

This report is written by Vietnamese research team on the outcomes of climate change risks assessment in Hue City, Vietnam, under the project ***Assessment of climate change risks and adaptation options for secondary cities in south-western Bangladesh and central Vietnam*** hosted by

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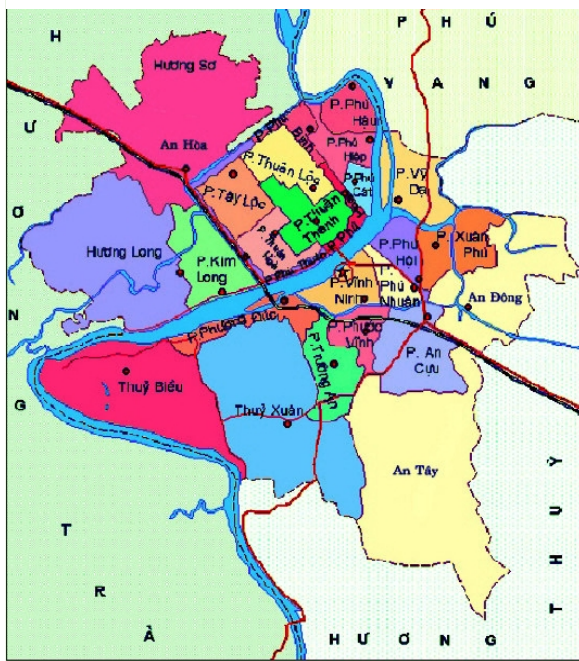
LIST OF ABBREVIATIONS

CORENARM	Consultative and Research Centre on Natural Resources Management
CRD	Centre for Rural Development in Central Vietnam
CSOs	Community social organisations
CSRD	Centre for Social Research and Development
GOs	Governmental organisations
GRC	German Red Cross
IPCC	Intergovernmental Panel on Climate Change
IREB	Institute of Resources, Environment and Biotechnology
ISSET	Institute for Social and Environmental Transition
JICA	Japan International Cooperation Agency
MONRE	Ministry of Natural Resources and Environment (Viet Nam)
NAV	Norwegian Aid in Vietnam
NGOs	Non-governmental organisations
SRD	Sustainable Rural Development

1. Introduction

Vietnam is one of the five countries in Asia considered as in most extreme risk from climate change (besides Bangladesh, India, Philippines, and Pakistan) (Maplecroft, 2011). In past 50 years, the temperature has increased from 0.5°C to 0.7°C . While the rainfall decreases about 2% in over past 50 years, the sea level rises averagely 3mm per year in the period of 1993-2008 (MONRE, 2009).

Figure 1. Map of Hue City



Hue City locates in the central land Vietnam, at geographical coordinates 16°N to 16.8°N and 107.8°E to 108.20°E . The total area is 70.99km^2 . Its population is 338,094 people. Belonging to tropical monsoon region which is hot and humid, Hue's annual average temperature is around 24°C - 26°C ; and the annual average rainfall is 2,600 mm (Statistics Office of Thua Thien-Hue, 5/2011).

With its location, Hue City receives both northeast monsoon and southwest monsoon. Therefore, the place is affected alternatively by different air courses depending on seasons. The convergence of cold front, coming down from the north, and warm and humid air, moving up from the south, causes heavy rain, thunderstorms, and cyclones. The

phenomenon creates serious floods, causing landslides and river-bank erosion.

The floods occur more frequently in past 50 years than in the previous half-century. In the period of 1952 to 2008, there were 36 hurricanes directly affecting Hue City. Besides, sea and the later flood levels are always higher than the earlier ones. In 1999, one historical flood reached up to 5.81m (People Committee of Thua Thien-Hue Province). Within the month of November, the serious flood made 352 people killed, 21 people lost, 99 people injured, and 1,040,213 animals (including livestock and poultry) killed. It also destroyed 25,012 houses and 1,027 schools, and damaged the whole area. To total economic lost was about 1,761.82 billion VND (Nguyen Viet, nd.: 3).

Although suffering from climate change, there are not many studies on this issue in Hue City. Moreover, there is no risk assessment on climate change so far. The City Government is confused as there are no guidelines to deal with the issue. The climate change risk assessment toolkits by APN can be considered as one of the most significant activities for climate change adaptation in Hue City.

This report focuses on the findings of the toolkits application in Hue. There are 17 tools in total, but only 15 tools were implemented accordingly the local conditions. The report will not include everything collected from the whole process but just the most significant points, which can be shared and up-scaled to other secondary cities.

2. Risk Assessment Process

The risk assessment process in Hue City started from January to May 2012. The process was followed 10 steps,

- (1) Step 1 - understanding the toolkits and concepts,
- (2) Step 2 - collecting secondary data and defining stakeholders (Tool 1),
- (3) Step 3 - discussing to city-level stakeholders (Tool 1 to Tool 6),
- (4) Step 4 - discussing to community-level stakeholders (Tool 8 to Tool 12),
- (5) Step 5 - in-depth interviewing (Tool 7 and Tool 13),
- (6) Step 6 - discussing among working group members and reviewing key findings,
- (7) Step 7 - drafting report and meeting stakeholder for validation (Tool 14 and Tool 15),
- (8) Step 8 - revising and supplementing data for report,
- (9) Step 9 - future climate change scenarios – workshop in Hue on 14-15 April, 2012, and risk quadrant (Tool 16 and Tool 17),
- (10) Step 10 - final report.

According to the stakeholders' availability of attendance, the steps' occurrence was adjusted a little bit comparing to the first plan, such as,

- Tool 6 was carried out before Tool 5,
- Tool 11 was implemented after Tool 12,
- In order to give convenience to stakeholders, the tools 2, 3, 4, 5 and 6 were practised within one day at the city level. Tools 2, 3, 4, and 6 were practised in the morning and the whole afternoon was for Tool 5. Similarly, tools 8, 9, 10, 11, and 12 were applied within another day at community-level. The morning was for tool 8, 9, 10, and 12 while the afternoon was for Tool 11. There are three main reasons for this occurrence:
 - (1) Saving cost: in order to encourage participants attending the activities as well as covering the time they spent for the event, a comfortable meeting room at a hotel was rented with provided fruit, cookies, tea and coffee serving participants during meeting breaks. Besides, some stipends for participants were also considered and extracted from the research budget.
 - (2) Saving time: most participants are busy so it is difficult to arrange the event in few days. The experience from the past activities showed that participants might leave early or would not attend on the next days. We were afraid this might happen again. In that case, the data would not be much meaningful. Therefore, we grouped Tool 6 together with Tool 3 and Tool 4 for indoor working, and spent the whole afternoon for Tool 5. Similarly, we grouped Tool 12 together with Tool 9 and Tool 10, and worked on Tool 11 on the afternoon. We learnt that both city and community groups had known the location very well so it was not necessary to capture the field through the transect practice. Instead, they continued working indoor for Tool 6 before Tool 5 and Tool 12 before Tool 11. Besides, instead going back to the meeting rooms to map the observations, the groups stopped at some coffee shops at the end of the routes to discuss, work, and enjoy coffee together. This helped people relief some tiredness after the walks as well as getting more energy for the next discussions.

We also converted Tool 10 before Tool 9 at the community level. From the experience of working at the city level, when working on Tool 3 and Tool 4 in order, we realised that it took more time to do the hazard mapping before hazard ranking. The reason is that after ranking the hazards, people can pick out the most affective ones to do the mapping. This application at the community did help the participants save time and work more efficiently.

- (3) Making convenience to participants: by grouping the activities indoor and outdoor together, the participants at each level could practise the tool group within one day by reducing moving forth and back.

