SURVEY ACTIVITY REPORT

Integrated Health, Social and Economic Impacts of Extreme Events: Evidence, Methods and Tools
&
MICRODIS: Economic Annex Study

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Executive Summary

Located in the heart of Vietnam, Quang Nam is one of the poor provinces of the country. In recent years, the province has been affected by increasing climate change events in both its frequency and intensity. Climate change events such as historical floods in 2007 had caused variety of adverse integrate health, social and economic impacts on local communities, particular of households who live in disaster-prone areas. Using the case study of Quang Nam province, the study argues that it is essential to understand integrated impact of disasters in terms of health, social and economics if we are to more fully understand climate change and impacts on local communities as well as strengthening local capacity in preparing prevention and mitigation strategies to adapt to climate change-related extreme events.

For study selection, Duy Xuyen district and Thang Binh one were selected as flooded area and less flooded area respectively for Microdis Integrated Study. By using EpiInfor software, the sample size was also calculated for questionnaire survey in flooded areas and less-flooded areas are 575 households and 192 households in respectively. Site selection and sample size calculation were also conducted for Economic Annex Study in which three districts were selected with ecosystem consideration are Hoi An (Coastal), Dien Ban (Delta) and Dai Loc (upland).

The mixed data gathering methods: secondary data, key informant interviews, focus group discuss and questionnaire survey were used for data collection in this study. Each method feeds into and is strengthened by the others and their combination provides a robust data set to work from. Due to large number of questionnaires need to be completed for Microdis Integrated Study and Economic Annex Study in the time constraint, 14 enumerators were selected, trained and contracted for over 1250 household questionnaires completion.

There were various challenges emerged from the fieldwork upon which probably affect the result of these two studies if we could not find proper solutions. However, great efforts have been made from local communities, government and HCE researchers to overcome such challenges in order to achieve considerable outcomes. Two datasets for MIQ and EAS, deliverables completed and adapted questionnaires as common instrument for integrated impacts of disaster survey are among of outputs completed in last few months.

The observations from fieldwork also reveal that both local government and local communities have made great efforts to adopt adaptation measures such as structural measures, and non-structural measures in order to reduce the impacts of climate change-related disasters such as 2007 floods. It is, however, important to note local government and communities have to deal with many barriers/difficulties constraining their capacity to adapt to climate change.

I. Introduction

Quang Nam is located in the heart of Vietnam, about 860 km to the north of the city of Ho Chi Minh and 865 km south of the country's capital, Ha Noi. The province is the point of intersection between the two geographical regions of North and South which are characterized by aslope topography from West to East with many mountainous ranges, short rivers, delta and coastal areas that created a diversified ecosystem and become one of the highly disaster prone disaster regions in Vietnam. The most frequency and severity disasters annually occurred in Quang Nam are floods; unfortunately it is projected to be increased in both frequency and intensity. The flood events are regular occurrences which result from heavy rainfall in September to November annually.

The year of 2007 was recognized as "year of flooding event" in Quang Nam (Quang Nam PC, 2008). Due to impacts of storm No. 5&6 in the North provinces and monsoons, heavy rain occurred in the whole province with rainfall averaging 2000 mm, in some districts rainfall reached nearly 3000 mm, in October 1st to 7th December, 2007. Within nearly 2 months, there were 9 flooding events occurred in Quang Nam province. In which there were three big floods occurred in only 20 days (from 15/10 to 5/11/2007). Consequently, many communes were inundated about 1.5-1.7 meter, about 0.5-1.5 meter higher than water level of historical flood in 1999. Especially, it caused many serious impacts as local communities have not recovered from previous floods yet.

It was reported that 2007 floods killed 67 people and 339 people injured and total damaged cost of VND 2000 billion. Local authorities had to evacuate about 70,000 people from inundated areas to public buildings (Quang Nam PC, 2008). There were 200,000 people need urgent aids of foods and water. The 2007 floods caused devastating impacts on local infrastructure: In the flood season, rain and overflowing limit transport, community roads experience serious damage. Floods isolate villages by disrupting community roads, prevent access to services, and suspend business activities. The 2007 floods also caused pupils off-schooling, collapsing information and communication systems. Infrastructures such as sea dykes, village-connected roads and main roads in coastal communities in Quang Nam were degraded seriously.

The floods caused serious problems to health of local people particularly of the elderly and disabled family members, women and children living in poor communities with limited food stocks, lack of drinking water sources and poor sanitation. Epidemic diseases such as marsh fever, malaria, dengue fever, diarrhea, amongst many others also appeared when floods occurred. At poor communities, sanitation facilities and public health care systems were destroyed after the floods in 2007.

In order to achieve valuable insights about the integrated health, social and economic impacts of extreme floods on local communities, qualitative information and quantitative information are really needed for research. HCE researchers are also in charge of conducting an economic annex study with special focus on local vulnerability, adaptation and local willingness to pay for prevention measures. In achieving above research objectives, a well-designed questionnaire survey, qualitative information collection and secondary data are really important activities required to be well designed and conduced at project site. From this research project, the findings will likely make significant contribution to both local communities and local authorities in preparing prevention, mitigation and adaptation strategies in order to reduce the integrated health, social and economic impacts of floods in particular and climate change-related disasters in general on local communities. The project will also provide local authorities with community-based prevention measures to mitigate the impacts of climate change-related disasters.

