ANALYSIS REPORT

1996 - 2013

Empowered lives.
Resilient nations.

Camdi.ncdm.gov.kh

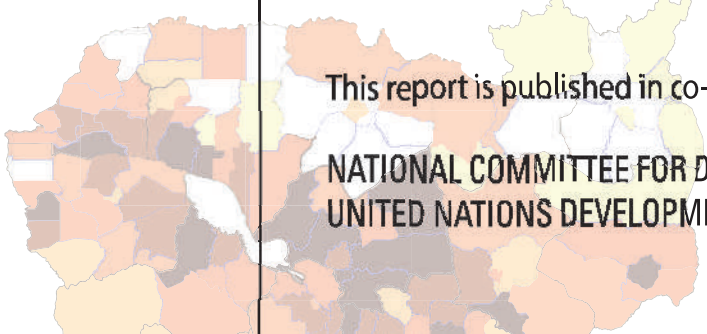
CamDi

CAMBODIA DISASTER LOSS AND DAMAGE INFORMATION SYSTEM

CAMBODIA

DEATHS
BY DISTRICTS (1996 - 2013)

Understand the past, save the future



This report is published in co-operation of

NATIONAL COMMITTEE FOR DISASTER MANAGEMENT
UNITED NATIONS DEVELOPMENT PROGRAMME

ACKNOWLEDGEMENTS

The National Committee for Disaster Management (NCDM) would like to thank all institutions and individuals who made contributions to establishing the Disaster Loss and Damage Information System (CamDi). During the course of developing the CamDi, several stakeholder consultation workshops were held where representatives of various ministries and government agencies from national and sub-national levels, international NGOs, Cambodian Red Cross, UN agencies and the Asian Development Bank (ADB) actively contributed to discussions.

NCDM would like to thank the United Nations Development Programme (UNDP) for providing financial and technical support, guidance and analysis to the CamDi. Specifically, we would like to thank Mr. Hum Sophon, Project Coordinator, Mr. Sam Sophal, Project Officer of UNDP Cambodia, Mr. Rajesh Sharma, Programme Specialist (Disaster Risk Reduction) and Mr. Pairach Homtong, Disaster Inventories Associate at UNDP Asia-Pacific Regional Centre in Bangkok. Thanks are also due to Dr. Yin Soriya for analyzing the data and producing this report, which provides useful analysis and findings.

Finally, NCDM would like to thank representatives from line ministries, and provincial and commune stakeholders who assisted us with data and information. Without their participation, knowledge and experience, this report would not have been possible.

PROJECT TEAM

National Committee for Disaster Management (NCDM)

H.E. Ponn NARITH, General Secretary
H.E. Choup SITHAN, Advisor
Mr. Man PHALLA, Technical Staff
Mr. Em HONG, Chief Officer

United Nations Development Programme (UNDP)

Mr. Sophon HUM, DRR-Project Coordinator, UNDP Cambodia
Mr. Sophal SAM, DMIS Officer, UNDP Cambodia
Mr. Rajesh SHARMA, Programme Specialist (Disaster Risk Reduction), UNDP APRC Bangkok
Mr. Pairach HOMTONG, Disaster Inventory Associate, UNDP APRC Bangkok
Dr. Yin SORIYA, National Consultant for Analysis Report

FOREWORD

It is my pleasure to share this report on the analysis of the Disaster Loss and Damage Information System (CamDi), providing insights into the occurrences and impacts of disasters in Cambodia. This report presents an analysis of the impact of disasters on human life, houses, agriculture, health, education and infrastructure. Loss and damage from disaster events such as floods, droughts, lightening, storm, river bank collapse, pest outbreak, epidemics and fire from 1996 to 2013 have been recorded and analyzed at national and sub-national levels. The NCDM project team has done a commendable job establishing CamDi. I appreciate the support given by the provincial, district and commune committees of NCDM to the project team and the representatives of various line ministries for their active participation and contribution to the various workshops and training events.

This report presents the impacts of disasters in Cambodia and highlights the main impact areas affected by disasters in the past. The findings and results of the report will greatly help in further developing and implementing disaster risk reduction programmes by the Government and all development partners in Cambodia. CamDi is a very useful tool which provides a good overview of loss and damage information that can be used for policy making, disaster intervention and monitoring.

On behalf of the Royal Government of Cambodia, I would like to take this opportunity to thank UNDP for financial and technical support to prepare this report. I also would like to express my gratitude to all line ministries and institutions which provided NCDM with information for the report.

H.E. Dr. Nhim VANDA
Senior Minister in Charge of Special Missions
First Vice President
National Committee for Disaster Management (NCDM)

PREFACE

Cambodia is prone to a number of natural disasters including floods, droughts, storms, lightening, fires and epidemics which affect people and their assets almost every year. In the 2011 and 2013 floods alone, the country suffered huge losses and damage. Like other countries, figures from the disasters were not recorded systematically to understand how much loss and damage occurred at national and sub-national level, to better target efforts and resources to reduce these losses in future.

Responding to this challenge and based on the experience of several other countries in Asia, UNDP supported NCDM to establish the Cambodia Disaster Loss and Damage Information System (CamDi) to systematically collect, store and analyze disaster data of past and recent disasters. For more than one year, NCDM has been leading efforts to collect past disaster data from all parts of the country and from various agencies to build CamDi.

I am pleased to note that after significant efforts and a series of consultation meetings with various stakeholders, training workshops and several discussions, CamDi has been completed to include records of all past disaster events. To share the findings from the CamDi information system, UNDP has supported the analysis of data for wider dissemination of findings and preparation of manuals to help undertake analysis from the online system. This report of past disaster loss and damage is the first of its kind in Cambodia that contains disaster data for 17 years, from 1996 to 2013. This report will be an important reference and resource for policy-makers, planners and practitioners to make informed decisions for future disaster intervention, and to contribute to a prosperous and resilient Cambodia. The implementation of CamDi has been supported by UNDP's Asia-Pacific Regional Centre in Bangkok, under the regional project, Strengthening Early Warning Systems for Extreme Weather Events to Advance Climate Risk Management in Southeast Asia, funded by the ESCAP Trust Fund for Tsunami, Disaster and Climate Preparedness.

Once again, I would like to express my deepest appreciation to NCDM for taking a leading role in this important project. I also would like to express my sincere thanks to all partners, line ministries, UN agencies, development partners, civil society organizations and individuals who contributed to the project.

Setsuko YAMAZAKI
Country Director
United Nations Development Programme (UNDP), Cambodia

EXECUTIVE SUMMARY

Cambodia is prone to a number of natural disasters including flood, lightening, drought, fire, storm, epidemics, pest outbreak and river bank collapse. Yet little was known about the impact of disasters at national and sub-national levels due to a lack of systematic organization and collection of information. There was general lack of reliable information about disaster losses and damage in line ministries, and the few existing datasets were not well organized in a systematic manner to assist in useful analysis.

Responding to this challenge, the Cambodia Disaster Loss and Damage Information System (CamDi) was developed to collect, store and analyze disaster loss and damage data, and to improve understanding of risks and vulnerabilities. This will guide future interventions aimed at reducing disaster risks.

A technical team from the National Committee for Disaster Management (NCDM) and UNDP was established to collect data about disasters from various agencies at commune, district, provincial and national levels. Data collection efforts were spread over several months and resulted in some 7,800 records of disaster events covering the period from 1996 to 2013. The data was used to undertake analysis at various levels using different techniques, such as temporal, spatial and composition analysis to identify various aspects and characteristics of impacts.

The key findings from the analysis report are:

- Cambodia is prone to floods, fires, droughts, storms, lightening, pest outbreak, epidemics and river bank collapse
- 2,050 people died from all disasters between 1996 and 2013
- Flood is the number-one killer, accounting for 53 percent of the total number of human lives lost
- Lightening is the second-highest killer, accounting for 36 percent of the total number of human lives lost
- Provinces with the highest death toll are Prey Veng, Kampong Cham, Kandal and Takeo
- Provinces prone to multiple hazards are Siem Reap, Kampong Cham, Takeo, Kratie and Prey Veng
- September and October are the months when floods are most likely to occur

It is important that floods, lightening, drought and storms are managed well if sustainable development is to be achieved in Cambodia. Maintaining and sustaining the CamDi as an open and accessible source to all stakeholders is important so that stakeholders, planners, researchers and relevant technical departments can access, retrieve and utilize data. This will inform their decisions in managing and reducing disaster impacts, by raising awareness, educating the public and targeting interventions.

Despite its strengths, a number of processes for data collection, storage and retrieval need to be further improved so that CamDi can continue to serve the information needs of decision makers and stakeholders. Data collection forms and processes need to be reviewed, validated and approved by relevant stakeholders. Training staff in data collection, its validation and analysis, needs to be conducted frequently so that reliable and credible data is fed into the CamDi system to provide accurate and useful analysis.

CamDi

CONTENTS

Acknowledgements i
Project Team ii
Foreword iii
Preface iv
Executive Summary vi
List of Figures viii
Acronyms & Abbreviations xi

I Introduction 1
1. Rationale 1
2. Cambodia's Disaster Loss and Damage Information System (CamDi) 2
3. Methodology 2
4. Limitations and Challenges 3
5. Cambodia Profile 4

II Natural Disasters in Cambodia (1996 – 2013) 5
1. Disaster Profiles 5
2. Impact on Human Life (1996 – 2013) 6
3. Impact on Housing (1996 – 2013) 9

III Hazard Specific Analysis 13
1. Flood 13
2. Lightening 15
3. Fire Hazard 16
4. Storm 18
5. Epidemic (2005 – 2014) 20
6. Drought 21

IV Sectoral Analysis 23
1. Agriculture 23
2. Health 25
3. Education 26
4. Rural Roads 27
5. National/Provincial/Town Roads 28

V Conclusion and Recommendations 29

Annex One: Data Collection Form 34
Annex Two: List of Organizations Which Provided Information 36
Annex Three: Summary: Disaster Typology and Impacts 37
Annex Four: Summary: Impact of Disasters by Year (1996-2013) 38
Annex Five: Summary: Impact of Disasters by Month (1996-2013) 39
Annex Six: Summary: Impact of Disasters by Province (1996-2013) 40
Annex Seven: Disaster Profile of Each Province 41
Annex Eight: List of Key Terms Used in the Report 85
Annex Nine: Report on Consultation Workshop 87

LIST OF TABLES

Table 1: List of provinces, cities and capital by area and population
Table 2: Frequency and percentage of disasters by data cards (1996 – 2013)
Table 3: High-impact provinces and districts
Table 4: High-impact communes
Table 5: Distribution of damaged and destroyed housing by province (1996-2013)

LIST OF FIGURES

Figure 1: Map of Cambodia by Province
Figure 2: Disaster Typology
Figure 3: Spatial Map: Number of Data Cards (1996-2013)
Figure 4: Causes of Human Life Loss by Different Disasters
Figure 5: Spatial Distribution of Human Life Loss
Figure 6: General Trend of Human Life Loss by Different Hazards (1996-2013)
Figure 7: Seasonal Distribution of Human Life Loss by Different Types of Hazards
Figure 8: Causes of Damaged and Destroyed Housing (1996-2013)
Figure 9: Spatial Distribution of Damaged and Destroyed Housing
Figure 10: Annual Time Series Distribution of Damaged and Destroyed Housing (1996-2013)
Figure 11: Seasonal Distribution of Damaged and Destroyed Housing
Figure 12: Trend: Number of Human Lives Lost
Figure 13: Distribution of Damage and Destroyed Housing (1996-2013)
Figure 14: Seasonal Distribution of Human Life Loss
Figure 15: Seasonal Distribution of Damaged and Destroyed Housing
Figure 16: Thematic Map of Human Life Loss (1996-2013)
Figure 17: Thematic Map of Damaged and Destroyed Housing (1996-2013)
Figure 18: Trend of Human Life Loss by Lightening (1996-2013)
Figure 19: Seasonal Distribution of Human Life Loss by Lightening
Figure 20: Thematic Map of Human Life Loss by Lightening (1996-2013)
Figure 21: Distribution of Human Life Loss by Fire (2000-2013)
Figure 22: Distribution of Houses Destroyed by Fire (2000-2013)
Figure 23: Seasonal Distribution of Fire Victims (2000-2013)
Figure 24: Seasonal Distribution of Houses Destroyed by Fire (2000-2013)
Figure 25: Thematic Map of Fire Victims (2000-2013)
Figure 26: Thematic Map of Houses Destroyed by Fire (2000-2013)
Figure 27: Trend of Human Life Loss by Storm (1996-2013)
Figure 28: Trend of Houses Damaged and Destroyed by Storm (1996-2013)
Figure 29: Seasonal Distribution of Storm Victims (1996-2013)
Figure 30: Seasonal Distribution of Damaged and Destroyed Houses by Storm (1996-2013)
Figure 31: Thematic Map of Storm Victims (1996-2013)
Figure 32: Thematic Map of Damaged and Destroyed Housing by Storm (1996-2013)
Figure 33: Distribution of Human Life Loss by Epidemic (2005-2013
Figure 34: Seasonal Distribution of Human Life Loss by Epidemic (2005-2013)
Figure 35: Thematic Map of Human Life Loss by Epidemic (2005-2013)
Figure 36: Trend of Drought Records
Figure 37: Trend of Transplant Fields Affected by Drought (1996-2013)
Figure 38: Trend of Paddy Fields (in Ha) Affected by Drought (1996-2013)
Figure 39: Trend of Crops Damaged by Drought (1996-2013)
Figure 40: Seasonal Distribution of Drought Data Card (1996-2013)
Figure 41: Thematic Map of Drought (1996-2013)
Figure 42: Causes of Paddy Field (in Ha) Damaged (1996-2013)
Figure 43: Trend of Paddy Field (in Ha) Damaged (1996-2013)
Figure 44: Seasonal Distribution of Paddy Fields (in Ha) Damaged (1996-2013)

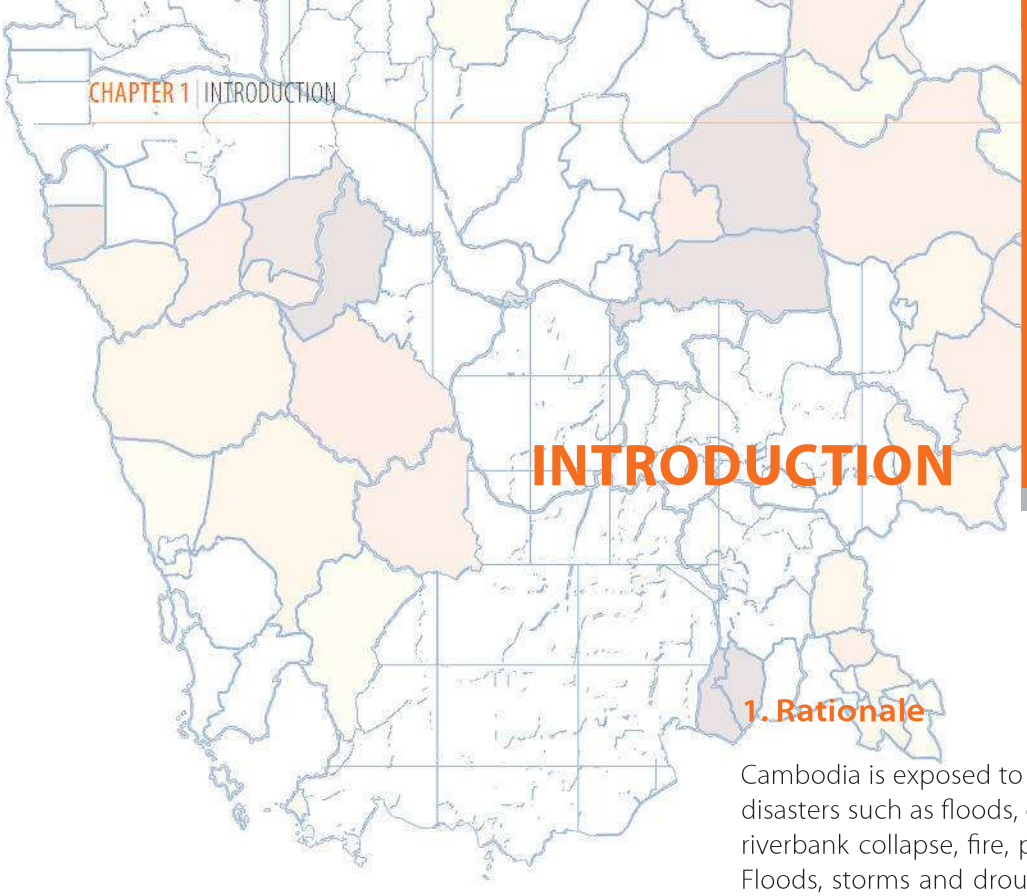
Figure 45: Thematic Map of Farming Crops (in Ha) Damaged (1996-2013)
Figure 46: Thematic Map of Paddy Field (in Ha) Damaged (1996-2013)
Figure 47: Hazards Affecting Hospitals and Health Centres (1996-2013)
Figure 48: Trend of Affected Hospital and Health Centres (1996-2013)
Figure 49: Seasonal Distribution of Affected Hospitals and Health Centres (1996-2013)
Figure 50: Thematic Map of Affected Hospitals and Health Centres (1996-2013)
Figure 51: Types of Hazards Affecting Schools (1996-2013)
Figure 52: Trend of Affected Schools (1996-2013)
Figure 53: Seasonal Distribution of Affected Schools (1996-2013)
Figure 54: Thematic Map of Affected Schools
Figure 55: Types of Hazards Destroying Rural Roads (1996-2013)
Figure 56: Trend of Rural Roads (M) Destroyed (1996-2013)
Figure 57: Seasonal Distribution of Rural Roads (M) Destroyed by Disasters
Figure 58: Thematic Map of Rural Road (M) Destroyed
Figure 59: Types of Hazards Destroying National/Provincial/Town Roads (M) (1996-2013)
Figure 60: Trend of National/Provincial/Town Roads (M) Destroyed (1996-2013)
Figure 61: Seasonal Distribution of National/Provincial/Town Road (M) Destroyed
Figure 62: Thematic Map of National/Provincial/Town (M) Destroyed (1996-2013)

LIST OF ANNEXES

Annex One: Data Collection Form
Annex Two: Summary: Disaster Typology and Their Impacts
Annex Three: Summary: Impact of Disasters by Year (1996-2013)
Annex Four: Summary: Impact of Disasters by Month (1996-2013)
Annex Five: Summary: Impact of Disasters by Province (1996-2013)
Annex Six: Disaster Profile of Each Province
Annex Seven: List of Key Terms Used in the Report
Annex Eight: Report on Consultation Workshop

ACRONYMS & ABBREVIATIONS

ADB	Asian Development Bank
APRC	Asia Pacific Regional Centre
CRC	Cambodian Red Cross
CamDi	Cambodia Disaster Loss and Damage Database
IFRC	International Federation of Red Cross and Red Crescent
MAFF	Ministry of Agriculture, Forestry and Fisheries
MoH	Ministry of Health
MoI	Ministry of Interior
MoP	Ministry of Planning
MPWT	Ministry of Public Works and Transport
MoWRAM	Ministry of Water Resources and Meteorology
MRD	Ministry of Rural Development
NCDD	National Committee for Sub-National Democratic Development
NGO	Non-government Organization
NCDM	National Committee for Disaster Management
PCDM	Provincial Committee for Disaster Management
PDEYS	Provincial Department of Education, Youth and Sport
PIN	People in Need
RGC	Royal Government of Cambodia
SNAP	Strategic National Action Plan
UNDP	United Nations Development Programme
UNESCAP	United Nation Economic and Social Commission for Asia and the Pacific
UNICEF	United Nations Children's Fund
WFP	World Food Programme



1

INTRODUCTION

1. Rationale

Cambodia is exposed to natural and human-induced disasters such as floods, droughts, storms, lightening, riverbank collapse, fire, pest outbreak and epidemic. Floods, storms and droughts are more localized and seasonal, while lightening, river bank collapse, fire and epidemic are less frequent. Major floods occurred in 2011, affecting 18 out of 24 provinces and claiming 250 human lives; approximately 50 percent were children. This flood affected more than 1.77 million people (13 percent of the population). Climate change is expected to increase the frequency, intensity and severity of these extreme natural events, which could turn into far worse disasters.

The National Committee for Disaster Management (NCDM) was established in 1995 to manage disasters in Cambodia. NCDM's role is to monitor, evaluate, collect, analyze and administer the disaster risk data, and report it to the Royal Government of Cambodia (RGC) to issue principles, policies, circulars, guidelines and measures for disaster management, as well as putting forward the resources for emergency response operations. NCDM's structure consists of 19 relevant ministries and civil society organizations and the Cambodian Red Cross (CRC) (NCDM, 2013). Collaboration between various government agencies, the private sector, NGOs and the inclusion of citizens are key to successful disaster management and risk reduction.

The NCDM-Strategic National Action Plan (SNAP) 2008 – 2013, highlighted that there was a general lack of reliable information and effective coordination which could help address the needs in the short term, as well as better understand the risks and vulnerabilities

of populations to be systematically addressed through various development interventions. NCDM recognized that, while there was some data about the impact and occurrence of disasters in various line ministries, it was not organized in a systematic manner. It needed to be improved to ensure that data could be systematically collected, stored, organized and analysed. This would generate information on risk and vulnerability, to inform policy-level decision-making for future disaster preparedness, mitigation, response and recovery.

Responding to this challenge, and at the request of NCDM, UNDP has been providing support to NCDM since August 2012 in establishing an information system, CamDi, to systematically collect, store and analyze the impacts of past disaster events. Currently, the CamDi project team is working closely with relevant stakeholders such as NCDM, PCDMs, ADB, APRC, UNESCAP, MoWRAM, MAFF, CRC, NCDD-S, MRD, PDEYS, MoH, MoPWT, IFRC, OXFAM, SC, PIN, ActionAid, Caritas, WFP, UNICEF, MoP and the Ministry of Information.

Since the beginning of CamDi's implementation in Cambodia, the following events were organized:

- The consultation meeting with NCDM officials, held in December 2012 at the NCDM office, for project orientation and to outline the work plan.
- The stakeholders' consultation meeting held on 16 January 2013 in Phnom Penh. The purpose of the meeting was to present the methodology to stakeholders and to identify sources of data on historical disasters.
- The national technical training workshop on CamDi to 41 participants, including line ministries and relevant key stakeholders. Held on 4-6 June, 2013, this meeting was to inform stakeholders about the project and collect relevant data from line ministries.
- The sub-national technical training workshop on CamDi to 37 participants, including PCDM officials, provincial departments from 10 provinces and other key stakeholders. Held on 3-5 July 2013, this meeting was for project orientation to provincial staff and to collect relevant data from the provinces.
- Loss and damage data has been collected from various public agencies.
- Field data collection has been conducted in 24 provinces and the capital.
- CamDi has been online since 21 October 2013 at www.camdi.ncdm.gov.kh.
- A national validation workshop was organized on 4 December 2013 to validate data collected.
- An analysis report of loss and damages was written based on the CamDi information system.
- A consultation workshop was conducted in Siem Reap on 26 February 2014 to get feedback and comments from relevant stakeholders on the analysis of losses and damages.

2. The Cambodia Disaster Loss and Damage Information System (CamDi)

The CamDi was adapted using DesInventar methodology. It is a cost-effective system used in Latin American countries to systematically record time, place and effects of disasters when they occur. CamDi is a web-based simple tool to systematically collect, store and analyze historical disaster loss and damage. Users can create charts, tables and graphs and generate risk and vulnerability information to help policy-makers and planners create better policy and make better decisions for disaster risk management (preparedness, mitigation, response and recovery stages) at national and sub-national levels. Several countries in Asia (Indonesia, Sri Lanka, Nepal, Iran, Tamil Nadu and Odisha States of India) have established similar disaster loss and damage information systems and many other countries such as Myanmar, Lao PDR and Vietnam are in the process of establishing similar systems.

