Teaching handout

Addressing environmental degradation and Climate Change in the Niger Delta Region of Nigeria

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Summary

This case study explores environmental degradation; climate change impacts; adaptation strategies as well as the potential role of stakeholders in climate change adaptation responses in the Niger Delta region of Nigeria.The Niger Delta region of Nigeria is the second largest delta in the world. The main impacts of climate change in the region include coastal erosion and floods. Coastal vegetation especially the mangroves have been lost to coastal erosion while settlements in the region have been displaced by coastal erosion. The inundation arising from the rise in sea level will increase problems of floods, intrusion of sea-water into fresh water sources and ecosystems destroying such stabilizing system as mangrove, and affecting agriculture, fisheries and general livelihoods (Apata, 2010). It is predicted that with a one meter rise in sea level, the Niger Delta could lose over 15000 square kilometers of land by the year 2100 and if urgent action is not taken to address the problem, at least 80% of the people of the region will be displaced. The goal of this case is to help students learn through the development of communication message, sustainable climate change adaptation initiatives that would support rural livelihoods in the Niger delta region. Using group discussions; interrupted case methods and communication exercises, students will learn about the impacts of climate change as well as the potential roles of institutions and stakeholders in responding to climate change and environmental degradation in the region. Students will be provided with climate change stories and discussions will emanate from the stories.

Keywords: Environmental degradation, climate change, adaptation, stakeholders' engagement, Niger Delta, Nigeria

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What course(s) is this case appropriate for?

This case study is appropriate for natural resources management, agriculture, climate change, adaptation strategies, sociology, extension, community forestry, environmental policy and management.

What level is this case appropriate for?
The case is appropriate for lower and middle undergraduate levels. For effective participation, the class size should not be more than 20 students.

SES Learning Goals- This case study addresses the following broad learning goals:

1. Understand the structure and behavior of socio-environmental systems.
   Learning objectives

- Ability to describe the Niger Delta region with its physical and ecological features
- Ability to identify the climate change issues and environmental degradation in the area

Related activity

- Students identify the location of Niger Delta on the map as well as physical, economic and climatic features of the region
- From the climate change news and stories, students will identify and describe the observed impacts of environmental degradation and climate change in the region

2. Develop research questions and conceptual models in inter-disciplinary teams.
   Learning objectives

- Students will be able to identify different stakeholders, their interactions and dynamics in climate change in the area.
- Communicate across disciplinary boundaries.
- Develop a climate change communication message
  Related activity
- Students will design stakeholders engagement and their interactions in the climate change adaptation process
- Students will identify their target audience for climate change communication message
- Students will develop a communication message for their target audience

3. Students should be able to analyze and synthesize existing data and ideas on climate change in the area.
    - Students should be able to locate the Niger Delta region on a map and read the trends in climatic variables from a graph

- Students should be able to make presentations from the group discussions, then develop communication plan for climate change adaptation.

Introduction/Background

The Niger Delta region falls within the tropical rain forest zone of Nigeria. The region spanning over 20,000 square kilometers hosts about 25% of the Nigerian population. About 2,370 square kilometers of the Niger Delta area consist of rivers, creeks, estuaries and swamps. The delta, with mangrove swamps spanning about 1900 square kilometers has the largest mangrove swamps in Africa. The ecosystem of the area is highly diverse and supportive of numerous species of terrestrial and aquatic flora and fauna and human life. Economic activities of the people in the region include fishing, farming and trading. The rural population commonly fish or practice subsistence agriculture, and supplement their diet and income with a wide variety of forest products. The case study begins with introduction and preliminary assessment of the students' knowledge of climate change by asking them some simple questions about climate change. This is followed by two climate change stories. The first story follows a young man painful narration of the observed impacts of climate change as evident in his community; while the second story went further to describe possible solutions to address the impacts of climate change. Using group discussions and role playing exercise, students will learn about the roles of institutions and stakeholders in addressing the challenge of climate change and environmental degradation in the region. The role playing exercise will involve the different stakeholders involved in the governance of climate change in the region.

