

RESILIENT DA NANG



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100

RESILIENT

CITIES

RESILIENCE STRATEGY FOR DA NANG CITY, VIETNAM

TABLE OF CONTENTS

LETTER FROM THE CHAIRMAN	1
LETTER FROM 100RC	2
ACRONYMS	3
TERMINOLOGY	4
1) EXECUTIVE SUMMARY	5
- VISION	6
2) RESILIENCE APPROACH AND APPLICATION	7
3) DA NANG CITY: PAST, PRESENT AND FUTURE	9
4) DA NANG’S RESILIENCE STRATEGY	23
- STRATEGY #1 ACTIONS	25
- STRATEGY #2 ACTIONS	35
- STRATEGY #3 ACTIONS	43
- STRATEGY #4 ACTIONS	53
5) PARTNERSHIPS IN ACTION	63
6) IMPLEMENTATION AND MONITORING	65
7) REFERENCES AND CREDITS	67
8) APPENDICES	69



LETTER FROM THE CHAIRMAN



HUYNH DUC THO
Chairman of Da Nang
People's Committee

Da Nang has experienced a period of growth and positive socio-economic change that has led us to become the biggest city in central Vietnam. This growth and prosperity has been recognized by many different international organizations and we are proud to have won the Asian Townscape Award and to be a burgeoning tourist destination attracting three million visitors per year. Da Nang also leads in the PCI (Vietnam Provincial Competitiveness Index) rankings, the Governance and Public Administration Performance Index (PAPI), and continues its reign as the top performing province in the Information and Communication Technology (ICT) Index for six years consecutively. It is thanks to the efforts of the whole community, all citizens and municipal authorities that we have been able to achieve this success.

However, as a coastal city, we are vulnerable to the severe the effects of natural disasters such as typhoons and floods. We have also become a global city and as such we are learning how urbanization and globalization are beginning to influence our city. As Da Nang continues to grow and develop we need to consider the challenges and change the future will bring when we think about urban planning, infrastructure development and management, water resource management, employment and public health.

At the end of 2013, Da Nang was honored to be selected by the Rockefeller Foundation as part of the first group of 33 cities to join the 100 Resilient Cities network.

This program and its holistic approach to resilience building is exactly what our city needs to survive and thrive in the face of adversity and to continue to grow stronger into the future. Resilience building helps citizens, communities and all of the systems within a city to better prepare for and recover from the shocks and stresses we may face. This includes catastrophes both natural and man-made as well as the slow-moving disasters that we face in the form of daily stresses on our city and community. We consider this a comprehensive approach that can help us become a community and an urban system that can be resilient regardless of the challenges we face.

Resilience building is not the sole responsibility of individuals or sectors. This process requires the cooperation and solidarity of the whole community, local businesses and the government. Specifically, municipal authorities must develop policies and programs for infrastructure investment, economic development and the building of social security. Businesses must ensure the operation of sustainable economic systems and the community and civic organizations must work to ensure we have an equitable, caring and adaptable society prepared to overcome and learn from any challenge.

This resilience strategy and the actions it lays out is the first step towards creating a resilient future for our city. But it is only part of the solution. In order to establish a pathway for the city toward sustainable development, we must all embrace resilience thinking and understand that we are all a part of the development process.

Yours faithfully,
Huynh Duc Tho
Chairman of Da Nang People's Committee

LETTER FROM 100RC

On behalf of the entire 100 Resilient Cities team, it is my honor to congratulate the city of Da Nang on the release of its resilience strategy. The work outlined within the strategy takes a bold approach toward confronting not only Da Nang's most severe shocks- from typhoons, floods, and heat waves, but also its most pressing stresses- such as water shortage, access to gainful employment, and improving public health. Da Nang's goal of building toward a peaceful, dynamic, prepared and connected city in the changing world reflects exactly the type of holistic urban resilience approach that 100RC seeks to spread far beyond our network of member cities.

The support and leadership of Chairman Huynh Duc Tho and the Da Nang People's Committee were critical to the development of this document, and we thank them for their commitment to the strategy process. Of course, this strategy would not have been possible without the tireless dedication of Da Nang's Chief Resilience Officer, Cuong Dinh Quang - and his exceptional team. Lastly, I would also like to extend thanks to our strategic partners from ISET- who provided invaluable expertise throughout this process and helped to build off the groundbreaking work previously undertaken in partnership with the Rockefeller Foundation through the Asian Cities Climate Change Resilience Network (ACCCRN).

Though the release of this strategy marks an important milestone in the pursuit of a more resilient Da Nang, we know that building urban resilience is a multi-generational effort. We also know that our success will not be measured by how well we plan for our future challenges- but rather how we implement the projects that will make the city as a whole stronger in the face of those challenges, no matter what form they may take. That is why we are so excited to continue our partnership into the implementation phase- to bring all of the innovative projects from concept to reality. That body of work- which varies from connecting the city's labor supply to growing business demands, increasing the city's organic food production, creating a Building Energy Accelerator, to establishing a comprehensive database that identifies homes most at risk to flooding- will positively impact the lives of all who reside in Da Nang, when disaster strikes and during the times in-between.

These projects will also serve as a valuable best practice for the rest of the 100RC Network to emulate. As one of the cities selected in the first round of the 100 Resilient Cities Challenge- Da Nang has time and again been a pioneer in our global movement. We could not be more excited to showcase the work we have done in partnership with our colleagues there- and to watch as Da Nang helps to spread the urban resilience revolution to cities across Vietnam, the Asia-Pacific region, and the world.

Congratulations again on this important achievement, and we look forward to the shared journey ahead.

Yours Faithfully,

Michael Berkowitz
President, 100 Resilient Cities



MICHAEL BERKOWITZ
President of
100 Resilient Cities -
Pioneered by The
Rockefeller Foundation.



LIST OF ACRONYMS

3S	3s Software Co., Ltd
ADB	Asian Development Bank
AFD	French Development Agency
Akzo Nobel	AkzoNobel - leading global paints and coatings company
CCCO	Climate Change Coordination Office
CRO	Chief Resilience Officer
CRF	City Resilience Framework
CSIRO	Commonwealth Scientific and Industrial Research Organization of Australia
DARD	Department of Agriculture and Rural development
DOC	Department of Construction
DOF	Department of Finance
DOLISA	Department of Labours, Invalids and Social Affairs
DONRE	Department of Natural Resources and Environment
DIDIF	Da Nang Development and Investment Fund
DISED	Da Nang Institute for Socio-Economic Development
FA	Focus Area
ISSET	Institute for Social and Environmental Transition
PRA	Preliminary Resilience Assessment
Swiss Re	Swiss Re Group-a leading wholesale provider of reinsurance, insurance of risk transfer
VCAP	Visual Climate Adaptation Platform
VINARE	Vietnam National Reinsurance Corporation
VN	Vietnam

TERMINOLOGY

Resilience: The capacity of individuals, communities, institutions, businesses and systems within a city to survive, adapt and grow no matter what kinds of chronic stresses or acute shocks they encounter.

Shock: A chronic (ongoing) or acute natural or man-made event or phenomenon threatening major loss of life, damage to assets and a city's ability to function and provide basic services, particularly for poor or vulnerable populations.

Stress: A chronic (ongoing) or acute natural or man-made event or phenomenon that renders the city less able to function and provide basic services, particularly for poor or vulnerable populations.

Resilience Assets: The physical, economic, social, built and natural resources, systems, infrastructure, services, organizations, etc. that contribute to a city's resilience.

Focus Area: Important high-level areas or issues mentioned in the city's Preliminary Resilience Assessment (PRA) report that the city desires to investigate further to identify scope of work during the resilience strategy development.

Resilience Strategy (RS): A tactical roadmap to build resilience in the city. The strategy articulates the city's resilience priorities and specific initiatives for immediate implementation as well as the city's longer continued path forward. The strategy and implementation process is supported by various partnerships including 100RC Platform Partners.

Platform Partner: The Platform is a curated suite of resilience-building tools and services, provided by partners from the private, public, academic, and non-profit sectors, giving our cities access to the resources they need to become more resilient.



1 - EXECUTIVE SUMMARY

Despite being recognized as one of the fastest growing cities in Vietnam and one of the most attractive tourism destinations in South-east Asia, Da Nang is vulnerable to shocks such as typhoons, floods, heat waves, droughts and saline intrusion and to long-term stresses such as typhoon and flood damaged housing, water shortages, unemployment, poor health care, and business continuity challenges.

Extreme weather events over the past few years have put pressure on the city. Typhoons, floods and droughts occur regularly, causing significant losses and presenting challenges to the government and citizens: housing, employment, and infrastructure revitalization after disasters; water supply for development demands; food hygiene; and livelihood improvement. These challenges are predicted to increase with development, climate change, and population growth. Failing to address them could lead to the decline of efficiency and productivity of some sectors and socio-economic fields in the city. For this reason, Da Nang has welcomed Rockefeller 100 Resilient Cities support to pro-actively build city resilience.

Resilience is the capacity of individuals, communities, institutions, businesses, and systems within a city to survive, adapt, and grow, no matter what kinds of chronic stresses and acute shocks they experience. In Da Nang City, the following natural disaster-related

SHOCKS:

- Typhoons
- Floods
- Flash floods
- Inundation
- Drought
- Saline intrusion

STRESSES:

- Housing Vulnerable to Typhoons
- Livelihoods of People Living in Resettlement Areas and Urbanized Areas
- Urban Traffic
- Water Supply
- Environmental Concerns
- Health Care
- Revitalization of Community and Businesses

In November 2015, Da Nang launched a Preliminary Resilience Assessment (PRA) which identified four areas in which the city needs to conduct in-depth studies and develop specific action plans, projects and initiatives to prepare adequate resources for city development. The end result of these planning efforts is Da Nang's Resilience Strategy.

The Resilience Strategy focuses on dealing with the major challenges of four focus areas of Da Nang's urban resilience planning. With this approach, Da Nang Resilience Strategy does not include or replace other existing strategies and plans of the city such as the Socio-economic Development Strategy, the Urban Development Planning, the Green Growth-led City Development Strategy and the Environmental City Plan. Under the view of urban resilience, the Resilience Strategy points out priority actions and initiatives that are needed to deal with future challenges.

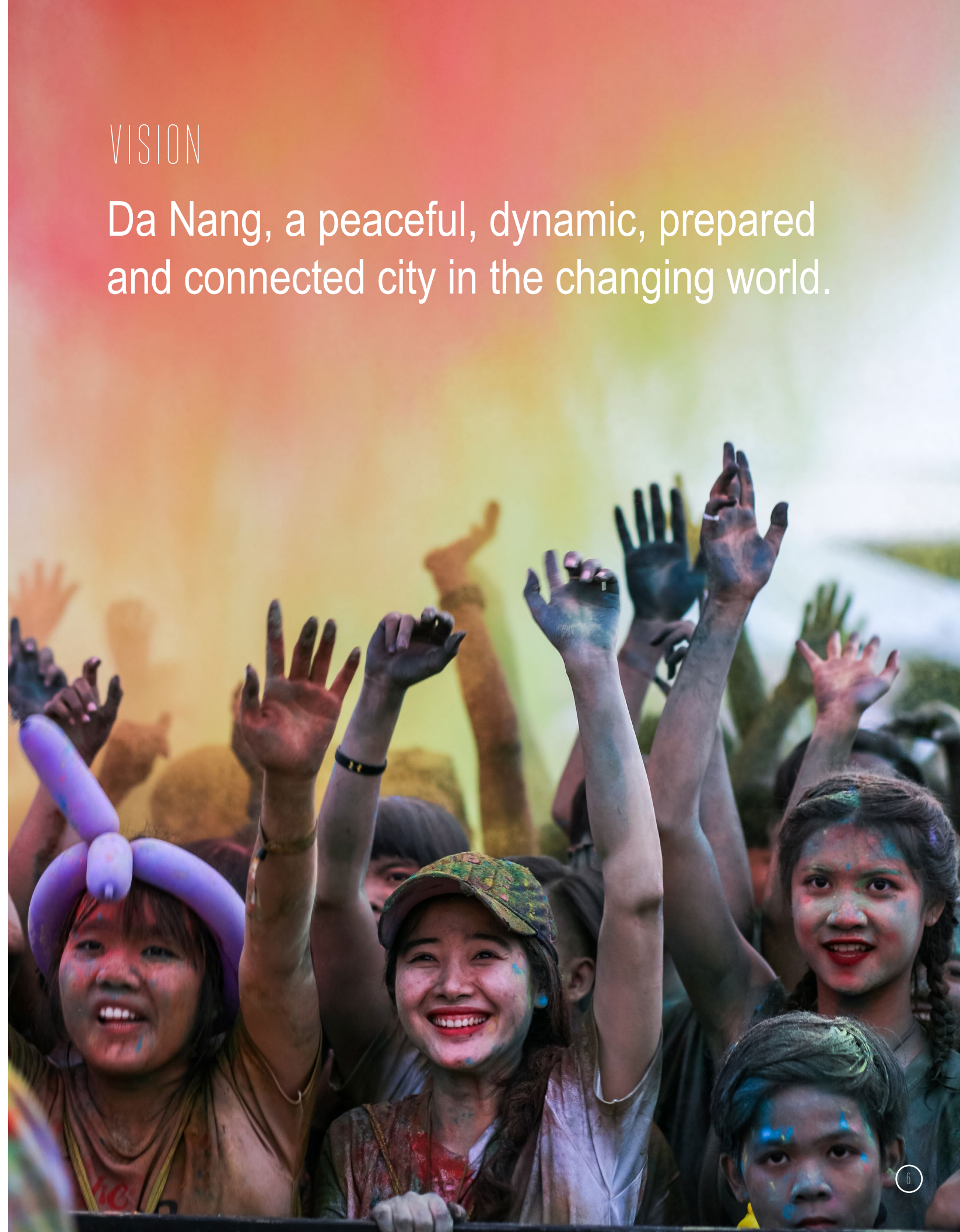
The Resilience Strategy is intended to be a living document that helps Da Nang become a city where residents can live in peace, have a dynamic economy with state-of-the-art infrastructure and resilient plans that address the city's shocks and stresses. Ongoing 100RC partnership will strengthen collaboration and assistance of needed resources and relevant partners, as well as providing meaningful exchange opportunities with other member cities.

Da Nang is the first city of Vietnam to develop and release a Resilience Strategy but implementing city resilience requires more than just a document. It requires an engaged community of residents from all walks of life partnering to combat the many challenges that confront the city. The proposed strategy actions are expected to inspire greater collaboration between the Da Nang city government and the public in order to jointly enhance city resilience.

Let's join hands to build a Da Nang City resilient to shocks and stresses in a changing world!

VISION

Da Nang, a peaceful, dynamic, prepared and connected city in the changing world.



2 - RESILIENCE APPROACH AND APPLICATION

SNAP SHOT OF DA NANG'S RESILIENCE CHALLENGES

Da Nang is a rapidly growing transportation, services, and tourism hub in central Vietnam. The city sits on a long strip of low-lying coastline, with the city center resting along the Han River. This city is no stranger to flooding. Typhoons have battered the city, and variable rainfall has caused both droughts and floods. The poor and near-poor households of the city face unstable employment and insufficient access to health care, education, housing, and other services. For years, the city has been developing innovative models to enhance resilience to climate change, including early flood warning systems and improved urban planning. Despite the challenges, Da Nang has become an attractive destination in Vietnam for Foreign Direct Investment (FDI). It also has ambitions of increasingly becoming a regional leader and powerhouse of innovation. The goal of the Resilience Strategy is to help the city to develop a comprehensive plan on how it can best address its multiple challenges and opportunities.

INITIAL STRATEGY DEVELOPMENT

With the support from 100RC, the CRO office was established and is led by the CRO and staff from the Da Nang Climate Change Coordination Office. The CRO has engaged a wide range of stakeholders to develop the resilient strategy, including technical departments, mass organizations, local experts and CCCO staffs. The process began with preliminary resilience assessment (PRA), including more than a dozen consultation meetings with working group and communities. The assessment aimed to identify key shocks and stresses the city is facing, to examine community resilience, and to review the existing resilient actions and projects that have been conducted in Da Nang.

Based on the PRA and in-depth research, the strategy team developed four guiding questions it would need to focus on to create resilience actions. These include: 1) How can the city build safe communities against storms and floods?; 2) How should the city stimulate livelihood, development and job opportunities for communities in transitional or newly urbanized areas? 3) When and how should the city protect and build water retention and storage spaces in response to climate change?; and 4) How can the city integrate information technology in response to natural disasters and climate change? Da Nang arrived at these questions by implementing a process common across the 100RC Network which uses the City Resilience Framework or CRF (shown right). The 12 drivers of resilience help determine where cities have a higher or lower level of resilience. The team further tested opportunities to respond in these four areas by applying a series of 100RC planning characteristics and process review questions known as the “Resilience Lens” and “Resilience Qualities” (Appendix 3).

STRATEGY DEVELOPMENT PROCESS AND SUPPORT

This effort was conducted by the CRO, CRO team, and experts from key technical departments (list of participants can be found in appendix 2). Research included revising existing data and information, conducting surveys and interviews with relevant stakeholders. The resulting four focus areas provided the basis for which the joint ISET and Da Nang strategy team developed the Resilient Strategy.