3. Methodology

The loss and damage data forms were developed to collect disaster data. Eight types of hazards including flood, drought, lightening, storm, pest outbreak, epidemic, river bank collapse and fire were included in the data collection form, based on discussions and consultations with NCDM. Disaster loss and damage data from 1996 to 2013 have been collected since the establishment of NCDM in 1995.

The data collection team collected data disaster loss and damage data from relevant line ministries

and agencies such as the Ministry of Agriculture, Forestry and Fisheries (MAFF), Ministry of Public Works and Transportation (MPWT), Ministry of Water Resources and Meteorology (MoWRAM), Cambodia Red Cross (CRC), Ministry of Health (MoH), Ministry of Education, Youth and Sport (MoEYS) and Ministry of Environment (MoE). The project team went to all provinces to collect data from various provincial departments and communes. The following are key milestones and timelines of field data collection.

- Collected data from archive reports at NCDM office from 1996 to 2013
- Collected data from concerned ministries: MAFF, MRD, MPWT, MoH and MoEYS
- Provincial data collected from PCDM, CRC, PDAFF, PDRD, PDPWT, PDWRAM, PDEYS, and PDH
- March 2013: Create data collection models by piloting data collection methodologies
- April – June 2013: Collect data from provinces
- Adjust data collection form and CamDi customization based on the data fields found from data collection at the provinces
- Software national technical training workshop to stakeholders (4-6 June, 2013)
- Software sub-national technical training workshop to stakeholders (3-5 July, 2013)
- CamDi online database, camdi.ncdm.gov.kh, accessible to all; includes Khmer interface (Oct 2013)
- Data validation and cleaning are in progress, including the data validation workshop (4 Dec, 2013)

As a result, 7,795 data cards or forms were completed. In addition, data about loss and damage from line ministries were also collected and entered into the system.

Four different types of data analysis, including composition, temporal, spatial and statistic analysis have been carried out in this report, to demonstrate how the CamDi information system can be used to support planning and decision making for disaster risk management. Composition analysis tells the number of records and effects with variables composed of different events. In this report, composition analysis is used to analyze types of disasters that have effects on other variables. It is shown in building charts, comparing the value of a variable for each type of event. Temporal analysis shows the trend of a variable over time. In this report, temporal analysis is used to analyze annual time series and seasonal distribution of different variables over time. Spatial analysis shows the distribution of selected variables across space. It is usually shown on a spatial/thematic map. In the report, spatial analysis is used to present distribution of selected variables across space in a spatial map. Finally, statistical analysis calculates several statistical indexes by showing frequency and percentages of selected variables of interest.

4. Limitations and Challenges

CamDi has several limitations and challenges which must be taken into consideration. Some of these are listed below:

- Data from various Government sources regarding the same event can be conflicting and take time to verify, validate and finalize.
- There were 7,800 data cards entered in the system. The number of data cards might not reflect all disasters recorded in all communes during 1996-2013. Though all possible efforts have been made to collect data, some disasters (particularly small disasters) may not have been recorded or data might have not been available at the time of collection of data.
- Some important data might not have been collected due to lack of information and poor loss and damage data management. This is a challenge with any past or historical data collection method.
- In some cases the date of a disaster event is not available as the source data did not have these details. In such cases, the disaster is registered without a date but using a month as the time of occurrence of the event.
- In a few cases, a disaster event is registered only at province/district level, while the database default is commune, so the disaster event had to be associated with either a province/district without actually assigning it to a commune. This skews the analysis at district and commune levels.

- Some hazards, such as flood and drought, have more data availability than other hazards, such as pest outbreak or river bank collapse. Thus, they might be significant when compared with other hazards for which fewer records are available.
- Reports of certain hazards are only available for certain time periods, which skews

5. Cambodia Profile

KEY FIGURES AT A GLANCE	
Land Area of Cambodia	181,035 km^2
Number of Provinces (including one capital)	25
Number of Districts including 9 Khans and 26 Cities	194
Number of Communes including 204 Sangkats	1,621
Number of Villages	14,036
GDP per Capita (2012)	971 USD
Population (2008)	13,395,682
Male (2008)	48.60 %
Female (2008)	51.40 %
Annual Population Growth Rate (2008)	1.54 %

Cambodia is located in Southeast Asia. It borders Thailand to the northwest, Laos to the northeast, Vietnam to the east, and the Gulf of Thailand to the southwest. It has 443 km of coastline along the Gulf of Thailand (Figure 1). Based on the last population census in 2008, Cambodia had a population of 13.4 million with a density of 73 persons per sq.km and 1.54% annual growth rate. The country has an area of 181,035 sq. km, divided into 25 provinces and municipalities (Table 1).

Cambodia's landscape is characterized by a low-lying central plain that is surrounded by uplands and low mountain ranges from the north to the southwest of the country. Tonle Sap (The Great Lake) lies in the heart of the country. In the dry season, the lake is about 2,590 square kilometres (1,000 sq mi), expanding to about 24,605 square kilometres (9,500 sq mi) during the rainy season. One main river is the Mekong River, flowing from north to south through the country's east. The southern coastal region is a narrow lowland strip, heavily wooded and sparsely populated, which is isolated from the central plain by the south western highlands.

Cambodia's climate is dominated by monsoons, which are tropical wet and dry seasons. The dry season lasts from November to April and the wet or rainy season lasts from May to October. Temperatures range from 21°C (69.8 °F) in the wet season to 35 °C (95.0 °F) in the dry season.

Table 1: List of Provinces, Municipalities' Native Name, Population and Density

No	Name	Population (2008)	Density
1	Phnom Penh Municipality	1,327,615	2,638
2	Banteay Meanchey	677,872	102
3	Battambang	1,058,174	89
4	Kampong Cham	925,992	N/A
5	Kampong Chhnang	472,341	86
6	Kampong Speu	716,944	102
7	Kampong Thom	631,409	51
8	Kampot	585,850	120
9	Kandal	1,265,280	355
10	Koh Kong	117,481	12
11	Kep Province (municipality)	35,753	120
12	Kratié	319,217	29
13	Mondulkiri	61,107	4
14	Oddar Meanchey	185,819	30
15	Pailin Province (municipality)	70,486	88
16	Preah Sihanouk Province (municipality)	221,396	230
17	Preah Vihear	171,139	12
18	Pursat	397,161	31
19	Prey Veng	947,372	194
20	Ratanakiri	150,466	14
21	Siem Reap	896,443	87
22	Stung Treng	111,671	10
23	Svay Rieng	482,788	163
24	Takéo	844,906	237
25	Tbong Khmum	754,000	n/

CamDi

2

NATURAL DISASTERS IN CAMBODIA (1996 – 2013)

The following section presents profiles of different major natural disasters that have occurred in Cambodia since 1996. They describe what disasters happened and where they happened based on data available in the CamDi system.

1. Disaster Profiles

Figure 2 and Table 2 show the number of data cards or records that have been entered for each type of hazard from 1996 to 2013 in the CamDi system. There are eight most frequently reported disaster events represented in the pie chart: flood, fire, drought, storm, lightening, pest outbreak, epidemics and river bank collapse. The hazard reported to occur most frequently is flood, with a total of 3,315 data cards, representing 43% reported between 1996-2013; followed by fire with 1,392 data cards (18%) reported; drought 1,172 (15%); storm (15%); lightening 581 (8%); pest outbreak 100 (1.3%); epidemic 47 (0.6%); and river bank collapse 42 (0.5%).

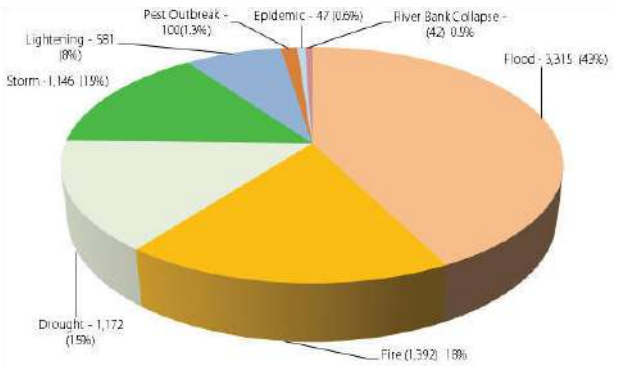


Figure 2: Disaster Topology

Table 2: Frequency and Percentage of Disasters by Data Cards (1996 - 2013)

No	Event	Data Card	Percentage
1	Flood	3,315	42.5
2	Fire	1,392	17.9
3	Drought	1,172	15.0
4	Storm	1,146	14.7
5	Lightening	581	7.5
6	Pest Outbreak	100	1.3
7	Epidemic	47	0.6
8	River Bank Collapse	42	0.5
	Total	7,795	100

Spatial Distribution of Disasters

Figure 3 below shows the distribution of data cards or records of disaster events across the 24 provinces and cities in the Kingdom of Cambodia. The top five provinces with most report cards are Siem Reap with a total of 1,135; followed by Kampong Cham (663); Takeo (501); Kratie (492); and Prey Veng (462).

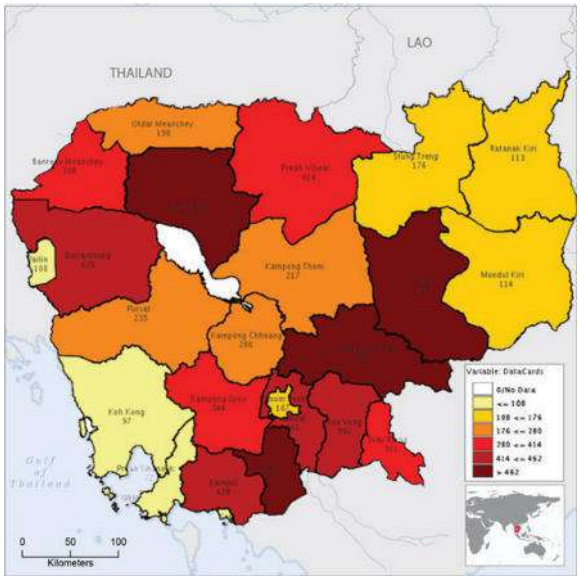


Figure 3: Spatial Map: Number of Data Cards (1996-2013)

Eight different disasters have been recorded in the CamDi from 1996 to 2013. They are: flood, fire, drought, storm, lightening, pest outbreak, epidemics and river bank collapse. The disaster events occur across the whole country, however, Siem Reap, Kampong Cham, Takeo, Kratie and Prey Veng are the five provinces with most disaster reports.

2. Impact on Human Life (1996 – 2013)

This section discusses the impact of major disasters on human life. It highlights key disasters that claimed human lives, where the people died and when the people died from different disasters.

A. Causes of Human Life Loss

Figure 4 below shows the types of natural disasters that caused human death from 1996 -2013. Based on the chart, there are several causes. These include flood, lightening, fire, storm and epidemic. Since 1996, 2,050 people have died from all types of natural disasters. Flood is the most dangerous natural disaster and has killed more than half of the total number of people (1,091) since 1996. The second most dangerous killer is lightening, which has killed 751 people.

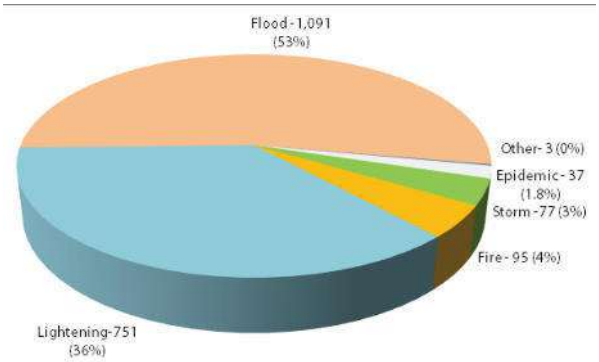


Figure 4: Causes of Human Life Loss by Different Disasters

B. Spatial Distribution of Death

People died from natural disasters in all provinces. Figure 5 below shows the distribution of death of people in each province. The spatial map shows two groups of provinces where most human death occurred. The first group of provinces includes Prey Veng (305), Kampong Cham (278), Kandal (189) and Takeo (176). These four provinces have the highest number of deaths, representing 46% of the total death toll (2,046). They are concentrated in one similar geographical location, the lower part of the country to where major rivers such as the Mekong, Tonle Sap and Tonle Basac flow. They usually experience heavy flooding, which is responsible for the largest number of human deaths.

The provinces with the second-largest group of human lives lost are located around the Tonle Sap Great Lake. These provinces include Siem Reap with 143 deaths, Battambang (124), Kampong Thom (112), Pursat (70), Banteay Meanchey (84) and Kampong Chhnang (53). As seen in the previous pie chart (Figure 4), flood is the main cause of human death. These six provinces are attached to the Tonle Sap Lake and are vulnerable to floods which flow from two main sources: the Mekong River and the surrounding mountains of Thailand.

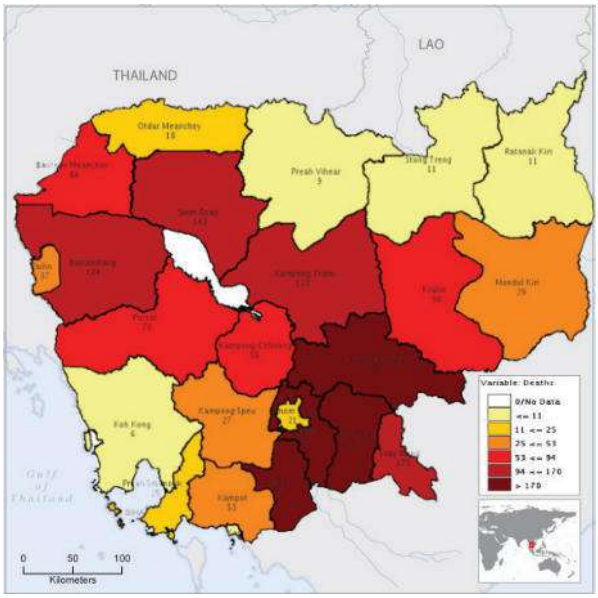


Figure 5: Spatial Distribution of Human Life Loss

C. High-Impact Provinces and Districts

As seen in Table 3, Prey Veng and Kampong Cham have the largest number of human deaths from flooding, lightening and other causes. The table below shows high-impact districts in two provinces where people died, not considering the number of dead people in other districts due to lack of data and data entries at the provincial level in Prey Veng province: Peam Chor (33), Pea Reang (31), Ba Phnum (30) and Preah Sdach (28) are the most high-impact districts in Prey Veng with more deaths from 1996 to 2013. In Kampong Cham: Kong Meas (22), Batheay (18), Kaoh Soutin (16) and Tboung Khmum districts (16) are the top four districts with more deaths of people since 1996.

Table 3: High-Impact Provinces and Districts

Province	District	No. of Death	Percentage
Prey Veng	Peam Chor	33	10.8
	Pea Reang	31	10.2
	Ba Phnum	30	9.8
	Preah Sdach	28	9.2
	Kampong Trabaek	18	5.9
	Kanhchriech	15	4.9
	Sithor Kandal	11	3.6
	Peam Ro	9	3.0
	Me Sang	7	2.3
	Krong Prey Veng	4	1.3
	Svay Antor	4	1.3
	Kamchay Mear	3	1.0
	Porieng	3	1.0
	Other districts	109	35.7
Sub-total		**305**	**100**
Kampong Cham	Kang Meas	22	7.9
	Batheay	18	6.5
	Kaoh Soutin	16	5.8
	Tboung Khmum	16	5.8
	Srei Santhor	12	4.3
	Krouch Chhmar	11	4.0
	Prey Chhor	11	4.0
	Stueng Trang	10	3.6
	Cheung Prey	9	3.2
	Dambae	8	2.9
	Kampong Siem	8	2.9
	Ponhea Kraek	6	2.2
	Ou Reang Ov	3	1.1
	Chamkar Leu	2	0.7
	Memot	2	0.7
	Krong Kampong Cham	1	0.4
	Other districts	123	44.2
Sub-total		**278**	**148.2**
Grand Total		**583**	**100**

D. High-Impact Communes

As seen in the table above, Prey Veng and Kampong Cham provinces have the highest number of human deaths. The table below shows high-impact districts and communes in the two provinces where most people died from all types of disasters, except drought, river bank collapse and pest outbreak. Not considering the number of deaths of people in other communes , Preaek Sambuor is the highest impact commune, with four people dying in Prey Veng province. Preaek Koy (2) and Reay Pay (2) in Kampong Cham have the highest record of deaths from 1996 – 2013.

Table 4: High Impact Communes

District (Province)	Commune	Deaths
Peam Chor (Prey Veng)	Preaek Sambuor	4
	Kampong Prasat	2
	Kaoh Chek	2
	Kaoh Roka	2
	Kaoh Sampov	2
	Krang Ta Yang	1
	Ruessei Srok	1
	Angkor Angk	0
	Preaek Krabau	0
	Svay Phluoh	0
	Other communes	19
	Total	**33**
Kang Mease (Krong Kampong Cham)	Preaek Koy	2
	Reay Pay	2
	Angkor Ban	1
	Khchau	1
	Peam Chi Kang	1
	Roka Koy	1
	Sour Kong	1
	Kang Ta Noeng	0
	Preaek Krabau	0
	Sdau	0
	Other communes	13
	Total	**22**

E. Annual Time Series Distribution of Death by Types of Disasters (1996 - 2013)

The chart below indicates the annual distribution of loss of human life by different types of disasters from 1996 to 2013. The highest death toll can be observed in the years 2011 (exceeding 420 people), 2000 and 2013 respectively. Flood and lightening are the main causes of death.

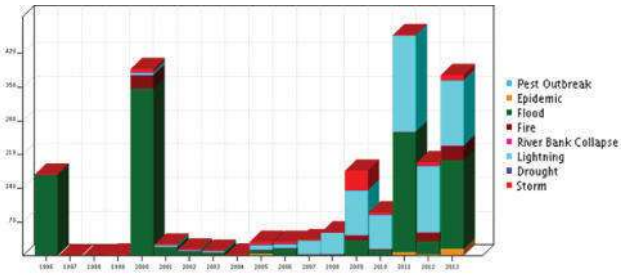


Figure 6: General Trend of Human Life Loss by Different Hazards (1996-2013)

Seasonal Distribution of Death by Types of Disasters (1996 – 2013)

The chart below shows the seasonal calendar of human life lost by different types of disasters from 1996 to 2013. September and October are observed to have the highest death toll. More than 700 hundred people have died in September since 1996. The second highest month of the year is October, almost reaching 500 people. Flood is the main cause of death in these two months. The second trend of human life loss is in May and June. Lightening is the main cause of death in these two months.

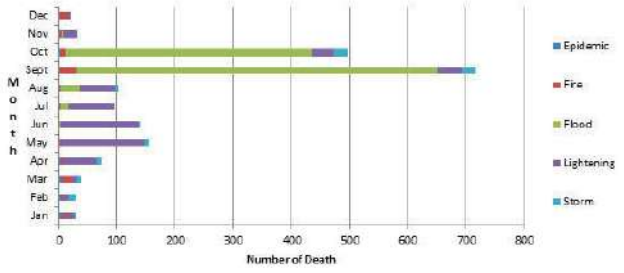


Figure 7: Seasonal Distribution of Human Life Loss by Different Types of Hazards (1996-2013)

In conclusion, 2,046 people have died since 1996 from different natural disasters including flood, lightening, fire, storm and epidemic. Flood is the most dangerous killer, claiming more than half the death toll. Lightening is the second most dangerous killer, claiming 36% of the total death toll. Both flood and lightening are responsible for 89% of human life loss in Cambodia during 1996-2013. The highest number of human death occurred in three different years 2000, 2011 and 2013. Human death usually occurs in September and October of the year. The loss of human life is unevenly distributed throughout the country. Prey Veng, Kampong Cham, Kandal and Takeo are observed to have high death tolls.

3. Impact on Housing (1996-2013)

This section focuses on the impact of natural disasters on housing from 1996 to 2013. It presents and discusses different disasters that damage and destroy houses. It also tells where and when the houses are damaged and destroyed by different disasters.

A. Profile of Damaged and Destroyed Housing

Since 1996, many houses have been damaged and destroyed. The figure below shows three different causes of damaged and destroyed houses. These include storm (51%), flood (41%), fire (7%) and other causes (1%) respectively.

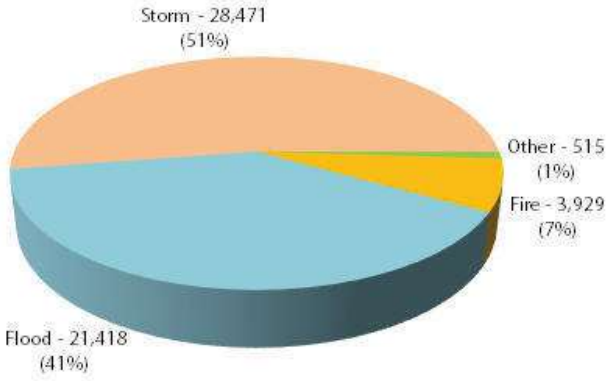


Figure 8: Causes of Damaged and Destroyed Housing (1996 – 2013)

B. Spatial Distribution of Damaged and Destroyed Housing

Houses are damaged and destroyed by storm, flood, fire and other causes throughout the country. However, from the map below, it is observed that Battambang (16%), Kandal (14%), Kampong Speu (11%) and Siem Reap (10%) are the top four provinces where most houses are damaged and destroyed. It is also observed that Kampong Cham, Kratie, Prey Veng and Takeo have the second largest number of houses damaged and destroyed.

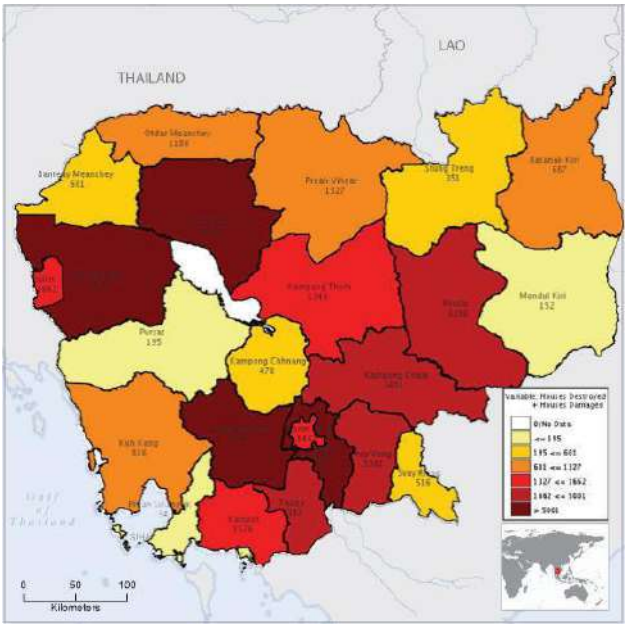


Figure 9: Spatial Distribution of Damaged and Destroyed Housing

Table 5 (1): Distribution of Damaged and Destroyed Housing by Province (1996-2013)

Province	No. of Damaged and Destroyed Houses	Percentage
Battambang	8952	16
Kandal	7404	14
Kampong Speu	6137	11
Siem Reap	5300	10
Kampong Cham	5001	9
Takeo	3382	6
Prey Veng	3361	6
Kratie	2260	4
Pailin	1662	3
Kampot	1576	3
Phnom Penh	1462	3

(continued on the next page)

Table 5 (2): Distribution of Damaged and Destroyed Housing by Province (1996-2013)

Province	No. of Damaged and Destroyed Houses	Percentage
Kampong Thom	1340	3
Preah Vihear	1327	2
Battambang	8952	16
Kandal	7404	14
Kampong Speu	6137	11
Siem Reap	5300	10
Kampong Cham	5001	9
Takeo	3382	6
Prey Veng	3361	6
Kratie	2260	4
Pailin	1662	3
Kampot	1576	3
Phnom Penh	1462	3
Kampong Thom	1340	3
Preah Vihear	1327	2
Otdar Meanchey	1186	2
Koh Kong	816	2
Ratanak Kiri	687	1
Banteay Meanchey	601	1
Svay Rieng	516	1
Kampong Chhnang	455	1
Stung Treng	351	1
Pursat	195	0.4
Kep	155	0.3
Mondul Kiri	152	0.3
Preah Sihanouk	94	0.2
Total	**54,372**	**100.2**

C. Distribution of Damaged and Destroyed Housing (1996 – 2013)

The damaged and destroyed houses were not evenly distributed throughout the years from 1996. The figure below shows three different trends of damaged and destroyed houses. The first and the highest trend of damaged and destroyed houses is in 2013, exceeding 9,960 houses. Storm was the main cause of damaged and destroyed houses in that year. The second highest trend is in 2000. Flood is the main cause of damaged and destroyed houses in that year. The third trend is in 2009 and 2010. Storm might be the main factor in damaged and destroyed houses in these two years.