Classroom Management

This case study includes small group discussions, interrupted design and problem-based learning to help students synthesize the socio-environmental issues in a local setting.

Total Estimated Time: 6 hours; 2 hours/day

This case study is divided into three units and is designed to take three teaching classes of two hours each. The first class will be devoted to introducing the topic, with preliminary questions, quiz and map analysis to assess students understanding of climate change and ability to identify the Niger Delta region with its physical/socio-economic features. The second class will be devoted to analyzing the two provided climate change stories using in group discussion method, this will be followed by developing a problem tree to identify the causes and effects of climate change in the region. The final class will involve stakeholders' analysis and developing communication message to address climate change in the area.

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Unit 1: Introduction to climate change and its impact

Total estimated time: 2 hours

Unit overview

This unit introduces the concepts of climate change and climate variability. It explores the causes and effects of climate change, with particular emphasis on how climate change is affecting the Niger Delta Region. It explores the linkages between climate change and rural livelihoods, and examines global efforts to address climate change.

Learning objectives

At the end of this unit, students should be able to:

- Describe climate change, it causes and its main effects.
- Describe how climate change is affecting the Niger Delta and community (including key sectors such as agriculture, fisheries, water, environmental management etc).
- Explain the main approaches to addressing climate change (adaptation and mitigation) and how to integrate these responses into local initiatives.

Activities

a) Students are asked to answer some preliminary questions about climate change, and writing their answers with their names on sticky notes/index cards. (10mins)

- What is climate?
- What do you think climate change is?
- Is climate change a problem?
- Is climate change affecting Nigeria?
- List the main ways in which climate change is affecting Nigeria.

b) The students are divided into groups consisting about four students per group. Each group is given an outline map of Nigeria with its region and topographic features (5mins)

c) Ask each group to identify the Niger Delta region on the map, as well as its basic features and climate. (10mins)

d) Each group is asked to document their findings (15mins)

e) Each group is asked to read some news articles and climate change stories (15mins)

f) Each group should discuss the news articles and stories, then document their findings. (30mins)

g) Each group should make a presentation of their findings. (40mins to be divided among the groups)

h) In the remaining hour, the students are given some take home reading assignments in preparation for the next class. (5mins)

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Unit 2: Problem tree and stakeholders analysis for climate change adaptation plan

Total estimated time: 2 hours

Unit overview

This unit focuses on building an understanding of community-specific climate change impacts, identifying key areas of vulnerability, and assessing the community's capacity to respond to climate change. Students are guided in the designing of a problem tree to identify the causes and effects of climate change in the area. It also explores the linkages between climate change and rural livelihoods. It identifies the various stakeholders involved in climate change decision in the area. It explores ways these stakeholders can be engaged in addressing climate change problems in the area.

Learning objectives

At the end of this unit, students should be able to:

- Develop a socio-environmental problem tree to identify the main causes and effects of climate change in the Niger Delta region.
- Understand climate change adaptation measures for developing adaptation message

Materials: Flip charts and paper; index cards; sticky notes; Markers

Activities

a) Students in small groups are asked to discuss in more detail the climate change stories they read at the previous class and from the take home reading assignment the identified socio-environmental problems from the stories, newspaper article and other literatures (10mins).

b) Each group writes the identified problems on a flip chart paper and this is pasted on the wall for everyone to see. The heart of the exercise is the discussion, debate and dialogue that is generated as factors are arranged and re-arranged, often forming sub-dividing roots and branches (like a Mind map). They should explain their feelings and reasoning, and record related ideas and points that come up on separate flip chart paper under titles such as solutions, concerns and decisions. Each group is guided in developing a problem tree to identify the causes and effects of the selected climate change problem in the region (40mins).

- The problem that each group has been assigned is the starter problem.
- Make this problem the trunk of the tree. Write this problem on an index card and place it in the middle of the page.
- Each group is asked to brainstorm the causes of this problem. They should think of these as the roots of the problem or the tree.

- Write each cause on a separate index card. For each cause ask, "What causes this?" until you reach the basic root cause of the problem.