The development process is highlighted with various consultation meetings engaging wide range of stakeholders. For each focus area, the CRO team conducted approximately four technical workshops and meetings with key stakeholders. Regarding the Resilience Strategy, the CRO team has organized three technical consultations. The strategy was submitted to 100RC, the Da Nang Steering Committee and the Vice Chairman of the People’s Committee for review on September 8, 2016. Through this process, Da Nang built a consensus and appreciation for the city’s approach to resilience and prioritized actions/initiatives that increase urban resilience

MINING LESSONS OF THE PAST WITH AN EYE TOWARD THE FUTURE

To develop Da Nang’s specific strategy actions, it is critical to understand both its past and future challenges. Da Nang’s ongoing challenges and past lessons learned helped set the stage for how the Resilience Strategy was developed. To that end, an overview of the cities struggles, key issues and trends are detailed in the following section.



100RC CRF		Related Da Nang Strategies	
Health & Wellbeing		A PEACEFUL CITY - A city that removes fear and anxiety from places where residents live, work and recreate.	
Economy & Society		A DYNAMIC CITY - A city with dynamic economy in partnership with people and business to meet needs in a changing world.	
Infrastructure & Environment		A PREPARED CITY - A city with infrastructure systems which can recover, and be well prepared for challenges in development process.	
Leadership & Strategy		A CONNECTED CITY - A city where knowledge is driven by meaningful information sharing.	

3 - DA NANG CITY: PAST, PRESENT AND FUTURE

OVERVIEW OF DA NANG'S HISTORY

Da Nang has a long history dating back to when the city was founded in 192 AD. Today, Da Nang is one of the five big cities in Vietnam. While this document deals largely with its more recent past it is important to note the city's rich culture and long history facing any number of shocks and stresses that have not only challenged Da Nang but shown its resilience.



DA NANG PAST (BEFORE THE YEAR 2000)

In the middle of the 16th century, Hoi An was a busy trade center about 30 km south of Da Nang and Da Nang was only a small port for goods in transit and ship repair. Da Nang gradually developed into a commercial port, replacing Hoi An in the early 18th century. French colonists separated Da Nang from Quang Nam as a concession and renamed the city Tourane, transforming it into a Western-style urban center in the late 19th and early 20th century. Social infrastructure and manufacturing engineering received continuous investment, and new household livelihoods and manufacturing industries were established and developed.

In 1975, the city gained independence, entering a new era of reform and development. In 1996, the 10th Session of the 9th National Assembly of the Socialist Republic of Vietnam approved the separation of Da Nang city and Quang Nam province from Quang Nam – Da Nang province, making the city a separate (centrally administered) municipality, one of the few in Vietnam. On January 1, 1997, Da Nang became a new administrative unit, with a natural land area of 1,248.4 km², and a population of 660 thousand.

In July 2003, Da Nang was recognized as a First Class city of Vietnam. On October 16, 2003, the Politburo released Resolution No 33-NQ/TW outlining plans for further industrialization and modernization of Da Nang, providing the city with more chances for development.

PAST URBAN RESILIENCE

The primary shocks and stresses of this period included typhoons and floods in 1998 and 1999, and inadequate basic living conditions, including water and power shortages, infrastructure challenges, urban traffic, environment quality problems, and economic recession.

However, there is little data available on this period for the four 100RC resilience dimensions with which to establish a baseline resilience. The broad conclusions that can be drawn about pre-2000 resilience include:



Generally, Health and wellbeing of this period had many shortcomings.

The major stress was post-war stabilization and rehabilitation. At this time, with a fragile economy after the war, the city government focused on dealing with difficulties and recovering production.

- The typhoons and floods in 1998 and 1999 caused 69 deaths.
- The 1998 flood inundated over 19,000 houses.



The Economy and society saw a mixture of positive changes and challenges.

A wide range of new production industries and new types of trade were introduced to Da Nang. However, scales were quite small and mainly used imported materials and outdated facilities and equipment. Labor productivity stayed low. Serious hyperinflation and economic recession occurred nationwide. Culture, health and education all had low quality.

The economy, which is primarily agriculture (Ag), industry, and services, shifted from agriculture toward increased services:

- 21% Ag. - 33% industry - 46% services in 1976
- 10% Ag. - 35% industry - 55% services in 1997



Initial plans and programs for Da Nang's reform and development appeared during this period.

- The city was recognized a First Class city of VN
- "5 No's, 3 Yes's" program was introduced — no starvation, no illiteracy, no beggars, no drug-addicts, no murders/robberies; all residents have houses, stable jobs and a cultural lifestyle.



Urban infrastructure and environmental quality were invested and improved

Infrastructure and Environment were impacted by recurrent disasters. Typhoons and floods occurred regularly, leading to devastating damage to infrastructure and environment.



Aerial view of the urban center of Da Nang in the past and at present.



DA NANG PRESENT (2005-2015)

Over the past 10 years Da Nang has become:

1. A MEDIUM-SIZED CITY WITH ALMOST CONSISTENT URBAN INFRASTRUCTURE AND UTILITIES SYSTEMS

Since 2005, Da Nang has developed six urban districts and two rural districts, including: Hai Chau, Thanh Khe, Son Tra, Ngu Hanh Son, Lien Chieu, and Cam Le as urban districts, Hoa Vang as a rural district and Hoang Sa as an island district. Da Nang total population was 1,007,425 as of 2014, with an estimated population density of 784 people/km². 87% of Da Nang's population (880,000 inhabitants) live in urban areas while 13% live in rural areas.

During this period, Da Nang invested in space, infrastructure and urban architecture development under the guiding principle of “extending the coastline, stretching the river”. Accordingly, the city put emphasis on the construction of bridges over the Han River, investment in riverside and coastal routes, making good use of land area, and promoting the value of urban lands. Improvements to transportation networks and connectivity in urban areas have changed the city and have gradually narrowed the gap between urban and rural areas. At the same time, the consistent development of infrastructure systems has attracted a wide variety of investors and urban and residential projects.

In addition to transportation infrastructure, the city also promoted investment in the medical sector, encouraging the construction of the Da Nang's Women's Hospital, the Maternity and Pediatric Hospital, and the Da Nang Oncology Hospital. Culture and tourism focused projects included construction of the International Exhibition Fair Center, the Da Nang Historical Museum, the Tien Son Sports Palace, and other infrastructure in districts throughout the city.

2. A RAPIDLY URBANIZING CITY FOCUSING ON TOURISM-SERVICES, DEVELOPING CLEAN INDUSTRIES AND TECHNOLOGY

To expand its existing reputation as a tourism destination, Da Nang has recently invested in a series of big-scale tourism infrastructure projects. A new terminal for the Da Nang International Airport has been constructed, allowing the airport to serve an expected 6 to 8 million passengers, and 400,000 to one million metric tons of cargo per year. In the next decade, Da Nang International Airport is expected to see an estimated 10 to 12 million visitors per year.

Along with infrastructure development to attract more investment and tourism, Da Nang also desires to promote the industrial sector, especially high technology and clean industries.

3. A CITY WITH A SMOOTHLY-OPERATING ADMINISTRATIVE SYSTEM SERVING ALL RESIDENTS AND BUSINESSES

In 2011, Da Nang authorities promulgated a program of administrative reform for the period of 2011-2020. Accordingly, by 2020, Da Nang will have a strengthened, democratic, transparent, professional and modern administrative system within the city that ensures consistent management with high efficiency, satisfies public demands, and supports socio-economic development.

In 2014, Da Nang People's Committee established the Steering Committee for Action Plan for implementation of the “Da Nang Business Year 2014” program, promulgating the Da Nang Enterprise Development Scheme and Da Nang Economic Reforms Plan until 2020. The city is also promoting outreach activities, establishing hotlines, holding meetings and directing dialogues addressing the difficulties and challenges faced by businesses. Especially, the city has reviewed and adjusted a number of policies to better support businesses, such as land-use efficiency policy in industrial zones and for coastal projects. Da Nang authorities strengthened the operation of the Investment and Development Fund, a Credit guarantee fund for local small and medium-sized enterprises, as well as lowering interest rates (including those of old loans) to below 13% per annum and supporting businesses to cooperate, connect supply and demand, sell more products and boost production and trading. These specific programs and policies have assisted businesses in stabilizing and developing their production and trade activities, contributing to meeting socio-economic development achievement goals. More importantly, revenues from businesses have become the main budget revenues of the city, making up nearly 50% of the GDP.

4. A CITY OF SOCIAL WELFARE AND SECURITY, WITH A PROTECTED ENVIRONMENT, AND RESPONSIVE TO DISASTERS

Since 2000, in addition to construction investments, the city has conducted the program of “5 No's, 3 Yes's,” which is now deeply rooted in local culture and values. This program includes mandates for “No hunger/poverty,” “No illiteracy,” “No begging,” “No drug addicts,” and “No murder/robbery.” In 2014, the city continued to focus on social welfare work, finishing construction and maintenance of 950 houses for social policy families. In 2014 Da Nang became the first locality to complete a plan for repairing the houses of veteran. The total capital for housing assistance to veteran and ethnic minority families reached 24 billion VND (1.08 million USD) in 2015.

At the end of 2014, nearly 100% of relocated households received assistance to build their new house. In addition, from 2011-2015, the program for Storm-resistant housing, funded by Rockefeller Foundation and implemented by the Da Nang Women's Union built or renovated 420 houses for typhoon resilience.

DA NANG TODAY

GOVERNMENT:	MUNICIPALITY
POPULATION:	1,029,000 PEOPLE (2015)
DENSITY:	784 PEOPLE / KM ²
AREAS:	1285 KM ²
GDP PER CAPITA:	2,568 USD (2015)

TYPE OF CLIMATE:	TROPICAL MONSOON
AVERAGE	
TEMPERATURE:	25.6°C
AVERAGE	
ANNUAL RAINFALL:	2,066MM



Leaders of the Da Nang Municipal Communist Party Committee check on housing repair progress in Ngu Hanh Son District.

DA NANG PRESENT URBAN RESILIENCE (2005-2015)

The primary shocks and stresses between 2005 and 2015 included: typhoons and super typhoons Xangsane (October 2006), Ketsana (September 2009), and Nari (November 2013), floods (2007, 2008, 2011 and 2013), droughts, saline intrusion (2014), rapid urbanization, and regional economic recession (2010-2014).

General analysis follows:



The city has paid attention to activities in the dimension of Health and wellbeing. Social security, life protection, and peace have been ensured. The city has strengthened the network of ward/commune health centers and provided most of the hospitals with adequate facilities and equipment. Social security and wellbeing-related activities gained several achievements, with successful implementation of the “5 No’s, 3 Yes’s” program.

- The proportion of households occupying permanent or semi-permanent homes increased from 94% in 2002 to 96.5% in 2008 to 99.8% in 2012.
- As of 2012, 99.6% percent of households enjoy clean water (up from 97.2% in 2002).
- The percentage of domestic waste collection as of 2015 reached 93% (98% of which was from urban areas).
- According to the standards of the city, poor households decreased from 11,735 households (6.4% of total city households) in 2006 to 1,934 households (0.85% of total city households) in 2012. As of 2015, poor households is reduce to 0%.
- Approximately 23.6% of children under five suffered malnutrition in 2003; in 2013 this number had dropped to 5.2%.
- The proportion of residents with access to hygienic toilets reached 60% in 1999, and 96% in 2010.



Although disaster-related shocks occurred regularly, the economy of the city retained double-digit growth rates. Even between 2010 and 2014, during the global economic crisis, the city growth rate remained around 9.7% per year.

The service sector had strong development in terms of scale and variety of services, reaching a growth rate of 12.8% per year. Da Nang’s industrial production also had a high growth rate. However, due to urbanization, several residential areas suffered impacts to livelihoods. In addition, the increase in immigrant laborers has increased the pressure on utilities, which have been unable to satisfy rising demands.

- Industrial production value: 8.5%/year in 2005-2010, increased to 9.7%/year in 2010-2014.
- Labor force accounted for 44% as of the population in 1997; unemployment was at 5.4%. In 2014, the labor force accounted for 53% of the population, with an unemployment rate of 3.6%.
- Trained labors constituted 22% of the labor force in 1997, 9% of which had college or university degrees. In 2014, trained labors made up 65% of the labor force, 39% of which have college or university degrees.



Despite facing many shocks and stresses during this period, Da Nang has maintained their strong economy and development rate thanks to the effective leadership and progressive management policies of Da Nang authorities. Da Nang is also the pioneer city to implement policies such as urban improvement, social security, information and technology application, and administrative reforms.

Social issues facing residents have been addressed gradually. An active program to build new rural areas is leading to a considerable change in rural appearance, in particular through the investment in power systems and transportation routes, and construction of educational and medical centers. Vocational training opportunities are providing employment for rural laborers with good results.

- Urban planing is now incorporating flood modeling, inundation impacts, and climate change.
- The city has released long-term objectives: The “Environmental City”; The E-government, The Resilient City.
- Scenarios for climate change and disaster response have been developed and are starting to be used in planning.

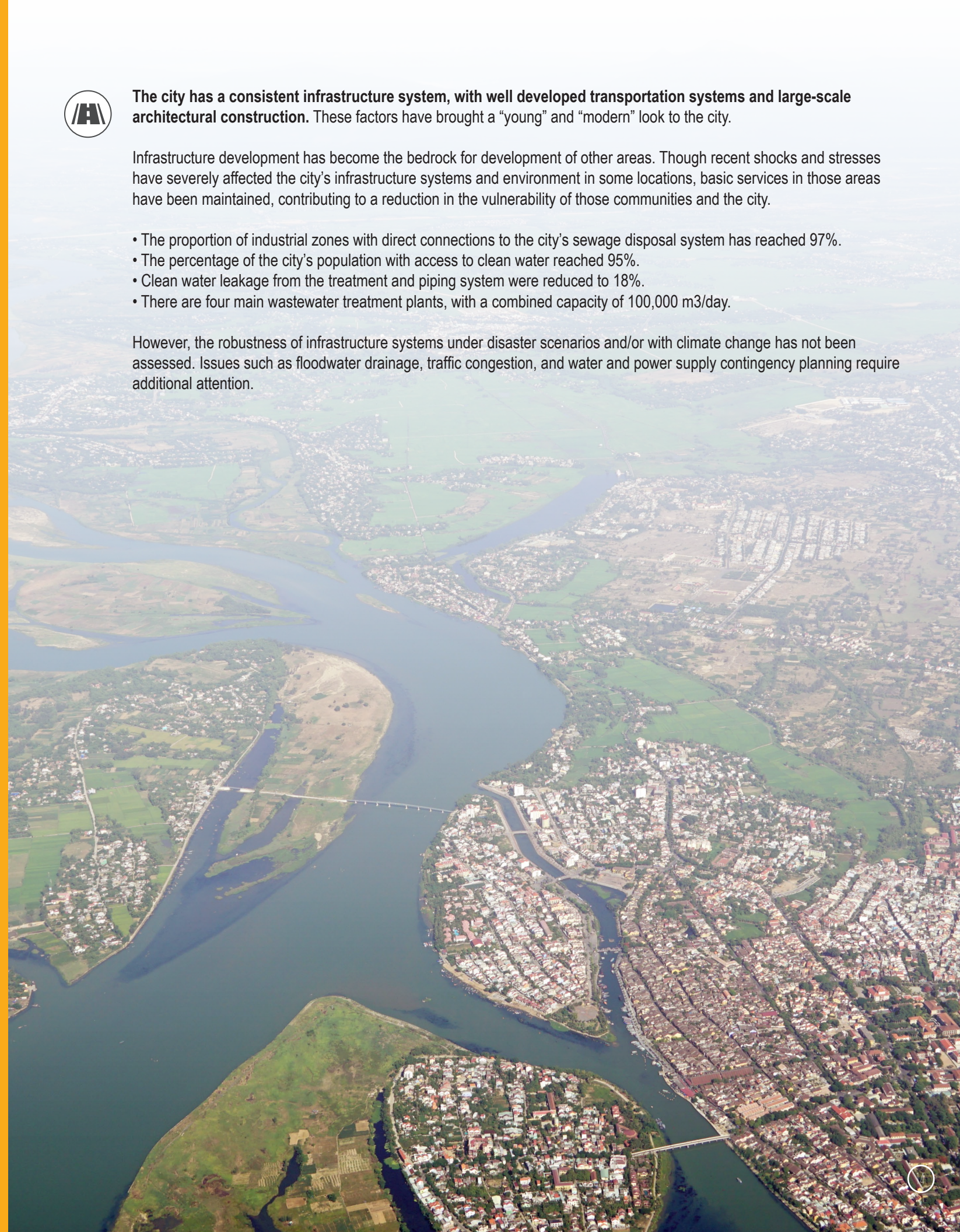


The city has a consistent infrastructure system, with well developed transportation systems and large-scale architectural construction. These factors have brought a “young” and “modern” look to the city.