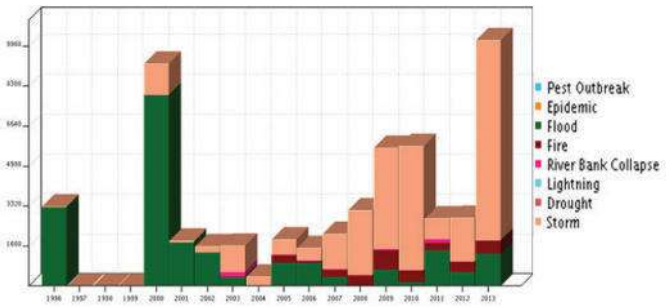


Figure 10: Annual Time Series Distribution of Damaged and Destroyed Housing (1996-2013)

D. Seasonal Distribution of Damaged and Destroyed Housing

The figure below shows seasonal distribution of damaged and destroyed houses from 1996 to 2013. It shows two trends of months when most houses are damaged and destroyed. The first trend is in October and September. As indicated in Figure 10, these two periods of time are flood season, thus houses may be damaged and destroyed by flood in these two months. The second trend of houses damaged and destroyed is in March, April and May. Storm may be the main factor that causes houses to be damaged and destroyed in these months as indicated in the figure. Storms usually occur in these three months of the year. It is also observed that storm is the main factor that causes houses to be damaged and destroyed, and is spread throughout the year, whereas flood appears to concentrate only in September and October.

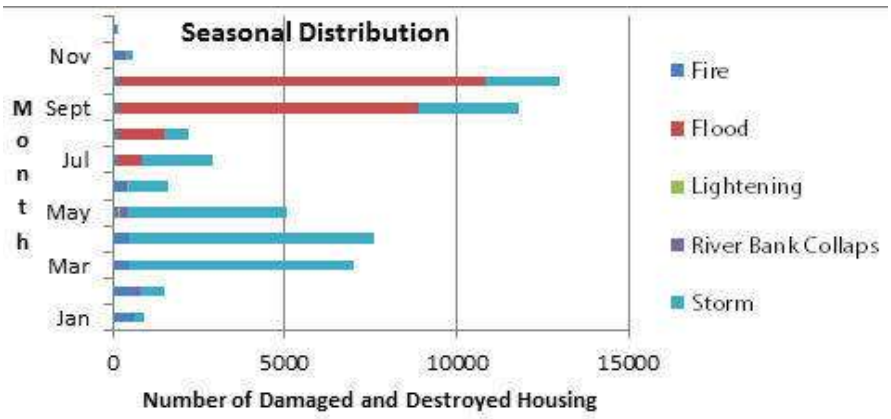
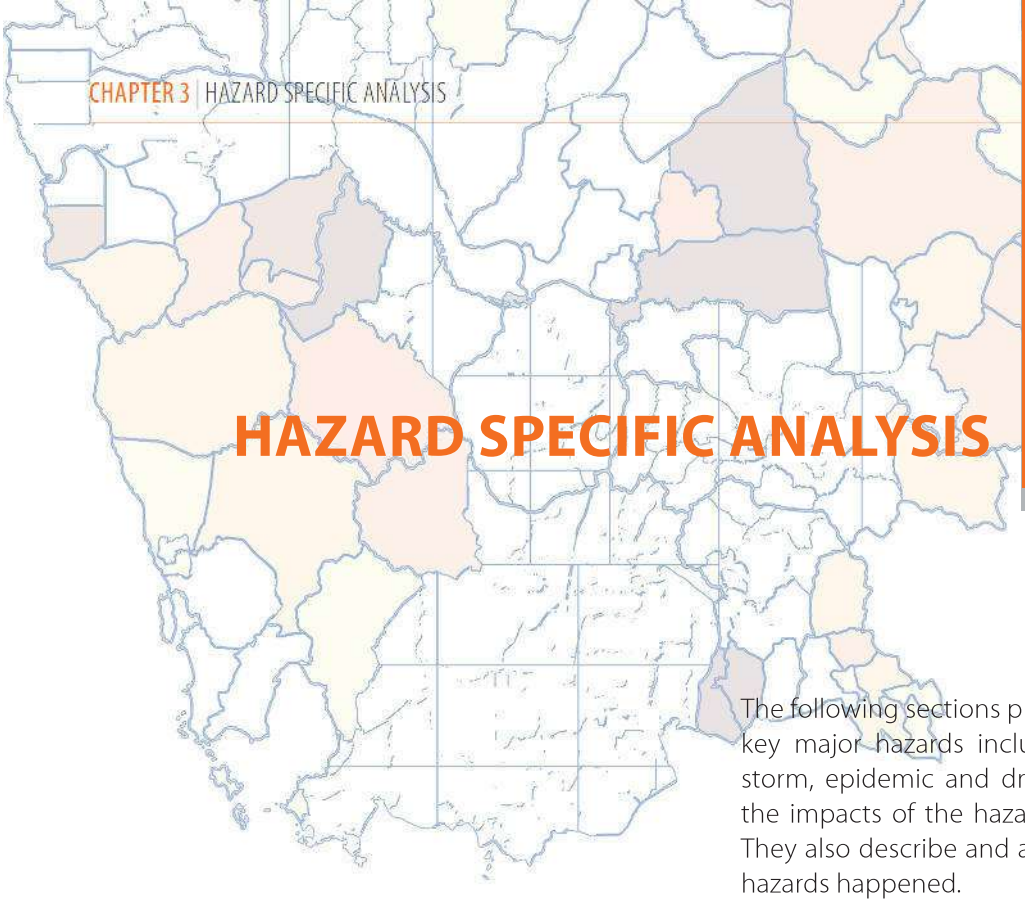


Figure 11: Seasonal Distribution of Damaged and Destroyed Housing

In conclusion, there were 54,372 houses damaged and destroyed since 1996. Storm, flood and fire were the three main factors. Most houses were damaged and destroyed in years 2013, 2000, 2010 and 2009 respectively. September and October are the two months of the year when most houses are damaged and destroyed. Flood is the main factor that damages and destroys house in these two months. March, April and May are also months when houses are damaged and destroyed. Storm is the main factor that damages and destroys houses in these three months. Distribution of damaged and destroyed houses is not even throughout the country. Battambang, Kandal, Kampong Speu and Siem Reap are the top four provinces where most houses were damaged and destroyed.



3

HAZARD SPECIFIC ANALYSIS

The following sections present and analyze profiles of key major hazards including flood, lightening, fire, storm, epidemic and drought. The sections analyze the impacts of the hazards on people and housing. They also describe and analyze where and when the hazards happened.

1. Flood

Flood is a major disaster that threatens sustainable development of Cambodia. It affects many people, causing many human deaths, damage and destruction of houses, crops and other properties. This section presents and analyzes what year major floods occurred, their impacts on human life and houses, and provinces that were prone to flood.

A. Trend: Annual Distribution of Human Life Loss, and Damaged and Destroyed Housing

The graph in Figure 12 shows trends of human life loss by flood from 1996 to 2013, while the graph in Figure 13 indicates trends of damaged and destroyed houses. Figure 12 shows four years with the highest number of people dying from flood. In year 2000 floods killed almost 350 people. In 2011, a major flood hit and more than 200 people died. Floods hit again in 2013 and almost 200 people died. A major flood in 1996 killed almost 200 people. Contrary to the loss of human life, the largest number of damaged and destroyed houses is observed only in year 2000, when almost 8,000 houses were damaged and destroyed.

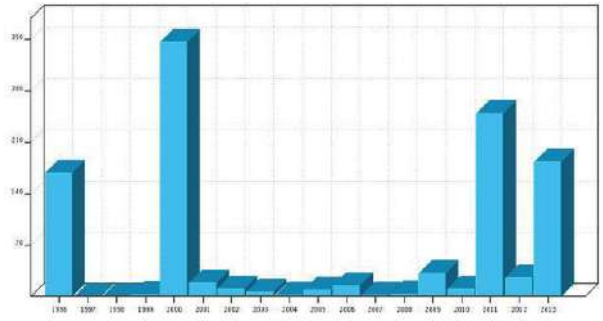


Figure 12: Trend: Number of Human Lives Lost

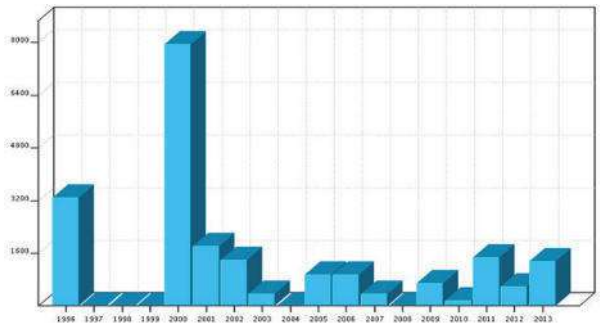


Figure 13: Distribution of Damage and Destroyed Housing (1996-2013)

B. Seasonal Distribution of Human Life Loss and Damaged and Destroyed Housing by Flood (1996-2013)

The graphs below show seasonal distribution of human life loss and houses damaged and destroyed by flood. The largest number of human deaths is observed in September and October. Floods and damaged and destroyed houses are also observed in these two months.

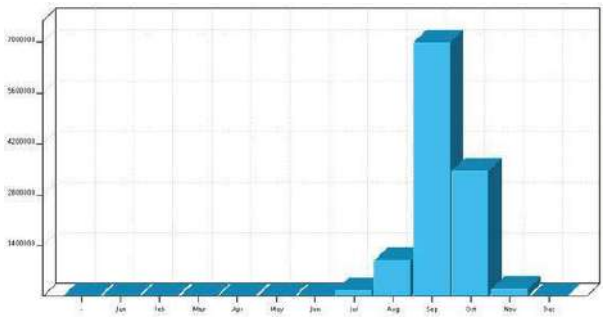


Figure 14: Seasonal Distribution of Human Life Loss

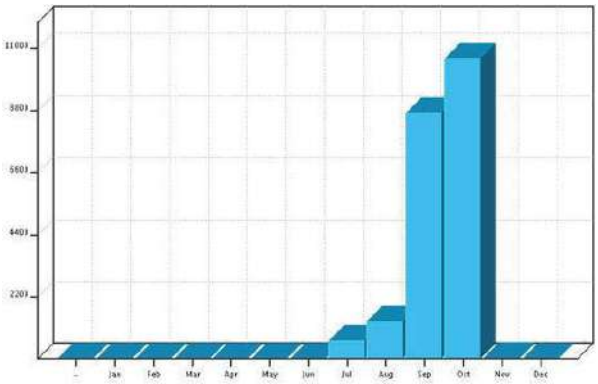


Figure 15: Seasonal Distribution of Damaged and Destroyed Housing

C. Spatial Distribution of Human Life Loss by Flood

Figure 16 shows spatial distribution of people who died from flood from 1996 to 2013. The distribution of human life loss is not even throughout the country. The map shows two major groups of provinces where more human life loss happened. The first group of provinces where more human life loss occurred includes Prey Veng (235), Kampong Cham (178), Kandal (125) and Kratie (85). These four provinces are located in a lower part of the country and are attached to the Mekong River and Basac River. The second largest number of deaths from flood appears to be in provinces located around the Tonle Sap Great Lake. These provinces include Siem Reap, Kampong Thom, Banteay Meanchey, Battambang, Kampong Chhnang and Pursat.

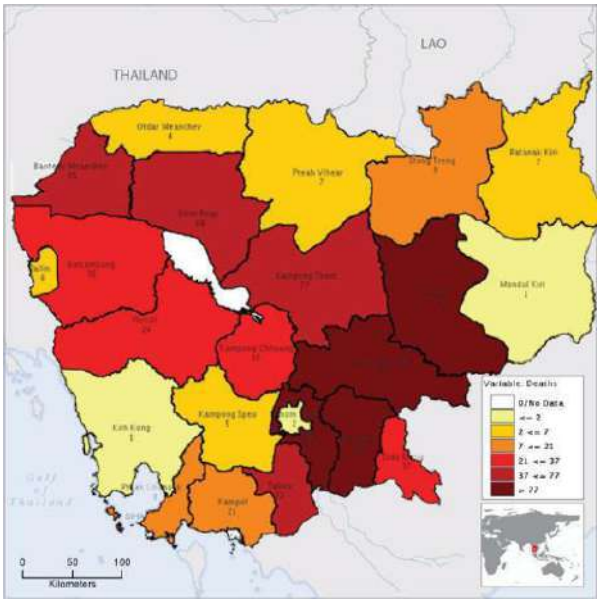


Figure 16: Thematic Map of Human Life Loss (1996-2013)

D. Spatial Distribution of Damaged and Destroyed Housing by Flood

Similar to human life loss, houses appear to be damaged and destroyed in the two geographical groups of provinces where floods occurred. Kampong Speu, which was not in the human life loss map, has the largest number of houses that are damaged and destroyed by flood in the country.

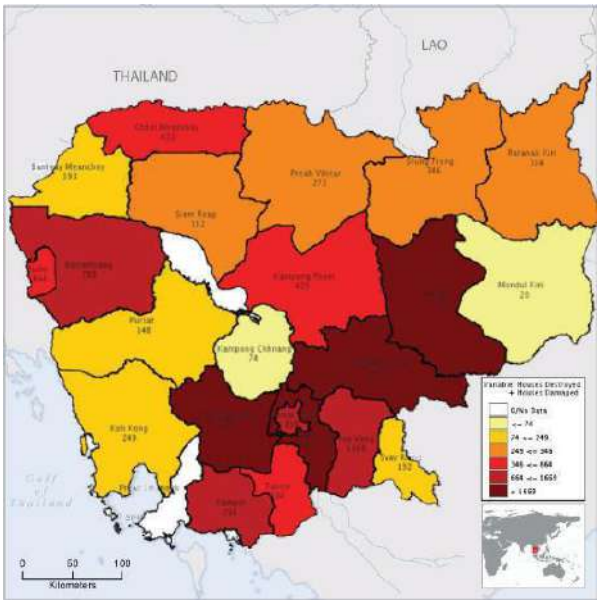


Figure 17: Thematic Map of Damaged and Destroyed Housing (1996-2013)

In short, flood is the major hazard. It has killed 1,091 people (53% of total deaths from all types of hazards since 1996) and damaged and destroyed 21,418 houses since 1996. The largest numbers of human deaths are observed in years 1996, 2000, 2011 and 2013 when major floods hit. Unlike human death, the largest number of damaged and destroyed houses is observed only in year 2000 when major floods hit. September and October are in the flood season when the largest number of human life loss, and damaged and destroyed houses, is observed. The number of human life loss and damaged and destroyed houses is not distributed evenly throughout the country. Two geographical regions are observed to have the largest number of human life loss and damaged and destroyed houses. The first region includes provinces that are located in the lower part of the country attached to the major rivers. The second group of provinces where human life loss and damaged and destroyed houses occurred are provinces around the Tonle Sap Great Lake where more flooding occurs.

2. Lightening

Lightening is the second most dangerous hazard after flood and has claimed 751 lives (36% of total deaths from all types of hazards since 1996). This section presents an analysis of the impact of lightening on human life.

A. Trend: Distribution of Human Life Loss, Injured People (1996-2013)

Since 1996 lightening has killed 751 people. The graphs below show trends of human life loss from 1996 to 2013. The largest number of human life loss occurred in year 2011 when 200 people were killed. The second highest number of human life loss is observed in years 2012 and 2013, when more than 100 people died in each year.

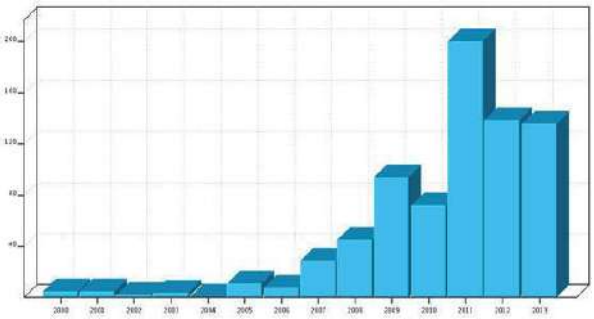


Figure 18: Trend of Human Life Loss by Lightening (1996-2013)

B. Seasonal Distribution of Human Life Loss by Lightening

April and May are the lightening season. The number of human lives lost almost reaches 180 people in these two months when the monsoon rain season starts. The number of people dying from the lightening declines in June, July and the following months when the monsoon rain is at its heaviest. It appears that lightening kills more people at the start of the monsoon rain season and fewer people when the monsoon rain is at its full strength.

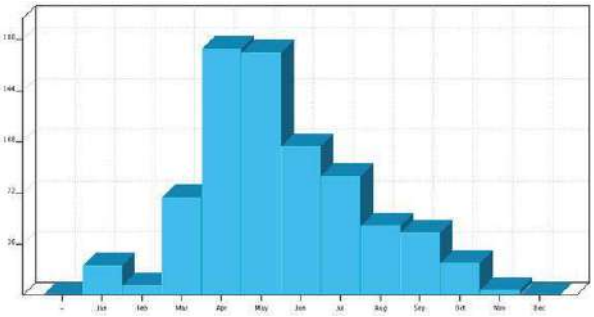


Figure 19: Seasonal Distribution of Human Life Loss by Lightening

C. Spatial Distribution of Human Life Loss by Lightening (1996 – 2013)

The number of human lives lost by lightening is not distributed evenly throughout the country. Svay Rieng (101), Takeo (98) and Kampong Cham (89) are the top three provinces where more people die from lightening.

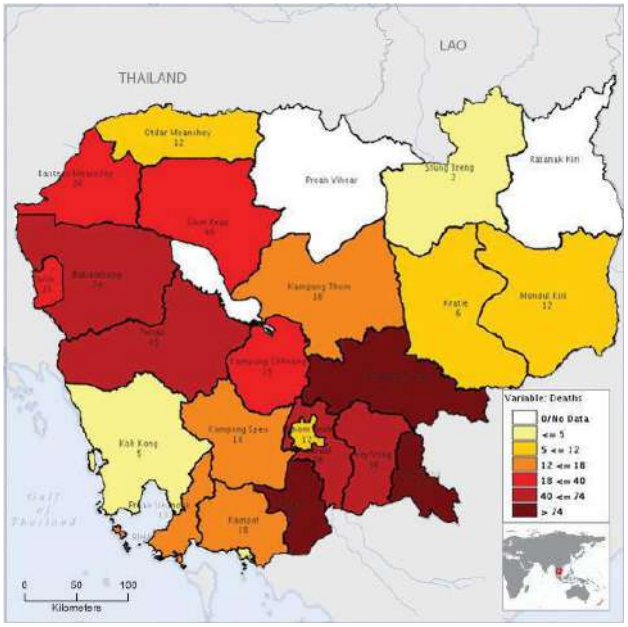


Figure 20: Thematic Map of Human Life Loss by Lightening (1996-2013)

Though lightening does not cause damage and destroy houses, crops, infrastructure and property the way flood, storm and other hazards do, it is the second most dangerous hazard in terms of human life loss. It killed 751 (36% of total deaths) from 1996 to 2013. The largest number of people killed from lightening was in 2011 when there was also a major flood. The lightening season is in April and May when monsoon rains start. The top three provinces where people died from lightening are Svay Rieng, Takeo and Kampong Cham.

3. Fire Hazard

Fire is a dangerous hazard made by humans. It killed many people and destroyed houses and other valuable properties. It is the third most dangerous hazard in terms of the number of human lives lost. It has killed 94 people (4% of the total number of people who died from all types of hazards) since 1996. In terms of destroying houses, fire is the second most dangerous hazard. It destroyed 3,584 houses (23% of the total destroyed houses) from 1996 to 2013. The following section analyzes general and seasonal trends of human life loss and houses destroyed by fire from 1996 to 2013. It also discusses in which provinces fire killed the most people and destroyed the most houses.

A. Distribution of Human Life Loss and Houses Destroyed by Fire (2000-2013)

Figure 21 shows an annual trend of human life loss by fire from 2000 to 2013. There are three major trends where the number of human deaths was greatest. Year 2013 claimed most lives, at 31 people. The second largest number of human deaths occurred in year 2000; almost equal to the number of deaths year 2013. Year 2012 has the third highest human life loss, exceeding 18 people.

Year 2013 claimed more human lives, but year 2009 as indicated in Figure 21 had the largest number of destroyed houses, at 630. Year 2013 has the second largest number of destroyed houses, reaching almost 500. Interestingly, year 2000 has the second highest number of human lives lost by fire but no significant number of houses were destroyed in that year.

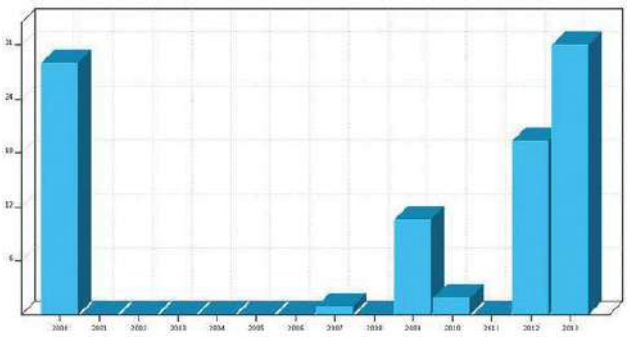


Figure 21: Distribution of Human Life Loss by Fire (2000-2013)

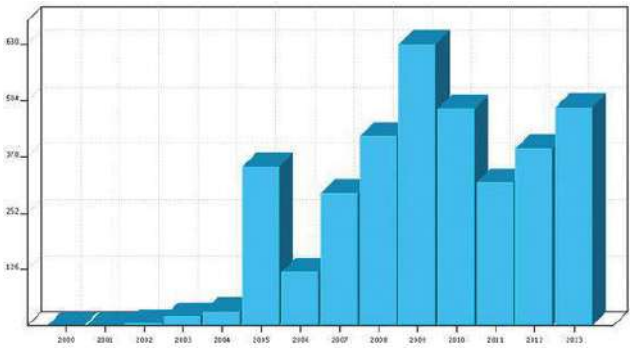


Figure 22: Distribution of Houses Destroyed by Fire (2000-2013)

B. Seasonal Distribution of Human Life Loss and Houses Destroyed by Fire

Both Figures 23 and 24 show similar seasonal trends of human life loss and houses destroyed by fire. It appears that fire occurs in the beginning of the year, from January to April. This is the hot season when fire easily becomes severe. This is also a season with more social activities, such as weddings, Chinese New Year, Khmer New Year and other festivals. This may contribute to the increase of fire incidents.

