plays a key role in communicating information between stakeholders. Local initiatives must be coordinated so that they can support one another's initiatives and avoid duplicating efforts.



## 2.5. Policy and Regulation Enforcement through Incentives and Disincentives

Incentive and disincentive strategies are expected to have a positive effect in the enforcement of regulations. Individuals, community groups or business groups who obey and follow the regulations are entitled to incentives that the government will provide based on agreed-upon policy processes. Incentives or rewards

can be in the form of tax deductions or direct bonuses. Meanwhile, those who violate the regulations are face disincentives in the form of fines or other penalties.

### STRATEGY - POLICY AND REGULATION ENFORCEMENT

ISSUES	RELATED PROGRAMS	VULNERABILITY REDUCTION
Weak enforcement of coastal development rules	<ul style="list-style-type: none"> <li>Enforcement of the RTRW, especially on the coastal development rules.</li> </ul>	<ul style="list-style-type: none"> <li>Increase the safety of coastal communities.</li> <li>Reduce vulnerability to coastal erosion.</li> </ul>
Weak regulation and enforcement of the use of ground water	<ul style="list-style-type: none"> <li>Strengthen and enforce the regulations on the use of ground water, especially for private sector.</li> </ul>	<ul style="list-style-type: none"> <li>Monitor the use of ground water in the city.</li> <li>Increase the general population's access to ground water.</li> </ul>
Weak enforcement of regulations on development in locations prone to hazards	<ul style="list-style-type: none"> <li>Prohibit development in the locations prone to hazard, such as steep areas.</li> </ul>	<ul style="list-style-type: none"> <li>Reduce the vulnerability of people, especially in the rainy season (January and February, when the probability of landslides are increased)</li> </ul>



**Figure 13:** The government needs a clear development policy regarding vulnerable areas, including regulation of coastal boundaries and development in hilly areas. The commercial use of groundwater should be regulated in order to protect vulnerable populations' access to water. All regulations must be monitored and enforced.



**Figure 14:**

*Efforts for the development of the coastal areas must be integrated and synchronized between institutions, particularly to ensure the alignment of the physical and economic development of the community.*



# 3 Institutional Framework and Climate Adaptation Plan

## 3.1. Institutional Framework

To ensure the agenda of climate change adaptation and disaster risk reduction, the city needs to establish a multi-stakeholder institutional platform to assume and maintain the coordination and synergy amongst

programs. The workshop agreed on establishing a working group called POKJA API – PRB (*Kelompok Kerja Adaptasi Perubahan Iklim dan Pengurangan Risiko Bencana*) made up of representatives from government, NGOs, media and academics.