3. Pre-Assessment Stage

3.1. Review of secondary information

The secondary information was selected before and during toolkits implementation from varied sources of Hue City and Thua Thien – Hue Province, including GOs (such as Provincial Hydro-Meteorological Service, City Statistics Office, City Office of Natural Resource and Environment, Provincial Office of Water Resource, Provincial Committee for Flood and Storm Control and Life Rescue, Provincial Centre for Disaster Management, City Office for Economic Development, Provincial Interdisciplinary Working Group on Climate Change Adaptation...), NGOs (such as CSRD, CRD, SRD, CORENARM, GRC...), research institutes and schools, and related websites.

The key information that we tried to obtain and its results are as follows,

- (1) Climate change projects: there are not many specific projects on climate change risk assessment or climate change adaptation in Hue City so far. There were some related projects on building strategies of climate change adaptation to livelihood of people living along coastal lines in the central Vietnam, conducted in 2008, and on climate change adaptation in Thua Thien-Hue Province, implemented in 2009-2010. Besides, there are some studies on climate change issues conducted by local agencies as well as related actions taken by the local government. However, climate change risk assessment with toolkits is first time implemented in the city.
- (2) Population and demography: the area of Hue City is almost 71km² with about 338,100 people living in. There are about 4.3% of the population under poverty line. The rate of male and female is 1/1.07. The population density of Hue City is quite high, with 4,763 people per km², comparing with other provincial cities in Vietnam. The annual average increase of population is 0.98%. Population average longevity is 75 years. The GDP is 1,500USD/person/year. And the urbanisation rate is 100%.
- (3) Terrain and natural resources: Hue City has different types of terrain, including hills, mountains, flat land, lakes, and rivers. The average height of Hue City is about 3-4m above sea level. The lowest area is about minus 1m while the highest area is 102m (Ngu Binh Mountain) (People Committee of Thua thien-Hue Province).
- (4) Climate, weather, and hydrology: Hue City belongs to tropical monsoon region with two seasons, hot-dry sunny season and cold-humid rainy season. The average temperature in the flat areas is about 24°C-25°C (People Committee of Thua thien-

Hue Province). The hot-dry sunny season starts from May to September, influenced by south-west wind so it is dry and hot with average temperature of 27°C-29°C. The hottest time is around May and June when the temperature can reach to 38°C-40°C. The cold-humid rainy season starts from October to March of following year, influenced by north-east wind which brings a lot of rains and cold front to the city. The average temperature in this season is around 20°C-22°C. The average humidity is 85%-86% (People Committee of Thua Thien-Hue Province).

Drought and soil salinisation occur quite often, especially in years having El Nino, such as 1988, 1992, 1993-1994, 1997-1998, 2002, 2003, and 2004. Those events affected much on economy, especially farming, industry, and health. The salinisation invaded to Huong River about 30km and observed to surrounding soil about 2,000-2,500 ha. The records of crop losses for period of 1993-1994 was 12,710 ha of rice field (about 20,000 tons) (Ministry of Science, Technology and Environment. 2001).

The annual rainfall rate is 2,500mm, starting from September to February of following year. The peak time of rain is in November, taking 30% rainfall of the whole year. Some rains are too heavy that cause floods and landslide (People Committee of Thua Thien-Hue Province).

In the years with La Nina phenomenon, there are heavy rains in short time causing serious floods. According to records, the historic floods happened in 1978, 1988, 1990, 1993, 1996, 1998, 1999, 2001, 2003, 2004, 2009, and 2010. Heavy rains brought a lot of problems to socio-economic activities such as unemployment, diseases, crop loss, and pollution.

Wind and storm often happen from August to October, being influenced by southwest monsoon and northeast monsoon which bring drought, cold front with humid air, and flood.

Hydrology system of Hue City is quite diverse and dense, including rivers, natural and artificial lakes, sewers... Its density rate of rivers and lakes is about 0.7km per one km² of mainland (while average density of the whole country is about 0.6km river/lake per one km² of mainland). Depending on the availability of water supply and drainage, the sanitation system of Hue can be divided into 4 grades: the first grade includes rivers; the second grade includes canals, main ponds, drains and sewers with 5-10 metre width; the third grade includes drains and sewers from 1.000mm to 3.000mm width depending on types; and the fourth grade includes other small drains and sewers (People Committee of Thua Thien-Hue Province, November 22, 2007).

- (5) Disasters and their effects to Hue: disasters that affect Hue most are flood, typhoons, and tropical depressions such as changes of temperature and precipitation. The main flooding time in Hue is from October to December. Besides this time, flood also happens in May and June. The main flooding period sometimes come early in September while withdrawing late until January in the latter year.

According to the records, in the period of 1977-2006, Hue receives averagely 3.5 serious floods which are equal to level-two alert. It even reached to 7 floods within one year. 36% of floods are from serious to extremely serious levels. In the years with La Nina phenomenon, flood was even worse. The period of flood time lasts from 3-5 days, sometimes up to 6-7 days. Flood margin varies from 3-5m. Its intensity is from

0.5-1m. Until now, there are no specific statistic data on damages caused by flood. The water speed of the serious flood in 1999 was $14,000\text{m}^2/\text{s}$ with water amount within the period off November 1-6, 2009 was 307 billion m^3 , causing the whole area sunk in water from 1-4m (Nguyen Viet, nd.: 4).

Figure 2. 1999 Flood in Hue City - view from above



Source: Nguyen Viet, nd.

Typhoon does not appear often, about 0.6 time a year. However, once it happens, the City takes many years to recover. From 1952-2005, there have been 32 typhoons affecting to Hue of which 5 typhoons are extremely serious, including the typhoon on 30 October 1952 with level 12 wind (122km/hour), the BABS Typhoon on 16 September 1962 with level 12 wind (118km/hour), the TILDA Typhoon on 22 September 1973 with level 13 (137km/hour), the PATSY Typhoon on 15 October 1973 with level 11 wind (104km/hour), and the CECIL Typhoon on 16 October 1985 with level 11 wind (104km/hour). The typhoon season starts from May and ends at October. There are more typhoons in September. However, there is no specific statistic data of damages caused by typhoons.

Cyclone also often happens in Hue. In recent years, the number of cyclone has increased, especially in the years when there are El Nino phenomena such as in 1993, 1997, and 2002. The cyclones normally come at the transition of seasons like April, May, August, and September. Like other disasters, there is no specific records on damaged caused by cyclone.

To deal with the climate change, the provincial and city governments have not established strategies in both short-term and long-term. So far, they still depend on the general plans by the central government, such as: Decision 153/2004/Q -TTg issued on 17/8/2004 about sustainable development strategies for Vietnam, Decision 158/Q /TTg issued on 02/12/2008 about national goals on climate change adaptation, Decision 1819/Q -BTNMT issued on 16/11/2007 about implementing activities related to climate change adaptation, Circular 3815/BTNMT-KTTVB KH issued on 13/10/2009 about planning guidelines of climate change adaptation, Decision 1781/Q -TTg issued on 24/9/2010 about supplementing budgeted to implement national goals on climate change adaptation.

Besides, there are some provincial documents that guide to deal with the climate change, such as: Plan 64/KH-UBND issued on 20/8/2010 about action plans to adapt climate change in

Thua Thien-Hue Province in period of 2011-2020, Circular 4703/UBND-N issued on 23/10/2010 about implementing the national goals on climate change adaptation.

About organisations which are working on climate change issue, we have not found any organisation in Hue City specialising directly on this issue yet. However, some organisations include climate change and/or merge climate change issues into their missions.