Infrastructure development has become the bedrock for development of other areas. Though recent shocks and stresses have severely affected the city’s infrastructure systems and environment in some locations, basic services in those areas have been maintained, contributing to a reduction in the vulnerability of those communities and the city.

- The proportion of industrial zones with direct connections to the city’s sewage disposal system has reached 97%.
- The percentage of the city’s population with access to clean water reached 95%.
- Clean water leakage from the treatment and piping system were reduced to 18%.
- There are four main wastewater treatment plants, with a combined capacity of 100,000 m3/day.

However, the robustness of infrastructure systems under disaster scenarios and/or with climate change has not been assessed. Issues such as floodwater drainage, traffic congestion, and water and power supply contingency planning require additional attention.



DA NANG FUTURE (2016-2020, WITH A VISION TO 2030)

Urban features and development trends of Da Nang in the future are described as follows:

RAPID DEVELOPMENT

At the urban scale, population will increase significantly due to the increase in immigrant labors. By 2030 Da Nang's population is estimated to be 2.5 million as shown in the chart below. Labor demand forecasting trends are similarly expected to increase as shown in page 16.

BECOMING A REGIONAL URBAN CENTER

As a modern regional urban center, and a national and international socio-economic center Da Nang will strongly and rapidly develop its transport infrastructure, high-technology centers, tourism, distribution and logistic centers in the future.

TRANSPORT INFRASTRUCTURE DEVELOPMENT

Building and maintaining cutting-edge urban transport systems is one of the key elements contributing to development of urban areas within a city. Da Nang, along with other surrounding localities, will be well connected by the network of highways. According to the approved planning, additional roads will be constructed along Da Nang's edges and riverside and coastal areas, including: The southern edge route (from 1A National Route to DT604 Route), the western edge route (from Da Nang – Quang Ngai highway), the northern edge route along Cu De River (as the riverside main route, connecting new urban areas along the river), and the southern edge route along Cau Do River (from DT604 Route to Cam Le Bridge, connecting with roads to Hoa Xuan urban area).

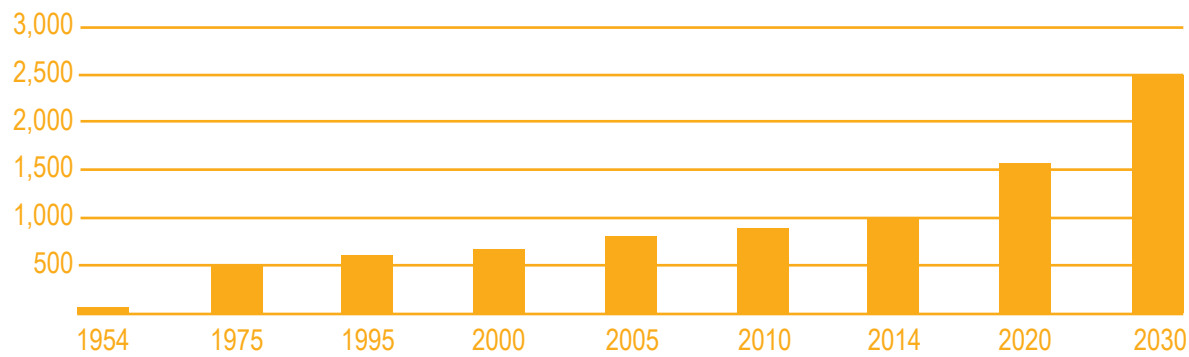
DEVELOPMENT OF CLEAN INDUSTRIES UTILIZING HIGH TECHNOLOGY

Da Nang Hi-Tech Park is one of the three national hi-tech parks of Vietnam, which will be a destination for both domestic and foreign investors, boosting the science and technology of Da Nang and the Central Vietnam and Western Highlands. Industries for investment attraction include: Bio-tech applied for agriculture, aquaculture and healthcare; Microelectronics, mechanical-electronics and opto-electronics; Automation and precision mechanics; New energies, nano technology and new materials; Information and communications technology; computer software; Environmental technology, technology applied for petrochemistry and other special industries.

DEVELOPMENT OF TOURISM, DISTRIBUTION AND LOGISTIC CENTERS, "ENVIRONMENTAL CITY"

In terms of tourism, the World Cultural Heritage Sites in Hue, Hoi An and My Son can be connected to Da Nang and Tam Ky, creating huge potential for the growth of a regional coastal tourism hub. The sector of distribution and logistic has been developed along the East-West Economic Corridor, Vietnam's No.1 National Route. Da Nang owns an international airport and port, stretching to the southern part to connect to industrial areas and enhance its competitiveness.

DA NANG'S POPULATION GROWTH UP TO 2030



LABOR DEMAND FORECASTING, 2015-2020

Contents	Units	2015 (statistical)	2016 (forecast)	2017 (forecast)	2018 (forecast)	2019 (forecast)	2020 (forecast)
Total population	Persons	1,029,000	1,143,200	1,257,400	1,371,600	1,485,800	1,600,000
Labor demands	Persons	579,721					*847,600
Working age population							1,120,000
Trained laborers (70%)	Persons						784,000
In-migration labor demands	Persons	44,400					63,000



IMPACTS, RISKS AND ANALYSIS OF FUTURE RESILIENCE CHALLENGES

ISSUE 1

CLIMATE CHANGE IMPLICATIONS FOR URBAN AND SOCIO-ECONOMIC DEVELOPMENT

Shocks such as typhoons, floods, heat waves, droughts, saline intrusion are unpredictable, impact the city, and are likely to increase. Da Nang lies within the tropical belt of the Northern Hemisphere. The weather is influenced by monsoon circulation and directly affected by tropical disturbances such as typhoons, tropical depressions, and the inter-tropical convergence zone. Vietnam’s complicated terrain, with high mountains and steep slopes lying right next to deltas, coupled with intense monsoon and typhoon rainfalls, result in regular floods.

Between 1998 and 2015, there were 26 typhoons, 13 tropical depressions and 46 floods directly affecting Da Nang City, resulting in 219 deaths/missing persons, 226 injured, loss of 156 ships, and destruction of 138,134 houses. Infrastructure and agriculture losses over these events totaled 9,401.6 billion VND (423 million USD).

Typhoon Nari, in 2013, resulted in 7,049 houses with detached roofs, 435 other homes inundated, 221 classrooms with detached roofs, 35 kindergartens severely damaged, 90m of fence collapsing and 1.539 m2 of fence broken. Moreover, there were over 40,000 uprooted trees and 5,000 seriously damaged ones, resulting in huge ecosystem losses. The flood in November 14-16, 2013, due to heavy rain, resulted in inundation of and serious damage to 32,793 homes.

In addition to disaster-related shocks, the city’s urban water supply is under stress. Droughts, saline intrusion in rivers and river water exploitation are increasingly impacting the ability to meet water demand, which in turn increases the pressure on socio-economic sectors such as tourism development, environmental sanitation, and public health. A detailed list of these shocks and stresses follows.

Shocks & Stresses	Associated Risks & Impacts
Rising Intensity of Typhoons	• Houses of the poor are seriously damaged, hard to recover after typhoons. • Tourism, services and industrial production are disrupted. • Traffic network is interrupted, increasing risk for tourists and residents.
Flooding Increase	• Housing and construction along rivers and in low-lying areas are damaged. • Flooding affects residents' lives including loss of life as well as financial and social impacts. • Property value within the city are reduced. • Constructions and infrastructure along rivers and in low-lying areas are damaged.
Heat Waves	• There is an increase in demands for energy. • Production activities (including tourism) are affected. • Infectious diseases increase among community.
Droughts	• Prices for water access, treatment and supply increase. • Conflicts arise between water users (irrigation, hydro-power generation, household use and agriculture). • Water quality decreases as flow volumes drop. • Saline intrusion increases due to reduced flow volume. • Agricultural productivity is reduced, leading to livelihood decline in rural areas.

Typhoon No. 11 in 2013 destroys the Bach Dang Street balcony.

ISSUE 2

POPULATION INCREASE, PARTICULAR IMMIGRANT LABORS, INCREASES LOCAL SOCIAL ISSUES

In Da Nang, urban infrastructure is overloaded, especially in populous areas. Critical stresses in crowded areas include traffic congestion, water shortage, neighborhood insecurity, lack of schools, and poor healthcare for children; addressing these stresses is a pressing task.

Results of a preliminary survey on labors show that immigrant labors share some common points: They mainly live in industrial zones of the city (especially in Lien Chieu District, accounting for 55%); women make up the largest proportion of this population, coming from Da Nang's neighborhood areas; they mainly work in the industries of textile and garments, leather shoes, electronic components; their incomes stay low (from 1.4 to 2 million VND/month); they mainly rent modest rooms for accommodation which are not resilient to typhoons and floods.

Results of a survey among 150 officials/employers show that there are issues around how local businesses use immigrant labor, including: (1) Young labors with high degrees and highly trained skills make up a significant and increasing proportion of the labor force (2.3% increase/year) but the city's model of development does not depend heavily on this population; (2) Young labors face difficulties in securing appropriate jobs, affording daily costs and recreation activities, covering childcare expenses; (3) Most of the older labors and residents living in urbanized areas (aged 45-50) find it hard to find and adapt to new jobs due to changes in working time and regulations (especially males).

When coupled with climate change, increasing disaster risks, and urban development, risks to vulnerable residents such as immigrant labors and poor households living in urbanized areas will increase.

ISSUE 3:

CLIMATE CHANGE AND URBAN DEVELOPMENT IMPACTING INFRASTRUCTURE AND THE ENVIRONMENT

Within Da Nang, urban expansion, infrastructure, and traffic investments have been prioritized, leading to risks of flooding and inundation in river basins near Quang Nam, and in downstream areas in Da Nang. In particular, in the past, urban development in low-lying areas and old flood drainage areas was promoted with no consideration for adaptation needs or solutions, creating a significant hazard-scape that will only increase in the future.

According to the Hydrology and Urban development simulation model (HUDSIM – ACCCRN), causes of floods in Da Nang include: Large flows from the upstream areas pouring into the floodplain while low-lying areas in the downstream of Da Nang do not have adequate water storage or drainage capacity; leveling grounds for urban development in low-lying areas in ways that reduce floodwater storage and drainage and/or constrict flows; construction and improvement of traffic routes in ways that block water flows; and a lack of flood drainage and floodwater storage solutions.

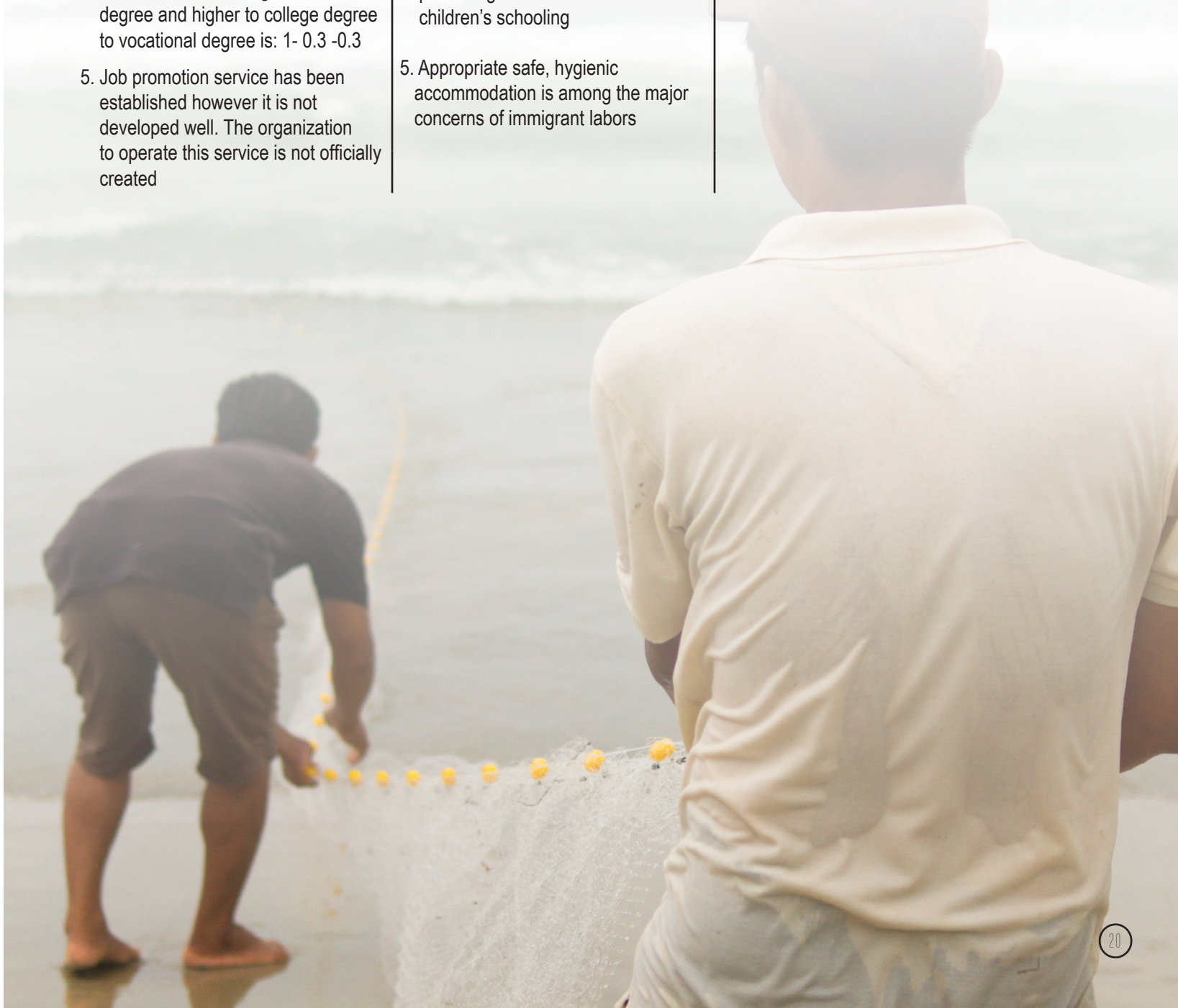
According to scenarios of climate change impacts on the South Central Coast, precipitation may increase by 1.5% in 2020 relative to 1990s, and by 4.0% in 2050 relative to 1990. In addition, sea level rise will slow floodwater drainage. As a result, Da Nang's flooding risk is projected to increase.

Aside from water issues, climate change scenarios indicate that increases in temperatures will likely result in increased heat waves and prolonged droughts, which in turn will severely affect urban residents and infrastructure in the future.

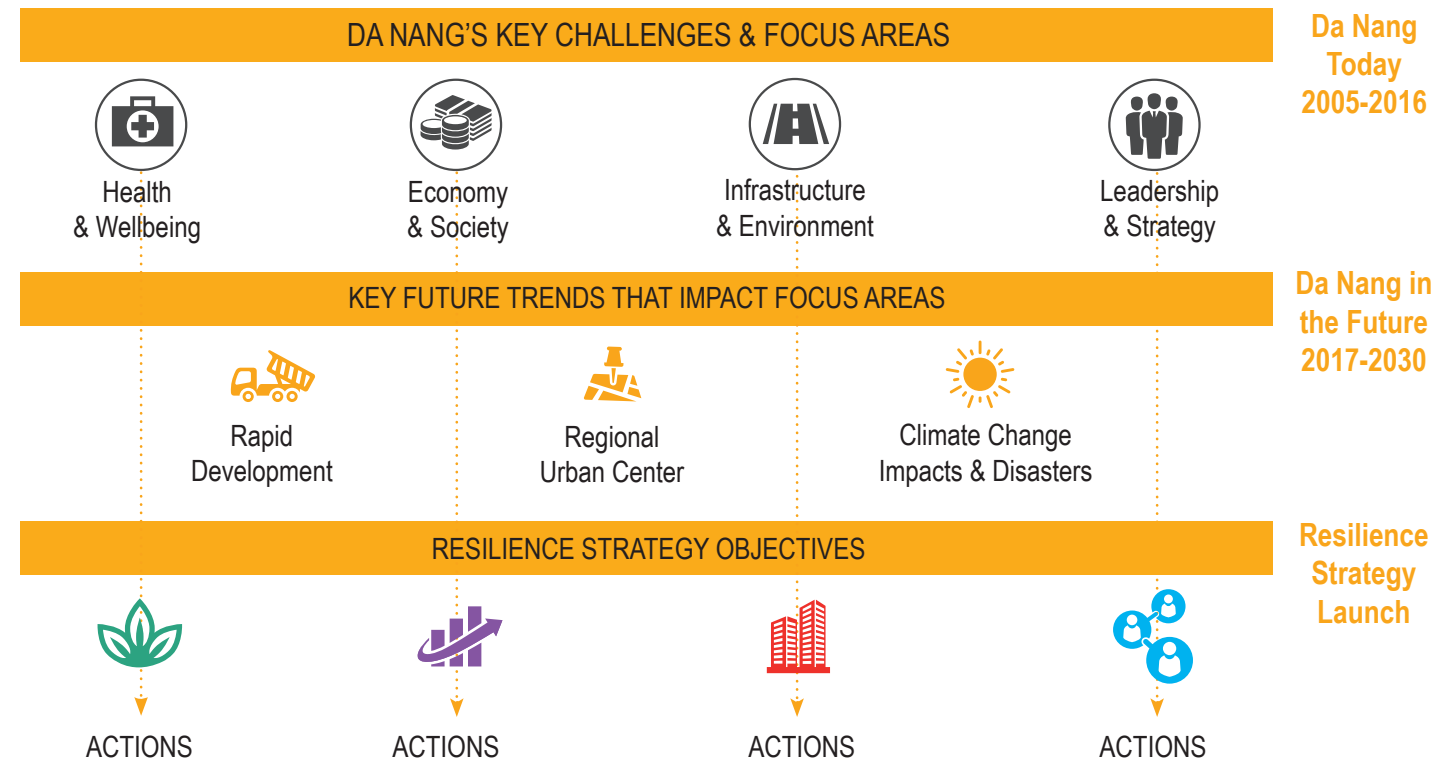
It is estimated that 25% (or 29,981) of the homes in Da Nang are in moderate, bad or very bad condition.