### STRUCTURE OF THE WORKING GROUP (POKJA RAD API-PRB)

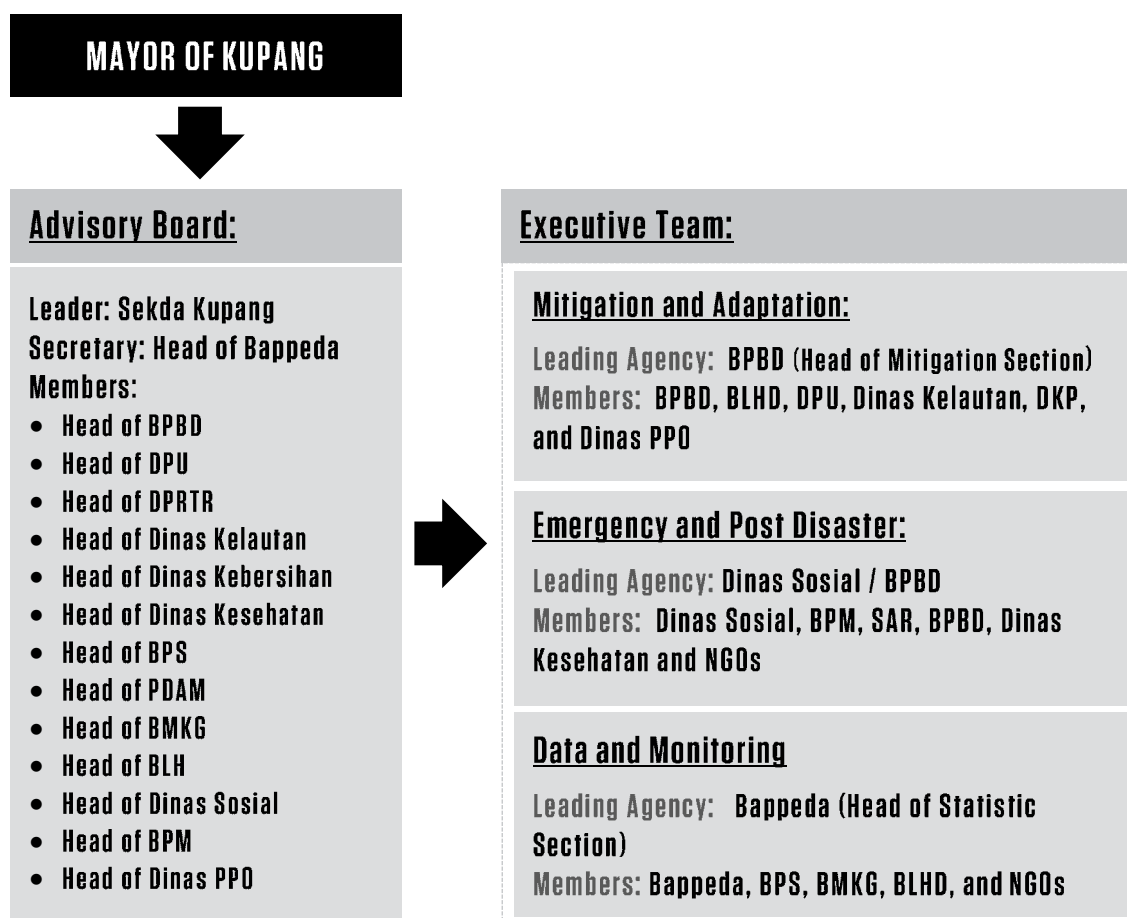


Figure 15: The proposed structure of the working group consists of an Advisory team and a Technical team, in which the technical team is divided into three sub-committees, i.e., the Mitigation, Emergency & Post-Disaster, and Data and Monitoring groups.

POKJA API - PRB functions include three important aspects:

### a. Coordination

The Working Group serves to oversee the process of coordination between government agencies and to encourage the participation of other stakeholders, NGOs, academics, the private sector, and universities. The Working Group should meet on a regular basis. Meetings in each program cluster should be conducted at least 4 times per year (every 4 months), while the full team coordination occurs at least 2 times a year (once per semester) to review the achievements of the program and the reduction of vulnerability

### b. Synergies

Synergy implies the consolidation of efforts from different departments and stakeholders in the city. The working group is not the implementing institution, but rather acts to direct and facilitate departmental and sectorial-based projects and ensure that they meet the expectations of the resilience vision and strategies.

### c. Monitoring and Evaluation

The working group also conducts monitoring and evaluation based on the vision and strategy in this UCRMP. The working group should also be able to manage data related to the outcomes and impacts of the programs being evaluated.

## 3.2. Program Cluster

To simplify the action and coordination mechanisms between agencies and institutions the POKJA is divided into three main program groups. These are: (1) Disaster Mitigation and Adaptation to Climate Change Programs, (2) Emergency and Post Disaster Programs, and (3) Data and Monitoring Programs. This grouping is done only to facilitate the inter-institutional working mechanism.