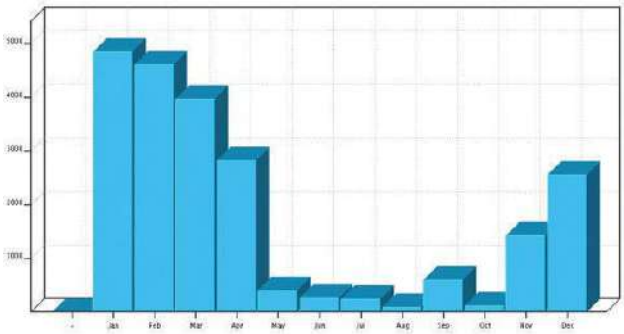


Figure 23: Seasonal Distribution of Fire Victims (2000-2013)

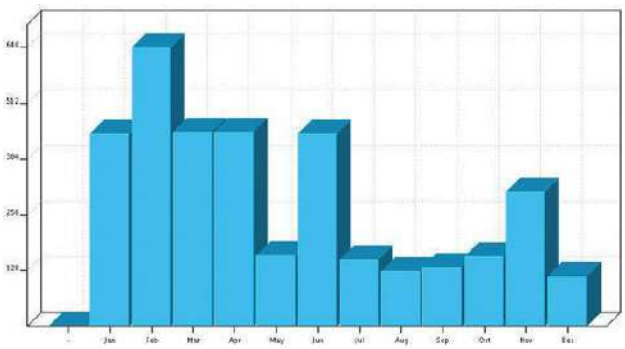


Figure 24: Seasonal Distribution of Houses Destroyed by Fire (2000-2013)

C. Spatial Distribution of Victims of Fire

The number of human lives lost and houses destroyed by fire is not distributed evenly throughout the country. Both Figures 25 and 26 show a similar distribution of victims and houses destroyed by fire. Kampong Cham (8,657), Phnom Penh (5,191), Battambang (2,319) and Kratie (1,216) are the top four provinces and city where people became victims of fire. In terms of destroying houses, fire is worst in Siem Reap with 1,021 houses destroyed, Phnom Penh (576), Battambang (373) and Kampong Cham (308). Interestingly, Phnom Penh, where no other hazard occurs, is in the map of fires. It has the largest number of fire victims, after Kampong Cham and Battambang provinces, in terms of destroyed houses. It is interesting to note that fires tend to occur in major cities (Phnom Penh, Kampong Cham, Battambang and Siem Reap)

where the population density is high (except Kratie province).

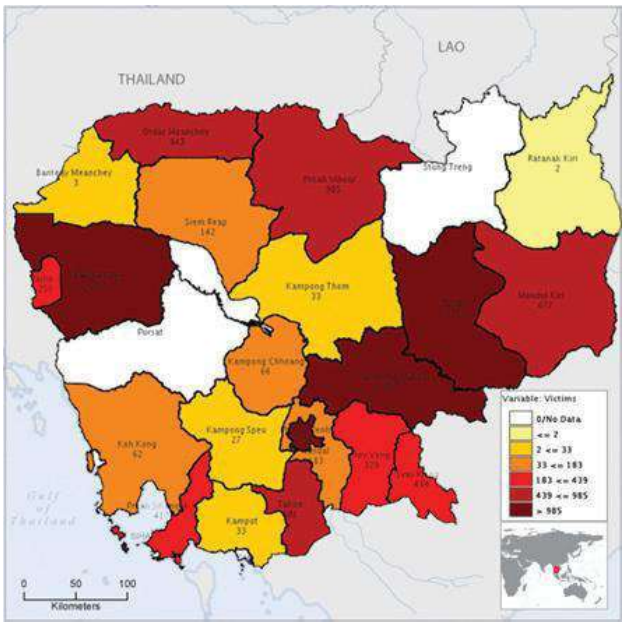


Figure 25: Thematic Map of Fire Victims (2000-2013)

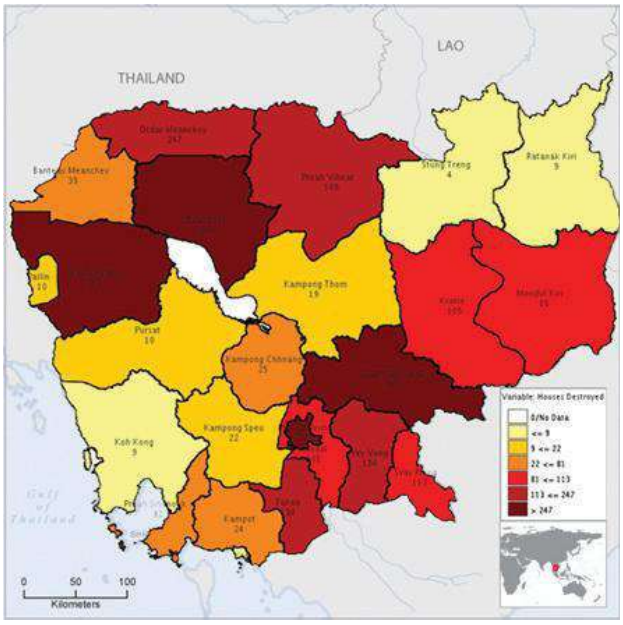


Figure 26: Thematic Map of Houses Destroyed by Fire (2000-2013)

In conclusion, fire is one of the hazards that has caused many human deaths and destruction of houses. Major fire incidents occurred in 2000, 2009 and 2013. Fire incidents tend to occur in the beginning of the year from January to April when the weather is hot. Major provinces and the city (Phnom Penh, Kampong Cham, Battambang and Siem Reap) appear to have the most fire incidents.

4. Storm

After flood, lightening and fire, storm is the fourth most dangerous hazard in Cambodia. It caused many human deaths, property loss and damage. The following section presents and discusses when and where storm events occurred from 1996 to 2013.

A. Trend: Annual Distribution of Human Life Loss and Damaged and Destroyed Housing (1996-2013)

As indicated in Figure 27, a major storm incident occurred in 2009 killing almost 40 people. Typhoon Ketsana from the Philippines passed through Cambodia and Vietnam in late September 2009. However, the largest number of houses destroyed was in 2013, not 2009, based on Figure 28.

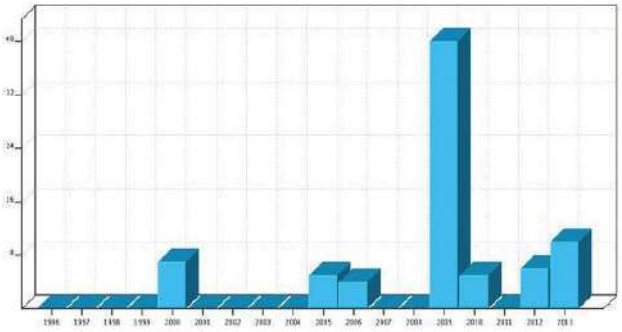


Figure 27: Trend of Human Life Loss by Storm (1996-2013)

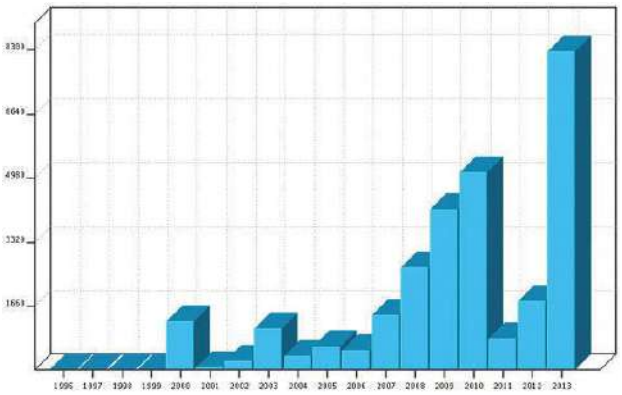


Figure 28: Trend of Houses Damaged and Destroyed by Storm (1996-2013)

B. Seasonal Distribution of Human Life Loss and Damaged and Destroyed Housing

Figures 29 and 30 below show similar seasonal trends when storms affected people and destroyed houses. March, April and May are storm season. Storms start in March and reach their highest peak in April, easing in magnitude in May and the following months. Considerably large numbers of storm victims and houses destroyed are observed in September and October, but this was when Ketsana occurred in 2009.

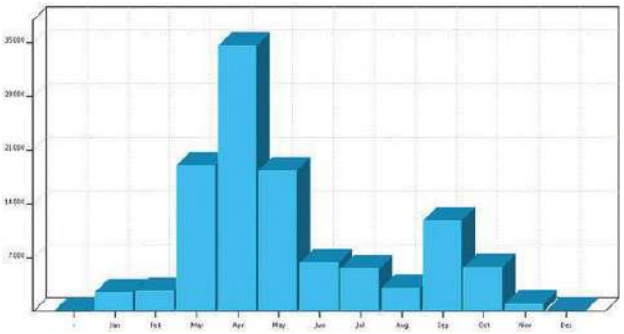


Figure 29: Seasonal Distribution of Storm Victims (1996-2013)

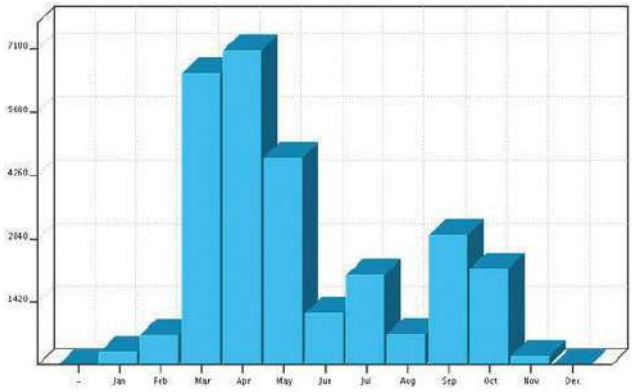


Figure 30: Seasonal Distribution of Damaged and Destroyed Houses by Storm (1996-2013)

C. Spatial Distribution of Storm Victims

The number of storm victims is not distributed evenly in the country. Battambang, Kampong Cham and Takeo are the three provinces with the most storm victims. Since 1996, storm has directly and indirectly affected 39,007 people in Battambang, 13,322 people in Kampong Cham and 13,098 people in Takeo provinces.

In terms of destroyed houses, Battambang remains the number-one province with most houses destroyed. There were 1,556 houses destroyed in Battambang over the last 18 years. Siem Reap (92,374) has the second highest number of destroyed houses. Prey Veng is the third top province with 996 houses destroyed in the last 18 years.

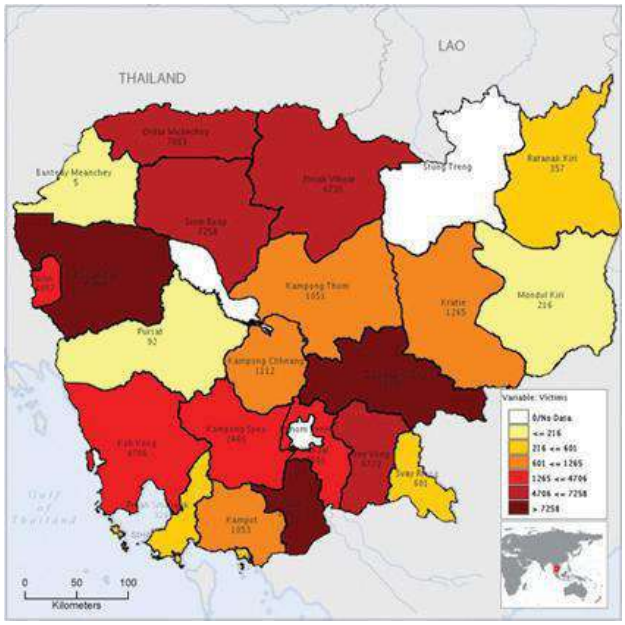


Figure 31: Thematic Map of Storm Victims (1996-2013)

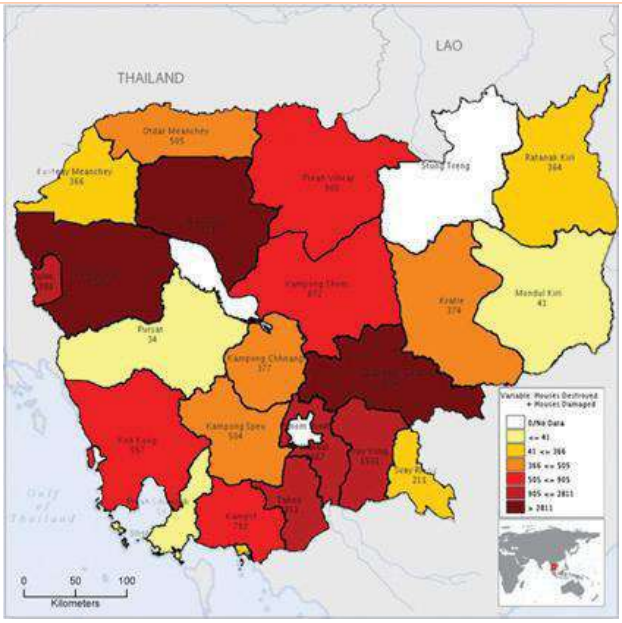


Figure 32: Thematic Map of Damaged and Destroyed Housing by Storm (1996-2013)

In brief, storms are a major hazard in Cambodia, causing many human deaths. They also destroyed many properties such as houses. Storms usually happen in March, April and May. Battambang, Siem Reap, Kampong Cham, Takeo and Prey Veng are the provinces most hard-hit by storms.

5. Epidemic (2005 – 2014)

Epidemic here refers to bird flu. Cambodia is one of the countries that is vulnerable to bird flu, with 34 people already dying from bird flu since 2005. The following section presents and discusses the epidemic of bird flu, and when and where it happened.

A. Distribution of Human Life Loss by Epidemic (2005-2013)

The graph below shows trend of human life loss by bird flu in Cambodia. Bird flu started in 2005 in Cambodia killing four people in that year, but the largest loss of human life was in 2013, with 14 deaths. The second highest number of human life loss was in 2011 when eight people died from bird flu.

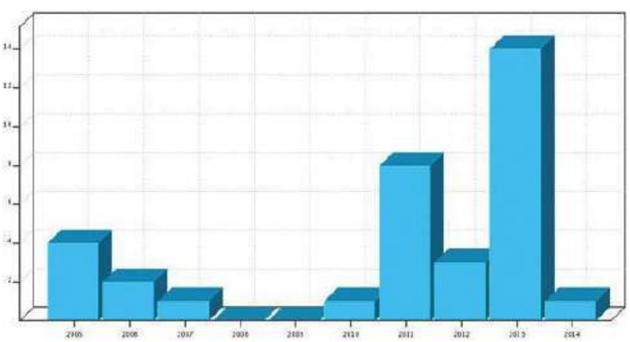


Figure 33: Distribution of Human Life Loss by Epidemic (2005-2013)

B. Seasonal Distribution of Epidemic (2005-2013)

The epidemic of bird flu occurs every month but it tends to be more severe in the beginning of the year, particularly from January to April.

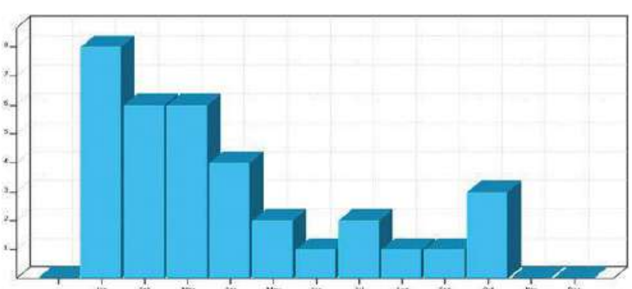


Figure 34: Seasonal Distribution of Human Life Loss by Epidemic (2005-2013)

C. Spatial Distribution of Epidemic

Not every province in the country has bird flu. Kampot province has the largest number of human life loss by epidemic, with 10 people dying (almost half of the total human life loss) from bird flu in the last eight years. Battambang, Kampong Cham, Prey Veng and Kampong Speu are the provinces with the second highest human life loss, with four people dying in each province.

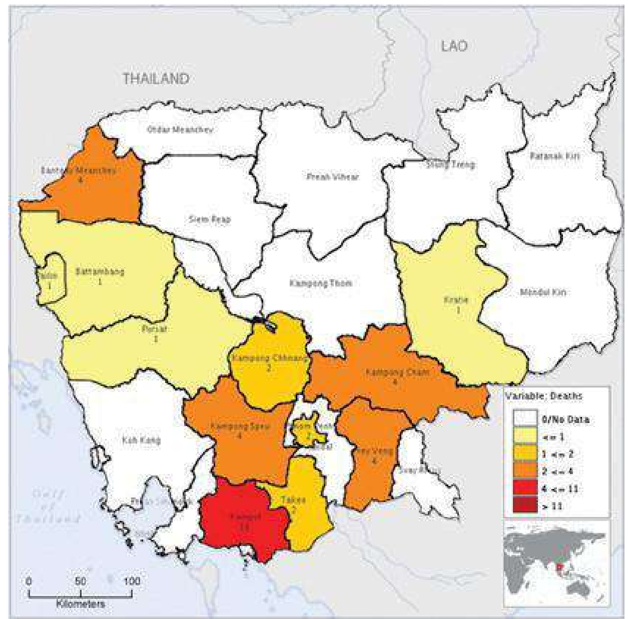


Figure 35: Thematic Map of Human Life Loss by Epidemic (2005-2013)

Bird flu is a new threat for Cambodia. It appears to occur almost every month of the year but tends to be severe in the beginning of the year. Bird flu occurs across half the country, but Kampot has recorded the largest number of human life loss.

6. Drought

Drought does not cause human life loss like other disasters, but its impact on livelihood, especially on agriculture, livestock and water is significant. The following section presents and discusses when and where drought occurred in the last 18 years in Cambodia and its impact on industrial and subsidiary crops, transplant rice fields and paddy rice fields.

A. Drought Data Card

The graph below shows the annual distribution of drought data cards (records) that have been entered and reported from 1996 to 2013. The largest number of drought records was reported in 2004, reaching almost 540 data cards. After seven years, drought was observed again, but it was not as significant as in 2004.

The impact of drought is significant on agriculture. In 2004 it affected almost 12,000 hectares of transplant rice fields and 790,000 hectares of paddy rice fields and damaged 490,000 hectares of farming crops.

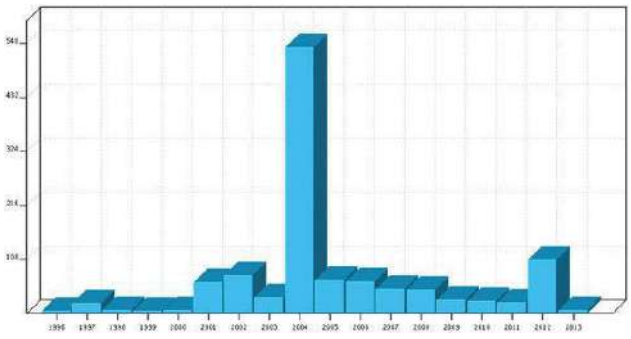


Figure 36: Trend of Drought Records

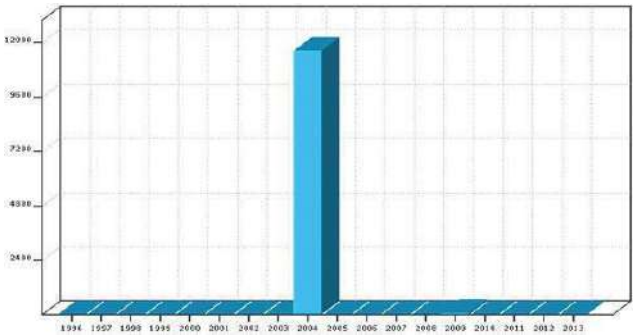


Figure 37: Trend of Transplant Fields Affected by Drought (1996-2013)

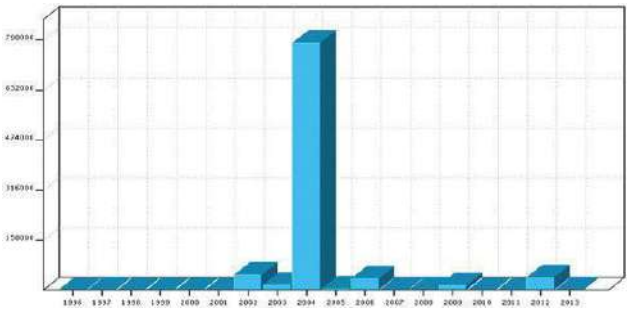


Figure 38: Trend of Paddy Fields (in Ha) Affected by Drought (1996-2013)

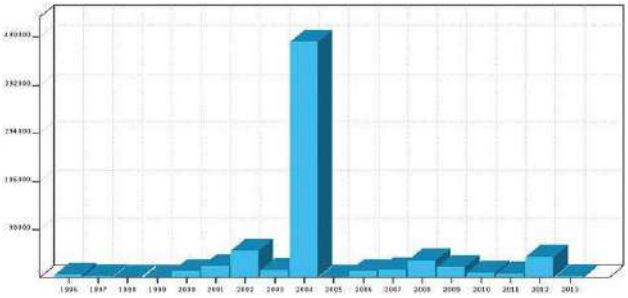


Figure 39: Trend of Crops Damaged by Drought (1996-2013)

B. Seasonal Distribution of Drought Data Cards

The rainy season starts in late April and ends in late November. The graph below shows seasonal distribution of drought data card (record) that has been entered and reported from 1996-2013. The largest number of drought data cards that have been recorded and reported is in July, reaching 600, followed by August with data cards exceeding 240. This indicates that most severe drought is observed in July and continues to early August.

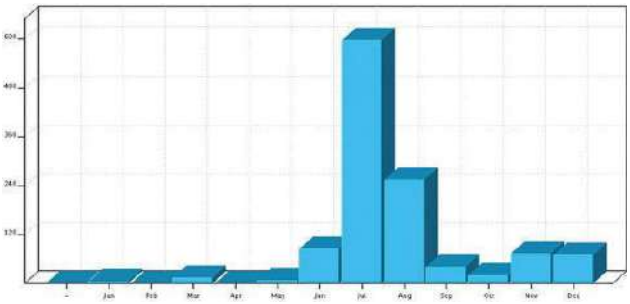


Figure 40: Seasonal Distribution of Drought Data Card (1996-2013)

C. Spatial Distribution of Drought Data Cards

Drought has been reported from all provinces. However, as indicated in the figure below, Kampong Speu province has the largest number of drought reports, totalling 197, followed by Kampot (153), Takeo (124) and Siem Reap (102).