Labor Market	Immigrant Laborer	Labors Suffering from Landuse Change and Resettlement
1. There are abundance of young labors with high skill and expertise	1. It is difficult for high skill immigrant labors to find a job in Da Nang due to priority for local labors and high competition	1. Young labors (under 45) in this group are easy to adapt to new working environment, however the older ones cannot find new jobs easily
2. Economic growth has created many jobs, particularly in service, tourism and private sectors	2. Living condition of immigrant labors in industrial zones is low	2. In some households, their living largely depend on the compensation from resettlement or selling their land
3. The economic growth is largely based on investment rather than productivity	3. The economic growth is largely based on investment rather than productivity	3. Female labors are willing to take training courses for new jobs, whereas male labors tend to work on freelance jobs
4. There is a slow change in the proportion of the labor force. The current ratio of undergraduate degree and higher to college degree to vocational degree is: 1- 0.3 -0.3	4. Immigrant labors spend on large percentage of their income for their children's schooling	
5. Job promotion service has been established however it is not developed well. The organization to operate this service is not officially created	5. Appropriate safe, hygienic accommodation is among the major concerns of immigrant labors	



MOVING FROM STRATEGY TO ACTION



KEY QUESTIONS STRATEGY ACTIONS MUST ANSWER

Based on the resilience analysis and the four principal resilience challenges facing Da Nang, the following questions should be asked

- A) HOW TO REMOVE FEAR AND ANXIETY FROM PLACES WHERE RESIDENTS LIVE, WORK AND RECREATE?**
1. How can the city create resident housing that is resilient to disasters such as typhoons and floods?
 2. How can the city mobilize stakeholders to pro-actively build social security and life safety against disasters?
 3. How can public space be leveraged to improve environmental quality and create places for recreation and social cohesion?
 4. How can the city create effective early warning systems to alert residents of imminent severe weather events?
- B) HOW TO DEVELOP A DYNAMIC, ROBUST, GLOBALLY INTEGRATED AND RESPONSIVE ECONOMY?**
1. Which priority solutions can the city take to reduce unemployment caused by global economic development and climate change?
 2. How should the city support local businesses to integrate and develop?
 3. How can the city improve the quality of life and the livelihoods of people in urbanized and resettlement areas with the support of clean agriculture and high technology?
- C) HOW TO DEVELOP INFRASTRUCTURE AND ECOSYSTEMS CAPABLE OF ADAPTING TO AND MITIGATING CLIMATE CHANGE IMPACTS AND SUPPORTING SUSTAINABLE DEVELOPMENT?**
1. Which solutions should the city pursue to strengthen flood management in the southern part of the city?
 2. What does the city need to do to create a roadmap of ecological and environmental adaptation and mitigation solutions that will address future shocks and stresses?
- D) HOW TO CREATE A CONNECTED INFORMATION COLLECTION AND DISSEMINATION SYSTEM THAT WILL SUPPORT EARLY WARNING FOR DISASTERS?**
1. How can infrastructure systems and contingency plans be improved to address changing, increasing disaster risks?
 2. How can the city improve its data collection and management to support disaster planning and response?
 3. Which disaster planning and response mechanisms are local communities and businesses concerned with and willing to participate in?

RESILIENCE ANALYSIS TOOL

NEED TO DO BETTER DOING WELL, BUT CAN IMPROVE AREA OF STRENGTH



4 - DA NANG RESILIENCE STRATEGY

Da Nang's past challenge, current struggles, aspirational goals and rich history of resilience planning are encapsulated in its Resilience Strategy. Through the process of its resilience planning (see section 2), Da Nang has been able to develop key focus areas, specific strategy objectives (shown right) and a range of high-leverage strategy actions which are shown in the following section.

The following content has been discussed with technical departments and local experts over the course of three consultation meetings. In early 2016, Da Nang's CRO first presented the city's draft Resilience Strategy to the Vice Chairman of Da Nang People's Committee and the city's Steering Committee. Feedback and comments have been incorporated into the final document and the revised strategy actions that follow.



- #1 - A PEACEFUL CITY
A city that removes fear and anxiety from places where residents live, work and recreate.
- #2 - A DYNAMIC CITY
A city with dynamic economy in partnership with people and business to meet needs in a changing world.
- #3 - A PREPARED CITY
A city with infrastructure systems which can recover, and be well prepared for challenges in development process.
- #4 - A CONNECTED CITY
A city where knowledge is driven by meaningful information sharing.

LEGEND DA NANG'S APPLIED RESILIENCE VALUES



REDUCE
VULNERABILITY
+ EXPOSURE



ENSURE SAFETY,
COMMUNITY HEALTH
+ PROTECT LIFE



INTEGRATE
PLANNING +
MANAGEMENT
PLANS



MAINTAIN
BASIC SERVICES
+ CRITICAL
INFRASTRUCTURE



MITIGATE
FLOOD IMPACTS
IN LOW-LYING
AREAS



IMPROVE
LANDSCAPE
+ ECOLOGY



MAINTAIN
RELIABLE
COMMUNICATION
SYSTEM



SECURE
ECONOMIC
DEVELOPMENT



MAINTAIN
LEADERSHIP
+ EFFECTIVE
MANAGEMENT



ENHANCE
SUSTAINABILITY
+ SOCIAL WELFARE



ENHANCE
COMMUNITY IDENTITY,
SUPPORT + DIVERSE
LIVELIHOOD



STRENGTHEN
+ ENHANCE
THE ROLE OF
STAKEHOLDERS

STRATEGY 1 A PEACEFUL CITY

A city that removes fear and anxiety from places where residents live, work and recreate.

STRATEGY #1 SHORT-TERM OBJECTIVE

The city will promote basic services for residents' safety against disasters

STRATEGY #1 LONG-TERM OBJECTIVE

The city and communities will have adequate capacity to become more resilient and recover against shocks and stresses

DETAILED OBJECTIVES

- ✓ • Improving housing quality, resilient to storms
- ✓ • Ensuring spare financial resources for disaster response
- ✓ • Improving employment and livelihoods
- ✓ • Improving daily life environment
- ✓ • Ensuring the safety against disasters of community

LIST OF ACTIONS:

- ACTION 1.1 Expanding loan supports for community to build/ repair housing resilient to storms
- ACTION 1.2 Scaling up, integrating the technical material when building storm-resistant housing
- ACTION 1.3 Assessing the city's housing vulnerability exposed to storms
- ACTION 1.4 Integrate climate change mitigation into housing sector
- ACTION 1.5 Conducting analysis on financial risks and insurance mechanism for disaster responses
- ACTION 1.6 Research and pilot insurance mechanism for disaster resilient housing
- ACTION 1.7 Promote outreach, training, awareness and education to increase community resilience
- ACTION 1.8 Promoting supports and sponsors of different donors for disaster and climate change response in the community



STRATEGY 1 A PEACEFUL CITY



ACTIONS AND INITIATIVES

1. ACTION 1.1

EXPANDING LOAN SUPPORTS FOR COMMUNITY TO BUILD/ REPAIR HOUSING RESILIENT TO STORMS

Storm-resistant housing funding managed by the city Women’s Union will be maintained in relation to results of the project scaling-up study of ADB. Now demands for loans of housing building of the poor and the near poor stay high. Thus, the increase in funding access for them to build storm-resistant housing is essential and necessary. This is a key actions that is conducted in small scale and needs to be scaled up.

ACTIONS	Based on study results of ADB*, mobilization for loans is recommended, specifically:
	Discussing demands for credit loans for storm-resistant housing 2016-2020 with financial units such as ADB, WB
	Discussing the possibility of mobilization of local funds in scaling up storm-resistant housing with relevant municipal departments and agencies
	The main action will be conducted when loan funding is developed.
RESILIENCE VALUE	   
TARGET AREA	Coastal, riverside districts and high mountainous areas
LEAD	CCCO
PLATFORM PARTNERS	100RC, ISET
LOCAL PARTNERS	DOF, DONRE, Da Nang Women’s Union, VN Central Committee of Fatherland Front of Da Nang, ADB, NDF, WB and other financial organizations
TIME	2017-2025

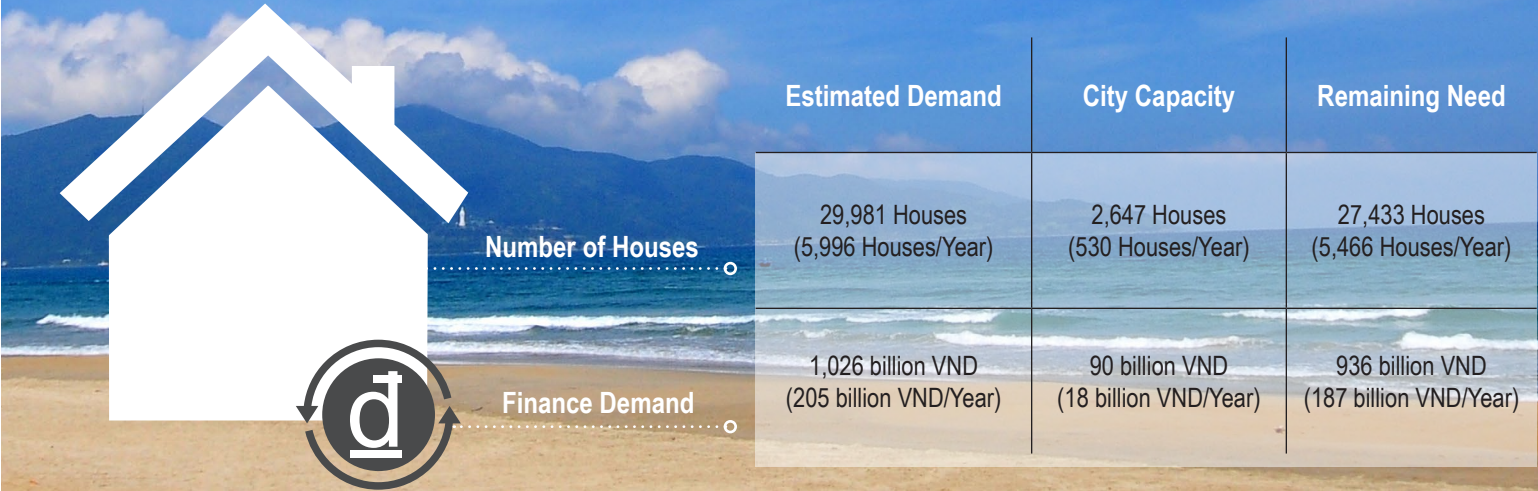
* Technical report on “Undertaking feasibility study for scaling-up the model of storm resistant housing for a resilient Da Nang City” Prepared by the Institute for Social and Environmental Transition & Da Nang Department of Foreign Affairs

EXISTING PROGRAMS THAT SUPPORT HOUSING IN DA NANG



National Programs	City Programs	ODA/Foreign Aided Programs
<i>The government’s VND30 trillion loan package for low-cost housing</i>	The program 48 (Decision 48/TTg) in Hoa Vang Rural District	Storm-resistant housing projects
• From 2013-2016 (State budget) • Conducted in the form of incentives for low-income housing loans • Low-income households joining the program need approval of municipal DOC • 70% provided to ordinary housing buyers, the other 30% provided to investors • As a social housing project which has been approved • Total ground area 70m2 • With low and stable interest = 5% per annum (in 10 years). • Each loan supports 50% of total cost of a house	• 2014-2016 (State budget via Vietnam Bank for Social Policies) • Conducted to support building and repairing 407 houses for the poor in Hoa Vang so that they can resist to storms and floods • Subsidy = 12,000,000 VND • Loan = 15,000,000 VND • Loan term = 10 years. • Suitable for financial status of the poor	• 2008-2013 (budget from WB). • Providing housing microfinance consisting of 1 million-worth loans • Interest = 12% per annum • Repayment rate of almost 100 % ACCCRN Program • 2011-2014 • Concerned with storm-resistant housing • Interest = 7.8% per annum • House design and consultation fees = 1,000,000VND/household • Up to 2016: over 400 households access the loans (poor and near poor)

DEMAND FOR HOUSING FINANCE [CREDIT] FROM 2016-2020 IN VIETNAMESE DONG [VND]



POTENTIAL FUNDING FOR SCALING UP STORM-RESISTANT HOUSING



Category	Fund for the poor	Fund for disaster control	Women Development Fund	Vietnam Environment Protection Fund
Operation and management costs of housing microfinance		✓	✓	
Cover for the difference between the interest rate of the state and outside interest rate	✓		✓	
Consultation/Design fees	✓	✓		✓
Housing insurance		✓	✓	✓

2. ACTION 1.2

SCALE UP, INTEGRATE TECHNICAL MATERIAL WHEN BUILDING STORM-RESISTANT HOUSING

Between 2013 and 2016, the city implemented Degree No.48/NĐ-CP and promulgated Decision No.9002/QĐ-UBND on a storm-resistant housing program. However, this program has been conducted in Hoa Vang only. The technical material for building storm-resistant housing has not been widely announced, yet it needs to be scaled up and shared with a wide audience. This is a supportive action that was conducted and has ended and needs to be scaled up.

ACTIONS	Conducting actions based on official responsibilities of DOC and PCs of districts:
	Existing related regulations will be reviewed and considered; design drawings and basic construction guidance for community use will be finalized
	Cooperate with and hand over deliverables to local units such as districts, wards/communes
	Organizing training courses for local units
RESILIENCE VALUE	
TARGET AREA	The city
LEAD	DOC
PLATFORM PARTNERS	ISSET and other organizations
LOCAL PARTNERS	The Steering Committee for Natural Disaster Prevention, Search and Rescue, Da Nang Women’s Union, People’s Committees of districts
TIME	2017-2020

3. ACTION 1.3

ASSESS THE CITY’S HOUSING EXPOSURE TO STORMS TO PRODUCE DISASTER ADAPTATION PLANS

During the development of the four Focus Areas, a Feasibility and Demonstration study of a Visual Climate Adaptation Platform (VCAP) was conducted by the CSIRO and the Da Nang CRO technical team from March to June 2016. The study assessed the exposure and vulnerability of the current residential housing in two wards (Tho Quang and Hoa Hai; subjected to wind storms). Impact levels, risks and costs were identified. The city needs to further investigate, collect housing data, and then to assess the feasibility of scaling up. This is a supportive action and would initially apply VCAP to produce disaster risk reduction and adaptation plans (also see Strategy 4).

ACTIONS	Conducting official tasks in storm and flood control
	Collecting data on current status of housing in GIS maps, and damages caused by historical disasters
	Preparing necessary steps and resources for setting up VCAP for Da Nang
	Consulting for necessity and resources for development of a vulnerability map of housing damages due to wind storms of the city
	Evaluating VCAP’s application in housing quality management
RESILIENCE VALUE	
TARGET AREA	The city
LEAD	The Steering Committee for Natural Disaster Prevention, Search and Rescue
PLATFORM PARTNERS	100RC, CSIRO
LOCAL PARTNERS	CCCO, DARD, DOLISA, DOC
TIME	2017-2018

4. ACTION 1.4

INTEGRATE CLIMATE CHANGE MITIGATION INTO THE HOUSING SECTOR

There is huge potential to reduce GHG emissions in households in Da Nang. The “Building Energy Accelerator” (BEA) program conducted by WRI will analyze and provide a wide range of potential solutions to reduce GHG in the building and housing sector. BEA program results will provide the basis for replication at the city scale. This is a supportive action and new initiative.

ACTIONS	In the first phase, several activities will be conducted within the BEA program, including:
	Conduct an assessment of current energy efficiency, and propose relevant solutions
	Develop a roadmap for solution implementation
	Conduct consultation meetings
RESILIENCE VALUE	
TARGET AREA	Citywide
LEAD	CCCO
PLATFORM PARTNERS	100RC, WRI
LOCAL PARTNERS	DOC, DTC, DIT, Office of Committee for Storm and Flood management
TIME	2017-2020

5. ACTION 1.5

CONDUCT AN ANALYSIS OF FINANCIAL RISKS AND INSURANCE MECHANISM FOR DISASTER RESPONSES

Under current regulations, local budgets allocate a 2% reserve for corrective work following a disaster. Therefore, the city should organize analysis to ensure the availability of financial resources, to more actively respond to disasters. Disaster risk finance solutions include contingent annual budget, insurance mechanism, preserved credit, financial aid after disaster. This is a key action and new initiative.