The programs identified in the RAD-API consider three main aspects of climate change vulnerability:

- **VULNERABLE PEOPLE** : THEY CONSIDER WHETHER THE PROGRAM OR INTERVENTION HAS AN IMPACT UPON STRENGTHENING THE CAPACITY OF INDIVIDUALS OR GROUPS OF PEOPLE, OR TO WHAT EXTENT IT CAN REDUCE THE VULNERABILITY OF INDIVIDUALS OR GROUPS OF PEOPLE TO CLIMATE CHANGE.VULNERABLE GROUPS INCLUDE THE POOR, FISHING COMMUNITIES, FEMALE HEADS OF FAMILIES, CHILDREN, THE UNEMPLOYED AND PERSONS WITH DISABILITIES.
- **VULNERABLE PLACES**: THEY CONSIDER WHERE PROGRAMS ARE LOCATED AND WHETHER THEY AIM TO REDUCE CLIMATE CHANGE VULNERABILITY IN CERTAIN VULNERABLE LOCATIONS THAT ARE EXPOSED TO THE THREAT OF CLIMATE CHANGE. THE LOCATIONS IDENTIFIED AS PARTICULARLY VULNERABLE INCLUDE THOSE AREAS PRONE TO FLOODING, REGIONS AFFECTED BY SEA-LEVEL RISE, AREAS WITH HIGH LEVELS OF POVERTY, SLUM AREAS OR DENSE URBAN AREAS.
- **VULNERABLE SYSTEMS**: THEY CONSIDER WHETHER THE PROGRAMS HAVE AN IMPACT ON INCREASING THE RESILIENCE OF AN URBAN SYSTEMS OR ECOSYSTEM TO CLIMATE CHANGE HAZARDS, OR WHETHER THE PROGRAM IS ABLE TO REDUCE THE RISK OF FAILURE OF THE SYSTEM. A SIMPLE EXAMPLE IS THE ROAD SYSTEM – THE PROGRAM WILL BE JUDGED AS TO THE EXTENT TO WHICH IT IS ABLE TO INCREASE THE ABILITY OF THE ROAD SYSTEM TO SURVIVE CLIMATE CHANGE THREATS AND REMAIN OPERATIONAL.

### A. Disaster Mitigation and Adaptation to Climate Change

Mitigation Strategies prepare and anticipate the impact of climate change, or in a broader sense, coordinate the programs of different government agencies. They relate to the preparation of people to adapt to, or reduce vulnerability to climate change hazards. The programs in this strategy include: capacity building, campaigns to raise awareness, environmental regulations, infrastructure improvements, and environmental conservation and protection efforts.

The programs and activities in this strategic group will be coordinated by the Regional Disaster Management Agency (BPBD Kupang), who also



manages the programs and activities of other agencies such as Badan Lingkungan Hidup Daerah (BLHD), Dinas Pekerjaan Umum (DPU), Dinas Perumahan Rakyat dan Tata Ruang (DPRTR), Dinas Kelautan dan Perikanan (DKP), and Dinas Kebersihan dan Pertamanan.

## **B. Emergency and Post Disaster**

This group of programs includes those related to disaster and post-disaster response. The programs or activities that are included in this strategy include -- health care for disaster victims, direct assistance to disaster victims, the reconstruction and improvement of public facilities affected by disasters, post-disaster housing repair or reconstruction, and others.

## **C. Data and Monitoring**

This program assembles a variety of programs related to data, information and documents that can be useful for reference, and materials for program planning related to climate change vulnerability. An example is the preparation of the vulnerability assessment document and the dissemination of information related to climate vulnerability. In addition, the activities can also include data collection for program planning and impact assessment.

## A. Disaster Mitigation and Adaptation to Climate Change

No	Programme/Activity	Implementor	Budget	Funding	Period
1	Conservation and rehabilitation of coastal ecosystem	BLHD		APBD	
2	Development, management, and conservation of rivers, lakes, and other water resources	DPU	Rp 1.500.000.000	APBD	2015
3	Rehabilitation of Forest & Land Resources : Nursery and Monitoring	Dinas Pertanian dan Kehutanan	Rp 920.000.000	APBD	Annual Routine
4	Conservation of Forest Resources	Dinas Pertanian dan Kehutanan	Rp 2.500.000.000	APBD	Annual Routine
5	Control of pollution and other modes of environmental destruction : <i>Kupang Green and Clean Programs</i>	Din. Kebersihan, BPLHD		APBD	Annual Routine
6	Management of Green Open Space (GOS) : (a) Organizing GOS, (b) GOS Maintenance, (c) Mangrove Plantation	Din. Kebersihan		APBD	Annual Routine
7	Improving pollution control	BLHD		APBD	Annual Routine
8	Control and Prevention of Environmental Pollution	BLHD		APBD	
9	Flood Control Program : Gabion Retaining Wall Construction	DPU	Rp 500.000.000	APBD	Annual Routine
10	Disaster Mitigation Program : Early Warning System (EWS)	BPDB / BMKG		APBD	Annual Routine
11	Improving Rubbish Management: Provision of Facilities and Infrastructure of Rubbish Management	Din. Kebersihan, BPLHD		APBD	Annual Routine
12	Improving sea disaster mitigation and ocean climate prediction	DKP		APBD	
13	Development and conservation of water resources	BLHD		APBD	