II. Preparation for Microdis Project

2.1 Study Design and Apply for local permit for data collection

Hue College of Economics received the "**Announcement of a competitive call for an additional project partner" to** involve in MICRODIS Project from CRED in August 2008. A study design was developed in the goal and specific objectives are close alignment with the overall goals of MICRODIS. This is a long process under contributive discussions between HCE team and Experts from CRED centre. Final version of study-design was finally approved in May, 2009. The study design developed finally not only makes contribution to the goal of Microdis but also to meet the demand from locality of both local authorities and communities.

In order to apply for local permit for data collection, HCE teams began at provincial level with introduction letter with HCE Rectors' signature and stamp with study-design attachment. The introduction letter also described in detail goal, objectives, research methods and target groups, particular the project activities would be conducted at this level. By doing the provincial government recognized the importance of project for not only for government but also local communities. As a result, we got approval of conducting this research project in Quang Nam province. To approve this project, Quang Nam provincial government also played a crucial role in facilitation for HCE team access to district and commune level by issuing "provincial introduction letter" to districts. However, HCE team also send district authorities with study-design and introduction letter from HCE team as the way of respecting district level rather the so-called top-down approach for permit. Similarly, at district level, the project activities and their schedule

were also discussed for conducting secondary data collection, invite key person to participate in our interviews, and participants for focus group discussions. Additionally, HCE team also seeks for district support to access to communes. Each commune, we held meeting with representatives from commune authority, mass organization and head of village in order to introduce the objectives and activities of project in area of each commune. It is important to recognize the importance of good relationship between HCE and Quang Nam province from provincial level to commune in applying for permit for conducting activities of this project.

2.2 Project Site Selection

There are some potential study sites which can be selected for this such as Thua Thien-Hue with the impacts of 2007 annual floods, Danang city with Xangxane typhoon in 2006 and Quang Nam province with historical floods occurred in 2007 (The most recent occurrence of disaster). Based on the reviewing literatures, and secondary data, Quang Nam was selected as project site as 2007 floods were considered as historical floods which caused serious health, social and economic impacts on local communities. Government had also made great effort to prevent and mitigate the impact of floods on local communities.

In early 2009, Hue College of Economics Research Team prepared a field visits to Quang Nam to collect secondary data and also select districts for survey. Based on the research objectives, there were two districts which were selected for Microdis Integrated Survey. In order to collect comparable information on integrated impacts of floods between heavily flooded areas and less-flooded one. Duy Xuyen district is randomly selected from the list of heavily flooded districts (Duy Xuyen, Dien Ban, Dai Loc, Hoi An, and Tam Ky). Less flooded district is Thang Binh, which was selected from the list of less flooded areas (Hiep Duc, Tien Phuoc, Nui Thanh, Phu Ninh).

There were also three districts selected for Economic Annex Studies from three ecosystems (coastal area, delta and upland area). Based on the list of coastal districts (Hoi An, Thang Binh, Nui Thanh) Hoi An was randomly selected as coastal district in Economic Annex Study. Dien Ban district was selected as delta district from the list of delta district (Duy Xuyen, Dien Ban, Thang Binh, Tam Ky, Phu Ninh, Hiep Duc). Upland district for Economic Annex Study Survey is Dai Loc, which was selected randomly based on the list of upland districts (Dai Loc, Bac Tra Mi, Nam Tra Mi, Que Son, Dong Giang, Tay Giang, Nam Giang and Phuoc Son).

2.3 Sample size estimation

The critical criteria that sample size was determined are basically three folds: (1) the required level of precision in the study result; (2) the level of detail in the proposed analysis and (3) the available budget. For the purposes of this study which are to investigate integrated health, social and economic impact of disasters with data comparability between heavily flooded village and non-flooded ones. Second step is to investigate the in-depth economic impact of flood on local communities. There were two sample size selected; one for Microdis Integrated Questionnaire and another for the Economic Annex Study.

The result of secondary data analysis indicated the overall panorama of disasters and impact on local communities in recent years. It is evidence that 2007 flood events caused severe impacts on large part (about 75%) of provincial population. Based on statistical theory of sample size calculation and actual information collected from Quang Nam province, the estimation of sample size by using Statistical Calculation Module of EpiInfor Package was calculated by experts of CRED. It was advised that in order to obtain an adequate precision to detect significant relative risks of 1.5 for a prevalence of 25% in the reference group, the sample size for MIQ survey was calculated is 750 households. In order to avoid non-response, incomplete responses or recording errors occurred during data collection in the context of vulnerable communities with low literacy and achieve precision result, the desired sample is 750 households, but the number of households will be contacted for survey is 767 households. This sample size was distributed for flooded communities and non-flooded ones with ratio are 75% and 25% respectively. In other word, a sub-sample of 575 households will be selected in flooded villages and the rest of 192 will be conducted in non-flooded one.

Estimation of sample size for Economic Annex Study was set up based on the method used in the economic study and resource availability. The main theme of the set of questionnaires designed for Economic Annex Study is Choice Experiment, which was used for identification of local willingness to pay for prevention measures. This card of Choice Experiment was designed for a sample size of 500 households. Thus, in order to obtain statistical significance for results of this economic study, a proportional sample size of 500 households is the target sample for survey. The Random Selection Techniques was used for household selection based on the list of households collected from each commune and villages.

2.4 Sampling Procedure

The multi-state cluster sampling techniques was used for sampling procedure in this project. The steps f multi-stage cluster sampling procedure was conducted as follow.

a. District selection

As mentioned previously, for purposes of this study re to investigate integrated health, social and economic impact of disasters with data comparability between heavily flooded village and non-flooded ones, Duy Xuyen district and Thang Binh one were randomly selected for Microdis Integrated Survey in which Duy Xuyen is heavily flooded district and Thang Binh is less flooded area of Quang Nam province. Secondary data collection, focus group discussion and key information interviews were conducted at these two districts. By the chance, the list of communes and villages were collected for identification of communes and villages for survey.

