

DEVELOPING THE DATA COLLECTION INSTRUMENTS TO MONITOR THE INDICATORS OF THE IMPACT OF CLIMATE CHANGE¹

Climate change refers to the variation in the earth's global climate or regional climates over time scales ranging from decades to millions of years. Changes may be driven by internal processes, external forces or, most recently, by human activities². It is generally recognized that it is one of the most serious environmental challenges facing the world.

In line with this, an initiative was implemented to examine and track the risks and impact of climate change on poverty. This is done through the development of a community-based monitoring system (CBMS) that incorporates the issues relating to climate change. One of the specific objectives of the initiative is to identify a set of indicators of the impact of climate on poverty at the local level. As such, the CBMS questionnaires (both the Household Profile Questionnaire and the Barangay Profile Questionnaire) were revised to include questions which collect the data that are necessary to monitor the indicators. In addition, corresponding manual for these questionnaires were revised to incorporate the additional items on climate change that were also included in the revised questionnaires.

This initiative was undertaken in part with the ongoing research initiative on monitoring and mitigating the impact of policy shocks such as economic crises (e.g., food and fuel price rise, global financial crisis) and climate change in the selected CBMS sites.

A. MANIFESTATIONS OF CLIMATE CHANGE

There are various ways by which climate change can be manifested. It can be manifested in the increase in the global average temperature resulting in meltdown in glacial ice causes sea level to rise and the ocean water temperature to increase. It has also led to more frequent extreme weather events. In the case of the Philippines, climate change is manifested with occurrence of strong warm (El Niño) and strong cold (La Niña weather). In fact, the country experienced five La Niña and seven El Niño episodes from 1970 to 2000 compared to only three La Niña and two El Niño episodes from 1950 to 1970. Given these, different indicators of climate change were identified as follows:

1. Increase in temperature

Indicator: Proportion of households which reported an increase in the temperature

Since the late 19th century, an increase in the global average temperature was recorded. In the case of the Philippines, extracted data from the gridded global database of the IPCC Data distribution center and the UK Climate Research Institute (CRU) show a definite increase in the average surface (land and ocean) temperatures since 1980s. In addition, a

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² Asian Development Bank. Web reference: <http://www.adb.org/Climate-Change/faqs.asp#3>

report by CRU in 1999 also revealed that local ocean temperatures peaked in 1998, following a global pattern.

In order to confirm whether the increase in temperature are already felt by households in particular community, additional questions are added in the revised CBMS HPQ. In section U5 of the revised CBMS Household Profile Questionnaire (HPQ), households living in the community for at least 3 years are be asked on whether the temperature in their area is hotter compared to 3 years ago.

ASK QUESTIONS (145)-(154) IF LIVING IN THE COMMUNITY FOR AT LEAST 3 YEARS	
U.5. TEMPERATURE	
(145) Compared to 3 years ago, is the temperature hotter now in your area?	<input type="checkbox"/>
1. Yes	2. No

2. Sea Level Rise

Indicator: Proportion of households which reported an increase in the sea level

The increase in global average temperature results in the melt down of glacial ice causing sea level rise by 10 to 20 cm. One of the most visible effects if warmer climate for the Philippines is the increase in sea levels as oceans expand with melting down of glaciers and draining into the oceans. Some islands and coastal areas might disappear with the rising waters. Household, especially those living in coastal areas, can observe an increase in seal level, as well as beach erosion. Having beach erosion would mean less land area for housing or commercial activities and could eventually lead to economic loss and social displacement. Low lying coastlines with gentle slopes will experience greater loss of land than those with steep topography. Given this, a study estimated that a 1-meter rise in 2025 (Perez, et al, 1999) will inundate more than 5,000 hectares and displace more than 2 million people, more than half of whom are in Manila.

Based on some studies, signs of sea level rise were detected from tide gauges installed in some of the major ports in the country with Manila invariably registering the highest increase. Analysis of the records in Manila and Legaspi conducted by the UK Climate Research Unit (CRU) revealed that the upswing started in the 1970s. However, it is important to note that according to geologists, the recorded increase in not all due to the changing ocean. In fact, is possible that ground subsidence because of groundwater extraction is another factor that led to this.

Given the above, in section U7 of the revised CBMS HPQ, households living in the community for at least 3 years are asked on whether the sea level in their area increased, decreased or remain the same.