ACTIONS	Several activities will be integrated within the WBG and GFDRR programs
	Collect information , conduct financial risk analysis, and propose relevant solutions
RESILIENCE VALUE	   
TARGET AREA	Citywide
LEAD	DoF
PLATFORM PARTNERS	WBG and GFDRR, Swiss Re, and other organizations
LOCAL PARTNERS	Relevant city departments
TIME	2017-2020

DRFIP aims to enhance financial resilience, thereby reducing expense and minimizing recovery time after disasters. To achieve this objective, DRFIP provides consultation and analysis tools, and solutions for recovery and disaster risk reduction. Expected results from DRFIP: Analysis of financial preparedness and resource mobilize solutions for disaster response.

6. ACTION 1.6

RESEARCH AND PILOT INSURANCE MECHANISMS FOR DISASTER RESILIENT HOUSING

Insurance mechanism is a useful financial tool to preserve an alternative funding for post disaster response. Swiss Re has provided analysis and a tentative insurance mechanism for housing sector in Da Nang to be proactive to natural disaster. This is a key action and new initiative.

ACTIONS	Combined with Action 1.1 in mobilizing loans for the Storm resistant Housing Project
	Collaborate with financial institutions such as ADB, WB to develop a housing insurance mechanism
	Negotiate with municipal departments to utilize disaster prevention funds to subsidize insurance premium pay-ments
	Consult with relevant stakeholders
	Pilot the insurance mechanisms (for 500 houses).
RESILIENCE VALUE	   
TARGET AREA	Citywide
LEAD	CCCO
PLATFORM PARTNERS	100RC, Swiss Re, VINARE, financial institutions
LOCAL PARTNERS	DoF, Woman Union, Office of Committee for Storm and Flood management
TIME	2017-2020

Da Nang is considering a parametric insurance mechanism for storm resistant housing in the city. This concept was proposed by Swiss Re in May 2016.



7. ACTION 1.7

PROMOTE OUTREACH, TRAINING, AWARENESS AND EDUCATION TO INCREASE COMMUNITY RESILIENCE

Communication program including training and workshops on climate change and natural disaster reduction has been conducted widely by city departments. In the coming time, it is necessary to build and provide basic knowledge, skills, and practices for community so that they can response and provide mutual supports during disasters. This is supportive action and ongoing activity that needs to be scaled up.

ACTIONS	Conduct training and communication on critical knowledge and skills for community
	Conduct training on resilience for students and workers in industrial zones
	Develop piloting model
	Develop guidance materials
RESILIENCE VALUE	 
TARGET AREA	Citywide
LEAD	Relevant city departments
PLATFORM PARTNERS	International and National Donors
LOCAL PARTNERS	Other city departments
TIME	2017-2025

7. ACTION 1.8

PROMOTING DONOR SUPPORT FOR CLIMATE CHANGE AND DISASTER RESPONSE IN THE COMMUNITY

International and national donor support has been and continues to be fundamental to preparing for and responding to disaster in Vietnam. For example, in 2015-2016, the Akzo Nobel Company provided materials and labors to repaint social houses and community buildings. The city would like to increase and scale up such contributions. This is supportive action and ongoing activity that needs to be scaled up.

ACTIONS	Promote the support and sponsorship for poor communities affected by disasters
	Enhance the awareness and involvement of private sector in responding to disasters
RESILIENCE VALUE	 
TARGET AREA	Hoa Vang District and coastal communes
LEAD	DoFA
PLATFORM PARTNERS	100RC, ISET, International and National Donors
LOCAL PARTNERS	Municipal departments, District people’s committee, CCCO, Office of Committee for Storm and Flood management
TIME	2017-2025

“HUMAN CITIES” INITIATIVE

REPAINTING STORM RESISTANT HOUSING SPONSORED BY AKZO NOBEL (2015-2016)

Akzo Nobel is a Dutch company which is a leading global paint and coating company and a major producer of specialty chemicals. In Viet Nam, Akzo Nobel is well known for two products of Dulux and Maxilite. In 2014, Akzo Nobel launched the “Human Cities” Initiative, focusing in six areas, including: Colorfulness, Heritage, Education, Sport, Transportation, and Sustainable Development. Within the scope 100RC Initiative, Akzo Nobel has provide the material for 100 storm resistant houses and two community buildings in Da Nang city. This also relates to actions in Strategy 2 (Diversifying livelihood), Strategy 3 (Improving living environment) and Strategy 4 (Ensuring safety of community against natural disasters) which are presented in the following sections.



STRATEGY 2

A DYNAMIC CITY

A city with dynamic economy in partnership with people and business to meet needs in a changing world

STRATEGY #2 SHORT-TERM OBJECTIVE

Da Nang creates diverse job opportunities and livelihood; local businesses are well supported to be proactive for integration; living condition of marginalized residents are improved through easy access to abundant jobs

STRATEGY #1 LONG- TERM OBJECTIVE

The city creates a dynamic economy, maintains close cooperation among government, businesses and residents

DETAILED OBJECTIVES

- ✓ Enhance communication between government, businesses, and labors
- ✓ Create an efficient environment for production and trade, improve living environment and social welfare
- ✓ Diversify the job market to improve living conditions for marginalized labors

LIST OF ACTIONS:

- ACTION 2.1 Building and managing online database of labor market
- ACTION 2.2 Conducting dialogues on policies related to labor, payment, recruitment, and training
- ACTION 2.3 Piloting the distribution channels for organic products
- ACTION 2.4 Research on “Uber model for tourism and services”
- ACTION 2.5 Creating favorable conditions for children of workers in industrial zone to attend school
- ACTION 2.6 Revitalizing open spaces (park, foot path) at high density residential area
- ACTION 2.7 Dialogues on investment attraction regarding globally economic integration



STRATEGY 2 A DYNAMIC CITY



ACTIONS AND INITIATIVES

1. ACTION 2.1

BUILD AND MANAGE A LABOR MARKET ONLINE DATABASE

In-depth interviews with businesses indicate a lack of conversation between businesses and labors. To address this problem, it is necessary to connect businesses and labors through an online database of labor demand and supply. The database should also house information on training, recruitment, and policies related to labor, salary, and support so that labors and employer can find relevant resources for their needs. This is a key action and new initiative.

ACTIONS	Build online database (investigate, develop the structure of the database, consult with different stakeholders, develop manual)
	Publicize the database
	Review and update annually
RESILIENCE VALUE	   
TARGET AREA	Citywide
LEAD	DoLISA
PLATFORM PARTNERS	To be identified
LOCAL PARTNERS	DISED, DIC, Consultating firms
TIME	2017-2020

2. ACTION 2.2

CONDUCT POLICY DIALOGUES RELATED TO LABOR, SALARIES, RECRUITMENT, AND TRAINING

The city of Da Nang needs to organize series of dialogues to communicate labor policies and inform revision of job training plans and programs. This is a key action and new initiative.

ACTIONS	Assess how businesses implement labor policies
	Convene dialogues engaging wide range of stakeholders
RESILIENCE VALUE	  
TARGET AREA	Citywide
LEAD	DoLISA
PLATFORM PARTNERS	To be identified
LOCAL PARTNERS	DISED, Management board of Industrial Zones, District People's Committee
TIME	2017-2020



3. ACTION 2.3

DEVELOP DISTRIBUTION CHANNEL FOR ORGANIC PRODUCTS

Currently, the city government is developing Da Nang into a “4 Safeties” city, including safe traffic, safe community, safe food and good social welfare. To achieve safe food, it is necessary to create a distribution channel to provide healthy organic products to community. This model also provide job and improve livelihood for people who are affected by urbanization. This is a key action and pilot initiative that needs to be promoted.

ACTIONS	Conduct survey, develop proposal for “Distribution channel for organic product project”
	Pilot the model: collaborate with producers, invest facilities and organize the market
	Evaluate the effectiveness of the model; scale up if successful
RESILIENCE VALUE	  
TARGET AREA	City center area
LEAD	DARD
PLATFORM PARTNERS	To be identified
LOCAL PARTNERS	DISED, DIT, DoH, PC at district level
TIME	2017-2020

Agricultural production in Hoa Vang district,
New Rural Area program, June 2016



4. ACTION 2.4

RESEARCH ON “UBER MODEL FOR TOURISM AND SERVICES”

Da Nang aims to be a tourism and service city, in particular to meet high demand in logistic and supportive services. To support this goal, the city will conduct research and pilot a tourism service hub model where information is provided connecting supply and demand sides, with the intent to create more job opportunities. This is a support action and new initiative.

ACTIONS	Conduct survey and develop a pilot model
	Mobilize funding for piloting
	Pilot the model, assess and replicate if successful
RESILIENCE VALUE	  
TARGET AREA	Inner city areas
LEAD	DOT
PLATFORM PARTNERS	To be identified
LOCAL PARTNERS	DISED, DOLISA, Tourism association, District People's committee
TIME	2017-2020

5. ACTION 2.5

CREATE FAVORABLE CONDITIONS FOR CHILDREN OF WORKERS IN INDUSTRIAL ZONES TO ATTEND SCHOOL

Based on the assessment on living condition in industrial zones, there is significant need to improve living condition for workers. The highest priority is to improve the learning environment of workers’ children. Currently, Da Nang is implementing a 3.8 mil USD project, “Centre for kindergarten education and care” sponsored by Half the Sky Foundation, to benefit the children of industrial zone workers. This is a key action and ongoing activity that needs to be scaled up.

ACTIONS	In the short term, implement the “Centre for kindergarten education and care” project
	Assess the effectiveness of the project
	Develop a roadmap for replication citywide
RESILIENCE VALUE	  
TARGET AREA	Industrial zones
LEAD	DoET
PLATFORM PARTNERS	Half the Sky Foundation (US)
LOCAL PARTNERS	DoFA, PC of Lien Chieu District
TIME	2016-2020



HALF THE SKY FOUNDATION (USA)

THE “CENTRE FOR KINDERGARTEN EDUCATION AND CARE – ONE SKY”

Half the Sky Foundation is an US NGO focusing on replicable health care and kindergarten education to improve quality of life for vulnerable children.

This project provides the first international standard kindergarten school in Viet Nam, piloted by Half the Sky foundation. The primary beneficiaries will be the children of industrial zone workers.

This 3-year, 3.8 million USD project will be implemented from 2016 to 2019 in the Hong Phuoc Residential area (Hoa Khanh Bac Ward, Lien Chieu district). 3.5 million USD of funding comes from Half the Sky Foundation; the remainder is covered by Da Nang city.

6. ACTION 2.6

REVITALIZE COMMUNITY SPACES IN HIGH DENSITY RESIDENTIAL AREAS

A key social challenge in Da Nang is the shortage of community spaces and social services in high density areas. This is a supportive action and new initiative.

ACTIONS	In the short term, the Social Cohesion Challenge initiated by 100RC will be implemented, the development of community open space in Nai Hien Dong community will be piloted.
	For other areas, surveys will be conducted to determine the current status of and demand for open spaces, including kindergarten school, parks, foot paths, etc., particularly in the Cam Le and Lien Chieu Districts.
	Based on survey results, proposals will be developed to transform currently abandoned or unused industrial zone areas into community open space assets.
RESILIENCE VALUE	   
TARGET AREA	Industrial zones or high density residential areas
LEAD	DoC
PLATFORM PARTNERS	100RC, Citimart
LOCAL PARTNERS	CCCO, DISED, People’s Committee of Son Tra, Lien Chieu, Cam Le
TIME	2017-2020

SOCIAL COHESION CHALLENGE

INITIATED BY 100 RC WITH SUPPORT FROM CITIMART

100 RC initiated the Social Cohesion Challenge with the support of Citimart, which aims to help cities in 100RC network deeply understand their social challenges, connect to different solution providers globally, and develop innovative solutions to enhance social cohesion. One of the key social challenges identified in Da Nang is the lack of community open spaces. For the Social Cohesion Challenge, Da Nang has selected to pilot the development of community open space in Nai Hien Dong community.

7. ACTION 2.7

INCREASE DIALOGUE ON INVESTMENT ATTRACTION AND GLOBAL ECONOMIC INTEGRATION

Da Nang frequently conducts promotion events to attract foreign investment. International and national dialogue should be increased to attract greater investment, promote global economic integration, and enhance the economy of Da Nang. This is a supportive action and ongoing activity that needs to be supported.

ACTIONS	Implement the “Central Focused Economic Zone” Program in Da Nang
	Organize Economic and Investment Forums
RESILIENCE VALUE	  
TARGET AREA	Citywide
LEAD	DPI
PLATFORM PARTNERS	100RC
LOCAL PARTNERS	CCCO, DISED, DDIF, relevant units
TIME	2017-2025



Typical open space near an apartment in Da Nang.



STRATEGY 3

A PREPARED CITY

A city with infrastructure systems which can recover, and be well prepared for challenges in development process.



STRATEGY #1 SHORT-TERM OBJECTIVE

Ecological and environmental solutions will be integrated into urban plan, development and management



STRATEGY #1 LONG- TERM OBJECTIVE

Da Nang city embeds multi-benefit solutions to create healthy ecological environment, and to improve community health,towards sustainable development

DETAILED OBJECTIVES

- ✓ • Maintain, protect, and recover the natural buffer and water retention to increase the flood drainage capacity
- ✓ • Plan, develop urban infrastructures and environmental services for climate change adaptation and mitigation
- ✓ • Enhance safety and living condition of hazard prone communities; *related to Strategy 1*
- ✓ • Enhance inter-regional, multidisciplinary solutions in urban and environmental management (flood, drought and pollution)

LIST OF ACTIONS:

- ACTION 3.1 Expand floodwater drainage corridors and develop mechanisms to manage and restore these corridors
- ACTION 3.2 Assessing flooding risk in new urbanized areas
- ACTION 3.3 Adjust the detailed plans which potentially impact drainage capacity
- ACTION 3.4 Restructuring the urban design in high flood prone areas (long term objective)
- ACTION 3.5 Resettling residential areas which are located in flooding plain or frequently affected by flood (short term adaptation)
- ACTION 3.6 Developing the model of flood resilient community (*short term adaptation*)
- ACTION 3.7 Research on energy efficiency in buildings (GHG mitigation)
- ACTION 3.8 Research on Quang Nam – Da Nang interregional river basin plan
- ACTION 3.9 Research on regional urban plan and management mechanism
- ACTION 3.10 GHG mitigation in wastes treatment sector and tourism services
- ACTION 3.11 Implementing the “Green Utility Network” in water supply sector
- ACTION 3.12 Develop monitoring and early warning systems for flood risk

STRATEGY 3 A PREPARED CITY



ACTIONS AND INITIATIVES

1. ACTION 3.1

EXPAND FLOODWATER DRAINAGE CORRIDORS AND DEVELOP MECHANISMS TO MANAGE AND RESTORE THEM

There is no current planning around maintaining flood corridors along major rivers in Da Nang. Urbanization runs all the way to the river bank to maximize development area, leaving no space for floodwaters. New urban areas are developed on the floodplain without consideration of drainage impacts. Development and redevelopment plans need to widen the flood corridor and increase the drainage capacity of the Vu Gia – Han river basin. This is a key action and new initiative.

ACTIONS	Research and design technical solutions for the flood corridor
	When developing new sites, clearly identify flood corridor borders
	Periodically dredge lakes and rivers
	Develop policy for river and drainage system management and protection
RESILIENCE VALUE	   
TARGET AREA	Southern area of Da Nang
LEAD	DoC
PLATFORM PARTNERS	International and national donors and consultants
LOCAL PARTNERS	IUP, DARD, DoNRE
TIME	2017-2025

2. ACTION 3.2

ASSESS FLOOD RISK IN NEW URBANIZED AREAS

There is currently no legal requirement for integrated flood risk assessment in urban planning. This is a supportive action and new initiative.

ACTIONS	Collect data, information on available assessment approaches
	Update the data on urban development; predict flood risk using existing hydrological simulation model.
	Develop policy mechanisms for disaster risk assessment, including flood risk assessment in new urbanized areas.
	Develop guidance for integrating risk assessment into urban planning
	Request People's Committee issue policies, regulations on risk assessment
	Enhance planning staff capacity for risk assessment
	Assess the flood risk in new urbanized area
	Propose relevant solutions
RESILIENCE VALUE	   
TARGET AREA	Citywide
LEAD	DoC
PLATFORM PARTNERS	To be identify
LOCAL PARTNERS	IUP, DARD, DoNRE, CCCO, District People's committee
TIME	2017-2025



3. ACTION 3.3

ADJUST PLANS WHICH POTENTIALLY IMPACT DRAINAGE CAPACITY

Urbanization, development on islands and construction of embankment has significantly obstructed river flows in Da Nang. This is exacerbated by floodplain transport infrastructure, which has been developed without consideration of drainage. Drainage systems in the old quarter are degraded with reduced capacity. This is a supportive action and new initiative.

