National Climate Change Impact Survey 2016 Major Findings

&

other activities of environment statistics

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National Climate Change Impact
Survey 2016
Major Findings
• Climate change impacts become highly visible affecting different aspects of human society and ecosystem across the globe
• Nepal experienced direct impacts of climate change and is one of the most vulnerable countries in the world
• Nepal government devised a number of policy instruments on climate change
• Effective implementation of such instruments is a challenge due to various limitations including lack of availability of integrated and reliable data
• CBS conducted a National Climate Change Impact Survey (NCCIS) aiming to contribute on bridging such gap and avail reliable data and information for regular planning process
Objectives of Survey

1. Understanding and acquiring knowledge on effect and impact of climate change from social, economic & environmental perspective;

2. Exploring how the respondents are developing or making adaptive capacity to confront the impact of climate change

3. Establishing linkage of climate change and environment related indicator with the SDG (Goal 13) for taking urgent action to combat climate change and its impact
Preliminary work

- Technical committee formation under the chairmanship of Director General of CBS having representative from various stakeholders
- Pilot Survey conducted in 5 districts (2014/15)
- Organized the interaction workshop in different rounds with CBS officials, other stakeholders and expert of climate change and got feedback
- Finalized Questionnaire, Manual, indicators & Tabulation Plan
- Endorced by the technical committee
Survey Methodology

• Sample Selection (Three Stage stratified Systematic Sampling)
  – Stage 1: Selection of Districts (26 districts by PPS)
  – Stage 2: Selection of PSU -Wards or sub wards- (253 PSU by PPS)
  – Stage 3: Selection of Households (20HHs for each PSU by Systematic Sampling)
• 16 Domain (5 Development region, 3 Eco belt and seperate Kathmandu valley)
• Frame used the Population census 2011
• Large wards were splitting by cartography work
• Listing of the enumeration area
• Total enumerated: 5060 Households
• **Selection criteria of the household**
  
  • Respondent should be 45 years or more
  
  • Respondent should be there since 25 years

• **Reference Periods**

  • Household income: 12 months
  
  • Impact on Daily life, Households and Business: 5 years
  
  • Impact of Climate change : 25 years
Characteristics of Survey

• Recall Method
• Various Analytical Domain
• Computer-assisted personal interviewing (CAPI) method
• Tablet was used for data collection
• Real Time Data Capture
• Computer Based Supervision
• Thematic Expert Contribution
Content of the Questionnaire

• More than 100 questions
• Trend & information since 25 & 5 years

12 Modules
1. Introduction
2. Demography & Household information
3. Land holding Information of household
4. Household Access to the socioeconomic services
5. Household Income Information
6. Knowledge and perception about climate change
7. Impact of natural disasters or events
8. Diseases and health impacts
9. Impact of climate change on water resources
10. Impact of climate change on bio-diversity
11. Impact of climate change on tourism
12. Coping strategies/action adopted by households due to impact of climate change
## Analytical Domains

<table>
<thead>
<tr>
<th>Mountain</th>
<th>Hill</th>
<th>Terai</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eastern Mountain</td>
<td>Eastern Hill</td>
<td>Eastern Terai</td>
</tr>
<tr>
<td>Central Mountain</td>
<td>Central Hill</td>
<td>Central Terai</td>
</tr>
<tr>
<td>Western Mountain</td>
<td>Western Hill</td>
<td>Western Terai</td>
</tr>
<tr>
<td>Mid-western Mountain</td>
<td>Mid-western Hill</td>
<td>Mid-western Terai</td>
</tr>
<tr>
<td>Far-Western Mountain</td>
<td>Far-western Hill</td>
<td>Far-western Terai</td>
</tr>
<tr>
<td>Kathmandu Valley</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Additional Analytical Domains

<table>
<thead>
<tr>
<th>NAPA Combined vulnerability Index</th>
<th>Very high</th>
<th>High</th>
<th>Moderate</th>
<th>Low</th>
<th>Very low</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(0.787-1.000)</td>
<td>0.601-0.786</td>
<td>0.356-0.600</td>
<td>0.181-0.355</td>
<td>0.000-0.180</td>
</tr>
</tbody>
</table>

### Bio Climatic zones:

1. Tropical (<1000m)
2. Sub-tropical (1000m-2000m)
3. Temperate (2000m-3000 m)
4. Sub-alpine (3000m-4000m)
5. Alpine (4000m-5000m)
## Analytical Domains - Income quintiles

