

TECHNICAL & FINANCIAL FILE

INTEGRATED WATER MANAGEMENT AND URBAN DEVELOPMENT IN RELATION TO CLIMATE CHANGE IN BINH THUAN PROVINCE

VIETNAM

DGCD CODE : 3012428
NAVISION CODE : VIE 12 043 11



THE BELGIAN
DEVELOPMENT COOPERATION **.be**

TABLE OF CONTENTS

ABBREVIATIONS	3
EXECUTIVE SUMMARY	6
ANALYTICAL RECORD OF THE INTERVENTION	8
1 SITUATION ANALYSIS	9
1.1 GENERALITY	9
1.2 BINH THUAN PROVINCE	14
2 STRATEGIC ORIENTATIONS	23
2.1 BUILDING RESILIENCE TO CLIMATE CHANGE.....	23
2.2 STRATEGIC ORIENTATIONS IN THE WATER SECTOR.....	24
2.3 STRATEGIC ORIENTATIONS IN SPATIAL PLANNING.....	26
2.4 CAPACITY DEVELOPMENT AND INSTITUTIONAL STRENGTHENING	30
2.5 COMPREHENSIVE APPROACH.....	32
3 INTERVENTION FRAMEWORK	36
3.1 GENERAL OBJECTIVE	36
3.2 SPECIFIC OBJECTIVE	36
3.3 EXPECTED RESULTS.....	36
3.4 INDICATORS AND MEANS OF VERIFICATION	56
3.5 DESCRIPTION OF BENEFICIARIES	57
3.6 RISK ANALYSIS	58
4 RESOURCES.....	65
4.1 BUDGET.....	65
4.2 HUMAN RESOURCES.....	70
4.3 MATERIAL AND EQUIPMENT	71
5 IMPLEMENTATION MODALITIES.....	72
5.1 IMPLEMENTATION AND FOLLOW-UP STRUCTURES	72
5.2 COORDINATION MECHANISMS	74
5.3 MANAGEMENT MODALITIES	78
6 CROSS CUTTING THEMES.....	90
6.1 ENVIRONMENT.....	90

6.2	GENDER.....	91
7	ANNEXES	92
7.1	LOGICAL FRAMEWORK.....	92
7.2	IMPLEMENTATION CALENDAR	97
7.3	TOR LONG-TERM PERSONNEL.....	103
7.4	TECHNICAL ISSUES	121

Abbreviations

ACHR	Asian Coalition for Housing Right
ADB	Asian Development Bank
ACVN	Association of Cities of Vietnam
AFD	Agence Française de Développement
AusAID	Australian Agency for International Development
BTC	Belgian Technical Cooperation
CAIA	Community Awareness and Infrastructure Activities
CBO	Community-Based Organization
CC	Climate Change
CD	Capacity Development
CDIA	Cities Development Initiative for Asia
CDWMS	Capacity Development of Water Management and Services Project
CEMDI	Centre for Environmental Monitoring Data and Information
CERWASS	Centre for Rural Water Supply and Sanitation
CMC	Community Management Committee
CPIA	Country Performance and Institutional Assessment
CPC	Commune People's Committee
CPRGS	Comprehensive Poverty Reduction and Growth Strategy
CV	Climate Variability
DANIDA	Danish International Development Assistance
DARD	Department of Agriculture and Rural development
DFW	Dry Weather Flow
DGDC	Directorate General of Development Cooperation
DMP	Department of Material Pricing
DoC	Department of Construction
DoF	Department of Finance
DOH	Department of Health
DPC	District People's Committee
DPI	Department of Planning and Investment
DoHA	Department of Home Affairs
DoNRE	Department of Natural Resources and Environment
DSENRE	Department of Science, Education, Natural Resource and Environment - MPI
DWRM	Department of Water Resources Management (MoNRE)
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EU	European Union
FC	Financial Cooperation
FERD	Foreign Economic Relation Department - MPI
FR	Formulation Report
GGSP	Green Growth Support Project (BTC)
GETS	Green Economy Technical Support
GENIES	Global Environment and National Information Evaluation System
GHG	Greenhouse Gas

GIS	Geographical information System
GoB	Government of Belgium
GoV	Government of Vietnam
HCMC	Ho Chi Minh City
HCS	Hanoi Core Statement
HH	Household
HQ	Headquarters
HRD	Human Resources Development
ICP	Indicative Cooperation Programme
IEC	Information, Education, Communication
IFAD	International Fund for Agricultural Development
IMHEN	Institute of Meteorology, Hydrology and Environment - MoNRE
IOCA	Institutional and organisational Capacity Assessment
IS	Institutional Strengthening
IRBM	Integrated River Basin Management
ITA	International Technical Assistant
IWRM	Integrated Water Resources Management
JBIC	Japanese Bank of International Cooperation
JICA	Japanese International Cooperation Agency
KfW	Kreditanstalt fur Wiederaufbau
LWR	Law on Water Resources
MARD	Ministry of Agriculture and Rural Development
MDG	Millennium Development Goals
M&E	Monitoring and evaluation
MP	Master Plan
MPI	Ministry of Planning and Investment
MoC	Ministry of Construction
MoF	Ministry of Finance
MoHA	Ministry of Home Affairs
MoLISA	Ministry of Labour, Invalids and Social Affairs
MoNRE	Ministry of Natural Resources and Environment
MoU	Memorandum of Understanding
MTR	Mid Term Review
NAMAs	Nationally Appropriate Mitigation Actions
NDRMP	Natural Disasters Risk Management Project - WB
NEX	National Execution
NGOs	Non Governmental Organization
NSC	National Steering Committee (TSU)
NTA	National Technical Assistant
NTP	National Target Program
NTP-RCC	National Target Program to Respond to Climate Change
NWRC	National Water Resources Council
NWRS	National Water Resources Strategy
ODA	Official Development Assistance
O&M	Operation and Maintenance
PAPI	Provincial Governance and Public Administration Performance Index

PAR	Public Administration Reform
PCERWASS	Provincial Center for Rural Water Supply and Sanitation
PCM	Project Cycle Management
PCU	Project Coordination Unit
PFM	Public Financial Management
PFS	Pre-feasibility Study
PPC	Provincial People's Committee
PPP	Public Private Partnership
PRSP	Poverty Reduction Strategy Paper
PSC	Province Steering Committee
PT	Provincial Treasury
QCC	Quality Control Committee
RR	Representation in Hanoi
SAV	State Audit of Vietnam
SA	Specific Agreement
SSP	Structural Strategic planning
SEDP	Socio-Economic Development Plan
SEDS	Socio-Economic Development Strategy
TFF	Technical and Financial File
TICA	Technical Institutional and Capacity Assessment
TOR	Terms of Reference
TSU	Technical Support Unit
UNDP	United Nations Development Program
USSAP	Unified Sanitation Strategy and Action Plan
URENCO	Urban Environment Companies
VDG	Vietnamese Development Goals
VIAP	Vietnam Institute for Architecture and Urban-Rural Planning - MoC
VND	Vietnamese Dong
VUDA	Vietnam Urban Development Agency - MoC
VUF	Vietnam Urban Forum - MoC
WB	World Bank
WR	Water Resources
WR-CCDB	Water Resource and Climate Change Data base
WRDB	Water Resources Data Base
WRIS	Water Resources Information System
WSS	Water and Sanitation Sector
WSC	Water Supply Company
WSP	Water and Sanitation Program (World Bank)
WU	Women's Union
WW	Wastewater

Executive summary

Two overarching phenomena progressively influence Asia's development trajectory in the 21st century; climate change (CC) and rapid urbanisation.

Anthropogenic climate change has become a global reality and is now being regarded as one of the world's top challenges: its impact is being felt in all countries, though with different impacts and on different scales. Evidence has shown that physical infrastructure and settlements, especially those in the coastal areas, are highly vulnerable to the effects of CC, e.g. sea-level rise, increased air and sea surface temperature, increased storm intensity, and changes in rainfall and runoff¹. The growing number of extreme weather events (climate variability ~ CV) and the dramatic impact on the fragile urban infrastructure and on settlements in risk-prone areas such as the coastal cities and towns is placing an increasing pressure for better spatial planning practices and enforcement of building codes in Vietnam².

The pressure from increasing human population, and lack of adequate supporting livelihoods has triggered increased migration from rural areas. This, plus economic growth, has led to rapid urbanisation. A large number of cities and towns have been expanded without proper planning which triggers difficulty for many developing countries, including Vietnam, in managing the urban development and climate impacts and the derived social and environmental issues and developing the appropriate urban policies and management tools.

Building more climate- and disaster-resilient settlements and communities in an urban development context will require a wide range of adaptive measures in relation to urban planning, e.g. increasing the urban permeability and respecting space for water, rural and urban reforestation, ways of designing to reduce greenhouse gas emissions (GHG) including green infrastructure, smart solutions for water sensitive design and energy efficiency, preventing heat islands, sustainable urban transport and reduction of non-renewable energy sources, establishing operational early warning systems and evacuation plans, etc.

The impacts of CC affect various groups in society, e.g. women and men, identify different measures in response to climate change. Since women's voices are too often neglected in decision-making on natural resources and disaster management, attention to women's involvement is crucial. Other vulnerable groups in society will also require special attention.

In addition, different adaptation strategies are required for different settlement and housing typologies since spatial planning concepts are dependent on the specific urban context. These issues however have not received adequate attention from both national and local levels in Vietnam.

Deficits in capacity, lack of inter-agency coordination at the local level, and the lack of involvement of the local actors and communities, are other factors that make the planning approaches in Vietnam unable to respond effectively to the CC challenge. This suggests an urgent need to strengthen institutional capabilities and enhance the leadership and management to ensure that an integrated urban planning approach is employed in response to the dynamics of climate variability and change. It also suggests that the institutions and their human capital must have the knowledge on CV and CC, are able to make effective and appropriate decisions, and are able to manage natural disaster risks. Better planned cities and townships, through collective action, will facilitate the transition to more sustainable and resilient urban communities in the future. In doing so, planning will have to balance short, medium and long term actions.

¹ WB, (2011) *Climate resilient in Vietnam: Strategic direction for the World Bank*, January

² Boateng, I (2009) *Spatial planning and climate change adaptation in Coastal regions: the case of Vietnam*, October

Binh Thuan province, located 200km North of Ho Chi Minh City is also affected by CC, with change of rainfall pattern, more regular and extremes flooding and drought conditions, increased desertification process, in particular in Bac Binh district. Annual floods are occurring regularly along the Luy river in the rainy season, while a desert expansion process is taking place for many years along the coastal line in the central part of the province.

In the framework of bilateral cooperation, Belgium decided to support the local authorities to address these issues. With a Belgian contribution of 5,2 million EUR and a six-year duration, the aim of this support is to complement the CC strategy and action plan developed by the local authorities of Binh Thuan province, by linking existing and future insights into the water system and the climate variability on the one hand, with the urban strategic planning on the other hand, thereby increasing the resilience of the various settlements in the province to meet the CC. Particular attention in the project will go to linking results of well-focussed research and selective data collection on water and climate variability, to action-oriented results and lessons learned from strategic pilot projects.

On the one hand, the focus will be on in-depth studies based on the collection and analysis of occurred CC data, including the hydraulic study and modelling of a river basin focussing on operational impact, considering that integrated water resource management is crucial for a comprehensive understanding of the CC impacts on any specific region. The climate variability data will supplement the understanding of the CC impacts. The intervention will focus on the Luy river basin, as demonstration.

On the other hand, and based on the preliminary results of these studies, the regional spatial plan of the Luy river basin and the Master Plans (MP) of Luong Son, Cho Lau and Phan Ri Cua towns will be reviewed, following strategic structural planning approach and sustainable urban development principle. A priority action plan with strategic projects for the Luy river basin and the 3 target towns will then be developed, with short-term to long-term proposed interventions, integrating objective criteria for selection. It will be submitted to both GoV and the donors' community for complementary funding. In order to explore appropriate adaptation measures in the water sector in urban area, the project will support a strategic pilot investment related to flooding and/or desert expansion control related to one of the 3 target towns.

This project, presents also an important capacity building component as well as specific activities aiming at informing and supporting the local communities and the private sector to adapt their behaviour and their housing conditions to CC.

The intervention "Integrated water management and urban development in relation to climate change in Binh Thuan province" is part of a larger CC program covering, not only Binh Thuan province but also Ninh Thuan and Ha Tinh provinces, both having similar results and activities. The program will therefore be supported by a Technical Support Unit (TSU), based at MPI in Hanoi that will ensure the overall coordination of the CC program, while providing technical assistance to the 3 provinces.

Analytical record of the intervention

Intervention Number	3012428	
Navision Code BTC	VIE 12 043 11	
Partner Institution	People Committee of Binh Thuan Province	
Length of the intervention	6 years + 1 year for SA	<u>Set up phase:</u> 9 months <u>Implementation phase:</u> 57 months, including 24 months for the CC study phase <u>Evaluation and closure phase:</u> 6 months
Date of the intervention	January 2013	
Contribution of the Partner Country	800,000 EUR	
Belgian Contribution	5,200,000 EUR	
Sector (CAD codes)	41010	
Brief description of the intervention	To develop appropriate operational CC modelling and strategy of Luy river basin in order to adapt the development of Luong Son, Cho Lau and Phan Ri Cua towns to the CC challenges, while reviewing their MP following strategic structural and sustainable planning approaches, including a strategic pilot project for experimentation of appropriate adaptation measures with regard to desert expansion and/or water based problem, such as flooding.	
Global Objective	To contribute to the sustainable development of Binh Thuan province	
Specific Objective	To support the institutional capacity in Binh Thuan Province in integrated water resources management and urban development in relation to Climate Change	
Results	<p>R1. The capacity of the authorities of the province and Binh Thuan in terms of Climate Change, Integrated Water Resources Management and urban planning are improved with appropriate monitoring and evaluation mechanisms in place.</p> <p>R2. A comprehensive strategy on CC is in place. It is based on various studies, including CC data and hydraulic modelling focused on operational impact on settlements of Luy river catchment and the revision of the existing master plans of Luong Son, Cho Lau and Phan Ri Cua towns, while key priorities of the CC action plan of the Luy river basin are defined.</p> <p>R3. Priority strategic pilot activities are developed for lessons learned targeting one of the 3 target towns to increase resilience to CC, with appropriate operational and maintenance modalities.</p> <p>R4. The provincial CC strategy is supported by the active involvement of the communities and the private sector.</p>	

1 SITUATION ANALYSIS

1.1 Generality

1.1.1 The Indicative Cooperation Programme

The project related to climate change (CC) in Binh Thuan province is part of a larger Programme covering the three provinces of Ninh Thuan, Binh Thuan and Ha Tinh and the related Technical Support Unit (TSU) described in the Indicative Cooperation Programme (ICP) 2011-2015 between Belgium and Vietnam signed on the 21st June 2011. These activities are referring to the focal sector 1 *"Support for water and sanitation management in the framework of urbanisation and climate change"* aiming at strengthening *"the capacity of the Government of Vietnam (GoV) to ensure that threats of rapid urbanisation and climate change are properly mitigated through a multidisciplinary approach in water and sanitation"*.

Four identification sheets were approved at the same time. The Joint Commission noted that the first three identified projects, related to CC, in the three provinces were of the same nature and therefore should be formulated under a single Programme allowing a more effective use of resources and technical assistance. With such a move from small projects towards a large and multi-disciplinary programme, the 4th identification file, related to the TSU providing the technical assistance, should be formulated in parallel.

The present document is related to the intervention in Binh Thuan province.

1.1.2 Climate Change: A major issue for Vietnam

According to the World Bank predictions on sea level rise, Vietnam ranks first among the 84 coastal developing countries in terms of impact of CC on population, gross domestic product, urban sprawl and wetland areas³. The official Vietnamese sea level rise predictions are higher than the worst-case scenario of the International Panel on Climate Change (IPCC). The Ministry of National Resources and Environment (MoNRE) estimates that sea level along the Vietnamese coast would rise on average with 75 cm by 2100, affecting many coastal and delta urban areas, such as Ho Chi Minh City. It will subject 17 million people to flooding with substantial impacts penetrating inland beyond the coastal zone with worsening saline intrusion, including the three provinces targeted by the Belgian-Vietnamese Programme.

With a temperature increase in the range of 1.5 C° by 2050 and 2.5C° by 2100, changes in rainfall patterns will be complex with an increase largest in the north and least in the southern plains. It is expected that rainfall will be concentrated more than now both in timescale and geography.

Together with the socio-economic development and population growth, water demand will increase and will have a strong influence on natural water sources. In the future, water shortages will lead to an imbalance and water scarcity in the dry season and more flooding during the rainy season.

1.1.3 Climate change: water management

In general, the effects of CC on water resource in Vietnam can be anticipated as follows:

- Changes to temporal and spatial distribution of rainfall that could lead to flow increases or decreases in some regions;
- Frequency of flooding and the severity of drought resulting from an increase or decrease of the

³ WB, (2011) *Climate resilient in Vietnam: Strategic direction for the World Bank*, January

total rainfall;

- Water quality in areas where shallow flow cannot dilute the contaminants arising from natural and human sources;
- Impact on river stream flow volumes and temporal and spatial distribution;
- Increase of annual levels of potential evapo-transpiration by 7-10% for 2040-2059 and 12-16% for 2080-2099 over present levels (B2 scenario);
- Significant changes in the groundwater tables and recharge, related to alteration on surface water runoff and human extractions ;
- Alterations of Water Temperature (surface- and groundwater), which has a significant impact on the aquatic biotopes and physical-chemical processes (e.g. pH, CO₂ solubility,...) and may causes the extinction of aquatic life forms).

Therefore, Vietnam is at high risk of extreme weather events from flooding, sea level increase with coastal erosion and increased saline intrusion. These will have a considerable impact on agriculture, fishery, water supply, sewerage and drainage and on the local environment. Considering these risks, and given the fact that women are also primarily responsible for household water collection, which is especially arduous during natural disasters such as floods, proper water management for all purposes and for both rural and urban areas will become of prime importance, not only for agricultural production, but also for industrial and domestic use, environmental preservation, flood control, and the living conditions in cities as well as in rural communities, especially of the poor.

Binh Thuan is one of the coastal provinces in the central part of Vietnam which has experienced severe weather during past decades with a number of extreme weather-related disasters including tropical storms, dry hot, droughts, heavy rain causing flood and flash floods. The more frequent climate hazards will consequently give rise to adverse impacts on almost all sectors such as water resources, agriculture productivity, fishery, forestry, and industrial development including civil works in terms of design and construction.

The province is also facing desert expansion and strong coastal erosion. The decrease in river flow is likely to cause saline intrusion in some areas and exacerbate it in others which are likely to result in increased scarcity of freshwater source and deteriorating water quality in many coastal districts. Heavy rains associated with increased temperature are likely to accelerate landslide and decrease the capacity of lakes compared with normal climate conditions.

1.1.4 Climate Change: urbanization and Poverty

During the past decades, Vietnamese cities have been subject to radical socio-economic and physical changes. Since the launch of the economic reforms in the late 1980s, land use rights have been modified and a proper housing market has been developed. Policy reforms have halted the state-support of housing, while foreign direct investment has mainly targeted urban agglomerations, contributing to the increase of living standards in cities without a reciprocal effect in the rural areas. The result has been a massive rural to urban migration. As a consequence, Vietnam will shift from being a predominantly rural society to be an urban-based economy by 2050, with an urban population expected to increase from about 27% in 2003 to 45% by 2020.

This rapid expansion is not always controlled despite the existence of rigid planning procedures and zoning master plans. In peripheral areas, highly fragmented and apparently random clusters of industry, office, hotel, shopping and residential typologies are developing amongst once productive agricultural landscapes and low-cost housing areas without interconnection. In city centres, other phenomena are taking shape, such as increased traffic congestion, filling of water bodies or marshlands for

infrastructure or real-estate developments, dwelling on low-lying land or riverbanks, pollution of water bodies, dilapidation of historic centres and social gentrification translated through the erection of pockets of slums within and around the existing urban landscape.

The rapid urbanisation process in Vietnam is presenting enormous challenges for water resource management and water supply. The urban areas, which have space needs, water needs and a huge amount of wastewater, are placing increasing pressure on the water system. Not only the urban areas but also the adjacent rural areas feel these impacts. This problem has increasingly become more serious in the urban areas, which are highly vulnerable to the impacts of CC and natural disasters.

According to the UN Population Division⁴, CC will have a significant impact on the future development of Asia's cities. The region's rapid urban growth is closely linked to the increase in GHG emissions that is considered to be the major driver for global warming and climate change. During the next two decades, Asian cities are likely to account for more than 50% of the rise in GHG emissions, increasing to 76% of the world's GHG emissions by 2030. Cities not only produce a large share of global GHG emissions, they also severely experience the adverse effects of climate change. Negative consequences include, among others, flooding, landslides, increasing inner temperatures and rising sea levels.

In Vietnam, these impacts are affecting mainly urban areas located on the coastline that are more exposed to storms and typhoons, sea level rise and associated flooding. In these cities the low-income people are affected in the first place, especially women, children, female-headed households, and the elderly. These groups tend to be most at risk from poverty and have the most tenuous livelihoods, while living primarily in informal or poor quality settlements.

Although poverty rates have been significantly reduced in Vietnam, it remains an issue, especially in minority ethnic groups and in some urban areas. Poverty is measured in a variety of ways, depending upon the agency involved. The Ministry of Labour, Invalidity and Social Affairs (MoLISA) uses a household (HH) per capita income. The lack of financial means, the instability of the jobs and the difficult access to cheap loans, explains the lack of provision of the basic needs and the difficult living conditions. But poverty is also proxy for social exclusion, segregation and vulnerability. Poverty is therefore a multidimensional, context-specific and dynamic process difficult to address.

Houses in low-income areas are generally precarious, with substandard or non-existent infrastructure, often located in flood plains or low coastal elevation zones where the risks from the impacts of CC are the greatest. The consequences of changes in climate patterns that exacerbate the vulnerability of the urban poor include:

- Increased flooding risks due to living predominantly in lowland areas with minimum or no basic infrastructure, such as drainage;
- Higher exposure to the consequences of natural disasters due to poor housing quality;
- Increased health hazards due to poor living environment;
- Income source – such as urban agriculture, fishery or informal production and selling – more susceptible to natural disasters (heavy rains, drought, higher temperatures, disease vectors, saline intrusion etc).

The urban poor have less capacity to adapt their environment, house and income generation source to address these risks, being poorly informed about these challenges, and lacking the necessary financial and technical capacities to tackle these issues. Considering the higher education levels for men,

⁴ United Nations (2010) *Climate Change Fact Sheet: Greenhouse Gas Emissions Inventories, projections, and options for mitigation in Viet Nam*, Hanoi

women and female headed households have less access to livelihood assets enabling them to cope with major shocks such as floods and storms, and less influence in decision-making in disaster risk management.

1.1.5 Climate change: Tools

1.1.5.1 Data management

In general it can be stated that Vietnam has substantially increased its Environmental awareness and developed legislative tools to confront environmental challenges. However, the adaptation to specific CC issues in towns and cities needs to be further developed.

The impacts of climate change are already visible for Vietnam, affecting the water sources⁵, but also the infrastructures (drainages, sewages, e.g.). These impacts require adapting their design to the new situation. To calculate measure and predict the direct and indirect impacts of CC, a good data base line is crucial.

The “data landscape” in Vietnam, related to all environmental information, is dispersed and the access to the data difficult and expensive, while the information provided not always reliable.

On water resources data exchange exists a “cost norm to exchange information on water resources”⁶, issued by the Ministry of Finance (MoF), which all government institutions use as a legal tool to apply costs on interchange, update or digitize WR data (e.g. wells, maps, collect data from data logger, etc). However it remains sometime difficult to get access to the required information.

The main agencies related to IWRM and CC data are:

- Centre of WR Management Planning and Investigation (CWRPI/CWRMF); data for GW, owner of national network on groundwater quantity and quality, with 3 divisions (South, Centre and North)
- Vietnam Environmental Administration (VEA); data on environmental information, including the Centre for Environmental Monitoring (CEM), 16 databases including water, soil, temp, air, fauna, flora
- Institute of Hydro-Meteorology and Environment (IHMEN), owner of the national network for Hydro-Meteorology Information Centre of IHEM
- General Department of Seas and island Administration of Vietnam (VASI), has data for ocean and wetlands
- Department of Geology and Minerals of Vietnam (DGMV), has geological maps
- Department of Hydro-Meteorology and Climate Change (DHMCC)
- Mekong Delta Committee (VNMCS)
- Publishing House of Natural Resources, Environment and Cartography, provides maps

⁵ WB, (2011) *Climate resilient in Vietnam: Strategic direction for the World Bank*, January

⁶ Decree No. 162/2003/ND-CP dated 19 December 2003 promulgating the Regulation for collection, management, exploitation and use of data related to natural resources and environment;

Decree No. 102/2008/ND-CP dated 19 September 2008 regarding collection, management, exploitation and use of data related to natural resources and environment.

The WR monitoring data in Vietnam are divided in “national” networks and “provincial” networks. Many data are collected and stored only on provincial level and maybe reported to central institutions, which cause a data redundancy. The main important agencies on provincial level, which collect data for water resources and environment are: DARD (on irrigation, hydropower, reservoirs), DoNRE (with Department on Monitoring and Water Resources), DOC (land use and water & sanitation), DOH (water quality data), PPC, irrigation companies, drilling Companies, provincial divisions of CWRPI.

Available data are generally costly, although many constraints could be listed: there is no data template available, no standards on data monitoring, digital database are rare, syntax and symbols are not consistent, there are no unification of ANSI codes...

1.1.5.2 The planning process

The unplanned development of many Vietnamese cities contrasts with the traditional centralised and controlled urban planning that is still typical in Vietnam, where master planning is well established. Master plans are produced and regularly updated. Unfortunately, they are rarely based on accurate data and not properly budgeted, and do not consider sustainable development and the CC dimension.

Another source of concern is the missing link between the various plans (spatial, socio-economic, water resource, agricultural etc) of a particular city and the required investments. There is rarely a defined and detailed action plan available with prioritised budgets allocated.

Since the 1990s, several official development supported urban projects and studies were conducted to overcome these issues. The earlier ones questioned the conventional master plan principles as being the most appropriate tool for dealing with the rapid evolution of the Vietnamese society and the authority's will to leave the private sector to take the lead in urban development. Alternative models were developed in order to demonstrate advantages of moving away from the inherited “command” approach. The proposals were less rigid, including participatory planning methods. They addressed details only in the more foreseeable short-term, dealt with variables and uncertainties, integrated socio-economic and physical plans, and took into account market forces in an increasingly mixed economy, while at the same time were based on realistic, identifiable investment resources.

The labels of the different initiatives were sometime confusing, some being called “Integrated Strategic Plans”, “City Development Strategies”, or “City Action Plans”, but all were largely influenced by strategic structural planning principles. The paradox between the country's relative openness for experimentation and the necessity of working within the strict rigid planning procedures was a consistent hurdle in many of these projects, the approach, mainly in terms of dialogue and decision-making processes, being in contradiction with Vietnam's existing legal framework⁷.

More recent interventions promote more flexible and participatory techniques to guide city development, and are developing instruments allowing city authorities to either face CCs risks and/or prioritise their investments according to various criteria, such as cost-benefit analysis and/or environmental and socio-economic impacts assessments. Unfortunately, there is no real comprehensive evaluation of the outcomes of these various initiatives that would allow national authorities to clearly define comprehensive planning method adapted to the specificities of Vietnam.

⁷ Standley, T., (2006) *Urban Planning Options and Lessons: Participatory, Integrated and Action-orientated Approaches*, National Symposium, Housing the Poor, in Urban Economies, Dili, Timor Leste, 24-25 April

1.2 Binh Thuan Province

1.1.1 Description

1.2.1.1 Generality



Fig 1: Location of Binh Thuan Province

Binh Thuan is a coastal province with a total area of 7,971 km² and about 200 km of coastline, located in the southern part of Central Vietnam. It shares its border with Ninh Thuan Province to the northeast, Lam Dong Province to the north, Dong Nai Province to the west, Ba Ria - Vung Tau Province to the southwest, East Sea to the east and southeast. Binh Thuan has three types of topography: mountainous, plain and coastal.

The total population is of 1,169,500 inhabitants (2010). Apart from the majority Kinh, there are several ethnic minorities, the larger being the Champa, located in the coastal region. Co Ho and Ra Glai mainly inhabit the mountainous areas along the border to Lam Dong province.

Binh Tuy, Binh Thuan and Ninh Thuan provinces were merged in 1976 to form Thuan Hai province. It was divided again into Ninh Thuan and Binh Thuan in 1991, Binh Tuy remaining part of Binh Thuan. Today, the province is divided into eight districts in which Tuy Phong, Ham Thuan Bac and Bac Binh are considered to be the poorest.

The province economy still largely depends on agriculture. However, other sectors are growing rapidly. The province is a major tourist spot in the south of Vietnam thanks to the Mui Ne beaches, while industries, such as garment or seafood processing, are expanding. The economy has been the fastest growing in the South Central part, with an average yearly growth of almost 14% from 2000 to 2007. During this period agriculture, forestry and fishing had an average growth of 7.4%, industry 21.6% and services 15.4%. In 2002, GDP per capita was 298 USD.

The towns' highest poverty rates of 31-38% are found in the fishing villages, which are characterised by high population densities, low quality houses separated by narrow alleys located on sandy areas adjoining the beach. The poor households have per capita incomes lower than 150,000 VND per month.

1.2.1.2 Ecologic conditions

Before 1975, much of the province was covered by pristine, lowland and dense dry forest. Since then this forest has disappeared, due to several reasons such as deforestation – that was made to make room for rice fields that never became productive – desertification, soil erosion, degradation and exhaustion, drought and water pollution caused by unplanned development.



Fig 2: Desertification area, IFS-Vietnam project, 2010 from data from MONRE

The White Sand dunes, or Bao Trang, are now part of the tourist attraction of the province, with 1,233km² (15% of province area) of white, red and gold sand dunes. But the dunes expansion is causing a major threat to the neighbouring agriculture activities.

1.2.1.3 Water resource management

The river network of the province originates from the Truong Son mountain range west, with 11 rivers. Most of their flow is from northwest to southeast, draining into the East Sea. The watersheds of most of the rivers are narrow, with some gradient.

Water resources of Binh Thuan depend mainly on surface water of its river network. However, irrigation for regulation and exploitation of the surface water is limited. There are several water resource works, but few of them are of sufficiently large scale or effective in exploitation.

The available groundwater is limited and subject to salt-intrusion. Its exploitation is concentrated around the La Nga river.

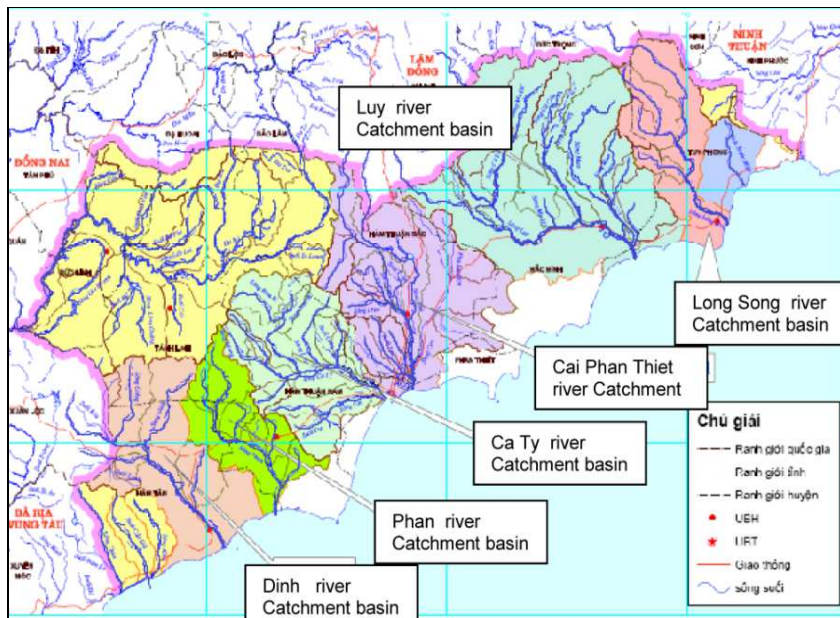


Fig 3: River basins of Binh Thuan Province

The tidal regime causes saline intrusion of the coastal areas and estuaries, though is relatively stable so that the vessels are able to access and exit the estuary and seaport. Flow regime has been causing serious, riverbank and coastal erosion in some parts of Bac Binh, Tuy Phong and Ham Thuan Bac districts in recent years.

1.2.1.4 The Luy river basin

Luy river basin is covering a surface of 1,952.7km² out of which 1,523.4km² within Binh Thuan

In many sites, poor choices of crop types unsuitable for the soil and the environmental conditions failed and increased the desertification process. Most of the Northern section of the coast of Binh Thuan province now comprises a desert-like environment.

province, the remaining being located in Lam Dong province; the total length of Luy river is 98 km, mainly located in Bac Binh district, except for the river mouth that is located in Tuy Phong district next to Phan Ri Cua town. The central section of the river is running along the Northeast part of the White Sand Dunes area.

The river flow is uneven. During the rainy season, flooding occurs regularly, causing banks erosion, while in the dry season the water flow is scarce, making access to water for domestic and agriculture purposes difficult. For these reasons the Cà Giây reservoir with volume of 37 million m³ was built at the elevation of 75 meter above sea level. Unfortunately it was not successful in limiting flooding.

The river water flow is also influenced by the 1.2 billion KWh/year Dai Ninh hydropower station located in Lam Dong province upstream of Luy river that has been put into operation in 2008. Its collects water from Dai Nhim and Da Queyon rivers with the capacity of 320 million m³ at elevation of 640 meter above sea level.

1.2.1.5 Urban development

With a population of around 170,000, Phan Thiet city is the provincial capital, the political-economic-cultural centre of the province, 200 km from Ho Chi Minh city.

As in other provinces in Vietnam, Binh Thuan province reflects a rapid urbanisation process, especially in recent years. The level of urbanisation in the province is higher than the national average with a rate of 39,73%. It is anticipated that this should increase to 55% by 2020. The rapid population growth is a major problem that places considerable pressure on the development of Binh Thuan province, especially in and around the provincial capital and along the major road infrastructures.

In Binh Thuan, there are three national highways: National Highway 1A (NH1A) that was upgraded/enlarged in early 2000, the National Highway 55 to Ba Ria - Vung Tau and the National Highway 28, to Di Linh - Lam Dong upgraded by 2001. NH1A attracts most of the urban development, as it is the major economic axis of the country.