- Each group then brainstorms the effects or consequences of the starter problem. Think of these as the branches of your tree.
- Write each effect on a separate card. For each effect ask 'what is the consequence of this effect?'
- They should continue doing this until they have exhausted the effects.

c) Each group makes a presentation of their findings (40mins).

d) Instructor summarizes main results, adds missing points and prepares the class for the final unit(10mins)

e) Each group to study the different types of adaptation measures in tables 1 and 2 and add to the list (15mins). If they are unable to complete these, it can be taken away as assignment to prepare them for the next class.

Table 1: Examples of adaptation measures

Infrastructure and changes in practices	**Ecosystem-based Measures**	**Governance, training and capacity Development**
Building grain silos Improved post harvest technologies such as: setting up small-scale agro processing industries to utilize farm products Building small and medium dams Building flood-resistant roads to ensure market access Specify others	Promoting sustainable agriculture. Organic farming and appropriate technology to reduce degradation Erosion control by encouraging contour farming and water storing Restoring vegetation around river beds to limiting flooding Specify others	Sustainable water management Farmers education – water harvesting and contour farming Training centers and microfinance credit to develop skills for off-farming season activities Vocational training – especially for youth, in places with high in-migration Creation of markets and training in other sector skills Developing agricultural extension services Specify others

Source: Bizikova and Bailey, 2009

Table 2: More examples of linking climatic impacts and identified adaptations responses

Climate impacts	Adaptation responses
Increased morbidity and disease prevalence Increased vulnerability of the poor Increased out-migration loss of human capital Increased demand - water, energy and basic services Decreased income for people in fish industry Increased out-migration Increased food insecurity Threats to forest-based livelihood Potential conflicts and social tensions Decreased food security Dry-ups of water bodies and underground water Pressure on land Decreased water availability and quality Higher burden on women Increased migration Increased cholera	Strengthening traditional social security support systems Strengthening public healthcare delivery Targeted social transfers and safety nets Increased investment in urban social services Public-private partnership in service provisions Development of early warning systems and awareness-raising Promotion of conflict management mechanisms Provision of social safety nets for communities and migrants Development of alternative and additional livelihood Improvement of social services to poor people Provision of small-scale irrigation Security of tenure Community-based land administration system Recycling and total rain water harvesting Improvement in formal and informal safety nets Social protection for immigrants Economic diversification in secondary towns Increased accessibility of health care Education and awareness-raising – health issues

Source: Bizikova and Bailey, 2009

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Unit 3: Designing stakeholders analysis and climate change communication message

Total estimated time: 2 hours

Unit overview

This final unit focuses on designing a stakeholder's analysis as well as climate change communication plan for communities in the region. The goal is to create a community that is well informed about climate change and thus able to make sustainable responsible choices. The challenge is to engage people in the climate change debate in order to break down some of the barriers that exist and to connect people to the role that their attitude and lifestyle plays in causing the problem and working towards solutions. The students are guided to develop a communication message in other to create awareness for climate change in the region.

Learning objectives

- To significantly raise the level of awareness of the community of the opportunities and threats brought about by climate change, and to accept their responsibilities to adapt to, and mitigate against its impacts.
- To provide advice and examples of best practice of how to communicate adaptation to climate change.

At the end of this unit, students should be able to:

- Identify stakeholders involved in climate change in the region
- Describe how to frame climate change communications.
- Explain how to develop a climate change communication plan
- Develop a communication message for the communities

Activities

a) Each group carry out stakeholder analysis to identify all the stakeholders involved in climate change governance in the community (20mins).

- Identify stakeholders relevant to the vulnerability, climate change impacts and adaptation issues.
- Prepare a stakeholder long list- Prepare a detailed list of stakeholders, structured by general categories (such as public sector and private sector) as well as sub-categories (see Table 3).
- The list should include stakeholders that meet any of the following criteria:

➢ They are affected by climate change and/or living in the areas of high vulnerability, which could be exaggerated by progressing climate change.