ACTIONS	Research and develop a land use plan for drainage
	Designate ground level for new developed areas (i.e. depth of fill used for new construction)
	Redesign transport routes that impact drainage, incorporating overpasses and other design features to allow appropriate water passage
	Transform flood sensitive area into green spaces
	Develop and issue regulations and technical guidance on leveling and developing park and green buffer areas
	Identify development areas adjacent to flood corridors and issue regulations concerning flood risk remedies for these properties
RESILIENCE VALUE	    
TARGET AREA	Southern area
LEAD	DoC
PLATFORM PARTNERS	International and national donors and consultants
LOCAL PARTNERS	IUP, DARD, DoNRE, CCCO, District People's Committee
TIME	2017-2025

4. ACTION 3.4

RESTRUCTURE THE URBAN DESIGN IN HIGH FLOOD PRONE AREAS

Rapid urbanization, particularly in the peri-urban and southern areas of the city that occupy natural water retentions areas, has been increasing impervious surface area, restricting drainage, replacing water retention area, and exacerbating city flood risk. This is a supportive, long-term adaptive action and new initiative.

ACTIONS	Identify areas of inefficient land use and/or land degradation.
	Re-plan toward efficient land use and increasing green space, water retention and pervious area
	Create a redevelopment roadmap to replace currently inefficient land use areas with high density, well equipped buildings
	Adjust land use plans to reduce flood risk
	Provide incentives for the redevelopment of ineffectively used areas
RESILIENCE VALUE	   
TARGET AREA	Southern and Northwest areas
LEAD	DoC
PLATFORM PARTNERS	International and national consultants and donors (to be identified)
LOCAL PARTNERS	IUP, DARD, DoNRE, CCCO, District People's Committee
TIME	2020-2030

5. ACTION 3.5

RESETTLE RESIDENTIAL AREAS THAT ARE LOCATED IN THE FLOOD PLAIN OR FREQUENTLY AFFECTED BY FLOOD

To ensure the safety of communities, it is necessary to relocate and resettle residential areas that are developed in the flood plain or frequently affected by flooding. This is a supportive and ongoing short-term adaptive action that needs to be promoted.

ACTIONS	Identify flood prone, frequently impacted areas
	Identify resettlement areas with low disaster risk
	Adjust the social housing strategy to take into consideration resettlement demand
	Provide support and incentives for households in high-risk areas to relocate and resettle
RESILIENCE VALUE	   
TARGET AREA	Southern area
LEAD	DARD
PLATFORM PARTNERS	International and national consultants and donors (to be identified)
LOCAL PARTNERS	DoC, DoNRE, District People's Committee
TIME	2017-2020



6. ACTION 3.6

DEVELOP A MODEL FOR DA NANG FLOOD RESILIENT COMMUNITIES

For a variety of reasons, some high risk areas cannot be resettled or relocated. These areas need to be well prepared for flood adaptation and response. Any model developed should correlate with Strategy 4 – a model of effective natural disaster response based on the community. This is a supportive action, short-term adaptation and new initiative.

ACTIONS	Design and publicize flood resilient housing designs
	Develop and publicize flood resilient housing technical guidance
	Provide training to increase flood response capacity for communities
	Provide incentives to build flood resilient housing
	Develop and publicize preparedness plans
	Conduct research on livelihood diversification options and strategies
	Create community groups to provide support and rescue in case of emergency
	Build multi-function community safe houses
RESILIENCE VALUE	    
TARGET AREA	Southern areas
LEAD	DARD
PLATFORM PARTNERS	International and national consultants and donors (to be identified)
LOCAL PARTNERS	IUP, DoC, DoLISA, District People’s Committee
TIME	2018-2025

7. ACTION 3.7

RESEARCH ENERGY EFFICIENCY IN BUILDINGS TO MITIGATE GREENHOUSE GAS (GHG) EMISSIONS

Energy efficiency is one of the most important components of sustainable development. Da Nang needs to learn from the Building Efficiency Accelerator project and apply successful solutions across the whole city. This is a key action and new initiative.

ACTIONS	In first phase, implement the Building Efficiency Accelerator sponsored by WRI (USA)
	Conduct survey, data collection and assessment
	Propose solutions and scale up if successful
RESILIENCE VALUE	  
TARGET AREA	Citywide
LEAD	CCCO
PLATFORM PARTNERS	100RC, WRI
LOCAL PARTNERS	DPI, DIT, DoNRE
TIME	2017-2025



“BUILDING EFFICIENCY ACCELERATOR”

A PROGRAM FROM THE WORLD RESOURCES INSTITUTE

“Sustainable Energy for All (SE4ALL) which aims to achieve three objectives by 2030, including doubling the global rate of improvement in energy efficiency was initiated by UN Secretary General Ban Ki Moon and the Director of the World Bank, Jim Yong Kim, in 2011. At the Climate Change Summit in 2014, SE4ALL launched a platform partner program, the Global Energy Efficiency Accelerator Platform, comprised of 6 components: buildings, lightning, appliances, district energy systems, industry and transport. Da Nang has been selected as one of 6 global “deep dive” cities which the BEA partnership has committed to concertedly supporting in 2017.

The Building Efficiency Accelerator (BEA) program executed by the World Resources Institute (WRI) is one of the partner efforts of SE4ALL. The goal of BEA is to support municipalities in energy efficiency policy development and practical adaption and implementation of energy efficiency technology solutions, thus accelerating building energy efficiency.

8. ACTION 3.8

RESEARCH ON QUANG NAM – DA NANG INTERREGIONAL RIVER BASIN PLAN

Many hydro power plants have been and are being built in the upstream of Vu Gia Thu Bon river basin. Da Nang is affected by these upstream activities due to its location; in particular, hydropower plant operations have the potential to significantly exacerbate or mitigate flood, water scarcity and saline intrusion issues. Unfortunately, the operation and management of the hydropower plants is currently not coordinated or executed well. Da Nang and Quang Nam have signed an MOU to mutually support and collaborate in resource management, environmental management, and climate change response. One of the key objectives is to request the Central Government to establish a River Basin Organization (RBO) for the Vu Gia Thu Bon basin. This is a supportive action and new initiative.

ACTIONS	Conduct dialogues between Da Nang and Quang Nam to discuss policy, mechanisms, and a working model for a regional organization that executes and directs the water resource use and management in the Vu Gia Thu Bon river basin.
	Conduct research on financial mechanism to maintain the operation of the RBO.
	In first phase, conduct activities within the Global Resilience Partnership (GRP) project (led by ISET)
RESILIENCE VALUE	  
TARGET AREA	Quang Nam province and Da Nang city
LEAD	DoNRE and DARD
PLATFORM PARTNERS	ISET, International and national consultants and donors (to be identified)
LOCAL PARTNERS	CCCO, DISED and other related departments
TIME	2017-2025

9. ACTION 3.9

RESEARCH ON REGIONAL URBAN PLAN AND MANAGEMENT MECHANISM

Upstream activities can increase disaster risk in Da Nang due to its downstream location. Integrated management through bilateral cooperation mechanism between Da Nang and Quang Nam is needed for development and urban management. This is a supportive action and new initiative.

ACTIONS	Conduct survey, research on regional plan
	Develop the regional plan and management mechanism
	Conduct dialogue, and implementation
RESILIENCE VALUE	  
TARGET AREA	Upper Vu Gia Thu Bon river basin
LEAD	DOC
PLATFORM PARTNERS	ISSET, International and national consultants and donors (to be identified)
LOCAL PARTNERS	DARD, DoNRE, other related organizations
TIME	2017-2025

10. ACTION 3.10

GHG MITIGATION IN WASTE TREATMENT AND TOURISM SERVICES SECTORS

Upstream activities can increase disaster risk in Da Nang due to its downstream location. Integrated management through bilateral cooperation mechanism between Da Nang and Quang Nam is needed for development and urban management. This is a supportive action and new initiative.

ACTIONS	Prioritized proposals: 1. Transform Khanh Son landfill (old one) in to park or zoo (the landfill has been closed) 2. Solid waste classification at source 3. Solid waste treatment complex, including: recycling module, composting, energy collecting from incineration, hazardous waste classification and treatment 4. GHG inventory for manufacturing and service sector 5. Using solar energy systems for service and tourism sectors 6. Waste water collection and treatment to minimize pollution at beaches
	   
TARGET AREA(S)	Waste treatment facilities and sewage systems
LEAD	DoNRE
PLATFORM PARTNERS	ISSET, International and national consultants and donors (to be identified)
LOCAL PARTNERS	DoC, Waste water management and treatment company, URENCO
TIME	2017-2030

11. ACTION 3.11

IMPLEMENT THE “GREEN UTILITY NETWORK” IN THE WATER SUPPLY SECTOR

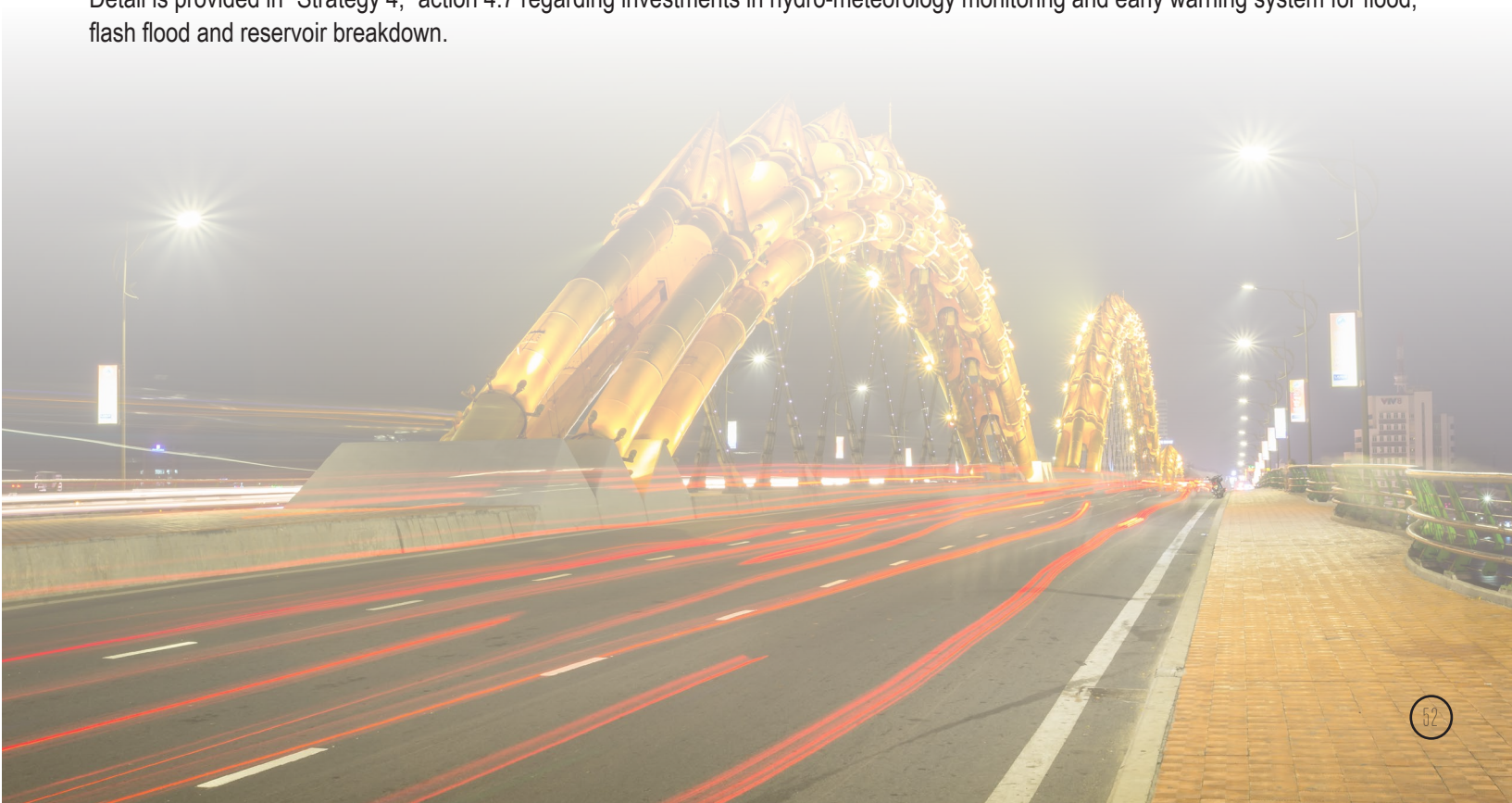
Water supply is one of the vulnerable sectors affected by climate change. Based on the report of “Water resource management project” (ACCCRN 2015), Da Nang need to strengthen the management and operation of water supply facilities, and adaptive capacity of water supply facilities to increasing climate change. Da Nang Water Supply Company (DAWACO), in collaboration with Vitens Evides International (VEI), conducts research to increase the resilience of water supply sector and reduce the GHG emission from operation. By this cooperation, DAWACO also take part in the Green Utility Network. This is a supportive action and new initiative.

ACTIONS	Conduct primary inventory to assess the energy and material efficiency
	Develop the Climate change action plan (CCAP) for water supply sector
	Share the results with international and national partners
RESILIENCE VALUE	  
TARGET AREA	Water supply system
LEAD	DAWACO
PLATFORM PARTNERS	Vitens Evides International (VEI)
LOCAL PARTNERS	Relevant city departments, CCCO
TIME	2016-2017

12. ACTION 3.12

DEVELOP MONITORING AND EARLY WARNING SYSTEMS FOR FLOOD RISK (DETAILED IN ACTION 4.7)

Detail is provided in “Strategy 4,” action 4.7 regarding investments in hydro-meteorology monitoring and early warning system for flood, flash flood and reservoir breakdown.



STRATEGY 4

A CONNECTED CITY

A city where knowledge is driven by meaningful information sharing.

STRATEGY #1 SHORT-TERM OBJECTIVE

Da Nang city proactively and inclusively enhances the use of communication systems for disaster management

STRATEGY #1 LONG-TERM OBJECTIVE

Data and resources are secured for proactive response to shocks and stresses

DETAILED OBJECTIVES

- ✓ • Strengthen data and communications infrastructure for disaster management.
- ✓ • Enhance the capacity of city officers in natural disaster early warning.
- ✓ • Engage communities around information communication for disaster management.
- ✓ • Secure the safety of communities against natural disasters

LIST OF ACTIONS:

- ACTION 4.1 Strengthen the Disaster Management Center
- ACTION 4.2 Applying crisis management system – CMS in flood management and response
- ACTION 4.3 Assessing the vulnerability of housing to storm using VCAP
- ACTION 4.4 Strengthen the database and infrastructures for disaster management
- ACTION 4.5 Improving the action plans for typhoon prevention, response, and recovery
- ACTION 4.6. Enhancing capacity for city officers in analyzing data for natural disaster forecasting and warning
- ACTION 4.7 Investing in hydro-meteorology monitoring and early warning system for flood, flash flood and reservoir breakdown
- ACTION 4.8 Applying IT in inclusively collecting and communicating disaster information
- ACTION 4.9 Developing an inclusive communication system with diverse communication channels



STRATEGY 4 A CONNECTED CITY



ACTIONS AND INITIATIVES

1. ACTION 4.1

STRENGTHEN THE DISASTER MANAGEMENT CENTER

Currently, DMC is moderately equipped and resourced for disaster management. Further investment is needed in facilities (equipment, data) and human resources that meet the demands of disaster management (database systems, warning infrastructure) in the future. This is a key action, ongoing activity and needs to be promoted.

ACTIONS	Review the policies and regulations governing the function and mandate of DMC.
	Assess current operation, human resources, capacity, and infrastructure for disaster management.
	Develop a proposal to strengthen the DMC
	Mobilize funding and support for capacity enhancement and facility investment
RESILIENCE VALUE	  
TARGET AREA	Citywide
LEAD	Office of Disaster Management and Rescue Committee
PLATFORM PARTNERS	International and national consultants and donors (to be identified)
LOCAL PARTNERS	DARD, Center for Hydro and Meteorology Forecasting in Central Vietnam
TIME	2017-2020

2. ACTION 4.2

APPLYING CRISIS MANAGEMENT SYSTEM – CMS IN FLOOD MANAGEMENT AND RESPONSE

Da Nang has recently developed guidance on disaster response, including the function and mandate of involved stakeholders. Effective communication with key decision makers is identified as a key element of efficient response. Based on this guidance, the Office of Committee for Storm and Flood Management has developed a series of flood response scenarios and for each, has assigned responsibilities to key decision makers at different levels. It is necessary to conduct drills on these scenarios. This is a supportive action and should scale-up to a pilot program.

ACTIONS	Pilot the CMS in a commune in Hoa Vang district (develop the scenario, update the tool, conduct a drill)
	Conduct workshop to assess the result and potential for replication (if successful)
	Scale up and maintain
RESILIENCE VALUE	    
TARGET AREA	Hoa Vang District
LEAD	Office of Committee for flood and storm management
PLATFORM PARTNERS	100RC, 3S, other organizations
LOCAL PARTNERS	DIC, Committee for flood and storm management at district level, CCCO
TIME	2017-2020



3. ACTION 4.3

ASSESS HOUSING STORM VULNERABILITY USING VCAP

The CSIRO Visual Climate Adaptation Platform (VCAP) can be effectively used as a tool to support the development of an integrated strategy on climate change adaptation and disaster risk reduction. Based on the piloting study conducted by CSIRO and technical team in Da Nang (see Action 1.3), VCAP can potentially be scaled up to 56 wards/communes to assess the vulnerability of residential housing against wind storms. This is a supportive action that should scale-up to a pilot program.