3.2. Initiating contact and finalising key local stakeholders

3.2.1. Initiating contact of local stakeholders

Stakeholders at the city level are defined according to organisations they are working for while the stakeholders at the community level include local authorities, who are in charge of or relate to environment and climate change issues, social groups' members, and habitants living in the community. More specifically, at the city level, we focus on organisations, positions, and responsibilities of stakeholders while at the community, we focus on vulnerability, and diversity of social roles. Besides, we also care about age, gender, and sectors.

To initiate contact at the city level, we follow “snowballing method” with two steps. First, we search from our network. Second, we get introduction from the network. The definition of stakeholders is described in Table 1.

Table 1. Initiating contact at the city level

Key definition	Stakeholders
Who should be included because of their relevant formal position?	Office of Natural Resources and Environment, Office of Urban Management (belong to the Provincial People Committee), Provincial Committee for Flood and Storm Control and Life Rescue, Hydro-Meteorological Service, Department of Natural Resources and Environment, Steering Committee of Climate Change Mitigation and Adaptation, and Provincial Interdisciplinary Working Group on Climate Change Adaptation
Who should be included because of their experience and knowledge?	NGOs: CSR, CRD, SRD, NAV, ISET. Research institutes: Institute of Resources, Environment and Biology, Institute of Climate Change, Institute of Architecture and Planning. Schools: Faculty of Geography and Faculty of Environment of University of Hue. International organisations: JICA project in Hue.
Who should be included because they have control over relevant resources?	- Women Union - Centre for Development of Land Source - Management Board of Fresh-Water Reservation Lake and Ta Trach Hydropower
Who has power to promote, hinder or block the assessment process?	- City Office for Planning and Budget Management - Department of Internal Affairs - Steering Committee on Climate Change Mitigation and Adaptation

After defining the stakeholders, we sent out the invitations included some introduction about the project. On the invitation, we also mentioned that the participants who planned to join should have experience on climate in Hue as well as being suitable to the assessment process.

We also discussed to the representatives of those organisations to give more details about the project. However, there were only 19 stakeholders involved besides CSRD and SISD members. One of two reasons is that the defined stakeholders in Hue relating to the project field are not many. The other is that we could not find the meeting date that was suitable to all. Moreover, although we had sent the project information as well as talking on phone to the stakeholders about the projects, some participants did not meet the requirements. Some were very enthusiastic and contributed a lot of ideas while the others were quite silent. In addition, it was hard to find stakeholders from the business sector.

At the community level, based on our desk-research of all the communities of the City and the observation results after working on the transect tool at the city level, we chose Phu Hiep Ward as it is considered the most vulnerable community. Then we set some small meetings with the community authorities at which we explained about the purpose of the project and requested their help in defining individuals and community groups' representatives who are suitable and able to engage to the project. Besides, we also received their help from inviting/gathering those people to the workshop. The stakeholders at the community level include: Farmer Union, Women Union, Elderly Union, and Youth Union. For the resident participants, in order to make it more specific and problem-focused for the working group, we selected randomly some residents in the most vulnerable part of the ward, called To 6 (Group 6).

What we have learnt from the process of initiating contact at both city and community levels are:

- It is important to get engagement of stakeholders because their participatory affects significantly to the assessment results;
- The more details of the project given to stakeholders and the more interacting between the working team and the stakeholders, the better results there are.
- There should have been representatives of each ward of the city because they know most about their location. From their knowledge and experience, they can help to draw the picture of the city more clearly. These also help the project to be more practical.

3.2.2. Finalising key local stakeholders

After analysing and defining city-level stakeholders and inviting them to the meeting, we prepared all the facilities and assigning who do what among the team. At the toolkit practising process, there were five tools were implemented, including tool 2, 3, 4, 5, and 6. Although we expected there should be stakeholders representing all sectors including GO, NGO, business, and research, no one from business sector participated (see Table 2).

Table 2. Final key stakeholders engaging to the project

Key definitions	Final key stakeholders
Who should be included because of their relevant formal position?	- Provincial GOs: Office for Natural Resources and Environment, Office for Urban Management, Provincial Committee for Flood and Storm Control and Life Rescue, Hydro-Meteorological Service, Department of Natural Resources and Environment, and Provincial Interdisciplinary Working Group on Climate Change Adaptation, Department of

	Construction, and Environmental Protection Agency. - City GOs: People Committee of Hue City, Office for Natural Resources and Environment.
Who should be included because of their experience and knowledge?	- NGOs: CSRD, CRD, SRD, German Red Cross. - Research institutes and schools: Institute of Resources, Environment and Biology, Institute of Climate Change, Faculty of Geography and Faculty of Environment of University of Hue.
Who should be included because they have control over relevant resources?	- Women Union
Who has power to promote, hinder or block the assessment process?	- City Office for Planning and Budget Management - Department of Internal Affairs - Steering Committee on Climate Change Mitigation and Adaptation

The outputs of the activities:

- Some participants are not relevant to the project such as administrative office staff, financial staff...
- There were 16 organisations per 26 invited organisations sending 20 representatives to the workshop.

The findings of the activities:

- The Table 2 shows that the governmental sector, academic sector, and non-governmental sector concerned about the project more than business sector.
- There should have been more preparation on giving details of the toolkit to the stakeholders before gathering them to the workshop. Some participant had not paid any attention to the climate change or issues related to climate change until they were in the workshop room. However, on some aspect, this reflects how people are aware of the climate change in their residential area.

The analysis of key stakeholders is followed guidelines of Tool 2 which is implemented within 60 minutes, according to the following steps:

- Step 1: Grouping the participants into three groups and brief introduction about the toolkits as well as general picture on climate change in Vietnam (10 minutes). The three groups include: GO group, NGO group, and research group. The members of each group are as in Table 3.

Table 3. Final key stakeholders: groups, number of participants and organisations

Groups	Numbers of participants	Organisations
GO group	7	Women Union Office for Urban Management Office for Planning and Budget Management Provincial Committee for Flood and Storm Control and Life Rescue Provincial Interdisciplinary Working Group on Climate Change Adaptation Office of Water Resource and Hydro-Meteorology

NGO group	6	SRD CSR GRC CORENARM
Research group	7	Office for Natural Resources and Environment Environmental Protection Agency Hydro-Meteorological Service Hue University Hue University of Agriculture and Forestry Institute of Resources, Environment and Biotechnology

- Step 2: Group discussion (25 minutes). During the discussion process, each group filled in a flip-chart with the information of the organisations of all the members in group representing, and their key interests, potential contributions, and partnership assessment.
- Step 3: Each group represents the results of their discussion (15 minutes) to all other groups.
- Step 4: Open discussion and agreement on conclusion (10 minutes).