Although the situation in Phan Thiet remains critical in some areas in terms of flooding ((especially along the Ca Ty river) and limited access to urban facilities in some low-income areas, the authorities decided to focus the intervention in Bac Binh district mainly.

The population of Bac Binh district was of 112,818 inhabitants in 2010. The urbanization process in this rural district takes place mainly in a section where the Luy river is running along the NH1A in 3 urban centres: Luong Son, Cho Lau and Pham Ri Cua towns, located around 7 to 12km from each other's. A kind of linear urban development is taking shape between the 3 towns.

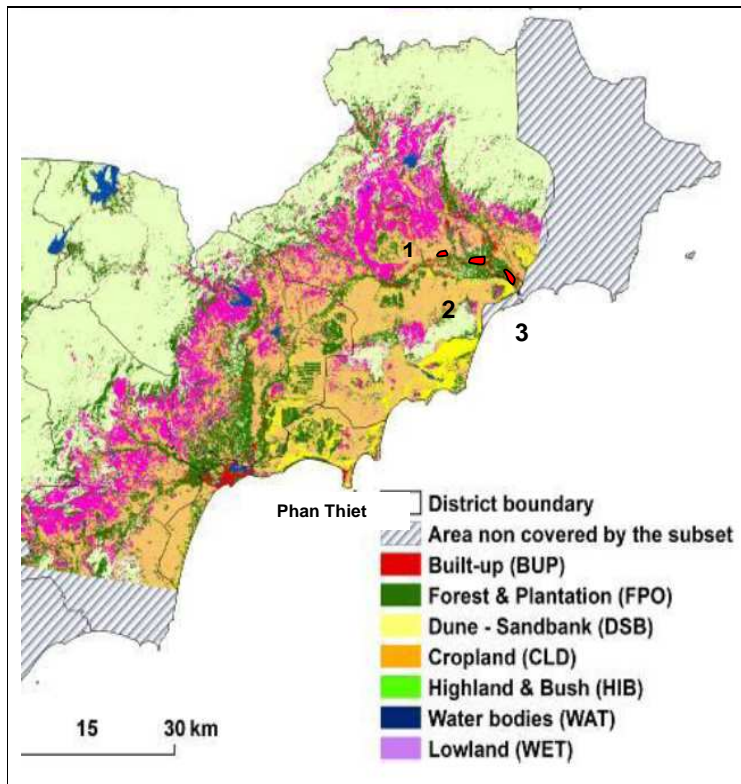


Fig 4: Land use in 2002 and localisation of the 3 towns, VITO, 2011

Luong Son and Cho Lau towns

In both Luong Son and Cho Lau towns the power supply is reliable; Pipe water supply services are provided in both towns, but there are very limited drainage facilities and no sewer system for wastewater collection and treatment. In term of accessibility both towns are well connected with the National Highway 1A, the national railway crossing the towns, the inter-provincial road to Lam Dong province and the direct connection to Mui Ne.

Both towns are located on the banks of Luy river and are suffering from river overflow with floods up to 1 meter high for several hours, causing erosion of river banks, blocking traffic, flashing out railway, households and agricultural products. Floods is getting worse, when the Dai Ninh hydro power station releases water to protect its dam.

Phan Ri Cua town

Phan Ri Cua town is located in Tuy Phong District. The town functions as the economic centre for its surrounding rural areas. It provides most of the non-agricultural employment in the district. Fishing is the main industry. Phan Ri Cua experiences a poverty level of 16.2%. Only 37% of households have access to piped water, 40% have septic tanks and solid waste is collected from about 19% of the households.

The town suffers severe water shortages during the prolonged (8-9 month) dry season. Households that do not have piped connections, purchase piped water from households that have direct connections, use individual wells, or purchase water from vendors who deliver the water in trucks or cars. The quality of well water is often poor, affected by saline intrusion during the dry season and subject to pollution from human activities.

Neither of the 3 towns has wastewater treatment, other than septic tanks at the household level. In the

1. Luong Son town had 15,340 inhabitants in 2010 with 3,400 households (HH). The foreseen population in 2020 is 18,500 people. It is the service and small business area serving the surrounding rural zone. It should become the service area for a future mining (titan) and industrial area.

2. Cho Lau town had 17,200 inhabitants in 2010 with 3,800 HH, while its foreseen population in 2020 is of 18,000 people. It offers services and commerce for the surrounding rural areas.

3. Phan Ri Cua town had 36,900 inhabitants in 2010 with 8,200 HH. The foreseen population in 2020 is of 65,000 people. It presents services, commerce, and a fishing sea port.

poor beachside areas, septic tank coverage is very low (<10% coverage), and residents from the fishing villages practice open defecation on the beaches, posing a major health hazard.

1.2.2 Climate change in Binh Thuan province

1.2.2.1 Present and future climate

The province is characterised by a monsoon climate, with high temperature and strong winds. The average temperature is 27° C with a relative humidity of 79% and a total of 2,459 sunny hours. The dry season occurs from November to April while the rainy season takes place from May to October.

Binh Thuan province is facing low and uneven rainfall with excess of water during the rainy season and severe drought during the dry season. With an average rainfall of around 800-1600 mm/year, the province can be divided in three parts: The Northeast part is the driest, with an annual rainfall varying from 600mm along the coast to 1200mm, the central part varying from 1200 to 2000mm, and the Southwest part, from 2000 to 2600mm, this maximum being found in the mountainous region. The area of Hong Phong near the white Sand Dunes is the driest area in South-east Asia, with an annual rainfall ranging less than 500 mm/year. With no ground cover, intense heat and sand soils, surface water evaporates quickly.

Drought is a common phenomenon in Binh Thuan, but the situation has been getting worse during the past 10 years. Around 43.26% of the province area is arid or semi-arid. High temperatures and strong winds are the factors contributing to the desertification process.

Despite the absence of scientific analysis, the effects of CC in the province are already observable, at least on five interrelated aspects; uneven level of rainfall, flooding, sea erosion, saline intrusion, and desertification, with strong side effects on the urban areas.

Extreme weather conditions have the tendency to increase due to CC: heavy rains occur during a shortened period leading to increased flooding – as in Ham Thuan Bac district, but also increasing drought during the dry seasons, especially in Bac Binh and Tuy Phong districts. The recurrent droughts are contributing to the desertification process observed for many years along the coastal line of both districts. Both flooding and drought are seriously affecting the population, especially the farmers.

During the rainy season, flooding occurs more often with a higher intensity, and some mortality, sweeping away and destroying many houses and causing great losses in agriculture and transport works, especially in the districts of Tuy Phong, Ham Thuan Bac and Bac Binh.

Since most of the rivers of the province are running through a relative short distance towards the sea, the retention time is rather short, which may explain the regular river overflow downstream. But the cause of flooding is multiple and complex. Besides deforestation, the flow of the seven main rivers of the province going directly towards the sea has been influenced by the construction of different facilities such as hydropower plants, dams and reservoirs, embankment, or bridges that could slow down or accelerate the flow velocity. These infrastructure works have often been built on an ad hoc basis without considering the interrelation between the different investment works, their environmental impact assessments not having been made according to international standards.

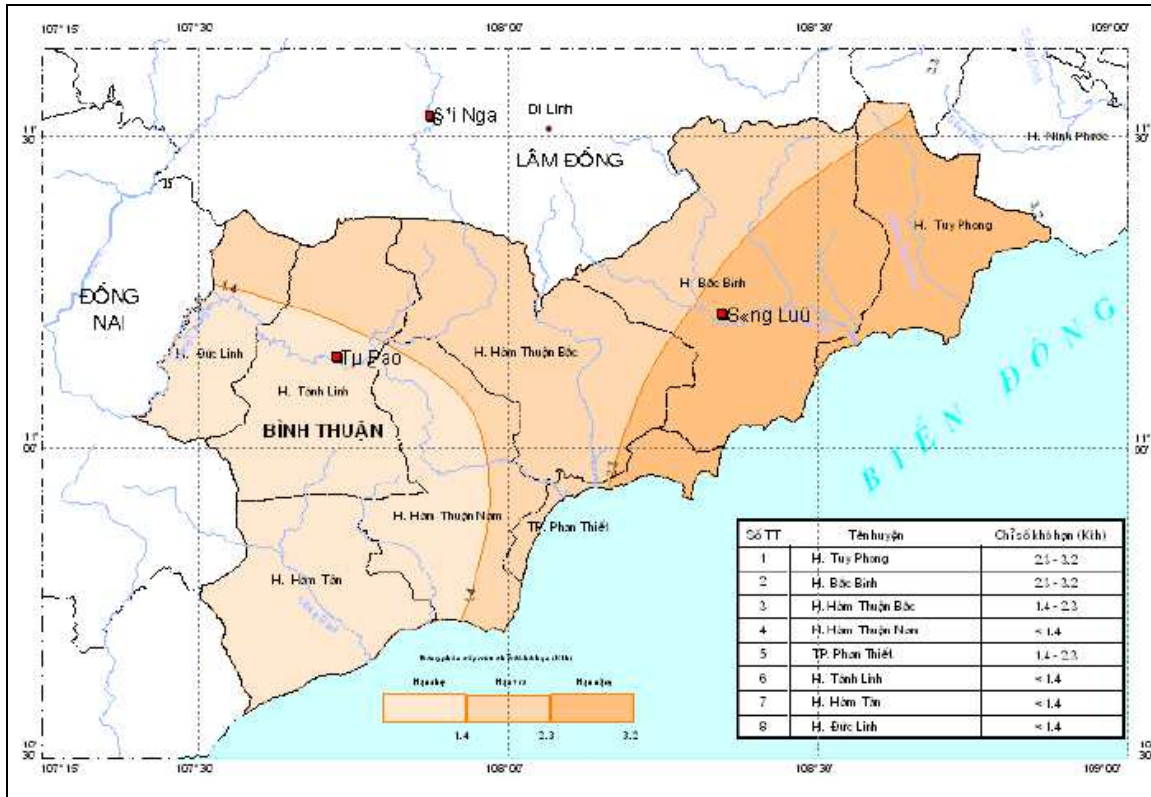


Fig 5: Map of drought index of dry season over years, VITO, 2011

Coastal erosion has always been a matter of concern in Binh Thuan Province. But it seems that this process has been accelerating during the last decade; annual land loss, varying from 4 to 8 m, has been recorded at parts of the coastline.



Fig 6: erosion process in a fishing village next to Phan Thiet from march 2006 to May 2009, Prof. P. Ozer, Ug, 2010

With the sea level rise, the consequent saline intrusion may reduce the water quality and available

Urban areas are subject to erosion due to the absence of embankment protection, a phenomenon that is expected to increase over the time. Many houses have already been lost in the recent past in some coastal wards of Phan Thiet and in some of the coastal towns in Tuy Phong district.

The problem of salinity also deserves closer scrutiny. It is reported that salt water now extends into the upstream part of the rivers, as is the case for Luy river in Bac Binh district.

drinking water supplies. Demands for productive water usage are already competing with domestic water requirements. In this context, the increased water demand may have to be addressed through alternative water sources, such as wastewater reuse or desalination. The anticipated sea level rise will have other consequences; such increased erosion of the coastline, a phenomenon that already affects Binh Thuan, causing important loss of valuable agricultural land, and housing.

The competing demands between domestic water use, agriculture and industry in the context of CC require a clear understanding and comprehensive assessment of the present problems. Effective governance including cooperation among agencies and with the private sector through Public Private Partnership (PPP), planning, monitoring and evaluation in the field of water management will become therefore essential, as well as effective operation and maintenance of the water supply networks.

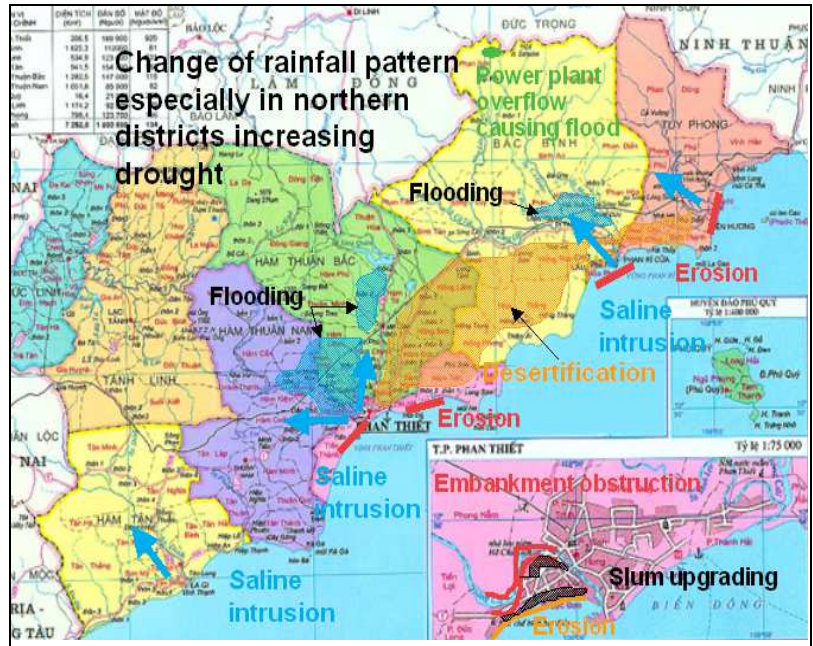


Fig 7: Synthesis map of CC threats to Binh Thuan province

In the context of CC and of socio-economic development of the province, especially from the tourism sector, efficient water management institutional capacity building, monitoring and evaluation and innovative infrastructure investment need greater support.

1.2.2.2 Institutional Arrangements for Climate Change

Several actors are involved in actions to address CC and natural disasters as follows:

Department of Natural Resources and Environment (DONRE): As a permanent agency of the Steering Committee for National Target Programme to respond to CC. it supports the Steering Committee to manage and implement, effectively, the action plan to respond to CC, focusing on some key activities as follows:

- Coordinate, guide and support departments, District People's Committee, cities, towns and other organisations to implement the Provincial plan to respond to CC
- General coordination of activities on information, education and communication related to climate change;
- Based on the projects and tasks under plan, calculate the required funds, aggregate annual capital plans of the Department of Planning and Investment and the Department of Finance reports to the Provincial People's Committee, and submit to the Provincial People's Council in accordance with the Law on State Budget.
- Chair and coordinate with the Department of Planning and Investment and the Department of Finance to formulate mechanisms of monitoring, evaluating the implementation of the action plan and implementation; and,

- Annually undertake preliminary review and evaluate experience, and report to the Provincial People's Committee the results of plan implementation, and proposals to resolve issues arising.

Department of Planning and Investment (DPI): Chair, coordinate, guide departments, agencies and People's Committees of districts, cities, towns to review, evaluate and mainstream CC factors into planning and the province's socio- economic development plan.

Department of Finance (DOF): Coordinate with the DPI and DONRE to balance and manage fund allocation (state budget, ODA, other funding) each year for projects and tasks to cope with CC, as defined within the plan.

Relevant sectors, departments, and agencies:

- Implement tasks assigned in the plan;
- Actively participate in coordination activities under the direction of the Steering Committee for implementation of the National Target Programme to respond to CC in the province;
- Ensure proper and effective use of the capital for the plan whilst at the same time actively mobilise additional resources and integrate the activities of this plan relating to the operation of other programmes and plans to achieve the objectives of this plan; and,
- Periodically check and report progress of the tasks of the plan, proposals to resolve problems and difficulties in the implementation process and submit to Provincial People's Committee (through DONRE).

People's Committee of Districts, Cities and Towns:

- Implementation of related activities approved in the plan;
- Mobilisation and rational use of local resources for plan implementation;
- Perform self-monitoring and preliminary evaluation of the lessons in plan implementation;
- Ensure proper and effective use of the capital of the plan; and actively mobilise additional resources and integrate the activities of this plan in related operations under other programmes and plans of the province to achieve the objectives of the plan;
- Periodically report to Provincial People's Committee plan progress and proposals to resolve any problems and difficulties in the implementation process (through DONRE); and,
- Periodically draw lessons learned from the implementation results of the plan.

Binh Thuan DONRE submitted a proposed provincial action plan response to CC to the provincial government for approval. The proposed action plan has been prepared by IHMEN and funded by UNDP. The proposal is still to be reviewed by a socio-economic consultant.

In general there is a significant scope for strengthening the planning and management capacity in the integration of CC issue in both water and urban sectors. All the stakeholders need exposure to alternative planning tools and techniques to tackle CC and on the importance of awareness-raising of the citizens. It is also clear that capacity building must be seen as a pre-condition for water resources management in Binh Thuan Province. This is very much a new role for DONRE (as the lead agency in the water sector) and the coordinating bodies, and relates not only to increasing the knowledge and skills of personnel, but also to strengthening available personnel and equipment so that they can carry out their duties effectively.

While the Women Union's action plan is assigned to focus on gender issues in adaptation activities, there is no mentioning of gender in other agencies' action plans. In general there is a lack of

information and knowledge on gender impacts in Vietnam. Most climate change studies do not address gender issues, since climate change adaptation is mainly seen as a technical and male competence and expertise.

Considering the above, both national and provincial authorities are acknowledging the fact that the CC action plan could be improved and have accepted to revise it.

2 STRATEGIC ORIENTATIONS

2.1 Building Resilience to Climate Change

Climate change challenges require two types of interventions: adaptation and mitigation measures. The former are made to manage the unavoidable, the latter to avoid the un-manageable. The reality of many Vietnamese cities situated in geographic locations prone to extreme weather conditions, especially those along coastal zones and river flood plains, calls for new urban governance approaches and massive investment in both adaptation and mitigation measures. This is necessary in order to build urban resilience and to avoid investment, which will be at risk of environmental disaster related to CC or even increase the risks of natural disasters, while limiting the negative impacts of these development processes on the climate.

As major global GHG producers, cities play a crucial role in leading the fight against global warming. Energy efficiency and saving measures include the promotion of low carbon transport alternatives, energy efficient buildings and industrial processes, and new approaches to wastewater treatment and solid waste management to reduce GHG emissions. To reduce energy demand, new ways of managing urbanisation; city form, design, development density, and logistics systems are required.

Although the present intervention will mainly focus on adaptation measures, it will include also some activities related to mitigation such as, awareness raising of various groups (decision makers, professionals, community leaders, schoolchildren...) and activities to support households to develop energy-efficient houses or mechanisms to promote rainwater harvesting and artificial ground water recharging.

Adaptation measures are deeply related to local territorial characteristics. They require an in-deep analysis – independent from administrative boundaries – of the local specificity before elaborating any strategy. They call for collective, comprehensive and coordinated actions. They are a trans-sector responsibility shared by multiple actors, private and public, including different authority and administration levels that should consider the following principles:

- i) Our societies remain vulnerable to the present climate and its extreme events. These events should be considered first, before thinking of the vulnerability to future climate. This should be done through desk study and socio-economic surveys;
- ii) An analysis of the conditions of the population's acceptance of the foreseen adaptation policy is required prior to any intervention. This is the call for a social debate on CC at local level, where women and men participate and contribute in finding solutions;
- iii) An overview of how the effects of the policy are dispatched over the different social classes and influence women and men differently is necessary, while considering specific policies to overcome the potential generated inequities; and,
- iv) As part of the poverty alleviation prime objective of a development cooperation project, the intervention should primarily focus on supporting the lower income people, in particular female-headed households to cope with CC challenges.

As new risks and vulnerabilities associated with CC require adapted governance mechanisms and tools, the present intervention will mainly focus on capacity building and institutional strengthening.

2.2 Strategic Orientations in the Water Sector

2.2.1 Integrate Water Resource Management

Water is both a resource and a threat. Climate change might not only lead to both a lack (drought) and excess (floods) of water but also quality problems (less dilution of pollution, increased turbidity, and saline intrusion). A reduction of water will affect agriculture, fish farming, boat transportation, biodiversity, drinking water supply, cooling of the electricity power stations. An excess of water is a threat for regional development, agriculture, infrastructure and urban areas. Adaptation measures require water saving, optimising use, organising awareness, and assistance before, during and after extreme events. This requires a trans-sectoral vision to manage future conflict related to the use of water.

Working on the issue of water and sanitation in urban areas in the perspective of CC requires comprehensive studies covering the selected cities and their hinterland. Flooding in cities located in coastal areas, along relatively short rivers coming from mountainous areas, has multifactor causes: tidal regime, rainfall precipitation, upstream river conditions, deforestation etc, all being affected by CC. Only hydraulic studies of an entire catchment considering various CC scenarios could help local authorities to define priority investment projects that could efficiently reduce flooding risks. Therefore, the project approach should focus on the analysis of a river basin for each province, as a case study following the approach of Integrated Water Resources Management (IWRM).

IWRM is a valued concept to maintain a sustainable development, allocation and monitoring of water for the current and future generations. Its basic logic is that all water functions (water for drinking, irrigation, industries and ecosystems) are interdependent. It is therefore best to tackle the water management of an entire river basin at once. The IWRM also considers the different users of water. It requires therefore a platform of dialogue between them through an inclusive and participatory approach.

IWRM and river basin approaches will be promoted since water is central to the socio-economic well being of populations of cities and peri-urban areas. The task is made challenging by the interconnected nature of water systems: it is often rural areas that supply urban communities with water.

The project will focus on the areas of the province mostly affected by CC with a focus on water management based on **Luy river basin**, covering mainly Bac Binh district. This basin was selected because it meets all priorities of the intervention: (i) It is covering one of the most driest area of the province with significant desertification problem and saline intrusion at the river mouth; (ii) The total area of the basin is appropriate (about 1,952.7km²) for conducting the required studies with different CC scenarios; (iii) Flooding in the basin has multi-factors origin. It is rather complex catchment, with reservoir and electric power plant; (iv) It represents typical coastal areas of southern central part of Vietnam, with severe droughts, river floods and coastal erosion; and, (v) flooding is affecting under-serviced urban areas located on the down-stream section that are facing fast and sometime uncontrolled urbanization without considering sufficiently the CC issue.

The proposed intervention will help to introduce an integrated water management approach to help solving the flooding problem in the Luy river catchment basin – especially in urban areas – during the critical weather conditions, likely happening more often due to climate change, with short period but intensive rainfalls in the catchment area, and important amount of water released from upstream hydropower station. At the same time, the proposed intervention will help to find the ways for storage of valuable fresh water sources for different usage purposes during the long dry period, for socio-economic development, while trying to find answers to desert expansion.

A comprehensive analysis of water resource, river hydrology, ground water, water demand will be made, including issues of CC effects, coastal erosion, saline intrusion, flood, drought, desertification... together with impact analysis on specific social groups such low income communities and women.

The comprehensive water management plans (water balance) of the selected catchment will integrate present and foreseen future water resources as well as present and future water demand. They will be the base of developing strategies aiming at:

- Changing the behaviour of the different water users in order to safe or economically use water , and limit pollution;
- Limiting erosion along the coastline of the province; and,
- Reversing desertification and deforestation within the related catchments areas.

As part of the outcomes of these plans, river contract will be signed among all the water users of the Luy catchment in order to address the future conflicting water demands and to preserve the water resource and to apply the water management plan. The stakeholders are including the local authorities (province, districts, communes and related departments), the private sector (industries, farmers, seafood production and processing, tourism, energy production that requires water...), mass organisations and the local communities.

2.2.2 Adaptation measures related to water management in urban areas

Climate change affects the pressure on, and the state of, the urban water system. Changes in precipitation patterns towards more intense storms lead to an increased risk of flooding. Therefore the impacts of flooding, such as economic damage and the spread of diseases, are likely to increase.

Coastal cities may have to cope with significant sea level rise, while at the same time the fluctuations in river discharge are expected to increase. This may lead to extreme high water levels and serious flooding or, during low discharge periods, to the intrusion of saline water. While storm events may become stronger, at the same time it is expected that dry periods will last longer, which could lead to increased water scarcity.

The response of cities (and regions) to the increase danger of flooding could be to build protective infrastructure, e.g. to level up heights of dykes and other protective measures. Alternatively measures could be to learn “to live with water”, through the use of flood-resilient buildings, floating cities or dismantling dykes and other flexible solutions. This strategic choice will have drastic impacts, such as financial or behavioural.

Cities face increasing risks of periods of water scarcity, either because the water resources are not sufficient or polluted, the capacity to treat and distribute the water is limited, or the population is not aware of the value of water and its scarcity. These are exacerbated by the drivers of CC and increasing populations. Water scarcity could be addressed by developing new water resources at a further distance from the city or to install additional treatment and transportation capacity. Alternatively, strong water demand management measures in the city could reduce the city’s demand for external water resources. In addition, alternative water resources in the city could be developed.

The expected increased frequency and intensity of storm events requires rethinking the strategy towards storm water management. A strategy could either be to increase the capacity of the centralised storm water drainage system or instead to invest in various forms of storm water retention, infiltration or use. Or a balanced combination of the two approaches.

Different types of measures should be considered including the ones aiming at reducing the impacts (erosion, flooding, saline intrusion, landslides etc) and the ones related to water management in the

perspective of reduced water quantity and quality:

- *Flooding prevention:* These types of measures are aiming at reducing the vulnerability of public and private assets and people; to favour water re-charge of aquifers; to protect/expand natural water retention and flood-prone areas (low-lying land, wetlands, major riverbeds etc), to decrease the hard-surfacing of lands and increase permeability (city parks, parking areas, gardens, etc). This requires adapted town-planning regulation to flood-prone areas as well as regulations and technical specifications on the materials to favour groundwater recharge;
- *Erosion prevention:* Prevention of the erosion of different kind of soils (cultivated exposed soil due to deforestation, slopes, river banks, sea coasts etc), accelerated reforestation programmes;
- *Geological prevention (karstic risks):* This requires geological analysis in relation to land use, especially in urban areas.
- *Reduction of water resources:* This implies in-depth analysis of the future water demand, pollution risks and forecasts of availability of both surface and underground water. It necessitates a comprehensive strategy aiming to:
 - o Include the CC issue into the Integrated Water Resource Management Plan;
 - o Favour exchange of information and coordination between service providers (water demand) and the users (public, private, communities) of the different river basins through different mechanisms (e.g. river contracts);
 - o Reinforce the follow-up, management and control of the minimum yield to guarantee these yields and modulate the demand accordingly;
 - o Adapt the management of the water offer and water demand considering CC issue;
 - o Reinforce a rational water management (change of behaviour, rainwater harvesting); and,
 - o Impose adapted water tariff to guarantee sustainable running water systems, including proper maintenance of water networks.

2.3 Strategic Orientations in spatial planning

Cities are variously affected by CC, which will mean that cities will experience a warmer climate, at times with significantly more rainfall but will also face the risk of seasonal water shortages. Cities will also experience a significant increase in the frequency and intensity of extreme weather events, such as heat waves, tidal surges, very high winds and very heavy rainfall. The impacts of these changes on cities will be increased risks of flooding, droughts and dangerously hot weather. There will also be secondary and indirect impacts, including an increased risk of infrastructure damage, erosion and landslides.

Adaptation measures to CC in urban areas will be needed to deal with the following issues:

- Extreme weather events including heavy rainfall, high temperatures, sea-level rises, tidal surges and super-typhoons;
- Flooding, overstrained drainage systems and groundwater pollution leading to possible disease, damage to property, soil degradation;
- Decreasing water availability, periods of drought, and increased water evaporation; and,
- Heat island, heat waves and dangerously hot days with the potential to cause death, severe

health problems to the elderly and young children and economic losses through damage to infrastructure.

Strategies on adaptation measures in urban areas need focus on:

- Clear guidelines for vulnerability assessments and CC mainstreaming into urban plans;
- Conducting vulnerability assessments using an inclusive, participatory and gender sensitive process to identify risks to urban development plans and their effects on different demographic sectors, and decide on objectives and ways to reduce those risks;
- Developing a vision to guide future development and find ways to relate CC responses to urban development aspirations;
- Adjustment of the structural organization of the city (densification, promotion of public transport, more space for both green space and water bodies in the city for both limiting heat island and providing buffer zone to flooding....) and building codes and standards to ensure that infrastructure and houses are climate-resilient;
- Investing to create or modify major infrastructure, e.g. larger reservoir storage, increased drainage capacity, higher sea walls;
- Avoiding negative impacts, e.g. land-use planning to restrict developments in flood plains and at-risk coastal sites, or favouring water recharge of the aquifer by limiting soil water proofing;
- Strengthening cooperation among ministries, sectors and localities;
- Capacity building for city governments in order to prepare and implement CC action plans;
- Developing greater understanding of climate risks and vulnerabilities through appropriate awareness raising campaigns;
- Close consideration by all stakeholders of the spatial impacts of adaptation measures that are long lasting and require change of behaviour;
- Expanding the scope of community participation and action by representatives of the private sector, neighbourhoods and grassroots groups, including the Women's Union, as well as opinion leaders;
- Adaptation of the existing construction norms and standards to CC issues for new constructions; and,
- Improving early warning systems and emergency contingency plans and responses.

2.3.1 Planning methodology

The traditional planning approach that prevails in Vietnam has shown its limitation for integrating the evolution of Vietnamese society and appropriate adaptation measures. Strategic structural planning is perceived as an appropriate alternative. Its aim is to facilitate the alignment of decision-makers to the requirements of the citizen and the local morphology, while integrating the ecological dimension. This methodology is considered to be valuable for the Vietnamese context subject to integrating the local spatial specificities, the environmental issues, and the adaptation of participatory planning to the local institutional and cultural context.

It could be defined as a social process aiming to model space within a long-term perspective, while developing short-term and mid-term actions through a hierarchical decision-making process inclusive of all possible stakeholders. The process should lead to a coherent long-term vision built upon the strengths and weaknesses identified by the actors. Once this process in place, more fundamental and

complex aspects can be studied in depth, with urgent actions executed by different actors. The implementation stage is important not only to demonstrate the efficiency of the approach, but also to experiment with the main ideas in a real context and to eventually correct them after evaluation. The dynamic process, combining studies, actions and evaluation, allows proximity with the ever-changing reality. It provides input for the regular revision of the long-term vision and a perspective to manage problems and threats.

The Binh Thuan authorities are aware of the serious impacts of CC to their province, especially along the coastal lines and the desert area. But the climate change impacts have not yet been taken into account in their master plans. The approach of the project will be to integrate them, while following the strategic structural planning approach considering a series of challenges such as: (i) limited participation and access of the poor, women and children to information on CC issues; (ii) need to develop awareness campaigns covering all the levels from the provincial leaders to the local communities; (iii) lack of development planning tools and capacity of the different actors; (iv) poor skill and technology in water management, solid waste management, environmental sanitation as well as in elaborating specific and appropriate urban design pilot projects incorporating recent innovations in water urbanism, city greening and appropriate infrastructure; and,(v) lack of resource to support local initiatives for CC adaptation.

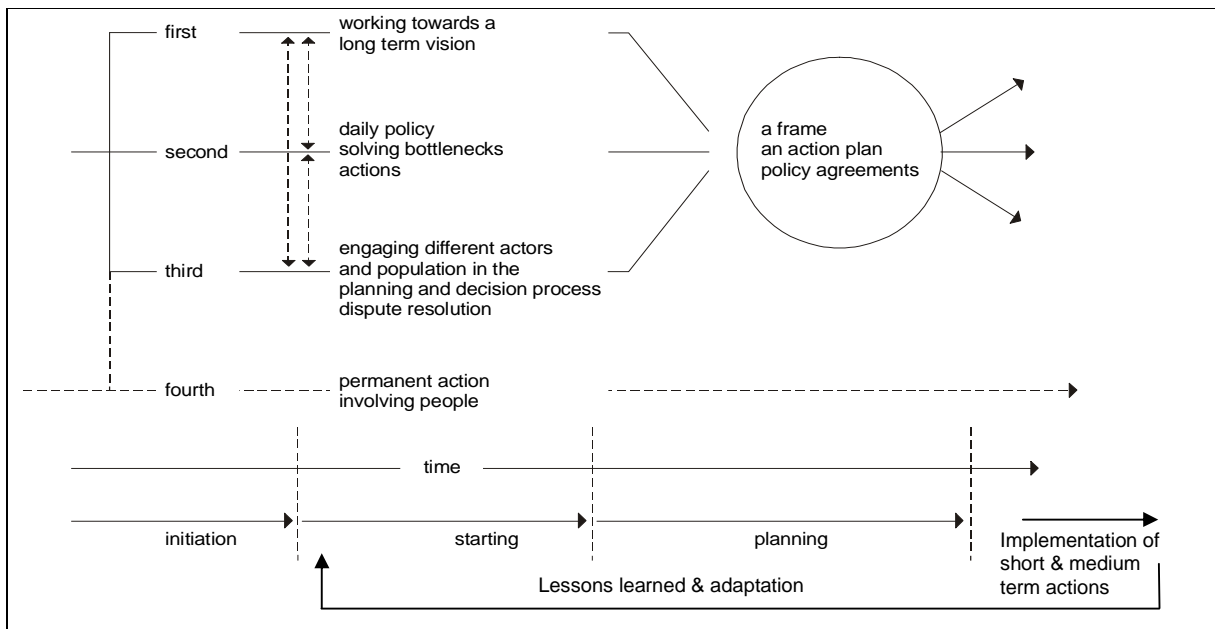


Fig. 8: Steps of the Strategic Structural Planning approach, Source: Loeckx et al., 2004

Therefore, the strategy in city planning to cope with these challenges should integrate the following activities:

- Training at all the levels - provincial leaders, professionals, different sectors and local communities - shall be carried out by means of training courses, workshops, group discussion, study tours, providing information at local media, education in the schools;
- Master planning and development programmes in all the sectors must be integrated with CC issues. Strategies for natural disaster management could be given priority;
- The target towns should be planned and built considering three major issues:
 - o IWRM, considering preservation of the resource both in terms of quantity and quality, while favouring techniques such as water saving, ground water recharging, rainwater

- harvesting and providing appropriate and sufficient infrastructure such as drains, tide gates, monitoring stations for environment quality...;
 - o Adaptation measures to CC, including flooding, droughts, storms, heat islands...;
 - o Mitigation measures limiting GHG emissions due to structural and spatial planning principles, energy efficient building design and norms;
- Models related to the use of renewable energy including solar energy systems and geothermal exchange systems should be developed to verify the use of such types of technologies in the different specific contexts of Vietnam; and,
- Awareness for targeted groups such as the poor, women and children... and establish community-based development credit funds should be undertaken.

2.3.2 Water urbanism

Living on water and/or near water is not a new challenge, but its analysis has been neglected for a long time. For long cities have grown without considering their negative impacts on their environment, especially the water networks, on which there are depending so much; e.g. drinking water, sanitation, transport, agriculture and industrial production.... Climate change and flood disasters, fast urbanization and a lack of space, excessive pollution and increasing complexity of our societies raise the necessity to deal with water in cities in more intelligent ways than only with engineering solutions. As for example, city planning should take into account that due to CC more land will be subject to flooding, with, as consequences, construction constraints and even building permit restrictions.