- They have information, resources or expertise required for climate change impact and vulnerability assessment, policy formulation and strategy implementation.
- They have control or influence on key mechanisms for adaptation and strategy formulation, implementation and communication

b) Each group to review the climate change adaptation measures and identify some activities that would benefit from communication support.

c) Ask each group to:

- Define communication objectives for their activity
- Determine the target audience or audiences
- Develop a communication message for their activity.

d) Each group should present the communication objectives audience and message for their activity. Ask each group to:

- Define communication objectives for their activity
- Determine the target audience or audiences
- Develop a communication message for their activity (this includes role play; policy briefs; stakeholders engagement etc).
- Review and discuss the presentations

The class ends with each group of students having a communication message on the socio-environmental problem (in form of policy brief, role play, stakeholder engagement etc) developed

Table 3: List of detailed stakeholders in climate change by influence and interest

Stakeholders	Influence to promote action at different levels of governance	Interest in participating in work on climate change	Capacity to participate (Expertise, data, availability etc.)
Public sector List them			
Private sector List them			
Civil societies List them			
International/multinational organization List them			
Others List them			

Blocks of Analysis

The Niger Delta

The Niger Delta, located in the Atlantic Coast of Southern Nigeria, is the second largest delta in the world1. The region spans over 20,000 square kilometers hosting about 25% of the Nigerian population (from 2006 census, the total population of Nigeria is about 140 million people). About 2,370 square kilometers of the Niger Delta area consist of rivers, creeks and estuaries and while stagnant swamp covers about 8600 square
kilometers. The delta, with mangrove swamps spanning about 1900 square kilometers has the largest mangrove swamps in Africa. The region falls within the tropical rain forest zone. The ecosystem of the area is highly diverse and supportive of numerous species of terrestrial and aquatic flora and fauna and human life. Resources (oil and gas) from the region are the main source of revenue for the Nigerian state, accounting for about 97% of the country's total export.

Economic activities of the people in the region include fishing, farming and trading. Very few are employed in the civil service and companies. GNP per capita in the region is below the national average of US$280. The rural population commonly fish or practice subsistence agriculture, and supplement their diet and income with a wide variety of forest products. Education levels are below the national average and are particularly low for women. The poverty level in the Niger Delta is exacerbated by the high cost of living. In some parts of the Niger Delta, the cost of living index is the highest in Nigeria

Climate Change and Impacts in the Niger Delta

Niger Delta is recognized as being vulnerable to climate change due to its low-lying area. The salinization of underground water leads to shortage of underground fresh water which the inhabitants of the region (mostly farmers) depend on as their main source of water for drinking and for other domestic use (Awosika, 1995). Other impact of sea level rise on the region is the emergence of health-related hazards for the farmer and his family. Rise in temperature and humidity increases pest and disease and the risk of invasion as well as other natural disasters like floods, ocean and storm surges, which not only damage sources of livelihood but also causes harm to farmland, post-harvest activities, life and property (Idowu et al, 2011). The resultant natural disasters such as flood, bush fires, ocean surges and landslides cause economic losses, population displacements, communal crises, forced migrations (promoting ecological refugees), and widespread soil erosion effects. Extreme storm events are likely to increase failure of floodplain protection as well as damage urban drainage and sewage system (Apata, 2010). More heat waves may cause discomfort for the farming family and also leads to electricity blackouts (Boko et al, 2007). Climate change is increasingly stressing coastal communities in the region, worsening the existing strains of