<table>
<thead>
<tr>
<th>First Quintile (Lowest)</th>
<th>Lowest 20%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Second Quintile</td>
<td>20%</td>
</tr>
<tr>
<td>Third Quintile</td>
<td>20%</td>
</tr>
<tr>
<td>Fourth Quintile</td>
<td>20%</td>
</tr>
<tr>
<td>Fifth Quintile (Highest)</td>
<td>Highest 20%</td>
</tr>
</tbody>
</table>
1. Agriculture
2. Forest
3. Disaster
4. Urban
5. Health and WASH
6. Water Resources and Energy
7. Gender
8. Tourism
Perception of Climate Change

Households’ knowledge on climate change

Main source of information about climate change
Perception of Climate Change...

Change on climatic variables in last 25 years

<table>
<thead>
<tr>
<th>Observation</th>
<th>Increased</th>
<th>Decreased</th>
<th>No change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monsoon</td>
<td>3</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Winter rainfall</td>
<td>89</td>
<td>91</td>
<td>10</td>
</tr>
<tr>
<td>Temperature</td>
<td>90</td>
<td>90</td>
<td>8</td>
</tr>
</tbody>
</table>

Perception on reason of climate change

- Deforestation, 59
- Natural cause, 41
- Urbanisation, 30
- Human intervention, 33
- God Gift, 11
- Earthquake, 6
- Others, 5
- Don’t know, 13
- Industrilisation, 24
Perception of Climate Change...

Potential results of climate change

- Drought: 86
- Fire (settlement): 43
- Innundation: 28
- Thunderstrom: 27
- Heavy rain: 23
- Soil erosion: 19
- Heat wave: 15
- Fire (forest): 19
- Hailstorm: 15
- Dry wind storm: 10
- Land slide: 8
- Sporadic rain: 6
- Cold wave: 6
- Diseases / insect: 4
Climate Induced Disasters and Impacts

Observed change in climate induced hazards in last 25 years

<table>
<thead>
<tr>
<th>Hazards</th>
<th>Response (%)</th>
<th>Decreased</th>
<th>Increased</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drought</td>
<td>1</td>
<td>99</td>
<td>0</td>
</tr>
<tr>
<td>Fire (forest)</td>
<td>40</td>
<td>60</td>
<td>40</td>
</tr>
<tr>
<td>Fire (settlement)</td>
<td>45</td>
<td>55</td>
<td>45</td>
</tr>
<tr>
<td>Flood</td>
<td>38</td>
<td>62</td>
<td>38</td>
</tr>
<tr>
<td>Inundation</td>
<td>49</td>
<td>51</td>
<td>49</td>
</tr>
<tr>
<td>Windstorm</td>
<td>43</td>
<td>57</td>
<td>43</td>
</tr>
<tr>
<td>Thunderstorm</td>
<td>71</td>
<td>29</td>
<td>71</td>
</tr>
<tr>
<td>Hailstorm</td>
<td>74</td>
<td>26</td>
<td>74</td>
</tr>
<tr>
<td>Heavy rain</td>
<td>72</td>
<td>28</td>
<td>72</td>
</tr>
<tr>
<td>Sporadic rain</td>
<td>7</td>
<td>93</td>
<td>7</td>
</tr>
<tr>
<td>Soil erosion</td>
<td>38</td>
<td>62</td>
<td>38</td>
</tr>
<tr>
<td>Land slide</td>
<td>22</td>
<td>78</td>
<td>22</td>
</tr>
<tr>
<td>Snow storm</td>
<td>3</td>
<td>97</td>
<td>3</td>
</tr>
<tr>
<td>Avalanche</td>
<td>8</td>
<td>92</td>
<td>8</td>
</tr>
<tr>
<td>GLOF</td>
<td>37</td>
<td>63</td>
<td>37</td>
</tr>
<tr>
<td>Heat wave</td>
<td>30</td>
<td>70</td>
<td>30</td>
</tr>
<tr>
<td>Cold wave</td>
<td>63</td>
<td>37</td>
<td>63</td>
</tr>
<tr>
<td>Diseases / insect</td>
<td>2</td>
<td>98</td>
<td>2</td>
</tr>
</tbody>
</table>
### Household Affected by Disasters in Last 25 Years