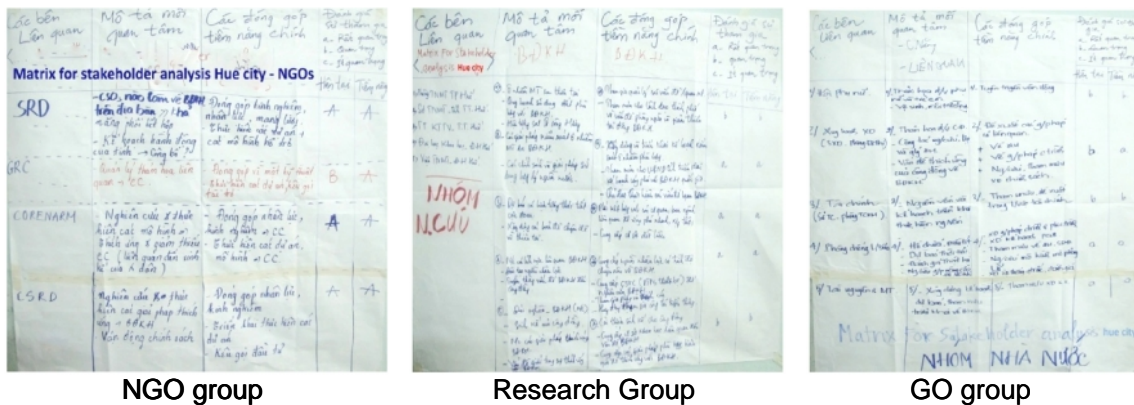
Outcomes of the activities:

Groups	Key interests	Key potential contributions	Partnership assessment	
			Current	Potential
GOs	• Effects of CC on women and children	• Information and communication	b	b
	• Disasters and their effects to community	• Policy advocacy and consultancy • Giving solutions and planning on disaster control	b	a
	• Budgets for climate change adaptation and mechanism	• Budget planning	b	b
	• Climate change adaptation actions and facilities	• Study on flood control models	a	a
	• Planning, strategies, and policies	• Build weather observation and evaluation systems	a	a
NGOs	• Which CSOs working on CC are located in Hue City and opportunities of cooperation	• Contribution on human resource, experience and networking • Implementing projects and supporting models	a	a
	• Management of disasters caused by climate change	• Technical supporting, project implementing, and fund-raising	b	a
	• Doing research on climate change adaptation and mitigation models which help community's	• Contribution on human resource and experience • Implementing projects on climate change	a	a

	<p>livelihood.</p> <ul style="list-style-type: none"> Seeking solutions for climate change and doing policy advocacy 	<ul style="list-style-type: none"> Contribution on human resource and experience Implementing projects on climate change Fund-raising 	a	a
Research Institutes/schools	<ul style="list-style-type: none"> Environment pollution after disasters 	<ul style="list-style-type: none"> Consult to the government on actions and strategies for improving environment 	b	b
	<ul style="list-style-type: none"> Solutions for improving environment which is affected by climate change 	<ul style="list-style-type: none"> Building plans for controlling pollution 	a	a
	<ul style="list-style-type: none"> Forecasts of extreme weather 	<ul style="list-style-type: none"> Providing data and networking with related organizations for more exact forecasts 	a	a
	<ul style="list-style-type: none"> Climate change research 	<ul style="list-style-type: none"> Contributing human resource and equipments; Mobilising community to participate in climate change adaptation and mitigation actions. 	a	a
	<ul style="list-style-type: none"> Relations between poverty and climate change 	<ul style="list-style-type: none"> Helping community/ poor people on livelihood and climate change adaptation. 	b	b

The details of the original flip-chart are as Figure 3

Figure 3. The matrix for stakeholder analysis of three groups in Hue City: NGOs, Research institutes/schools, and GOs



Findings:

- All stakeholders concerned about the climate change, but members from each organisation expressed different interests on how climate change affected to the city as well as how they could contribute to mitigate climate change effects.
- Although some participants did not have much experience on climate change, they still could capture the issue and got involved in the activities very fast. The diversity of the participants helped to give different ideas from different aspects.

- In order to get business sector engaged in the activities, the project team should receive supports from local government, in which local GOs can help to contact companies for joining the event. Besides, business sector should have more corporate social responsibility (CSR) to climate change.

4. Assessment Stage

4.1. City level risk analysis

Purpose: The findings at this stage are based on local experience and knowledge. The stage aims to assess climate change risks at the city scale.

Methods: group discussion, open discussion, in-depth interview, and fieldwork.

Activities: this process is included in tools 3, 4, 5, 6, 7, and 15. The activities are,

- In-door activity: discussion among stakeholders and research team (tools 3, 4, 6, and 15);
- In-field activity: in-depth interview (Tool 7) and transect walk (Tool 5);

Outputs:

- 20 representatives from 16 organisations engaging in the assessment stage at city level.
- The mapping of organisations caring climate change in Hue City.
- Hazard map of Hue City including flood, typhoon, cyclone, drought, cold front, landslide, forest-fires, etc, of which flood and typhoon are most serious disasters.
- Transect walk map with its analyses.
- Ideas, knowledge, and experience on climate change in Hue City from local experts.

Comments: the implementation process met some advantages and some disadvantages.

- Advantages:
 - Almost of the participants were engaged in all the activities.
 - It was quite convenient to contact the local stakeholders for in-depth interviews.
 - The weather was cool during the period of practising tools. The traffic was also supporting for the transect walk.
- Disadvantages:
 - Some potential stakeholders we expected did not join the activities.
 - Some participants still left the workshop before it ended.
 - Time was quite tight because we made the in-door activities within a half of a day.

4.1.1. Hazard mapping

Purpose: to recording information about different types of climatic hazards affecting the city.

Activities:

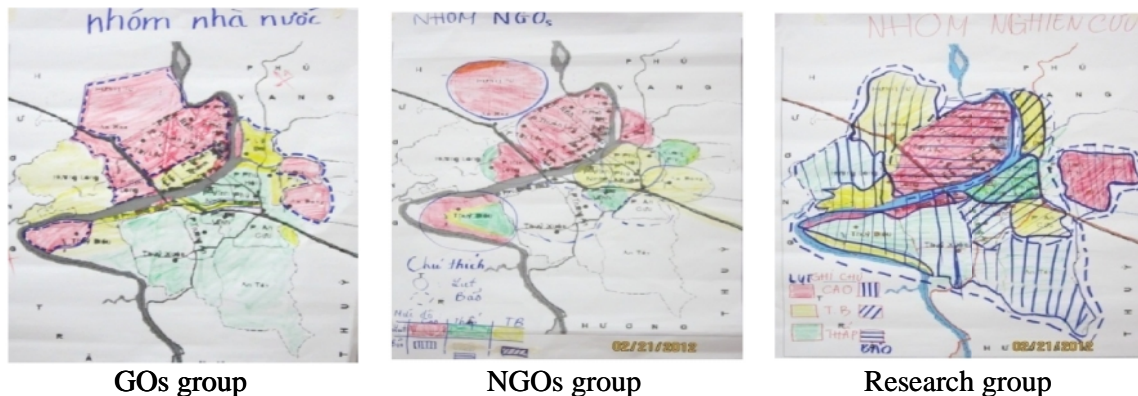
- Obtain a city map and make a number of A⁰ size copies.

- The same groups worked as before (GOs, NGOs, and research institutes/schools) on the provided copy of map.
- Each group highlighted areas in the map with different colours for each hazard.
- Each group presented its hazard map.
- Open discussion and agreement.

Outputs:

- Coloured maps of city hazards by the three groups (see Figure 4).
- The different levels of hazard - high risk, medium risk, and low risk – at each type of hazard, of which:
 - Flood: represented in brushing. The levels of risk are showed in three colours, red for high risk, yellow for medium risk, and green for low risk.
 - Typhoon: represented in lines. The vertical lines shows high risk, the lean lines show medium risk, and the horizon lines show low risk.

Figure 4. Hazard mapping results from the three groups: GOs, NGOs, and research institutes/schools.



Findings:

- Hue basically has two serious hazards including flood and typhoon, but flood is the most serious one.
- Three groups discussed and worked separately, but they got quite the same result on the hazards in Hue. Besides, they had the same ideas about the most affected areas (see Figure 4).
- The high, hilly, and mountainous areas in the west of the city have less effect from flood and typhoon while the low areas with poor infrastructure, such as the area along Huong River banks, have more hazards (An Dong Ward, Xuan Phu Ward, Thuy Bieu Ward, Duc Ward, and Phu Hiep Ward). The areas with good infrastructure also have less effect, such as the imperial area (inner-city) where there are more stable housing and protecting wall.
- Some participants understood well the hazards in the city, but some were not aware of them much.
- Some had more knowledge about one area than another area, so they took more time to discuss and come to agreement.