The results of above methods found that there are 92 villages with 26,236 households and total population of 131,668 person were heavily affected by 2007 floods in Duy Xuyen district. It is also figured out that there are 131 villages with 47,137 households and total population of 192,550 person living in Thang Binh district (less flooded area). These lists of villages and total number of households in each village were entered into Excel Package for 25 village selection in flooded district and 8 villages in less-flooded districts by using probability proportionate to size technique.

b. Village selection

Based on the list of village collected, all information was entered into Excel Package for village selection (cluster selection) by using Probability Proportionate to Size method. The list of 25 villages in flooded district (Duy Xuyen) and 8 villages from less flooded district (Thang Binh) was selected (see the list of villages from Appendices 1&2). It is important to note that the list of households is not available at district level. Thus, after defined clusters, the researchers collected the list of households of each village from head of village.

c. Household selection

Based on the list of households collected from village, number of 23 households on average is the target sample size of each village needs to be surveyed. Random selection technique was used to select households for survey based on the list of households. List of households selected was, then, distributed to each enumerators for household interviews. In case of any households could not be interviewed after three time of visits, interviewers will conduct next households and survey supervisors will select new

household for displacement. Local people, most of them are head of village were employed as local guide for enumerators to identify households from the list of households selected.

MICRODIS INTEGRATED SAMPLING PROCEDURE

Duy Xuyen (flooded district) Randomly selected	Thang Binh (Less- flooded district) Randomly selected
↓	↓
92 villages 26,236 households	131 villages 49.137 households
↓ PPS	↓ PPS
25 villages selected	8 villages selected
↓ Random	↓ Random
23 households/village Selected	24 households/village selected
↓ Random	↓ Random
575 househols selected	192 households selected
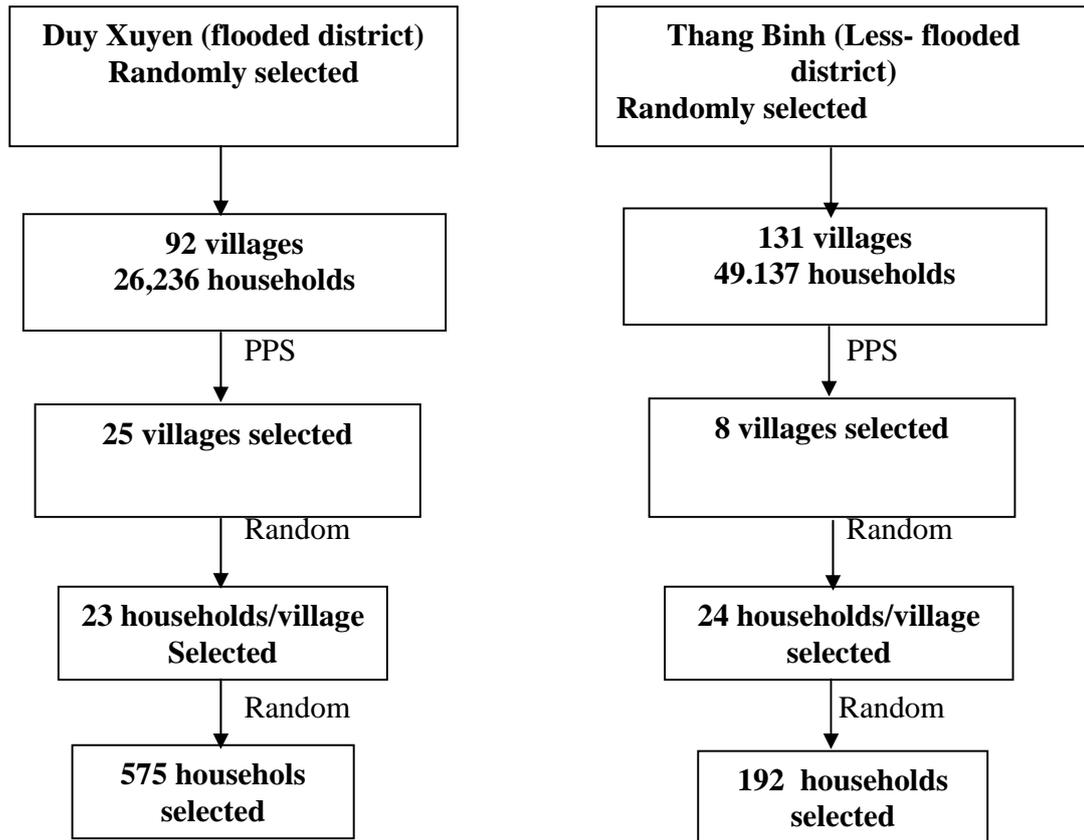
Sampling procedure for Economic Annex Study

As mentioned previously, there were three districts selected from coastal (Hoi An), delta (Dien Ban) and upland (Dai Loc) regions of Quang Nam province. The list of communes from these districts was collected for commune selections. There were 6 communes; two in every district were randomly selected for survey. The list of household was collected from villages of each commune for household selection.