ACTIONS	In short term: collect the data on attributes of houses, historical damages due to storms, and consider necessary skills, resources, and governance requirements in applying VCAP to assess the vulnerability
	In long term: develop proposals for a full VCAP project in Da Nang in collaboration with the CSIRO, including: - Identify the scope of the project (sectors and areas that will be involved) - Assess the vulnerability and the potential impacts of storm to sectors or study areas - Scale up for the whole city - Develop the disaster risk reduction and adaptation action plan for Da Nang city
RESILIENCE VALUE	   
TARGET AREA	Citywide
LEAD	CCCO
PLATFORM PARTNERS	100RC, CSIRO, International and national consultants (to be identified)
LOCAL PARTNERS	Relevant departments
TIME	2017-2020

Demonstration of VCAP for storm prone area in Tho Quang commune, CSIRO, May 2016.



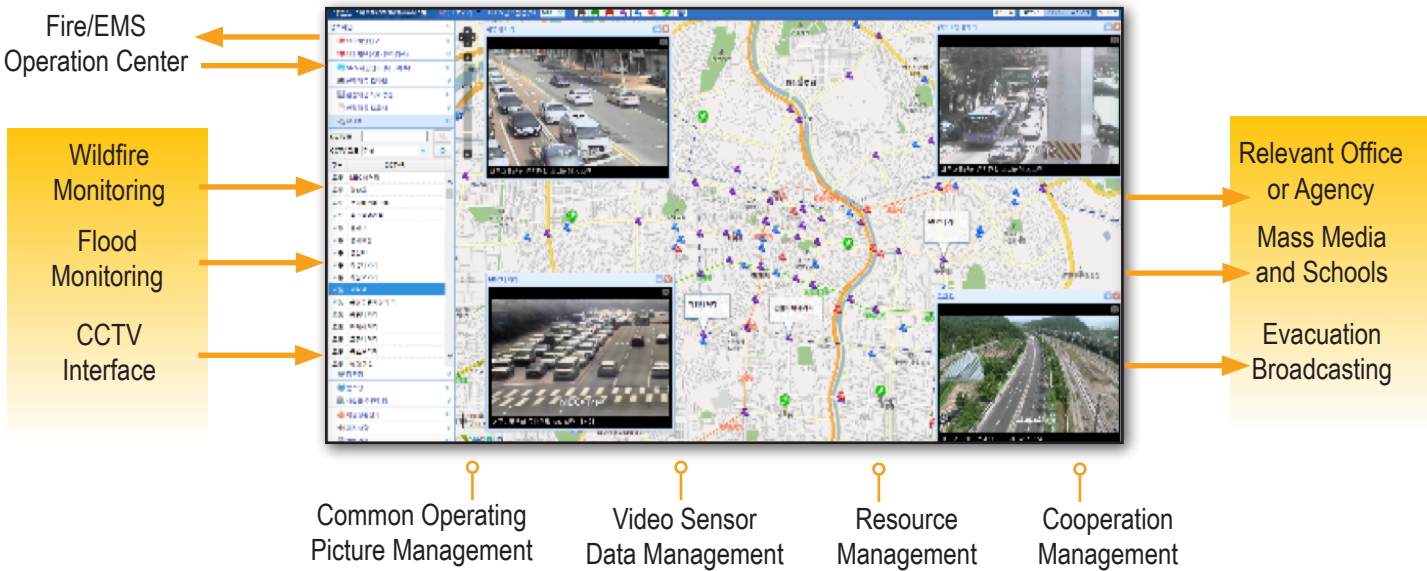
4. ACTION 4.4

STRENGTHEN DISASTER MANAGEMENT DATABASES, INFRASTRUCTURE AND INFORMATION SYSTEM SAFETY

On the infrastructure side, much of Da Nang's communication facilities are old, inconsistent, not well connected, and are ineffective for directing, commanding and connecting stakeholders. There is no contingency facility; shutdown of critical elements could result in complete system failure. Stakeholders, including community, organizations and communication companies, are not fully engaged in communicating disaster information. On the data side, a shortage of data and information reduces the quality of early warning. Data needs include: maps, sector planning, urban development planning, and social economic development, population distribution, past storm data inventories, forecasting, and fisheries development plans. Existing data has gaps, is sometimes out of date, and is scattered across multiple organizations and departments. Most of the data are available only in hard copy, significantly limiting their utility. This is key action and new initiative.

ACTIONS	Review, assess existing infrastructures for disaster response at different levels
	Develop proposal for a project to “Build the data and infrastructure for disaster management”
	Develop the proposal of Cyber security for information system of Da Nang city
	Mobilize funding and implement the project
RESILIENCE VALUE	  
TARGET AREA	Citywide
LEAD	DARD
PLATFORM PARTNERS	International and national consultants (to be identified) in collaboration with Project “Smart Safety Center” initiated by Daegu city, sponsored by Korean Government.
LOCAL PARTNERS	CCCO, Office of the Committee for Storm and flood management, DIC, municipal departments
TIME	2017-2030

Demonstration of Disaster and Crisis Response Center
“Da Nang Smart Safety Center” Project initiated by Deagu City, July 2016



5. ACTION 4.5

IMPROVE ACTION PLANS FOR TYPHOON PREPAREDNESS, RESPONSE, AND RECOVERY.

Improve action plans for typhoon preparedness, response, and recovery. This is a supportive action and the implemented activity needs to be updated.

ACTIONS	Collect existing data, develop potential scenarios, propose responding actions
	Consult with different stakeholders at different level
	Integrate response plan into the Crisis Management System (CMS) to direct the response
RESILIENCE VALUE	  
TARGET AREA	Citywide
LEAD	DARD
PLATFORM PARTNERS	3S, International and national consultants (to be identified)
LOCAL PARTNERS	Office of the Committee for Storm and flood management, DIC, Center for Hydro-Meteorology forecast in Central Vietnam
TIME	2017-2025

6. ACTION 4.6

ENHANCE CITY OFFICER CAPACITY IN NATURAL DISASTER FORECASTING AND EARLY WARNING

Enhance city officer capacity in natural disaster forecasting and early warning. This is a key action and ongoing activity that needs to be promoted.

ACTIONS	Conduct survey and assessment, and develop an action plan for city officers on forecasting and early warning
	Identify training needs and priorities
	Implement the action plan (provide long-term, short term, and theme based training)
RESILIENCE VALUE	  
TARGET AREA	Citywide
LEAD	Office of the Committee for Storm and flood management
PLATFORM PARTNERS	International and national consultants (to be identified)
	In collaboration with the project “Smart Safety Center” initiated by Daegu city, sponsored by Korean Government
LOCAL PARTNERS	Relevant municipal department, Center for Hydro-Meteorology forecast in Central Vietnam
TIME	2017-2020

7. ACTION 4.7

INVEST IN A HYDRO-METEOROLOGIC MONITORING AND EARLY WARNING SYSTEMS

Early warning systems are needed for flood, flash flood and reservoir failures. The limited number of hydrological monitoring stations on the Vu Gia – Han river system is insufficient to meet the need for water quality and flow monitoring, particularly at critical locations such as river junctions, narrowed sections, and before and after key infrastructure. Existing monitoring stations are primarily located on the Vu Gia river system – including the Yen river, Vinh Dien river, Qua Giang river, and Cau Do – Cam Le river. There is no flow monitoring station on the Tuy Loan or Cu De, two of Da Nang’s major rivers. This is a key action and is a new action which correlates to Strategy 3, Action “Planning and Urban Management.”

ACTIONS	Develop proposal and roadmap for investment of monitoring system, including: - Build an early warning system for Tra Can reservoir - Build warning systems linked to water level at Truoc Dong and Hoc Khe reservoirs - Build one hydrologic monitoring station on each of the Tuy Loan and Cu De rivers. - Develop the infrastructure needed to provide early warning for Tuy Loan and Cu De river floods and flash floods: + On Tuy Loan river: install six precipitation gauges in upstream area, install two automatic water level monitoring stations at Tuy Loan pump station and Dong Lam commune, Hoa Phu; + On Cu De river: install six precipitation gauges in upstream area, install two automatic water level monitoring stations at Cau Sap, Hoa Bac commune, and Truong Dinh bridge or Nam O Bridge. - Build river flow monitoring stations at Ai Nghia and behind the discharge point of Dak Mi 4 hydro power plant. - Build a system of monitoring stations for urban environmental quality (air, urban lakes, and wastewater).
RESILIENCE VALUE	  
TARGET AREA	Vu Gia – Han, Cu De, Tuy Loan river
LEAD	DARD, DONRE
PLATFORM PARTNERS	International and national consultants (to be identified) In collaboration with the project “Smart Safety Center” initiated by Daegu city, sponsored by Korean Government
LOCAL PARTNERS	Relevant municipal department, Center for Hydro-Meteorology forecast in Central Vietnam
TIME	2017-2025



8. ACTION 4.8

APPLY IT TO INCLUSIVELY COLLECT AND COMMUNICATE DISASTER INFORMATION

Timely, relevant disaster warning communication from ward people's committees to communities is constrained by infrastructure and resource limitations. Post-disaster feedback from communities to higher levels (ward PC to district PC, district PC and departments to city PC) is not conducted well, particularly in reporting response activities, assessing damages and recording resource needs. This is a supportive action and a new initiative.

ACTIONS	Develop mechanisms for information sharing during emergency situations
	Provide wireless communication tools for off-shore boats.
	Publish technical manuals for fisherman that provide guidance for emergency situations.
	Pilot a community-based early warning system.
	Build early warning systems for flash flood areas (Hoa Phu, Hoa Nhon, Hoa Phong, Hoa Ninh, Hoa Bac and Hoa Lien).
	Provide training for communities on early warning process
RESILIENCE VALUE	    
TARGET AREA	Citywide
LEAD	DARD
PLATFORM PARTNERS	International and national consultants (to be identified)
	Flood and Storm Management Bureau in Central region to pilot the community based flood warning model via text message
LOCAL PARTNERS	Relevant municipal department, Center for Hydro-Meteorology forecast in Central Vietnam
TIME	2017-2025

9. ACTION 4.9

DEVELOP AN INCLUSIVE COMMUNICATIONS SYSTEM WITH DIVERSE COMMUNICATIONS CHANNELS

Engagement of social stakeholders is almost absent in communicating disaster information to communities. There are no regulations or policies on the integration of disaster warning into broadcasting, so residents receive disaster warning only on the national channels. Information is not promptly transferred to all people. Social network tools such as email, SMS and Facebook are not exploited well. This is a supportive action and a new concept.

ACTIONS	Conduct a survey on different channels for communication; propose relevant channels for disaster warning.
	Conduct a survey on the digital service providers who could engage in the warning process
	Provide incentives to encourage the engagement of providers
	Generate MOUs between providers and local government to ensure provider engagement in emergency situations
	Set up different channels to share information and provide feedback on disaster warning
	Set up hotlines for emergency response, including landlines, cellphones, email
	Improve communication, including: content, frequency, tools and channels that are relevant and familiar to the community.
	Provide training to increase community awareness
RESILIENCE VALUE	    
TARGET AREA	Citywide
LEAD	Office of the Committee for Storm and flood management
PLATFORM PARTNERS	International and national consultants (to be identified)
LOCAL PARTNERS	Relevant municipal department, Center for Hydro-Meteorology forecast in Central Vietnam
TIME	2017-2025



5 - PARTNERSHIPS IN ACTION

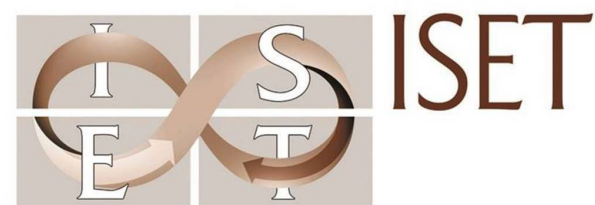
100 Resilient Cities – Pioneered by The Rockefeller Foundation (100RC) is dedicated to helping cities around the world become more resilient to the physical, social and economic challenges that are a growing part of the 21st century. Da Nang City shares this commitment and has worked with 100RC and a range of partners to help develop its Resilience Strategy and implement actions. To that end, the city would like to recognize all the important partners who continue to play a key role in actively working to create a more resilient Da Dang.

PIONEERED BY THE
ROCKEFELLER FOUNDATION

100



CITIES



WORLD
RESOURCES
INSTITUTE



TRANSFORMING
THE WAY CITIES
SOLVE PROBLEMS



WORLD BANK GROUP



6- IMPLEMENTATION AND MONITORING

IMPLEMENTATION

This strategy is the very first document in Da Nang that aims to enhance city resilience to major shocks and stresses. The strategy is integrated with existing social-economic development strategies, climate change action planning, and urban planning to address resilience in Da Nang across elements and sectors, including adaptation and recovery capacity. Based on these analyses, actions and initiatives have been identified and prioritized to increase city resilience over the short-term, mid-term, and long-term.

The platform partners who have collaborated with the city of Da Nang in this work are indicated in the strategy. Da Nang expects to maintain relationships, support, and collaboration with platform partners in the future.

In the implementation phase, beginning in 2017, this resilience strategy will serve as the basis and guidance for municipal departments to implement proposed actions and initiatives. The strategy will also support those departments in playing their part in achieving city resilience goals by clearly communicating action objectives for each resilience initiative.

The CRO office will lead the resilience process, including communicating the strategy, collaborating with relevant departments, platform partners, and 100RC, and promoting the implementation of the strategy. Specific tasks follow:

1. Closely collaborate with financial institutions, and technical consultants (WB, AFD, ADB, GRP, etc.) to mobilize resources and implement high priority resilient actions/initiatives, specifically:

- Mobilize extended funding for storm resistant housing;
- Conduct research on financial mechanism for proactive disaster response;
- Maintain, protect, and recover natural ecosystems and buffers to increase floodwater storage and drainage capacity;
- Adjust urban planning towards sustainable development;
- Invest in hydro-meteorologic monitoring systems for flood early warning and environmental quality;
- Invest in data, data management and infrastructure for disaster response at all level;
- Begin integrated management of the Vu Gia Thu Bon river basin and for inter-regional development.

2. Develop work plans for the implementation phase, collaborate with 100RC and platform partners, mobilize resources to implement four key initiatives, including:

- Efficient energy use in buildings: collaborate with WRI.
- Crisis management tool: collaborate with 3S.
- Visualize climate adaptation platform: collaborate with CSIRO.
- Insurance mechanisms for storm resistant housing: collaborate with Swiss Re.

3. Maintain and enhance the resources of the CRO Office to implement the Strategy and promote activities:

- Conduct outreach, communicate resilience concepts, and integrate resilience approach into planning and socio-economic development plans and strategies, thus enhancing the implementation of resilience initiatives.
- Implement communications and awareness-raising programs on resilience in communities.
- Conduct surveys, interviews, and assessments on resilience in different phases. Develop action plans to increase the city's resilience index and address residual challenges.
- Maintain frequent discussions with 100RC on the implementation process, and collaborate with relevant partners and 100RC to solve challenges that emerge during the implementation phase.

EXPECTED BUDGET

The budget will be mobilized from city funding and external donors (by 2020):

Expected Budget for Resilience Strategy Implementation

No.	Strategy Objective	Expense (million VND by 2020)	
		City funding	Others
1	Strategy 1	6,900	7,200
2	Strategy 2	6,800	7,620
3	Strategy 3	6,300	45,000
4	Strategy 4	5,800	25,500
5	Management in implementation phase	800	1,200
	Total	26,600	86,520

The expected budget does not include investment in buildings and infrastructure. Budgets for each action can be found in Appendix 1.

MONITORING

Monitoring will help Da Nang track the current status of city resilience, the implementation of resilient building process, and the progress toward increased resilience. Monitoring will also allow for timely adjustment to the resilience implementation process.

In order to achieve outlined objectives and enhance the implementation process, the CRO office will develop a monitoring plan, conduct periodical assessment, and report performance results annually and in 5-year increments in 2020, 2025 and 2030 to the 100RC Steering Committee and the People's Committee.

The CRO Office will also conduct surveys on the perception of resilience. This is to see the change in resilience perception in different project phases, and to identify gaps in resilience that need to be addressed in the future.