<table>
<thead>
<tr>
<th>Hazards</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diseases / Insect</td>
<td>20</td>
<td>80</td>
</tr>
<tr>
<td>Cold wave</td>
<td>16</td>
<td>84</td>
</tr>
<tr>
<td>Heat wave</td>
<td>7</td>
<td>93</td>
</tr>
<tr>
<td>Avalanche</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td>Snow storm</td>
<td>6</td>
<td>94</td>
</tr>
<tr>
<td>Land slide</td>
<td>35</td>
<td>65</td>
</tr>
<tr>
<td>Soil erosion</td>
<td>28</td>
<td>72</td>
</tr>
<tr>
<td>Sporadic rain</td>
<td>7</td>
<td>93</td>
</tr>
<tr>
<td>Heavy rain</td>
<td>27</td>
<td>73</td>
</tr>
<tr>
<td>Hailstorm</td>
<td>26</td>
<td>74</td>
</tr>
<tr>
<td>Thunderstone</td>
<td>13</td>
<td>87</td>
</tr>
<tr>
<td>Dry wind wave</td>
<td>38</td>
<td>62</td>
</tr>
<tr>
<td>Inundation</td>
<td>29</td>
<td>71</td>
</tr>
<tr>
<td>Flood</td>
<td>32</td>
<td>68</td>
</tr>
<tr>
<td>Fire (settlement)</td>
<td>32</td>
<td>68</td>
</tr>
<tr>
<td>Fire (forest)</td>
<td>7</td>
<td>93</td>
</tr>
<tr>
<td>Drought</td>
<td>22</td>
<td>78</td>
</tr>
</tbody>
</table>
Household experiencing food insecurity due to disasters in last five years

- Diseases / insect: 22% Yes, 78% No
- Cold wave: 6% Yes, 94% No
- Heat wave: 0% Yes, 100% No
- Avalanche: 0% Yes, 100% No
- Snow storm: 0% Yes, 100% No
- Land slide: 12% Yes, 87% No
- Soil erosion: 15% Yes, 85% No
- Sporadic rain: 21% Yes, 76% No
- Heavy rain: 4% Yes, 96% No
- Hailstorm: 26% Yes, 73% No
- Thunderstorm: 1% Yes, 97% No
- Windstorm: 10% Yes, 89% No
- Inundation: 15% Yes, 85% No
- Flood: 15% Yes, 84% No
- Fire (settlement): 15% Yes, 85% No
- Fire (forest): 2% Yes, 96% No
- Drought: 33% Yes, 66% No
Climate Change Impacts on Human, Health, Crops, and Livestock

Climate change impact on crops and livestock in last 25 years

- Emergence of diseases in crops
- Emergence of new insects/pests in crops
- Emergence of new diseases in livestock

Climate change impacts on human health in last 25 years

- Increase the incidence of vector borne diseases
- Increase the incidence of water borne diseases

Graphs showing the percentage of responses for each category.
Climate Change Impacts on Human, Health, Crops, and Livestock...

Main diseases and frequency of increment in last 25 years

- Water/Food borne diseases: 9
- Viral infection: 1
- Respiration: 12
- Psychological: 3
- Malnutrition: 1
- Jaundice: 4
- Asthma: 12
- Typhoid: 13
- Fever: 35
- Cough: 39
- Skin diseases: 20
- Malaria: 2
- Dysentery: 3
- Diarrhea: 22
Observed changes on water resources in last 25 years

- Decreased: 84%
- Increased: 74%
- No change: 4%
- Don't know: 2%
- Not applicable: 8%
Climate Change and Natural Resources: Water and Biodiversity...

Causes of changes in water resources in last 25 years

- Earthquake: 13.9%
- Population increase: 21.1%
- Mining: 1.4%
- Heavy use of underground water: 8%
- Deforestation: 37.9%
- Urbanization: 11.1%
- Land slide / soil erosion: 3.9%
- Road construction: 9.8%
- Temperature decrease: 0.4%
- Temperature increase: 44.1%
- Sufficient rainfall: 0.5%
- Insufficient rainfall: 89%
### Climate Change and Natural Resources: Water and Biodiversity...

#### Changes in the status of animal and plant species in last 25 years

<table>
<thead>
<tr>
<th>Plant and animal type</th>
<th>Changed</th>
<th>Not changed</th>
<th>Don't know</th>
<th>Not applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insects</td>
<td>57</td>
<td>21</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>Birds</td>
<td>78</td>
<td>12</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Wild animal</td>
<td>61</td>
<td>12</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>Aquatic plant</td>
<td>15</td>
<td>20</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Aquatic animal</td>
<td>33</td>
<td>17</td>
<td>38</td>
<td></td>
</tr>
<tr>
<td>Grass / Fodder</td>
<td>45</td>
<td>26</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>Herbal/ NTFPs</td>
<td>24</td>
<td>24</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>Shrub / bush</td>
<td>43</td>
<td>30</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>Tree</td>
<td>70</td>
<td>17</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

Response Percentage: 0% - 100%
Climate Change and Natural Resources: Water and Biodiversity...