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                        ┌─────────────────┐
                        │    Quangnam     │
                        │    province     │
                        └─────────────────┘
                     RANDOM SELECTION
         ┌──────────────┐  ┌──────────────┐  ┌──────────────┐
         │    Hoi An    │  │   Dien Ban   │  │   Dai Loc    │
         └──────────────┘  └──────────────┘  └──────────────┘
            │ Random          │ Random          │ Random
         ┌──────────────┐  ┌──────────────┐  ┌──────────────┐
         │  Cam Kim,    │  │ Dien Phuong  │  │   Dai Tan    │
         │  Thanh Ha    │  │  Dien Phong  │  │  Dai Phong   │
         └──────────────┘  └──────────────┘  └──────────────┘
            │ Random          │ Random          │ Random
         ┌──────────────┐  ┌──────────────┐  ┌──────────────┐
         │  Selected 90 │  │  Selected 90 │  │  Selected 90 │
         │  households  │  │  households/ │  │  households/ │
         │  /commune    │  │  commune     │  │  commune     │
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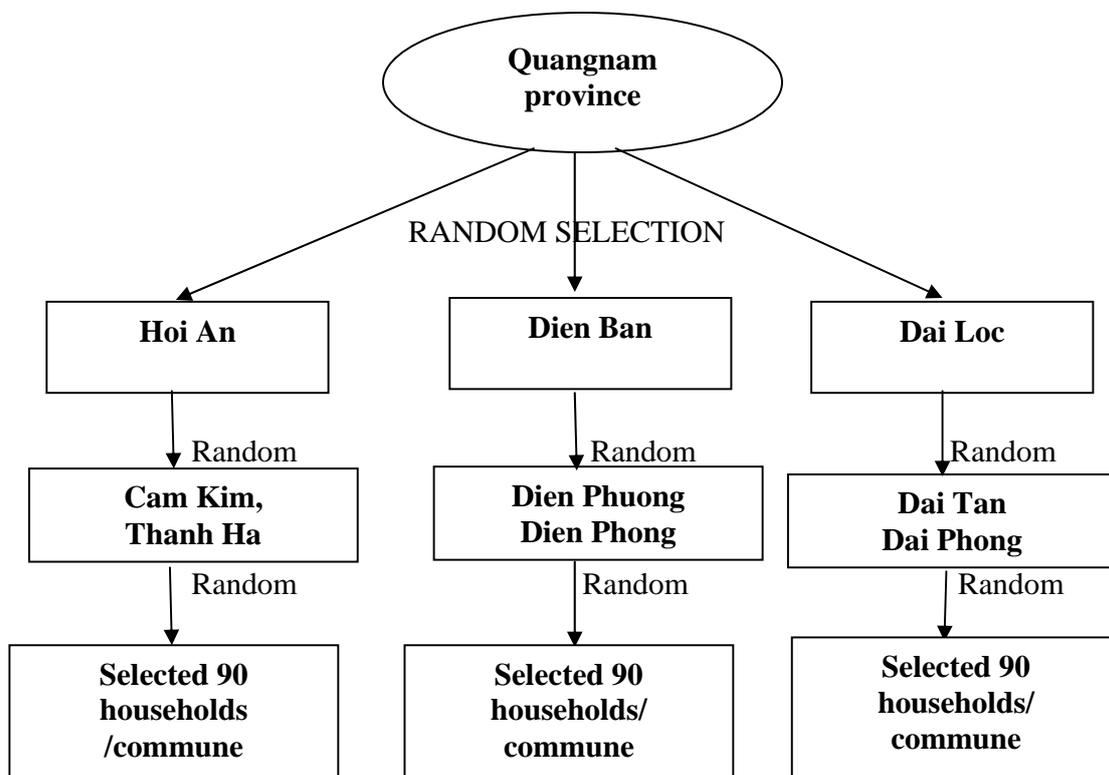
III. Enumerator Recruitment, Training and Pre-test

3.1 Enumerator Recruitment and Training

Timely recruiting enumerators for survey in June gave HCE team a good opportunity to recruit good enumerators from about 200 graduated students. HCE team collected the list of graduated students from Department of Student Affair Based and contacted them via phone and announce about work package. There were 32 students replied and were invited to interviews. All of them have fairly good or excellent results of bachelor degree and experience in conduction of survey. Finally, 14 students were selected from the list of over 32 graduated students participated in the interviews which are 6 students are from Quang Nam province, the rest are from neighbor provinces.

The 14 enumerators recruited were invited to participate in 3-day training course held by HCE team from 1st to 3rd of June, 2009. At the beginning of workshop, the role of all enumerators and quality of data collection were particularly mentioned as the most important factor contributing to the success of this project. Enumerators were, then, introduced about the overviews, goal, objectives, research site and sample of this project. Possible difficulties upon which occur and constrain enumerators from approach and conduct interview with households and the way to overcome it in order to have accurate data collection (see Appendix 4).

During the second day and third day of training course, enumerators were also requested to involve in role-playing practice to conduct questionnaires under the consultancy of supervisors. In this process, enumerators were also asked to both practice interviewing techniques and to identify obscure Vietnamese terms in questionnaires. By so doing, we confirm the all questions raised in MIQ are understandable questions before conducting pilot survey. Enumerators were also invited to question for any concerns about survey and facilitation in project site. Enumerators were provided with necessities for survey such as ball-pens, plastic bags, and notebook.

3.2 Pre-test questionnaires

The pretest surveys were conducted with 20 households in flooded districts for MIQ questionnaire and 50 households for questionnaire used for Economic Annex Study in study sites in Quang Nam province. The pilot survey was conducted by HCE team who are knowledge and experience in survey at household level. Household were selected randomly based on the list of household provided by head of village. Enumerators were also requested to observe interview skill and experience of supervisors during the pretest of questionnaires.