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- Page 46 Image from demonstration on water retentions along rivers to maximize drainage function; FA3 Technical team (July 2016)
- Page 57 Images from demonstration of VCAP on the storm prone area in Tho Quang ward, CSIRO, May 2016

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8 - APPENDICES

Appendix 1:
TIMEFRAME AND EXPECTED BUDGET FOR IMPLEMENTATION (BY 2020)

No.	Strategy Action Description	Timeframe							Assignment			Source (by 2020), Million VND		Resilience Value
		2016	2017	2018	2019	2020	2021-2025	2026-2030	Lead	Platform partners	Local Partners	City Budget	Others	
1	Objective 1											6,900	7,200	
1.1	Expanding loan supports for community to build/ repair housing resilient to storms													
	Mobilize funding								CCCO	100RC, ISET	DOF, WU		1,000	
	Implement the loan								DOF		Municipal departments		To be identified	
1.2	Scaling up, integrating the technical material when building storm-resistant housing													
	Review existing regulations, designation drawings and construction guidance								DOC	ISET	DOFA (ADB), CCCO, WU	200		
	Cooperating and handing over the deliverables to local units such as districts, wards/ communes								DOC	ISET	CCCO, WU, DOFA	400	400	
	Organize training courses for local units								DOC	ISET	CCCO, WU, DOFA	400	400	
1.3	Assessing the city's housing vulnerability exposed to storms (related to Strategic objective 4) – Initially applying VCAP in produce disaster adaptation plans													
	Collect data in 56 communes								Office of CSFM	100RC, CSRIO	District PC CCCO, DOC, DIC	300		
	Develop map on storm vulnerable areas								Office of CSFM	100RC, CSRIO	CSIRO, District PC CCCO, DOC, DIC	100	1000	

No.	Strategy Action Description	Timeframe							Assignment			Source (by 2020), Million VND		Resilience Value
		2016	2017	2018	2019	2020	2021-2025	2026-2030	Lead	Platform partners	Local Partners	City Budget	Others	
1.4	Research to integrate climate change mitigation into housing sector													
	Conduct assessment on current status and propose relevant solutions								CCCO	WRI, 100RC	DOC, DIT		800	
	Develop a roadmap and implement the solutions								CCCO	WRI, 100RC	DOC, DIT		Need to Identify	
1.5	Analysis on financial risk and insurance mechanism for disaster response													
	Conduct analysis and research on financial mechanism for proactive disaster response								DOF		CCCO, Municipal departments		Need to Identify	
1.6	Research and piloting the insurance mechanism for disaster resilient housing													
	Conduct research on housing insurance mechanism								CCCO	100RC, Swiss Re/ VINARE	Municipal departments		300	
	Collaborate with financial institutions for funding, Consult the people committee and relevant stakeholders								CCCO	100RC, Swiss Re/ VINARE	Municipal departments	100	300	
	Pilot the model (for 500 houses)								CCCO	100RC, Swiss Re/ VINARE	Municipal departments	600	3,000	
1.7	Promote training, propaganda, awareness raising, integrated education to improve resilience													
	Conduct training and workshop on critical skills for disaster response, Conduct training on resilience for students and workers, Develop guidance materials.								DOFA	Donors	Municipal departments	4000	Need to Identify	
1.8	Promoting donors support for community based disaster and climate change responses													
	Assess and promote supports and sponsors								DoFA	Akzo Nobel	Departments	800	Need to Identify	

No.	Strategy Action Description	Timeframe							Assignment			Source (by 2020), Million VND		Resilience Value
		2016	2017	2018	2019	2020	2021-2025	2026-2030	Lead	Platform partners	Local Partners	City Budget	Others	
2	Objective 2											6,800	7,620	
2.1	Building and operating the Online Database of labor market													
	Build online database (investigate, develop the structure of the database, consult with different stakeholders, develop manual)								DOLISA	Need to identify	IZMB, District PC	100	1,000	
	Publicize the database and update data								DOLISA	Need to identify	IZMB, District PC	100	1,000	
	Assess and improve the system								DOLISA		IZMB, District PC	200		
2.2	Conducting dialogues on the issues related to labor, payment, recruitment, and training related to labor, payment, recruitment, and training													
	Assess the implementation of labor policy at businesses								DOLISA		DISED	200		
	Organize the dialogues engaging wide range of stakeholders								DOLISA		DISED	200		
2.3	Piloting the distribution channels for organic products													
	Conduct survey and develop the proposal for Organic product distribution								DARD	Need to identify	DISED	300	500	
	Conduct pilot model: develop and sign the MOU with producer, invest in infrastructures, and organize the fair places								DARD	Need to identify	DISED	200	2,000	
	Assess the results and potential to scale up								DARD			300		
2.4	Research on “Uber model for tourism services”													
	Conduct survey and develop the pilot model								DOT	Need to identify	DISED	300	1,000	
	Mobilize funding for piloting								DOT		DISED		Need to Identify	
	Pilot the model, assess and replicate if success								DOT		DISED		Need to Identify	

No.	Strategy Action Description	Timeframe							Assignment			Source (by 2020), Million VND		Resilience Value
		2016	2017	2018	2019	2020	2021-2025	2026-2030	Lead	Platform partners	Local Partners	City Budget	Others	
2.5	Providing studying opportunity for children of workers in industrial zone													
	Implement the project of “Centre for kindergarten education and care”								DOET	Half the Sky Foundation	DOFA		Funded	
	Assess the effectiveness of the project								DOET		DOFA	100		
	Develop a roadmap for scaling-up								DOET		DOFA	200	Need to Identify	
2.6	Revitalizing the open spaces (park, foot path) at high density residential area.													
	Design the open space at Nai Hien Dong commune								CCCO	100RC, Citimart	Son Tra PC		120	
	Piloting on funding mobilizing mechanism for the open space at Nai Hien Dong commune								Son Tra PC	100RC, Citimart	CCCO		Need to Identify	
	Conduct survey on current status and demand on open spaces, including kindergarten school, parks, particularly at Cam Le and Lien Chieu District.								DOC		Municipal departments	300	1,000.00	
	Develop proposals to transform the abandoned areas into parks, footpath, and open spaces in industrial zones								DOC		Cam Le, Lien Chieu PC	300	1,000.00	
	Implement the proposals												Need to Identify	
2.7	Conducting dialogues with investors regarding the global economic integration													
	Implement the project “Central Focused Economic Zone” in Da Nang								DPI		DISED, CCCO	2,000	Need to Identify	
	Organize Economic and Investment Forums in Da Nang								DPI		DISED, CCCO	2,000	Need to Identify	

No.	Strategy Action Description	Timeframe							Assignment			Source (by 2020), Million VND		Resilience Value
		2016	2017	2018	2019	2020	2021-2025	2026-2030	Lead	Platform partners	Local Partners	City Budget	Others	
	Objective 3											6,300	45,000	
3.1	Widening the flooding corridor and developing management mechanism													
	Conduct research and design the flooding corridor and related technical solutions								DOC	Need to Identify	DARD, DONRE, IUP	500	5,000	
	Set out the corridor border at site								DOC		DARD, DONRE, IUP		Need to Identify	
	Develop the policy for management and protection								DOC	Need to Identify	DARD, DONRE, IUP	500	1,000	
3.2	Assessing the flooding risks in new urbanized areas													
	Collecting data, information on the available assessment								DOC		Municipal departments	300	5,000	
	Assess the flooding risk										Municipal departments			
3.3	Adjust the detail plans which potentially impact the drainage capacity													
	Conduct researches to adjust the design of buildings which integrate water retention function								DOC		DARD, DONRE, IUP	500	3,000	
	Implement the solutions								DOC		DARD, DONRE, IUP		Need to Identify	
3.4	Restructuring the urban form in high flood prone areas													
	Identify the degraded areas or inefficient land-used areas								DOC		Municipal departments	300	1000	
	Simulate urban development and flood to project flooding risks, design flood adaptive urban areas								DOC		Municipal departments		3,000	
	Implement the solutions								DOC		Municipal departments		Need to Identify	
3.5	Resettling residential areas which are located in flooding plain or frequently affected by flood													
	Conduct survey and research on alternatives for resettlement								DARD		Municipal departments	300	1000	
	Resettle the high risks areas								DARD		Municipal departments		Need to Identify	

No.	Strategy Action Description	Timeframe							Assignment			Source (by 2020), Million VND		Resilience Value
		2016	2017	2018	2019	2020	2021-2025	2026-2030	Lead	Platform partners	Local Partners	City Budget	Others	
3.6	Piloting the safety community against flood													
	Conduct survey and research on safety community								DARD		Municipal departments	300	500	
	Implement the solutions								DARD		Municipal departments	300	5,000	
3.7	Conducting research on Energy Efficiency in Buildings													
	implement the Energy Efficiency Accelerator sponsored by WRI: conduct survey, collect data, conduct analysis, and propose solutions								CCCO	WRI, 100RC	Municipal departments		800	
	Scale up the solutions								CCCO	WRI, 100RC	Municipal departments		Need to Identify	
3.8	Conducting research on Quang Nam – Da Nang interregional river basin plan													
	Conduct dialogues between Da Nang and Quang Nam to discuss on policy, mechanism, and working model of regional organization								DONRE	100RC, ISET	DARD, DOC	400	2,000	
	Establish the river basin organization								DONRE	100RC, ISET	DARD, DOC	400	Need to Identify	
3.9	Conducting research on regional urban plan and management mechanism													
	Conduct survey, research on regional plan								DOC	GRP (ISET)	Municipal departments	200	2,000	
	Develop the regional plan and management mechanism								DOC	GRP (ISET)	Municipal departments	200	2,000	
	Conduct dialogue, and implement the plan								DOC	GRP (ISET)	Municipal departments	100	1,000	

No.	Strategy Action Description	Timeframe							Assignment			Source (by 2020), Million VND		Resilience Value
		2016	2017	2018	2019	2020	2021-2025	2026-2030	Lead	Platform partners	Local Partners	City Budget	Others	
3.10	Conducting GHG mitigation in waste treatment and tourism services													
	Conduct survey, research on potential solutions:								DONRE	To be identified	DARD, DOC	2,000	10,000	
	1. Transform Khanh Son landfill (old one) in to park or zoo (the landfill has been closed)													
	2. Solid waste classification at source													
	3. Solid waste treatment complex, including: recycling module, composting, energy collecting from incineration, hazardous waste classification and treatment													
	4. GHG inventory for manufacturing and service sector													
	5. Using solar energy systems for service and tourism sectors													
	6. Waste water collection and treatment to minimize pollution at beaches													
	Promote investment and implementation								DONRE		DARD, DOC	Need to Identify	Need to Identify	
3.11	Implement the “Green Utility Network” in the Water Supply Sector													
	Conduct primary inventory to assess the energy and material efficiency								DAWA-CO	Vitens Evides	CCCO, Municipal departments		2,700	
	Develop the Climate change action plan (CCAP) for water supply sector										Municipal departments			
	Share the results with international and national partners													
3.12	Investing in monitoring system and early warning system (explain in objective 4)													

No.	Strategy Action Description	Timeframe							Assignment			Source (by 2020), Million VND		Resilience Value
		2016	2017	2018	2019	2020	2021-2025	2026-2030	Lead	Platform partners	Local Partners	City Budget	Others	
4	Objective 4											5,800.00	25,500	
4.1	Strengthen the Disaster Management Center													
	Review the policy, regulation on the function and mandate of DMC.								DARD		Departments	300		
	Assess the current operation, capacity, and infrastructures for disaster management													
	Mobilize funding and support on capacity enhancing and facility investment								DARD		Departments	1,000	Need to Identify	
	Piloting the crisis management system – CMS in flood management and response													
4.2	Piloting the crisis management system – CMS in flood management and response													
	Piloting the CMS in a commune in Hoa Vang district (develop the scenario, update the tool, conduct a drill)								CCCO	100RC, 3S	Office of CSFM	100	1,000	
	Scale up and maintain								Office of CSFM	100RC, 3S	CCCO	300	3,000	
4.3	Assessing the vulnerability of housing to storm using VCAP													
	Develop proposal on the VCAP project in Da Nang								CCCO	100RC, CSIRO	Office of CSFM	100	500	
	Mobilize funding								CCCO	100RC, CSIRO	Office of CSFM	100		
	Develop the full version of VCAP								CCCO	100RC, CSIRO	Office of CSFM	300	6,000	
4.4	Strengthen the database and infrastructure for disaster management													
	Review, assess the existing infrastructures for disaster response at different level								DARD, DoH, DoIC		Municipal departments	600		
	Develop proposal for “Building database and infrastructure for disaster management”								DARD		Municipal departments	500	2,000	
	Develop proposal for “Cyber security for information system in Da Nang”								DoIC		Municipal departments	500	2,000	
	Develop proposal for “Continuous operation Da Nang’s medical infrastructures”								DoH		Municipal departments	500	2,000	
	Mobilize funding and implement the project								DARD, DoH, DoIC		Municipal departments		Need to Identify	

No.	Strategy Action Description	Timeframe							Assignment			Source (by 2020), Million VND		Resilience Value
		2016	2017	2018	2019	2020	2021- 2025	2026- 2030	Lead	Platform partners	Local Partners	City Budget	Others	
4.5	Fulfilling scenarios for typhoon prevention, response, and recovery													
	Collect existing data, develop potential scenarios, propose responding actions								DARD		Municipal depart-ments	200	2,000	
	Consult with different stakeholders at different level								DARD		Municipal depart-ments	100	1,000	
	Training on the application of CMS										Municipal depart-ments			
4.6	Enhancing capacity for city officers in analyzing data for natural disaster forecasting and warning													
	Assess, conduct survey, and de-velop an action plan to enhance capacity								DARD		Municipal depart-ments	200	1,000	
	Implement the action plan								DARD		Municipal depart-ments		Need to Identify	
4.7	Investing in hydro-meteorology monitoring and early warning system for flood, flash flood and reservoir breakdown													
	Conduct research, survey, and design monitoring and early warning system on Vu Gia – Han river								DONRE, DARD		DARD, DOC	600	2,000	
	Build the monitoring and early warning system								DONRE, DARD		DARD, DOC		Need to Identify	
4.8	Applying IT in inclusive collect-ing and communicating disaster information													
	Conduct survey and develop the online communication system								Office of CSFM		Municipal depart-ments		1,000	
	Implement the system (in collaboration with “Smart Safety Center” initiated by Deagu City								Office of CSFM		Municipal depart-ments		Need to Identify	

No.	Strategy Action Description	Timeframe							Assignment			Source (by 2020), Million VND		Resilience Value
		2016	2017	2018	2019	2020	2021- 2025	2026- 2030	Lead	Platform partners	Local Partners	City Budget	Others	
4.9	Developing an inclusive communication system with diverse communication channels													
	Conduct survey on different channels for communication; propose relevant channels for disaster warning.								Office of CSFM		Municipal depart-ments	200	1,000	
	Provide incentives to encourage the engagement of providers, Set up different channels to share information, give feedback on disaster warning, Set up hotline for emergency response: landline, cellphone, email								Office of CSFM		Municipal depart-ments	200	1,000	
5	Management on implementation phase:								CCCO	100RC, WRI	Municipal depart-ments	800	1,200	
	Maintain CRO office										Municipal depart-ments			
	Conduct outreach activities on resilience													
	Conduct meeting with donors and partners to facilitate the implementation													
	Monitor implementation process and assess resilience													
	Participate other activities in the network													
Total												26,600	86,520	



Appendix 2: STRATEGY DEVELOPMENT TEAM MEMBERS

STRATEGY PARTNER

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Dr. Stephen Tyler, ISET
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FA4 WORKING GROUP

FA4 Working Group
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Appendix 3:

RESILIENCE LENS & QUALITIES

RESILIENCE LENS

The Resilience Lens is a fundamental diagnostic tool used to identify and evaluate options, helping CRO and teams to make decisions and trade-offs and ensure maximum resilience benefit. Resilience Lens guidance (to be used in conjunction with the CRF):

1. Does this proposed plan, or action, approach risks and vulnerabilities in an integrated and comprehensive way using the CRF?
2. Does this proposed plan, or action, consider impacts of multiple shocks and stresses identified through a risk and hazard assessment?
3. Have the short, medium and long-term direct and indirect benefits (and negative impacts) of the proposed action or plan been identified?
4. Does this proposed plan or action incorporate the relevant qualities of resilience?
5. Does this proposed plan, or action, aim for broadly equitable outcomes?
6. Does this proposed plan, or action, leverage the ability and capacities of a broad group of stakeholders?
7. Does this proposed plan, or action, take into consideration cross-jurisdictional implications (i.e. Intercity/regional/national)?

RESILIENCE QAULITIES

The Resilience Qualities are characteristics of resilience systems and cities, and are a key element of the 100RC City Resilience Framework. Not all Qualities are relevant to a given system or actions. However, 100RC recommends that each Focus Area Working Group uses these Qualities as they deem most appropriate, in order to advance thinking and decision-making in each Focus Area.

Reflective: Reflective systems are accepting of the inherent and ever-increasing uncertainty and change in today’s world.

Robust: Robust systems include well-conceived, constructed and managed physical assets.

Redundant: Redundancy refers to spare capacity purposely created within systems so that they can accommodate disruption.

Flexible: Flexibility implies that systems can change, evolve and adapt in response to changing circumstances

Resourceful: Resourcefulness implies that people and institutions are able to rapidly find different ways to achieve their goals or meet their needs during a shock or when under stress.

Inclusive: Inclusion emphasizes the need for broad consultation and engagement of communities, including the most vulnerable groups.

Integrated: Integration and alignment between city systems promotes consistency in decision-making and ensures that all investments are mutually supportive to a common outcome.





DA NANG