- The GO group and research group have more knowledge and experience of hazards in the whole city than the NGO group.
- Some participants were so active and they influenced the rest of their groups to follow their ideas.

Comment: There should have been one more step on this tool, of which all the groups could produce a hazard map generalized from the three maps and show their agreement on it.

4.1.2. Hazard ranking

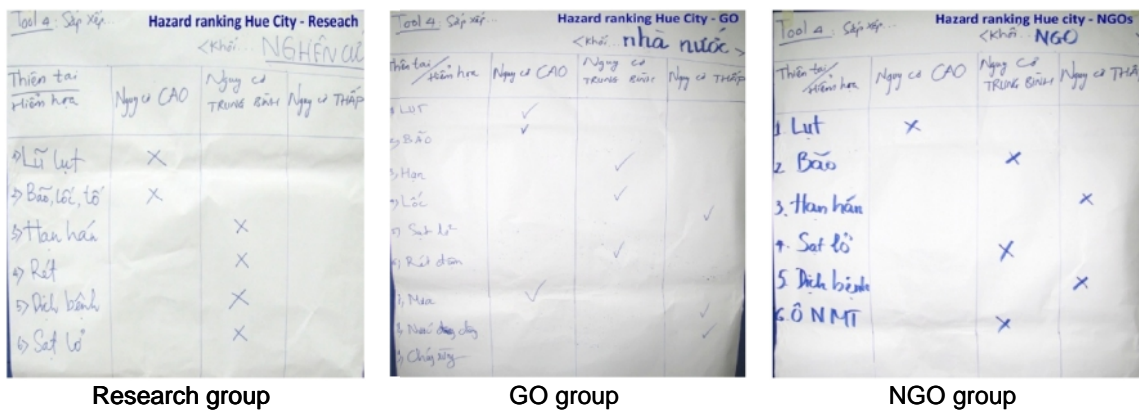
Purpose: to rank the hazards affecting the city.

Activities:

- Working in groups;
- Listing the main hazards that the city faces;
- Ranking the hazards;
- Each group presents its hazard ranking;
- Open-group discussion.

Outputs:

Figure 5. Hazard ranking by three groups: GO, NGO, and Research.



Findings:

- The main hazards that the city faces are flood, typhoon, cyclone, drought, cold front, landslide, etc., of which flood and typhoon are the most serious hazards.
- Besides the similarities among the groups. Each group also had their own ideas and evaluation on the hazards as well as level of hazards. While the research and GO groups marked drought in medium risk, the NGO group considered it as low risk. The NGO group did not put “cold front” into their consideration while both GO and research groups highlighted it. Both research and NGO groups also concerned about diseases while the GO group cared forest-fires, rains, and sea-level rise.

Comments:

- The participants should have understood the formula of risk (as below) better before ranking the hazards.

$$\text{Risk} = \text{Hazard} \times \frac{\text{Vulnerability} \downarrow}{\text{Capacity} \uparrow}$$

- There should be a grade-scale of five or ten accordingly to the formula for participants to rank and calculate for their group ranking results. This could help the group to decide which hazard is significant to be considered as hazard to their city.

4.1.3. Transects

Purpose: to understand risks at the city scale by observation, mapping, and analysis.

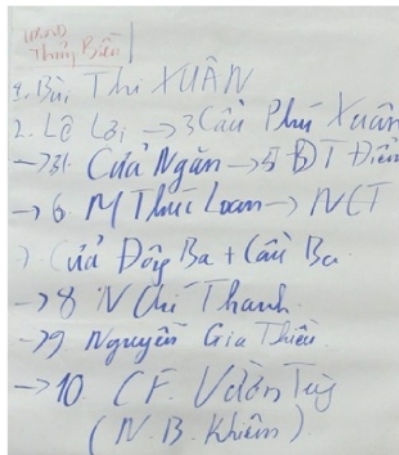
Activities:

- Working in groups.
- Doing transect walk for a half of a day.
- Taking notes accordingly to each group's observation and internal discussions along the route.
- Mapping and describing the route based on what each group obtained.
- Presenting the transect walk results from each group.
- Open discussion and knowledge sharing.

Outputs:

- Based on the results from hazard maps, there was an open discussion among the three groups to decide which route they should take for the transect walk. The result was that all the three groups took the same route accordingly to Table 4.

Table 4. Information of transect walk route



The route starts from The People Committee of Thuy Bieu Ward, which locates in the west of the city, often in flooding. It goes along Huong River (Bui Thi Xuan Street and Le Loi Street), then crosses Phu Xuan Bridge leading to the imperial area streets, such as Doan Thi Diem Street and Mai Thuc Loan Street, to Cua Ngan Street. After going out of the imperial area, the route goes through Dong Ba Gate to lead to Nguyen Chi Thanh Street and Nguyen Gia Thiệu Street before reaching to the end of the route at Vung Tung Coffee Shop on Nguyen Binh Khiem Street, where is in the East of Hue City and the lowest area of the City.

- The three groups took notes along the routes. We also stopped at some points to discuss and marked carefully some important observations accordingly to the provided charts.

Figure 6. Transect walk maps by three groups: research, NGO, and GO



Findings:

- The north bank of Huong River is lower than its south bank. Also, the infrastructure in the north riverbank is older and worse than the one in its south riverbank. As the result, the north bank usually suffers from flooding.
- The population in the north riverbank are denser than in the south riverbank. Besides, people in the north riverbank have less opportunity of economic and infrastructural development than people in the south riverbank. However, people in the south riverbank have more opportunity to develop tourism as it possesses Dai Noi, Tinh Tam Lake, nha ruong (ruong houses)¹, etc.

Figure 7. Some pictures of the transect walk



The group starting the transect route



Discussing along the route

Comments: One of difficulties of doing transect walk tool is that the participants did not know how to define the altitude. Therefore, the analysis is just relative to the site.

4.1.4. Scenarios analysis

Purpose: (1) to define the possible impacts of from different aspects of climate change on people, built environment, and economy; and (2) to consider the effects of the different climatic changes.

Activities:

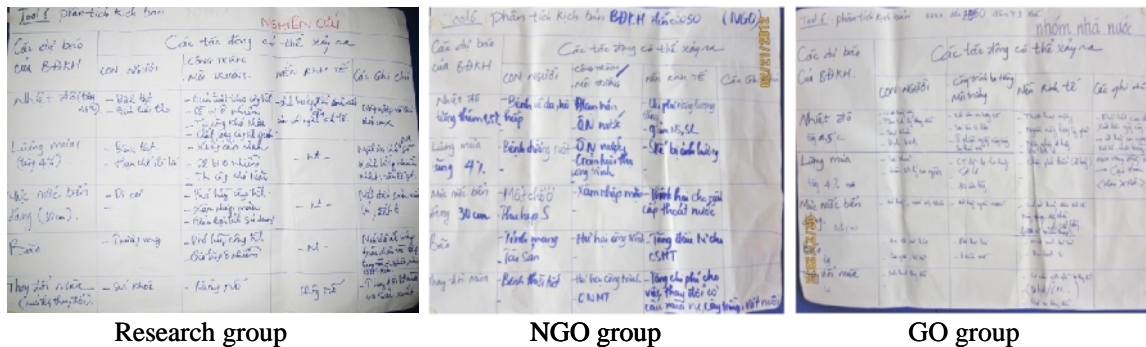
¹ Hue traditional garden houses.

- Obtaining IPCC's and Vietnam MONRE's climate change scenarios information and presenting it to participants;
- Defining key projected climatic changes;
- Working in groups;
- Filling out the provided worksheet;
- Group presentations;
- Open-discussion.