<b>Vulnerable People</b>	<b>Vulnerable Places</b>	<b>Impact on Ecosystem</b>
Coastal communities	Coastal area	Improving coastal ecosystem
Citizens of Kupang	City of Kupang	Improving water provision system
Citizens of Kupang	Conservation area	Improving the forest ecosystem and other conservation areas
Citizens of Kupang	Conservation are	Improving the forest ecosystem and other conservation areas
Citizens of Kupang	City of Kupang	Improving Rubbish Management
Citizens of Kupang	City of Kupang	Improving environmental conditions and green open space
Citizens of Kupang	City of Kupang	Improving environmental conditions
Citizens of Kupang	City of Kupang	Improving environmental conditions
Coastal communities and also communities live in riverbasin	Kelurahan Pasir Panjang, Oesapa, TDM; Kelurahan Daerah Aliran Sungai	Coastal protection
Citizens of Kupang	City of Kupang	
	City of Kupang	Improving waste management system
Coastal communities	Coastal area	
Citizens of Kupang	City of Kupang	Improving water provision system



No	Programme/Activity	Implementor	Budget	Funding	Period
14	Raw water provision	DPU	Rp 1.313.000.000	APBD	Annual Routine
15	Provision of water and sanitation for poor household	DPRTR	Rp 190.000.000	APBD	Starting in 2016
16	Improving water and sanitation management : Providing communal septic tanks and PAMSIMAS (community based water provision & sanitation)	DPU	Rp 2.000.000.000	APBD	Annual Routine
17	New drainage construction to reduce standing water	DPU	Rp 600.000.000	APBD	Annual Routine
18	Construction of facilities & infrastructures to control floods, landslides, and coastal erosion	DPU		APBD	
19	Upgrading slum areas	DPRTR		APBD	
20	Development planning for disaster prone areas	BPBD		APBD	
21	Economic empowerment for coastal communities	DKP / BPMK	Rp 210.000.000	APBD	Annual Routine
22	Community development in coastal communities : Fisheries tools & Infrastructure for fisherman	DKP (kerjasama dengan IFAD)	Rp 7.000.000.000	APBD	2013 - 2017
23	Economic empowerment for farmers	DPPPK	Rp 100.000.000	APBD	Annual Routine
24	Increasing the use of appropriate agricultural technology to increase productivity	DPPPK	Rp 1.500.000.000	APBD	Annual Routine
25	Coaching programs for informal vendors and hawkers	Disperindag	Rp 50.000.000	APBD	Annual Routine
26	Programs to build the institutional capacity of local cooperatives	Dinas Koperasi dan UMKM	Rp 90.750.000	APBD	Annual Routine
27	Business support for micro, small and medium enterprises: Access to finance cooperatives and SMEs	Dinas Koperasi dan UMKM	Rp 170.000.000	APBD	Annual Routine