A more respectful dialogue between city planning and IWRM needs to be found, through the development of multi-disciplinary approaches.

2.3.3 Heat Islands

Heat waves are particularly difficult to cope with in urban areas. They are affecting public health directly and indirectly and more largely population comfort and well-being, especially of the poor, as they have not the means for air-conditioning. Indirectly they will increase energy demand to supply artificial cooling systems. This problem requires adaptation measures for the existing and future land housing stock, including more resourceful land management and housing typologies, and change of life style and production and consumption patterns, while adopting a new development vision based on a more sustainable regional planning development and low carbon growth (transport, densification, mixing of activities, social mixing). It implies also rethinking urban planning, giving more integrated spaces to water and green areas considering that the heat island phenomenon is related to climatic conditions and the ratio between green and water spaces, the size and the density of the urban landscape, the coverage of the ground by mineral and reflective surfaces, poor thermal insulation of the buildings, as well as wind exposure.

A series of adaptation measures should be considered:

- Awareness-raising campaigns to both local authorities and the population in order to promote alternative solution to traditional cooling for buildings in order to decrease GHG production;
- Mapping the risk areas related to floods, erosion (both rivers and coastal areas), heat islands, and air pollution risks;
- Support passive architecture measure to improve users comfort in buildings without requiring high energy demand;
- Develop and apply adapted construction standards and norms (e.g. roof capacity to resist storms,

percentage of green space within a major investment project, hanging gardens, etc);

- Define a compromise between urban density to reduce transport needs and the introduction of interconnected green spaces; and,
- Promote the use of public transport.

2.3.4 Efficient buildings

In 2007 the IPCC identified the building and construction sector as the sector with the largest mitigation potential. More than half of this reduction potential is situated in non-OECD-countries. Developing countries, as well as countries with economies in transition, present the largest potential for new construction in the coming decades. Applying criteria for sustainable development including, but not limited to, energy efficiency of buildings as early as possible in the design and construction process is far more cost-efficient than a possible retrofitting of the building stock. Sustainable building implies not only making future building eco-friendly and energy efficient, but also adapting buildings to CC. The lack of awareness of consumers and also of professionals within the building sector is a major barrier to improve the energy efficiency in buildings, especially for developing countries. This results in low political support for the development and implementation of energy efficiency policies. To increase this support, and raise overall awareness on energy efficiency improvements, education and training is needed for the public, the authorities and the private sector.

2.4 Capacity development and institutional strengthening

Addressing climate change challenges implies new mandates and new roles for a large number of actors involved at the provincial level. Key stakeholders for enhancing institutional capacities related to climate change in provincial level are: PPC, DOC, DONRE, DARD, DPI, PC of Districts, cities and towns... It also include non-state actor as the private sector and local communities.

Strengthening the capacities of these authorities to fulfil their mandate and carry out their duties in this new institutional landscape is thus key to help integrating climate changes perspectives in water resources management and urban development in particular.

Supporting capacity development to cope with CC entails significant change at different levels : knowledge, skills, but also work, processes, tools, systems, management style, leadership, among others. It also involves promoting an enabling institutional environment for those new and emerging capacities to develop (inter- agencies coordination at local level, involvement of the local communities etc...)

Some results areas for capacity development processes have already been identified during formulation as follow :

- avoid overlapping responsibilities of different stakeholders related to cross-sector issues such as comprehensive water resources management (DARD/DoNRE), climate change (DoNRE/ DARD/ DoC/ DPI/ DMHEN), urban/rural spatial planning (DoC/DARD);
- Improve coordination between the state actors, the private sector and the local communities in the field of IWRM and spatial urban development considering both the urban areas and their rural hinterland;
- enhance individual and organizational knowledge : better understanding of the effective impact of climate change and the measures to address it both in terms of mitigation and adaptation; taking also into account gender implications
- support new planning approaches : and particularly

- Effective inclusion of the hydraulic and CC modelling outcomes into the spatial planning process considering the city and its links with the surrounding rural areas;
- implementation of participatory planning mechanisms;
- More selective and effective data management and analysis so as to be of immediate and long term service of the planning process.

The capacities to consider go thus beyond enhancement of individual skills to address also change at the organisational and institutional levels. The areas and focus for support will differ greatly from one actor to the other and depend on its specific context . Rather than providing a detailed Capacity Development (CD) action plan at this stage, the TFF will provide orientations on the methodological path and capacity development mechanisms that should be adopted during project implementation.

First, a context analysis will be conducted in order to inform any subsequent CD process design. An institutional and organizational capacity assessment will be led by the each concerned agency with coordination and support from the TSU and possible external expertise. Tools will have to be customized by each actor according to its context and its specific agenda.

This Technical Institutional and Capacity Assessment (TICA) should rest first on a detailed stakeholders mapping that will look at the roles (legal and actual) and responsibilities of main actors related to climate change (and more particularly in the areas of IWRM and urban planning). This exercise will build on the institutional arrangements highlighted during formulation and go deeper into the analysis. It will facilitate focus on key organisations and give some priorities for CD support. It will also focus on the relationships between stakeholders.

The TICA should encompass the following elements:

- Context analysis: a quick scan of the factors that enable and constraints capacity and performance of the key stakeholders : factors which influence their capacity to perform key functions;
- Institutional factors: (formal and informal rules) a particular attention will be paid to transversal reforms on-going in Vietnam like decentralization process and planning reform;
- 2 assessing organizational capacities: the TICA will look at external aspects of the organization (user satisfaction, mission, outputs, inputs, stakeholders, context...) as well as internal aspects (structure, strategy, procedures & systems, formal and informal culture , management style, motivation of staff etc..). Methodologies will vary greatly depending on the context but also on the scope of the analysis which will be proper to each agency.

The technical assessment results will help each actor to develop a vision for change and formulate CD strategies. They will also identify the drivers and the constraints that will have to be addressed.

The focus areas for CD could be related to:

- Change in structure, procedures and enhance skills and individual competences;
- Focus on incentives, motivation, performance based management;
- Work on the enabling environment: legal mandates, institutional linkages, coordinating platforms...

The following principles and considerations should guide the whole CD support process:

- Each agency will lead and drive the assessment and strategy formulation process with the support of the TSU and external expertise. It must guide the use of tools and instruments, the reform pace etc...Self -assessment are to be privileged as they are more effective for creating

ownership of the analysis and buy-in for any change initiatives that will follow;

- The more complex the needs and the context, the bigger the need for a range of responses simultaneously: a mix of strategies with short-term (quick wins) and long-term objectives should be privileged;
- The level of capacity desired should be clearly assessed: results in capacities should be linked to concrete outputs of the organizations (capacity 'for what') , and be part of a global vision for change in the organization;
- An incremental approach of CD should be promoted that can be reoriented throughout the project by means of a very regular and structured review processes, to keep adjusting if context changes or if capacities emerge. This implies a clear monitoring system with clear milestones in the change process (alternative methodologies for planning and monitoring of change could be used here like outcome mapping etc..).
- Spaces for learning and knowledge exchanges will be promoted as learning is essential for sustainable capacity change

As soon as this 'vision for change' is developed, the training needs assessments could also be used as an instrument to inform main capacities that should be enhanced at individual level or at a the level of a team.

In addition to this CD process support on the long run , the PPC and the project coordination unit (PCU) capacities will also be enhanced with respect to project management and monitoring techniques in order to facilitate a smooth implementation of the project . This will be done during the set up phase of the project.

2.5 Comprehensive Approach

2.5.1 Overview

The project objective will be related to 3 major GoV strategies:

- The national strategy on CC developed by MoNRE⁸;
- The sustainable urban development strategy produced by MoC; and,
- The green grown strategy under development by MPI.

The intervention should support GoV in implementing these three strategies in a comprehensive way, while promoting the idea of developing in medium-term a single strategy embracing these three issues should be supported.

2.5.2 Ten-step strategy

In order to tackle these complex and inter-related issues, a holistic approach is required, taking into account a large set of preliminary studies prior to the implementation of concrete adaptation measures. This approach can be translated into a ten-step strategy with specific implication for Binh Thuan province that is summarised in the following table:

⁸ Decision No. 2139/QĐ-TTg dated December 5th 2011 by the Prime Minister approving the National Strategy on Climate Change.

Table 1: Ten steps project's strategy

Steps	Description	Specific implications for Binh Thuan province
1. Capacity development & institutional strengthening	<p><u>Capacity development</u> of all relate agencies on:</p> <ul style="list-style-type: none"> - Integration of CC & related environmental issues in planning - Integration of the results of water resource management into urban planning studies - Participatory planning tools, strategic structural planning, priority action planning, water urbanism, sustainable planning, energy efficient buildings norms and techniques - Monitoring and evaluation mechanisms of CC issues and project management at provincial level and take lessons for future investments, knowledge management and dissemination - Gender mainstreaming approaches <p><u>Institutional strengthening</u> of all relate agencies on:</p> <ul style="list-style-type: none"> - coordination and cooperation mechanisms - integration of all stakeholders, including communities and private sector in decision process - IWRM tools such as River contract management 	
2. Awareness raising of all stakeholders	<ul style="list-style-type: none"> - Information through different types of campaigns to be provided to local authorities, communities, mass organisations, community-based organisations (CBO), private sectors about CC, natural disaster risks management, measures to protect public and private assets, natural resource preservation (water, energy, space etc) - Initial set up of a future comprehensive early warning disaster system for the target river basin 	- Focus on the Luy river basin
3. Data collection	<ul style="list-style-type: none"> - Existing and new data collection (meteorology, hydrology, flooding, saline intrusion, erosion, heat island, groundwater) and mapping - Installation/ equipment of existing/new hydraulic and meteorological monitoring stations - Set up CC/IWRM information system to store and analyse data - Above data and information must be selective and linked to relevant CC modelling and strategic planning necessities 	<p><u>CC issue:</u> Data for meteorology, hydrology are available province wide and at the level of South-Central region The saline intrusion and erosion must be studied province-wide.</p>
4. Analysis and modelling	<ul style="list-style-type: none"> - Hydraulic modelling per river basin - Flooding studies (survey, analysis and modelling considering topography, velocity, dikes, gates and various obstacles etc) - Saline intrusion and coastal erosion survey and modelling from the estuary - Rainfall, temperature and wind survey and forecast - Natural disaster impact and vulnerability analysis of public infrastructure and private assets including environmental consequences (where relevant and possible statistics will be disaggregated with respect to gender) - Based on the above, CC modelling considering low, intermediate and severe risks 	<ul style="list-style-type: none"> - Focus on Luy River basin - Provision of hardware and software with appropriate training in coordination with MoNRE and Nga Trang Regional Centre
5. CC strategy for the province	Based on the results of the CC and hydraulic modelling, comprehensive strategy for the province, considering both adaptation and mitigation activities related to water management and urbanisation (based on sustainable planning, construction norms for energy-efficient buildings etc) considering short to long-term impacts	
6. City planning	<ul style="list-style-type: none"> - Comprehensive and participatory structural strategic planning for selected cities integrating CC issue with a focus on water management - Revision in a comprehensive way of the different plans (spatial master plan, including drainage and sewerage master plan, solid waste management plan, socio-economic development plan, investment plan etc) at the level of the city and region-wide considering the Eco²-cities concept of the WB 	SSP for the 3 towns based on flood and desert conditions limiting the present linear urban development along the highway and the river

7. CC priority action plan	Based on methodologies already experimented in Vietnam and worldwide, review of short and medium-terms priority activities of the CC strategy and the SSP of the selected cities based on cost/efficiency, environment and socio-economic impacts distinguishing between short-, medium- and long term actions	Revision of the existing action plan, considering hydraulic studies of the Luy river basin
8. Resource mobilization	Coordination with donors and GOV initiatives to support implementation of CC strategy and priority action plan	
9. Pilot projects implementation	<ul style="list-style-type: none"> - Physical investment related to urban areas according to priority of the project - Technical support, scholarships, training to develop green economy <p>Present Vietnamese construction norms and standards will be applicable in a flexible way to these investments, as these norms are not considering CC issue</p>	<p>Implementation of one of the proposed activities with selection based on objective criteria</p> <ol style="list-style-type: none"> 1. Limit river overflow, flooding and river bank erosion of one of the selected towns 2. Upstream intervention to favour artificial ground water recharge as to desert expansion 3. Limiting desert expansion in front of one of the select town (through re-forestation with flood derivation from Luy river as irrigation)
10. Feedback & knowledge management	<ul style="list-style-type: none"> - Improvement of the reporting mechanisms from provincial level to line ministries to feed policy dialogue - Knowledge up-scaling by documenting the project process and progress and learning from similar projects elsewhere - Communication and dissemination of lesson learned - Gender specific assessment where relevant 	

2.5.3 Ministry and province implications

Applying the National strategy on CC at provincial level will require different supports/decisions from central and provincial authorities as follow:

- The related ministries (MoNRE and MoC) and Binh Thuan PPC are agree to revise the approved CC action plan of Binh Thuan province, under approval process, and the different spatial master plans (Regional MP of Luy river basin, PMs);
- All the related institutions shall provide all the necessary existing available data, and their annual update throughout the project implementation, based on the cost norms defined by MoF, or at lower rates;
- In order to tackle the cross-cutting dimension of CC, close cooperation between departments and ministries is required. At province level, this coordination will be ensured by PPC with the support of the Project Coordination Unit (PCU), with technical guidance from the TSU, and, at central level, by MPI with the support of the TSU;
- In order to include the CC implications defined in the CC model, the present planning design standards and construction norms will have to be applied in a flexible way as they are not considering this issue to the design of both the revised MP and the detail design of the selected investment project. This principle is accepted by MoC and all other related authorities;
- The principle of integrating the participatory approach into the decision-making process of the project through the River basin Committee is agreed by the local authorities;
- Based on the revised CC action plan of the Luy river basin, the Master Plan of the 3 target towns will be reviewed, as well as the priority action plan. The pilot investment of the intervention will

then be selected following objective criteria. The selection will be made in a participatory way, with TSU guidance, and will be submitted to SC approval.

- In addition to (a) major pilot project(s), several immediate/short-term actions can be undertaken, particularly in and with the support of local communities and the River Basin Committee (see activity 4.2).
- In order to feed the policy dialogue at central level, all the lessons to be learned from the intervention in Binh Thuan province will be provided to the related ministries through an appropriate M&E system covering technical issues. This tool will be developed during the course of the project in coordination with the other 2 project interventions in Ninh Thuan and Ha Tinh provinces and the support of the TSU.

3 INTERVENTION FRAMEWORK

3.1 General Objective

The general objective of the programme is to “contribute to the sustainable development of Binh Thuan province”.

3.2 Specific Objective

The specific objective is "to support the institutional capacity in Binh Thuan Province in integrated water resources management and urban development in relation to Climate Change”.

3.3 Expected Results

The 10-step strategy shall be translated into four result areas.

Result 1 The capacity of the authorities of the province in terms of Climate Change, Integrated Water Resources Management and urban planning are improved with appropriate monitoring and evaluation mechanisms in place.

Result 2 A comprehensive strategy on CC is in place; based on various studies, including CC data and hydraulic modelling focused on operational impact on settlements of Luy river catchment and an integrated planning revision of the existing master plans of Luong Son, Cho Lau and Phan Ri Cua towns, while key priorities of the CC action plan of the Luy river basin are defined.



Fig. 9: Localisation of the major activities

Result 3 Priority strategic pilot activities are developed, for lessons learned, targeting one of the 3 towns to increase resilience to CC with appropriate operational and maintenance modalities.

Result 4 The provincial CC strategy is supported by the active involvement of the communities and the private sector.

3.3.1 RESULT 1: The capacity of the authorities in terms of CC, IWRM and urban planning are improved with appropriate monitoring and evaluation mechanisms.

The present result area responds to some institutional issues and capacity needs identified as follow:

- Avoid overlapping responsibilities of different institutional stakeholders related to cross-sector issues such as comprehensive water resources management (DARD/DoNRE), climate change (DoNRE/ DARD/ DoC/ DPI/ DMHEN), urban/rural spatial planning (DoC/DARD);
- Improve coordination between institutional stakeholders, the private sector and the local communities in the field of IWRM and spatial urban development considering both the urban areas and their rural hinterland;
- More selective and effective data management and analysis so as to be of immediate and long term service of the planning process;
- Better understanding of the effective impact of climate change and the measures to address it both in terms of mitigation and adaptation;
- Effective inclusion of the hydraulic and CC modelling outcomes into the spatial planning process considering the city and its links with the surrounding rural areas;
- Better understanding of different impacts on women and men and on gender relations between them;
- Implementation of participatory planning mechanisms.

Activity 1.1 Capacity development of the Project Coordination Unit (PCU) in project management, procurement, M&E and reporting

Project Operation Manual and project management training

During the set up phase training sessions will be provided, to the PCU on project administration management, sound financial management, computer skills, gender, English, public procurement, reporting, financial and activity planning and M&E.

During the same period, a Project Operation Manual (POM) will be developed in a participative way in coordination with the TSU as to include both GoV and BTC requirements, and ensure the overall coherence in the procedures applied within the 3 provinces of the CC program. The POM, to be approved by the steering committee, will describe the practical arrangements for the functioning of the project, and particularly of the PCU. It will translate the implications of the concepts defined in the present TFF in terms of project management and finance. It will be written by the PCU – with the support of an expert in coordination with the TSU to ensure coherence with the other two projects and to include the description of the coordination working modalities among the 3 provinces – BTC Representation and headquarters.

The expertise foreseen (one international expert during 2 years and one Vietnamese expert during the project life-spent) to give assistance to the PCU to write the POM and implement its modalities includes, among other, (i) on-the-job coaching on project, planning, monitoring and finance management and (ii) training identification and organisation through regular visits.

Both experts will be recruited by the BTC representation and will share their time (full-time job) between the 3 projects. Terms of references are presented in the annexes.

M& E strategy with software

The monitoring and reviews modalities should meet the principles of the BTC M&E Policy. It will use as much as possible Vietnamese regulations and templates.

The monitoring process aims at collecting data in order to take operational (PCU level) and strategic (PSC level) decisions (*evidence based decision making*). These data contribute also to the internal accountability and lessons learned. The primary beneficiaries of the monitoring process are the project implementers themselves, and first of all the PCU. In that respect, the processes and templates should be very well owned and used.

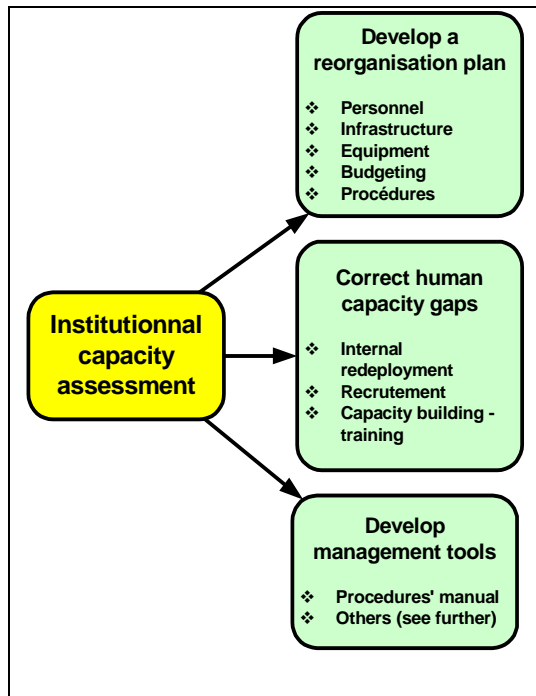
A proper M&E strategy, including procedure and tools will be developed jointly during the set up phase. This exercise will be linked to the project baseline survey (see activity 1.5), while selecting some key indicators in order to contribute to the monitoring and evaluation of the ICP 2011-2015.

The project will develop specific software as M&E tool. It will consider both the procedures and guidelines applied in Vietnam, (such as the financial accounting tool used by the Vietnamese authorities is the BRAVO software), as well as the BTC requirements. An IT tool will be set up for the 3 projects through the coordination and technical guidance of the TSU. It will be based on existing experiences developed in Vietnam such as the Monitoring and Evaluation Tool (MET) open source software developed by the MoNRE/ BTC CAPAS. This tool is explained in more detail in the annexes.

Activity 1.2 Needs assessment of the Institutional and Technical Capacities

This activity will be conducted by consultants recruited by the project that will be guided and coordinated by the TSU, and in particular its Capacity Development expert (short-term with regular input), and the key agencies involved in the 3 fields of interest of the project namely CC, IWRM and urban planning.

First, it will be based on a detailed stakeholders mapping that will look at the roles (legal and actual) and responsibilities of the different actors at province, district and city/town levels with regards to CC, IWRM and urban planning. It will also cover the cooperation and coordination mechanisms between the different provincial administrative bodies in the related fields, while considering both the regional (cooperation with bordering provinces) and national scales.



It will then identify the strengths and gaps in the provincial legislation, the overlaps and inconsistencies in roles and responsibilities related to CC issues of institutional stakeholders at different levels. This context analysis will help understand what are the main factors that influence negatively or positively the agencies effective capacities to cope with climate change. Second the organizational assessment, will look at external and internal organizational dimensions (see chapter 2.4). The scope of the exercise will vary a lot depending on the context and the motivation of both the institutions and the individuals. It will have to be clarified from the outset by each actor with the support of the TSU.

This exercise will be used as the baseline study for monitoring and evaluation of the CD component of the intervention targeting the related agencies concerned with the technical, managerial, procurement, and finance issues related of the project.

Fig. 10: Indicative list of possible outcomes from an institutional/organisational capacity assessment

Activity 1.3 Design a CD process

The assessment exercise will help designing a participatory CD process in coordination with TSU activities. Any activities specific to the province needs will be covered by the present intervention. CD topics to be shared with the other two provinces and/or the central level will be coordinated and/or supported by the TSU.

The strategy will cover the various levels of capacities (individual , organisational , institutional). It will include technical issues related to IWRM, CC and urban planning but also change processes at the level of the organization.

The strategy should define a sequencing of results areas (and milestones) that should consider quick wins as well as long term objectives. It will define a long-term plan, including key priority sort to medium actions that could be easily developed by the project. Considering the large number of actors involved in the climate change action plan of the province, the strategy will identify the key agencies and, among them, the specific related units on which the project should focus on. This selection will be based on a set of objective criteria including the role of the agency/unit to implement the provincial plan and the wiliness from both the organization and the individuals to participate into the process. A formal approval from the concern authorities to support the required future institutional and organizational changes will be needed prior to the start of the elaboration of detailed strategy for each specific agency/unit. Organizational engineering tools such as CAF or 6Sigma will be used to develop solutions to improve the processes of the selected institutions.

During the whole duration of the project the capacity building activities shall be carried out in accordance with this capacity development strategy. Sufficient flexibility will be foreseen in order to allow regular review and adjustment of the strategy according to evolving capacities but also to the changing environment.

Active training

An expected result of the project will be to enhance the technical capacities of the local authorities notably in the fields of CC, IWRM, urban development and community involvement. In coordination with the TSU, this will be applied through appropriate training activities.

At selective occasions during the project, the authorities' capacity to better understand and evaluate, and to develop appropriate solutions on the impact of CC on settlements and on the daily life of people, will be increased through training sessions. In addition specific training needs within the PCU and the province authorities will have to be met (e.g.. improving communication skills, working in multi-disciplinary environment, preparation of information for the public...).

So as to carry out effective training, the use of modern training techniques and pedagogies should be supported wherever possible. Special attention will be given to the participation of women and women leaders in these activities and the integration of gender specific training topics in the training programmes.

Much of the initial training will need to be directed towards the stakeholders involved in the planned studies and investments related to the project. Technical training will be given on covering broad fields such as database management through GIS, difference between CC and CV and their differentiate impacts on planning, CC modelling, green economy, integration of adaptation and mitigation measures towards climate change into the urban planning process, participatory planning, strategic structural planning, priority action plan, sustainable urban planning, energy and water efficient buildings, construction norms, communication skills, gender, community involvement, development of an project exit strategy...

However the project not only aims to strengthen the technical skills necessary to implement technical activities but also to integrate the provincial authorities into a unified approach to water resource management and a comprehensive spatial planning of the entire province and its urban areas, considering the links of the cities with their hinterland in the perspective of CC. This will be implemented through a more general and conceptual training on IWRM, urban planning, CC and environmental management concepts and approaches, following sustainable development principles.

Exchange of experience

In addition to more classical training the project will also promote learning from national and international experiences. A variety of activities shall be considered, such as experience sharing working groups on topics specific to the province; on-the job training and coaching, learning by doing, national and international study tours, etc where appropriate, in coordination with TSU and the other two provinces activities.

Special attention will be given to the SEA for urban planning projects and the EIA on physical infrastructures conducted so far within the province to be compared with the international best practice.

Studies as on-the-job training

The different studies developed in chapter 3.3.2 will be conducted in close cooperation with the related departments, this exercise being considered as an on-the-job training activity. Consultants, research centres and academics involved in these studies will therefore be attentive of conducting these studies in close consultation/cooperation with the related authorities and stakeholders, with the management and technical guidance of the TSU.

Links with academics and research centres

The support of academic research in the related fields and the specificities of Ha Tinh province will be favoured. The project will favour academic studies related to CC, IWRM and urban planning, providing all the required data and information to these studies.

Links with national and international universities and research centres are considered as opportunity to:

- Favour exchange of information;
- Promote basic and applied research activities both at national and international levels based on the data collected within the course of the project;
- Favour project contribution to intergovernmental thinking on CC;
- Develop the local knowledge and explore alternative solutions;

Cooperation with national universities and research centres in association with renowned Vietnamese and international universities will be favoured to guarantee the quality of the studies as well as to facilitate the introduction of new concepts and ideas in the local debate. In coordination and support with the TSU, the project during the set up phase will select the most appropriate partners and will define the most appropriate working modalities with them (e.g. MoU).

All the training tools produced by the project will be evaluated after implementation for lessons learned. The useful materials will then be transferred to the central level for scaling-up.

Activity 1.4 Strengthen cooperation/coordination mechanisms among agencies with regards to CC issues in the water and urban sectors

This activity will be detailed further after the stakeholders mapping and the institutional and organisational capacity assessment of activity 1.2.

In that respect, the role and links between agencies with regard to improved coordinated integration of water resources management, CC and spatial planning will be reviewed, such as:

- DPI, in relation to introducing bottom up approaches to the implementation of the SEDP;
- DoNRE in relation to integrated Water Resource Management and CC;
- DoHA in relation to capacity building and PAR;
- DARD in relation to agriculture and spatial rural development, particularly irrigation schemes;
- DoC in relation to urban planning and the construction of physical infrastructure projects;
- PPC of the selected towns; and,
- Donor funded projects within these areas.

Considering the number of actors involved and the fact that the success of such coordination improvement depends very much on the organizations willingness to participate, the project will have to limit its efforts in few technical fields requiring the coordination of a limited number of agencies, as a demonstration case. The definition of the focus areas will be directly related to the outcomes of the survey described in point 1.2 and the related CD strategy developed in point 1.3.

This exercise will assist the administration in developing local legislation and operation modalities to support the sustainability of new coordination mechanisms, procedures etc, including participatory mechanisms with the citizens and the private sector.

It is expected that the Provincial Anti-corruption Committee shall be consulted in order to secure the clarity and transparency of the new coordination mechanisms.

This strengthening of institutional linkages will be applied following a step-by step approach. Exchange of information, as well as coordination mechanisms will be developed among the related selected agencies in order to help PPC to develop and apply a comprehensive strategy to tackle CC issues in the fields of water management and urban planning considering both adaptation and mitigation measures. The PCU, with the support of the TSU, will play the role of facilitator among the different agencies, while considering the set-up of a technical coordination committee to give advice to the PPC, to be coordinated with the River Basin Committee of Luy river (see chapter 4.2).

Technical consultancy, training and coaching will be provided with the support and the guidance of the TSU.

In parallel, exchange of information and cooperation mechanisms will be developed between the 3 provinces involved in the Belgian-Vietnamese CC program. Exchange of lessons learned, coaching, joined activities will be organised with the support of the TSU throughout the project duration. There will be a shared workshop on the application of these tools to integrate gender into the daily functioning and organisation. Specific lines are foreseen within the 3 project budgets to support this cooperation exercise. TSU will ensure the coordination of the use of these funds.

Activity 1.5 Data collection

This activity is articulated around 3 specific tasks (i) collection of existing data throughout the project duration, (ii) baseline survey of CC data and (iii) additional surveys. The collected data and the regular monitoring of key indicators will also be used as the baseline study to evaluate the impacts of the project.

Where relevant, socio-economic and demographic data will be disaggregated considering women, men, elderly and young, as well as specific vulnerable groups in society.

Existing data inventory and collection

A large number of initiatives have been undertaken either by GoV or donor projects to collect valuable reference data related to IWRM, hydrology, meteorology, including natural disasters (e.g. the WB Natural Disasters Risk Management Project or the Institute of Geography/VITO project funded by Belspo related to desertification and CC), socio-economic analysis, specific data collection for infrastructure design...The prime activity of the project will be to conduct an inventory and to collect those data, to assess their degree of accuracy, in order to compile and analyse them in a later stage in a GIS (see activity 1.7). TSU will support PCU in this task, especially in the relation with the central level. However, considering the abundance of data, the operational relevance of the data in relation to CC and its impact on settlements should be carefully assessed.

All the national and provincial agencies will provide in due time all the required available data that will be listed during the set up phase and the periodicity of the update of these data defined.

Available data will be provided based on the cost norms of Vietnam, but whenever as possible, free of charge. Any excessive requirement related to the collection of data by a public institution should be endorsed by the Vietnamese contribution on the top of the project funding.

Baseline survey of both the project intervention and CC impacts

In order to obtain a detailed picture of both the legal framework and the prevailing local situation, a baseline survey will be carried in the Luy river basin, with a focus on the 3 target towns. This survey will collect the necessary information to both evaluate the impacts of the project based on measurable quantitative and qualitative indicators and to measure a set of CC related data, both types of data being linked.

The baseline study of the project will define the M&E system and indicators. This is an essential tool for the follow-up and control of the funds (value for money) provided by the Belgian government. Its proper definition and use is mandatory, but it should be developed in order to guarantee ownership by the PCU and Provincial structures.

The baseline will be developed in two complementary and consecutive phases:

- The first phase is a prerequisite of project management good practices. It will focus on setting up a M&E system at project level, allowing the follow-up of activity implementation. It will mainly define outputs indicators directly linked to the planning of activities. It will be owned by the PCU and will respect BTC and Vietnamese standards in terms of project management. It will be finalised for the end of the set up phase and approved by the PSC;
- The second phase is an output of the project. It will focus on setting up a M&E system at sector level, allowing the follow-up of the CC effects, and linking activities and outputs of the project with concrete results at Provincial level. It will mainly define outcome and impact indicators. It will be owned by the permanent technical structures at Provincial level. It should be finalised six months after the end of the set up phase and approved by the PSC.

Taking into account the strategic orientations of project, the baseline and M&E system at sector level will be revised after the completion of the studies related to CC and will be part of the updated Master plans. The M&E system at project level will be updated accordingly. Any revision will be justified, documented and approved by the PSC.

The baseline survey will include:

- A Socio-economic survey, including, vulnerability and poverty mapping, gender issue, population behaviour and level of awareness on CC issues (CC present and future impacts, perception of their vulnerability, knowledge of the adaptation and mitigation measures from national to individual levels). It will be important to develop vulnerability, gender and poverty maps that visualise the impacts of CC on the population and its assets, especially the urban poor. With such tools, it should be easier for the local authorities to make urban infrastructure investment plans more inclusive, poverty-focused and sustainable;
- A situation analysis of the level of knowledge of the CC issues of the local authorities, from province, district to commune levels and the on-going strategy and activities to limit CC impacts in their respective tasks and responsibility;
- During this exercise, the list of appropriate quantitative and qualitative indicators, including gender issue, to evaluate the intervention will be defined in detail, as the list is dependent on the existence of a database. The first step will be the organisation of a participatory workshop during which the project indicators proposed in the logical framework described in chapter 7.1 will be fine-tuned and converted into more measurable indicators that will be used during the baseline survey and will be regularly monitored during the course of the project.

Additional surveys

Additional surveys might be required depending upon the outcomes of the above efforts. Based on the analysis of the quality of the collected data, a listing of complementary data collection will be made by the PCU in dialogue with the TSU. The most needed information will then be collected and analysed through the appropriate surveys.

Whenever useful and relevant, selective information can be included within an appropriate Geographical Information System (GIS) as explained below. However, the necessity of additional surveys and the use of information systems and tools should be evaluated on the basis of their operational and decision-making relevance.

Activity 1.6 Support to hydrological and meteorological monitoring stations

This activity foresees the provision of equipment to support the existing stations to collect reliable weather and hydrological data for climatic forecasts and hydraulic studies. As GoV is planning to invest also in the upgrading of the existing stations, close coordination will be required to avoid duplication, while only a limited budget will be provided to fund this activity.

This activity will include the training for the use of equipment (hardware and software) and support to the setup of the operation and maintenance (O&M) measures to guarantee the operational durability of the stations.

The provision of water resources monitoring equipment and the definition of measurement methodology (quantity and quality of both surface and ground water) will be made in consideration with the Guideline on Standards for Monitoring and Assessing Water Resources in Vietnam produced by the BTC/MoNRE CAPAS project.

In general, the density of observations with the existing meteorology and hydrology network in Binh Thuan province is sparse. There is no hydrological station or rain-gauge station on the upstream part of

the Luy river system or on the reservoirs. This affects the collection of observation information for natural disaster threats as well as for the optimisation of the regulating reservoirs.

The various stations are using mainly manual equipment, not allowing real time measurement and modelling, lacking the relevant synchronised and automatic sensors. The uploading of data is slow due to the use of un-dedicated landline telephones, which are used extensively by members of the public seeking information during extreme weather conditions (such as storm, rain, and flood).