development and pollution. Though some farming families in the region still engaged in farming and fishing, they work more with little in return. Their fishing and fish farming have been impaired in recent times by the deplorable environment as a result of climate change (Uyigue & Agho, 2007). Because of the degradation of the environment, the local farmer can no longer engage in sustainable fish farming and/or fishing leading to risen poverty level in the region. Many people in the Niger Delta whose source of livelihood once depended on natural sectors such as, farming and fishing are now changing their means of livelihood. Change in occupation will have adverse impacts on the agricultural sector in the region. Continued degradation of land and water as a result of climate change in the region will affect the major agricultural produce in the region, thus increasing hardship for the farmer and his family. Settlements in the coastal region have been uprooted by coastal erosion (Uyigue & Agho, 2007). Coastal erosion poses serious problem for the economic activities in the region especially natural sectors such as crop farming and fisheries. Apart from coastal erosion, flood in general has impacted negatively the livelihood of many communities in the region. The National Emergency Management Agency (NEMA) described the 2012 flood incident as the worst flooding to hit the country in over 50 years. From the coastal areas of Bayelsa, Cross Rivers, Delta and Rivers states to the hinterlands in Oguta in Imo State, the unprecedented flood left in its wake a national disaster that has rendered millions homeless with several deaths recorded (Ahaoma, 2012). The flood which was at a level over seven feet submerged most farmlands and houses in the region with only their roofs visible. Most of those affected were indigent and had occupations ranging from crops, animal to fishing farming of which River Niger was their major source of fishing livelihood. The costs of cultivation have also increased with changing environmental trends. More physical labour is needed to prepare the farmland for good yield and all these are occurring as a result of climate alteration in the region. Projected reductions in water flows and increases in sea level may negatively affect water quality and fish species in the region. This is expected to affect the food supply for communities that depend on these resources especially, the fishermen in the region whose occupation is mainly fishing. Adverse effect of sea level rise in the Niger Delta has increased salinity of both surface and underground water due to the intrusion of sea water which will lead to the death of aquatic plants and animals that cannot tolerate high salinity (Uyigue & Agho, 2007). The salination of the brackish waters in the region has been greatly affected by flooding and sea water intrusion leading to lose of indigenous aquatic species (Awosika, 1995). Sea water intrusion could have serious impact on food security in the region as it affects the coastal agriculture. Temperature rise have increased algal blooms in lakes, favouring invasive species, increasing stratification and lower lake levels (Lemke, 2006). Other effects are the flooding of fish ponds especially those sited in wet or dried farmland near rivers and increased pond temperature resulting to high death rate in cultivated fishes in the region (Idowu et al, 2011).

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Definition of concepts

Climate versus weather: The words 'climate' and 'weather' are sometimes used interchangeably, but they are in fact different, though related, phenomenon. Weather refers to short-term, atmospheric conditions, climate to long-term ones. Weather is measured by temperature, humidity, wind speed, atmospheric pressure, cloudiness, and precipitation. Climate is the average, or typical, weather conditions of a given area observed over a long period of time, usually 30 years or more. Different areas, or climate zones as they are called, are distinguished from each other by their prevailing temperature and precipitation, which have a natural range and variability within zones. Climate variations can occur from year to year, one decade to another, one century to another, or any longer time scale. Weather conditions change quickly, for example it may be sunny and dry one day and rainy and cool the next. Climate, on the other hand, is slower to change, but the implications of change are far reaching.

Climate change: United Nations Framework Convention on Climate Change, defines climate change as a change of climate that is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and that is in addition to natural climate variability observed over comparable time periods (UNFCCC, 2011). According to (IPCC 2014), human influence on the climate system is clear, and recent anthropogenic emissions of greenhouse gases are the highest in history. Recent climate changes have had widespread impacts on human and natural systems.

Climate impacts: Consequences of climate change on natural and human systems

Two main approaches to addressing climate change include: adaptation and mitigation.

Climate change adaptation is concerned with the impacts of a changing climate on society, the economy and the environment, and promotes activities to reduce vulnerability to extreme weather events and other longer term changes in our climate (ESPACE, 2007)

For people, it means being ready for climate change by building capacity and putting measures in place to cope with and recover from the impacts of climate change. It also means preparing ourselves to live with any climate-induced change to our surroundings. Community-based adaptation to climate change is a community-led process, based on communities' priorities, needs, knowledge, and capacities, which should empower people to plan for and cope with the impacts of climate change. Planned and proactive community-based adaptation is gaining acceptance and support as an approach to enabling communities to build resilience to the impacts of climate change (Reid *et al*. 2009).