<b>Vulnerable People</b>	<b>Vulnerable Places</b>	<b>Impact on Ecosystem</b>
Citizens of Kupang	City of Kupang	Improving water provision system
Poor households	City of Kupang	Improving water provision and sanitation system
Poor households	City of Kupang	Improving water provision and sanitation system
Citizens of Kupang	City of Kupang	Urban drainage system
Community living in natural disaster (flood, landslide, coastal erosion) prone areas	City of Kupang [Disaster prone areas : flood, landslides, coastal areas]	
Citizens of Kupang	Slum Area in the City of Kupang	Upgrading settlements
Citizens of Kupang	Disaster prone areas	
Fishermen & coastal communities	Neighborhoods in coastal areas	Improving the economic/financial management of coastal communities
Fishermen, vendors, fish farmers	Neighborhoods in coastal areas	
Farmers	City of Kupang	Regional food security system
Farmers	City of Kupang	Regional food security system
Vendors & hawkers	City of Kupang	
Poor households	City of Kupang	-
Poor households	City of Kupang	-

No	Programme/Activity	Implementor	Budget	Funding	Period
28	Creating a conducive environment for small and medium enterprise (SMEs) to encourage an increasing number of SMEs	Dinas Koperasi dan UMKM	Rp 19.000.000	APBD	
29	Developing neighborhood/village based economic agencies/institutions	BPMK	Rp 2.200.000.000	APBD	Annual Routine
30	Agriculture and food security improvement program: (a) Increasing farmers' skills, (b) Increasing agricultural production	DPPPK	Rp 900.000.000	APBD	Annual Routine
31	Technical spatial planning: Rehabilitation of buildings	DPRTR	Rp 100.000.000	APBD	2016
32	Surveying and mapping <i>Advise Plan</i>	DPRTR	Rp 175.000.000	APBD	Annual Routine
33	Control of the use of space: (a) Facilitation of increasing the role of society, (b) Training apparatus PPNS, (c) Monitoring utilization of space (air-IMB Building / no), (d) Dissemination of policy, (e) Monitoring Evaluation and Reporting	DPRTR	Rp 1.000.000.000	APBD	Annual Routine
34	Increasing community participation in neighborhood level development: PEM Fund	BPMK	Rp 500.000.000	APBD	Annual Routine

## Strategies

-  Strategy 1 – Environmental Conservation and Public Awareness
-  Strategy 2 – Improving Infrastructure and Public Services
-  Strategy 3 – Eco-friendly Community Empowerment
-  Strategy 4 – Strengthening Communications and Coordination Mechanisms and Improving Access to Climate Change Information
-  Strategy 5 – Policy and Regulation Enforcement



Vulnerable People	Vulnerable Places	Impact on Ecosystem
Poor households	City of Kupang	-
Poor households in rural areas	City of Kupang	-
Citizens of Kupang	City of Kupang	Regional food security system
Citizens of Kupang	Old city area	Building use system
Citizens of Kupang	Land use	Land use system
Citizens of Kupang	City of Kupang	Land use system
Poor households	Neighborhoods throughout City of Kupang (51 Neighborhoods)	

## B. Emergency and Post Disaster

No	Programme/Activity	Implementor	Budget	Funding	Period
1	Healthy Kupang Brigade	Dinas Kesehatan		APBD	
2	Provision of medicines and medical supplies	Dinas Kesehatan		APBD	
3	Prevention and control of communicable diseases - in times of disaster	Dinas Kesehatan	Rp 1.036.232.000	APBD	Annual Routine
4	Improvement of public nutrition	Dinas Kesehatan		APBD	
5	Disaster mitigation : Inventory of post-disaster damage to coastal neighborhoods	DKP		APBD	
6	Improving preparedness and prevention of fire	DPRTR	Rp 199.650.000	APBD	Annual Routine
7	Housing improvement program due to natural disasters	BPBD	Rp 350.000.000	APBD	Annual Routine
8	Rehabilitation services and social welfare in emergency cases.	Dinas Sosial		APBD	
9	Post Disaster Aid	Dinas Sosial		APBD	

## Strategies

-  Strategy 1 – Environmental Conservation and Public Awareness
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-  Strategy 5 – Policy and Regulation Enforcement