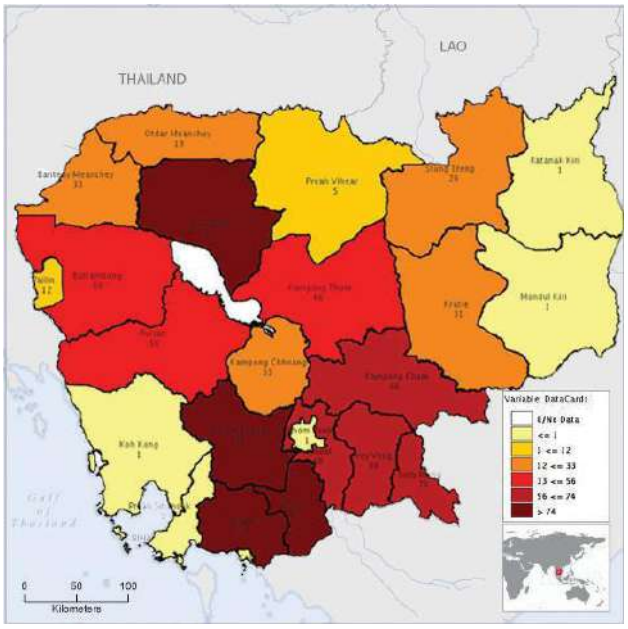
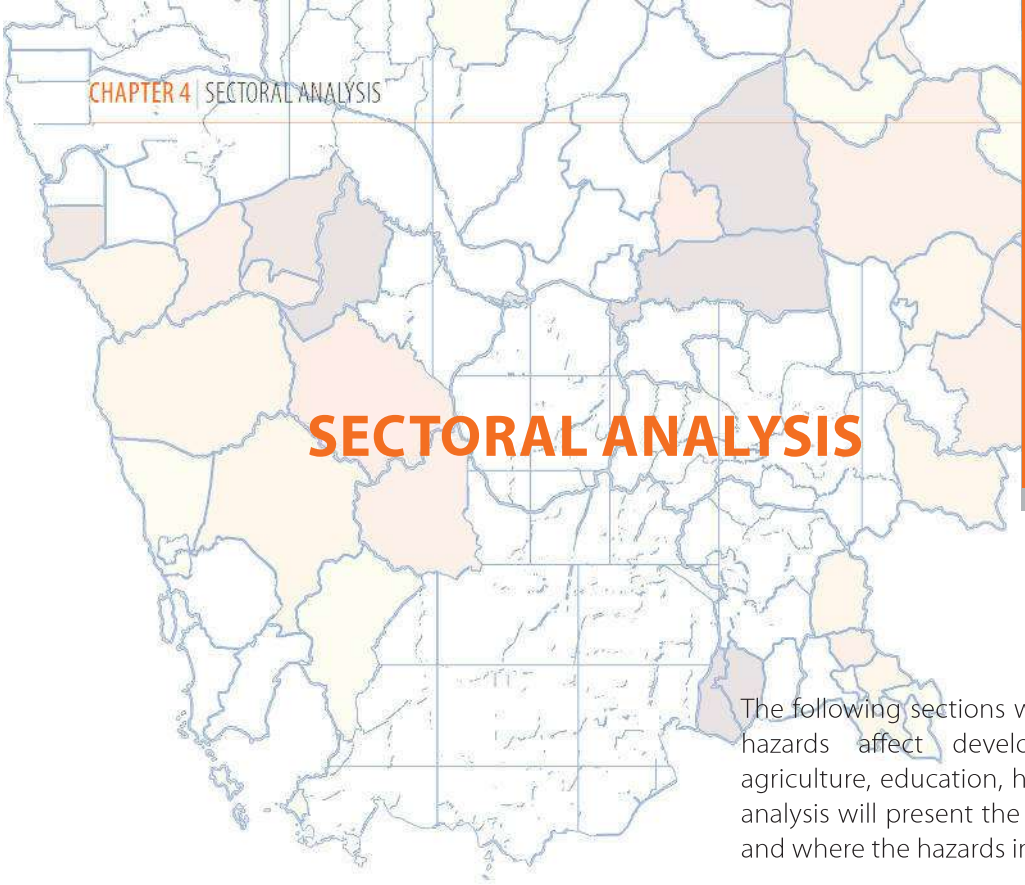


Figure 41: Thematic Map of Drought (1996-2013)

Drought may not kill people immediately like other disasters but its impact on livelihoods is significant. The 2004 drought affected and destroyed many hectares of farming crops, transplant rice and paddy rice. Drought happens in the middle of raining season (July and early August). Kampong Speu has the largest number of drought records, followed by Kampot, Takeo and Siem Reap.

CamDi



4

SECTORAL ANALYSIS

The following sections will present and analyze how hazards affect development sectors including agriculture, education, health and infrastructure. The analysis will present the causes of impact, and when and where the hazards impact each sector.

1. Agriculture

Agriculture is vulnerable to natural disasters. The following sections present and discuss types of hazards that affect agriculture, namely farming crops and paddy rice field. Annual, seasonal and spatial distribution of the impact of hazards on farming crops and paddy rice fields will also be analyzed.

A. Causes of Paddy Fields Damaged in Ha (1996-2013)

The pie chart below presents two major causes that affected paddy rice fields from 1996-2013. Flood has the biggest impact on paddy rice fields. From 1996 to 2013, flood had damaged 1,695,969 hectares of paddy rice fields, representing 67% of the total damaged paddy rice fields. Drought has the second highest impact on paddy rice fields, damaging 775,519 hectares, representing 31% of the total loss. Flood and drought are the two hazard types that have caused most damage to paddy rice fields in the last 18 years.

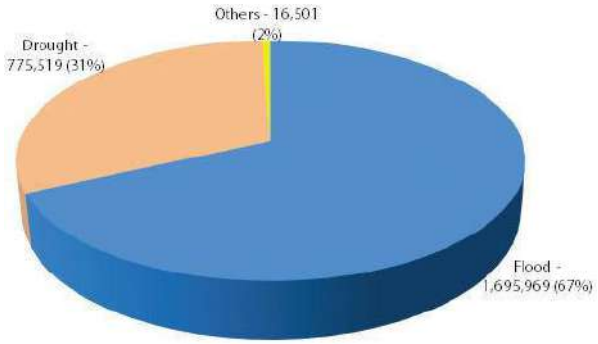


Figure 42: Causes of Paddy Field (in Ha) Damaged (1996-2013)

B. Distribution of Paddy Fields and Industrial and Subsidiary Crops Damaged in Ha (1996-2013)

The graph below shows two major trends of damage to paddy fields by types of hazards, namely flood and drought from 1996 to 2013. The largest number of paddy rice fields damaged was observed in 2004. Drought is probably the cause of the loss. Severe drought occurred in 2004. The second largest number of paddy rice fields damaged was observed in 2000, at more than 448,000 hectares. Flood is probably the main cause of the loss. Severe floods occurred in 2000.

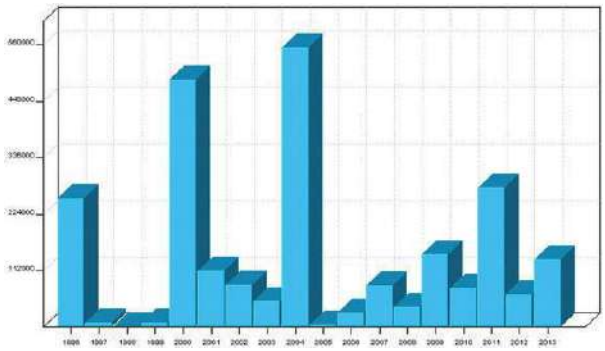


Figure 43: Trend of Paddy Field (in Ha) Damaged (1996-2013)

C. Seasonal Distribution of Paddy Fields and Industrial and Subsidiary Crops Damaged in Ha

The graph below shows three major trends of damaged paddy rice fields from 1996 to 2013. The largest number of damaged paddy rice fields is observed in September, reaching almost one million hectares, followed by October, exceeding 600,000 hectares and July, exceeding 400,000 hectares. Flood is probably the main cause of affected paddy rice fields in September and August.

As discussed in the previous section, flood occurred in September and late October. Drought might cause the third trend of damaged paddy rice fields. As discussed earlier, Cambodia usually has a short drought in the middle of the rainy season, in July.

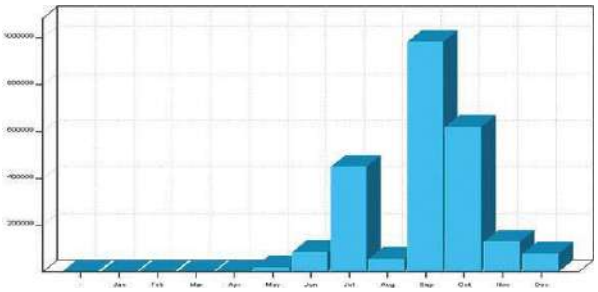


Figure 44: Seasonal Distribution of Paddy Fields (in Ha) Damaged (1996-2013)

D. Spatial Distribution of Paddy Fields and Industrial and Subsidiary Crops Damaged in Ha

Damage to industrial and subsidiary crops and paddy fields is not distributed evenly throughout the country. Figure 44 shows the distribution of damaged crops and Figure 45 shows distribution of damaged paddy rice fields. Kandal, Battambang, Kampong Cham and Pailin are the top four provinces where many hectares of industrial and subsidiary crops have been damaged. In terms of paddy fields, Prey Veng and Takeo are the top two provinces with large numbers of destroyed paddy fields. Kampong Cham remains the third top province with larger numbers of both damaged crops and paddy fields. Banteay Meanchey is the fourth province with large numbers of destroyed paddy fields.

Natural disasters have severely affected agriculture. Flood is the main factor, damaging 67% of the total damaged paddy rice fields. Drought is the second main cause, at 31%. The largest number of damaged paddy fields occurred in 2004 as a result of drought, and the second largest loss of paddy fields was in 2000 when major floods occurred.

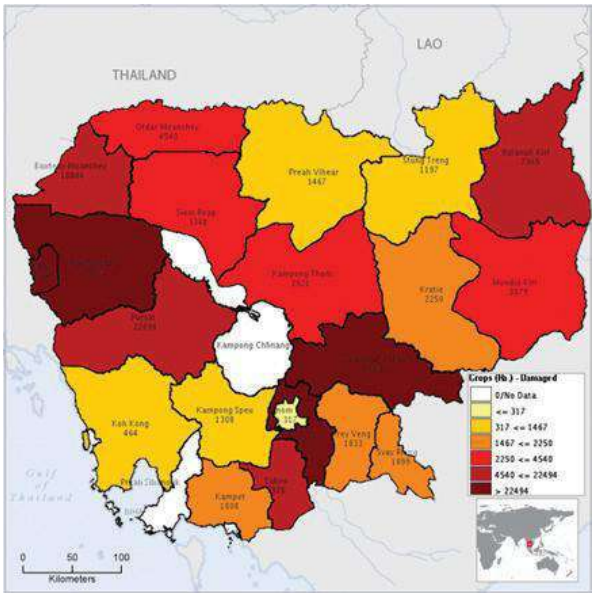


Figure 45: Thematic Map of Industrial and Subsidiary Crops (in Ha) Damaged (1996-2013)

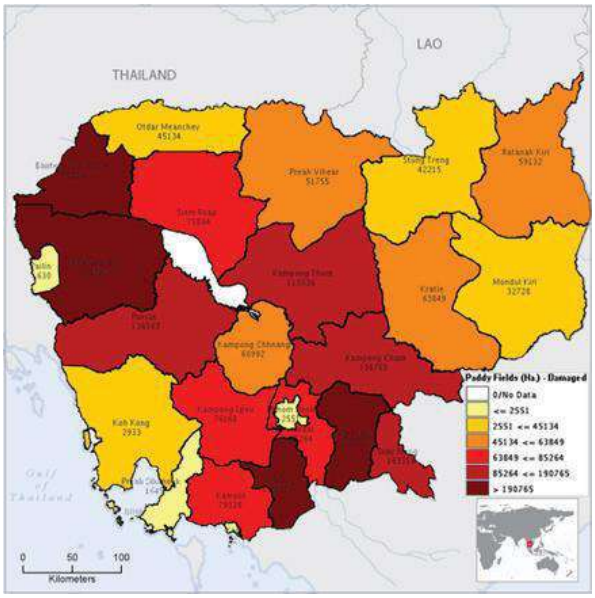


Figure 46: Thematic Map of Paddy Field (in Ha) Damaged (1996-2013)

Paddy rice fields tended to be damaged in September and October when floods occurred, and in July after a short rainy-season drought. Distribution of destroyed farming crops and paddy fields is not even. Kandal, Prey Veng, Kampong Cham, Battambang, Pailin, Takeo and Banteay Meanchey are the provinces where greatest loss of farming crops and paddy fields occurred. Flood and drought are also observed in these provinces.

2. Health

A. Causes of Hospitals and Health Centres Affected by Types of Disasters (1996-2013)

The pie chart below shows the types of hazards that affected hospitals and health centres from 1996 to 2013. There were 194 hospitals and health centres affected by flood and storm. Flood is the main factor affecting hospitals and health centres, with 191 hospitals and health centres (98%) affected by flood alone.

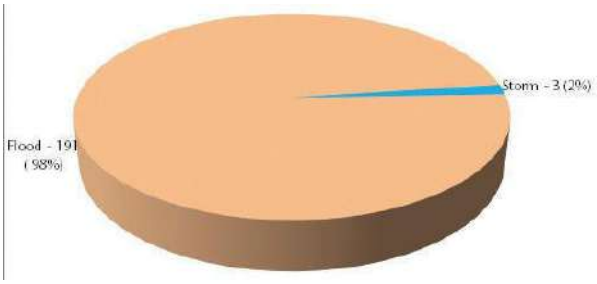


Figure 47: Hazards Affecting Hospitals and Health Centres (1996-2013)

B. Distribution of Affected Hospitals and Health Centres (1996-2013)

The graph bellow shows the trend of hospitals and health centres that have been affected by floods and storms from 1996 to 2013. The largest number of hospitals and health centres affected by flood and storm is observed in 2011, reaching almost 100, followed by 2013, reaching almost 80. The two years observed with highest number of affected hospitals and health centres was when the CamDi system was being formulated.

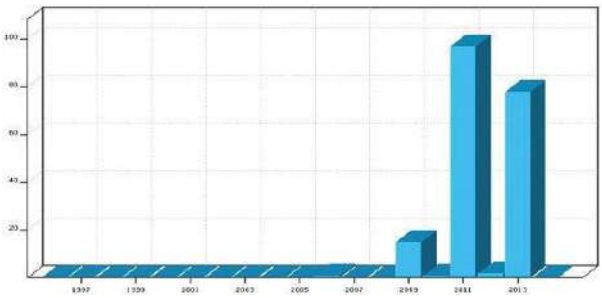


Figure 48: Trend of Affected Hospitals and Health Centres (1996-2013)

C. Seasonal Distribution of Affected Hospitals and Health Centres (1996-2013)

As indicated in the graph below, the largest number of hospitals and health centres affected is observed in September, reaching almost 179. Flood occurs in September, thus flood may be the main factor affecting hospitals and health centres.

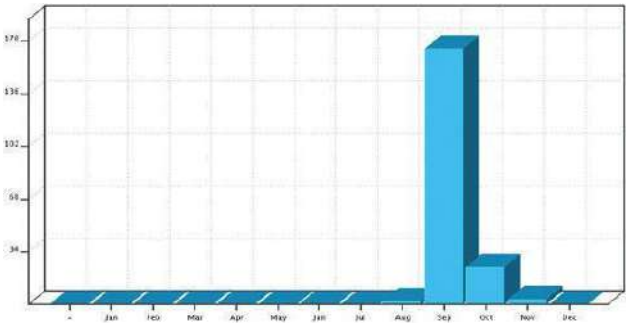


Figure 49: Seasonal Distribution of Affected Hospitals and Health Centres (1996-2013)

D. Spatial Distribution of Affected Hospitals and Health Centres (1996-2013)

The figure below shows an uneven distribution of affected hospitals and health centres in the country from 1996 to 2013. Kampong Cham has the largest number of hospitals and health centres affected by flood and storm. After Kampong Cham, Kandal province has the second highest number of affected hospitals and health centres.

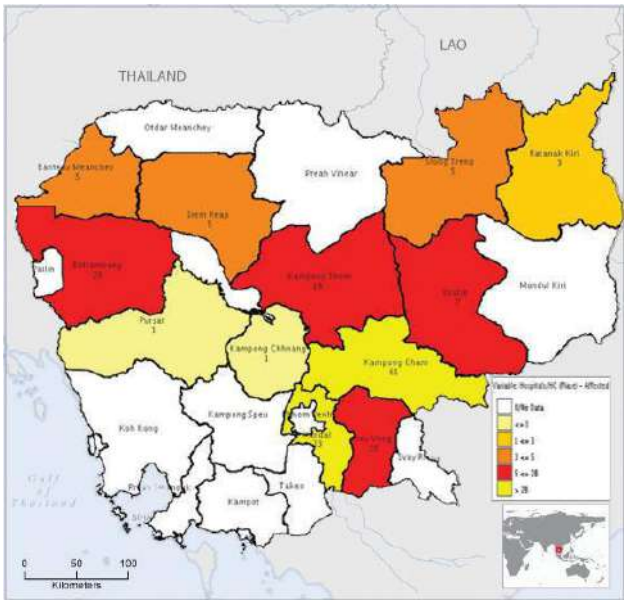


Figure 50: Thematic Map of Affected Hospitals and Health Centres (1996-2013)

Flood and storm are the two main natural hazards that have affected hospitals and health centres. With better records of loss and damage, large numbers of affected hospitals and health centres are observed in 2011 and 2013, mostly in September when flood occurs. Kampong Cham and Kandal are the provinces with the largest number of affected hospitals and health centres.

3. Education

Natural hazards have affected the education system, particularly schools. The pie chart below shows the types of natural disasters that have affected schools in the last 18 years. It shows that flood is the main natural disaster, affecting 2,950 schools (99% of the total affected schools).

High numbers of affected schools are observed in 2013, reaching almost 1,400, and in 2011, exceeding 1,120 schools. Large numbers of affected schools are observed in September when major flood incidents occur.

As shown on the map in Figure 54, Kampong Cham and Banteay Meanchey are the two provinces with the largest number of schools affected by flood and storm in the last 18 years.

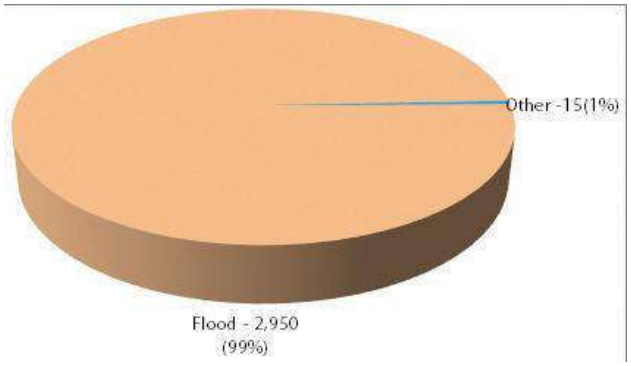


Figure 51: Types of Hazards Affecting Schools (1996-2013)

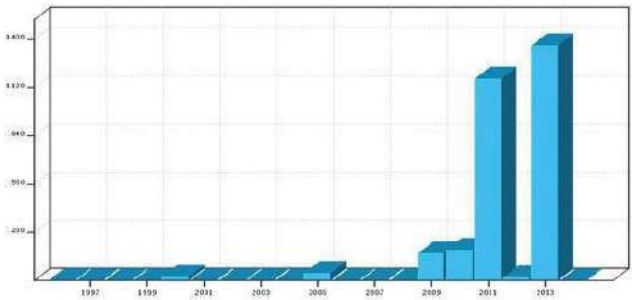


Figure 52: Trend of Affected Schools (1996-2013)

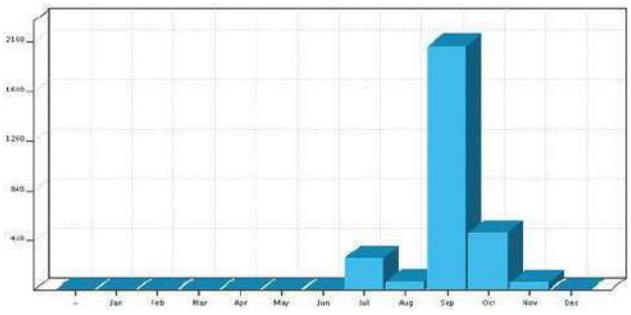


Figure 53: Seasonal Distribution of Affected Schools (1996-2013)

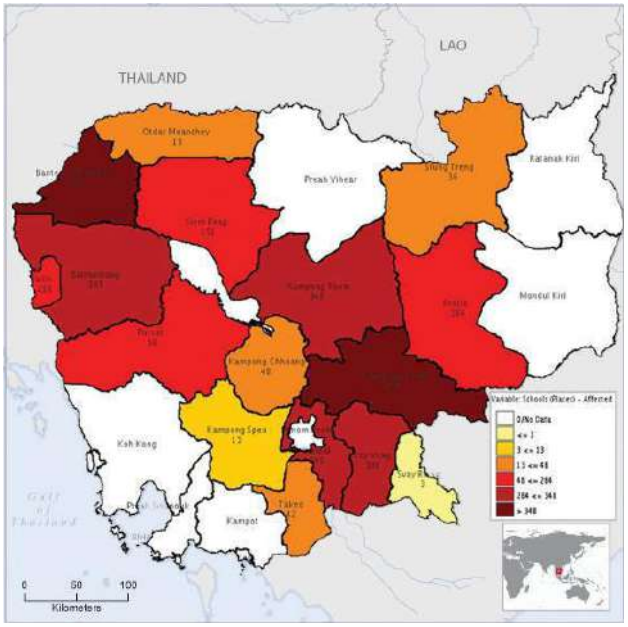


Figure 54: Thematic Map of Affected Schools

4. Rural Roads

Natural disasters have badly affected and destroyed rural road infrastructure. Figure 55 shows the types of hazards that have destroyed rural roads, with flood being the main factor. In the last 18 years, flood destroyed 1,769.74 kilometres of rural roads, with the largest destruction observed in 2011 and 2000, when severe floods occurred. Rural road destruction occurs mostly in September during the flood season, and is not evenly distributed throughout the country. Otdar Meanchey, Prey Veng, Kampong Speu and Kandal are the four provinces where rural roads were largely destroyed.

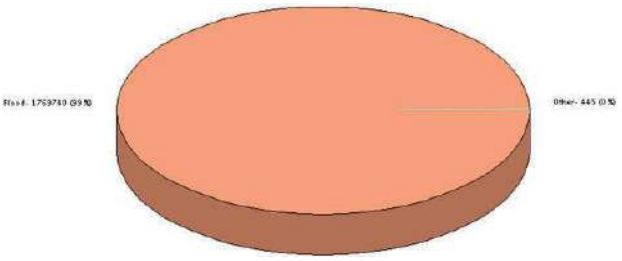


Figure 55: Types of Hazards Destroying Rural Roads (1996-2013)

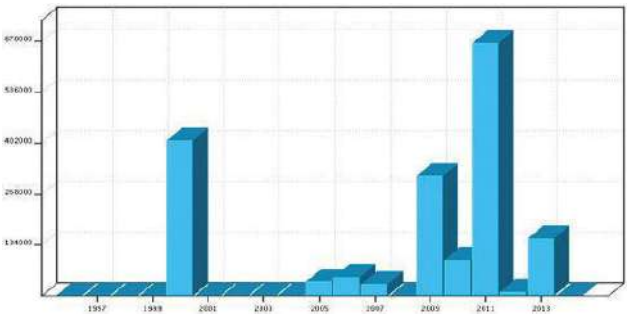


Figure 56: Trend of Rural Roads (M) Destroyed (1996-2013)

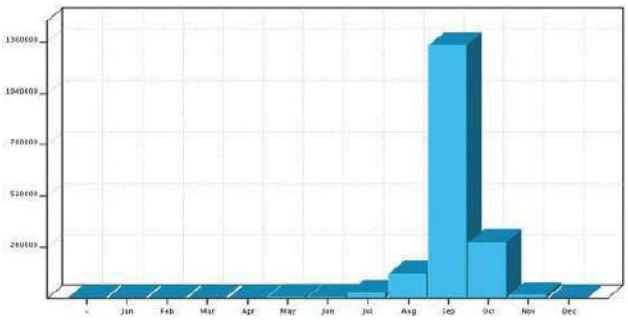


Figure 57: Seasonal Distribution of Rural Roads (M) Destroyed by Disasters

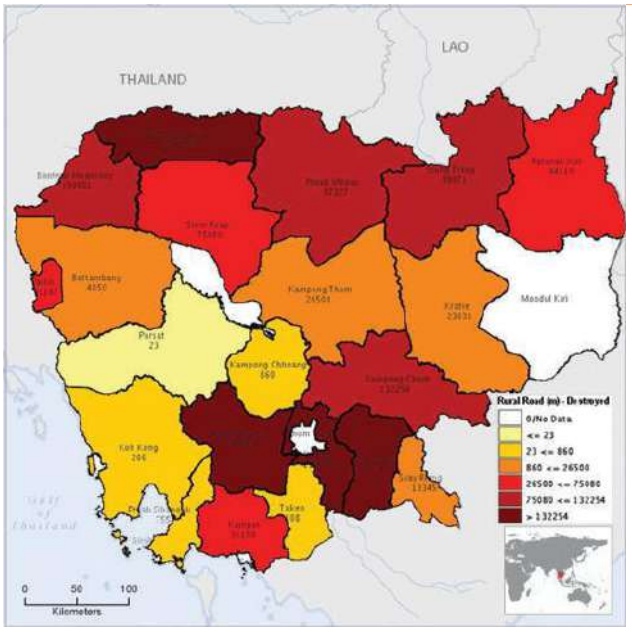


Figure 58: Thematic Map of Rural Road (M) Destroyed

5. National/Provincial/Town Roads

Natural disasters have badly affected infrastructure. This section presents the impact of natural disasters on national/provincial/town roads. As shown in the pie chart in Figure 59, flood is the main factor that has destroyed 245,475 meters of national/provincial/town roads in the last 18 years. Of the total roads destroyed, 100% was due to flooding. The largest number of destroyed roads is observed in 2011 when severe floods occurred; September and October are the two top months when road destruction occurred, as these two months are in the flooding season. As shown in Figure 58, Pursat and Otdar Meanchey province are the two provinces where many kilometers of roads were destroyed.