Outputs:

- The climate change scenarios information in Vietnam to 2050 (from IPCC's and MONRE, 2009);
- The medium emission scenarios (B2) information related to Hue to 2050 (based on IPCC's and MONRE, 2009), of which temperature increases 1.5°C; rainfall increases 4%; sea level rises 0.3m; typhoon increases in numbers and strength; seasons change.
- Charts of scenarios analysis by the three groups, as Figure 8.

Figure 8. Charts of Tool 6 filled by the three groups: research, HGO, and GO.



Research group

NGO group

GO group

Findings: to 2050, under the effects of climate change, Hue City is predicted to face with the following problems,

- To human: diseases and health problems (mental and physical)
- To environment: pollution on water, salinisation in wide spread, drought, etc.
- To infrastructure: roads in damage, shorter life expectancy, renovation and construction in difficulties... Especially, the Thanh Noi (Imperial City), where there are many cultural heritages, will face with degradation.
- To economy: the climate change will impact to production of all economic fields, reducing productivity and outputs in agriculture, increasing expenses for changing crops. The unemployment in rural areas may increase, forcing labours moving from rural areas to urban areas.

Comments

- There should be more information on climate change scenarios related to Hue City for participants before practising the Tool.
- The hazard mapping did help the three groups in analysing the impacts of CLIMATE CHANGE on Hue City.

4.1.5. Key informant interviews

Purpose: to understand,

- Extreme weather events or disasters that impacted Hue City,
- The experience of people on those events;
- The influence of people on the city after those events;
- Etc.

Activities:

- At the pre-assessment stage, 8 key informants were selected to interview, of which 7 persons participated in all previous activities. All the key informants represent different sectors. The reasons to choose those people because they have deep knowledge of the local context and are networked to a wide set of links.
- Preparing guidelines for interviews according to the context of Hue City. However, the research member also depended on the situation to decide the specific questions.
- Interviewing each informant about 60-90 minutes, depending on their experience, knowledge, and time availability.

Outputs:

- 8 interviews from stakeholders with notes and transcripts;
- The information about extreme weather events and disasters in Hue City in the past;
- The ways people dealt with the difficulties, and their experience, including their good lessons and mistakes;
- The better ways people can do in case of facing the similar events and how they prepare for the future.

Findings:

- Climate change is still a very new term to most of people in Hue City, including officials, researchers, and other citizens. However, people still realise there are some changes in climate such as season change, more flood and other disasters, extreme weather events, etc. This promises that the issue can be raised higher and people can work together to solve the problem in near future.
- Hue people used to face with many extreme weather events and disasters, of which the flood in November 1999 is the most serious one, damaging many properties, killing many people, and hindering a lot of activities.
- The flood attacked suddenly so both local government and residents could not control and manage. However, based on the experience people had got from the previous disasters (which were less serious) to settle the issue, such as declaring the state of emergency, life rescues and reliefs, and processing consequences.
- Once a disaster occurs, all sectors such as GOs, NGOs, business, social groups (Youth Union, Women Union, Veteran Union...), students, etc. actively give their hands to help solving the problem. Besides the support of people from many regions around the country, Hue people also receive help from people around the world.
- The main reasons the disasters affected so seriously to the city are: poor infrastructure, weak and old housing system, short of sewages, lack of information, inaccurate forecast, and subjectiveness of residents.

- People believe that they will do better if there is a similar disaster in future as they got experience from previous ones.
- After the flood in 1999, the Provincial People Committee has restructured the organisational system to fulfil the strategies regarding to disasters and extreme weather events. One of organisations was restructured after the 1999 flood is committees for flood and storm control and life rescue at provincial level and community level. The Provincial People Committee also assigned the specific tasks to specific people on dealing with disasters. Besides, the Provincial People Committee also upgraded the infrastructure system (especially drainage system), and renovated the old or damaged public buildings with consideration on damaging possibility of future disasters.
- Besides the actions taken by the government, residents upgraded their houses, following the strategy “living with flood”. They also stored and preserved food, and prepared necessary facilities such as life vests, medicines, porches, etc.
- Climate change affects on seasons and weather can be seen clearly in recent years. The weather from 1995 to 2005 was warmer, and then turned to being cold in long period of time in 2008 while its summer became very hot. This made the year of 2008 have only two seasons – cold season and hot season. In 2009, there were four seasons, but to late 2011 and early 2012, there was late cold killing all the rice fields so farmers had to re-plant many times.
- Hue Government has been building strategies to adapt to the climate change, such as establishing committees for flood and storm control and life rescue at all levels, implementing projects and calling for investment on climate change adaptation such as upgrading infrastructure, building temporary houses, organising training courses to raise awareness about climate change and give skills of rescue when disasters happen.

4.2. Community level participatory risk analysis

The community chosen for the research is resulted from the hazard mapping and transect walk activities at the city-level assessment. It belongs to the most vulnerable area in Hue City.

Before practising the tools at community level, the research group had a half of the day on February 25, 2012 with the stakeholders to introduce about the project as well as the purpose of the upcoming activities.

Similarly to the assessment at the city level, the assessment at the community level was carried out in one day (March 2, 2012); the morning was for tools 8, 9, 10, and 12; and the afternoon was for Tool 11. The transect walk was taken in the afternoon and its route was inside Cluster 6.

The participants include local authorities, local associations, and local social groups. Altogether were 10 people. 5 presented Cluster 6, and 5 presented Phu Hiep Ward.

Purpose: to assess climate change risks at the community scale.

Methods: group discussion, open discussion, in-depth interview, ‘participatory’ approach, and fieldwork.

Activities:

- Profile the community including its key characteristics.
- Organise workshop with community members.
- Conduct structured exercises.
- Review the workshop findings.
- Identify key aspects of risk within the community.

Outputs:

- Two groups joined the activities, one at cluster level (t)² and the other at ward level (ph ng).
- Community profile, including population, area, income, livelihood, location, environment, years of settlement, housing, infrastructure, service, and others (see Figure 9).
- Information about the community as Table 5.
- Results of risk assessments at community level.

Figure 9. Community profile of Cluster 6 and Phu Hiep Ward



Table 5. Brief information about the community

Community profiles	Cluster 6 of Phu Hiep Ward	Phu Hiep Ward
Population	544 people/136 households	12,650 people
Area	4 ha	94.46ha
Main income sources	Farming and retails	Trading, service, retails, farming, etc.
Livelihood	Small production, furniture and craft, used-stuff trading, farming, retails, motorbike taxi,...	Trading, service, retails, instant-employment
Environment	Soil acidity, water pollution, wetland...	Pollution, flooding...
Housing	Unstable and temporary	Stable houses are about 40%, the rest are unstable or temporary.
Infrastructure	Most roads are damaged or in poor quality	Most roads are damaged or in poor quality
Service	Poor service, especially public service	Poor service, especially public service such as schools, clinics...

² A unit indicates a group of households in a ward.

Comments:

- Advantages:
 - The local authorities were supportive and helpful in connecting the research group with the stakeholders at community level.
 - Through the meetings with local authorities to set up the series of assessment activities at community level, the research group had a chance to introduce the project and got the commitment from the local government.
- Disadvantages:
 - The time spent for profiling the stakeholders at community level was less than that at the city level. Therefore, the project was not introduced in details.
 - There were only two small groups of stakeholders at different scales – cluster level scale and ward level scale. Moreover, the cluster unit belongs to the ward. This was somehow duplicated and difficult for the research group to do comparative analysis.
 - The participants at community level were from social groups and local GOs. There were no residents joining the activities, especially most vulnerable people such as elderly, people with disabilities...