Vulnerable People	Vulnerable Places	Impact on Ecosystem
Kupang Citizen	City of Kupang	
Disaster affected communities	Disaster affected areas	
Disaster affected communities : particularly children	Disaster affected areas	
Kupang Citizen	City of Kupang	
Coastal communities	Neighborhood in coastal areas	Improving coastal settlements
Kupang Citizen	City of Kupang	Improving settlement system
Disaster affected communities	Disaster affected area	Improving settlement system
Disaster affected communities	Disaster affected area	
Disaster affected communities	Disaster affected area	



### C. Data and Monitoring

No	Programme/Activity	Implementor	Budget	Funding	Period
1	Study about water resource availability (focusing on river and coast areas)	DPU	Rp 50.000.000	APBD	2015
2	Healthy Settlement Program : Monitoring existing settlements	DPRTR	Rp 190.000.000	APBD	starting 2015
3	Monitoring coastal area : (1) High sea waves and storms	DKP		APBD	Annual Routine
4	SMS gateway for climate information	PIKUL, GMI, dan CIS Timor		Donor	
5	Monitoring coastal area: (2) Quality control of fishery products	DKP		APBD	Annual Routine
6	Dissemination of urban data : City of Kupang Dalam Angka	Bappeda dan BPS		APBD	Annual Routine
7	Creating PODES (Village Asset/Potential) Database	BPS		APBD	Setiap dekade (1 kali dalam 10 tahun)
8	Create profile of specific needs of women and children – Gender and Children Profile	Bagian Pemberdayaan Perempuan dan Perencanaan Setda	Rp 50.000.000	APBD	Annual Routine
9	The study of changes in the function of green open spaces, watersheds, and coastal areas of Kupang.	Litbang	Rp 250.000.000	APBD	2015
10	Data collection and documentation of slum areas in the City of Kupang	DPRTR	Rp 250.000.000	APBD	2015
11	Mapping of disaster-prone areas	BPBD		APBD	

<b>Vulnerable People</b>	<b>Vulnerable Places</b>	<b>Impact on Ecosystem</b>
Kupang Citizen	City of Kupang	Information System of Natural Resources in River and coastal area
Kupang Citizen	City of Kupang	Drainage and sanitation system
Fishermen and coastal communities engaged in fishing pengeolahan	Coastal area and ocean which affected by disaster	Settlement system at coastal area
Fisherman and Farmers	Coastal area	Information system, communication, and open access to data
Fishermen and coastal communities engaged in fish processing.	Coastal area and ocean which affected by disaster	Settlement system at coastal area
Kupang Citizen	City of Kupang	Information System of Disaster Management
Kupang Citizen	City of Kupang	Information system, communication, and open access to data
Kupang Citizen particularly vulnerable group : children (child workers, street children, dropout) & women	City of Kupang	Information system, communication, and open access to data
Kupang Citizen	City of Kupang (open spaces, river basin, and coastal area)	Database for analysis of changes in the function of green open space, watersheds, and coastal city of Kupang
Kupang Citizen	City of Kupang	Information System of slum area
Kupang Citizen	Disaster-prone areas in the City of Kupang	Information System of Disaster Management

<b>N o</b>	<b>Programme/Activity</b>	<b>Implemen tor</b>	<b>Budget</b>	<b>Funding</b>	<b>Period</b>
12	Implementation of the housing program: Information housing development for low-income households	DPRTR	Rp 111.000.000	APBD	2016
13	Land-use control program	DPRTR	Rp 115.000.000	APBD	Annual Routine
14	Data and information on Planning and Development Control	BAPPEDA		APBD	

## Strategies

-  Strategy 1 – Environmental Conservation and Public Awareness
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-  Strategy 5 – Policy and Regulation Enforcement



Vulnerable People	Vulnerable Places	Impact on Ecosystem
Low income households	City of Kupang	Settlements system at urban areas
Kupang Citizen	City of Kupang	Control of space utilization
Kupang Citizen	City of Kupang	Information system, communication, and open access to data



**Figure 16:**

*Climate change adaptation programs should take the specific needs of vulnerable groups into account, particularly fishing communities, farmers, the elderly, women, children, and the disabled.*





# 4. Recommendation and Closing

In concluding this UCRMP document, several recommendations proposed by workshop participants are presented here to inform program improvement in the coming years. This document should be updated every year, therefore the recommendations below can be considered in future planning or revision of the RPJMD.