This activity foresees both the upgrading of existing stations and the construction of additional monitoring meteorological and river gauging stations. The location of the existing hydrological and metrological observation stations are shown in the map below:

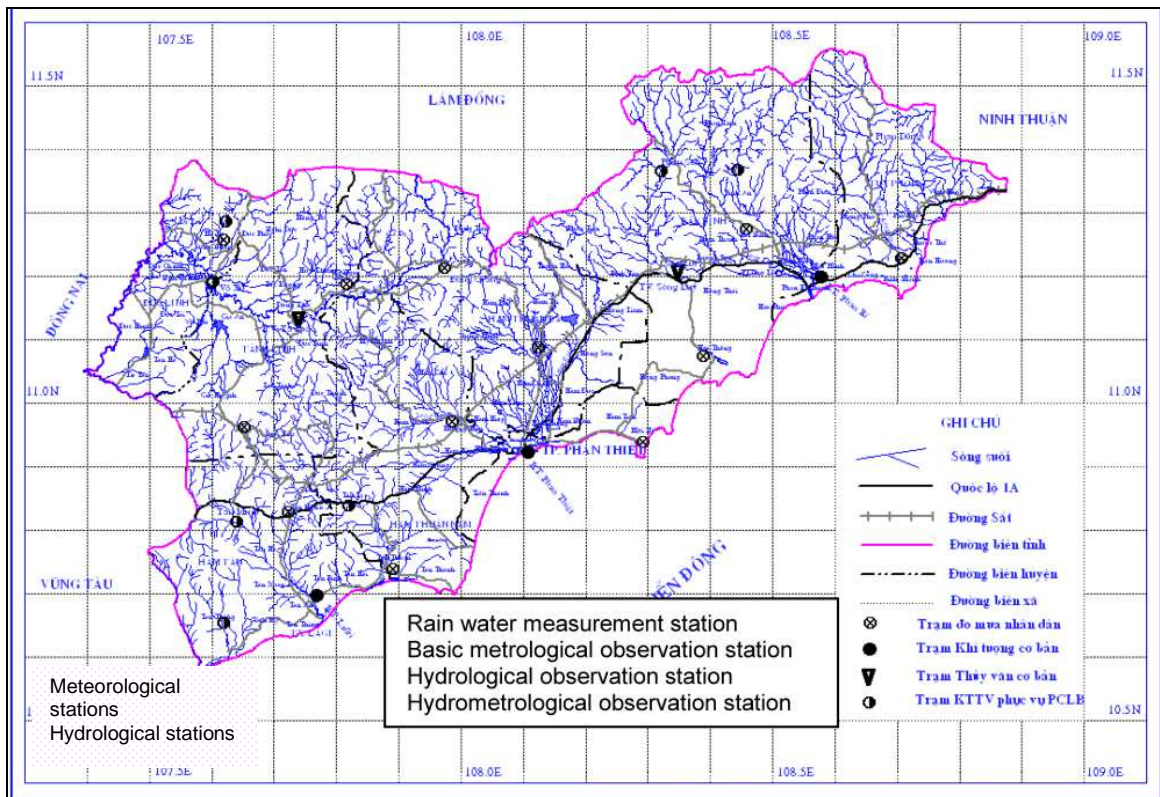


Fig. 11: Localisation of the existing meteorological and hydrological stations

The below proposal is to support the existing hydro-met stations and to develop new ones. It will be revised during the start of the implementation phase, considering the limited available budget of the present intervention, while considering in priority the needs of the stations covering the Luy river basin. It is considered that to implement natural disaster mitigation effectively, to improve the capacity to respond to CC, additional meteorological stations and a hydrological station on the upstream of the Luy river, at least four public rain-gauge stations (or auto-reporting rain-gauge), and additional oceanographic monitoring stations along the coast are required. The following network is envisaged (four meteorological stations and seven hydrological stations).

Most of the existing hydrological and meteorological observation stations are lacking of basic equipment and mean for transmitting the information to the regional and national analysing centres. It is proposed that the existing hydrological observation stations to be equipped with (i) water depth chart recorders, (ii) flow measurement equipment⁹, (iii) equipment for transmitting the information to centres

⁹ These measurements will consider the horizontal river bed cross section that is needed for the calculation of the water flow

at provincial, regional and national levels considering the following basic equipment:

- Water level measures
- Water temperature thermometers
- Automatic water level recording
- Flow meters
- Rain gauges (bottle and tube)
- Contact information: computers and internet access

Comprehensive training in O&M of the equipment will support the provision of equipment; the collating, recording and analysis of the data obtained and storing and transmitting information.

It is envisaged to equip the existing meteorological stations with the following equipment:

- Self-recording rain-gauge (SL1- TQ) and pluviometer
- Timed temperature measurements
- Thermometer to measure air temperature (four)
- Timed humidity measurements (TQ)
- Automatic reporting anemometer (EL1 - TQ)
- Self-recording anemometer
- Contact information: computer, and internet access

Internet-connected computers (with DCOM 3G) are required to connect directly with the Centre. With current equipment, it takes 15-30 minutes to receive information from Nga Trang Regional Centre by the Binh Thuan Meteorological and Hydrological Centre (assuming favourable conditions). The following are envisaged, (depending on the available budget).

- Periphery hydrological stations: internet-connected computer, printer, mobile phone, and an automatic water flow tester (Flowquet 600), generator when required;
- Binh Thuan Centre: two, high-speed computers, one laptop and DCOM 3G to send and receive information, 1-2 mobile phones to receive message directly from auto-reporting rain sensor

A network of rain-gauge stations is need that transmits real-time data in Binh Thuan province, especially in western mountainous region for warning and forecasting flood in downstream areas and flash flood warning in mountainous areas:

- Anticipated equipment: Experience of the BTC/MoNRE CAPAS project will be taken to select the required equipment, considering automatic rain gauge system, data transmission in real time VH-022R produced in Vietnam, deployed to cover 83 measurement points located in the northern mountainous provinces controlled by the National Hydro-meteorological Centre.
- Anticipated locations: to be defined during the set up phase.

Training courses to improve staff capacity on CC, responding to CC, access to information technology is also required.

At provincial level, DoNRE, as responsible for water resource management, will play the lead role in integrated water resource management. Therefore, DoNRE will also be equipped with a server to

(m/s) and the volume stream (m³/s).

receive, analyse, synthesize and record all the information measured and transmitted from river gauging stations. DoNRE will also be supported with hardware, software and necessary trainings for managing all surface and groundwater resources in the province. This includes: (i) availability of water sources; (ii) level of their exploitation by all water user groups (domestic, industrial, agricultural, tourism, hydropower etc...); and, (iii) quantity and quality of used water discharged into water resources. These information will be used for the socio-economic planning development of the province.

Significant cooperation and coordination will be required with DoNRE, DARD, the IMC and the Department of Statistics to obtain additional data required (rainfall and evaporation, reservoir level, dam discharges, irrigation off take quantities etc) to fully analyse and model the water resource situation in the Luy river basin and to develop action plans and appropriate integrated operational strategies. The budget for O&M of the new stations and equipment is to be foreseen by GoV.

Activity 1.7 Data base management

In order to analyse the information, plan, ensure proper coordination and, subsequently measure progress of the project, a database must be set up, integrating all the above information through the creation of a comprehensive but also appropriate, cost-efficient and selective GIS.

Different data bases have been set up in Vietnam with ODA assistance such as the IWRM data base developed by the BTC/MoNRE CAPAS project VIE 07 034 11, an interactive Water Resources Data Base (WRDB), including a basic version of the Water Resources Information System (WRIS). The technical description of the WRIS is presented in the annexes.

The existing WRDB system may be expanded to include Climate Change (CC) and other relevant environmental, socio-economic and urban data. The existing WRIS may be enhanced by adding graphic assessment tools and other crucial functionalities to assist the PCU and the TSU in the implementation of the project.

The specific objective of the GIS Water Resource and Climate Change Data base (WR-CCDB) shall be:

- Adjusting the existing WRDB to integrate and record all necessary information about water resources, climate change and urban development based on the various surveys and data collection described above;
- Importing the existing meteorological and hydrological data from the national network into the WRDB;
- Adding on the WRIS some crucial graphic analysing and statistic tools (e.g. time lines) and program assessment queries for the interpretation on quality and quantity of water resources and CC effects;
- Import automatically all collected data (data logger under the WR network, managed by the DoNRE), related to WR and CC, e.g.: from GW wells and SW gauging station;
- Importing in WRIS actual land use maps (digital) of the province;
- Considering the classification of "potential hazards of land use in relation to the water resources, using methodology POSH" and program assessment queries in the WRIS;
- Importing the CAPAS Water Resource Status Template into the WRIS to use it as a standard reporting tool on water resources;
- Adapting the WR Status Report to the CC issues and design a report tool on CC effects in relation to IWRM and urban development.

This database should be considered as M&E tool on CC aiming at reporting the main outcomes and lessons learned of the project to the line ministries in charge of CC, IWRM and urban planning (MoNRE and MoC). TSU will coordinate with the 3 CC projects the selection of the selected software and its customization.

The database will be installed within DoNRE. It will be responsible for all data entry throughout the project duration and future data analysis and reporting. Support will be given to the department with equipment and training of the staff to be appointed by PPC. During the set up phase, the possibilities of integrating the database of the 3 provinces at central level, will be explored. Such a centralised database should be seen as a component of a more comprehensive strategy to tackle IWRM/CC issues at central level.

The improved planning mechanisms supported by reliable data will lead to a better and more effective prioritisation of planned investments to tackle CC. This activity will include training and coaching consultancy services.

Activity 1.8 Communication and dissemination of lessons learned

In line with the Paris Declaration and Hanoi core statement on aid effectiveness, to increase the efficiency of aid and to consolidate efforts in the target sectors, this activity will focus on the development of a learning network of related projects both nation-wide and internationally, through active exchange of information and experiences with the support of the TSU.

The Project will document the lessons learned and include central government ministries in follow up, so that positive results could serve as models or inspire necessary changes to national regulation. The PCU, through TSU will involve the line ministries like MoNRE, MARD and MoC to participate at key project steps, and invite them for workshops, as well as for MTR & FE meetings. The project will then develop a few selective and carefully chosen tools to ensure proper dissemination of lessons learned throughout the project life span.

As part of an IT support, the project will support the department assigned by PPC to design/update the province's website, integrating the IWRM, urban planning and CC issues, having in mind the idea, among other objectives, of facilitating the exchange of best practice cases drawn from similar projects. This will eventually be accessible by other donor projects in other Provinces on a reciprocal basis. Links with the Vietnam Urban Forum (VUF) website will also be explored.

The development of such communication tools will contribute to the setting up of coordination mechanisms and support vertical and horizontal coordination between project stakeholders. The website may also function as a source of information for private citizens. It should be made accessible through the commune one-stop shops. This should not be a "stand alone" activity but should be considered alongside other communication and awareness activities (see activity 4.1) such as local TV, radio, billboards, loudspeakers etc.

3.3.2 Result 2: A comprehensive CC strategy is in place

Activity 2.1 Comprehensive studies and modelling of the Luy river basin

This activity will consist of a series of studies of the local conditions, followed by modelling that will consider different scenarios of investment interventions. During the development of these studies a multi-disciplinary approach through cross-cutting sector analysis (CC, IWRM and urban planning) will be promoted in an integrated way. To do so, exchange of information and coordination between the experts in charge of the different studies will be ensured with the support of the TSU.

Collaboration between the consultants firms, the academics and research centres involved in the

related fields and all the related stakeholders (different level of authorities, communities and private sector) will be favoured, through the support of the TSU, the studies being considered as an opportunity for capacity development of the related authorities. To guarantee the integration of the world best practice and the promotion of innovation, the consultant teams in charge of the various studies will be composed of both national and international experts.

The challenge will be to remain very selective and well-focussed on the project objective; i.e. to link the understanding and impact of CC on well-defined settlements and cities so as increase resilience and make better decisions to develop more sustainable settlements and communities.

At different stage of the studies process, exchange of information and cooperation between the 3 provinces of the CC program will be favoured through the TSU. The latter will also provide technical guidance for writing terms of references of the studies and for the technical follow-up of the studies and modelling.

As key steps, such as terms of reference writing, progress and final reports, the input of other donors and academics will be requested through the TSU, as peer review. The related costs will be taken from the related studies budget lines of the intervention. This quality control exercise will be a guarantee of quality, while favouring the endorsement of the donors' community of the studies and to favour alternative sources of funding.

Vulnerability assessment

An analysis of the province vulnerability to natural disasters and CC affecting public infrastructures, private assets, livelihood and income generation activities within the Luy basin area, with a focus on the 3 target towns, including the review of physical capital (access to improved water supply, sanitation facilities and services), economic capital (sectoral productivity, access to employment and productive assets), and financial capital (HH wealth characteristics).

Hydraulic study

An hydraulic study and modelling of Luy river basin, covering all the tributaries influencing the flood conditions of Luong Son, Cho Lau and Phan Ri Cua towns, considering the rainfall, temperature, evaporation and wind surveys and forecasts, the Ca Giay reservoir and Dai Ninh hydropower station impacts, including:

- Survey, analysis and modelling of the surface water within the catchment considering topography, velocity, dikes, reservoirs and various existing and foreseen physical obstacles. The study should include the identification and mapping of the present and future flooding areas, considering impacts of indirect factors such as ground waterproofing (urbanisation), loss of natural river overflow areas including wetlands, river embankments, unsuitable drainage systems, various dams;
- Regular water stress due to low water yields of rivers due to lower rainfall and higher evaporation;
- Study of recharge of underground water table that might be lower due to reduced rainfall and increased urban waterproofing;
- Pollution risk assessment based on the agriculture and industrial activity within the basin;
- Impact of sea level rise on the water levels within estuary leading to increased overtopping stress on canal and channel walls, decreased bank stability, and the decline in freshwater entering the estuarine system leading to change in salt/freshwater interface and consequently change in species composition as well as coastal erosion survey and modelling around the Luy estuary;
- Study of soil erosion due to deforestation, expansion of more intensive agriculture (monoculture),

increased precipitation, change of chemical change of soil composition (e.g. loss of organic carbon in silt-laden soils), desert expansion process (including wind) as well as modification of sediment transport system in river bed and estuary leading to increased erosion.

The hydraulic modelling will consider the impact of a series of potential investments within and around on of the 3 target towns aiming at reducing both flooding and desert expansion (see chapter 3.2).

Climate Change modelling

The impacts of CC require adaptation measures that should reflect three forecast timeframes: short-term 2030 (2015-2045), mid-term 2050 (2045-2065) and long-term 2085 (2065-2100). The selection of the models of predictability is usually based on a mixture of global and regional available models. Existing CC model in Binh Thuan was developed by IMHEN providing for climate change, rainfall and sea level rise scenarios from medium emission scenario (B2). Climate change and rainfall scenarios were built based on the result of combinatorial method (MAGICC/SCENGEN 5.3) and statistics method. Binh Thuan rainfall scenario was built on medium emission scenario with the assumption that the sea level in Binh Thuan is the same as the national average level.

Assessment should be based on one reference model with two more extreme models in order to consider the uncertainty. These three models will be developed for the entire province in coordination with the existing national models. Training will also be provided to the appropriate stakeholders such as DoNRE for operation, monitoring and updating of the model.

Activity 2.2 Integrated strategy on CC for the basin is operational

The uncertainties on CC necessitate evolving adaptation strategy based on regular update of knowledge (mid-term and long-term weather forecasts, risks management). The Provincial strategy should be flexible and dynamic. The following activities are envisaged:

- Support from research institutes to elaborate a comprehensive strategy in CC;
- Establish a platform of dialogue and exchange for all stakeholders to define key challenges and potential solutions in a participatory way ; (see activity 4.2) and,
- Review, select and align existing models and tools to the needs of the province, in general, and to elaborate a priority action plan based on objective criteria (see below), in particular.

The provincial strategy on CC will be based on the national strategy developed by MONRE, considering both mitigation measures that should be in line with the Green Growth Strategy to be developed by DSENRE, and adaptation measures covering at least the 3 target towns and their hinterland, considering in priority the issues of desert expansion, temperature increase, saline intrusion and flooding around the urban areas. A series of general principles will be considered in the writing of the strategy, such as resources preservation (raw materials, including land, energy and water), green growth development, endogenous economic development, sustainable planning...

Activity 2.3 Master plans revision

The growing number of extreme weather events and the dramatic impact on the fragile urban infrastructure and on settlements in risk-prone areas such as the coastal cities and towns are placing an increasing pressure for better spatial planning practices and enforcement of building codes. The project will address both issues at the provincial level through the revision of the master plans, which will require a wide range of adaptive measures in relation to urban planning – as for example, ways of designing to reduce GHG emission including green infrastructure, smart solutions for water sensitive design and energy efficiency, sustainable urban transport, while favouring compact and dense urban settlements, with appropriate green space to limit heat islands – and the support to the communities to

adapt their houses to disaster risks (see activity 4.3).

Participatory planning mechanisms shall be introduced in order to secure the active participation of local citizens, citizens groups and local interests such as tourism, industry and trade, mass organisations... Particular attention will be paid to introducing bottom up planning approaches to integrate the views of poor or other disadvantaged groups, including women and ethnic minorities.

Following these principles, the existing master plans (MP) of the 3 target towns should be revised and integrated within a single vision of the area through a regional physical and socio-economic plans covering the down section of the Luy river basin. Such a plan will specifically address the risks of linear urban development along the Highway 1A and the relationship between urban centres, their rural hinterland and the Luy river. The new MPs will integrate the preliminary results of the above studies and modelling, especially the ones related to flooding and desertification process.

Such innovative and comprehensive planning approach will be beneficial even at the level of district town as it is to be considered as a learning process for the province authorities to be duplicated afterward.

Considering that the above described studies and models are complex to develop and will need data to be regularly collected during a long period of time to increase their reliability, the MPs to be revised during the course of the present project will only consider the preliminary outputs. They will therefore need to be up-dated regularly, following the evolution of the models.

This revision will be based on the strategic structural planning approach integrating, among others, the principles of water urbanism – e.g. avoiding building in flood-prone areas, leaving space for water within the towns through an interconnected network of water bodies that could absorb overflow, within urban parks – and sustainable urban development. Careful assessment of short-, medium-, and long-term strategies and actions should be made.

In order to tackle the issue of flooding of Cho Lau and Luong Son towns in a comprehensive way, the revision of the master plan of these towns should consider in parallel the overall hydraulic problematic at the level of Luy river basin and the expansion of the White Sand Dunes area. Recommendations related to land use, upstream interventions such as dams, diversion channels, artificial ground water recharging... having a direct impact on the down-stream flooding conditions in the target towns will therefore be considered during this exercise and the hydraulic and desert expansion modelling (see activity 2.1) and included in the future revision of the regional MP of the Luy river.

The master plan revision should integrate at least the following inter-related specific issues:

- Flood control: Concrete embankment is perceived as the straightforward solution to river overflow. But alternative solutions should also be considered as being potentially less expensive and more respectful to the environment – such as upstream interventions (diversion channels, artificial ground water recharging systems...) or green banks, while having multi-purpose objectives. Diversion channels could at the same time be used as irrigation system for reforestation purpose, while an artificial ground water recharging system may limit saline intrusion and recharge water table for water drinking purposes.
- Desert expansion control: The expansion of the White Sand Dunes is a major threat for the agriculture activities around the target towns but also for the living conditions within those towns as they contribute to the temperatures increase. It is therefore essential to limit the desert expansion. The feasibility of the re-forestation using endemic trees of the Northwest side of the Luy River through an urban and productive park should be considered in that perspective.
- Linear urban development control: The linear urban development along NH1A is a natural

process that should be contained as this form of urban development is not sustainable. Alternative types of urban expansion should be explored, while considering their socio-economic viability.

- The socio-economic and spatial relationships between the selected town with its hinterland, on the one hand, and the Luy river, on the other hand, will be assessed in detail during the MP revision exercise. In that perspective, any investment will not only be considered as a technical solution to solve an environmental issue but also as an opportunity to strategically re-qualify the urban fabric through provision and design of the public spaces. As for example, the embankment proposal should not only consider the flooding issue but also the spatial relationship between the town and the Luy river by providing access to the river banks through well-designed public spaces.

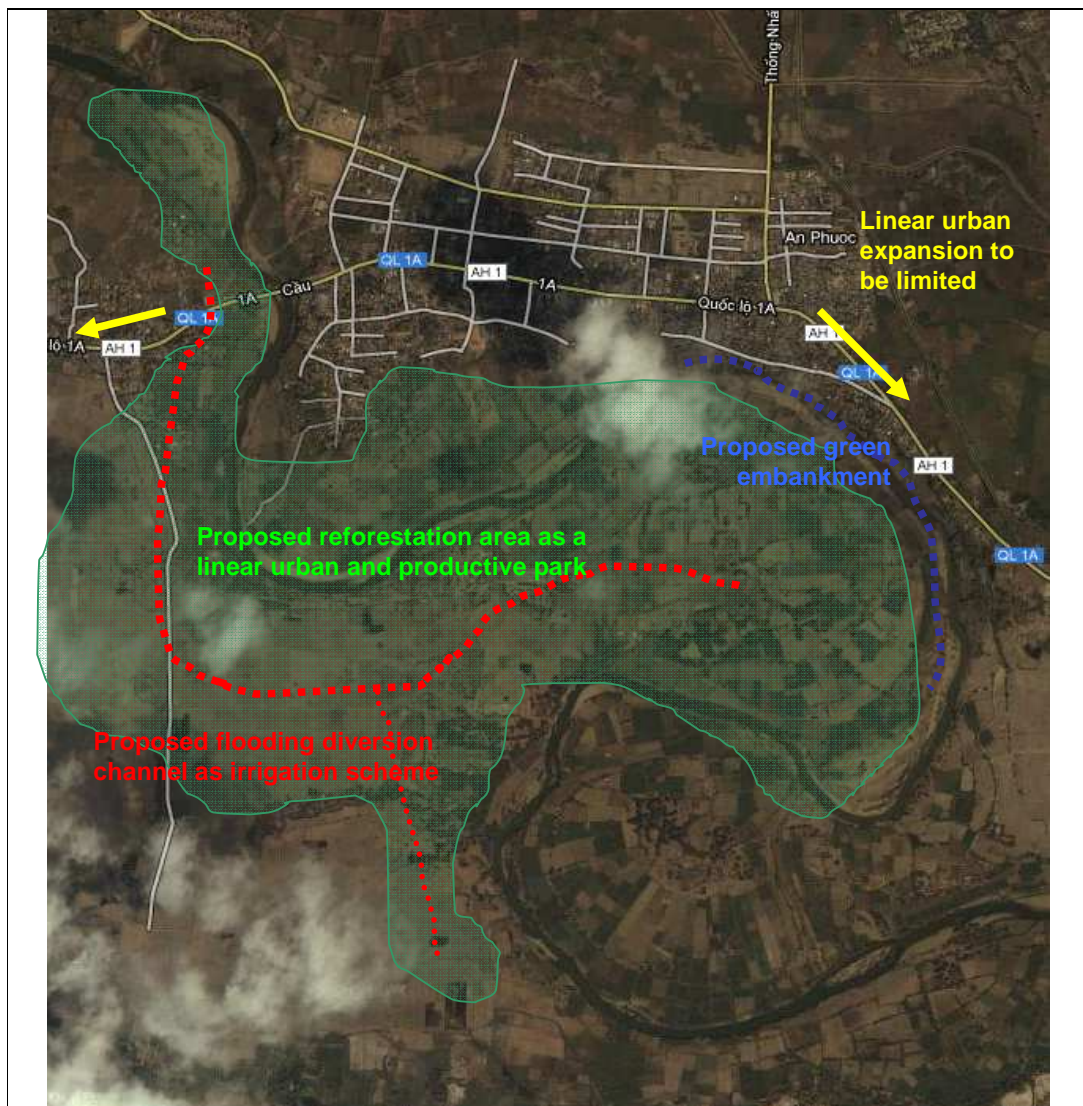


Fig. 12: Areal picture of Cho Lau with proposed activities to be assessed

Activity 2.4 Establishment of a priority action plan

Based on the comparative analysis conducted with the guidance of the TSU of the different existing

methodologies and tools to assist the decision-making process developed in Vietnam, such as the GENIES from ADB, or the Climate proofing tool from GIZ-JLIFAD, and other current practices worldwide, the project will develop a comprehensive priority action plan of the adaptation measures for the Luy basin with a focus on the 3 target towns. This process will be participatory, involving all related actors, including community and private sector representatives. It will define the investment priorities for short term, medium term and long-term interventions integrating various criteria for prioritization, such as cost-efficiency, socio-economic and environment impacts, while integrating the preliminary results of the different modelling and studies.

At the end of this process, a workshop will be organised, involving representatives of the different stakeholders at province level, ministries (MPI, MoC, MoNRE) as well as donors. During this event, the selection of the major investment to be supported by the intervention will be made, based on objective criteria. The proposal will then be submitted to the PSC for approval. The workshop will be also an opportunity to present the action plan to both GoV and the donors' community for potential funding. In order to guarantee that enough time will be provided to the implementation of investment pilot activity (see activity 3.3.3) this workshop should take place 2 years after the start of the project at the latest.

3.3.3 RESULT 3: Priority pilot activities are developed, for lessons learned, targeting one of the 3 target towns to increase resilience to CC with appropriate operational and maintenance modalities

The purpose of the physical investments foreseen in the present intervention will be threefold:

- (i) To assist, as a case study, the authorities to select the most efficient and cost-effective priority intervention within the Luy River basin listed in the action plan based on the evaluation of objective criteria;
- (ii) To experiment and test alternative appropriate technologies in the water sector aiming at adapting urban areas to CC for potential duplication after positive evaluation, both province and national wide;
- (iii) To support the local authorities in improving the living conditions of the most vulnerable urban population through the provision of appropriate physical investments.

The identification of these investments being the result of the studies, modelling and revised master plans described above, it is not possible to detail them at the present stage, and therefore, to conduct detail cost estimates. Considering the limited budget available and the importance of the needs, it could be anticipated that it will not be possible to support all the investments presently foreseen. Therefore, priority should be made, considering that to ensure a certain degree of efficiency, the selected pilot investments would need to reach a certain critical scale, while being focused on strategic areas. The selection process should be participative, including all the related stakeholders, while considering the above set of eligible criteria:

- Be related to the water sector while serving a dense and sufficiently large urban context;
- Be located within the Luy river catchment area;
- Give an appropriate answer to the strategic risk assessment described above, considering the risk on the public infrastructures, land use, private facilities, and loss of natural assets;
- Contribute to the reduction of the impacts of CC in the short/medium term to the infrastructure of one of the 3 target towns, its population and their physical assets. The evaluation of the urgency of the action should not necessarily be linked to the temporal proximity of the impacts (e.g. long-term CC impact having to be integrated into design of infrastructure). The location of the investment shall not be obligatory within the administrative boundary of one of the target towns,

but it should have a direct impact on the flooding condition of the city (e.g. an upstream investment limiting the water flow towards the city, and therefore flooding risks downstream) and/or the bordering desert expansion;

- Improve the living conditions of the densest parts of the selected urban areas, especially of the low-income households;
- Provide an optimum ratio cost/efficiency, cost/benefit with the minimum cost per beneficiary. The adaptation measures that have the highest impact at the lowest cost, while having the lowest socio-economic and environmental impacts should be considered in priority;
- Be innovative in terms of design, technology and operation modalities;
- Respect the hierarchy of the impacts with an emphasis on transversal stakes;
- Positive evaluation of the readiness of all the different actors (authority, private sector, community) to assume the different consequences of the adaptation measures, not only in terms of finance, but also in change of behaviour, impact on the landscape, socio-economic side effects and so on.

The intervention will be specifically designed to adapt the area to CC. All relevant authorities involved in the approval design process, will allow the project not to strictly follow the present design standards and construction norms of Vietnam that have not yet integrated CC.

The TSU will provide its technical input during the selection process of the pilot activities through technical guidance and non-objection, as well as throughout the design and implementation process of the selected one(s). The following paragraphs are presenting, in order of priority, the type of investments that are presently foreseen.

Activity 3.1a Flooding prevention investment targeting one of the 3 target towns

The investments will be the result of the studies and modelling of the Luy river basin. The priority action plan will verify the pertinence and the order of priority of activities listed below for potential investment, while considering their feasibility according to the available budget.

Although it would be recommended to develop the comprehensive set of investments defined in the revised master plan, due to budget constraints, this activity will only consider either working upstream to limit the overflow of the Luy river during the rainy season, or to develop a set of interventions within the target town to limit the impacts and the duration of the flooding.

A series of upstream interventions could be envisaged such as:

- Direct interventions on the shape of the Luy river bed and its banks to influence water flow;
- Diversion channels to collect the overflow (to be potentially used as irrigation channels);
- Artificial ground water recharge systems such as surface and underground dams; or,
- Retention lakes around the target towns to be used as green spaces.

Within the target town, beside the development of a proper drainage system, a scheme should be studied to protect the most exposed river bank areas from both erosion and overflow. Instead of an expensive classical concrete embankment project, alternative and cheaper solutions will be explored. Recognizing the value of riparian vegetation in preventing flood damage, the feasibility of "green embankment" will be considered as well as other techniques such as gabions, or small peeps placed perpendicularly to the banks at key locations to divert the water flow from the most exposed banks.

The feasibility and the impacts of the above proposals should be assessed in detail through the

hydraulic modelling study (see activity 2.1), considering cost/benefit, socio-economic and environmental impacts as well as their urban integration within the town. The most promising solution from which valuable lessons could be learned for duplication should be selected in priority.

Activity 3.1b Desert expansion limitation around on of the 3 target towns

Beside an investment aiming at limiting flooding, the project could alternatively consider an investment aiming at limiting desert expansion around the selected town. Re-forestation through endemic trees is an option that should be assessed in detail considering both environment and socio-economic impacts. Provision of water to the new forest area would be a key issue. It could take the form of either irrigation channel or artificial ground water recharge system, following the experience of a similar project developed in Ninh Thuan “Re-hydrating the earth” supported by the Dutch cooperation in 2009. In any case, the water needed for the trees growth should not compete with the water demand of existing surrounding activities.

The resulting forest area could have several functions. The area should be economically sustainable, the selected trees having a productive function, while part of the area could be used as a recreation park for the adjacent town. The positive impacts of such schemes to the well-being of the population living nearby should not be under-estimate as such a schemes could reduce sandy winds coming from the White Sand Dune area as well as the average temperature within the town.

Likewise, and equally important will be to raise the importance of a long-term reforestation programme from the higher grounds of the river basin, including the built-up areas and up to where the river basin meets the coastline. Benefits are multiple (protection against erosion, slowing down of run-off, increasing permeability, stimulating biodiversity, absorption of greenhouse gasses, ...).

Here again the feasibility of such proposal will be integrated within the hydraulic and the desert expansion modelling to assess its potential impacts before selection.

The Project Steering Committee (see chapters 4 and 5) will approve the choice of the priority investment, based on the technical comments formulated by the PCU and the TSU. The resulting costs of the chosen activities will include the consultancy fees related to the study, EIA, appraisal and supervision of the works, the investment infrastructure and the related investment for its proper integration within its/their physical environment. The costs related to land acquisition, compensation and O&M will be covered by the provincial authorities above the present Vietnamese contribution.

Activity 3.3 Appropriate O&M measures of the constructed infrastructures

Beside the physical investment, the project will support the local authorities to put in place the appropriate Operation and Maintenance measures, including the availability of the required O&M budget. The first point will be to assist the PPC to determine the most appropriate agency to manage, operate and maintain the newly constructed facility. A series of workshops and meetings will be facilitated by the PCU and the TSU to assist the PPC to evaluate the options available, define the most appropriate agency and approve its establishment together with mandate for operation, organisational structure, staffing, operational budgets and the like.

Once the agency selected, the project will assess the capacity requirements of the organization and staff, and develop a comprehensive capacity building and training program. The training program will be implemented during project construction and commissioning to ensure that the O&M agency staff participate and is fully trained and ready to take over the facilities from the construction contractors. This activity also aims to provide for the long-term sustainability of the selected agency. It will assist them to manage asset inventories, prepare O&M plans and guidelines, and budget for appropriate asset maintenance.

3.3.4 RESULT 4: Active involvement of the communities and the private sector

Activity 4.1 Awareness-raising of all stakeholders

Limiting of GHG emissions and the vulnerability risks of the private assets to the CC require adapted population behaviour, including on a gender perspective. This necessitates a long-term and efficient communication strategy. The following activities should be developed in the framework of the present project:

- Assess the agencies and different local initiatives involved in awareness raising issues (Women's Union, Youth Association, Ministry of Education, DoNRE, ONGs and private initiatives...) to ensure their coordination while favouring networking with different existing initiatives in Vietnam and in the region for exchanges of good practices;
- Develop adapted awareness raising strategy targeting the different population groups as well as related agencies, especially in the 3 towns, through different media in a coordinated way with guidelines, medium and long-term actions plan, and regular evaluation. A series of messages shall be provided to the local authorities, the population and the economic actors on:
 - o The foreseen short-term and medium term impacts of CC and natural disaster vulnerability risks on the lifestyle, income activities, housing conditions;
 - o The importance of mitigation and adaptation measures, including adapting the existing building stock to climate change;
 - o The purpose of IWRM and the role of the different stakeholders in the preservation of water resources, considering the advantages of artificial ground water recharge and rainwater harvesting systems, as well as limiting the excessive coverage of soil waterproofing;
 - o Promoting change of behaviour and sustainable buildings and urban development as a means to develop eco-friendly, energy and water efficient buildings and neighbourhoods (mitigation).
- Propose alternative activities to accompanying the awareness raising campaigns to strengthen their effect, including coordinated action plans including all the actors involved;
- Training the staff of the selected agencies in the strategy and guidelines;
- Pilot projects activities targeting the beneficiaries of the infrastructure investments of the projects and evaluation. These pilot activities should provide general messages on the importance of adaptation measures to CC, including of their house and their neighbourhood, as well as the application of a river contract, both activities described below.

Activity 4.2 Establishment of different platforms for dialogue with stakeholders

In order to raise the awareness of the stakeholders, promote their active involvement and favour participatory planning, some platforms for dialogue should be put in place including key representatives from the local authorities, the target communities and the private sector. The set-up of the Luy River Basin Committee is therefore required.

This Committee is aiming at (i) favouring the dialogue between all the water users of the Luy River basin that could be translated into a River Contract (the definition of a river contract is provided in the annexes); (ii) supporting the development of the CC strategy and the related priority action plan of the province; and (iii) guiding the strategic planning process of the 3 selected towns and their hinterland. This committee will be the coordination body to establish the long-term vision of the towns, initiate

strategic activities, evaluate them and revise regularly the plans based on their evaluation.

The project will support the PPC to define the most appropriate modalities and legal framework to set up such committee - that might be divided into 3 thematic groups, or taking the form of a general Committee – select the representatives, and establish the operation modalities with the aim of insuring a certain degree of autonomy and sustainability. A particular attention will be given to the representation of women and other particular groups within the Committee and its thematic groups.

The PCU will act as facilitator and secretariat of the Committee, before establishing more sustainable solutions with the related stakeholders.