U.7. SEA LEVEL	
(147) Compared to 3 years ago, does the sea level ___ in your area?	<input type="checkbox"/>
1 Increase	3 Remain the same
2 Decrease	4. Don't know

3. More frequent occurrence of natural calamities and longer time of occurrence

Indicator: Proportion of households which experienced an increase in the frequency of occurrence of natural calamities, including typhoon, flood and drought

Indicator: Proportion of households which experienced longer flooding

Indicator: Proportion of households which experienced longer drought

Another possible manifestation of the climate change is the increase in the frequency of natural calamities, including typhoon, flood and drought. For instance, warm oceans which can be a result of climate change enhance the strength, frequency and range of tropical cyclones.

In the Philippines, the number of typhoons dramatically increased from 27 typhoons in the period of 2000-2003 to 39 from 2004-2007 based on the records of the Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA). There were also massive flooding that occurred in recent years brought about by destructive typhoons including Ondoy and Pepeng in 2009 and Sendong in 2011. Furthermore, strong typhoons and flooding could also lead to massive landslides.

Questions on whether households were affected by natural calamities were already included in the earlier version of the CBMS HPQ. However, in section U.4 of the revised version, additional types of natural calamities were included such as landslide, tsunami and forest fire. Moreover, questions that will capture the frequency of occurrence were added. When panel data for a particular community is already available, the information on the frequency of occurrence of natural calamities could be further analyzed. The number of times the natural calamity has affected the households can be compared in different time periods.

U.4. CALAMITIES		
(141) During the past 12 months, which of the following calamities affected your household:	1. Yes 2. No	(142) How many times did the ___ happen?
1. Typhoon		
2. Flood		
3. Drought		
4. Earthquake		
5. Volcanic eruption		
6. Landslide		
7. Tsunami		
8. Fire		
9. Forest fire		
10. Armed conflict		
11. Others, specify		

Information on the frequency of occurrence of natural calamities is complemented by the items on page 5 of the Barangay Profile Questionnaire (BPQ). The BPQ was also revised to include additional questions relating to the number of times the natural calamities (including typhoon, flooding, drought, landslide, tsunami, forest fire, etc.) occurred in the past 3 years. In addition, the frequency occurrence of pest infestation and livestock and poultry diseases which affected many households in their community is determined.

Significant Events in the Barangay For Past 3 Years			
(44) During the past 3 years, how many times did the event occur? Put number in box provided.			
1 Typhoon	<input type="text"/>	7 Tsunami	<input type="text"/>
2 Flooding	<input type="text"/>	8 Fire in houses/properties	<input type="text"/>
3 Drought	<input type="text"/>	9 Forest fire	<input type="text"/>
4 Earthquake	<input type="text"/>	10 Epidemic	<input type="text"/>
5 Volcanic Eruption	<input type="text"/>	11 Pest infestation	<input type="text"/>
6 Landslide	<input type="text"/>	12 Livestock/Poultry Diseases	<input type="text"/>
		13 Armed conflict	<input type="text"/>
		14 Closure of large firm	<input type="text"/>
		15 Closure of many small firms	<input type="text"/>
		16 Mass lay-off	<input type="text"/>
		17 Opening of large firm	<input type="text"/>
		18 Opening of many small firms	<input type="text"/>

Meanwhile, additional questions were asked to households living in the community for at least three years to determine whether floods occur more often compared to three years ago. The length of time for the flood to subside in during the last 12 months and three years ago will also be determined for those households which experienced flooding. This will enable comparison of the length of time the flood subsides and may give an indication of the severity of the flooding.

U.9. FLOODING	
(150) Compared to 3 years ago, do floods occur more often in your area now?	
1. Yes	(GO TO 151) <input type="text"/>
2. No	(GO TO 151) <input type="text"/>
3. Did not experience flood	(GO TO 153) <input type="text"/>
(151) Three years ago, how long does it usually take for the flood to subside? (Specify the number of hours) <input type="text"/>	
(152) During the past 12 months, how long does it usually take for the flood to subside? (Specify the number of hours) <input type="text"/>	

In addition, households living in the community for at least 3 years were also asked on whether they experienced more frequent drought in their area. For households, which experienced drought, the length of time it lasted was also determined.