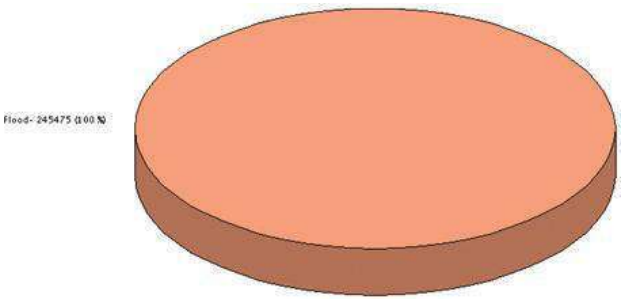


Figure 59: Types of Hazards Destroying National/Provincial/Town Roads (M) (1996-2013)

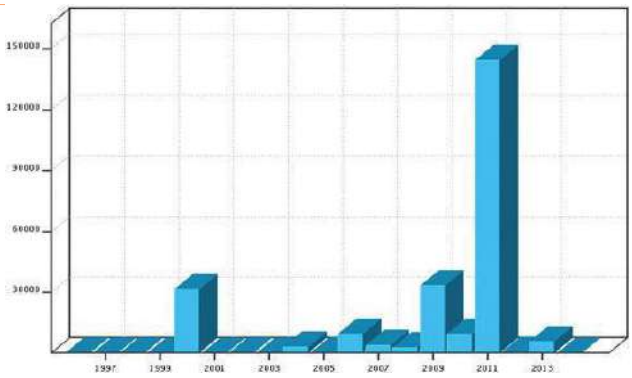


Figure 60: Trend of National/Provincial/Town Roads (M) Destroyed (1996-2013)

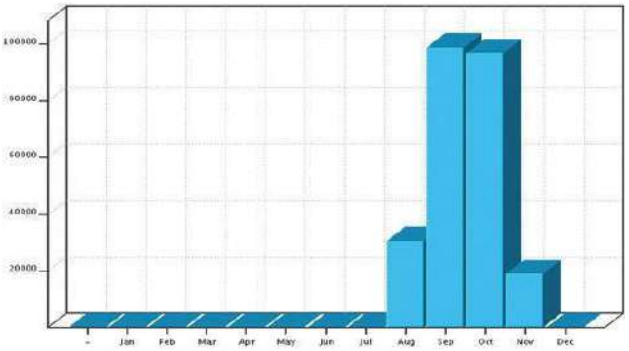


Figure Figure 61: Seasonal Distribution of National/Provincial/Town Road (M) Destroyed (1996-2013)

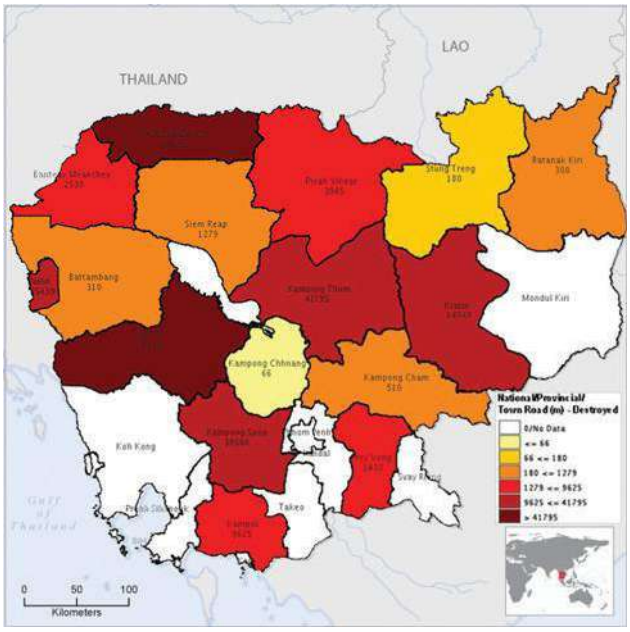
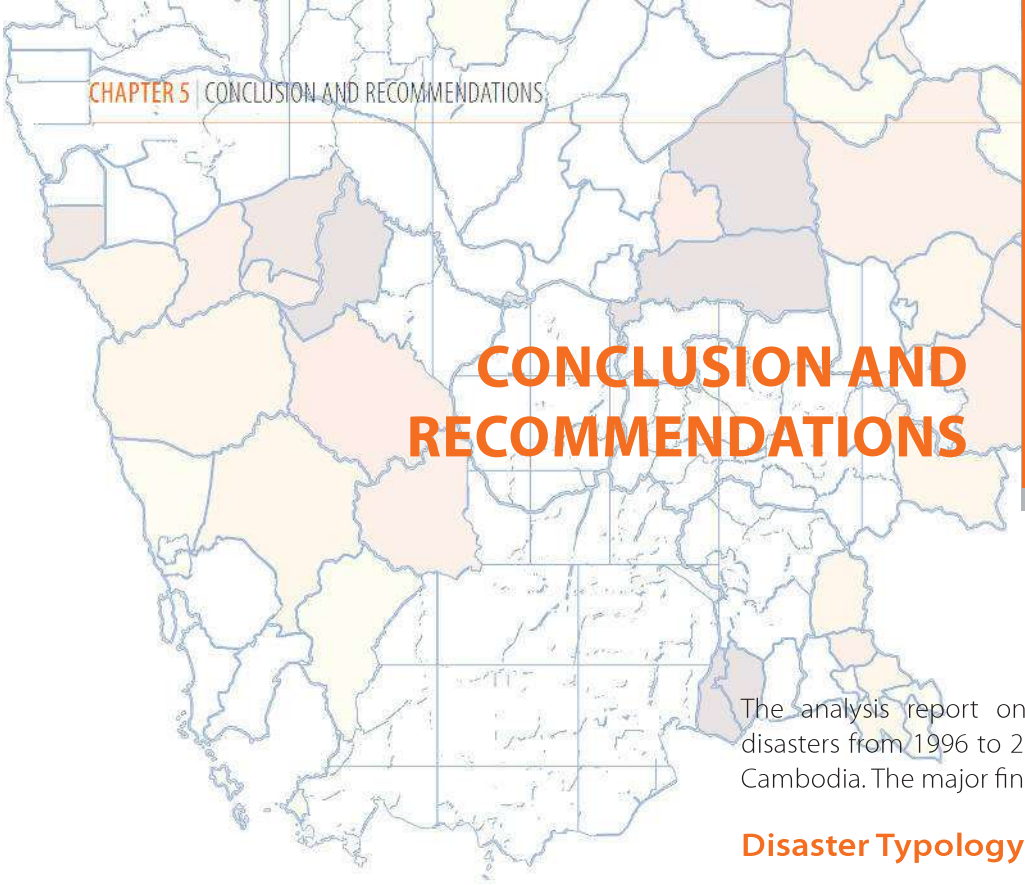


Figure 62: Thematic Map of National/Provincial/Town (M) Destroyed (1996-2013)

CamDi

5

CONCLUSION AND RECOMMENDATIONS



The analysis report on losses and damage from disasters from 1996 to 2013 has been carried out for Cambodia. The major findings are summarized as:

Disaster Typology

- Flood (42%), fire (17%), drought (15%), storm (14%), lightening (7%) and pest outbreak (1%) were reported to occur in Cambodia.
- Siem Reap, Kampong Cham, Takeo, Kratie and Prey Veng are the top five provinces with most disaster records.
- Two geographical regions are prone to flood. The first region includes provinces that are located in the lower part of the country. These include Prey Veng, Kampong Cham, Kandal and Kratie. The second group of provinces is around the Tonle Sap Great Lake. These include Siem Reap, Kampong Thom, Banteay Meanchey, Battambang, Kampong Chhnang and Pursat.
- Provinces that are prone to lightening are Svay Rieng, Takeo and Kampong Cham.
- Phnom Penh, Kampong Cham, Battambang and Siem Reap appear to have the most fire incidents.
- Battambang, Siem Reap, Kampong Cham, Takeo and Prey Veng are prone to storms.
- Kampot is prone to bird flu.
- Kampong Speu, Kampot, Takeo and Siem Reap are prone to drought. - Kandal, Prey Veng, Kampong Cham, Battambang, Pailin, Takeo and Banteay Meanchey are the provinces where greatest loss of farming crops and paddy fields occurred. Flood and drought are also observed in these provinces.

Impact of Disasters on Human Life

- 2,050 people died from all disasters from 1996 to 2013.
- Flood is the main cause of human life loss, killing 1,091 people in the last 18 years.
- Lightening is the second main cause of human life loss and is responsible for 36% of the total death toll.
- Both flood and lightening are responsible for 89% of total human life loss from all disasters.
- The largest number of human life loss occurred in 2000, 2011, and 2013 when major floods happened.
- September and October are the two months when most human life loss occurs.
- Prey Veng, Kampong Cham, Kandal and Takeo are the four provinces where the largest number of people died.

Impact of Disasters on Housing

- Disasters damage and destroy houses, with 54,372 houses damaged and destroyed by storm, flood and fire since 1996.
- The most houses damaged and destroyed were in 2000, 2009 and 2010.
- September and October are the two months of the year when most houses are damaged and destroyed.
- Battambang, Kandal, Kampong Speu and Siem Reap are the four provinces where most houses were damaged and destroyed.
- Impact of Disasters on Education:
- Disasters usually affect schools in September when major flood incidents occur.
- Kampong Cham and Banteay Meanchey are the two provinces with the highest number of schools that have been affected by flood and storm in the last 18 years.

Impact of Disasters on Health

- Flood and storm are the two main natural hazards that have affected hospitals and health centres.
- September is the month when most hospitals and health centres are affected by disasters.
- Kampong Cham and Kandal are the provinces with the largest number of hospitals and health centres affected.

Impact of Disasters on Infrastructure

- Natural disasters have damaged and destroyed rural and national roads.
- Flood is the main cause of rural road destruction.
- Rural road destruction occurs in September.
- Otdar Meanchey, Prey Veng, Kampong Speu and Kandal are the four provinces where rural roads were largely destroyed.

Establishing CamDi at NCDM has been a positive step in systematizing data and information about losses and damage from disasters in Cambodia. Disaster data and information from 18 years has been entered into the system. The CamDi system is maintained and information is disseminated and accessible to all stakeholders, planners, researchers and relevant technical departments. They can utilize the data to inform their decisions and enable them to analyze disaster impact on their various sectors.

Building on the work accomplished so far, further improvements are needed to streamline a number of processes and ensure efficient and effective data collection and use of analysis by stakeholders. The following recommendations are developed to improve the CamDi information system:

- Data collection processes: Development and finalization of data collection format in consultation with relevant line agencies and stakeholders, streamlining data collection processes from lowest levels and appropriate flow of information to the national level through various line ministries.
- Further development of capacity at national and sub-national levels for correctly and coherently collecting information about occurrences and impacts of disasters.

- Appropriate controls for ensuring quality of data and access controls for entry and modification of data.
- Development of clear definition of terms and elaboration on processes to ensure accountability for accuracy of data.
- Establish national and sub-national user forums to share findings from CamDi and to ensure further discussions and follow-up by stakeholders. For example, lightening is number two killer (after floods) in Cambodia. CamDi could be used as a tool to raise awareness of deaths from lightening and suggestions on various interventions to reduce/minimize such deaths.
- Increase use of CamDi as a tool for monitoring impact of various interventions at national, provincial, district and commune levels.
- Periodically undertake analysis and share with stakeholders at various levels.

CamDi


CHHNANG
KAMPONG CHAM
PHNOM PENH
KAMPONG SPEU
KOH KONG
PREY VENG
KANDAL
SVAY RIENG
KAMPOT
TAKEO
SIHANOUKVILLE
KEP
50
100
Kilometers

ANNEX

ANNEX ONE

Data Collection Form

DataCard Form
Total Loss and Damage for One Data Level of One Disaster Event

Location - Municipal/Provinces ☐ Entered ☐

Serial		Date		Duration (days)		Sources	
Disaster Type		District		Commune		Num of Villages	
Cause				Description of Cause			

Standard Data Fields

1. Affects on People

Deaths ☐		**Missing** ☐		**Injured** ☐		Magnitute	
Women		Women		Women		**House Damage**	
Children		Children		Children			
Elderly		Elderly		Elderly		**House Destroyed**	
People Affected ☐		**People Victim** ☐		**People Evacuated** ☐		**People Relocated** ☐	
Family		Family		Family		Family	
Women		Women		Women		Women	
Children		Children		Children		Children	
Elderly		Elderly		Elderly		Elderly	

2. Sector Affected

Transportation ☐	**Communications** ☐	**Education** ☐
Damage in Road (Rual, Provincial, and National Road in Meters)		Education Centers Damage (Number of School Buildings)
Agriculture ☐	**Water Supply** ☐	**Health Sector** ☐
Damage in Crops (Seedling and Transplanted Rice + Subsidiary Crops in Hectar)		Hospital Damage(Number of Hospital or Health Center Buildings)
Loss Cattle (Livelstock)		
Power and Energy ☐	**Industries** ☐	**Relief** ☐
Other Sectors ☐		**Sewerage** ☐

OTHER LOSSES

3. Estimated Loss in Currency

Losses $Local (Riels) Losses $USD

4. Comments

Extended Data Fields

5. Victims

Death Reason	
Number of People Evacuated to Safe Area	

6. Social Sector

Hospital/Health Center Affected (Places)	
Hospital/Health Center Damaged (Buildings)	
Hospital/Health Center Destroyed (Buildiings)	
School Affected (Places)	
School Damaged (Buildings)	
School Destroyed (Buildings)	
Public Building Affected (Places)	
Public Building Damaged (Buildings)	
Public Destroyed (Buildings)	
Pagoda Affected (Places)	
Pagoda Damaged (Buildings)	
Pagoda Building Destroyed (Buildings)	

7. Productivity Sector

Farming Crop Affected (Ha.)	
Farming Crop Damaged (Ha.)	
Transplanted Rice Affected (Ha.)	
Transplanted Rice Damaged (Ha.)	
Paddy Fields Affected (Ha.)	
Paddy Fields Damaged (Ha.)	
Agriculture Land Planted (Ha.)	
Agriculture Land in Plan (Ha.)	
Livestock Dead/Loss (Number)	
Livestock Evacuated (Number)	

8. Infrastructure

National/Provincial Road Flooded (m)	
National/Provincial Road Damaged (m)	
National/Provincial Road Destroyed (m)	
Rural Road Flooded (m)	
Rural Road Damaged (m)	
Rural Destroyed (m)	
Total Length of Rural Road in Commune/District (m)	
Bridge Flooded (Place)	
Bridge Damaged (Place)	
Bridge Destroyed (Place)	

9. Irrigation System

Irrigation System Damaged (Place)	
Dike Flooded (m)	
Dike Destroyed (m)	
Dike Damaged (m)	
Dam Flooded (m)	
Dam Damaged (m)	
Dam Destroyed (m)	
Sewage Affected (m)	
Sewage Damaged (m)	
Sewage Destroyed (m)	
Water Gate Affected (Place)	
Water Gate Damaged (Place)	
Water Gate Destroyed (Place)	

10. Sanitation Water

Water Point Affected (Place)	
Water Point Damages (Place)	
Toilet Affected (Place)	
Toilet Damages (Place)	

Additional Information	

Data Collector:_____

Date:_____

2

ANNEX TWO

List of Organizations Which Provided Information

2. Rationale

- National Committee for Disaster Management (NCDM)
- Provincial Committee for Disaster Management (from 24 provinces)
- Ministry of Agriculture, Forestry and Fisheries (MAFF) and its Provincial Departments
- Ministry of Public Works and Transport (MPWT) and Provincial Departments
- Ministry of Water Resources and Meteorology (MoWRAM) and its Provincial Departments
- Ministry of Health (MoH) and its Provincial Departments
- Ministry of Education, Youth and Sport (MoEYS) and its Provincial Departments
- Ministry of Interior (MoI)
- Ministry of Rural Development (MRD) and its Provincial Departments
- Cambodia Red Cross (CRC) and its Provincial Branches

3 ANNEX THREE

Summary: Disaster Typology and Their Impacts

Event	Data Cards	Deaths	Houses Destroyed	Houses Damaged	Hospitals/HC (Place) - Affected	Schools (Places) - Affected	Industrial & Subsidiary Crop (Ha.) - Damaged	Paddy Fields (Ha.) - Damaged	Rural Road (m) - Destroyed	National/Provincial/Road (m) - Destroyed
Drought	1,172	0	0	0	0	0	24,060	775,519	0	0
Epidemic	51	34	0	0	0	0	0	0	0	0
Fire	1,392	94	3,584	344	0	0	0	99	0	0
Flood	3,315	1,091	2,242	19,176	191	2,961	225,920	1,635,969	1,769,740	245,475
Lightening	581	751	24	19	0	0	0	30	0	0
Pest Outbreak	100	0	0	0	0	0	0	14,231	0	0
River Bank Collapse	43	3	67	448	0	0	0	0	383	0
Storm	1,146	77	9,291	19,180	3	4	2,361	2,141	0	
TOTAL	**7,800**	**2,050**	**15,208**	**39,167**	**194**	**2,965**	**252,341**	**2,427,989**	**1,770,123**	**245,475**

Note: The number '0' here denotes either absence of impact or no data at the time of data collection.

ANNEX FOUR

Summary: Impact of Disasters by Year (1996-2013)

Year	Data Cards	Deaths	Houses Destroyed	Houses Damaged	Hospitals/HC (Place) - Affected	Schools (Places) - Affected	Farming Crop (Ha.) – Damaged	Paddy Fields (Ha.) - Damaged	Rural Road (m) - Destroyed	National /Road (m) - Destroyed
1996	41	169	0	3,289	0	0	14,764	255,517	0	0
1997	25	0	0	0	0	0	0	9,873	0	0
1998	18	0	0	0	0	0	0	2,652	0	0
1999	27	3	1	2	0	0	0	8,976	0	0
2000	203	388	1,305	7,920	0	23	82,970	491,853	409,330	31,482
2001	158	24	167	1,725	0	0	591	111,763	0	0
2002	178	13	129	1,522	0	3	13,402	83,320	1,333	0
2003	99	11	47	1,639	0	0	1,713	52,083	46	0
2004	608	3	274	123	0	0	1,948	555,726	0	3,134
2005	227	29	874	1,056	0	45	0	4,934	37,355	415
2006	369	29	459	1,128	1	0	8,216	28,314	49,831	9,724
2007	379	33	1,040	1,139	0	0	62	82,717	31,162	3,790
2008	259	49	1,609	1,541	0	0	26	40,765	105	2,757
2009	817	177	2,052	3,679	15	156	7,230	143,992	316,432	33,515
2010	531	91	2,636	3,190	1	178	9,969	77,965	95,217	9,590
2011	1,273	458	963	1,838	97	1,172	26,815	277,379	666,536	144,386
2012	765	194	957	1,875	2	21	3,908	66,127	11,333	670
2013	1,818	375	2,694	7,499	78	1,367	80,727	134,033	151,505	6,012
TOTAL	**7,795**	**2,046**	**15,207**	**39,165**	**194**	**2,965**	**252,341**	**2,427,989**	**1,770,185**	**245,475**

Note: The number '0' here denotes either absence of impact or no data at the time of data collection.

5 ANNEX FIVE

Summary: Impact of Disasters by Month (1996-2013)

Month	Data Cards	Deaths	Houses Destroyed	Houses Damaged	Hospitals/HC (Place) – Affected	Schools (Places) - Affected	Farming Crop (Ha.) - Damaged	Paddy Fields (Ha.) - Damaged	Rural Road (m) - Destroyed	National Road (m) - Destroyed
January	246	38	529	402	0	0	0	0	0	0
February	242	18	811	536	0	0	0	0	0	0
March	455	101	2,033	5,127	0	2	0	1,775	0	0
April	552	187	2,674	4,901	0	0	260	305	0	0
May	412	179	2,401	2,459	0	0	12,940	19,602	9,250	0
June	380	111	873	973	0	0	1,395	85,050	7,343	0
July	994	101	856	1,979	0	272	10,989	449,988	29,082	86
August	636	91	570	1,677	2	71	2,898	57,934	127,273	30,729
September	2,147	713	3,056	8,745	165	2,064	78,026	983,685	1,286,841	98,778
October	1,211	481	894	12,155	24	490	134,962	621,296	285,638	96,772
November	340	12	395	200	3	66	10,871	129,027	18,258	19,000
December	185	18	116	13	0	0	0	79,327	6,500	110
TOTAL	**7,800**	**2,050**	**15,208**	**39,167**	**194**	**2,965**	**252,341**	**2,427,989**	**1,770,185**	**245,475**

Note: The number '0' here denotes either absence of impact or no data at the time of data collection.