During the set up phase the exact geographical coverage of the river contract within the Luy basin will be assessed (it could be limited to a sub-basin), its success depending primarily on the wiliness of the different stakeholders to participate actively into the process. This experience will be used as a demonstration. Development of integrated river management through the set-up of a river contract even within a single district is complex and entails a range of different types of activities. These include:

- Technical studies, such as hydrological data collection, analysis and modelling which take into account existing and foreseeable variations, anomalies and CC trends;
- Infrastructure, including assets inventory of existing infrastructure, assessment of the condition and suitability of current water structures, and rehabilitation or construction of new infrastructure for water use efficiency and effective management especially in the face of increased climate variability;
- Institutional, including establishment of efficient local water management institutions or authorities for irrigation sub-systems and water storage;
- Social, especially development of water users groups, education and public awareness, as well as agricultural extension support; and,
- Management and governance, with training and capacity building for various stakeholders, including development of a self-sustaining financial system of tariffs and revenue to support operations and maintenance of physical infrastructure.

The river contract will help the different actors to:

- Understand the implication of their activities on water quality and quantity;
- Clarify their role and responsibility towards water management;
- Find agreement on the way to share in an equitable way the water resource among the different users, while taking into account the ecological dimension;
- Develop in a coordinated way practical activities specific to the different groups of users (households, farmers, family-based industries...) to improve the quality and the quantity of both surface and underground water within the selected basin or sub-basin.

3.4 Indicators and Means of Verification

The indicators and means of verification can be found in the logical framework. They will be revised and detailed at the occasion of the baseline survey to be conducted during the set up phase, as described in the activity 1.5. The baseline will consist as much as possible of the collection of existing data for which the evolution could be regularly assessed and eventually on a series of complementary information that could be collected during the course of the project thanks to the installation of new equipment.

Some of the selected indicators should contribute to the evaluation of ICP 2011-2015, its water sector component in particular. The ICP shall contribute to the implementation of the Socio-Economic Development Plan (SEDP) of Vietnam that has clear goals in terms of water management and urbanization in reference to climate change.

Some of the proposed indicators related to climate changes are:

- Evolution of annual and seasonal air and surface water temperatures and maxima;
- Evolution of annual and seasonal rainfall (frequency, intensity, spatial distribution);
- Evolution of extreme events (heat waves, extreme rainfall, drought, flood and flash flood);
- Evolution of the vegetation cover (satellite data: Normalised Difference Vegetation Index);
- Evolution of shore lines (sea level, coastal erosion, deposition);
- Evolution of electric conductivity/salinity of ground water of the shallow aquifers linked to the coastal line, as indicator of saline intrusion;
- Evolution of river flow (meandering, cut-off, saline intrusion, bank erosion);
- Evolution of the vulnerability levels of both public and private assets.

Impact indicators (secondary indicators) and adaptation indicators should be defined. As for example, with regards to flooding, the primary indicator 'very heavy rainfalls' should be followed by secondary indicator 'number of water level rises' as well as the mapping of the 'flooding risk areas'.

Considering the limited budget of the intervention and the relative small scale of the selected pilot investment, the project could not contribute significantly to the evolution of any of the above indicators. It is only through the implementation of a large part of the CC action plan, for which the implementation will have significantly contribute to its revision, that positive impact on the evolution of the above indicators within the Luy river basin, should be observed.

3.5 Description of Beneficiaries

3.5.1 Direct Beneficiaries

Capacity development

The beneficiaries of the CD and institutional strengthening measures of the Project include all the provincial departments involved in the Project implementation, namely the selected units involved in urban planning, water management and climate change issues of the PPC, DPI, DoNRE, DARD, and DoC as well as district and town officials located within the Luy basin. Furthermore the local citizens, local professionals involved in CC and urbanization plans and mass organisations involved in project activities will be direct beneficiaries of the Project. It targets also the Hydro-met regional centre in Nga Trang, and indirectly the central authorities (MPI, MoNRE and MoC).

In addition, members of the Community Management Committee, Women's Union and associated MFI, The River basin Committee and environmental motivators will benefit from the capacity development programs and be able to use the skills learned in other donor or government funded awareness programs.

Staff members of the O&M agency will benefit from capacity development in management, operations and maintenance of the completed facilities enabling them to undertake their work more effectively.

Integrate Water Resource management

All the citizens of the Luy river basin, which represent approximately 108,000 people located mainly located in Bac Binh district, will benefit from the integrated management of water resources and adaptation measures strategy that will result from the different studies and planning revision. All the inhabitants of the basin will benefit from the community awareness.

Urban planning

The entire population of Luong Son, Cho Lau and Phan Ri Cua, which have a current population of about 70,000 people, will benefit from the revised master plan and action plan as they will integrate adaptation measures to CC. Direct participants of the platforms of dialogue of the CC strategy, the river contract and the spatial planning revision will benefit from the training provided, while the interest groups they are representing will benefit from the integration of their concerns and point of views in the decision process.

Households located around the implemented priority investment projects in the selected town will directly benefit from reduced flooding of flood prone areas, as the investment will attenuate peak flows. The inhabitants of the targeted low-income areas of this town will also benefit from the saving and credit scheme.

3.5.2 Indirect Beneficiaries

The overall population of Binh Thuan province will benefit from the more effective management of the water resources in the province as a result of improved monitoring of rivers, a water usage, data management and analysis, and the spatial planning revision of their urban areas integrating CC adaptation measures. The low-income households living in the urban centres will be targeted in the first place, with a focus on women. More globally, the concerned institutions and ministries at national level will also benefit from the lessons learned in order to improve their strategies.

3.6 Risk Analysis

3.6.1 Implementation risks

Item	Comments	Level	Mitigation measures
Existing data not accurate, up-to-date and/or made available	As the project is highly related to the availability of data, importance of the access to reliable data and exchange of information should be stressed. The BTC/MoNRE CAPAS Programme could be a reference.	Medium	Capacity building of the technical staff of the related departments. General agreement from all related ministries to share all the needed data at from the start of the project - Use experience from CAPAS project
Disagreement on parameters, standards, technology, methodology related to the assessments	Divergence of opinion may occur between project experts and local authorities regarding these issues	High	Exposure to good international and national practice by the TSU and support from consultants could convince the local authorities
No approval of the revised MP and the detailed design of the investment	The spatial plan and infrastructure works designed by the project aim at integrating CC	High	Technical Ministries shall approve the project objective of integrating CC in the urban planning procedure, and therefore accept the principle of not following strictly

project in each province	issues, which are still not integrated within existing Vietnam design standards and construction norms. They may therefore be in contraction, causing their non approval by MoC		the present standards and norms Set up of a Technical Advisory Committee under MPI will facilitate the resolution of such issue among ministries and ODA representatives
Chances to introduce new concepts reduced	A large number of official standards are normalizing the design of investment projects, which reduce the possibility of experimenting with alternative technologies. The concept of IWRM and CC implication in Vietnam are not widely known or understood	Medium	By carefully monitoring of the project and by retaining the right of no objection at key stages in the approval process, BTC could deploy technical assistance of the TSU in a strategic manner and positively influence the project and develop appropriate E&M tool such as the MET software from CAPAS
Legal basis and regulations on construction planning and urban planning not consistent	There are many sector plans in one city/town, which are under the responsibility of separate agencies while coordination and cooperation between these organizations are limited. There is not yet strategic vision and communication of planning ideas at all level of governments	High	Review for amendment of all legal documents on management of urban planning and architecture
Planning management methods are obsolete, fragmented, and inconsistent	The central government proposes master plans. However, planning implementation depends on the consensus and enforcement of local authorities at all levels (from provincial to communal level)	High	Comprehensive renovation of planning management methods towards more strategic, development-oriented and spatially unified
Lack of transparency in planning management and urban development	Community has a little chance for participation in planning and information access	High	Participatory planning approach; increasing transparency and information sharing in planning process
Inadequate numbers and limited capacity of engineers, planners and architects, staff in planning, designing and planning management particularly focussing on innovative CC approaches.	Enrolment issues; inadequate policies to employ capable staff; leaving of good staff for private sector	High	Capacity development activities required Selection of both national/local and international staff has to be carefully done so as to verify capabilities to transcend disciplines and sectorial approaches.
Poor coordination	Single sector approach	High	Planning and implementation have to be

between sectors, stakeholders involved and limited public participation in planning process	and limitation of multi-sector coordination		clear, detailed and represent the role of each sector and stakeholder involved as well as to determine the responsibility of stakeholders
Overlap among different sector plans	Single sector approach; and lack of coordination; sector benefit	High	Clear mechanism to mobilize the involvement of multi-sector in every step of the process of planning and implementation. Studies on new methods of planning towards integrated multi-sector planning which is spatially unified
Geological/naturals constraints	Technical constraints may occur due to unforeseen geotechnical/ natural conditions, such as water quality, soil permeability foundation conditions at project investment site, etc	Low	Comprehensive site investigations and monitoring will mitigate these risks
Delays in undertaking land acquisition and resettlement and compensation aspects or obtaining approvals	Design program affected, changes in the scope or extent of works and disruption during construction	High	Framework of RAPs adopted by PPC. Workshop procedures with PSC and SPMU and monitor continually during land acquisition / compensation phase
Lack of effective provincial mechanisms for planning and coordinating urban development activities	Potential to cause design changes during construction phase resulting in cost increases and construction delays	High	PCU to have mandate to facilitate cross agency coordination. Participation and cooperation of local agencies in project orientation programs and workshops
Construction incidents	Loss of life or worker injury. Delay in construction works	Medium	Undertake OHS training workshops prior to construction and contractors at commencement of physical works. Erect clear safety signs. Use site safety manual and appoint site safety officer
Land limitation, water scarcity and pollution	Climate change affects to environment, food supply	Medium	Improve soil quality in rural areas; advanced technology in agriculture to cope with climate change
Prolonged or severe wet season, flooding, or cyclone	Construction delays possibly leading to extension of project completion date	High	Construct in-ground elements during dry seasons as much as possible
Unforeseen environmental impacts	Need for change to project scheme designs. Construction delays	Medium	Establish Environmental Management and Monitoring framework and ensure EMPs implemented by each contractor. Assess/monitor conditions throughout project
Local authorities professionals, and major stakeholders have difficulties to coping with CC threats	This is the new and complicated issue; limitation in climate change awareness	Medium	Awareness raising on climate change impacts; adaptation, mitigation and national program on climate change. Liaise with international experiences.
Rapid increase in	Urban infrastructure	Low	Incentive in energy efficiency (fee, tax...)

energy consumption	services is overloaded		
Sustainable housing trends in future	Authorities facing challenges in new planning approach as well as revising inappropriate plans	Medium	Experience learnt; trend prediction with suitable long-term vision

3.6.2 Management risks

Item	Comments	Level	Mitigation measures
Timely access to data	Improved consideration of CC, improved IWRM and planning will depend on the smooth cooperation with key stakeholders in exchanging information. Reluctance to share data will reduce the efficiency of the program.	Medium	The PCU and TSU will set-up communication channels among partner agencies while platforms of dialogue should be set up at both national and provincial levels
Delays in approvals	The various studies and investment works detail design foreseen within the project should be approved at the provincial level.	Medium	Close contact with the PPC and the related Ministries through PCU and TSU should facilitate the procedures
Limited interest for environmental and awareness raising issues and innovative alternatives	The necessity for society to adopt a more Climate proof friendly behaviour as well as interest in alternative approaches may go in contradiction with construction standards	Medium	Changes of mentality on these issues require a long-term commitment. Highlighting-environmental issues to decision makers and exposing them to alternative solutions of both technical issues and O & M modalities is important. Contacts and networking within Vietnam should bring new ideas up-front.
Unnecessary interference	Provinces are now responsible for both planning and implementation; however some interference by the national level may still happen as strong centralized political system has a long history in Vietnam.	Low	The PCU, in coordination with PPC, may play a decisive role in strengthening the provincial agencies and gaining confidence in order to endorse their new responsibilities.
Lack of qualified staff at the Provincial and district departments	Related departments have a limited number of staff that are not always highly qualified. Furthermore staff rotation policies often result in qualified staff being promoted	Medium	Capacity building assessment will define the present skill levels and will inform the PPC in case additional skill manpower is required.
Lack of cooperation in the awareness raising activities among the related agencies	Different agencies, even involved in the same sector are not used in coordinating their action, while not being professional	Medium	Consensus and dialogue being part of the decision making process, development of a platform of dialogue, including the non-govt agencies as well as networking might be appreciated
Contractors do not adhere to	Potential for significant adverse environmental	Medium	PCU to carefully monitor the contractor's performance and bring any major non-

environmental management plans included in their contracts	impacts and inconvenience to communities during construction		adherence of EPM to attention of relevant authority and the PSC
PCU not provided with a clear mandate to coordinate all subproject activities with government agencies	The different departments are keen to keep their prerogatives		Project SC will have to make sure that all appropriate political decision will be taken
Inadequate in-country training capacity	Most of the topics covered by the program have largely been addressed in the past by the donors' community	Low	Extensive networking within Vietnam should allow identification of the proper trainers

3.6.3 Effectiveness risks

Item	Comments	Level	Mitigation measures
Low impact of the awareness campaigns	Current annual one-shot awareness activities do not change the local habits of the population	Medium	Involvement of TSU and consultants, exposure to nationwide best practice and implementation of well-prepared IEC activities coordinated by the PCU will enhance effectiveness
Low impact of the capacity development program	Training might not be appropriate and/or sufficient to gain all the required skills	Medium	Involvement of TAs of TSU on capacity building and exposure to nationwide best practice. The training will be adjusted to the skill level and expectation of the audience
Reluctance of the PPC to fully consider regional concepts and planning of urban infrastructure development for the Luy basin	Revised Master plans of both cities might not fit with overall planning of the province	Medium	PM revision should be considered as an on-the job training activity with relevant authority to raise their awareness. Close coordination with different agencies should mitigate the risk

3.6.4 Institutional risks

Observations both at the national and the provincial level revealed unclear boundaries and distributions of tasks and responsibilities between institutions with regard to water management, climate change and spatial planning, especially when considering the city with its hinterland. Fortunately, initiatives are currently underway with the drafting of new decrees to correct the institutional imbalances. As described above, some of the project tasks will be to contribute to clarifying the roles and responsibilities of the different departments, while developing coordination mechanisms.

Item	Comments	Level	Mitigation measures
Unclear distribution of tasks and	Current overlaps of responsibilities among the different agencies lead to	Medium	Clear mandates and division of tasks and responsibilities is expected from new decrees. Exposure to international best

responsibilities between various institutions that relate to the project	loss of time and unclear situation. Despite new decrees, ambiguous arrangements may continue		practice, clearer decrees may clarify the administrative organization, while training programs will strengthen the defined agencies in charge of the Program execution modalities. New Water Law should clarify responsibilities in relation to Water Resource Management and new Planning Law in relation to Bottom up planning techniques
Lack of Provincial leadership for coordinating the project	The vertical Vietnamese administration does not favour horizontal coordination on geographic areas or transversal issues	High	PCU will have a key role in coaching the stakeholders on the importance of local coordination that will have a benefit for all parties. Intensive capacity building of agencies will occur during the Set up phase
Reluctance of the PPC to consider the involvement of the private sector	Intermediate administrative levels in Vietnam remain reluctant to develop public-private partnerships	Medium	Exposure to examples of successful experiences might promote interest
Delay in defining the management, O&M agency for investment works	Important that members of the management and O&M company are seconded as part-time members of the PCU to be involved throughout the implementation of the investment project and participate in the capacity development training programs	Medium	Options for infrastructure management will be analysed in detail at completion of the study Phase and decision implemented by PPC

3.6.5 Sustainability risks

Item	Comments	Level	Mitigation measures
No long-term application of the awareness activities	Preparation of the long-term awareness strategy and programs must be undertaken in participatory manner and developed by the agency that will implement the strategy / programs to ensure ownership	Medium	The long-term strategy and guidelines and the training conducted should ensure the technical sustainability of the intervention.
Monitoring and evaluation as well as maintenance of completed infrastructure not applied	The lack of monitoring and evaluation as well as maintenance of existing infrastructure is a problem accounted in many developing countries due to lack of funding and of political will	Medium	Appropriate O & M modalities as well as monitoring tools and reporting as well as the consolidation of financial resource should guarantee the proper maintenance of the schemes in line with the new national policy
Local agencies and organisations lack sufficient time, or are unable to provide suitably qualified staff, for training	Lack of sustainability of the capacity development, training and community participation objectives	Medium	PCU to work closely with province, districts agencies and operating agencies to develop training programs. Develop good coordination mechanism with the local agencies

Neighbourhood groups and schools not willing to participate in the project and contribute their skills	Community infrastructure outputs may not be able to be fully delivered	Low	Commence community consultation, participation and education/awareness processes early in the project. Encourage active participation and work towards gaining community confidence and ownership of the project
Consumers/households unwilling to develop appropriate adaptation and mitigation measures to their house	Lack of awareness and willingness to conduct investment for medium-term impacts	Medium	Establishment of local community groups will help WU to develop close contacts with the communities. Project provides funds to start the revolving fund. PPC and local authorities encourage communities
Contractors demonstrate inexperienced management or poor workmanship	Poor or unsafe site management. Poor construction quality. Risk of site accidents	Medium	PCU evaluation/ prequalification of local contractors is important. Establish and maintain quality control procedures throughout construction phases with TSU support. Provide construction management training
O&M program does not run to schedule. Lack of manuals, delays in the translation of the documents or agencies not able to provide suitable personnel for O&M roles	O&M training is not undertaken at the right time resulting in loss of impact and intensifying sustainability problems	Medium	Obtain PPC/PSC agreement on the provision of O&M personnel. Comprehensive O&M planning and monitoring. Clear specifications for manuals and provision of commissioning and start-up operations training from suppliers
DoNRE and DARD not willing to adopt improved practices for managing water resources on a Province wide basis	Roles and responsibilities of the two agencies needs to be clarified at early stage in project	High	Undertake orientation awareness raising workshops at early stage of the project. Assist local agencies to develop their own management policies and practices to ensure ownership

4 RESOURCES

4.1 Budget

The Belgian contribution amounts to 5,200,000 EUR. The contribution of Binh Thuan Province will amount to 800,000 EUR and will mainly consist of the cost of the salaries and other costs of the Vietnamese personnel involved in the program and premiums.

The project will ensure adherence to:

- For budget under BTC own-management: internal rules of BTC
- For budget under Vietnamese management (Project Management - PM): the most recent UN-EU guidelines for financing local costs in Development Cooperation with Vietnam.

The details of the Belgian and Vietnamese contribution are shown in the following table.

BUDGET TOTAL				Unit	Q	Amount	BEL contribution	Mod.	%	VN contribution
A			support institutional capacity in Binh Thuan in IWRM and UD in relation to CC				3,895,000		75%	526,800
A	01		<i>R 1: The capacities in CC, IWRM and urban planning within the province are improved</i>				1,035,000		20%	
A	01	01	Capacity building of PCU in project management, procurement, M&E and reporting				210,000	OM		
			Training in project management and procurement, support to POM writing with coaching	lump	1	170,000	170,000			
			Development of a M&E strategy in coordination with central level, the RR and TSU, with training and coaching	lump	1	40,000	40,000			
A	01	02	Technical Institutional and Capacity Needs Assessment	lump	1	40,000	40,000	PM		
A	01	03	Capacity building of related agencies and stakeholders in IWRM, urbanization and CC				260,000	PM		
			Training on update modeling and experience sharing working groups on topics specific to province	lump	1	100,000	100,000			
			National and international study tours in coordination with TSU	lump	1	50,000	50,000			
			Organization of workshops, seminars at province level in coordination with TSU	lump	1	60,000	60,000			
			Support to academic studies related to CC, IWRM, urban planning in the province	lump	1	50,000	50,000			
A	01	04	Strengthen cooperation/coordination mechanisms among agencies with regards to CC, IWRM & urban planning				80,000	PM		
			Training and coaching consultancy services including operational costs	lump	1	50,000	50,000			
			Coordination & coaching mechanisms with other 2 provinces	lump	1	30,000	30,000			
A	01	05	Data collection (including baseline survey)				205,000	PM		
			Socio-economic survey and baseline study, including behavior, HH knowledge about CC	lump	1	50,000	50,000			
			Existing data inventory & collection	unit	5	25,000	125,000			
			Additional surveys	lump	1	30,000	30,000			
A	01	06	Support to hydro-meteorological monitoring stations				60,000	PM		
			Hardware & software support to stations for collection, weather, climate, and hydro levels forecasts	lump	1	30,000	30,000			
			Training	lump	1	30,000	30,000			
			O & M measures	FR	1					
A	01	07	Comprehensive database management through GIS	lump	1	100,000	100,000	PM		
A	01	08	Communication & dissemination of lessons learned	lump	1	80,000	80,000	PM		
A	02		<i>R 2: comprehensive integrated strategy to respond to CC is in place</i>				890,000	PM	17%	
A	02	01	Comprehensive studies and modeling of Luy river basin				610,000			
			Hydraulic modeling of Luy basin, including flooding, surface and underground water	lump	1	200,000	200,000			
			Coastal line erosion study, including sea level rise impact, Luy river sedimentation and saline intrusion	lump	1	80,000	80,000			
			Desertification process study including geology in relation with hydraulic study and	lump	1	100,000	100,000			

			winds							
			CC modeling	lump	1	150,000	150,000			
			Vulnerability impact analysis on socio-economy and private & public assets	lump	1	80,000	80,000			
A	02	02	Support to revision of the CC strategy in a participative way based on the studies	lump	1	50,000	50,000			
A	02	03	Master plans revision of towns & hinterlands along Luy river considering CC and SSP principles	lump	1	150,000	150,000			
A	02	04	Priority action plan, methodology, tool, process and consultancy	lump	1	80,000	80,000			
A	03		<i>R3: Pilot intervention to improve physical conditions of one target town</i>				1,800,000	PM	35%	526,800
A	03	01	Physical infrastructure to adapt 1 urban center & its close hinterland to CC				1,800,000			
			Study, EIA, appraisal, supervision	%	12		250,000			
			Land acquisition	A. cost						
			Compensation	A.cost						
			Works	lump	1	1,550,000	1,550,000			526,800
A	03	02	Support to appropriate O & M measures	FR			0			
A	04		<i>R4: Active involvement of community and private sector</i>				170,000	PM	3%	
A	04	01	Awareness raising campaigns about CC impact, change of behavior, water & energy efficiency	lump	1	100,000	100,000			
A	04	02	Set-up of platforms of dialogue for Rao Cai river basin with all major stakeholders	lump	1	70,000	70,000			
			Activities related to Cao Rai river to integrate CC in IWRM and strategic structural planning	lump	1	30,000	30,000			
			Coordination and follow up	lump	1	40,000	40,000			
X			Contingencies			162,900	203,900		4%	
X	01		<i>Contingencies</i>			162,900	203,900		4%	
X	01	01	Contingencies Project management			162,900	162,900	PM		
X	01	02	Contingencies Own Management			41,000	41,000	OM		
Z			General means				1,101,100		21%	273,200
Z	01		<i>Human resources</i>				677,200		13%	273,200
Z	01	01	Technical assistance specific to the province				346,000	OM		50,000
			National technical assistant in water management and TSU liaison officer	man/m	72	2,500	180,000			
			National community and communication specialist	man/m	24	1,500	36,000			
			Independent quality control consultancy for second opinion	lump	1	70,000	70,000			
			Provision for consultancy specific to the province needs	lump	1	30,000	30,000			
			Provision for national consultancy for VN procedures	FR	1	50,000				50,000
			Legal advice	Item	20	1,500	30,000			
Z	01	02	PCU staff				331,200			223,200
			Allowance for project director part-time (from DPI)	FR	72	300				21,600

			Allowance for Deputy director full-time, expert in water management and M&E	FR	72	500				36,000
			Project coordinator	FR	72	1,000				72,000
			Allowance to collaborators of other departments		72	300				
			CC and environment officer	FR	72	700	50,400			
			Data management & GIS expert (DoNRE)	man/m	72	1,000	72,000			
			Urban planning officer	FR	72	700	50,400			
			Hydro-met officer	FR	72	700	50,400			
			Financial manager	FR	72	500				36,000
			Accounting and administrative assistant	man/m	72	500				36,000
			Translator	FR	72	1,500	108,000			
			Driver	FR	72	300				21,600
Z	02		<i>Investments</i>				57,200	PM	1%	
Z	02	01	Vehicle				31,000			
			Motorbikes	unit	2	1500	3000			
			All road vehicle	unit	1	28,000	28,000			
Z	02	02	Office equipment	unit	9	500	4,500			
Z	02	03	IT equipment				16,700			
			Computers	unit	10	500	5,000			
			Laptops	unit	2	600	1,200			
			camera & scanner	unit	1	2,000	2,000			
			Printers	unit	2	500	1,000			
			Copiers (large)	unit	1	7,500	7,500			
Z	02	04	Office rehabilitation & LAN installation	lump	1	5,000	5,000			
Z	03		<i>Operating costs</i>				229,200	PM	4%	-
Z	03	01	Office rent	FR	72	0				-
Z	03	02	Utilities	month	72	300	21,600			
Z	03	03	Vehicle operating costs (1)	month	72	500	36,000			
Z	03	04	Communications incl. internet	month	72	250	18,000			
Z	03	05	Operational costs	month	72	800	57,600			
Z	03	06	Flights and per diem (to attend TSU activities)	unit	120	700	84,000			
Z	03	07	Provincial Steering Committee	unit	12	1,000	12,000			

Z	04		<i>Audit, follow up and evaluation</i>				137,500	OM	3%	0
Z	04	01	Backstopping	lump	5	2,500	12,500			
Z	04	02	Audit	lump	11	5,000	55,000			
Z	04	03	MTR, final evaluation in coordination with TSU & other 2 provinces	lump	2	35,000	70,000			
TOTAL							5,200,000			800,000

734,500	Own M
4,465,500	Project M

4.2 Human Resources

4.2.1 Resources specific to the province needs

The Representation of BTC in Hanoi will recruit the National Technical Assistant in Integrated Water Resources Management (NTA-IWRM) and the National Community and Communication Specialist (NCC) according to BTC Human Resources policy. The selected person will be presented to PPC for its advice.

Other local staff members recruited for this programme financed by the VIE counterpart fund or BTC funds will be in accordance with Vietnamese Government rules and regulations, except for their fees: EU/UN cost norm will be applied. The selection of key staff will need to be approved by BTC prior to employment.

The list of the PCU is provided in the following table. Depending on the project implementation conditions, the PCU could submit request for personnel adjustment to PSC approval.

The PSC will have also the possibility to call for the advices of independent quality control consultancy for two specific cases:

- Quality and security control of infrastructure investment;
- Independent advice in case of conflict on a technical issue; e.g. conflict between BTC non objection and PPC decision. If consensus could not be found, recommendation will be requested to an independent consultant, for which the selection will be approved by both parties. The ToR are described in the annexes

Table 2: List of PCU staff

Function	Time allocation	Contracted by	Funded by
Project Director	50%	PPC	PPC
Deputy director – expert in water management and M&E	100%	PPC	PPC
Project coordinator	100%	PPC	PPC
National Technical Advisor in IWRM	100%	BTC	BTC
National Community and Communication Specialist	100% (2 years)	BTC	BTC
CC officer	100%	PCU	PPC
Data management and GIS expert	100%	PCU	BTC
Hydro-Met officer	100%	PCU	BTC
Urban planning officer	100%	PCU	BTC
Financial manager	100%	PCU	PPC
Accounting and administrative Assistant	100%	PCU	PPC
Secretary and Translator	100%	PCU	BTC

4.2.2 Resources shared between the 3 provinces

The programme will require the support of high quality expertise in the field of climatology, adaptation and mitigation measures with regard to CC, strategic spatial planning and IRWM, including hydrology. In order to ensure a certain economy of scale and to favour exchange of experience, this expertise will be shared

between the 3 provinces involved in the CC program financed by Belgium and Vietnam (Ha Tinh, Ninh Thuan and Binh Thuan provinces). This expertise will be located within a Technical Support Unit (TSU) at central level as to ensure overall coordination between central and provincial levels as well as among the 3 provinces.

The TSU will be composed of a series of (i) long-term national and international Technical Advisor (NTA and ITA), (ii) National officers detached from the line ministries and, (iii) short-term national and international consultants, having different tasks.

- NTA and ITA will ensure the overall coherence and coordination of the CC program, while providing on a regular basis, technical guidance to the 3 provinces. They will mainly facilitate the working process between the different authority levels, and the other actors (universities, research centres, consultant firms, communities, private sector...) and ensure the quality control of the activities. The NTAs will more specifically provide their specific knowledge of the Vietnamese context, while the ITA, among others, will bring innovative ideas in reference to the world best practices;
- National officers will facilitate the link with their respective ministries, the program having the objective to facilitate the exchange of information between province and national levels on both sides;
- Short-term national and international consultants will provide high quality expertise on specific topics.

The detail description of this expertise is provided within the TFF of the TSU.

The most appropriate linkages will be needed between research centres, universities and consultancy firms specialised in the related topics (with a focus on existing associations between Vietnamese and regional and international institutions) and the TSU to support the programme.

4.3 Material and equipment

In the framework of the intervention, material and equipment will be purchased (including means of transport, office and ICT equipment) based on a needs assessment.

The GoV will exempt all goods, equipment and services purchased for the project from all custom duties and taxation. The administrative procedures for tax exemption or tax and duties refund will be assumed by the Provincial authorities.

5 IMPLEMENTATION MODALITIES

5.1 Implementation and follow-up structures

5.1.1 Project Steering Committee (PSC)

A Project Steering Committee (PSC) will guide and direct the project. The PSC will include the following representatives as voting-members:

- The vice-chairman of the PPC as chairman;
- The resident representative of the Belgian Technical Cooperation (BTC) as co-chair;
- A representative of the Ministry of Planning and Investment (MPI);
- A representative of the Ministry of Finance (MoF);
- The Vietnamese and International TSU coordinators, as advisors and non-voting members;

The chairman and the co-chairman can invite different stakeholders, as non-voting members, to attend the meeting such as representatives from DPI, DoF, DoC, DoHA, DoNRE, PPC of the 3 target towns.

Responsibilities of the PSC

The PSC represents the highest coordination and management level of the project. It is responsible for providing the necessary strategic guidance to all project implementers and will support the project management in timely manner.

The PSC will assume the following responsibilities and is mandated to:

- Ensure that the roles and responsibilities of the different agencies and entities involved in the project are clearly defined;
- Approve the project inception report, detailed six-months action plan and annual action plan;
- Provide implementation and policy guidance to all project stakeholders;
- Appraise the state of progress of the project and the achievement of its results and specific objective;
- Approve consolidated progress and project financial reports and budgeted work plans prepared by the PCU;
- Based on the progress and financial reports as well as audit reports, approve the submission to BTC of the requested documents for fund transfers;
- Approve reports related to the disbursement and use of project funds based on the consolidated six-monthly budgeted action plans submitted by the PCU;
- Approve modifications of activities, modalities and budget realignments provided that such modifications do not alter the project's general and specific objectives nor its overall budget;
- Approve proposals related to modifications to project indicators;
- Seek approval of both Governments for modifications to the validity of the project's Specific Agreement, changes to Specific objectives, duration of the Specific Agreement and the project's overall budget;
- Ensure that annual external audits are carried out by an accredited accounting firm, appraise any findings and recommendations and follow-up their implementation. Based on the conclusions of the audit reports, the PSC will eventually decide to make the audit bi-annual;
- Ensure that the mid-term review and the final evaluation are carried out in time, as well as appraise their recommendations and follow-up their implementation;

- Approve action plan related to the closing process (planning, last operational and financial commitments), the final report and the final closure of the project, following the procedure mentioned in the guideline “Closing Procedure” provided by BTC

Operating Mode of the PSC

The PSC must meet at the end of the set up phase to approve, among others, the baseline of the project and the updated activity and financial planning. Thereafter, the PSC will meet every six months. The final PSC meeting will be organised about 3 months prior to project completion. During this meeting the draft final report will be presented for approval.

In order to facilitate coordination of the CC program, whenever possible, the PSC of the 3 provinces will be organised during the same period and before the PSC of the TSU.

Additional PSC meetings may be held upon request of one of its members.

The PSC will establish its own internal rules and take decisions generally by consensus of the members. This includes the choice of the location of the meetings.

The Project Director, the deputy vice director of the PCU and the NTA will participate to the PSC as observatory and assume the secretariat of the meeting.

The PCU Director will propose the agenda of the PSC and present the PMU 6 monthly reports as defined hereafter and in the POM for approval. A copy in English and Vietnamese of that report will be transmitted to all members of the PSC at least 6 working days before the PSC.

Minutes of the meeting of the PSC as well as amended reports with comments and recommendations from the PSC members will then be transmitted at latest one week after the meeting to all the members of the PSC and to the Attaché for International Cooperation through BTC Representation in Hanoi.

5.1.2 Project Coordination Unit (PCU)

The PPC will set up a new project coordination Unit, to be hosted within DPI that will carry out coordination, management and implementation of all the activities of the present intervention in coordination with the relevant provincial departments and the TSU.

The PPC will guarantee that the PCU is fully operational during the whole duration of the project, with the minimum staffing as defined in chapter 4. If the PCU manages other projects as well, it will make sure that the human resources are adapted in consequence in order to guarantee the quality of all the interventions.

Responsibilities of the PCU

The PCU will be in charge of the following responsibilities:

- The daily management of all activities as defined in the TFF;
- Ensure that all activities outputs are linked to the results and specific objective through a close monitoring based on pre-defined indicators;
- Assure the administrative support of the PSC (secretariat, agenda, documents, minutes, dissemination of minutes);
- Assure the effective operation of the set up phase;
- Submit a consolidated inception report to the PSC at the end of the set up phase – end month 9;
- Set up a monitoring and evaluation system to feed an evidence based planning and reporting system;
- Prepare the quarterly activity and financial reports and planning as well as the cash-call file to be submitted to BTC approval;
- Guarantee the proper use of funds;

- Prepare the annual reports and the final report;
- Prepare a draft ToR for the Mid-Term Review and other review missions as deemed required;
- Facilitate the work by providing all necessary information to the external audits and evaluation missions and to guarantee the good execution of their recommendations;
- Follow-up all the necessary administrative procedures for tax and VAT exemption/refund;
- Ensure the adequate closure of the project activities, including the preparation of the final report at the end of the project duration and other needed activities following the procedure mentioned in the guideline “Closing Procedure” provided by BTC
- Coordinate the execution of the project in accordance with the project work plans approved by the PSC;
- Under the guidance of the TSU, guarantee the respect of an integrated program approach with the other two provinces;
- Secure alignment with central authorities and institutions, in particular MPI, MoNRE, MoHA, and to coordinate with other related donor funded projects.

Operating Mode of the PCU

The PCU will report directly to the PSC in terms of activities and results linked to the project. It will also provide all required information to the BTC representation in terms of administrative and finance reporting, as described below.