U.10. DROUGHT		
(153) Compared to 3 years ago, does drought occur more often in your area now?		
1. Yes	(GO TO 154)	<input type="text"/>
2. No	(GO TO 154)	
3. Did not experience drought	(GO TO 155)	
(154) In the past 3 years, how long did the last drought occur?		
1. < 1 month	4. 3 months < 4 months	<input type="text"/>
2. 1 month < 2 months	5. 4 months < 5 months	
3. 2 months < 3 months	6. 5 months or more	

4. Decrease in the supply of water due to drought or less rain

Indicator: Proportion of households which experienced a decrease in water supply due to drought or less rain

As a result of extreme weather conditions, particularly drought, it is likely that some households would experience a decrease in water supply. In some cases, there are areas which could experience lesser rain than before which could also lead to a decrease in the supply of water. In the revised version of the CBMS HPQ, households living in the community for at least 3 years are asked to compare their water supply to 3 years ago. This question aims to determine if the water supply in their area increase, decrease or remain the same. For those households which experienced a decrease in water supply, the reason for the decrease is determined. As mentioned, the decrease in water supply may be due to drought that occurred during the reference period.

U.8. WATER		
(148) Compared to 3 years ago, does the water supply ____ in your area?		
1. Decrease	(GO TO 149)	<input type="text"/>
2. Increase	(GO TO 150)	
3. Remain the same	(GO TO 150)	
(149) What is the primary reason for the decrease in water supply?		
1. Drought	5. Increase in number of consumers	<input type="text"/>
2. Broken faucet/pump	6. Others, specify	
3. Lower water level in the dam		
4. Less frequent delivery of tanker truck/peddler		

5. More frequent power shortage

Indicator: Proportion of households which experienced an increase in the frequency of brownouts or power shortage in their community.

Hydropwer capacity is highly dependent on rainfall. Since climate change could lead to less rain, areas which depend on hydroelectric power as source of electricity could experience power shortage. Power outages which could last for hours could affect businesses (e.g., business may be costly and may turn to pollutive diesel-fired generators) and even households. Hence, household living in affected areas could possibly experience more frequent brownouts or power shortage if this concern is not addressed. Given this, households in section U.6 of the revised questionnaire, households living in the community for at least 3 years are asked whether the households experienced more frequent brownouts compared to 3 years ago. As panel data is generated, this will give an idea of the extent of power shortage that the community is experiencing over time.

U.6. ELECTRICITY	
(146) Compared to 3 years ago, are brownouts more frequent now in your area?	<input type="checkbox"/>
1. Yes	2. No

B. INDICATORS OF THE IMPACT OF CLIMATE CHANGE

Although the existing CBMS questionnaires already capture the core indicators of poverty, additional indicators on the impact of climate change on agriculture and hence income, were considered. Some additional indicators on the impact of climate change on human health and living conditions are also added.

ON AGRICULTURE PRODUCTION

One of the most apparent impacts of climate change may be felt on agriculture, particularly in terms of crops production, livestock and poultry production and fishing. For instance, growth in agriculture production could be hampered by barring storms that hit the country. Even commercial and backyard farms were damaged by frequent and strong typhoons. Massive coral bleaching in various reefs throughout the Philippines occurred during the severe 1997-98 El Niño episode. Fish kills and high mortality of cultured giant clams and severe red tide were also observed. The decline in harvest or yield would mean a decline in income among agriculture-dependent households.

1. Decrease in crop yield due to typhoon, flood, pests, drought, or decrease in supply of water from the irrigation

Indicator: Proportion of farm households which experienced a decrease in crop yields due to typhoon, flood, pests, drought or decrease in supply of water from the irrigation

As mentioned earlier, crops production is one of the areas that could potentially be affected by climate change. In particular the volume of harvest may be affected by strong typhoons and flooding, as well as drought. To determine the impact, the revised HPQ added questions that would determine whether households engaged in crops production and living in the community for at least 3 years experienced a change in the volume of their harvest. In particular, question 133 determines whether the harvest decrease, increase or remain the

same when compared to 3 years ago. For farm households which experienced a decline, the reason for the decrease is determined. Some of the possible reasons may be related to climate change, such as the occurrence of drought, typhoon and flood.