Climate change mitigation is about reducing human impact on the climate system. It involves measures to reduce greenhouse gas emissions, by limiting activities that produce greenhouse gases, or to enhance the natural systems or sinks that remove greenhouse gases

from the atmosphere. Without mitigation, climate change would continue unchecked and would eventually outstrip all our efforts to adapt (IPCC, 2001)

Developing adaptation responses

Key characteristics of adaptation

Societies have a long record of adapting to the impacts of weather and climate, but climate change poses novel risks, often outside the range of experience, such as impacts related to drought, heat waves and floods. There is increasing recognition that the world's current progress in reducing emissions of GHGs is not occurring rapidly enough to avoid impacts from climate change in the coming century. Because of this, the world is ―committed‖ to a certain level of global warming, and therefore a degree of impacts that will require adaptive responses by nations, communities and individuals. When addressing climate change, we must aim for actions that will get us onto a resilient, low emission development pathway, which operates at two levels (Robinson, *et al.,* 2009):

(i) the large collective decisions about structural issues such as coastal development, urban form, land use, transportation infrastructure, energy and water systems, etc., which will determine the framework within which we adapt and mitigate; and (ii) the cultural, social and psychological dimensions of values, lifestyle and consumption behaviour.

(ii) To effectively develop adaptation responses to climate change relevant for the community, community representatives need to understand the consequences of the climate change impacts at the level of local development and ecosystems. Depending on the character of the coast, for example, increases in sea-level rise and heavy precipitation could lead to many different local impacts, including coastal wetland loss; changes in estuarine communities and littoral biological productivity; potentially negative impacts on ocean biodiversity and productivity; decreased food supply for sea birds and fishing communities. Additionally, an increase in extreme weather events could breach dykes, cause flooding and place additional stress on the ecological integrity of coastal areas. Furthermore, depending on the population density, the impacts could also cause serious damage to human settlements, infrastructure and agricultural production. Examples of identified specific impacts of climate change and tailored adaptation is presented in table 2.

Types of adaptation actions

When identifying adaptation options, we often think about **infrastructure development,** for example, building dykes, flood-resistant road and dams. Adaptation measures, however, should also consider options that help improve ecosystem resilience and building capacities, change governance systems, training and skill development (Bizikova et al 2009).

Ecosystem-based adaptations are those that help to preserve and restore natural ecosystems that can provide cost-effective protection against some of the threats that result from climate

change. For example, coastal ecosystems like wetlands, mangroves, coral reefs, oyster reefs and barrier beaches all provide natural shoreline protection from storms and flooding in addition to their many other services (Munang et al., 2009). By making ecosystems more resilient, ecosystem services (e.g., fish stocks, fuel, clean water) on which vulnerable communities depend for their subsistence and livelihoods are maintained (Hale, *et al.,* 2009). Finally, it is also important to identify measures that are focused on **capacity-development;** for example, helping communities learn new farming practices, use of technologies and develop new processing, marketing and vocational skills, to assist extension agencies in using early warning systems and forecasts, and assist government officials in integrating climate change into day-to-day planning (Bizikova et al 2009).