The organisation and operation of the PCU will follow the Vietnamese Rules and Regulations for ODA projects¹⁰.

Through project orientation workshops, presented by the PCU, a thorough understanding of the PCU roles, responsibilities and function as a project coordination mechanism will be introduced to all stakeholders.

5.2 Coordination mechanisms

The detail coordination mechanisms between the different stakeholders will be described in the POM. They will be in line with the general principles described below.

5.2.1 Coordination with the Provincial structures

At provincial level, the relevant provincial departments will be mobilised whenever needed. Similarly, the authorities of the cities and/or towns directly involved in the project will provide their support to the good execution of the project whenever needed with the PCU as coordination body.

For all aspects of the activities as well as disbursement of the project, the final responsibility will always be assumed by the PPC through the PCU. They will have to guarantee that every department involved respect financial and technical norms applicable for this project.

In particular, the PCU will be responsible for engaging and managing national consultants for supervision of all construction works and will manage the construction contracts including certification of works for payment.

¹⁰ The related decrees / circulars are:

1. Decree 131/2006/ND-CP dated 09/11/2006 of the government on the promulgation of Regulations on ODA use and management.
2. Circular 03/2007/TT-BKH dated 12/03/2007 of MPI, guiding the functions and organisation of ODA PMU
3. Circular 04/2007/TT-BKH dated 30/07/2007 of MPI guiding the implementation of Decree 131/2006/ND-CP
4. Circular 803

5.2.2 Overview of the coordination of the CC program

A specific Project Steering Committee (PSC) will guide each project of the 3 provinces involved in the CC program funded by Belgium and Vietnam. The Steering Committee (SC) of the TSU will ensure the overall coherence of the program as shown on the table below:

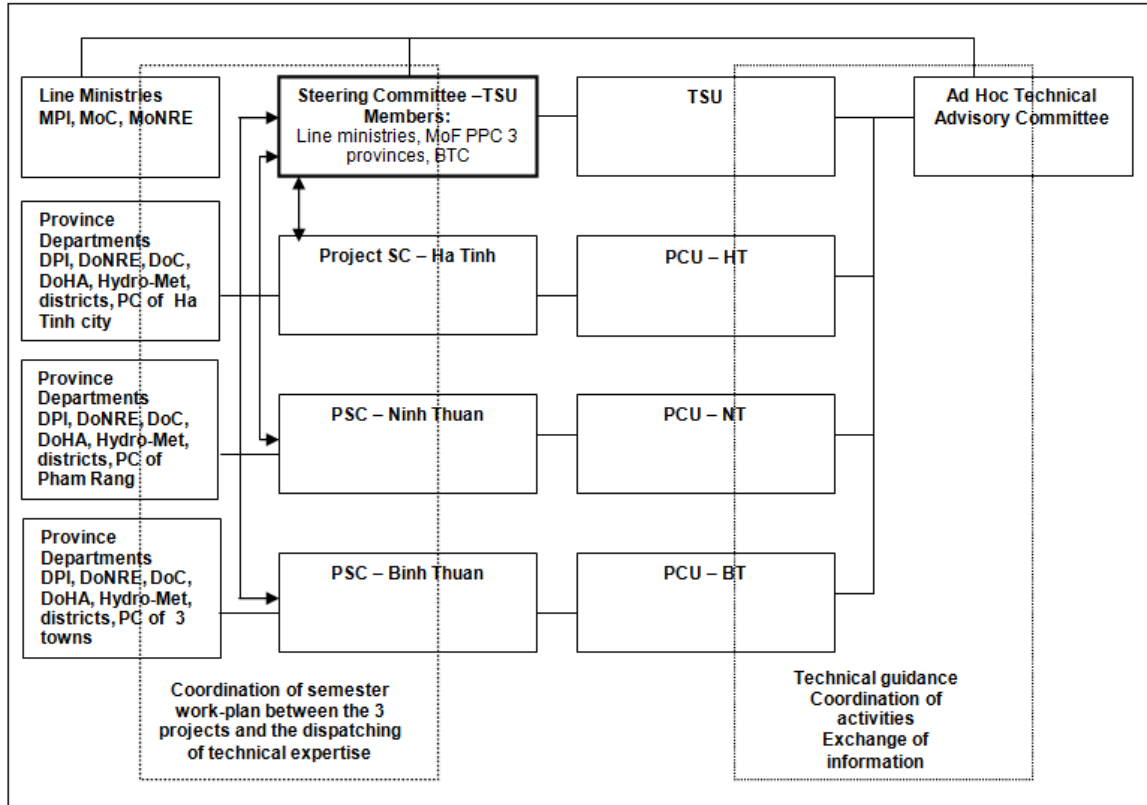


Fig. 13: Structure of the Climate Change program funded by Belgium and Vietnam

The SC of the TSU will be, among others, in charge of the validation of the coordination of both the joint activities between the 3 provinces organised under the guidance of the TSU and the repartition of the available expertise of the TSU between the 3 projects. If the capacity of the TSU is not sufficient to deal with the various demands of the 3 provinces at the same time, a negotiation process between the 3 provinces and the TSU will be launched in order to adapt the work plan of the TSU in the best way considering the priorities. This work plan will be approved by the Steering Committee of the TSU where the 3 provinces are represented.

5.2.3 Coordination mechanisms between the 3 provinces of the program

Similar results and activities will be conducted in parallel through 2 other separate interventions in Ninh Thuan and Ha Tinh provinces. Exchange of information and coordination among the three provinces and their respective PCUs will be favoured as much as possible during the different phases of the project through the support of the TSU, especially for the following:

- The selection of the different tools, software equipment, working methodologies... necessary for the implementation of the three interventions will be made in dialogue between the 3 provinces and the TSU as to reach a consensus. In order to make some economy of scale and to guarantee a certain degree of consistency in the results, the possibility will be explored of grouping the activities of the 3 provinces related to CD studies, MP revision, software development... within a single tender procedure with one batch per province, leading to 3 separate contracts to be signed by the 3

provinces with the same consultancy firm. Furthermore, the different software (E&M, database management, GIS, support for priority action plan...) to be provided/developed/purchased by each project of the 3 provinces, will have to be the same. The TSU will make sure that a consensus is found between the 3 provinces and the central level and will coordinate the bidding process.

- The quarter and half-year work plans of the 3 interventions will be made in coordination between the 3 provinces in order to (i) favour joint-activities such as training, study-tour, tendering procedures for studies... whenever possible, and (ii) to share equitably the technical expertise of the TSU between the 3 provinces. To do so, the preparation of the plans will be made in dialogue with the TSU that will act as facilitator between the 3 provinces. In case of conflict, a decision will be taken at the level of the Steering Committee of the TSU.
- In order to maximize the share of information and to allow each province to learn from the experiences of the other two, joint meetings, activities and visits will be organised regularly by the TSU.
- The costs of joint activities developed by the TSU such as training, study tours, share of external consultants will be divided between the three provinces, considering the number of participants coming from each province and the number of man/day specifically devoted for a specific province, while dividing equally the costs of the inputs that are benefiting equally to the 3 provinces (e.g. time for training preparation).

5.2.4 The Technical Support Unit

As defined in the identification file, the role of the TSU is related to 7 key activities as follows:

1. Support to knowledge management for Vietnamese partners and projects;
2. Continuous support to partner institutions and projects to improve quality;
3. Assure overall coherence of projects implementation, considering evolving role of different agencies;
4. Set up of holistic strategy of M&E and strengthening capacity of partners;
5. Support the operational, sector and policy dialogue at all levels with the possibility of coordinating with the GEFS facility;
6. Support the reporting process of the interventions;
7. Assure the mainstreaming of crosscutting themes.

Role and responsibility of the TSU

The TSU should be considered as a broker between the different stakeholders involved in Climate Change, urban development and water resource management, both at provincial and at central level. The TSU will assume no direct responsibility in terms of outputs and outcomes at provincial level. The TSU will be the institutional, organizational and technical advisor of the project. In that respect, it will have to provide the necessary advice and capacity development support to the implementers at provincial level in order for them to realistically plan activities and target results, and accurately follow the planning, outputs and outcomes of the project. The TSU will guarantee the general coherence of the program (the TSU and the 3 Provinces).

The TSU will in the first place support the implementation of the projects in the 3 selected provinces and can contribute in the application of all 10 elements of the strategy, i.e.:

- capacity development and institutional strengthening
- awareness raising

- data collection
- analysing and modelling
- complement Climate Change strategies
- integrate Climate Change in urban planning
- develop priority action plans
- resource mobilisation
- implementation of pilot projects
- feedback & knowledge management

The TSU will ensure the coordination between all interventions related to climate change supported by Belgium in terms of technical support, particularly with regard to:

- Support the province to define M&E methodology and tool for project monitoring, as well as similar baseline study for potential comparison between the 3 projects and to facilitate the project follow-up;
- support the provinces to complement and implement approved Climate Change Action Plans and revise spatial master plans of selected towns, cities and river basin regions accordingly;
- Expose the 3 provinces to alternative solutions, innovation as well as worldwide and Vietnamese best practice related to CC, IWRM and urban development;
- Stimulate interaction between the selected provinces and ensure the overall coordination of the program and facilitate cooperation between the 3 provinces;
- Stimulate interaction between central level and provincial level and ensure coordination between the related technical ministries and the provinces;
- Stimulate collaboration between different departments and institutions at central level;
- Ensure the overall coherence of the 3 projects by maximizing the exchange of information between the 3 PCUs and the coordination of their respective activities;
- Ensure the coordination between the 3 provinces and the central level for the selection of similar CC/IWRM monitoring equipment and software among the 3 provinces, and be responsible for the development of customized software, their installation, their maintenance and upgrading;
- Favour the access of the 3 provinces to data and information at ministry level, and the dialogue between provincial and national levels;
- Favour linkage, exchange of information, join activities between the 3 provinces;
- Initiate cooperation with other donors initiatives and advocate for complementary funding;
- Contribute to the capacity development of actors in the sectors of Climate Change, water resource management and urban development;
- Ensure the technical quality control of the tender documents initiated by the PCUs, the consultants input related to surveys, studies, modelling, feasibility studies, detail design and planning, as well as of the physical investment;
- assure that experiences of the provinces serve as feedback to the policy makers;
- Favour the capitalisation of the lessons learned for feedback to policy level and produce concept notes and comparison analysis;
- Coordinate the dissemination of results from the 3 provinces;

- Facilitate the coordination of the CC program with the GEFS;
- Provide technical guidance to the PCUs for the preparation of the documents to be submitted to BTC RR for non objection.

In order to be able to conduct their duties, the province shall support the TSU to have access to all required data, information, reports... related to the topics of the project and meet, under PCU coordination, whenever necessary the all the stakeholders involved in the project implementation (PCU, province agencies, district, commune authorities of the Luy river basin, mass organisations, community and private sectors representatives...). As to ensure the quality of the results, the TSU is also entitled to give, through the PCU, recommendations to the providers of services and construction works contracted by the project during the implementation of the activities. As the contracting authority, the PCU has the responsibility to verify the good execution of the recommendations by the services/works provider.

Furthermore, the PCU will inform the TSU about the progress of the different technical activities necessary to the good execution of the project, and will share with the TSU all the related documents at key stages.

In case of conflict between, on the one hand, the province experts and/or the PCU and the technical advices provided by the TSU either through the form of direct recommendations or a BCT official technical non objection, the SC will request the advice of an independent expert, selected by both parties.

Cross-cutting technical issues involving both central and provincial levels, should be addressed at the level of the ad hoc Technical Advisory Committee of the TSU (see TFF TSU).

5.2.5 Supporting role of the BTC Representation in Hanoi

BTC representation in Hanoi will provide support to the PCU in project management and finance related issues. More specifically it will:

- Assist the PCU and the recruited consultants in developing the Project Operation Manual (POM) , while insuring the coherence and consistency between the 3 projects;
- Advice the PCU on management, making sure that the principles, rules and regulations set in the operation modalities chapter of the TFF (see chapter 3), and the POM are properly applied;
- Assist the PCU in the preparation of its work plan (see above), and the reporting, following both GoV and BTC requirements.

Assistance and advices will be done mainly through support of the international advisor in management (first 2 years of the projects) and the VN advisor in management (full project duration) recruited by BTC for which the costs will be split between the 3 project equally, while the controlling aspects will be done by BTC.

5.3 Management modalities

A POM (project operation manual) will be written during the starting phase of the project, describing into details all the procedures related to the execution modalities.

5.3.1 Administrative responsibilities

The Vietnamese Government has designated the Provincial People's Committee (PPC) of Binh Thuan Province as the project owner. The PPC is the administrative entity responsible for the coordination, implementation and monitoring of the project, and for the Vietnamese contribution to the project.

It has financial responsibility to ensure that all the project funds transferred to provincial accounts as financial contributions by Belgium and Vietnam are properly used. It is also responsible for the daily

management of the project activities by means of a Project Coordination Unit (PCU).

The PPC of Binh Thuan Province will be responsible for the financial and technical management of the funds received as financial support for implementation, and limited ex ante control will be done by BTC in order to mitigate financial risks.

The Belgian Government designates the Directorate-General for Development Cooperation (DGDC), represented by the attaché for International Cooperation in Hanoi as the Belgian entity responsible for the Belgian contribution to the project.

The Belgian Technical Cooperation (BTC), represented by its Resident Representative in Hanoi, is the Belgian entity responsible for the coordination, implementation and monitoring of the project and the management of the Belgian contribution. More specifically it will be responsible for the financial and technical management of the Belgian managed budget lines, including the management of the transfers of funds to the Provincial Treasury upon positive evaluation and approval of the financial and activity planning reports.

BTC will be responsible for the organization of the external audits and evaluations. This concerns, among others, Financial and Technical Auditors from the Belgian State, Mid-Term Review, external financial and operational audits and Final Evaluation. BTC will guarantee the correct information of MPI and PPC of Binh Thuan during the whole processes, as well as the institutional dialogue around the output of these audits and evaluations.

The project will adopt a combination of Belgian managed funds (own management) and Vietnamese managed funds (Project Management), in the form of financial support to the province for direct implementation by the province.

5.3.2 Technical responsibilities

The technical aspects of the intervention will be under a joint responsibility between BTC and PPC of Binh Thuan. PPC of Binh Thuan will assume the final responsibility while following the Vietnamese regulations. BTC will retain a “no objection” right.

The Resident Representative of BTC in Vietnam will give the “no objection” for BTC. In order for him to make an informed and objective decision, he will seek technical advice in priority from the TSU with the unconditional approval of one expert under BTC contract mandated for that purpose (either one International Technical Assistant or one BTC expert). If this is not possible, he will seek advice from independent international and national consultants contracted by BTC following Belgian public procurement rules.

Finally, BTC can ask an unplanned independent technical audit to check the regularity and quality of works and procedures.

Except for the activities of the TSU that will have its own budget, all the costs related to the technical supervision and control will be supported by the budget of the project, including all costs related to BTC “no objection”.

5.3.3 Reporting

The reports will be structured to allow the comparison with previous plans and reports.

The quality (reliability, timeliness, completeness) of the reporting will determine the future disbursements for the project. Unsatisfactory documented explanations could lead to funds transfer suspension until further notice. The PSC will lead the additional enquiries to obtain the quality level required and assurance that the funds are correctly followed. All this process must be documented.

All reports as specified in the table below will be issued in Vietnamese and English. In case of interpretation, the English version will always prevail.

Table 3: Reporting steps

Report	Responsible	Content	Destination
Quarterly activity/progress report and planning	PCU	Progress and financial report Analysis of the implementation Activity and financial planning	PPC, TSU, BTC Representation
semi-annual activity/progress report and planning before a PSC	PCU	Same as 3-monthly, but with additional strategic section for PSC	Steering Committee PPC, TSU, BTC Representation, Attaché
Annual report	PCU	Assessment of the progress of the project based on a result-oriented approach	BTC Representation/Steering Committee, DGD, PPC, MPI, TSU, Attaché
MTR report	BTC HQ / External consultant	External Mid Term Review	BTC Representation/Steering Committee, PPC, MPI, TSU, Attaché
External project audit + GoV project audit	Auditing firm/GoV	Financial audit of the projects commissioned by BTC / GoV	BTC Representation/Steering Committee, PPC, MPI, TSU, Attaché
ETR report	BTC HQ / External consultant	External End Term Review	BTC Representation/Steering Committee, PPC, MPI, TSU, Attaché
Final report	PCU	Provisional acceptance of program activities	BTC Representation/Steering Committee, DGD, PPC, MPI, TSU, Attaché

BTC may ask for additional information on the report content and/or additional documents. The PPC will send the requested information or documents within the next 15 days following the request.

The reports could be based on Vietnam Dong. In that case, and to draw up the reports, the effective expenses will be converted into Euro with a conversion method approved by BTC at the start of the project. In these financial reports, the expenses will be presented in their original currency and in Euros.

Probative supporting documents justifying the expenses (invoices, detailed account, payment attests), should respect international standards and will be kept by the PPC. Those files will be archived in chronological order and will be kept at the permanent disposal of BTC and the external auditors for a period of eight years from the date of the first payment/spending. The PPC allows BTC to consult the supporting documents anytime.

Structure and content of the progress reports (quarterly)

The format of the progress reports shall comply with the harmonized reporting system agreed between GoV and the donors, in accordance with Decision 803 and use as much as possible its prescription and templates. During the set up phase, on the basis of the PCU and BTC proposals, the first PSC will decide on the budget structure and all necessary templates for the reporting on the basis of the VN system and structure. If necessary, that system will be completed to guarantee that the report will include the following requirements:

Progress and financial report:

- follow-up of the implementation of the planning with a list of the activities implemented;
- follow-up of the procurement plan;
- if useful, narrative of (some of) the activities;
- list of incomes and expenses of the previous quarter;
- budget follow up;

- a narrative highlighting the discrepancies with the previous periods;
- Supporting schedules comparing actual and planned expenditures with detailed deviation analysis between actual figures and budgeted ones;
- cash flow reports (bank account statements and cash reconciliation);

This part will clearly identify the difference between what has been planned (on an operational and financial ground) with what has been implemented.

Analysis of the implementation:

- identification and description of successes;
- identification and description of problems;
- identification and description of risks.

This part will clearly identify the reasons for not respecting the planning, clear action plan with corrective measures, responsible and deadlines.

Activity and financial planning:

- update of the planning taking into account the analysis of successes, problems and risks;
- update of the procurement planning;
- The three-monthly budgeted Action Plans and list of main engagements;
- The related cash forecast.

Annual report

Each year an annual report must be written according to a result-oriented strategy. The PCU will appropriate the report format and methodology and write it first for its own utilisation. Besides it should keep in mind that this report:

- is a legal obligation of BTC towards the Belgian state;
- must use of the standards set in the BTC M&E Policy.

Frequency

Progress reports and activity planning will be written on a quarterly basis in accordance with templates and guidelines to be defined in the POM.

The reports prepared prior to a PSC (6-monthly activity/progress report and planning) must be completed with an additional and separate section dealing with strategic recommendations and or decisions to be endorsed by the PSC.

The Representation should align the following with Vietnamese constrains:

- The report prepared at the end of a civil year will be used to define and serve as reference for the annual planning of PPC, MPI and BTC:
- December: planning for the following year;
- June: revision of the planning of the current year + first estimation of the planning of the following year.

Mid Term Review

An independent mid-term review will be undertaken after the completion of the study phase, or at least 3 years after the start of the project. External international and national short-term consultants will be recruited for this exercise by BTC. Its purpose will be mainly to assess the state of implementation of the project and to propose recommendations for the remaining time of the project.

Moreover an audit will be planned in parallel of the mid-term review to enhance the effectiveness and

scope of the exercise. This audit will focus on value-for-money, financial performance and internal control system.

The PCU will be responsible to define a plan of implementation of the recommendation. Its follow-up will be included in each progress report.

For both exercises, the ToR will be drafted by the TSU with the participation of the PCU and BTC, and following BTC template and guideline. The validation of those ToR will be the responsibility of BTC. MPI can add specific tasks and objective to the final ToR prior publication.

The report will be submitted to the PSC, which will take appropriate decisions on the proposed recommendations. The mid-term evaluation and audit can suggest revisions of the program TFF, including the logical framework or implementation modalities. These proposed changes should be appraised by the Steering Committee within the limits of its mandate.

The PCU will be responsible to define a plan of implementation of the recommendation. Its follow-up will be included in each progress report.

Both evaluations will be financed by own-management funds.

End Term Review

A final external review will be conducted at the end of the project implementation. The mission will gather the required information through direct contact with implementers and program beneficiaries, through a review of program documents and in depth analysis through questionnaires.

5.3.4 Financial management

Regardless of the source of funding, all financial resources of the program will be managed transparently and reported in accordance with the principles of joint partnership, as defined by the Paris Declaration and respecting the rules on Public Financial Management.

Provincial People's Committee (PPC) of Binh Thuan province is responsible for the management of funds and will respect the principles of cost efficiency, economy, transparency and respect of the Vietnamese legal framework.

Budget

The budget has been defined bearing in minds the following principles:

- All costs are before VN tax; as the project is supported with ODA grant funds, all investment and international support costs are tax exempt;
- Investment costs are split between BTC and GoV; This split should be easy to manage and auditable (no split per invoice but full part of some investments could be left for one or the other party);
- All preparation, feasibility study, EIA, detailed design, construction supervision, technical control audits costs are estimated at 12% of the investments;
- Land acquisition compensation and resettlement costs are considered to be 100% counterpart contribution. The project of resettlement and compensation plan will be subject to "no objection" by BTC, as part of an institutional dialogue among the parties.
- Salary costs for full time members of PCU are counterpart contribution;
- The PPC will provide appropriate office infrastructure and furniture for the PCU, including the availability of a room for punctual consultants, and members of the TSU;
- EU costs norms will be applicable for all local consultancies services related to the different activities of the project;
- TA and consultant costs are all inclusive of air travel, accommodation and per diem.

The budget of the project includes the budgetary constraints in which the project must be carried out. The total budget amount cannot be exceeded.

Both parties can revise the allocation by budgetary lines through PSC meetings. In every case, PCU must document the budget modifications. The possible budgetary changes are:

- Change of the budget structure;
- Transfer of resources between existing budget lines for more than 5% of each budget line;
- The contingencies budget can only be used for project activities and after approval of the PSC. Its use must always be accompanied by a change of the budget.

The practical details will be part of the POM.

In order to facilitate the start-up of the intervention, commitments and expenses may be made before the signature of the Implementation Agreement between Belgian Government and BTC. These shall concern vehicles (31,000 EUR), ICT (16,700 EUR + 5,000 EUR = 21,700 EUR) and recruitment (6 x 500 EUR / national technical assistant = 3,000 EUR) for a total amount of 55,700 EUR.

Financial planning

Every quarter, the financial manager of the PCU will prepare financial planning for the current quarter and upcoming quarters of the current year and the future years for the total budget. Each financial planning will be approved by the PCU director. The quality of the planning will be assessed and reviewed; the transfers of subsequent funds will be subject to the quality of such planning.

The financial planning will be closely linked to the operational activities and will constitute best estimates for disbursements for the coming periods.

Accounting and payment process

The management and further release of the funds will follow the Vietnamese Rules and Regulations for ODA projects¹¹. The PCU will use a software approved by BTC and applied sound management procedures regarding the following steps of accounting: ordering, committing, paying and encoding.

Contractors will submit an expense with the supportive document to the PCU that will check them. The payment request will then be submitted by the related management unit to the Provincial Treasury that will control it within maximum 5 working days based on the contractual documents. Treasury will inform the local branch of DoF about the expense approval as well as PCU that will authorize the Bank to release the money to the contractor.

Each expense has to be useful and opportune, and its consistency with the budget must be checked by the finance manager. BTC reserves the right to consider the expense as ineligible, not justified, or not respecting the obligations mentioned in the TFF. In that case, the expenses will be deducted from the next instalment that will go with an explicative note. In the event of the next instalments not being paid or not being sufficient to cover the deduction of unjustified expenses, those amounts will be reimbursed by PPC to BTC.

The eligible costs are the ones that meet the following criteria:

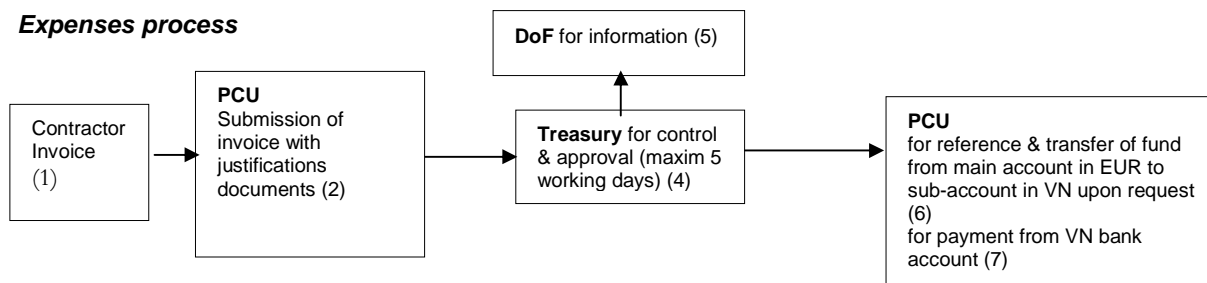
- They are necessary to the project;
- They are foreseen in the budget and the action plan of the project;
- They meet the principles of sound financial management, economy, cost efficiency;
- They were effectively incurred, booked in the partner's accounting and are supported by original

¹¹The related decrees are:

1. Decree 131/2006/ND-CP dated 09/11/2006 of the government on the promulgation of Regulations on ODA use and management.
2. Circular 03/2007/TT-BKH dated 12/03/2007 of MPI, guiding the functions and organisation of ODA PMU
3. Decision 61/2006/QD-BTC dated 02/11/2006 of Ministry of Finance on the cost norms applied for ODA projects/programs
4. Circular 04/2007/TT-BKH dated 30/07/2007 of MPI guiding the implementation of Decree 131/2006/ND-CP

supporting documents.

Expenses process



Cash management for Project Management funds

Bank account

For the budget under Project Management (PM) modality, the PCU shall open dedicated project accounts:

- A bank account in EUR at a commercial bank where project funds will be channelled from the Belgian contribution;
- A bank account in VND at a commercial bank.

The accounts should be managed using the same procedures and controls as the ones for Treasury accounts.

Those bank accounts in EURO en VND will have the double signature of PCU Director and the project finance manager.

Under no circumstances, these accounts can have a debit balance. They cannot receive funds from other sources and cannot serve to finance other activities.

The possible interests generated by these accounts will be deducted from the expense of the project. There will be first and foremost used to cover the banking costs of the account.

Whenever possible, payment through bank transfers will be privileged.

Cash call : first transfer

From the notification of the execution agreement, a cash call can be introduced to the local Representation of BTC. The requested amount can correspond with the needs of first six (6) months, plus a buffer amount initially set at 10% of the needs. This will be done by the PCU and directly submitted to the Representation if no PSC is in place at that moment.

This cash call will go together with a signed detailed expenses program of the first 12 months of the projects, following the format prescribed in the POM.

Cash call : next transfers

PCU, on behalf of PPC, will request BTC transfers of funds to the specific project account, based upon half yearly work-plans and budgets which will have been approved by the PSC, as well as financial reports on the utilization of the contribution. This cash call will represent the cash needs of the project for the following six months. The request will be sent to BTC Representation.

From the second instalment on, transfers of funds will be subordinate to the justification by PMU of 70% of the previous cash call and 100% of the one before. If a bigger amount of cash would be needed without fulfilling this condition, a specific request can be introduced.

The transfer will be processed by BTC after approval by PSC and BTC of the following documents (described in chapter "2.6. Reporting"):

- The letter requesting the transfer;
- A detailed financial report of previous expenses ;

- The last six-month progress and financial report. In the financial report, all expenses done on the project and the related fund transfers should be mentioned;
- The last analysis of implementation report;
- The last six-monthly activity and financial planning and the related detailed disbursement plan, included a list of commitments;
- The last external audit reports approved by the Project Steering Committee;
- The follow-up of the audit recommendations approved and controlled by the PSC.

These cash calls will be certified by PMU and checked and validated by BTC. The expenses that cannot be justified shall be deducted from the next replenishment.

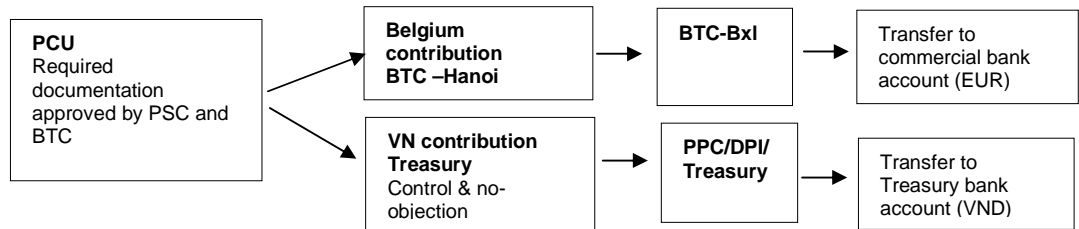
BTC commits itself to transfer the funds in the 30 days following the date of the request receipt. If BTC assesses that a cash call request cannot be honoured, it will address to the partner a letter specifying the necessary additional information that have to be sent. The time for payment will be postponed till the registration of a cash call introduced in due form.

Cash call: Last transfer

The payment of the final balance will be subordinated to the fulfilment by the partner of the obligations related to the agreement and on the basis of the following documents:

- The same documents as for all other cash calls;
- A closing action plan (see guideline Closing procedure) approved by PSC;
- The “financial balance” set up according to the rules describes in the BTC closing procedure manual, including, among others the last commitments, the advances, and any other liabilities towards external parties;
- A project follow up (objectives + results) and the follow up of the mid-term review and audit recommendations.

Cash-call process



Cash management for own management funds

All the funds under own management (Regie) should be managed under the BTC internal rules and regulations that will be made available at the start of the project. The management of these funds is under the responsibility of BTC Hanoi.

5.3.5 Procurement Management

Procedures to apply

The procurement under PM budget lines will apply Vietnamese rules and regulations. The procedures will be detailed in the POM.

Table 4: Procurement procedure to apply and publication requirement

Procedure	Publication	Works	Supplies	Services
Direct purchase Detailed ToR Minimum 3 pro- forma	Not mandatory	< 5.000 EUR	< 5.000 EUR	< 5.000 EUR
Competitive negotiated procedure Detailed specifications Minimum 3 invitations	Invitation to national and/or international bidders subject to the technical complexity of the assignment and the availability of the needed expertise in the country	5.001 < 67.000 EUR	5.001 < 67.000 EUR	5.001 < 67.000 EUR
Open procedure Detailed specifications	Mandatory: Invitation to national and/or international bidders subject to the technical complexity of the assignment and the availability of the needed expertise in the country	67.000 EUR <	67.000 EUR <	67.000 EUR <

BTC No-objections

In order to comply with the Belgian requirements for control of public expenses, the use of Vietnamese systems has to be combined with an ad-hoc system of No-objections. In that respect BTC will adapt its own guideline about procurement competences and no-objection to manage its share of responsibility. The thresholds for the non objection process will be in line with the BTC rules and regulations related to delegation of responsibilities as indicated in the table 5.

The No-objection is required at the following steps of the process:

- Tender documents (complete file) including ToR and selection criteria;
- Attribution report including proposal of contract;
- Acceptance of the works / supplies.

PCU will request advices from TSU prior to the submission of the no objection related documents to the RR in order to ensure their quality.

Table 5: BTC No-objection threshold

Threshold amounts	Technical advice	Legal advice	No-objection from BTC*	Timing for the NO in working days ¹²
5,000 – 25,000	Upon request of BTC RR		BTC RR	Max 5
25,000 – 67,000 €	1. unconditionally positive advice of BTC co-coordinator of the TSU or 2. BTC expert	According to the needs	BTC RR	Max 10
67,000 € - 200,000 €	1. unconditionally positive advice of BTC co-coordinator of the TSU or 2. BTC expert or 3. Independent expert	1. Unconditionally positive advice from a local jurist or 2. BTC legal advisor if the advice of the local jurist is not unconditionally positive	BTC RR	Max 25
200,000 -	Independent expert	BTC legal advisor on the basis of the advice of the local jurist	BTC RR with ad-hoc mandate	Max 25

All threshold amounts are taxes inclusive, with the exception of the 'threshold' (EUR 67,000), which is always excluding VAT

The detail modalities of the application of the No-objection will be described in the POM.

5.3.6 Audits

Vietnamese audits

The PPC will share with BTC the reports that result from GoVs regular auditing procedures and all other audit reports that would be made available by other donors.

Financial and procurement project audits

BTC will deploy an independent qualified audit firm (International Accounting Standards) to audit the dedicated project accounts biannually. BTC will write the terms of references of the audits. These audits will be financed out of the own-management lines and carried out by the auditors according to the BTC framework contract in force.

The audit reports will be submitted to the PSC who will decide on the measures to be taken, if any. This biannual external audit will:

- Check the compliance, ex-post, between payments from the specific bank account and the work realised on field and locally, with the supporting documents, kept by the partner;
- Check the respect of the management procedures of the project including management of all project assets and procedures mentioned in the POM;
- Check the respect of the public procurement Vietnamese rules and internal regulations.

The auditing reports shall be discussed in the PSC.

¹² Upon reception of the complete set of documents

The PCU shall set-up an action plan based on the audit recommendations to allow it to remedy the noticed weaknesses. The action plan and its follow up must be presented at each PSC meeting, which will approve its implementation. The cash call will be conditioned by the settlement of possible reserves/issues revealed by the audit mission. Both parties should consult each other to settle those reserves/issues. If after consultation no solution is found, BTC reserves the right to postpone the next instalments.

Biannual audit could take place at any time, initiated by one or the other party.

If the audit is negative, or if the evaluation of experiments using similar modalities appears to be negative, BTC is entitled to submit to the PSC a modification of the execution modalities in order to limit the related fiduciary risks.

If the auditing report shows that the funds are not managed in a transparent and appropriate way, BTC Resident Representative can suspend the next instalment and request the reimbursement of the funds already transferred.

Audits by Belgian external bodies

In accordance with the legal status of BTC, each year an Audit Committee reviews the accounts of BTC. Within this framework, the Audit Committee may also carry out audits of programmes in Vietnam. The Audit Committee of BTC may also request that BTC's internal auditor audit a specific programme¹³. Those audits are independent of BTC management, therefore it must be accepted that they can take place whenever the Audit Committee judges it useful.

5.3.7 Closure of project

The partner commits itself to close the specific accounts at the end of the execution agreement of the project. The PSC will be responsible to implement the closing process according the guideline "Closing procedures" of BTC.