Recommendations concluded from UCRMP Workshop 5-6 May 2015:

## Regulation

1. **The government needs to issue regulations (mayoral decisions) to regulate the establishment of Vulnerable Areas in Kupang.** The regulations must be updated every year so that necessary changes can be made, such as the designation of new areas as vulnerable. The review of vulnerability reduction must be held every two years.
2. **Regulations about the need for climate data and the sources of data must be settled.** This will make the process of updating data easier, and help to maintain accurate vulnerability assessments.
  - **DEMOGRAPHIC DATA** (POPULATION, NUMBER OF FAMILY MEMBERS, RATE OF ABSENTEEISM, ETC.). SOURCE: CITY STATISTICAL BUREAU (BPS)
  - **CLIMATIC DATA** (AVERAGE TEMPERATURE, RAINFALL LEVELS, STORM RATINGS, ETC.). SOURCE: METEOROLOGY, CLIMATOLOGY AND GEO-PHYSIC (BMKG)

- **DISASTER RELATED INFORMATION** (FLOOD, DROUGHT, HURRICANE, FIRE, ETC.). SOURCE: LOCAL BODY FOR DISASTER MANAGEMENT (BPBD).
3. Establish **standard operating procedure for disaster management.**
  4. **Regulations on green spaces** in the city:
    - REGULATIONS TO MANAGE GREEN SPACE FUNCTIONALITY
    - REGULATIONS TO GIVE INCENTIVES AND DISINCENTIVES.
  5. Disseminate information to the community about **vulnerable places** in the city
  6. **Legalize the working group** (POKJA API-PRB).

## Capacity Building

1. Strengthen groups of community members so that they may help disseminate ideas about climate change adaptation. Prospective groups include:
  - RT, RW, LPM, KARANG TARUNA, TAGANA AND POSYANDU.
  - A VILLAGE WORKING GROUP ALREADY EXIST AS RESULTS OF FISHERY DEPARTMENT'S PROJECT. THEY CAN HELP TO IDENTIFY EXISTING TYPES OF ACTIVITIES IN FISHING COMMUNITIES, ADOPT CLIMATE CHANGE ADAPTION INTO THE GROUP ACTIVITIES, HELP DISSEMINATE CLIMATE CHANGE INFORMATION TO



THE VILLAGERS, AND HELP TO INTRODUCE CLIMATE CHANGE ADAPTATION INTO THE SCHOOLS.

2. Build the capacity of city officials with regards to climate change adaptation.
3. Maximize BMKG roles to inform the community about information relating to climate. This can be coordinated with local BPBD to help make people aware of potential future hazards.
4. Give training to the community about alternative economic options so that they are more prepared when climate change hazards impact their livelihoods. For example, train fishermen about alternative jobs they can pursue during the stormy season, or train farmers to diversify their crops.
5. Encourage cooperatives in the local economy, this can provide support community during difficult times.

## Programatic and Development Projects

1. The government needs to review their infrastructure systems and building codes. For example, wave breakers in Kupang (Oesapa and Lasiana) have been found to be destructive to mangrove ecosystems. This indicates a need for improvement in future infrastructure planning. Another example is that buildings on Siliwangi Road currently require a feasibility study, and strong building code.
2. There is a need for more projects empowering coastal communities
  - ECONOMIC EMPOWERMENT ALONG WITH ENVIRONMENTAL CONSERVATION
  - ENFORCEMENT OF RTRW REGULATIONS PROTECTING

COASTAL ZONES. DEVELOPMENT IN COASTAL AREA SHOULD CONSIDER:

- (I) PUBLIC CONSULTATION WITH LOCAL COMMUNITY AND STAKEHOLDERS,
  - (II) PROTECTING THE ACCESS OF THE COMMUNITY TO THE LOCAL MARKET / ECONOMY, AND
  - (III) PRESERVING SEA ECOSYSTEMS SUCH AS CORAL REEFS, MANGROVES AND FISH BREEDING ZONES.
3. Utilization of water resources. Potential projects related to improving the use of water in Kupang include:
    - CONTROL OF DEEP WATER RESOURCES,
    - CONTROL OF DEEP WATER USE BY THE PRIVATE SECTOR,
    - CREATION OF STRICT REGULATIONS REGARDING THE USE AND TAXATION OF WATER, AND FINES FOR VIOLATIONS RELATED TO WATER
  4. There needs to be a strategy regarding the protection of the most vulnerable groups
    - PROGRAMS TO PROTECT CHILDREN
    - ECONOMIC EMPOWERMENT FOR FEMALE-HEADED HOUSEHOLDS
    - SOCIAL SECURITY PROGRAMS
    - PROGRAMS TO PROVIDE CREDIT ACCESS FOR SMES
  5. There should be a plan to address migration
    - COORDINATION WITH OTHER MUNICIPALITIES AND PROVINCES FOR JOB CREATION IN THE VILLAGE.
    - CONSISTENT COORDINATION TO ENFORCE POPULATION POLICIES.

The UCRMP document needs to be updated annually, with particular attention paid to the design of programs and activities addressing climate change. Annual monitoring is needed to measure progress with regards to climate change adaptation in the city.

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# Annex

Kupang UCRMP Workshop was held in 5-6 May 2015 at On The Rock Hotel, Kupang. This workshop was attended by 38 participants from different institutions and organizations, including 11 government agencies (Bappeda, BPBD, Dinas Kebersihan, BPS, DPU BPMK, DPRTR, Dinas PPO, dan Bagian Pemberdayaan Perempuan Setda), 7 NGOs, 2 academics, and 1 person from the local media.

Participants of the UCRMP Workshop:

No	Name	Institution	No	Name	Institution
1	Ir. Elvianus Wairata	BAPPEDA	20	Desi Manubulu	Bagian PP Setda
2	Arnol Kay	BAPPEDA	21	Sam Adu	Bagian PP Setda
3	Elsje Sijoen	BPBD Kota Kupang	22	Andri Y. Missa	BAPPEDA
4	Ernest S. Ludji	Dinas Kebersihan dan Pertamanan	23	Matheos Mahury	BAPPEDA
5	Rita Haryani	Dinas Kebersihan dan Pertamanan	24	Filpin A Day	BAPPEDA
6	Ahmad Yani	Dinas Kelautan dan Perikanan	25	Rame Ratu	BAPPEDA
7	Agustina B. Ratu	Dinas Kelautan dan Perikanan	26	Suprpti Rahayu	BAPPEDA
8	Tio Farida Gultom	BPS Kota Kupang	27	Meri	BAPPEDA
9	Fandi Akhmad	BPS Kota Kupang	28	Ridol Pelokila	BAPPEDA
10	Gustan TA	BPS Kota Kupang	29	Zevan Aome	TKPKD Kerda Sapta
11	Tris Adoe	Dinas Pekerjaan Umum	30	Conny Tiluata	JORMAS
12	Idris Moedar	BPMK	31	Enget Welkis	KB KS Kota Kupang
13	Elpis Yohanis	BPMK	32	Serlinia R. Anawoli	Koalisi Perempuan Indonesia
14	Nila Tri Sartika	DPRTR Kota Kupang	33	Zet Malalak	UKAW
15	Josefina Ghetta	DPRTR Kota Kupang	34	Adi Nange	PIAR NTT
16	Frengky Amalo	BLHD	35	Bambang Sudarsono	OISCA NTT
17	Elisabeth Logo	BLHD	36	Pantoro Tri K.	Perkumpulan Pikul
18	Ambo	Dinas PPO	37	Noldy Sakau	Rumah Perempuan
19	Fransisca Johana	Bagian PP Setda	38	Theodorus Ndu	Timor Expres

## Documentation



**Figure 17:** Documentation of the UCRMP Workshop that held in Kupang, 5-6 May 2015. (Up) Closing and photo session in the end of the workshop. (Below) One of the group present the result of group discussion about the option for city resilience vision and strategies.