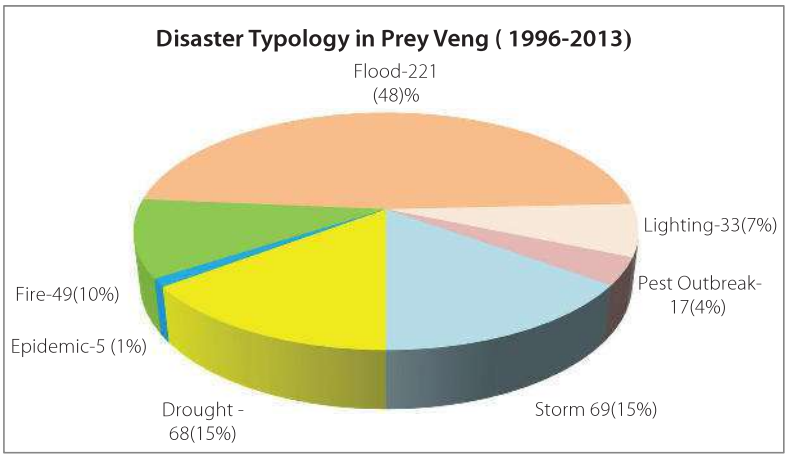
ANNEX SIX

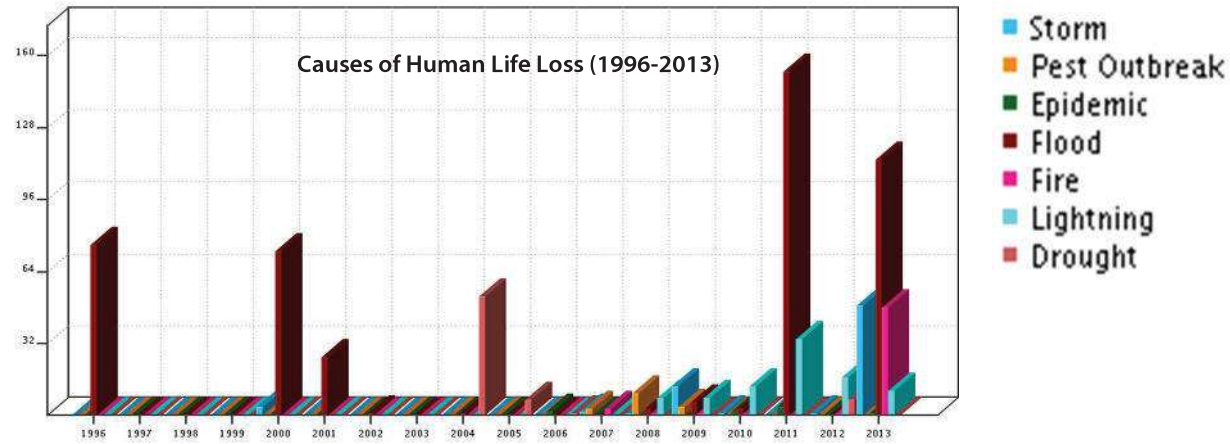
Summary: Impact of Disasters by Province (1996-2013)

Province	Data Cards	Deaths	Houses Destroyed	Houses Damaged	Paddy Fields (Ha.) – Damaged	Farming Crop (Ha.) – Damaged	Hospitals/HC (Place) - Affected	Rural Road (m) - Destroyed	National/Provincial/Road (m) - Destroyed	Schools (Places) - Affected
Banteay Meanchey	388	84	61	540	229,657	18,844	5	100,851	2,530	369
Battambang	425	124	2,034	6,918	302,454	73,064	26	4050	310	303
K.Cham	664	278	1,341	3,660	190,765	23,447	61	132,254	510	424
K. Chhnang	276	53	253	202	60,992	0	1	860	66	48
K. Speu	344	27	144	5,993	76,168	1,308	0	161,944	30,564	13
K.Thom	217	112	286	1,054	115,536	2,921	19	26,500	41,795	348
Kampot	427	52	177	1,399	79,328	1,808	0	31,150	9,625	0
Kandal	440	192	1,970	5,437	85,264	46,412	33	159,882	0	305
Kep	23	4	34	121	12	0	0	0	0	0
Koh Kong	97	6	146	670	2,933	464	0	206	0	0
Kratie	494	94	275	1,985	63,849	2,250	7	23,631	16,545	284
Mondul Kiri	114	29	131	21	32,728	3,579	0	0	0	0
Otdar Meanchey	198	18	677	509	45,134	4,540	0	460,364	50,823	15
Pailin	108	37	471	1,191	630	25,878	0	51,167	25,439	258
Phnom Penh	166	20	579	883	2,551	317	0	0	0	0
Preah Sihanouk	72	25	84	10	1,645	0	0	755	0	0
Preah Vihear	414	9	558	769	51,755	1,467	0	97,327	3,945	0
Prey Veng	462	305	1,140	2,221	333,323	1,833	28	287,507	1,432	308
Pursat	235	70	108	87	136,563	22,494	1	23	60,132	58
Ratanak Kiri	113	11	73	614	59,132	7,345	3	44,110	300	0
Siem Reap	1,135	143	3,532	1,768	75,864	3,348	5	75,080	1,279	151
Stung Treng	176	11	22	329	42,215	1,197	5	99,071	180	36
Svay Rieng	311	170	238	278	143,310	1,899	0	13,345	0	3
Takeo	501	176	874	2508	296,181	7,926	0	108	0	42
TOTAL	**7,800**	**2,050**	**15,208**	**39,167**	**2,427,989**	**252,341**	**194**	**1,770,185**	**245,475**	**2,965**

ANNEX SEVEN
Disaster Profile of Each Province

Prey Veng Province





Summary: Disaster Typology and Their Impacts

Event	Data Cards	Deaths	Houses Destroyed	Hospitals/HC (Place) - Affected	Schools (Places) - Affected	Paddy Fields (Ha.) - Destroyed	Rural Road (m) - Destroyed
Drought	68	0	0	0	0	74,725	0
Epidemic	5	4	0	0	0	0	0
Fire	49	6	134	0	0	0	0
Flood	221	235	10	28	308	236,736	287,507
Lightening	33	58	0	0	0	0	0
Pest Outbreak	17	0	0	0	0	2,838	0
Storm	69	2	996	0	0	0	0
TOTAL	**462**	**305**	**1,140**	**28**	**308**	**314,299**	**287,507**

Note: The number '0' here denotes either absence of impact or no data at the time of data collection.

Summary: Impacts of Disasters by District (1996-2013)

District	Data Cards	Deaths	Houses Destroyed	Hospitals/HC (Place) - Affected	Schools (Places) - Affected	Paddy Fields (Ha.) - Destroyed	Rural Road (m) – Destroyed
Ba Phnum	47	30	21	2	11	16,241	47,471
Kamchay Mear	23	3	62	0	0	2,824	28,000
Kampong Trabaek	46	18	28	0	21	16,800	37,680
Kanhchriech	30	15	14	0	2	8,307	8,000
Krong Prey Veng	20	4	4	0	7	17,234	11,070
Me Sang	22	7	70	0	0	697	0
Peam Chor	53	33	20	2	60	17,147	44,036
Peam Ro	20	9	1	0	18	1,924	752
Pea Reang	41	31	12	5	37	40,523	24,225
Porieng	21	3	0	10	22	723	10,610
Preah Sdach	60	28	12	3	47	21,636	60,397
Sithor Kandal	37	11	6	6	83	41,833	15,266
Svay Antor	25	4	3	0	0	4,396	0
Not assign	17	109	887	0	0	124,014	0
TOTAL	**462**	**305**	**1,140**	**28**	**308**	**314,299**	**287,507**

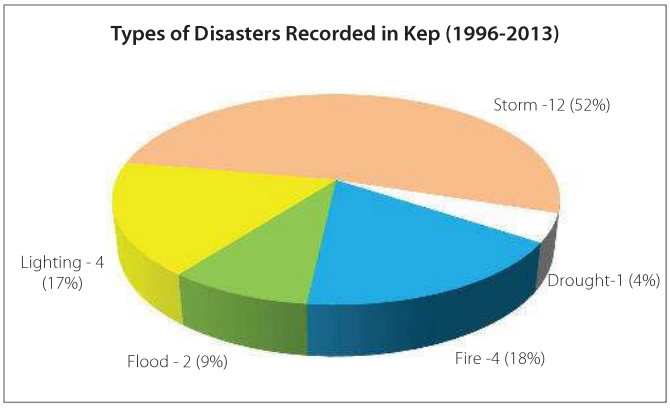
Note: The number '0' here denotes either absence of impact or no data at the time of data collection.

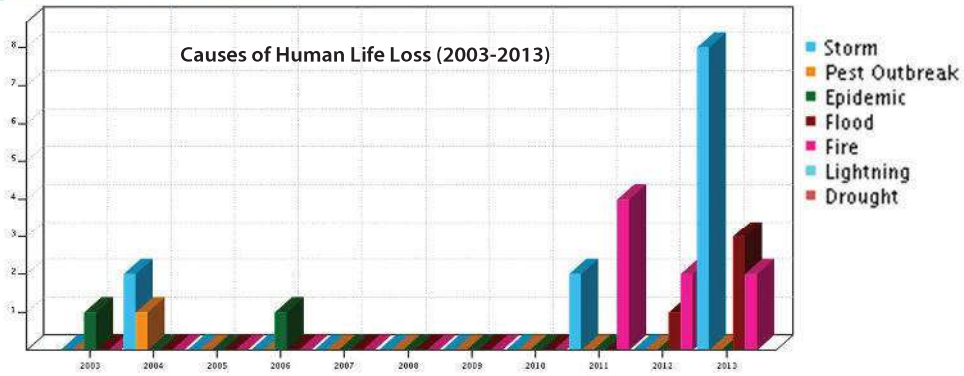
Summary: Impact of Disasters by Year (1996-2013)

Year	Data Cards	Deaths	Houses Destroyed	Hospitals/HC (Place) - Affected	Schools (Places) - Affected	Paddy Fields (Ha.) - Destroyed	Rural Road (m) - Destroyed
1996	1	75	0	0	0	80,885	0
1997	0	0	0	0	0	0	0
1998	0	0	0	0	0	0	0
1999	0	0	0	0	0	0	0
2000	12	65	198	0	20	84,059	212,700
2001	11	15	0	0	0	24,358	0
2002	1	0	0	0	0	0	0
2004	54	0	0	0	0	74,044	0
2005	7	0	0	0	0	0	0
2006	2	1	0	0	0	2,438	0
2007	8	0	15	0	0	2,780	0
2008	14	9	289	0	0	0	0
2009	25	7	351	0	0	58	0
2010	5	15	146	0	0	0	0
2011	119	72	0	21	227	41,711	33,796
2012	17	9	1		0	3,243	0
2013	186	37	140	7	61	723	41,011
TOTAL	**462**	**305**	**1,140**	**28**	**308**	**314,299**	**287,507**

Note: The number '0' here denotes either absence of disaster or its impact or no data at the time of data collection.

Keb Province

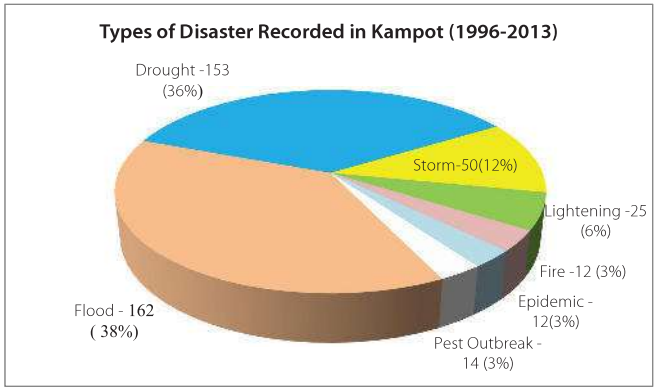


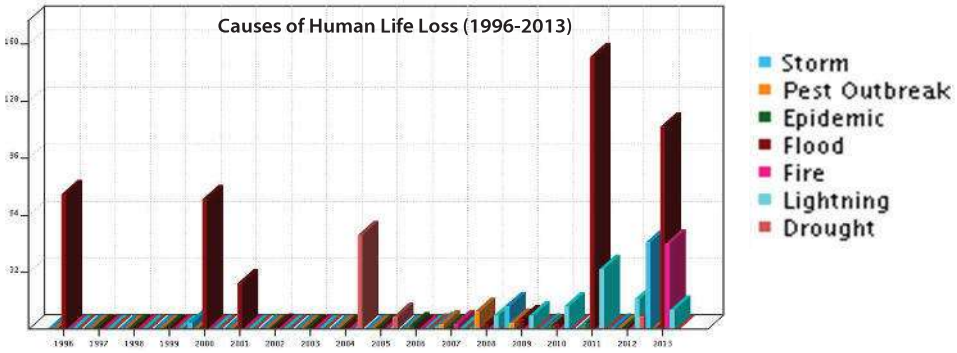


Summary: Impact of Disasters by District (1996-2013)

District	Data Cards	Deaths	Houses Destroyed
Damnak Chang'aeur	11	2	16
Krong Kaeb	6	2	3
Not assign	6	0	15
TOTAL	**23**	**4**	**34**

Kampot Province





Impact of Disasters by Year (1996-2013)

Year	Data Cards	Deaths	Houses Destroyed	Paddy Fields (Ha.) - Destroyed	Rural Road (m) - Destroyed
1996	19	0	0	9,227	0
1997	15	0	0	2,446	0
1998	0	0	0	0	0
1999	0	0	0	0	0
2000	26	8	34	18,807	0
2001	13	0	0	5,409	0
2002	53	1	0	13,258	1,050
2004	94	0	13	17,710	0
2005	11	4	0	0	0
2006	85	12	38	6,265	30,100
2007	10	0	7	30	0
2008	6	0	13	0	0
2009	3	3	3	0	0
2010	12	3	6	0	0
2011	34	7	8	286	0
2012	30	3	54	0	0
2013	16	11	1	0	0
TOTAL	**427**	**52**	**177**	**73,438**	**31,150**

Note: The number '0' here denotes either absence of disaster or its impact or no data at the time of data collection.

Disaster Typology and Their Impact

Event	Data Cards	Deaths	Houses Destroyed	Paddy Fields (Ha.) - Destroyed	Rural Road (m) - Destroyed
Drought	153	0	0	29,647	0
Epidemic	11	10	0	0	0
Fire	12	0	24	0	0
Flood	162	21	72	42,858	31,150
Lightening	25	18	1	0	0
Pest Outbreak	14	0	0	923	0
Storm	50	3	80	10	0
TOTAL	**427**	**52**	**177**	**73,438**	**31,150**

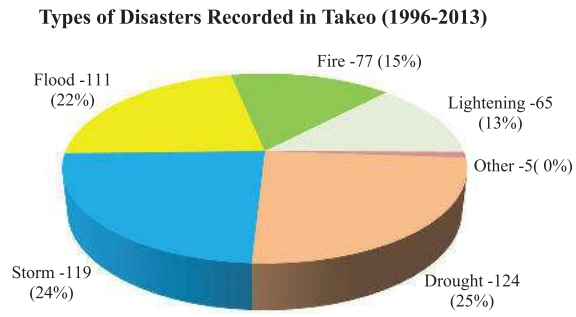
Note: The number '0' here denotes either absence of impact or no data at the time of data collection.

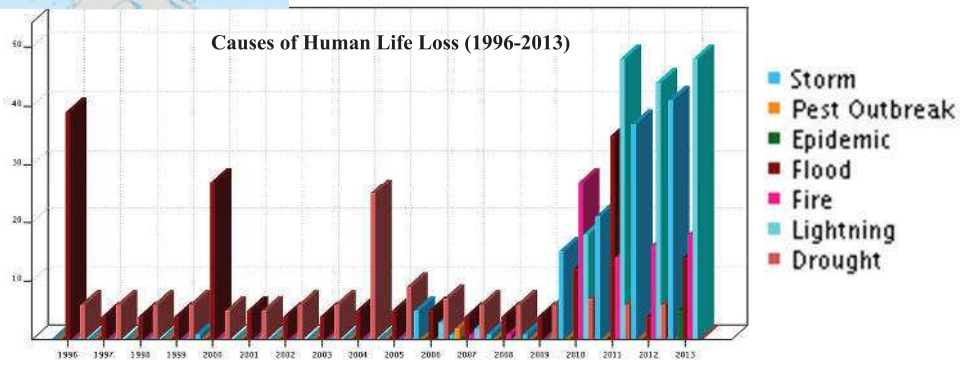
Summary: Impact of Disasters by District (1996-2013)

District	Data Cards	Deaths	Houses Destroyed	Paddy Fields (Ha.) - Destroyed	Rural Road (m) - Destroyed
Angkor Chey	39	6	21	2,884	0
Banteay Meas	95	7	21	23,148	0
Chhuk	49	6	13	3,605	0
Chum Kiri	32	0	16	6,156	0
Dang Tong	33	2	0	4,046	0
Kampongbye	10	0	4	550	0
Kampong Trach	100	6	69	18,199	0
Krong Kampot	31	12	16	5,023	30,100
Tuek Chhou	28	5	14	835	0
	10	8	3	8,992	1,050
TOTAL	**427**	**52**	**177**	**73,438**	**31,150**

Note: The number '0' here denotes either absence of impact or no data at the time of data collection.

Takeo Province





Impact of Disasters by Year (1996-2013)

Year	Data Cards	Deaths	Houses Destroyed	Schools (Places) - Affected	Paddy Fields (Ha.) - Destroyed	Rural Road (m) - Destroyed
1996	11	34	0	0	63,446	0
1997	10	0	0	0	7,427	0
1998	10	0	0	0	1,610	0
1999	10	0	0	0	2,971	0
2000	12	21	83	0	105,196	0
2001	10	0	0	0	34,470	0
2002	10	0	0	0	12,226	0
2003	10	0	0	0	436	0
2004	30	0	0	0	10,859	0
2005	14	0	0	0	199	0
2006	14	6	96	0	87	0
2007	15	1	8	0	3,418	0
2008	12	0	5	0	60	0
2009	11	0	17	0	760	0
2010	64	15	71	0	420	108
2011	86	38	47	42	5,535	0
2012	79	28	66	0	0	0
2013	93	33	481	0	0	0
TOTAL	**501**	**176**	**874**	**42**	**249,120**	**108**

Note: The number '0' here denotes either absence of impact or no data at the time of data collection.

Disaster Typology and Their Impacts (1996-2013)

Event	Data Cards	Deaths	Houses Destroyed	Schools (Places) - Affected	Paddy Fields (Ha.) - Destroyed	Rural Road (m) - Destroyed
Drought	124	0	0	0	43,173	0
Epidemic	3	2	0	0	0	0
Fire	77	0	134	0	0	0
Flood	111	72	24	42	202,590	108
Lightening	65	98	1	0	0	0
Pest Outbreak	2	0	0	0	3,357	0
Storm	119	4	715	0	0	0
TOTAL	**501**	**176**	**874**	**42**	**249,120**	**108**

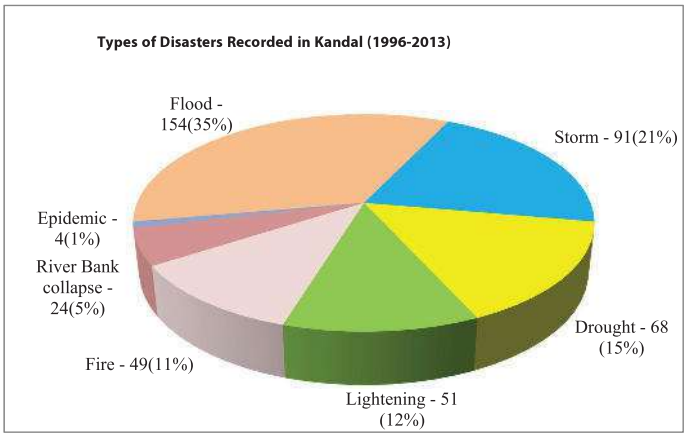
Note: The number '0' here denotes either absence of impact or no data at the time of data collection.

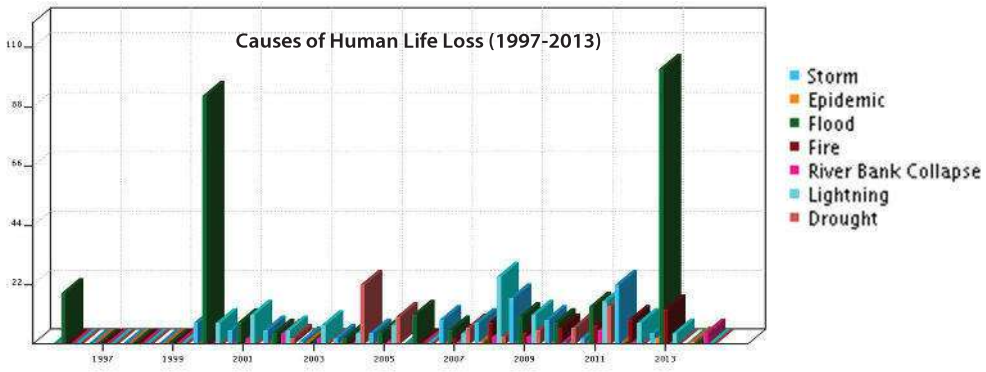
Impact of Disasters by District (1996-2013)

District	Data Cards	Deaths	Houses Destroyed	Schools (Places) - Affected	Paddy Fields (Ha.) - Destroyed	Rural Road (m) - Destroyed
Angkor Borei	34	7	28	5	8,195	0
Bati	60	13	82	0	3,423	0
Borei Cholsar	29	0	13	22	11,362	0
Kaoh Andaet	43	19	8	12	53,868	0
Kiri Vong	47	10	14	0	45,086	0
Krong Doun Kaev	34	3	9	1	1,541	0
Prey Kabbas	40	12	25	2	6,165	0
Samraong	80	27	293	0	11,664	108
Tram Kak	61	16	209	0	2,373	0
Treang	59	14	84	0	19,084	0
Not Assigned	14	55	109	0	86,359	0
TOTAL	**501**	**176**	**874**	**42**	**249,120**	**108**

Note: The number '0' here denotes either absence of impact or no data at the time of data collection.

Kandal Province





Impact of Disasters by Year (1996-2013)

Year	Data Cards	Deaths	Houses Destroyed	Hospitals/HC (Place) - Affected	Schools (Places) - Affected	Paddy Fields (Ha.) - Destroyed	Rural Road (m) - Destroyed
1996	1	18	0	0	0	14,826	0
1997	0	0	0	0	0	0	0
1998	0	0	0	0	0	0	0
1999	0	0	0	0	0	0	0
2000	15	93	782	0	0	21,127	34,730
2001	21	5	160	0	0	535	0
2002	17	3	53	0	3	7,536	283
2003	6	4	0	0	0	0	0
2004	28	2	3	0	0	6,991	0
2005	22	4	137	0	0	329	0
2006	11	0	0	1	0	52	0
2007	26	1	137	0	0	0	0
2008	33	15	169	0	0	0	0
2009	44	6	224	0	0	1,665	0
2010	29	1	62	0	0	1,550	0
2011	45	13	67	21	95	5,944	124,520
2012	33	7	98	0	0	0	0
2013	108	17	77	11	207	0	349
TOTAL	**439**	**189**	**1,969**	**33**	**305**	**60,555**	**159,882**

Note: The number '0' here denotes either absence of impact or no data at the time of data collection.

Disaster Typology and Their Impact (1996-2013)

Event	Data Cards	Deaths	Houses Destroyed	Hospitals/HC (Place) - Affected	Schools (Places) - Affected	Paddy Fields (Ha.) - Destroyed	Rural Road (m) - Destroyed
Drought	68	0	0	0	0	15,252	0
Epidemic	3	0	0	0	0	0	0
Fire	49	0	101	0	0	0	0
Flood	154	125	905	33	304	45,303	159,599
Lightening	51	59	1	0	0	0	0
River Bank Collapse	24	3	66	0	0	0	283
Storm	91	5	897	0	1	0	0
TOTAL	**440**	**192**	**1,970**	**33**	**305**	**60,555**	**159,882**

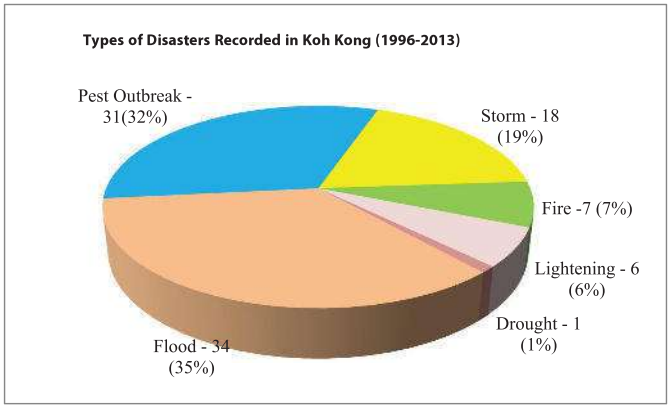
Note: The number '0' here denotes either absence of impact or no data at the time of data collection.