IV. Final Survey and Data Management

4.1 Questionnaire survey and data management

There were 743 Microdis Integrated Questionnaires and 510 Economic Annex Questionnaires were completed during August and early September in 2009 by

enumerators under supervision of HCE researchers. The distribution of sample (households surveyed) follows the sampling design before final survey. Survey supervisors also observe enumerator during their interviews. In order to increase validity and accuracy of data collected, during the final survey, HCE researchers also randomly select completed questionnaire to re-interview and cross-check completed questionnaire analysis. Number of questionnaire completed each day was also carefully checked in order to make sure that information collected and recorded in correct manner. By doing so, especially for first days of survey, a relative large number of questionnaire contained minor mistakes of recording information that needed to be re-correct before data entry. Finally, these questionnaires were entered in SPSS for data cleaning and analysis.

Currently, HCE researchers have been cleaning data and conducting initially descriptive analysis of data in next few days. The expected preliminary results of data will be presented MMW in Depok Indonesia.

4.2 Qualitative Information and Secondary Data
a. Secondary data collection

Secondary data is one of important source of information for any studies as it initially help to contextualize the study site and study issues. For purposes of this study, secondary data about integrated health, socio, economic impacts of floods in 2007 on local communities such as number of dead, injury, social disruption, and economic damages were collected from national level to local ones. Secondary information about socio-economics and local livelihoods were also collected from various government authorities such as from provincial centre for storm and flood control, provincial hydrometeorology centre, department agriculture and rural development, department of environment and natural resource, department of health, department of education and so on.

Secondary data collected was then analyzed by reducing it into meaningful and manageable indicators which were described in the final reports. Secondary data were also providing basic information for sample size decision and sampling design in this study.

b. Key Informant Interviews

Based on the objectives of this study, set of semi-structured questionnaire were designed for key informant interviews with key persons at government agencies, community and mass organizations from provincial level and local ones. During the process of secondary data collection, researchers also introduced the purpose of this project and invite key persons who are in charge of important position in government agencies, mass or community organizations working on the themes related to climate changes to interviews.

There were 10 key interviews conducted from provincial level to local one. List of key informant interviews:

1. Head of Committee for Flood and Storm Control
2. Representative from Department of Agriculture and Rural Development
3. Representative from Dept. of Planning and Investment
4. Representative from Dept. of Environment and Resources
5. Representative from Dept. of Science and Technology
6. Representative from Dept. of Health
7. Director of Preventive Centre for Health
8. Representative from Hydro-metrological Centre
9. Head of Committee for Flood and Storm Control
10. Head of Women Union

Conducting Key Informant Interview by face to face techniques allowed collecting qualitative information about local government awareness and attitudinal responses toward the flooding impacts; set of prevention and mitigation activities adopted to reduce the adverse impacts of flood among local communities and local government at different levels; constraints and barriers in their preparedness and adaptation behaviors. It also investigated in-depth insights about health, social and economic impacts of floods in 2007 on local communities; particular focus was also placed on the issue of children nutrition in relation with mother breastfeeding pattern, dietary diversity and relevancies in Quang Nam province.

c. Focus Group Discussion

There were also 9 focus group discussions held from provincial level (1) to district level (2) to commune level (3) and village ones (3). From district level to village one, focus group discussions were only organized at flooded areas. Conducting these focus group discussions helped to collect deep insights about research issues as raised in research questions, but also validate core themes and questions raised in MIQ questionnaires.

- At provincial level: There was 1 focus group discussion organized at this level. There were 9 participants from different government agencies and mass organizations joined in this focus group discussion.

- At district level: There were 2 focus group discussions being held at this level. There were 15 participants from government agencies and mass organizations involved in discussions.

- At commune level: There were 3 focus group discussions being held at this level. There were 22 participants from commune agencies and mass organizations of selected communes in Duy Xuyen district involved in these focus group discussions.

- At village level: There were 3 focus group discussions held at village level. There were 25 participants involve in these discussions. Participants were invited to discussions based on the list of households collected from village.

Administrative level	# of FGDs	# of participants
Provincial Government agencies	1	9
District agencies	2	15
Commune	3	22
Village	3	25

V. Challenges and Achievement

5.1. Challenges

Conducting data collection for this study, including secondary data collection, key informants interviews, focus group discussions and questionnaire survey, HCE researcher team had to deal with a number of challenges that were able to affect the final results of

this study. Below is the list of challenges and possible solutions adopted to reduce its affect.

- It is important to recognize that fact that although the Microdis Integrated Questionnaire was adapted by HSPH, it still take over 2 hours, even 3 hours of old/low literacy respondents (observed from pretest survey). HCE team had to shorten it by taking out some questions got poor responses from respondents and which may be able to collect secondary data, key informant interviews and focus group discussions.

- Although the Microdis Integrated Questionnaire was shorten, respondents still looked tired to complete the final questions, survey supervisors consulted enumerators to change the way of getting start of interviews the clear purpose of survey and time needed to complete the survey and give incentive to respondents.

- There was some participant tent to dominate focus group discussions who are in charge of important position at provincial level and intensive experience in floods. HCE moderators had balance his critical views by stopping his endless responses by inviting others' responses or raising new topics for discussion.

- There were some participants who had factual errors or critical views in the areas of their concerns or they are being in charge at government agencies. HCE researchers had to identify and confirm by another source of relevant information such as from another participation and secondary data.

- Identifying exact households sampled from large and scatter living areas village - use local, HCE researchers had to employed local people, most of them are head of villages to guide for enumerators.

- Managing validity and accuracy of large number of household questionnaires completed by enumerators (over 1250 questionnaires), HCE enumerators considered the role of enumerator recruitment and training as important factor contributing to successfulness of this project, thus recruitment and training enumerators were carefully conducted. Random re-interviewing and cross-checked were also conducted right after the enumerators completed them. Checking completed questionnaire before data entry was also implemented.