4.2.1. Hazard mapping

Purpose: to recording information about different types of climatic hazards affecting a city.

Activities:

- Participants are divided into two groups, each group includes 5 persons.
- Filling the provided flipchart.
- Identify the hazards; and identify areas and resources which are most affected.
- Present hazard maps.
- Open group discussion.

Outputs: Pictures of the hazard maps from the two groups (Figure 10) with the hazards as following:

Figure 10. Hazard maps at community level



Findings:

- The areas in red colour are in high risk.
- The areas in green colour are in medium risk.

- The areas in yellow colour are in low risk.
- The Cluster 6 is in the high risk with a lot of houses settled in.

Comments:

- There should have been participants who are residents of the areas, especially ones who belong to most vulnerable groups such as elderly, people with disabilities.
- The two groups of stakeholders should have been in the same level for significant comparison.

4.2.2. Hazard ranking

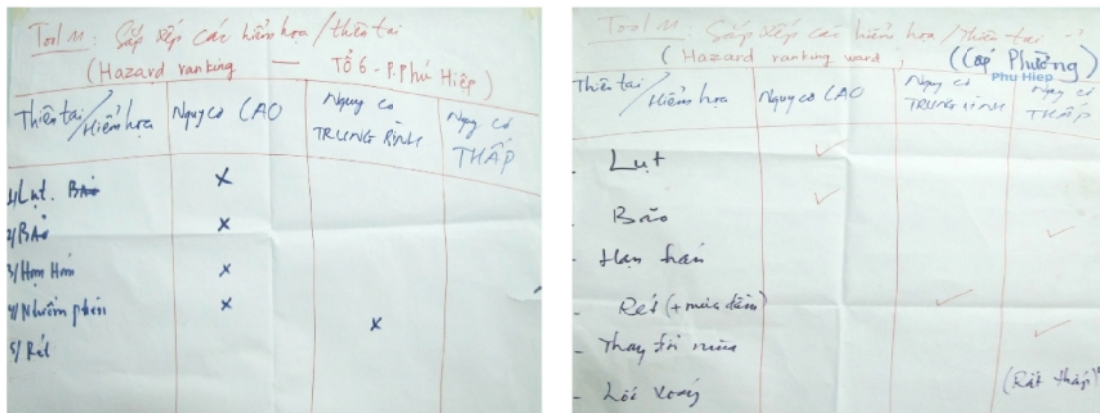
Purpose: to rank the hazards affecting the community.

Activities:

- Getting understood the tool and its activities.
- Filling out the provided worksheets.
- Listing the main hazards that the community faces.
- Ranking the hazards.
- Group presentation.
- Open-group discussion.

Outputs: Hazard ranking pictures of Cluster 6 and Phu Hiep Ward (Figure 11).

Figure 11. Hazard ranking at community level – Cluster 6.



Findings:

- There are four hazards in Cluster 6, including flood, typhoon, drought, acidity, and cold front. However, besides the hazards that are similar to the ones of Cluster 6, Phu Hiep Ward suffers season change, cyclone, and persistent rain. Generally, flood and typhoon are two hazards affecting the community most.
- Four of five hazards of Cluster 6 are in high risk, excluding the cold-front hazard which is in medium risk. Differently from the small area of Cluster 6, Phu Hiep Ward has only flood and typhoon in high risk; while the cold front combining with persistent rain is in medium risk. The cyclone and drought are not very significant.
- The hazards at the community affect resident’s living and livelihood. Drought, season change, and soil acidity cause difficulties to crops.

- Because Cluster 6 is a low-land area with poor infrastructure, so when it is in flood, the rescue activities face with difficulties.
- The flood and cold-front hazard also causes job-loss to residents, especially farming workers, and class-skipping to pupils.
- Besides, the hazards cause serious pollution to the area.

Comments:

- Some participants did not fully understand the activities so it took more time than being planned.
- There should have been a ranking scale to make it easier for participant to grade each hazard before ranking.
- Tool 10 should have been implemented before Tool 9 to save time. After ranking the hazards, participants are aware more of these in their area; therefore, they can map them better.

4.2.3. Transect walk

Purpose: to complement the hazard map at the community level.

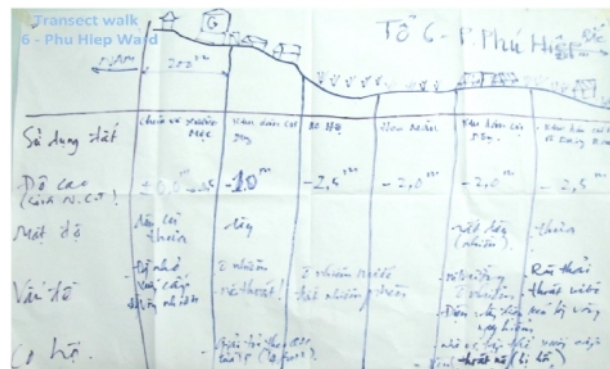
Activities:

- Discussing and deciding the transect route.
- Walking through the selected route.
- Taking notes and mapping the route accordingly to what the participants observed and discussed.
- Working and preparing the transect walk diagram.
- Giving presentation.
- Discussion and agreement.

Outputs:

- The route was taken in Cluster 6, the most vulnerable area in Hue City. It starts from Nguyen Chi Thanh Street leading to furniture production section, then crossing a lake to the re-settlement section. From this point, the group followed a dense residence area, crossing a vegetable farm to a concrete alley before getting to the drainage gate, which is also used for vegetable irrigation.
- Transect walk diagram of the community stakeholders, including land use, altitude, resident dense, environmental issues, and opportunity, as Figure 12.

Figure 12. Transect walk diagram of the community stakeholders



Findings:

- At the first section, including pagoda and furniture factories, land is higher. However, roads are narrow and damaged.

- The second section is for residents. It is quite dense with houses. Land is lower than the first section, but still higher than the rest. This section is scoping with pollution and poor drainage system. However, according to the city planning, it will be improved soon.
- The third section is an uneven land, including land and lakes. It is the lowest section of all the five sections of the route. It faces with two main problems: water pollution and acidity.
- The fourth section is just a little bit higher than the third one. Its economic activity is mainly about vegetable farming. It has the same rate of residents as well as environmental problems as the third section.
- The fifth section is the densest area. This also is the most polluted area, mainly caused by the residents living in. Besides, because there are many households, the electricity system is messed up. As the result, it is dangerous to residents, especially when disasters come. The drainage canals and public toilets here are also under serious pollution.
- The last section is a combination between farming and residents. It is almost as low as the third section. Residents are not many. However, the area still faces with littering and poor drainage.

Figure 13. The route of community transect walk



4.2.4. Long term trend analysis

Purpose:

- To understand future uncertainty, particularly climate change, based on past trends.
- To cross-check with interview responses of elderly key informants from the community.

Figure 14. Long term trend analysis at community level

Activities:

- Identifying the changes in weather and climate as far back as the participants can recall.
- Analysing the root causes of the changes.
- Describing what participants expect to take place over the next 10-15 years based on the important historical climatic trends that they have analysed.
- Presentation and discussion.



Outputs: diagram of long term trend analysis at community level (Figure 14).

Findings:

- Flood lasts long in rainy seasons. Power system is very poor and unstable.
- Most residents living in the area are farmers and often face with risks from climate change.
- The area will suffer more from the climate change in the future. The trend of climate shows most in the phenomena, such as: longer cold-front period, heat (especially from April to August or September), early typhoons (starting from February or March), heavy rain causing flood (sudden and abnormal flood happens from April to November), and early flood (before it started from July, now it is from April).
- The trend of climate change affects more and more to community, causing diseases, destroying crops and reducing livestock and poultry productivity.
- Based on its condition and long term trend of climate change, the local government plans to move its community out of the area to another place (one third of its population).