In the long-run, agriculture area may decrease due to sea level rise. A decrease in soil fertility may also result because of erosion. Although temperature is not expected to increase significantly given the country's geography, the small changes is still likely to affect rice crops. However, some insects and pests may also find warmer temperature more favourable which may also lead to lower harvest.

U.1. AGRICULTURE		
ASK QUESTIONS (133)-(136) IF CODE "1" IN (88) AND IF ENGAGED IN FARMING AND LIVING IN THE COMMUNITY FOR AT LEAST 3 YEARS		
(133) Compared to 3 years ago, did your harvest __?		
1. Decrease	(GO TO 134)	<input type="text"/>
2. Increase	(GO TO 135)	
3. Remain the same	(GO TO 135)	
(134) What is the primary reason for the decrease in harvest?		
1. Increase in cost of farm inputs such as seeds, fertilizer, pesticides, etc.	6. Decrease in supply of water from the irrigation	<input type="text"/>
2. Affected by drought	7. Change in primary occupation of member	
3. Affected by typhoon	8. Others, specify	
4. Affected by flood		
5. Affected by pests		

2. Decrease in livestock and poultry production because of animal diseases, typhoon, flood or extreme hot weather condition

Indicator: Proportion of households engaged in livestock and poultry production which experienced a decrease in production because of animal diseases, typhoon, flood or extreme hot weather condition

Livestock and poultry are also sensitive to extreme weather changes. Hence, climate change could affect the volume of production and thereby, income of farm households. In particular, some households may experience a decrease in livestock production, especially when their animals are stricken by diseases (some of which are brought about by changes in weather) and when they experienced strong typhoon, flood or extreme hot weather conditions.

In the revised CBMS HPQ, households engaged in livestock and poultry raising and living in the community for at least 3 years are asked to compare their production to 3 years ago, i.e., whether their production decrease, increase or remain the same. The reason for the decline is also specified in order to determine if the decline is somewhat related to climate change.

U.2. LIVESTOCK AND POULTRY		
ASK QUESTIONS (137)-(138) IF CODE "1" IN (89) AND IF RAISING LIVESTOCK AND POULTRY AND LIVING IN THE COMMUNITY FOR AT LEAST 3 YEARS		
(137) Compared to 3 years ago, did the number of your livestock and poultry ___?		
1. Decrease	(GO TO 138)	<input type="text"/>
2. Increase	(GO TO 139)	
3. Remain the same	(GO TO 139)	
(138) What is the primary reason for the decrease in number of livestock and poultry?		
1. Increase in cost of farm inputs (feeds, chicks, etc.)	3. Decrease in land holding	<input type="text"/>
2. Stricken with diseases (swine flu, bird flu, foot and mouth disease, etc.)	4. Affected by typhoon	
	5. Affected by flood	
	6. Affected by extreme hot weather condition	
	7. Others, specify	
U.3. FISHERY		
ASK QUESTIONS (139)-(140) IF CODE "1" IN (90) AND IF ENGAGED IN FISHING AND LIVING IN THE COMMUNITY FOR AT LEAST 3 YEARS		
(139) Compared to 3 years ago, did your fish catch ___?		
1. Decrease	(GO TO 140)	<input type="text"/>
2. Increase	(GO TO 141)	
3. Remained the same	(GO TO 141)	

3. **Decrease in fish catch due to occurrence of coral bleaching, frequent occurrence of typhoons or merely due to the fact that there are fewer fishes in the fishing area**

Indicator: Proportion of households engaged in fishing which experienced a decrease in fish catch due to the occurrence of coral bleaching, frequent occurrence of typhoons or due to the fact that there are fewer fishes in the fishing area

Fish and other aquatic animals are also sensitive to climate change. The increase in sea surface temperature induces expulsion of essential microscopic algae which live in symbiosis with the coral which cause coral bleaching. There were earlier research works which provide evidence of the impact on the fish communities of a mass bleaching even which resulted from the 1997-1998 El Niño episode. This process also resulted in changes in diversity, size and composition of fish communities. The huge decline in corals affects those fish that depend closely on coral colonies, either as feeding grounds or as protection. Some farmers also experienced a decline in fishes in the fishing area. In addition, more frequent typhoons could prevent fishermen from going out into the sea resulting in a decline in their fish catch.