- Not many but one enumerator did not really complete questionnaire with low quality data collected. HCE enumerators had paid special attention to this enumerators and conducted re-interview all of 9 questionnaires completed in his first two days. "Mistakes/errors" were highlighted for experiences for all enumerators.

- There were some questions used in this questionnaire are sensitive (S_D3.2; S_D3.3; S_H16; S_H17) are very sensitive for enumerators. HCE survey supervisors requested enumerators to stop or even do not raise questions if respondents are local officials.

- Recording local specific data such as source of family income by member, for many cases wife and husband all involved in agricultural productions which are main sources of family income, respondents could not say exact amount of wife/husband contribute to family income. HCE researchers request enumerators to ask respondent as detailed as possible, if not simply recorded for both in total income.

- Conducting questionnaire for Economic Annex Study, especially when enumerator read introduction of Choice Experiment Section, many local respondents did not have good understanding about the purpose of this method and think enumerators are insurance sellers. HCE researchers requested enumerators use motorcycle insurance scheme as similar example to explain for respondents.

- Some respondents were not available for interviews even in the third visit, this is really challenge for enumerators and local guide. HCE researchers request enumerators to conduct interview with new sampled households and new household for displacement will be selected after completed all sampled households in that cluster.

- Heat waves and early flood occur during August and September are also challenge to the implementation of study activities of HCE team, to adapt with heat waves, HCE teams decided to start interviews in early in the morning and late in the afternoon. HCE team had also extended for one week for economic survey due to early floods.

5.2 Achievements

There are number of challenges and barriers constraining HCE researchers from the implementation of study activities. Much efforts and solution have been made to completed deliverables in accordance with overall Microdis Timeframe. Below is up-to-date achievement of HCE Team.

- Completed secondary data collection for study
- Completed pre-test of questionnaires for Microdis Integrated Questionnaires and Questionnaires for Economic Annex Study
- Translated and back-translated for Microdis Integrated Questionnaires

- Prepared instruments and agendas for Key Informant Interviews and Focus Group Discussion
- Completed qualitative data collection (10 Key Informant Interviews, 9 Focus Group Discussions)
- Completed 760 questionnaires for Microdis Integrated Survey and 510 questionnaires for Economic Annex Study
- Produced data entry templates in SPSS for Microdis Integrated Survey and Economic Annex Study
- Completed data entry and cleaning data for two datasets
- Completed deliverables D4.4.2; D6[1].1.7.; Contextual Report on Survey Site;
- Set up a good relationship with local governments from provincial to commune level.

VI. Preliminary Observations from Study Site

- Although Centre for Storm and Flood Control were established from provincial level to district level and commune one, with participation of various government agencies and mass organizations, annual prevention and mitigation strategies designed follow a top-down approach; information and prevention strategies developed and provided by provincial to district and then to commune level. There was a lack of local community participation in planning process in responses to annual disasters. Such plan and strategies often miss the real needs of households and sometime ignore the potential of local resources and capacities.

- It is indicated that the local government has paid much attention to and great effort made for prevention, and mitigation of disasters. However, there are barriers and difficulties constraining the effectiveness of disaster mitigation and management. The constraints and limitations include: prevention and mitigation activities are passive and mainly focus on addressing specific problems; the lack of early warning systems to from provincial to local level which possibly work in the extreme condition of disasters.

- Seeking alternatives in local livelihood practices for local communities to adapt to and mitigate the impact of climate change-related disasters is still challenge for government from provincial level to commune. Local livelihoods are still largely

dependence on access to natural resources and very vulnerable to the impacts of annual disasters such as agricultural production, livestock, aquaculture, and small business.

- Provincial government has adopted various adaptation measures such as structural adaptation and non-structural ones to enhance local capacity and increase their resilience to climate change-related disasters in recent years, such as projects on upgrading local infrastructures in the disasters-prone areas such as dam, dyke and reservoirs constructed in order to reduce the impacts of floods and flood flash; resettlement for 5000 out of 7000 households in flooding basin. However, due to a lack of budget, social welfare systems (e.g. school, electricity stations, and local health care systems) are still poor and vulnerable to annual floods.

- Local health care systems in flooded areas did not meet the high demanding in terms of local health treatments, particular of first aids in the context of extreme disasters. It is indicated that local health care system lack of medical facilities and medicines in order to deal with infectious diseases after floods. As a result, health problem such as diarrhea, skin diseases and water-borne diseases are among serious problems threaten the local community, especially in flooding season.

- During the fieldworks, it is observed that provincial government have been mobilizing external resources in order to implement structural adaptation to floods such as "two in one community houses" construction, which is built for local evacuation during flood season and use for community meeting house in off season funded by JICA, World Bank.

- Due to a lack of budget and expertise, there were few of training courses organized for local staff involve in Local Centre for Storm and Flood Control. It should be recognized that none of training courses of enhancing their adaptation capacity to climate change-related disasters. There was no courses of raising local awareness to environmental pollution and risks of disasters for household in flooding basin in Quang Nam.

- A lack of dataset about vulnerable groups and risk maps are also barriers constraining local government from response to annual disasters in Quang Nam. Thus, annual strategies on prevention and mitigation of disaster impacts are normally designed based on the experiences of staff.

- There are various adaptation measures were adopted at local communities, including structural measures such building mezzanine, constructing house with higher foundation, two-storey cattle cage construction, etc.; or behavior adaptation measures such as changes cropping calendar, short-term varieties,

storing food and necessities during flood season, selling cattle, etc; or financial measures.