Comments

- The participants at community level are not aware of the climate change much even though they can identify some changes of weather and increase of disasters. Therefore, it is also hard for them to analyse the long term trend.
- The Tool should be divided in more small steps which are more visualized and more understandable to community-level participants. However, this may take more time to practise the Tool.

5. Consolidation Stage

5.1. Key findings

Although there were some difficulties and limits during practising the toolkits, the assessment brought to some key findings:

- There is variety of stakeholders and organizations working in aspect of climate change in Hue City. They can be divided into 3 groups as follows:
 - GOs: Office for Natural Resources and Environment, Office for Urban Management, Provincial Committee for Flood and Storm Control and Life Rescue, Hydro-Meteorological Service, Department of Natural Resources and Environment, and Provincial Interdisciplinary Working Group on Climate Change Adaptation, Department of Construction, and Environmental Protection Agency, etc.. Although GOs have different concerns and roles, they can be divided into two main functions: (1) Guidance and implementation of policies promulgated by the Government in response to climate change; (2) In coordination with other agencies, including foreign organizations to implement related projects.
 - Research organisations: researchers from universities, institutes, etc. They are experts on studies on issues related to climate change and apply their findings through the support of the project funded by Government or Foreign organizations.

- NGOs: they often find funds from foreign organization to implement projects in local areas.
- Information of climate change in Hue City is still limit. In other work, most information related to climate change is stated under disaster figures.
- Many participants, regardless working for organisations related to climate change, are not fully aware of the climate change and its effects. However, they can feel some signals of the climate change through the increasing number of disasters, change of seasons, phenomena of extreme weather events, etc.
- Different hazards of Hue City are identified and ranked. The main hazards are floods, storms, tornados, cold front, drought, epidemic, landslide and environmental pollution. Among of these, flood and storm are the highest threats.
- Hazard map of Hue City is established and developed. This also helps the stakeholders to be more aware of the climate change and its effects to the vulnerable areas at both city and community levels.
- Hue infrastructure system is behind the standards of facing climate change.
- By practising the toolkit, the stakeholders can evaluate and measure the situation of climate change and its effects in Hue City.
- The research activities help to collect the information of climate change from stakeholders. Besides, stakeholders' knowledge and experience provide a clearer picture of climate change in Hue City as well as inspiring some potential strategies and policies on climate change adaptation.
- Experiencing from serious disasters helps Hue people to find ways of adaptation and response better (upgrading house foundation, preserving food, preparing equipments, etc).
- By analysing the climate change trends, the stakeholders believe that, to 2050, Hue City will face more risks. Some effects that people in this city will have to bear are: diseases, extreme weather events, difficult livelihood, pollution, salinisation, drought, environment degradation... Besides, people also concern about the historical sites and buildings which may be unable to be maintained from the affects of climate change.

5.2. Recommendations for contextualising toolkit

- The occurrence of tools should be consider and re-order in order to save time and cost of the process.
- A network of organisations and individuals, who are interested in or care about climate change issues, should be established. This helps to conduct similar projects in Hue City in future. To do this, an organisation should take this responsibility as a leader. The process of toolkit practice has created a small network. However, it is better to include business sector in as well as having an organisation to be a leader to maintain and develop the network.
- There should be more studies on climate change, its trends and effects as well as adaptability of residents in Hue City. Based on those research results, evidences should be provided to governments at all level of Hue for making policy and establishing development strategies.
- The diversity of stakeholders gives different aspects of climate change in Hue City. This suggests that an inter-organisational cooperation is necessary.
- There should have business sector's commitment to the risk assessment process.

- There should be a point scale for the hazard-ranking tool. This helps the participants to grade the risks of their city more accurate.
- The information about climate change should be stated specifically to help raising more awareness among people of Hue City.
- For better adaptation and response to climate change of residents, climate change adaptation manual books should be published. Enhancing communication is also a necessary way to improve people's awareness and preparation.
- There should be more time for both stakeholders and research group to understand the climate change in Hue City and defining ways to practise the toolkit best. This is partially because Hue people are not familiar with the concept "climate change" so far. However, taking more time faces with some other difficulties such as participants do not have time to join the assessment process. Therefore, budget plan should include some allowances to participants.
- Besides allowance, budgets for meetings (food and drink served during breaks, meeting room...) and for purchasing documents/data should be considered.

5.3 Feedback from stakeholders

The feedbacks from stakeholders come from different sources, such as through in-depth interviews, communication between the research group and the stakeholders, and especially from the validation and interim workshops.

Some remarkable feedbacks are,

- It is necessary to practise people the toolkit as it provides a clear picture about climate change in their location. A lesson withdrawn from the assessment in Hue is that the toolkit should be up-scaled and replicated to other areas. However, it also suggests that a contextualisation of the toolkit is needed.
- By working on the assessment toolkit, stakeholders are more aware about the climate change as well as its effects.
- After mapping the hazards, the government should have policies to help vulnerable communities. Besides, there should be more practical actions, such as putting warning signs at hazard areas, providing radios to fishermen, delivering leaflets or manuals which guide people what and how to do in case of disasters or any phenomena of climate change.
- Research results on climate change should be given to government as evidence for policies of climate change adaptation or of socio-economic development in the trend of climate change.
- Hue City should get more attention from international organisations to solving climate change.
- The data on climate change of Hue is too general. In order to have a clear picture of climate change in Hue, a systematic, focusing and deep survey reflecting multi-sector and different socio-economic aspects is required.

REFERENCE

- IPCC. 2007. *IPCC Fourth Assessment Report*.
http://www.ipcc.ch/publications_and_data/publications_and_data_reports.shtml
- Maplecroft. 2011. *Climate Change Vulnerability Index*.
http://maplecroft.com/about/news/ccvi_2012.html
- Ministry of Science, Technology and Environment. 2001. *General report on the program "Studying methods of recovery adapting to estuaries Thuan An-Tu Hien and Tam Giang-Cau Hai"*. Ha Noi.
- Nguyen Tham and Nguyen Hoang Son. 2010. *Impact of climate change in the watershed of Huong River, Thua Thien-Hue Province*. Science Review, No.58. College of Pedagogy, Hue University.
- Nguyen Viet. nd. *Disasters in Thua Thien-Hue Province and general guidance of prevention*. Hydro-Meteorological Service of Thua Thien-Hue Province.
- People Committee of Thua Thien-Hue Province. *Thua Thien-Hue Geography*.
<http://www3.thuathienhue.gov.vn/GeographyBook/Default.aspx>. Accessed on June 5, 2012.
- People Committee of Thua Thien-Hue Province. November 22, 2007. *Decision 2605/Q -UBND on approvals of building surface water drainage system in Hue City*. Hue City.
- People Committee of Hue City. May 2012. *Report on socio-economic activities and production in first 5 months of 2012, estimating for the first half of 2012, and targets for the rest of 2012*. Hue City.
- People Committee of Hue City. December 9, 2011. *Report on the implementation of the 2011 socio-economic missions and targets of 2012*. No. 99/BC-UBND. Hue City.
- People's Council Standing of Thua Thien-Hue Province. 12/2010. *14th Meeting proceedings of Term V (2004-2011) on December 7-9, 2010*. Internal Circulation. Hue City.
- Statistics Office of Thua Thien-Hue. May 2011. *Thua Thien-Hue Statistical Yearbook*. Hue.
- Vietnam Ministry of Natural Resources and Environment. 2009. *Climate change, sea level rise scenarios for Vietnam*. Ha Noi.