Given the above, a decline in fish catch may be experienced by households engaged in fishing. Section U.3 of the revised CBMS HPQ collects information on whether households experienced changes in their fish catch. Those households which experienced a decline in fish production are asked further to determine the reason for the decrease.

U.3. FISHERY		
ASK QUESTIONS (139)-(140) IF CODE "1" IN (90) AND IF ENGAGED IN FISHING AND LIVING IN THE COMMUNITY FOR AT LEAST 3 YEARS		
(139) Compared to 3 years ago, did your fish catch ___ ?		
1. Decrease	(GO TO 140)	<input type="text"/>
2. Increase	(GO TO 141)	
3. Remained the same	(GO TO 141)	
(140) What is the primary reason for the decrease in fish catch?		
1. Decrease in fishing area due to government restrictions	6. Occurrence of oil spill and other kinds of pollution	<input type="text"/>
2. Decrease in fishing area due to competition	7. Less frequent fishing because of increase in fuel prices and other expenses	
3. Fewer fishes	8. Frequent occurrence of typhoons	
4. Occurrence of coral bleaching	9. Others, specify	
5. Fishkill		

ON HUMAN HEALTH

4. Increase in the occurrence diseases such as dengue fever, malaria, diarrhea, cholera, typhoid fever or heat stroke

Indicator: Proportion of households with at least one member of the household which experienced dengue fever, malaria, diarrhea, cholera, typhoid fever or heat stroke.

El Niño phenomenon, which is one of the manifestations of climate change, is also correlated with dengue epidemics, such that the number of dengue victims significantly increased. Other waterborne diseases are also spreading fast, such as cholera, diarrhea and typhoid fever. There might be some possibilities of alteration in the range and seasonality of the mosquito-borne diseases such as malaria and dengue. If these diseases infect more people globally, it is possible for them to mutate into more virulent forms.

In order to determine this potential impact on human health, additional questions are included in the revised CBMS HPQ, particularly in section U. Health. These types of waterborne and mosquito-borne diseases are included as possible types of diseases that any of the household members may experienced. The extent of the population which are affected by these diseases may give an indication of the possible impact of climate change on human health.

J. HEALTH	
(51) During the past 12 months, did you or any member of the household got sick (aside from common cough, colds and fever)?	
1 Yes	(GO TO 52)
2 No	(GO TO 55)
<input type="checkbox"/>	
(52) What are these sicknesses or diseases ?	
(1. YES 2. NO)	
<input type="checkbox"/> Pneumonia	<input type="checkbox"/> Chicken pox
<input type="checkbox"/> Bronchitis	<input type="checkbox"/> Dengue fever
<input type="checkbox"/> Diarrhea	<input type="checkbox"/> Cholera
<input type="checkbox"/> Influenza	<input type="checkbox"/> Typhoid Fever
<input type="checkbox"/> Hypertension	<input type="checkbox"/> Heat stroke
<input type="checkbox"/> Tuberculosis	<input type="checkbox"/> Asthma
<input type="checkbox"/> Disease of the heart	<input type="checkbox"/> Others, specify _____
<input type="checkbox"/> Malaria	

ON CAUSES OF DEATH

5. Increase in the frequency of occurrence of death due to drowning from flood, landslide or electrocuted during typhoon

Indicator: Proportion of households with at least one member who died due to drowning from flood, landslide or electrocuted during typhoon

As mentioned earlier, one of the manifestations of climate change is the increase in the frequency of natural calamities, including typhoon and flooding. These natural calamities could lead to drowning and electrocution, particularly when typhoon or floods occur. In addition, landslide may also occur as a result of heavy rains and flooding which could affect those households living in flood-prone and landslide prone areas. In extreme cases, these could also cause death to some members of these households. In section L of the revised HPQ, these causes of death were added in the list of possible answers.