APPENDICES

Appendix 1: List of village and number of households selected for survey in flooded district

Selected villages	Total #. of households	# of households selected
My Phuoc	550	23
Ha Thuan	385	23
Cau Lau Tay	360	23
Cau Lau Dong	344	23
Trieu Chau	349	23
Hoa Binh	358	23
Lang Chau Nam	423	23
Lang Chau Bac	436	23
Van Quat	550	23
Thi Thai	470	23
An Lac	540	23
Nhan Bau	280	23
Vinh Thanh	267	23
Dong Hoa	311	23
Trung Hoa	266	23
Trung Chau	238	23
Phuoc Thanh	279	23
Dong Binh	350	23
Vinh Nam	500	23
Tra Dong	460	23
Ha Thuan	500	23
Ha My	360	23
Tra Nam	155	23

Ha An	284	23
Phuc Khuong	225	23
Total number of households contacted		**575**

Appendix 2: List of village and number of households selected for survey in less flooded district

Selected Village	Total # of households	# of households selected
An Lac	314	24
Phuong Tan	183	24
Nghia Hoa	275	24
An My	163	24
An Thanh	326	24
Binh Quang	248	24
Thang Binh	157	24
Binh Phung	238	24
Total		**192**

Appendix 3: List of districts, communes and number of households selected for Economic Annex Study

District selected	Communes	Total households	# of household selected
Hoi An	Thanh Ha	1463	90
	Cam Kim	1091	90
Dien Ban	Dien Phuong	2547	90
	Dien Phong	2421	90
Dai Loc	Dai Tan	1520	90
	Dai Phong	1800	90
Total			540

Appendix 4: THE ENUMERATOR TRAINING PROGRAM

| Time	Contents	Activities/Methods
Day 1		
08:00	Opening	
08:15	Getting Acquainted	
08:45	Expectations and Ground Rules	
09:15	Overview of the course and schedule	
10:00	*Break*	
10:15	**Introduction about Microdis project** - Overview of project - Goals and objectives	- Instructors explain and invite questions and responses
10:30	**Introduction about research site and sampling**	- Instructor explain to participants bout the study site & sampling method
11:30	*Lunch break*	

14:00	**Introducing about the Microdis integrated questionnaire (MIQ)**
	MIA has 4 main modules: **Microdis core, social thematic, health thematic, and economic thematic**. The questions are grouped into blocks.
	Part 1. Core module
	  - consent form
	  - identification & interview results (Reg1-Reg4)
	  - general information of the family (Demo1-Demo20)
	  - occurrences of natural disasters A1-A2)
	  - experiences during referenced disasters (A3- A27)
		Instructors explain enumerators Invite questions and responses from participants

15:00	*Break*	

15:15	**Part 2. Health module**
	  - Water & sanitation
	  - Access to and use of health care
	  - Individual health characteristics in the household
	  - children nutritional status
	  - children nutritional status
		Instructors explain enumerators Invite questions and responses from participants

17:00	*End of the day*	

Day 2		
8:00	Review and preview and respond to feedback	- Instructor will review session learnt in the 1st day and feedback
08:00	**PART3. Social module** **-** individual coping (3.1.1-3.1.3) - received social support (3.2.1-3.2.6) SENSE OF COMMUNITY (3.3.1-3.3.17) **-** Functioning and quality of life (3.4.1-3.4.15) - coping behavior and social protection (3.5.1-3.5.9)	Instructors explain enumerators Invite questions and responses from participants
10:00	*Break*	
10:15	**PART 4. Economic module** 4.1-VALUATION OF DAMAGES CAUSED BY THE 2007 FLOOD - Damages on Residential House and Amenities - Damages on Household Goods/ Documents - Damages on Agriculture, Horticulture, and Forestry production - Damages on Livestock - Damages on Household based Industry and Small-scale Industry/ Commercial Activities - Damage on public infrastructure and its impact on your household -Damages on Aquaculture/Pisciculture 4.2. TEMPORARY DISPLACEMENT & MIGRATION (4.2.1-4.2.4) 4.3. IMPACT ON MONTHLY INCOME AND EXPENDITURE (4.3.1-4.3.8)	Instructors explain enumerators Invite questions and responses from participants
11:30	*Lunch break*	
14:00	**Introduction about economic annex study** - Objectives - Methodology	- Instructor will introduce the purpose of study and research methods
14:30	- **Question coding used in this set of questionnaire** **I.** HOUSEHOLD INFORMATION (1.1-1.17) II. VULNERABILITY ASSESSMENT (2.1.-2.22) III: ADAPTATION MEASURES (3.1-3.14) IV: CHOICE EXPERIMENTS - Scenario description - Show cards - Questions (4.1-4.6)	- Instructor will explain Scenario description, shown cards, and questions coding used in this set of questionnaire and invite question and responses

15:00	*Break*	
15:15	**Enumerators practice Micodis integrated questionnaire interviews**	- Enumerator will be required to change the role (role playing) and practice survey - Instructor will observe and consult if any comment
16:30	Group discussion about difficulty in raising questions and recording data during the conducting survey	- Instructor will facilitate group discussion for enumerators - Instructor will also invite questions and response - Enumerators will be required to discuss difficulties upon which they had to deal with during practicing survey
16:50	Conclusion, question and answer	- Instructor will conclude
17:00	*End of the day*	
Day 3		
08:00	Continuing role playing & practice interviews	- Enumerator will be required to continue role playing & practice interviews and require to take note if they find difficulty - Instructors observe and consult enumerators if necessary
9.30	Reviewing and responding to the feedbacks of enumerators	- instructor will review practices done in the morning and also invite questions and responses
10:00	*Break*	
10:15	- **Enumerators practice economic annex questionnaire interviews**	- Instructor will also play in role of interviewer to complete this part. - Invite questions and responses
11:35	Enumerator practice raising questions and record information in the part of choice experiment	- Enumerator will be required to practice this part by playing in role of interviewers
11:20	Conclusion, questions and answers	
11:30	*Lunch Break*	
14:00	Data entry and management	- Instructor will explain about data entry and data management
15:00	*Break*	
15:15	Group feedback	- Each group of participant will be required to have feedback and discussion
16:50	Wrap up training course	- Instructor will wrap up the