One year before the end of the project the PSC will validate a closing action plan. Six months before the end of the project, an updated closing action plan and a financial balance (see guideline Closing procedure) will be set up by the PCU and submitted and approved by PSC. The last will, among other issues, list the last commitments, the potential guarantee, advances or any liabilities towards external parties.

The PSC will agree upon the re-allocation of the funds remaining on the projects accounts. The final financial report must be submitted in the next three (3) months after the end of project activities and at the latest six (6) months before the end of the Specific Agreement.

Drafting the Final Report is the responsibility of the PCU that could decide to hire an external consultant for this purpose. The Final Report shall be submitted to the PSC members at the final Steering Committee meeting for approval. The report will comprise an overview of the realized activities and include a survey of the status and opinion of a representative sample of beneficiaries related to the impact of the Project. The final financial report of the project is also the responsibility of the PCU.

The PSC is responsible for recommendation and approval of the final closure of the accounts. The last Project Steering Committee shall decide on the destination of all program equipment, and the remaining financial resources, if any.

5.3.8 Modification of the TFF

The present TFF may be amended by mutual consent of the parties. Careful consideration must be given not to change the present TFF in a way that would unnecessarily change the outcome of the intervention as originally agreed between the parties. A formal agreement by the Belgian and Vietnamese

¹³ Please note that this is standard BTC practice

governments is needed for the following:

- Modification of the duration of the Specific Agreement;
- Modification of the total Belgian financial contribution;
- Modification of the Specific Objectives of the intervention.

The request of the above modifications has to be approved and motivated by the PSC. The exchange of letters requesting these modifications shall be initiated by the Vietnamese party and shall be addressed to the Belgian Embassy.

The modification of execution modalities will request a formal agreement of BTC headquarters. That modification has to be approved and motivated by the PSC.

The following changes to the TFF will have to be approved by the PSC:

- The program activities and their respective budget;
- The specific objective indicators and result indicators;
- The composition and responsibilities of the PSC;
- The mechanism to change the TFF.

All other changes to the TFF should be approved by the chairman of the PSC or his mandated responsible and the BTC Resident Representative, as co-chairman of the PSC. The adapted version of the TFF shall be communicated to the BTC headquarters Coordination and to the Attaché for International Cooperation (DGDC).

6 CROSS CUTTING THEMES

6.1 Environment

The objectives and results of the project “*Support to integrated water management in the framework of urbanisation and climate change in Binh Thuan province*” are very much linked to environmental preoccupations and as such could be considered as an environmental project (cfr. DAC code 41010). The environment is therefore to be considered here both in a sector perspective (main objective of the project) and as a cross-cutting theme.

A special point of attention will be to keep explicit throughout the project implementation phases, that adapting to climate change, and promoting sustainable urbanisation and water management, relies on sound environmental practices and following principles such as the wise-use of resources, energy saving, clean mobility and technology, etc...

Since water is essential for socio-economic development and for maintaining healthy ecosystems, properly managed water resources are a critical component of growth and poverty reduction and equity. The livelihoods of the poorest are typically associated with access to water services.

With higher rates of urbanisation, increasing demand for drinking water will put stress on existing water sources. Energy demand will more than double in poor and emerging economies in the next 25 years and hydropower will need to be a key contributor to clean energy production. Floods and droughts will continue to threaten farmer livelihoods and lowland economies. Besides the needs for these human activities we have to ensure that the environmental water flows required to maintain ecosystems are also maintained.

Water resource management aims at optimising the available natural water flows, including surface water and groundwater, to satisfy these competing needs. Adding uncertainty, climate change will increase the complexity of managing water resources.

One of the main impacts of climate change in the province is sudden and large-scale floods which affect urban infrastructures such as water or waste management systems and often lead to environmental pollution. Prevention and management of floods will therefore be at the heart of the project’s strategy.

In many cases, it has been observed that the CC debate (aiming at preparing long-term mitigation and adaptation strategies) has eclipsed immediate crucial environmental problems such as air or water contamination, industrial hazards, lack of waste management policies, rapid loss of biodiversity, etc...It will be a priority of this project that the policies and strategies developed through the project, including institutional strengthening and capacity building, will also tackle local and urgent environmental preoccupations. In that sense, addressing the environment will not be translated by the financing of specific micro activities (project greening), but is integrated in the overall strategy of the project.

The chapter 2 on Strategic orientations provides a detailed vision on how the CC issue will be tackled, including environmental aspects. We may refer here to the following chapter 2.1 Building resilience to climate change, 2.2 Strategic Orientations in the water sector, 2.3 Strategic orientation in the spatial planning sector.

The ten steps project’s strategy aims at promoting both mitigation and adaptation strategies which will include elements such as:

- Urban planning that considers climate change
- Energy efficient housing
- Low carbon transport

- Sustainable water management
- Floods prevention & warning
- Institutional strengthening & capacity building
- Pilot projects experimentation such as mangrove preservation, reforestation, greening of urban areas,
- Studies, surveys and research specifically focussing on CC and increasing resilience in towns and cities.

Institutional strengthening and capacity building will be crucial components of the project. Specific attention will be given, through the training sessions, workshops, conferences or studies organised within the project to sustainable development and environmental management issues in order to provide authorities, public bodies, civil society and private stakeholders with a common “green culture” adapted to the local context specificities and potential. This “green culture” will need to address water management challenges:

- Associated with food security and developing water-smart agricultural plans;
- Associated with rapid urbanisation;
- Developing hydropower schemes integrated with other water uses (e.g. irrigation and flood control);
- Functional early warning systems, infrastructure and institutional arrangements for coordinated action to address increased variability and changes to runoff and flooding patterns;
- Strengthening institutions for effective river basin management; and,
- Increasing the efficiency of water use.

6.2 Gender

Gender equality is critical to the outcome and impact of development interventions and central to improving development effectiveness. A strategy that considers the integration of crosscutting issues in decision-making, from planning till evaluation and feedback for new decision-making processes, taking into account the effects and impacts of these decisions on gender, is commonly called "gender mainstreaming".

Since women's economic and social rights are related to these gender differences and because women impact their direct environment through empowerment, the present programme addresses women not only as possible victims of climate changes, but also as agents of change in contributing to mitigation and adaptation measures, and more precisely in contributing to the development of the integrated water management. Therefore different gender mainstreaming initiatives are developed within the course of the project, being directly integrated as a component of the different activities. Furthermore gender sensitive indicators will be developed in the framework of this project.

The context of climate change makes women more vulnerable than men. Women's lack of capital, market access, knowledge, skills and decision-making powers, render them as a group, generally neglected by climate financing mechanisms. Where gender considerations are included, it is largely on an *ad hoc* basis. In order to avoid missed opportunities and to address differential impacts of climate change from the beginning of the implementation the programme 'Support to integrated water management' addresses gender in a cross-cutting way through all phases of the project cycle.

7 ANNEXES

7.1 Logical framework

	Logic of the intervention	Indicators	Means and source of verification	Assumptions, Pre-conditions, and Risks
GO	<p><u>General Objective</u> To contribute to the sustainable development of Binh Thuan province</p>	<p><u>Outcome indicators:</u> The capacity of the province has improved in terms of SD and the province demonstrates increased resilience to CC</p> <p><u>Impact indicators:</u> All Provincial People's Committee members understand how CC affects their areas of management and decision-making responsibility</p>	<p>Weighted-reduction in losses (human, physical assets, costs) due to CC-related disasters – see Vulnerability assessment survey</p> <ul style="list-style-type: none"> Sustainable Development Provincial Plan linked to CC – see all <u>plans and decisions approved by the province</u> All Decisions by the PPC refer to CC (where appropriate) and indicate how CC has been taken into account 	<p><u>Assumptions:</u></p> <ul style="list-style-type: none"> Acceptance by the PPC that they have a responsibility to take into account CC in their decisions The PPC provides leadership in requiring all provincial entities/agencies to take into account CC in their operational processes Adequate provincial budget is allocated after the completion of the BTC project to carry forward the outcomes <p><u>Risk:</u> Flux in PPC membership</p> <p><u>Mitigation:</u> The project's emphasis is on developing institutional capacity and processes, and to training individuals</p>
SO	<p><u>Specific objective</u> To support the institutional capacity in Binh Thuan Province in integrated water resources management and urban development in relation to Climate Change</p>	<p><u>Outcome indicators:</u> The institutional capacity of the provincial institutions responsible for water management and spatial planning has improved, in terms of CC preparedness, by the end of the project</p> <p><u>Impact indicators:</u></p> <ul style="list-style-type: none"> All water management and spatial plans have been designed to cope with the effects of CC All directors/vice directors/heads/managers understand how CC affects their areas of technical and management responsibility 	<p>Weighted-reduction in losses (human, physical assets, costs) due to CC-related disasters – see <u>PPC annual reports on natural disasters</u></p> <ul style="list-style-type: none"> Water Management and Spatial Plans have taken CC into account – see IWRM plan and MPS of province and of 3 target towns All staff understand and can demonstrate how CC may affect their work and the approaches (adaptation and mitigation) necessary to overcome these effects – see CD assessment versus evaluation reports 	<p><u>Assumptions:</u></p> <ul style="list-style-type: none"> Acceptance by the provincial institutions that they have a responsibility to take into account CC in their work The provincial entities/agencies take into account CC in their operational processes Adequate provincial budget is available after the completion of the BTC project to carry forward the outcomes <p><u>Risk:</u> Flux in directors/heads/managers etc</p> <p><u>Mitigation:</u> The project's emphasis is on developing institutional capacity and processes, in addition to training individuals</p>

R 1	<p><u>Result 1:</u> The capacities of the authorities of Binh Thuan province in terms of CC, IWRM and urban development is improved with appropriate monitoring and evaluation mechanisms in place.</p>	<p><u>Process/output indicator:</u></p> <ul style="list-style-type: none"> Needs assessment Improved capability in water management and urban planning M & E mechanisms and O & M modalities are developed <p><u>Outcome indicator:</u> Improved urban plans and water management operational processes are developed, approved and applied</p>	<ul style="list-style-type: none"> Needs Assessment Reports Project progress report, training material and evaluation Revised urban master plans and water management operational procedures Standard M & E are in place <p>See revised urban plans with integrated water management and sustainable urban planning principles for the 3 target towns and province website</p>	<p><u>Assumptions:</u></p> <ul style="list-style-type: none"> City institutions are prepared to update their urban planning and water management operational processes Adequate provincial budget is available after the completion of the BTC project to carry forward the outcomes <p><u>Risk:</u></p> <ul style="list-style-type: none"> Reluctance of the City authorities to revised their 2nd draft of the urban master plan to produce a 3rd revision Unclear lines between BTC project and the existing urban master planning consultants <p><u>Mitigation:</u> Formal agreement of how to proceed with the master plan revision</p>
R 2	<p><u>Result 2:</u> A comprehensive strategy on CC is in place. It is based on various studies, including CC data and hydraulic modelling focused on operational impact on settlements of Luy catchment and the revision of the existing master plans of Luong Son, Cho Lau and Phan Ri Cua towns, while key priorities of the CC action plan of the Luy river basin are defined.</p>	<p><u>Process/output indicators:</u></p> <ul style="list-style-type: none"> Improved capability in CC and hydraulic modelling Improved capability in integrated urban planning and water management Improved understanding of how to incorporate CC Action Plan priorities within water and sanitation urban planning <p><u>Outcome indicator:</u></p> <ul style="list-style-type: none"> CC Action Plan priorities for the Luy river basin and the 3 selected towns related to water and sanitation is based on the results of the studies and CC modelling and appropriately used and applied Improved capability in CC and hydraulic understanding within urban planning and water management Revised urban masters plan integrating mitigation and adaptation measures towards CC risks 	<ul style="list-style-type: none"> Data collection and baseline survey reports CC and hydraulic models in place and functional These models are being used to support greater CC resilience CC Action Plan priorities incorporated within water and sanitation urban planning <ul style="list-style-type: none"> CC and hydraulic model runs/projections Integrated strategy on CC Integrated urban plans revised for CC for 3 target towns Revised approved CC action plan for the Luy river basin and following PPC decisions Urban water and sanitation plans are revised and in place for 3 target towns Capacity building baseline initial survey and following monitoring surveys 	<p><u>Assumptions:</u></p> <ul style="list-style-type: none"> Use by the provincial institutions of CC and hydraulic models in their urban planning and water management operational processes Adequate provincial budget is available after the completion of the BTC project to carry forward the outcomes City Authorities accept CC Action Plan priorities and are prepared to incorporate into existing or new water and sanitation plans <p><u>Risk:</u></p> <ul style="list-style-type: none"> Reluctance of local authorities to share data Lack of upgrading of software etc after the completion of the BTC project Lack of relevance of the CC Action Plan priorities to 3 target towns <p><u>Mitigation:</u> The project demonstrates the practical usefulness of modelling and subsequent planning in reducing CC impact The project demonstrates the practical usefulness of CC Action Plan priorities to 3 target towns CC preparedness</p>

<p>R 3</p>	<p><u>Result 3:</u> Priority strategic pilot activities are developed for lessons learned targeting one of the 3 target towns Appropriate O & M modalities are in place</p>	<p><u>Process/output indicators:</u> Resilience measures piloted in one of the 3 target towns(physical infrastructure) <u>Outcome indicators:</u> <ul style="list-style-type: none"> Improved flooding/desert expansion conditions of one of the 3 target towns </p>	<ul style="list-style-type: none"> Adaptation measures improve resilience to CC in one of the 3 target towns – see evaluation report Standard O & M are in place – see manuals, evaluation reports O&M agency corporate plan 	<p><u>Assumptions:</u> Adequate provincial budget is available after the completion of the BTC project to carry forward the outcomes <u>Risk:</u> Lack of funds to develop the priority project at a critical scale <u>Mitigation:</u> The project demonstrates the practical usefulness of CC Action Plan priorities to 3 target towns CC preparedness while cooperation with GoV and donors community is developed during the course of the project</p>
<p>R 4</p>	<p><u>Result 4:</u> The provincial CC strategy is supported by the active involvement of the communities and the private sector.</p>	<p><u>Process/output indicators:</u> <ul style="list-style-type: none"> Active engagement by communities most affected by CC Active engagement by the private sector most concerned with CC impacts <u>Outcome indicator:</u> Improved understanding of CC at community and private sector level</p>	<ul style="list-style-type: none"> Awareness-raising events attended by community leaders and opinion-formers Awareness-raising events attended by key private sector actors See mass-media, campaign assessment surveys, WU and Education department reports Practical measures being undertaken by private sector in relation to CC Initial vulnerability assessment and following monitoring 	<p><u>Assumptions:</u> <ul style="list-style-type: none"> Communities are willing to be engaged Adequate incentives are available after the completion of the BTC project to carry forward the outcomes <u>Risk:</u> Key community leaders and opinion-formers are not involved <u>Mitigation:</u> The project demonstrates the practical usefulness of resilience-building measures</p>

	Activities to reach Result 1	Means	Belgian Contribution
R 1	<u>Result 1:</u> The capacities of the authorities of Binh Thuan province in terms of CC, IWRM and urban development is improved with appropriate monitoring and evaluation mechanisms in place.		Costs in Euros
A 1.1	Capacity development of the PCU in project management, procurement, M&E and reporting	Consultants, with TSU guidance	210,000
A.1.2	Needs assessment /IOCA	Consultants, with TSU guidance	40,000
A 1.3	Capacity building activities specific to province of the related agencies and stakeholders in CC, IWRM, urban development	Consultants, with TSU guidance Provincial and City Authorities, private sector and communities	260,000
A1.4	Strengthening cooperation/coordination mechanisms among agencies with regards to CC, IWRM and urban development	Consultants, with TSU guidance Provincial and City Authorities	80,000
A.1.5	Data collection: baseline survey, existing data collection and additional surveys	Consultants, with TSU guidance Central, Provincial and City Authorities	205,000
A.1.6	Support to hydrological and meteorological monitoring stations	Consultants, with TSU guidance, equipment	60,000
A.1.7	Database management	Consultants, with TSU guidance, software and equipment	100,000
A.1.8	Communication and dissemination of lessons learned	Consultants, with TSU guidance provincial and city authorities	80,000
	Activities to reach Result 2	Means	Belgian Contribution
R 2	<u>Result 2:</u> A comprehensive strategy on CC is in place. It is based on various studies, including CC data and hydraulic modelling focused on operational impact on settlements of Luy catchment and the revision of the existing master plans of Luong Son, Cho Lau and Phan Ri Cua towns, while key priorities of the CC action plan of the Luy river basin are defined.		Costs in Euros
A.2.1	Studies and modelling of Luy river basin	Consultants, with TSU guidance	610,000
A 2.2	Integrated strategy on climate change for the basin	Consultants, with TSU guidance Provincial and City Authorities	50,000
A 2.3	Master plans revision	Consultants, with TSU guidance Provincial and City Authorities	150,000
A 2.4	Establishment of a priority action plan	Consultants, with TSU guidance Provincial and City Authorities	80,000
	Activities to reach Result 3	Means	Belgian Contribution

R 3	Result 3: Priority strategic pilot activities are developed for lessons learned targeting one of the 3 target towns with appropriate O & M modalities are in place		Costs in Euros
A 3.1	Physical infrastructure for one of the 3 target towns	Consultants, with TSU guidance Provincial and City Authorities	1,800,000
	Activities to reach Result 4	Means	Belgian Contribution
R 4	Result 4: The provincial CC strategy is supported by the active involvement of the communities and the private sector.		Costs in Euros
A 4.1	Awareness raising of all stakeholders	Consultants, with TSU guidance Provincial and City Authorities, private sector and communities	100,000
A 4.2	Establishment of different platform of dialogue with stakeholders	Consultants, with TSU guidance Provincial and City Authorities, private sector and communities	70,000

7.2 Implementation calendar

7.2.1 Planning

Considering the complexity of the project, its duration will be of 6 years, with a Specific Agreement of 7 years. The activities will begin after the official start of TSU. The chronogram of the activities is organised according 3 major steps: project set up (9 months), implementation (57 months) including 24 months for the CC study, and closure (6 months) phases summarised in the following table:

		P Set up		studies		Implementation		closing	
		-1	Y1	Y2	Y3	Y4	Y5	Y6	
R 1: The capacities in CC, IWRM and urban planning within the province improved									
01	Needs analysis								
02	Capacity building in project management, procurement, M&E								
03	Capacity building of related agencies in CC, IWRM, urban development								
04	Strengthen cooperation/coordination mechanisms among agencies								
05	Data collection (including baseline study)								
06	Support to hydro-meteorological monitoring stations								
07	Database management through GIS set up								
08	Communication & dissemination of lessons learned								
R 2: comprehensive integrated strategy to respond to CC in place									
01	Comprehensive studies and modelling of river basin								
02	Integrated strategy on CC								
03	Detailed Master plans & revision								
04	Priority action plans								
	Workshop for selection of priorities								
R3: Improved physical conditions integrating CC issues									
01	Physical infrastructure								
	design								
	implementation								
02	Support to develop appropriate O & M measures								
R4: Active involvement of community and private sector									
01	Awareness raising of all stakeholders of CC & early warning system								
02	Set-up of 3 platforms of dialogue for river basin with stakeholders								
	CC platform								
	Urban development platform								
	IWRM platform								
03	Saving & credit to support communities to improve housing conditions								

The disbursement planning is provided in the following table.

7.2.2 Set up phase

General principles

The set up phase is a privileged moment for the PCU to internalise the project documents and for BTC and VIE partners to share a common understanding. The essential steps to follow and goals to achieve are described below:

Administrative and Financial aspects

- Setting up the PCU: recruit staff, settle down offices
- Purchase equipment – vehicles when necessary
- Opening bank accounts – define signatures – emit the first cash call
- Legal steps (establishment decree, customs, social security, employer...)
- Project Operation Manual (POM)
 - o It detail how the project will be implemented (PCU, PSC, procurement, HR, etc.);
 - o It is based on the SA, TFF and Local rules from RR and partners ;

- It is written by the PCU, with the help of the TSU, BTC and endorsed by the PSC before the end of the set up phase.
- Logical framework and planning
 - Update of the logical framework and of activities planning (multi-year and year 1)
 - Describing what the project will implement and when
 - It is based on SA, TFF , additional studies and participatory workshop
- Baseline and M&E system
 - Reference situation
 - Determination of indicators and monitoring and evaluation
 - It is the starting point of the project and on how it will be continuously improved

Technical aspects

In parallel with the recruitment of the personnel of the PCU, its installation and equipment, some specific activities should be conducted during the set up phase as follow:

Result 1

- After the redaction of the POM in consultation with the other 2 provinces and coordination with the TSU, the consultant will provide training and will conduct on-the-job coaching;
- Based on the assessment of the PCU needs, training on project management (administration, finance, M&E, reporting...) will be conducted with the support of the TSU and the BTC headquarter;
- The organizational assessment and the need assessment for capacity development of all related agencies within the province (including the hydro-met regional centre of Nga Trang) will be launched, including a detailed stakeholders analysis to identify the various roles, responsibilities and interests in CC, IWRM and urban development. This analysis will be supplemented by a study of the legal framework of the rights and duties of the provincial, regional and national institutions involved and their specific applications on the field;
- Under the guidance of the TSU, the PCU will ensure the identification of the potential and relevant capacity building organizations to carry out the CD services relevant to the project and to verify their availability;
- The understanding by all related stakeholders of the purpose, scope, methods and analysis of data collection of meteorological, hydraulic and socio-economic impacts of CC will be ensured by the PCU with the support of the TSU. A strategy of data management will then be launched by the TSU in coordination with the 3 provinces, including a need assessment for each province to be conducted by the PCU of the required data to be collected in perspective of the CC and hydraulic studies (R2) and the identification of the potential sources of existing information, with costs;
- Based on the above, terms of reference and the selection of the data management expertise will be conducted in a coordinated way by the 3 provinces, under the guidance of the TSU. In parallel, the terms of reference of the baseline survey, the socio-economic and the vulnerability assessment surveys targeting the Luy river basin will be elaborated in a coordinated way;
- Based on the available budget, the PCU with the guidance of the TSU will detail the strategy to support the meteorological and hydraulic monitoring stations (existing and new), considering the needs of the upcoming hydraulic and CC studies and modelling. This will be done in a participatory way with the related agencies. The necessary steps to install the required new stations within the Luy river basin will be defined, including cost estimates;
- The TSU, in dialogue with the 3 provinces, will conduct a detail survey of the relevant national and international institutions and universities as well as national and international consultant firms that

could support the project either as:

- o Potential consultants to conduct the various studies;
- o Providers of independent advices (peer review...) during the various stages of the studies;
- o Complement the project activities thanks to the coordination with their own research and study program.

Based on the result of the survey, the TSU will elaborate a strategy to be submitted to the 3 provinces, to collaborate with the relevant institutions and academics that could result in the signature of specific MoU that will be based on BTC templates and guidelines.

Result 2

- A process involving all required stakeholders – provincial, national authorities, academics, donors community – to elaborate an action plan to realise all the required CC and hydraulic studies and modelling in a coordinated way will be set-up by the PCU in dialogue with the other 2 provinces and the support of the TSU;
- Under the guidance of the TSU, information to elaborate the terms of references of the CC and hydraulic studies will be collected in collaboration with the 3 provinces.

Table 6: Proposed action plan of the set up phase

What	Responsible	Contributors	Deadline
Recruit staff	PPC	TSU, PO	Month 1
Settle down offices	PPC		Month 1
Purchase office equipment	PCU	PO	Month 1
Opening bank accounts	PCU	TSU, RR	Month 1
Define signatures	PPC	RR	Month 1
TOR and Tendering consultancy support to POM and coaching	PCU	PCU, PO, TSU	Month 2
The detail working modalities of the coordination mechanisms between the 3 provinces and the TSU	TSU	TSU, PCU, PPC, BTC	Month 1
ToR baseline (phase 1 and 2)	PO	PCU, TSU, OPS	Month 2
Tendering baseline	PCU	TSU, PO	Month 3
Starting baseline (phase 1)			Month 4
Finalising baseline (phase 1)			Month 6
Update of the logical framework and of activities planning (multi-year and year 1)	PCU	TSU	Month 6
Starting baseline (phase 2) (after approval of phase 1)			Month 9
Finalising baseline (phase 2)			Month 12
Purchase vehicles	PCU	RR	Month 2
Emit the first cash call	PCU	TSU	Month 1
Legal steps: establishment decree, customs, social security, employer	PPC, PCU	RR	Month 1

ToR training on project management (administration, finance, M&E, reporting...)	PCU	TSU	Month 3
Training of PCU on Project management		TSU, BTC-HQ	Month 4
ToR needs assessment CC	PCU	TSU, EST Gov	Month 4
Tender needs assessment CC	PCU	TSU	Month 6
Starting needs assessment CC			Month 8
identification of the potential and relevant capacity building organizations to carry out the CD services relevant to the project and to verify their availability	PCU, TSU		Month 6
A process involving all required stakeholders – provincial, national authorities, academics, donors community – to elaborate an action plan to realise all the required CC and hydraulic studies and modelling in a coordinated way	PCU, TSU		Month 6
TOR of the CC and hydraulic studies	PCU	TSU	Month 4

The outcomes of the project set-up phase, including the results of the baseline study and the selected indicators, will be communicated through the different project reporting mechanisms.

	BEL contribution	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
support institutional capacity in Binh Thuan in IWRM	3,895,000	345,000	860,000	730,000	735,000	925,000	300,000
<i>R 1: The capacities in CC, IWRM and urban planning within the province are improved</i>	1,035,000	265,000	390,000	155,000	85,000	75,000	65,000
Capacity building of PCU in project management, procurement, M&E and reporting	210,000	85,000	85,000	10,000	10,000	10,000	10,000
Training needs assessment / IOCA	40,000	40,000					
Capacity building of related agencies and stakeholders in IWRM, urbanization and CC	260,000	40,000	120,000	100,000			
Strengthen cooperation/coordination mechanisms among agencies with regards to CC, IWRM & urban planning	80,000	0	20,000	20,000	20,000	20,000	
Data collection (including baseline survey)	205,000	30,000	75,000	25,000	25,000	25,000	25,000
Support to hydro-meteorological monitoring stations	60,000	30,000	30,000				
Comprehensive database management through GIS	100,000	40,000	60,000				
Communication & dissemination of lessons learned	80,000	0			30,000	20,000	30,000
<i>R 2: comprehensive integrated strategy to respond to CC is in place</i>	890,000	80,000	470,000	340,000	0	0	0
Comprehensive studies and modeling of Luy river basin	610,000	50,000	360,000	200,000			
Support to revision of the CC strategy in a participative way based on the studies	50,000		30,000	20,000			
Master plans revision of towns & hinterlands along Luy river considering CC and SSP principles	150,000	30,000	80,000	40,000			
Priority action plan, methodology, tool, process and consultancy	80,000			80,000			
<i>R3: Pilot intervention to improve physical conditions of one target town</i>	1,800,000			200,000	600,000	800,000	200,000
Physical infrastructure to adapt 1 urban center & its close hinterland to CC	1,800,000			200,000	600,000	800,000	200,000
Support to appropriate O & M measures	0						
<i>R4: Active involvement of community and private sector</i>	170,000			35,000	50,000	50,000	35,000
Awareness raising campaigns about CC impact, change of behavior, water & energy efficiency	100,000			25,000	25,000	25,000	25,000
Set-up of platforms of dialogue for Rao Cai river basin with all major stakeholders	70,000			10,000	25,000	25,000	10,000
Contingencies	203,900						203,900
<i>Contingencies</i>	203,900						203,900
Contingencies Project management	162,900						
Contingencies Own Management	41,000						
General means	1,101,100	187,100	207,900	266,900	141,900	135,900	161,400
<i>Human resources</i>	677,200	91,200	150,200	174,200	91,200	85,200	85,200
Technical assistance specific to the province	346,000	36,000	95,000	119,000	36,000	30,000	30,000
PCU staff	331,200	55,200	55,200	55,200	55,200	55,200	55,200

<i>Investments</i>	57,200	57,200					
Vehicle	31,000	31,000					
Office equipment	4,500	4,500					
IT equipment	16,700	16,700					
Office rehabilitation & LAN installation	5,000	5,000					
<i>Operating costs</i>	229,200	31,200	45,200	45,200	38,200	38,200	31,200
Office rent							
Utilities	21,600	3,600	3,600	3,600	3,600	3,600	3,600
Vehicle operating costs (1)	36,000	6,000	6,000	6,000	6,000	6,000	6,000
Communications incl. internet	18,000	3,000	3,000	3,000	3,000	3,000	3,000
Operational costs	57,600	9,600	9,600	9,600	9,600	9,600	9,600
Flights and per diem (to attend TSU activities)	84,000	7,000	21,000	21,000	14,000	14,000	7,000
Provincial Steering Committee	12,000	2,000	2,000	2,000	2,000	2,000	2,000
<i>Audit, follow up and evaluation</i>	137,500	7,500	12,500	47,500	12,500	12,500	45,000
Backstopping	12,500	2,500	2,500	2,500	2,500	2,500	
Audit	55,000	5,000	10,000	10,000	10,000	10,000	10,000
MTR, final evaluation in coordination with TSU & other 2 provinces	70,000			35,000			35,000
	5,200,000	532,100	1,067,900	996,900	876,900	1,060,900	665,300

7.3 TOR long-term personnel

7.3.1 Project Director

Duty station: Phan Thiet city and environs, Province of Binh Thuan – Vietnam

Duration of the assignment: 72 months

Recruited by PPC of Binh Thuan province

1. Tasks

The Project Director (PD) will function on a part time basis of up to 50% as the leader of the Project Coordination Unit (PCU) during the life of the Project and be responsible for ensuring that the tasks of the PCU, as described in the TFF, are carried out smoothly and in a timely manner.

In particular the PD will refer to the Project Steering Committee (PSC) and ensure that the members are well informed of project progress and are adequately supplied with sufficient information to carry out their decision-making responsibilities. The PD will feed back to the PCU and the Technical Support Unit (TSU) any changes in policy or direction that the PSC may wish to carry out within the Project framework.

Reporting to the Chairman of the PSC the PD shall:

- Provide overall leadership of the PCU and coordinate the operations of the project activities with the province departments, related ministries and the TSU;
- Ensure sufficient capacity building for the PCU so that it can carry out their duties effectively;
- Cooperate with the National Technical Advisor of the project and the international and National TA of the TSU of both the in developing plans for TA utilisation and supervise and facilitate the work of the TA staff;
- Supervise the development of Strategic and Annual Plans of Operation and Budgets of the Project components;
- Develop work plans and budgets for Project Management;
- Ensure that new coordination mechanisms among departments are approved and applied by the relevant provincial authorities;
- Facilitate efforts of the TSU to coordinate activities with the other 2 provinces of the CC program and ensure exchange of experiences between the 3 projects;
- Supervise the preparation of quarterly and annual progress reports;
- Supervise the monitoring and evaluation of the Project implementation;
- Analyse and consolidate monitoring reports and prepare recommendations to the PSC;
- Organise bi-annual PSC meetings;
- Prepare the contents and agenda of the PSC meetings;
- Be responsible for regular communication with BTC on the management and supervision of Project implementation;
- Act on behalf of the Chairman of the PSC when authorised, and report back to the Chairperson on actions taken;
- Ensure the setting up of an effective website for sharing of information;
- Ensure the capturing and integration of lessons learnt and experience drawn in the implementation

of project activities under the components;

- Recruit international and national consultants according to proper terms of references with the guidance of the TSU;
- Enter into employment contracts and commercial contracts for fulfilling the task of the PCU for consultancy and or training providers;
- Be authorised account-holders for the accounts;
- Implement other duties as assigned by the PSC Chairperson and or BTC;
- Be proactive in securing alignment with central authorities and institutions, in particular MPI, MONRE, MoC, MOHA, MOHA, BTC and other related donor funded projects;
- Arrange regular PCU meetings normally on a monthly basis or more frequently if deemed necessary;
- Guarantee the setting up of appropriate coordination mechanisms among Provincial agencies in charge of the water management;
- Guarantee the project focus on the cross cutting issues, especially environmental protection, throughout its implementation and activities.

2. Reporting

The Project Director shall discuss and agree with the Chairperson of the PSC on the form and frequency of reporting. Besides periodic progress and financial reports the PD shall provide the following reports:

- An Inception Report six months after commencement of the Project including assessments on the effectiveness of the PMU operations and, if needed, proposing options for improving the structures, systems and procedures;
- Prepare consolidated and coordinated quarterly and annual progress reports including recommendations with justification for improving the effectiveness of the project activities;
- Prepare financial reports in accordance with the requirements of BTC and the Provincial authorities;
- A Final report summarising the results of the Project including lessons learnt, conclusions and recommendation on how the achievements of the Project can be sustained;
- Any other reports as requested by the Chairperson of the PSC or BTC.

3. Qualifications

The Project Director shall be a high ranking member of the Office of the People's Committee Office, preferably with a project management experience, and technical or human resources development background, including good communication and coordination skills, English language knowledge, computer use being considered essential. Knowledge and experience of ODA donor procurement, safeguards and project accounting mechanisms is preferred.

7.3.2 Deputy Director, expert in water management and M&E

Duty station: Phan Thiet city and environs, Province of Binh Thuan – Vietnam

Duration of the assignment: 72 months

Recruited by PPC of Binh Thuan province

1. Tasks

The Deputy Director (DD) will function on a full-time basis as the deputy leader of the Project Coordination Unit (PCU) during the life of the Project. S/he will second the Project Director (PD) as responsible for ensuring that the tasks of the PCU, as described in the TFF, are carried out smoothly and in a timely manner.

Reporting to the PD the DD shall:

- Provide day-to-day guidance to the PCU staff and coordinate the daily operations of the project activities with the province departments, related ministries and the TSU;
- Ensure on-the-job coaching to the PCU so that it can carry out their duties effectively;
- Cooperate with the National Technical Advisor of the project and the international and National TA of the TSU of both the in developing plans for TA utilisation and supervise and facilitate the work of the TA staff;
- Be in charge of the M&E strategy of the project and its good implementation;
- Follow-up the application of the new coordination mechanisms by the relevant provincial authorities;
- Give input in the preparation of quarterly and annual progress reports;
- Contribute to the monitoring reports and the recommendations to the PSC;
- Support the organisation of bi-annual PSC meetings;
- Contribute to the contents and agenda of the PSC meetings;
- Act on behalf of the PD when authorised, and report back to him/her on actions taken;
- Coordinate the setting up of an effective website for sharing of information;
- Support the recruitment of international and national consultants according to proper terms of references with the guidance of the TSU and follow-up the technical aspects of their input especially in the fields of IWRM, CC capacity development, M&E;
- In coordination with the related department, the National Technical Advisor in IWRM and the TSU, give technical input on issues related to IWRM, CC, data management and M&E, whenever needed;
- Be co-authorized account-holders for the accounts;
- Implement other duties as assigned by the PD and/or the TSU;
- Be proactive in securing alignment with central authorities and institutions, in particular MPI, MONRE, MoC, MOHA, MOHA, BTC and other related donor funded projects;
- Support the building up a the CC-IWRM data base in coordination with the nationwide NRE database set up and managed by MoNRE;
- To further improve the integrated character of the project, s/he should participate in any network on Climate Change (CC), IWRM and urban development in Vietnam (together with the relevant

representatives of provincial authorities and the TSU when possible).