L. HOUSEHOLD MEMBERS WHO DIED			
(62) Was there any household member who died in the past 12 months?			
1 Yes		(GO TO 63)	<input type="text"/>
2 No		(GO TO 67)	
IF YES IN (62)			
(63)	(64)	(65)	(66)
What is the name of the person who died?	What is ___'s sex?	What was ___'s age at the time of death?	What was the cause of ___'s death?
NAME	1 - Male 2 - Female	AGE	(SEE CODES BELOW)
1			
2			
3			
(66) Cause of death 1. Disease of the heart 2. Disease of the vascular system 3. Pneumonia 4. Tuberculosis 5. Cancer 6. Diarrhea 7. Measles 8. Complication during pregnancy or childbirth 9. Accident (ex. hit by a vehicle) 10. Diabetes 11. Disease of the lungs 12. Disease of the kidney 13. Drowned from flood 14. Victim of landslide 15. Electrocuted during typhoon 16. Other causes, specify			

ON HOUSING

6. Displacement of households

Indicator: Proportion of households which moved out or leave previous dwelling unit because of any calamity

Indicator: Proportion of households which temporarily evacuated from their dwelling unit because of any calamity

During period of calamities which may be caused by climate change (e.g., during strong typhoons and flooding) some households may need to move out, either temporarily or permanently, from their dwelling unit. Questions 155 and 156 of the revised HPQ determine whether households evacuated from their dwelling unit during the period of the calamity. In addition, Question 157 asks where the household temporarily evacuated when appropriate. This will provide useful information on whether households were displaced because of the calamity.

(135) During the past 3 years, did you do the following in the last planting season?	1- Yes	2- No	(136) Why?
(135.1) Changed the variety of the same crop	<input type="text"/>	<input type="text"/>	<input type="text"/>
(135.2) Changed major crop	<input type="text"/>	<input type="text"/>	<input type="text"/>
(136) 1. The former crop is more expensive	4. The present crop enables the member to earn more profit		
2. More resistant to pests and diseases	5. Availability of crops		
3. The present crop does not require much water	6. Others, specify		

2. Increase in the availment of insurance

Indicator: Proportion of households which availed of insurance for their crops, livestock and poultry or agricultural equipments

Since one of the manifestations of climate change is more frequent typhoons, floods and drought, among others, which could damage agriculture production. In particular, these could damage crops, livestock and poultry production and even agricultural equipments and facilities. Hence, in order to reduce the risks to these damages, households may avail of insurances. Questions 122 and 123 collect information on whether households have availed of these insurances. The insurance provider is also determined which could also guide the decisionmakers in making policies that would protect the farming households from the potential damages that may be brought by these calamities.

ASK QUESTIONS (122)-(123) IF CODE "1" IN (88) OR (89)		
(122) Do you have an insurance for the following:	1 - Yes 2 - No	(123) Who is the insurance provider?
(122.1) Crops	<input type="text"/>	<input type="text"/>
(122.2) Livestock and poultry	<input type="text"/>	<input type="text"/>
(122.3) Agricultural equipments/facilities	<input type="text"/>	<input type="text"/>
(123) 1 - Government insurance	3 - Bank	
2 - Private insurance company	4 - Others, specify	

Indicator: Proportion of households which availed of insurance for their house, motorized vehicle or appliances

As mentioned earlier, one of the manifestations of climate change is more frequent typhoons and flood, among others. Because of this, households could experience damage to their properties, including appliances, motorized vehicles and even houses. Given this, some households may also opt to avail of insurance to protect them from the risks associated with these calamities. Additional items (Questions 161 and 162) are incorporated in the CBMS core HPQ in order to capture these information. In addition, the provider of insurance is also determined. This will

U.13. INSURANCE		
(161) Do you have an insurance for the following?	1-Yes 2- No	(162) Who is the insurance provider?
161.1 House		
161.2 Motorized vehicle		
161.3 Appliances		
(162) 1 - Government insurance 2 - Private insurance company		3 - Bank 4 - Others, specify

3. Increase in the proportion of households with disaster preparedness kit

Indicator: Proportion of households with disaster preparedness kit

In order to prepare for any types of disaster or calamities, households could also adopt some strategies. In particular, they could have a disaster preparedness kit in their dwelling unit that will allow them to survive in the next 72 hours after the onset of the disaster. A disaster preparedness kit is an easy-to-carry container which have the items that one would most likely need during an evacuation when a calamity occur like water, food, medical kit, clothing, etc. The Office of Civil Defense recommended that every family should keep a disaster preparedness kit good for 72 hours or the so-called “golden hours”. It is the maximum period for disaster victims to wait for rescuers to come to their aid. Hence, the revised questionnaire also determines the number of days each item in the disaster preparedness kit will last, particularly water, food and other applicable items.