Identifying key stakeholders for climate change adaptation initiatives

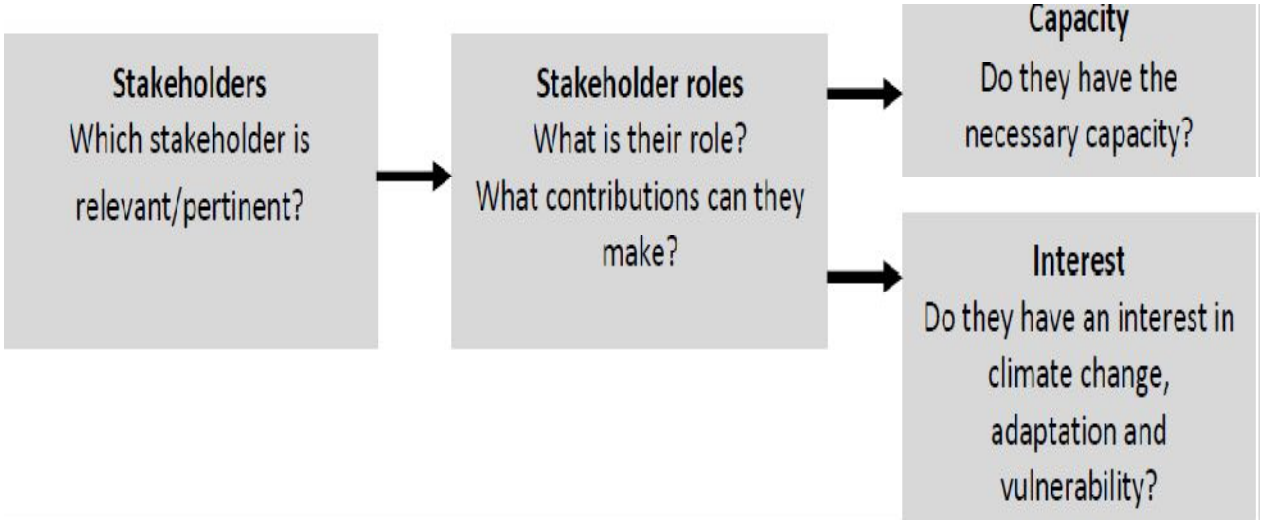
Stakeholder involvement is an essential component of climate change adaptation plan. As climate change affects a very wide segment of society, consider involving a wide range of stakeholders. Assessing vulnerability to climate impacts at the local and regional level and developing adaptation options are strongly based on involvement and knowledge of stakeholder diversity, including community members, policymakers, researchers, experts, civil society, non-governmental organizations and media. Local community members have valuable knowledge about consequences of climate change impacts and many of the adaptation options are already familiar to communities, even if they are not explicitly recognized as helping to reduce vulnerability to climate change. Building on the familiarity of these actions increases the empowerment of local communities and decision-makers, as they can see themselves as valuable sources of knowledge for developing responses to climate change. In order to assure that the different stakeholders are represented, a **stakeholder analysis** is very helpful. The analysis identifies and examines key stakeholders, fulfilling criteria such as representation across sectors, gender and available capacities. The analysis alone does not guarantee, however, that the identified stakeholders are going to be active in the process—this may require incentives and strong leadership (Figure 1).

The questions listed below serve as a guide for identifying appropriate stakeholders to design and implement an adaptation initiative (UNDP, 2010).

- Who is directly affected by climate change, including variability?
- Who might already have experiences in this domain?
- Who could be the potential leaders in this initiative?
- Who might have access to the funds necessary to make this initiative possible?
- Who can help inform the discussion on problem identification based on a thorough understanding of the issues?
- Who can help inform the discussion on potential response measures to manage the short, medium, and long-term implications of climate change, including variability?

- Who is in a position to influence policy adjustments to support adaptation in the context of the identified problem?
- Who can advise on the governance, institutional, policy, economic and other systems required to ensure that the response measures deliver long-term results and benefits?
- Who can provide assistance in preparing a monitoring system for measuring the effectiveness of response measures?

Figure 1: Identifying stakeholders, their roles and interests



Communicating climate change messages for adaptation responses

Communication is a tool that you can use to help you meet any overarching project goal. Your communication may be for the purpose of public education and awareness and/or advocacy.

Communication for **public awareness and education** provides people with information about a subject so that they can better understand it, and encourages them to change specific practices or behaviour. Communication for ***advocacy*** seeks to influence policy decision-makers to take a particular action. Advocacy campaigns generally focus on achieving change on a specific issue or policy of local, regional, national or international importance. For example:

A **communication plan** helps you to be clear about: what change you want to bring about using communication (objectives);

- Which individuals or groups you want to influence (target audiences);
- What you want to say (key messages);

- Who or what are the most effective messengers or champions;
- What are most effective products and activities for each target audience (channels);
- How you will accomplish your objectives (activities and timetable);
- How you will measure the results of your project (evaluation).

The messages that need to be clearly communicated are:

- That climate change is real and the effects are long-term
- It is possible to adapt to the impacts climate change will bring and mitigate the causes
- There are risks to the "do-nothing" option

Assessment

The students will be graded for participation based on their engagement as observed during the discussion periods of the exercise. They will also be graded on the communication message they will be asked to develop as a part of the case study process (see classroom management).

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