Appearance of invasive species in last 25 years

- Shrub / bush: Yes 36, No 8, Not applicable 56
- Creeper plant (climber): Yes 75, No 11, Not applicable 11
- Creeper plant (land): Yes 71, No 17, Not applicable 13

Appearance of invasive species based on land use in last 25 years

- Forest: Shrub / bush 27, Creeper plant (climber) 41, Creeper plant (land) 12
- Pasture Land: Shrub / bush 3, Creeper plant (climber) 12, Creeper plant (land) 2
- Agriculture: Shrub / bush 60, Creeper plant (climber) 57, Creeper plant (land) 92
Climate Change and Natural Resources: Water and Biodiversity...

Cause for appearance of new invasive species in last 25 years

- Naturally: Shrub / bush 81%, Creeper plant (climber) 94%, Creeper plant (land) 97%
- Human: Shrub / bush 1%, Creeper plant (climber) 0%, Creeper plant (land) 1%
- Don’t know: Shrub / bush 19%, Creeper plant (climber) 5%, Creeper plant (land) 2%
Adaptation Measures

Adaptation measures (farm based) adopted in last 25 years

- Work on water and land conservation
- Start seed bank
- Use of cold storage
- Use of tunnel for vegetable farming
- Started mixed cropping
- Start agro-forestry
- Both livestock and crop farming
- Crop cultivation only
- Raise livestock only
- Agriculture insurance
- Livestock insurance
- Switch to another livestock
- Cultivate new crop
- Increase compost fertilizer
- Increase in-organic fertilizer
- Change crop cultivation time
- Improved seed
- Investment on pond
- Supplimental irrigation management
- Raise improved breed of livestock
- Change cultivation technique
- Agriculture skills training

Response (%)

- Not applicable
- No
- Yes

- Adaptation measures adopted in last 25 years.
Adaptation Measures (off-farm) Adopted in last 25 years

- Involve on community based NRM
  - Yes: 57%
  - No: 42%
  - Not applicable: 1%

- Road/infrastructure improvement
  - Yes: 50%
  - No: 48%
  - Not applicable: 2%

- Flood/landslide/water management
  - Yes: 56%
  - No: 42%
  - Not applicable: 2%

- Temporary out-migration
  - Yes: 58%
  - No: 41%
  - Not applicable: 1%

- Shift to non-agri-employment
  - Yes: 53%
  - No: 45%
  - Not applicable: 1%

- Started off-farm activities
  - Yes: 65%
  - No: 34%
  - Not applicable: 2%

- Change on food consumption habit
  - Yes: 71%
  - No: 29%
  - Not applicable: 1%

Response (%)

- Green bar: Not applicable
- Red bar: No
- Blue bar: Yes
Outcomes

1. Contributes to integrate climate change measures into policies, strategies and planning

2. Contributes on projects related to strengthening resilience and adaptive capacity to climate-related disasters

3. Serves as a reference tool on improving education, awareness raising, and human and institutional capacity on climate change adaptation and impact reduction

4. Contributes on overall climate change related planning and management focusing on women, local and marginalized
Other activities of environment statistics

• CBS continued attempts to bring out the environment related statistics by compiling and publishing its publication “Environment Statistics of Nepal” in the United Nations statistical guideline FDES

• Compendium of Environment Statistics Nepal it is the analytical report contributed by the sector expert on the FDES guidelines
COMPRENDIUM OF ENVIRONMENT STATISTICS
NEPAL 2015
Compilation from different sources

• Censuses and surveys conducted by CBS and other stakeholders
• Administrative records of government, semi government & non governmental organizations
• Monitoring Stations
• Scientific research & special projects
Major highlights

• 9th series

• Following the FDES 2013

• Seven Chapters

• Annexes

• National, Province & District level

• According to climatic zone, eco region etc.
• Regular collection of waste management related data from all the Municipalities of Nepal

• Process to implement System of Environment Economic Account(SEEA) in Nepal

• As a pilot work compiling land and forest account
Thank you !!!
Your comments and queries are highly appreciated !!!