U.12. DISASTER PREPAREDNESS		
(158) Do you have a disaster preparedness kit?		
1. Yes	(GO TO 159)	<input type="checkbox"/>
2. No	(GO TO 161)	
(159) Do you have the following in your disaster preparedness kit?	1 - Yes 2 - No	(160) How many days will it last?
1. Water		
2. Food (canned goods, biscuit, bread)		
3. Matches/Lighter		
4. Flashlight/Emergency light		
5. Radio/Transistor (battery-operated)		
6. Candle		
7. Medical kit		
8. Whistle		
9. Clothes		
10. Blanket		
11. Battery (cellphone, flashlight, radio, etc.)		
12. Important documents (land title, birth certificate, etc.)		
13. Others, specify		

4. Disaster risk reduction and prepared among barangays

Indicator: Proportion of barangays with a written disaster risk reduction plan

Indicator: Proportion of barangays with a disaster/emergency response team

Indicator: Proportion of barangays with disaster/emergency response equipment

During periods of calamities, it is important that the local government units are also prepared to respond to the needs of their community. In order to ensure that they are ready in case of disasters and calamities, it is important that each barangay has a written disaster risk reduction plan and a disaster/emergency response team. In addition, the barangay should also have disaster/emergency response equipments that will help them during periods of disaster or calamity. The emergency response equipments may include rubber boats, handheld radios, rain gear (e.g., raincoats and boots), emergency/service vehicle, flashlights, medicines/first aid supplies, life vests, megaphone and others. Given these, page 5 of the revised BPQ included additional questions that will capture these information.

Disaster Risk Reduction and Preparedness			
(45) Does the barangay have a written disaster risk reduction plan?	1-Yes 2-No	<input type="checkbox"/>	
(46) Does the barangay have a disaster/emergency response team?	1-Yes 2-No	<input type="checkbox"/>	
(47) Does the barangay have any of the following disaster/emergency response equipment?	1-Yes 2-No		
1 Rubber boats	<input type="checkbox"/>	5 Flashlights	<input type="checkbox"/>
2 Handheld radios	<input type="checkbox"/>	6 Medicines/First Aid Supplies	<input type="checkbox"/>
3 Rain gear (e.g., raincoats and boots)	<input type="checkbox"/>	7 Life vests	<input type="checkbox"/>
4 Emergency/service vehicle	<input type="checkbox"/>	8 Megaphone	<input type="checkbox"/>
		9 Others, please specify _____	<input type="checkbox"/>

D. GOVERNMENT RESPONSE

1. Providing assistance to households affected by natural calamities

Indicator: Proportion of affected households which received assistance during calamities

In the revised HPQ, affected households were asked whether they received assistance or not when they were affected by each of the calamities. The provider of assistance is also determined (i.e., government, non-government organization, relatives or others). This also helps in determining whether affected households were provided assistance by the government.

The detailed information that will be collected through the revised questionnaire which includes additional questions on climate change could be used by the local policymakers

in identifying the appropriate interventions and identifying eligible beneficiaries. For instance, the availability of safe and conducive evacuation centers where people can stay temporarily during period of calamities is an important. Moreover, information about insurance which households availed of will inform decisionmakers on policies that need to be implemented relating to insurance. One way of distributing the risks is through insurance which should be done by the government in order to manage the risks associated with the climate change.

U.4. CALAMITIES				
(141) During the past 12 months, which of the following calamities affected your household:	1. Yes 2. No	IF YES IN (141)		
		(142) How many times did the __ happen?	(143) Did you receive any kind of assistance?	IF YES IN (143)
			1-Yes 2-No	(144) Where did it come from?
1. Typhoon				
2. Flood				
3. Drought				
4. Earthquake				
5. Volcanic eruption				
6. Landslide				
7. Tsunami				
8. Fire				
9. Forest fire				
10. Armed conflict				
11. Others, specify				
(144) Assistance from: 1. Government 2. NGO 3. Relatives 4. Others, specify				

REFERENCES

Manila Observatory for the Congressional Commission on Science and Technology and Engineering (COMSTE), 2010. *Technical Primer on Climate Change in the Philippines*, Paper presented at COMSTE Conference “Engineering Resilience, Confronting Risk Beyond Adaptation”, 2010 March 15-16, Sofitel Philippine Plaza Manila.