		course, invite comment and response from participants
17:00	*Closure*	

Appendix 5: Introduction letter of HCE sent to Dai Loc district
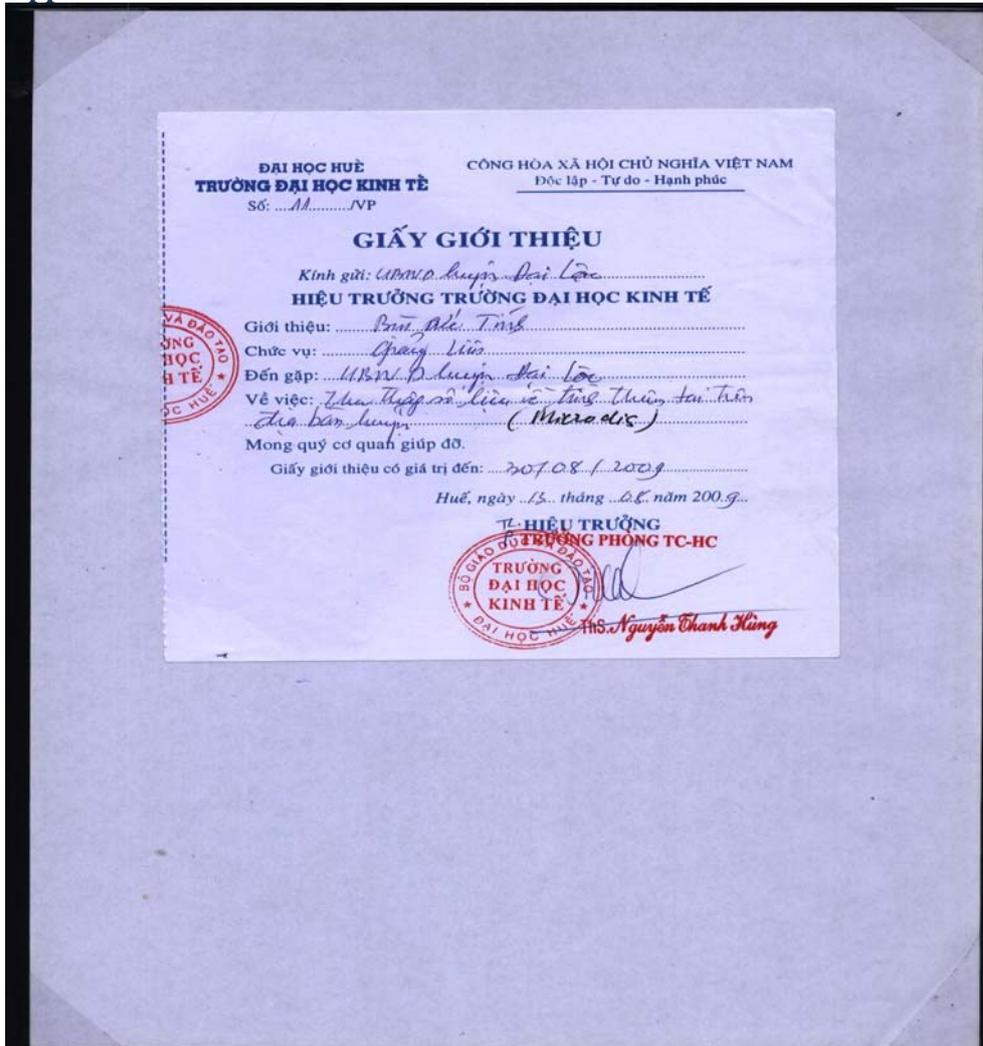
Appendix 6: Introduction letter of District sent to commune level on the request of HCE research team

ỦY BAN NHÂN DÂN
HUYỆN ĐẠI LỘC

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập - Tự do - Hạnh phúc

Số : 30.... / GM-UB

GIẤY GIỚI THIỆU
ỦY BAN NHÂN DÂN HUYỆN ĐẠI LỘC

Giới thiệu đồng chí : *Bùi Đắc Tính*

Chức vụ : *Giảng viên*

Đơn vị công tác : *Trường Đại học Kinh tế Đại học Huế*

Được cử đến : *UBND xã Đại phong và UBND xã Đại Tân*

Để : *Thu thập số liệu về tình lũ lụt để phục vụ cho việc xây dựng và triển khai dự án Microdis*

Đề nghị quý cơ quan, đơn vị hết sức giúp đỡ đồng chí : *Bùi Đức Tính*
.... hoàn thành nhiệm vụ.

Giấy này có giá trị đến hết ngày ...21... tháng ...8... năm 200......

Đại Lộc, ngày ...28... tháng... 8... năm 200.9

KT. CHÁNH VĂN PHÒNG
PHÓ VĂN PHÒNG

PHẠM THÚY

Appendix 7: Introduction letter of HCE sent to Dien Ban district and their writings to facilitate the meeting with department of agriculture and rural development

Appendix 8: Introduction Letter of HCE sent to Duy Xuyen Ditrict