2. Reporting

The DD shall discuss and agree with the PD on the form and frequency of reporting. Besides periodic progress and financial reports the DD shall support the PD in the provision of the following reports:

- An Inception Report six months after commencement of the Project including assessments on the effectiveness of the PMU operations and, if needed, proposing options for improving the structures, systems and procedures;
- Consolidated quarterly and annual progress reports including recommendations with justification for improving the effectiveness of the project activities;
- Financial reports in accordance with the requirements of BTC and the Provincial authorities;
- A Final report summarising the results of the Project including lessons learnt, conclusions and recommendation on how the achievements of the Project can be sustained;
- Any other reports as requested by the Chairperson of the PSC or BTC.

3. Qualifications

The DD shall be a high ranking member of a technical department of the Province (DARD, DoC, DoNRE, Hydro-Met), with expertise in water management and data management preferably with a project management experience, and technical or human resources development background, including good communication and coordination skills, English language knowledge, computer use being considered essential. Knowledge and experience of ODA donor procurement, safeguards and project accounting mechanisms is preferred.

7.3.3 National Technical Assistant on IWRM

Duty station: Phan Thiet city and environs, Province of Binh Thuan – Vietnam

Duration of the assignment: 72 months

Recruited by the Belgium Technical Cooperation in Hanoi

1. Tasks

The National Technical Assistant on Integrated Water Resources Management (IWRM) (NTA-IWRM) will support the Project Coordination Unit (PCU) during the six years of the Project. S/he will be under the leadership of the Project Director (PD). He/she will support the PD to ensure that the tasks of the PCU, as described in the TFF, are carried out smoothly and in a timely fashion. S/he will assist the PD in his/her different duties as an on-the-job training, while insuring smooth coordination with the Technical support Unit (TSU).

The NTA-IWRM has to assist the PD to ensure the coherence and unity of the Project. S/he will work and collaborate closely with the PCU and the International and the technical National technical assistants of the TSU. The NTA-IWRM shall ensure the smooth integration of the various stages and activities deployed. S/he ensures the adequate liaison with the TSU and ensures the PCU members and the related PPC agencies are regularly briefed about the progress of the Project. S/he supports the PD in the day-to-day management of the Project in close cooperation with the TSU.

Reporting to BTC and the PD, the NTA shall focus on, but not necessarily be limited to, the following tasks:

- Oversee the project activities under the direction of the PD in close cooperation with the TSU;
- Provide support to the PCU in daily management of the project;
- Maintain close relationships with relevant provincial departments and agencies and Binh Thuan PPC;
- Assist in identification of key national stakeholders and local stakeholders for the project;
- In cooperation with the PD and the Deputy Director (DD) contribute to a smooth running of coordination and cooperation between the PCU and the TSU and facilitate the coordination with the other 2 provinces of the Belgian-Vietnamese CC program (Ninh Thuan and Ha Tinh provinces);
- Support the PD and the DD in the supervision of international and local technical consultancy in close collaboration with the PCU and TSU and give technical advises on IWRM, CC, capacity development and M&E whenever needed;
- Supervise the contracting of Capacity Building Organisations and other training providers in close collaboration with the PCU and TSU;
- Ensure the daily guidance and follow-up the capacity development and institutional strengthening activities;
- In close cooperation with the PD and the DD, coordinate the building up a the CC-IWRM database in coordination with the nationwide NRE data base set up and managed by MoNRE;
- To further improve the integrated character of the project, s/he should participate in any network on Climate Change (CC), IWRM and urban development in Vietnam (together with the relevant representatives of provincial authorities and the TSU when possible);
- Participate in the setting up of an effective O&M of a website for sharing of information;

- Ensure the capturing and integration of lessons learnt and experience drawn in the implementation of project activities;
- Support the PD in the preparation of project work plans in cooperation with the PCU and TSU;
- Participate in the monitoring and evaluation of the Project implementation;
- Assist the PD to apply properly the Monitoring and Evaluation (M&E) tools of the project, making sure that all the information are collected and entered in the M&E software on time;
- Participate in regular communication with other provincial departments, districts, towns and communes on the management and running of Project implementation;
- Be proactive in securing alignment with central authorities and institutions, in particular MPI, MoNRE, MoHA, MARD, MOC and to coordinate with other related donor funded projects and in particular the projects in relation to CC, IWRM and urban development;
- Assist in the preparation of the contents and agenda of the PSC meetings;
- Assist the PD to act as a secretary of the Project Steering Committee (PSC);
- Participate in the recruitment process of international technical consultancy together with BTC and PPC;
- Participate in the recruitment process of national technical consultancy;
- Contribute to recruitment of Capacity Building Organisations to carry out Project training programmes;
- Participate in all PCU meetings;
- Guarantee the project focus on the cross cutting issues, especially environmental protection, throughout its implementation and activities;
- Implement other duties as assigned by the PD and/or TSU.

2. Reporting

The NTA-IWRM shall assist the PD in the preparation of periodic progress reports and financial reports on the project activities. He/she will:

- Assist the PD and the NFM to supervise the preparation of regular financial reports for the Belgian contribution;
- Analyse and consolidate monitoring reports and prepare recommendations to the PSC;
- Assist in the preparation of reports for PSC meetings;

In particular the NAVD shall assist the PD in preparing:

- An Inception Report six months after commencement of the Project including assessments on the effectiveness of the PCU operations and, if needed, proposing options for improving the structures, systems and procedures;
- Consolidated and coordinated, in collaboration with the PD, the NFM, under the guidance of the TSU, quarterly and annual progress reports for the CDWMS including recommendations with justification for improving the effectiveness of the CDWMS;
- A Final report summarising the results of the Project including lessons learnt, conclusions and recommendation on how the achievements of the Project can be sustained.
- Any other reports as requested by the PCU, PSC or BTC.

3. Qualifications

- Relevant degree for the job (water engineering) or equivalent professional experience;
- At least 15 years of relevant working experience;
- Experience in IWRM and, if possible, in CC related issues;
- Minimum of five years of project management experience (planning activities, finance, administration);
- Have a broad technical knowledge of the project's area of intervention;
- Have in depth knowledge of the Logical Framework Approach;
- Have excellent interpersonal skills and a proven track record of managing technical inputs from a range of part time consultants and experts;
- Be fluent in written and spoken English and Vietnamese;
- Excellent computer skills and report writing skills are essential;
- Good communication and coordination skills.

7.3.4 Finance Manager

Duty station: Phan Thiet city and environs, Province of Binh Thuan – Vietnam

Duration of the assignment: 72 months

Recruited by the PPC Binh Thuan Province

1. Tasks

The financial manager is responsible for a variety of finance-related tasks including the ones listed below (this list is not exhaustive). S/he works under direct supervision of the Project Director (PD) for all Project Management modality (PM) related expenses ; S/he reports also to the financial coordinator of the Representation. His/her main tasks are as follow:

1. Responsible for financial administration and procedures
 - Control all financial administration issues: solves problems, helps improve financial administration, points out and corrects errors and problems, reports any major problem to the PD and seeks advice from the Representation when necessary.
 - Ensure a correct, smooth and efficient organization of the financial administration;
 - Ensure good communication, information and cooperation within the financial administration team;
 - Supervise compliance with legal and administrative procedures and guidelines; this implies s/he studies, checks and reinforces financial guidelines and procedures with the support of the Representation financial coordinator;
 - Ensure all instructions of the POM are correctly applied and followed and that the requests are met within the deadline.
2. Financial activity reporting
 - Produce financial reports whenever requested following format lay out (e.g. for steering committees) as mentioned in the TFF and the POM;
 - Make electronic back-up of final versions of financial reports
3. Budgeting and financial planning
 - Follow up and update of budget; Compare budget and planning with actual expenses; Provide monthly overview of budget balance to PCU director and technical teams;
 - Financial short-and long-term planning: overall, yearly and quarterly (in co-operation with technical teams); monthly and weekly;
 - Overall management of bank and cash accounts, making cash calls on basis of the financial planning and according to the TFF rules.
4. Auditing, monitoring, consulting, training
 - Audit and analyze project expenses monthly, report any inconsistencies or irregularities;
 - Control supporting accounting documents on quality and completeness, and follow up on corrections by the accounting assistant;
 - Consult and monitor financial issues related to technical project components;
 - Prepare and provide training on financial management for stakeholders;
 - Preparing and assisting internal and/or external financial audit missions.

2. Qualification

- University degree in finance, business administration or business economics;

- Minimum 8 years experience in financial management and project administration;
- Management experience, and experience with an international organization or NGO, 3 years minimum;
- Very good hands-on knowledge of Excel and Word is a must. Other programs (Database, accounting programs) a strong advantage;
- Proficient in English and Vietnamese with good translation skills;
- Mature, good communicator and team player;
- Able to work under stressful conditions.

7.3.5 Accounting and administrative assistant

Duty station: Phan Thiet city and environs, Province of Binh Thuan – Vietnam

Duration of the assignment: 72 months

Recruited by the PPC Binh Thuan Province

1. Tasks

The accounting and administrative assistant is responsible for a variety of finance and administrative-related tasks including the ones listed below. S/he works under direct supervision of the finance manager. His/her main tasks are as follow:

1. Banking & cheque and cash management

- Prepare, register and keep cheques;
- Ensures all invoices from external parties (contractors, suppliers...) are paid in due time, by bank transfer, cheque or cash and arrange those documents by date: her/his task of preparing bank transfer and cheque documents and manage pipeline payment to external parties;
- Check and approve document requested by the financial manager;
- Attend and record all bank transactions, maintain bank accounts, ensure monthly bank statements and account overviews;
- Final responsibility for the cash management;
- Ensure liquidation of any internal advances and update advance outstanding by the end of each month and report to financial manager;
- Responsible for sound cash planning & cash withdrawals, so as to avoid cash shortages or large amounts cash in safe (security issue);
- Updates fixed asset register, follow up consultancies, contractor contract and stock of stationary.

2. Financial activity reporting

- Record all project expenses properly in the accounting software, following guidelines and within the deadlines the latest 15th of the following month;
- Produce financial statements for control by PCU management/financial manager, make all necessary corrections and make all preparations for the monthly closing of the accounting;
- Supervise daily entry of expenses in the cashbook;
- Check and control to ensure quality and completeness of justification and supporting accounting documents of all expenses following guidelines;
- Ensure accounting coding and budgeting lines are corrects: this includes verification of financial reports, expenses and supporting documents;
- Ensure monthly balance of Cashbooks/Cashboxes and bank statements are the same, and responsible for completion and approval of reconciliation statements if any;
- Responsible for transparent and consistent filing of all accounting, banking and cash management documents.

3. Financial Administration

- Check to ensure correct application of allowances;
- Assist financial manager with a variety of tasks: e.g. cost calculations, filing finance-related

documents, monthly and weekly financial planning, managing pipeline payments...etc;

4. Budgeting and financial planning

- Provides all necessary accounting data and information to the financial manager, for him/her to be able to follow up on budget and planning.
- Assist financial manager in the elaboration of reports, budgets or plans.

2. Qualification

- Degree: Certified Public Accountant or equivalent;
- Minimum 3 years experience accounting and project administration;
- Experience with an international organization or NGO;
- Very good hands-on knowledge of Excel and Word is a must. Other programs (Database, accounting programs) a strong advantage;
- Mature, good communicator and team player;
- Able to work under stressful conditions.

7.3.6 National community and communication specialist

Duty station: Phan Thiet city and environs, Province of Binh Thuan – Vietnam

Duration of the assignment: 24 months

Recruited by the Belgium Technical Cooperation in Hanoi

1. Tasks

The National Community and Communication specialist (NCC) will support the Project Coordination Unit (PCU) during a 2-year period the Project. He/she will be responsible under the leadership of the Project Director (PD) and the coordination of the Technical support Unit (TSU) on:

- Support the development and execution of activities to improve the awareness and subsequent actions of community groups and the citizens of the Luy river basin, and more specifically of the 3 target towns (Luong Son, Cho Lau and Phan Ri Cua towns);
- Introduce the concepts and methods for management of a Revolving Credit Fund specifically set up for loans for housing and neighbourhood upgrading.

His/her activities will include but not necessarily be limited to:

- Review and eventually complete the vulnerability survey (collation of existing information and selected additional interviews) of the existing housing situation with regards to Climate Change (CC);
- Develop, in coordination with the TSU and the PD the approach and work plan for the community development and awareness;
- Liaise with relevant community groups and key community stakeholders to set up the Community Management Committee (CMC);
- Design awareness programmes and train CMC staff & field workers on dissemination of information and other awareness raising activities;
- Identify equipment requirements for the CMC and the WU and arrange for procurement and delivery to relevant users;
- Consult with the WU regarding the revolving credit funds and provide training as required;
- Support the establishment, the management and operation and the monitoring of the revolving credit fund;
- Liaise with other PCU and TSU team members and local authorities to ensure that the awareness raising is closely related to, and supports the activities in the field;

2. Reporting

Reporting will include but not necessarily be limited to:

- Vulnerability review survey report
- CMC work programmes including recommended approach and activities
- Quarterly Progress Reports & contribution to Project Progress report
- Project Completion Survey Report
- Contribution to the Project Completion Report

3. Qualifications

- Relevant degree for the job (communication and social involvement) or equivalent professional

experience;

- At least 10 years of relevant working experience;
- Experience in environment awareness raising and, if possible, in CC related issues;
- Have a broad technical knowledge of the project's area of intervention;
- Have excellent interpersonal skills and a proven track record of managing technical inputs from a range of part time consultants and experts;
- Be fluent in written and spoken English and Vietnamese;
- Excellent computer skills and report writing skills are essential;
- Good communication and coordination skills.

7.3.7 National data management and GIS Expert

Duty station: Phan Thiet city and environs, Province of Binh Thuan – Vietnam

Duration of the assignment: 72 months

Recruited by the PPC of Binh Thuan Province

1. Tasks

The National data management and GIS Expert (NDM) will support the Project Coordination Unit (PCU) throughout the project duration. He/she will be responsible under the leadership of the Project Director (PD) and the coordination of the Technical support Unit (TSU) on supporting the PCU and the PPC in developing a comprehensive database and Geographic Information System (GIS) related to climate change (CC) and Integrate Water Resource Management (IWRM), considering urban development.

His/her activities will include but not necessarily be limited to:

- Establish a close working relation to the TSU and international GIS/database consultants, support and understand his/her professional expertise
- Assist in the upgrading/improvement/creation of the database and GIS related to CC and WR
- Participate in all working groups of national and international informatics experts related to the structure development and design of the database and GIS
- Assist in the creation of the English-Vietnamese language interface for the database and the information system;
- Assist in the development of applications for the interactive database system and GIS
- Maintenance of the database / GIS system, including updating and backup, restore
- Develop import routines (programs) to import the exiting data/information
- Create new database tables, fields and queries for the database and GIS
- Update the database labels and look-up tables for both languages (English and Vietnamese)
- Conduct trial runs and suggest necessary improvements
- Update the user manual in Vietnamese
- Develop a working and training plan for the users in cooperation with the TSU
- Provide Training for the use of the database and GIS system
- Assist the helpdesk for the system user
- Preparing technical reports about the database and system (creation and structure)

2. Reporting

- Prepare technical reports about the database and system (creation and structure)
- Quarterly Progress Reports & contribution to Project Progress report
- Updating User Manual
- Problem reports to the TSU

3. Qualifications

- Academic graduation in relevant field of computer from a recognized national university;
- At least 5 years of proven professional experiences in creating or working with relational database;

- Experience in create dynamic applications in Internet, using languages SQL, HTML, PHP, AJAX, Java and JavaScript, to communicate with a central server database;
- Professional knowledge about server and network system, using LINUX and Apache;
- Proven knowledge about Geographic Information Systems, desirable with MapServer (or other online GIS)
- Experience in creating and designing web pages;
- Training skills, and also experience in preparing and executing workshops to teach the use of the system;
- Good English skills in spoken and written;
- Experience working with public sector and government organizations in Vietnam.

7.3.8 ToR for an international advisor in management

Duty station: BTC-Hanoi with frequent travels to the provinces of Ha Tinh, Binh Thuan and Ninh Thuan – Vietnam

Duration of the assignment: 24 months

Recruited by BTC

1. Tasks

The International management advisor (IMA) will function on a full-time basis – time to be shared equally between the 3 provinces of the program on Climate Change (CC) supported by Belgium, i.e. the provinces of Ha Tinh, Binh Thuan and Ninh Thuan – during the first 2 years of the 3 projects. S/he will work in close cooperation with the Project Coordination Unit (PCU) of each project and more particularly their Project Director (PD) to ensure properly the management and finance duties described in the TFF, and the BTC Representation in Hanoi.

Reporting to Representation the IMA shall:

Overall management support

- Give support to projects in order that required procedures are in place and propose concrete measures to ameliorate when needed;
- Provide assistance in the development of new tools;
- Provide advice in the set-up of the operation and financial reporting;
- Identify and help to organise the needed capacity building;

Planning, Monitoring and Evaluation management support

- Draw lessons learned from the implementation of the other NEX projects in Vietnam
- Implement a M&E evidence based learning framework and process based on Vietnamese procedures, which is oriented toward achieving results rather than monitoring activities
- Give tools and assistance to the projects for
 - o Strategic steering: support the PCU to identify specific adjustments of activities and indicators defined in the projects logframe, based on lessons learned from the previous period of implementation, and to formulate recommendations to the SC on project design and targets.
 - o Operational steering: support the PCU to reliably appraise progress and take decision based on evidence, i.e. to look back at the experiences of the last interval planning, assess lessons, and plan for the next interval.
 - o Implementation steering: support the PCU to identify accurate chains of actions needed for the implementation of the activities, and to realistically plan the time and resources needed for each (use of result based activity and budget schedules and milestones).

Financial management support

- Give assistance to the set-up of proper procedure to the projects for
 - o budget preparation, monitoring and follow up
 - o financial planning and reporting

- o audit recommendations follow up
 - o treasury management
- When required by other the Representation or TSU members or the projects PMU
 - o helps to recruit and train finance and administration staff
 - o proposes and provide assistance in the development of new tools

2. Qualifications

- Degree in economics;
- At least 10 years experience in developing projects with the public sector;
- At least 7 years in project management;
- Good knowledge of:
 - o Financial management, including rules and tools applied by the GOV;
 - o Procurement management, following Vietnamese rules;
 - o Project monitoring and evaluation tools;
- Experience in capacity building, coaching on the job in an international environment.

7.3.9 ToR for a VN advisor in management and Vietnamese rules and procedures

Duty station: BTC-Hanoi with frequent travels to the provinces of Ha Tinh, Binh Thuan and Ninh Thuan – Vietnam

Duration of the assignment: 60 months

Recruited by BTC

1. Tasks

The VN management advisor will function on a full-time basis – time to be shared equally between the 3 provinces of the program on Climate Change (CC) supported by Belgium, i.e. the provinces of Ha Tinh, Binh Thuan and Ninh Thuan. S/he will start by assisting the IAM in its work and will then follow up the implementation of the management procedures during the project execution.

S/he will work in close cooperation with the Project Coordination Unit (PCU) of each project and more particularly their Project Director (PD) to ensure properly the management and finance duties described in the TFF, and the BTC Representation in Hanoi.

Overall management support

- Give support to projects in order that required procedures are well followed up
- Provide assistance in the development of new tools;
- Follow up the set-up of the operation and financial reporting;

Financial management support

- Give assistance to the follow-up of proper procedure to the projects for
 - o budget preparation, monitoring and follow up
 - o financial planning and reporting
 - o audit recommendations follow up
 - o treasury management
- Ensure that the TFF financial procedures are put in place and respected.

2. Qualifications

- Degree in economics;
- At least 5 years experience in developing projects with the public sector;
- At least 5 years in finance and procurement management under Vietnamese law
- Deep knowledge rules and tools applied by the GOV
- Experience in capacity building, coaching on the job

7.4 Technical issues

7.4.1 Monitoring and Evaluation Tool software

Context: the CAPAS project

The project “Capacity Building in Assessing and Monitoring Water Resources of Vietnam” follows the Finance Cooperation modalities. BTC is the executing agency and responsible for the implementation and follow up of the project, providing supervision and technical assistance by the TAs. The activities are executed on central level (in Ha Noi) and in seven pilot provinces, which are geographically disperse located and not easy frequently to visit. Each province has a provincial PMU responsible for management and implementation of activities at provincial level, which also is accountable responsible.

All PMU’s finances are managed by the local Ministry and Departments, using their own financial accounting tool (BRAVO). The internal BTC financial tool “FIT” is not used/usable for the 8 project management units, as FC modalities demands to follow national rules. The intention of the project was therefore to develop a more appropriate and comprehensive tool considering the dispersed location of the different stakeholders and the different systems in use.

Objective of MET

MET is designed to:

3. Avoid redundancies in data exchange (sending spread sheets with disbursement reports back and forwards);
4. Timesaving, e.g. in merging all 8 PMU disbursements manually;
5. Improve data quality and security (better control and backup function on central server);
6. Dynamically and user-friendly update project information online, via Internet access;
7. Facilitate the daily follow-up for the PMU/TA/BTC, providing graphic online analyzing tools;
8. Measurement of project performance on all levels;
9. Enhance visibility for BTC and Partner, thanks to an online solution;
10. Generating frequently project reports (on disbursement and progress);
11. Including alert systems to avoid disbursement or activity bottlenecks/crisis;
12. Avoiding installation of any program (except standard Internet applications on the clients side);
13. Avoiding license cost.

MET is not an accountant software, however have accountant components, for example stores all budget transfer details, budget allocation’s and actual disbursements.

System Components

The database is established on a central (Apache) Server, located in the Department of Water Resource Management, managed by the Program Support Unit (PSU/BTC).

The initially used ACCESS database was migrated and installed to an open-source, PostgreSQL database on the central server.

The database includes all planed budget lines, activities on central and provincial level, updated disbursement (31.08.10), activity progresses (in %) and milestones (indicators).

For the graphic display MET use the free version of the php graphic library, called jp-graph, which

includes a numberless of graphic solutions, including GANTT, Spider, stacked bar charts, bubble-charts, etc.

In future MET could also include a map-based (GIS) application, to display project activities in a geographical context, using the open source application, mapserver.

The communication between client and server is mainly done with AJAX (Asynchronous JavaScript and XML) and JSON (JavaScript Object Notation), which provides a good compromise between performance and flexibility, and a high data security.

On the clients side the browser (running javascript) send a request to the server, using AJAX. On the server side the php program communicates with the PostgreSQL database, using a SQL query and the results will be send back to the client using JSON and embedded the result in the javascript of the client HTML site.

Using the modern communication solutions like AJAX and JSON reduce appreciable the overhead (slow) of information sent over internet, in comparison with the standard communication technique (done by HTML or XML).

For a comfortable data management MET provides the user with a SIMPLE and EASY to use data entry menu and standards forms, to fill up by the different PMU's, as MET is bilingual (English/Vietnamese).

Reporting and AAS

MET could be updated by introducing an Automatic Alert System (AAS) in form of plausibility routines, which are programmed in SQL, so the system automatically gives a "yellow, orange, red light" when certain conditions are reached or not.

MET is accessible via the project website: www.capas.vn

7.4.2 Technical description and basic functionality of the WRIS

The WRIS is based on a server system (local host or Internet access), which stores all the hydro-geological and topographic information, documents (like PDF-Files), photos and maps.

The user connects via his browser using local host network or the Internet with the system. The rights of access to the system depend on passwords and of the profile assigned by the data base administrator to the user. The main components of the system are as follow:

The user communicates with the system using dynamic internet page forms, programmed in PHP 5.x. and JavaScript using the AJAX technology. The user can, depending on his access rights, input or edit hydro-geological information using predefined data input forms or execute a query. All information entered into the forms is checked against errors and only error free data is stored in the database.

When the user executes a query or uses the system to edit attribute data (e.g. chemical data), the system generates on the server in SQL a consultation in the data base. The open source program **PostgreSQL** in connection with **PostGIS** which stores all spatial information and the attribute data. The same query returns the result to the system in PHP. If the query is based on territorial information the system use **P-Mapper open source GIS** component, which is the software to display maps using HTML (Internet) browser.

P-Mapper retakes the result of the consultation and generates the map. The **PostGIS** data bank stores all the special information represented by existing Shape Files and imported into this spatial database. So it is essential to complement the system with basic of the country, like for example, maps with information of river streams, highways, delimitations of municipalities, cities, etc. The number of map layers and the spatial resolution is not limited and depends only on the shape files.

The PHP application generates the final product, a page in **DHTML** code, a combination of HTML and JavaScript, which achieves with the AJAX technology the interactive properties of a desktop application. In the given example it is a topographic or thematic map, which the system displays on the screen.

One of the many advantages of this system is that the system is safe in respect of the access to data base (attribute data and spatial information is stored in a data base and the access is performed via SQL). All procedures of the consultation to the database and the elaboration of results execute by the server. The result is only a page in **HTML** which not permits to manipulate the information stored in the database without control.

7.4.3 River contracts

“River contracts” are set up as interrelated negotiated planning instruments for the process of strategic planning of the re-qualification or river basins. The adjective “strategic” indicates a course of co-planning in which the methodology and path itself are divided into itineraries with all of the stakeholders. These processes are in fact finalized with the completion of enduring development scenarios for the basins in a fully shared manner.

The “re-qualification of the basin” is understood in its broadest sense and refers in its entirety to the environmental-landscape aspects as established in the National Law adopted in the European Landscape Convention.

The elaboration of enduring development scenarios of the under basin refers to environmental landscape re-qualification processes, which are conscious of the “founding matrices” of the regional territory (hydro-geologic, geomorphology, evolution of the natural and anthropic ecosystem, etc.) and which opportunely interpret the “local settlement history”.

The River Contract is therefore the signing of an agreement that allows for the adoption of a system of rules in which the criteria of public use, economic performance, social value and environmental sustainability intervene in a preferential manner in the search for effective solutions for the re-qualification of a river basin.

The elements that come into play in this agreement are:

- A community (municipalities, provinces, regions, associations, companies, citizens, etc.)
- A territory (ground, water, settlements, air, etc.)
- A group of policies and projects on various scales/levels

These elements, always within their relationship with one another, must therefore be oriented towards shared objectives for re-qualification through the appropriate active processes.

The River Contract therefore enters into a regulatory context represented by Directive 2000/60 of Legislative Decree 152/06, Law 14/06 (that ratifies the principles of the European Landscape Convention) and of regional norms and regulations such as: LR 12/2005 (on the governing of the territory), LR 6/73 (on hydraulic works), LR 2/2003 (on negotiated Planning), PSR 2007/2013 (regarding the Strategy for the conservation of biodiversity and the System of ecological networks).

The promotion of a River Contract is intended to implement the passage from policies for environmental conservation to broader policies for the “management of environmental-landscape resources”, operating in multiple sectors:

- Protection and conservation of natural environments;
- Water conservation;
- Preservation of the land;
- Protection from hydraulic risk;

- Conservation of natural beauty.

To meet this objective the River contract definition is developed as:

- a) A shared strategic scenario, or a medium-long term widely shared strategic vision of local development that it intends to pursue (intended as a socio-economic model such as landscape in the general sense, quality of life, etc.) which includes a visual representation (cartography) and an integrated group of development policies/strategies in synergy with each other. The strategic scenario thus built and shared would be able to find its formalization through the definition of an Area Plan as provided for in the regional urban regulation;
- b) An instrument of evaluation of the policies and their effectiveness and coherence with the objectives;
- c) Planning of the basin which indicates shared and integrated operations and rules to be implemented within a specific time frame, by the interested parties.

7.4.4 Erosion of rivers

Rivers are dynamic ecosystems meandering and changing course within the flood plain. Banks are constantly being eroded and are reformed in areas where silt is deposited. In their natural state, rivers form green arteries within the countryside, providing both habitat for river species and corridors for movements of wetland species. Rivers are not usually free to follow their natural course. Engineering techniques have been used to alter the course of rivers, for bank protection and to protect land and property from flooding. To prevent erosion in the 20th century, engineering solutions typically involved cladding a sloping soil bank with hard materials including:

- rip-rap (large boulders)
- concrete blocks or precast concrete units
- metal sheet piling
- gabions (wire mesh cages with tightly packed stones)

These attempts to prevent erosion of river banks rarely offer a long-term solution, since they do nothing to address the causes of erosion. Hard engineering solutions have also reduced the distribution and abundance of biodiversity. In addition, they can contribute to erosion further downstream by channelling water downstream at a faster rate.

Causes of Erosion

Addressing the causes of erosion is the only long-term solution to the problem of erosion.

- Overgrazing - If allowed unrestricted access to banks, livestock, in particular cattle, can breakdown the banks causing silting in the channel;
- Mismanagement of bank-side trees - If trees are allowed to shade out all other vegetation they can reduce habitat diversity. The river can undercut the trees' root system causing the trees to become unstable, eventually falling into the water. A toppled tree causes local erosion producing a "tear point" which can lead to erosion moving further down the river bank;
- Recreation - Irresponsible driving of boats can cause waves (boat wash) that erode banks and undercut trees. Many public paths run alongside rivers and heavy use of a footpath may damage the surface and surrounding plants, leading to erosion.
- Poaching of banks by overgrazing is a major cause of bank erosion.
- Building of dwellings too close to the river bank may weaken the natural strength of the bank and continual discharges (e.g. sanitary waste) may also facilitate disintegration.

Preventing Erosion

Reducing Recreational Pressure through zoning of uses to reduce disturbance, can allow the public to enjoy the river while protecting vulnerable sites. Paths should be sited away from critical areas and moving the course of an eroding path may be the only long-term solution. To reduce boat wash, speed limits should be imposed and enforced.

Exclude Livestock

Plants can protect against erosion. Fencing an area to permanently exclude livestock or temporarily exclude them during vulnerable times of the year can reduce erosion. In some areas, reducing the stocking densities may allow grazing all year round. In many cases, simply fencing livestock away from a badly poached bank (bank eroded by hooves) is sufficient to allow marginal vegetation to recover.

Soft engineering techniques work with the natural stabilising forces of trees and plant roots. Roots bind the soil in the bank and vegetation reduces the erosive forces of water. Plants are able to adapt to changing conditions and can provide long-term, low cost bank reinforcement. Allowing vegetation to recover may have the added benefit of naturally narrowing over-widened channels, which in turn raises water-levels. Using vegetation to support and protect the bank is advantageous because it:

- improves wildlife habitat
- improves fish spawning habitats
- is easily achieved
- offers long-term protection
- integrates into other protection schemes
- has low capital costs
- integrates into the landscape better than hard engineering methods

Techniques include the use of trees, stakes or poles, fencing out livestock, spiling (use of willow bundles inter-woven with living osier willow withies), faggots (osier willow, poplar or hazel bundles trapping silt) hurdles, geotextiles (especially when combined with vegetation planting) tall wetland and bankside plants (reduce wash action/erosive power of the water).

7.4.5 Capacity development needs for urban planning responding to climate change

Decision No. 158/2008/QĐ-TTg dated on 2/12/2008 by the Prime Minister on National target program to respond to CC includes an important objective of institutional capacity building and policy making to cope with CC. Particularly, the government adopted the National strategy responding to CC by the Decision No. 2139/QĐ-TTg. Capacity building to respond to CC requires developing advanced technology, science and human capacity; strengthening institutional framework and policy; effectively using resources for the competitiveness of Vietnam economy; taking advantage of CC for socio-economic development; developing friendly consumption to climate system.

In terms of urban planning and development at all levels, the current ministries requirements are to have a sustainable urban system to cope with CC issues, which requires capacity development.

In this note, the selected matters and levels for capacity building are proposed based on policies, regulations and orientations for coping with CC already in place as well as risks and SWOT analysis results of the urban sector.

Capacity building in relation to CC should cover the following aspects: i) assessment of CC impacts on cities, ii) adaptation and mitigation measures in urban planning and management, iii) integration of CC considerations into urban planning and management, and iv) implementation of projects such as adjustment of infrastructure and residential planning according to CC scenarios, addition of planning/construction standards related to CC and development of technical guidelines providing

measures to cope with CC in urban planning and management. Specific actions are suggested as follows:

- Awareness raising and capacity building in responding to CC at all levels through mainstreaming CC considerations in urban planning and management process. In order to do this, legal texts in the form of circular which require mandatory CC integration in urban planning and management need to be issued. For example, SEA is currently the only legal tool for integrating environmental considerations in urban planning and therefore it needs to incorporate CC assessment...
- Developing a database recording climatic changes as well as CC impacts in cities and in different regions of the country. This database can be managed by the MoNRE but linked with the IT system of MoC. GIS is an effective tool for use to formulate a spatial information basis for CC assessment;
- Conducting comprehensive studies on CC impacts and vulnerability assessment for cities and regions in the context of river-basin. These studies would provide a reliable scientific basis for strategic planning and decision-making process;
- Delivering CC training to planners including various specialities such as spatial planning, water supply planning, sewage and drainage planning, transportation planning, electricity supply planning, etc;
- Developing a tool set for CC adaptation and mitigation that urban planners and managers can use in CC integration. This tool set can be in the form of technical guidelines with practical application;
- Introducing planners to alternative concepts and paradigms: water urbanism, sustainable urban planning, strategic structural planning, participatory planning, with theory and practical tools for application;
- Adjusting construction and planning standards/codes to respond to CC. Technical standards should take into account not only adaptation but also mitigation measures. Since cities are the major energy consumer, issues such as compact city, green building, energy-efficiency urban form, environmentally-friendly construction materials should be considered;
- Reviewing master plans of cities that could be significantly affected by CC and sea level rising with a focus on coastal ones. There is currently a tendency of developing tourism facilities and industrial/economic zones by the coast. This should be carefully planned taking into account future potential impacts;
- Reviewing investment and construction projects along the coast with special focus on those located in the Central Region of Vietnam where most of projects are near the coast and along with 1A National Highway;
- Awareness raising for the public through the use of media. CC causes are global but impacts are local. This is also an opportunity for renovating planning process in Vietnam towards a more participatory planning and public decision making.