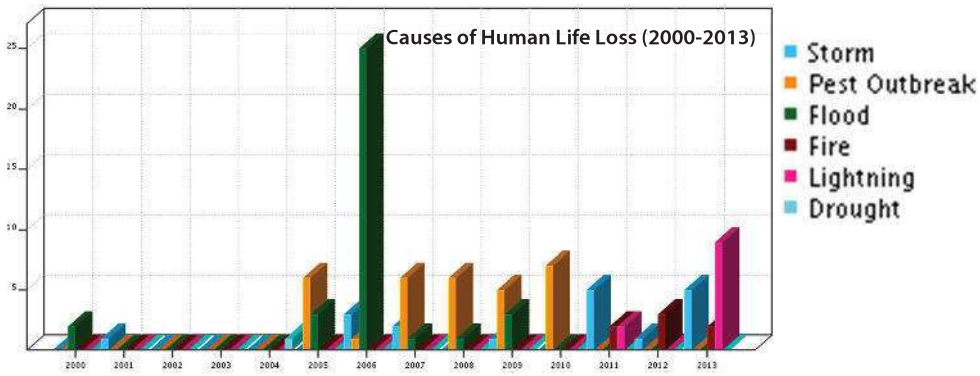
Impact of Disasters in Kandal by District (1996-2013)

District	Data Cards	Deaths	Houses Destroyed	Hospitals/HC (Place) - Affected	Schools (Places) - Affected	Paddy Fields (Ha.) - Destroyed	Rural Road (m) - Destroyed
Angk Snuol	31	1	25	0	0	800	0
Kandal Stueng	22	6	1	0	0	705	0
Kaoh Thum	27	6	147	0	1	803	0
Khsach Kandal	59	15	171	2	40	4,932	0
Kien Svay	26	8	61	11	11	225	0
Krong Ta Khmau	20	2	18	0	0	45	0
Leuk Daek	35	15	41	0	11	151	1,100
Lvea Aem	62	20	49	0	57	0	91,000
Mukh Kampul	48	8	134	8	29	578	33,869
Popnhea Lueu	41	21	817	2	25	2,224	33,630
S'ang	56	7	474	2	3	1,729	283
Not assign	13	83	32	8	128	48,363	0
TOTAL	**440**	**192**	**1,970**	**33**	**305**	**60,555**	**159,882**

Note: The number '0' here denotes either absence of impact or no data at the time of data collection.

Koh Kong Province





Impact of Disasters by Years (1996-2013)

Year	Data Cards	Deaths	Houses Destroyed	Paddy Fields (Ha.) - Destroyed	Rural Road (m) - Destroyed
1996	0	0	0	0	0
1997	0	0	0	0	0
1998	0	0	0	0	0
1999	0	0	0	0	0
2000	1	1	0	0	0
2001	1	0	0	0	0
2004	1	0	0	551	0
2005	9	0	0	935	0
2006	29	0	59	1439	206
2007	9	0	34	8	0
2008	7	0	0	0	0
2009	9	0	0	0	0
2010	7	0	0	0	0
2011	8	1	1	0	0
2012	4	0	6	0	0
2013	12	4	46	0	0
TOTAL	**97**	**6**	**146**	**2933**	**206**

Note: The number '0' here denotes either absence of disaster and/or its impact or no data at the time of data collection.

Disaster Typology and Their Impacts (1996-2013)

Event	Data Cards	Deaths	Houses Destroyed	Paddy Fields (Ha.) - Destroyed	Rural Road (m) - Destroyed
Drought	1	0	0	551	0
Fire	7	0	9	0	0
Flood	34	1	47	2,374	206
Lightening	6	5	0	0	0
Pest Outbreak	31	0	0	8	0
Storm	18	0	90	0	0
TOTAL	**97**	**6**	**146**	**2,933**	**206**

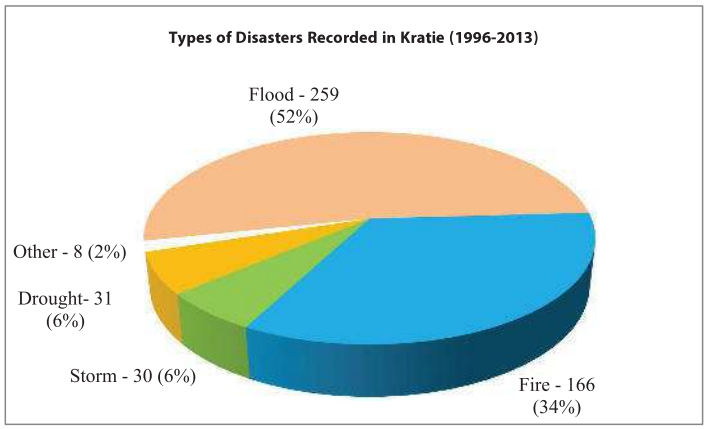
Note: The number '0' here denotes either absence of impact or no data at the time of data collection.

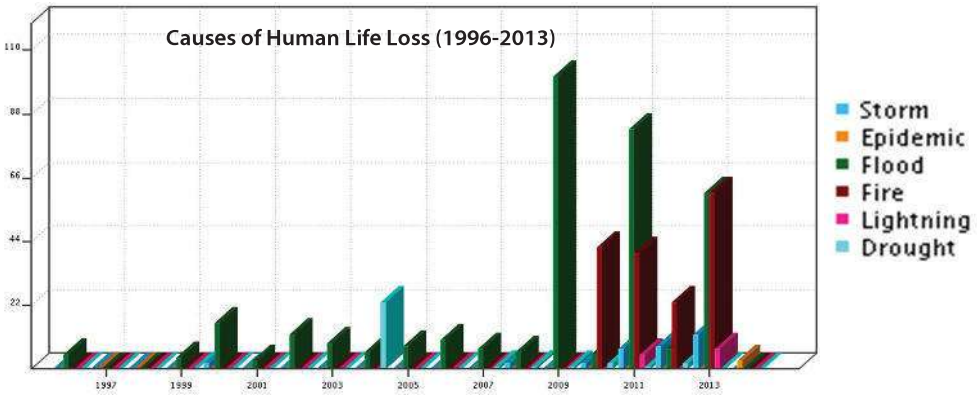
Summary: Impact of Disasters by District (1996-2013)

District	Data Cards	Deaths	Houses Destroyed	Paddy Fields (Ha.) - Destroyed	Rural Road (m) – Destroyed
Botum Sakor	13	0	2	31	0
Kiri Sakor	5	0	0	2	0
Koh Kong	17	1	23	38	0
Krong Khemarak Phoumin	16	0	14	1	0
Mondol Seima	15	1	61	0	0
Srae Ambel	18	1	46	2,310	206
Thma Bang	10	2	0	0	0
Not assign	3	1	0	551	0
TOTAL	**97**	**6**	**146**	**2,933**	**206**

Note: The number '0' here denotes either absence of impact or no data at the time of data collection.

Kratie Province





Impact of Disasters by Year (1996-2014)

Year	Data Cards	Deaths	Houses Destroyed	Schools (Places) - Affected	Paddy Fields (Ha.) - Destroyed	Rural Road (m) - Destroyed	Farming Crop (Ha.) - Destroyed
1996	1	4	0	0	6,588	0	876
1997[1]	0	0	0	0	0	0	0
1998	0	0	0	0	0	0	0
1999	1	3	1	0	0	0	0
2000	3	15	58	0	9,056	0	1,015
2001	1	2	4	0	0	0	0
2002	3	9	1	0	0	0	0
2003	2	7	0	0	0	0	0
2004	28	1	0	0	16,155	0	0
2005	3	5	0	45	91	0	0
2006	7	3	1	0	37	0	0
2007	8	0	0	0	210	0	0
2008	7	2	10	0	244	0	26
2009	97	5	6	17	6,341	6	21
2010	49	2	0	0	452	0	0
2011	115	21	58	162	12,418	21,325	176
2012	37	3	5	0	46	0	0
2013	130	11	131	60	0	2,300	98
TOTAL	**492**	**93**	**275**	**284**	**51,638**	**23,631**	**2,212**

Note: The number '0' here denotes either absence of impact or no data at the time of data collection.

Summary: Disaster Typology and their Impact

Event	Data Cards	Deaths	Houses Destroyed	Schools (Places) - Affected	Paddy Fields (Ha.) - Destroyed	Rural Road (m) - Destroyed	Farming Crop (Ha.) - Destroyed
Drought	31	0	0	0	15,899	0	15
Epidemic	2	1	0	0	0	0	0
Fire	166	0	105	0	0	0	0
Flood	259	84	46	284	35,634	23,631	2,197
Lightening	6	6	0	0	0	0	0
Storm	30	3	124	0	105	0	0
TOTAL	**494**	**94**	**275**	**284**	**51,638**	**23,631**	**2,212**

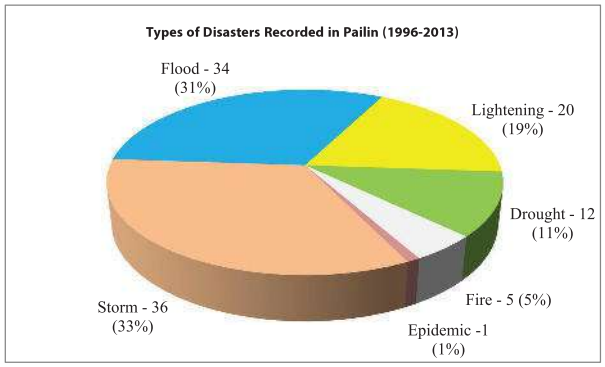
Note: The number '0' here denotes either absence of impact or no data at the time of data collection.

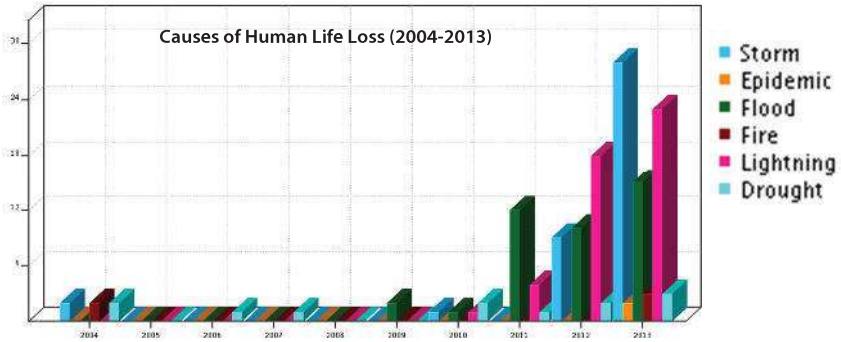
Summary: Impact of Disasters by District (1996-2013)

District	Data Cards	Deaths	Houses Destroyed	Schools (Places) - Affected	Paddy Fields (Ha.) - Destroyed	Rural Road (m) - Destroyed	Farming Crop (Ha.) - Destroyed
Chhloung	84	47	18	114	7,640	13,225	4
Chitr Borie	94	2	26	37	2,186	9,600	12
Krong Kracheh	57	8	62	36	11,603	300	876
Preaek Prasab	57	13	11	25	3,041	0	63
Sambour	139	4	96	27	7,039	506	242
Snuol	56	3	62	0	1,761	0	0
Not assign	7	17	0	45	18,368	0	1,015
TOTAL	**494**	**94**	**275**	**284**	**51,638**	**23,631**	**2,212**

Note: The number '0' here denotes either absence of impact or no data at the time of data collection.

Pailin Province





Summary: Impact of Disasters by Years (1996-2013)

Year	Data Cards	Deaths	Houses Destroyed	Schools (Places) - Affected	Farming Crop (Ha.) - Destroyed	Paddy Fields (Ha.) - Destroyed	Rural Road (m) - Destroyed
1996	0	0	0	0	0	0	0
1997	0	0	0	0	0	0	0
1998	0	0	0	0	0	0	0
1999	0	0	0	0	0	0	0
2000	0	0	0	0	0	0	0
2001	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0
2003	0	0	0	0	0	0	0
2004	6	0	0	0	0	65	0
2006	1	0	0	0	7,510	0	0
2007	1	0	0	0	50	0	0
2009	2	0	0	0	0	0	6,500
2010	5	0	0	0	3,121	0	0
2011	15	2	40	258	1,459	50	28,027
2012	23	16	218	0	3,842	180	9,330
2013	55	19	213	0	4,670	305	7,310
TOTAL	**108**	**37**	**471**	**258**	**20,652**	**600**	**51,167**

Note: The number '0' here denotes either absence of impact or no data at the time of data collection.

Summary: Disaster Typology and Their Impact

Event	Data Cards	Deaths	Houses Destroyed	Schools (Places) - Affected	Farming Crop (Ha.) - Destroyed	Paddy Fields (Ha.) - Destroyed	Rural Road (m) - Destroyed
Drought	12	0	0	0	17681	500	0
Epidemic	1	1	0	0	0	0	0
Fire	5	0	10	0	0	0	0
Flood	34	6	248	258	2971	100	51167
Lightening	20	26	0	0	0	0	0
Storm	36	4	213	0	0	0	0
TOTAL	**108**	**37**	**471**	**258**	**20,652**	**600**	**51,167**

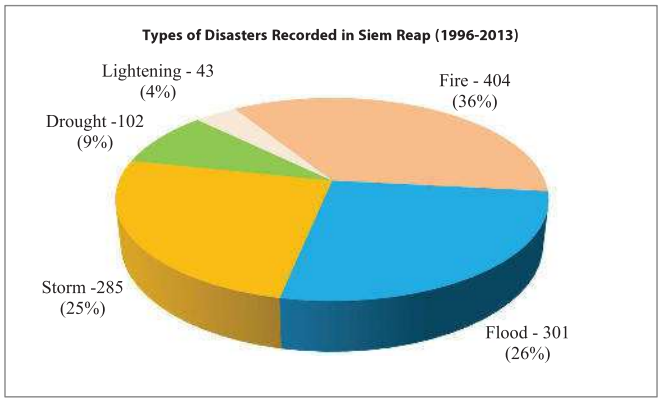
Note: The number '0' here denotes either absence of impact or no data at the time of data collection.

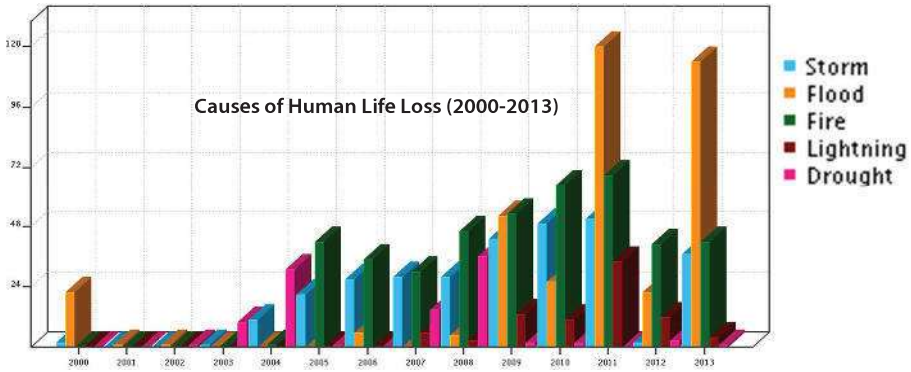
Summary: Impact of Disasters by District (1996-2013)

District	Data Cards	Deaths	Houses Destroyed	Schools (Places) - Affected	Farming Crop (Ha.) - Destroyed	Paddy Fields (Ha.) - Destroyed	Rural Road (m) - Destroyed
Krong Pailin	41	12	62	0	260	305	13,900
Sala Krau	42	18	319	0	1,620	50	11,840
Not assign	25	7	90	258	18,772	245	25,427
TOTAL	**108**	**37**	**471**	**258**	**20,652**	**600**	**51,167**

Note: The number '0' here denotes either absence of impact or no data at the time of data collection.

Siem Reap Province





Summary: Impact of Disasters by Year (2000-2013)

Year	Data Cards	Deaths	Houses Destroyed	Schools (Places) - Affected	Farming Crop (Ha.) - Destroyed	Paddy Fields (Ha.) - Destroyed	Rural Road (m) - Destroyed
1996	0	0	0	0	0	0	0
1997	0	0	0	0	0	0	0
1998	0	0	0	0	0	0	0
1999	0	0	0	0	0	0	0
2000	3	21	27	0	581	0	0
2001	1	0	0	0	16	0	0
2002	2	0	0	0	0	9	0
2003	11	0	4	0	0	779	0
2004	43	0	140	0	0	8,556	0
2005	59	5	734	0	0	0	0
2006	68	0	221	0	0	180	0
2007	76	3	215	0	0	2,009	0
2008	116	2	568	0	0	221	0
2009	147	16	409	75	612	390	12,500
2010	141	12	604	52	0	0	3,783
2011	235	39	246	12	206	0	42,217
2012	52	28	24	12	17	105	0
2013	181	17	340	0	0	185	16,580
TOTAL	**1,135**	**143**	**3,532**	**151**	**1,432**	**12,434**	**75,080**

Note: The number '0' here denotes either absence of impact or no data at the time of data collection.

Summary: Disaster Typology and Their Impact (2000-2013)

Event	Data Cards	Deaths	Houses Destroyed	Hospitals/ HC (Place) - Affected	Schools (Places) - Affected	Farming Crop (Ha.) - Destroyed	Paddy Fields (Ha.) - Destroyed	Rural Road (m) - Destroyed
Drought	102	0	0	0	0	305	12,219	0
Fire	404	20	1,021	0	0	0	0	0
Flood	301	68	130	5	151	1,127	185	75,080
Lightening	43	40	7	0	0	0	30	0
Storm	285	15	2,374	0	0	0	0	0
TOTAL	**1,135**	**143**	**3,532**	**5**	**151**	**1,432**	**12,434**	**75,080**

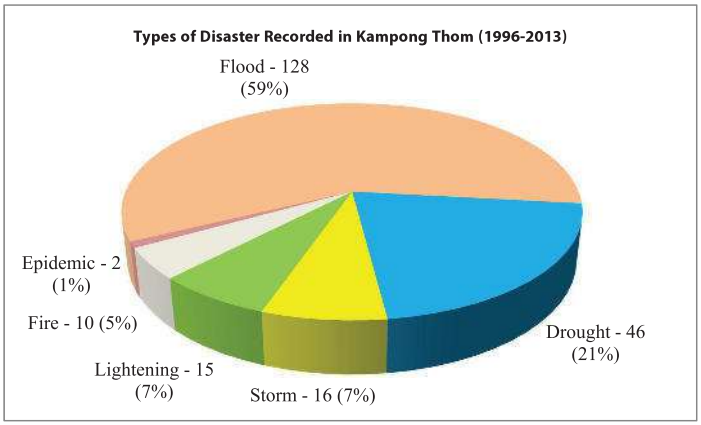
Note: The number '0' here denotes either absence of impact or no data at the time of data collection.

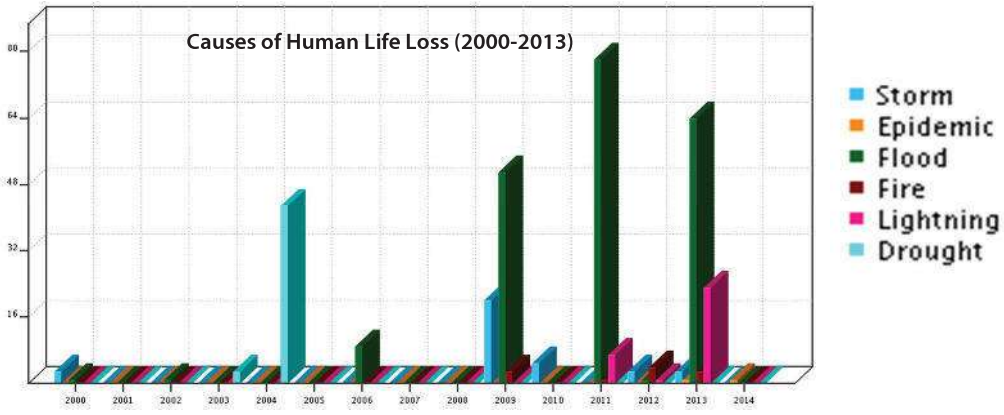
Summary: Impact of Disasters by District (2000-2013)

District	Data Cards	Deaths	Houses Destroyed	Schools (Places) - Affected	Farming Crop (Ha.) - Destroyed	Paddy Fields (Ha.) - Destroyed	Rural Road (m) - Destroyed
Angkor Chum	65	7	156	0	305	805	18,570
Angkor Thum	55	1	118	0	38	289	1,555
Banteay Srei	67	3	123	10	6	211	1,400
Chi Kraeng	118	7	264	12	0	810	4,693
Kralanh	71	11	71	0	0	2,127	830
Krong Siem Reab	143	40	529	52	0	260	7
Prasat Bakong	128	8	624	0	17	190	133
Puok	236	23	805	68	289	170	24,635
Soutr Nikom	100	11	433	2	0	1,160	776
Srei Snam	62	2	133	0	0	810	11,060
Svay Leu	20	1	26	0	180	493	75
Varin	58	0	118	5	0	1,110	11,241
Not assign	12	29	132	2	597	3,999	105
TOTAL	**1,135**	**143**	**3,532**	**151**	**1,432**	**12,434**	**75,080**

Note: The number '0' here denotes either absence of impact or no data at the time of data collection.

Kampong Thom Province





Disaster Typology and Their Impact

Event	Data Cards	Deaths	Houses Destroyed	Farming Crop (Ha.) - Destroyed	Paddy Fields (Ha.) - Destroyed
Drought	1	0	0	0	1,130
Epidemic	4	1	0	0	0
Fire	144	5	579	0	0
Flood	8	2	0	317	1,421
Lightening	9	12	0	0	0
TOTAL	**166**	**20**	**579**	**317**	**2,551**

Note: The number '0' here denotes either absence of impact or no data at the time of data collection.

Summary: Impact of Disasters by Year (1996-2013)

Year	Data Cards	Deaths	Houses Destroyed	Farming Crop (Ha.) - Destroyed	Paddy Fields (Ha.) - Destroyed
1996	1	0	0	0	0
1997	0	0	0	0	0
1998	0	0	0	0	0
1999	0	0	0	0	0
2000	1	0	0	317	128
2001	1	0	0	0	0
2002	0	0	0	0	0
2003	1	0	0	0	1,293
2004	1	0	0	0	1,130
2005	0	0	0	0	0
2006	0	0	0	0	0
2007	5	1	117	0	0
2008	0	0	0	0	0
2009	2	0	230	0	0
2010	2	0	0	0	0
2011	7	8	0	0	0
2012	60	4	154	0	0
2013	85	7	78	0	0
TOTAL	**166**	**20**	**579**	**317**	**2,551**

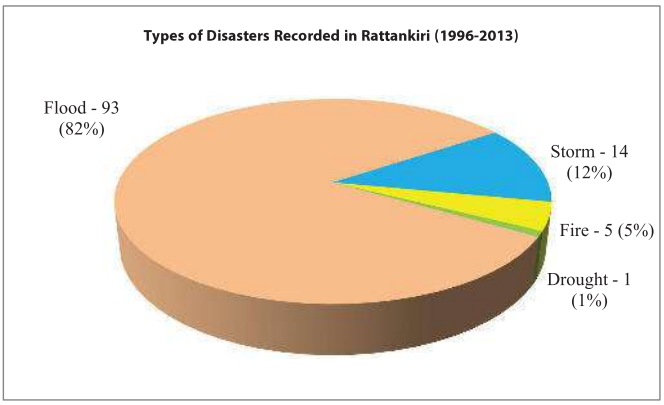
Note: The number '0' here denotes either absence of impact or no data at the time of data collection.

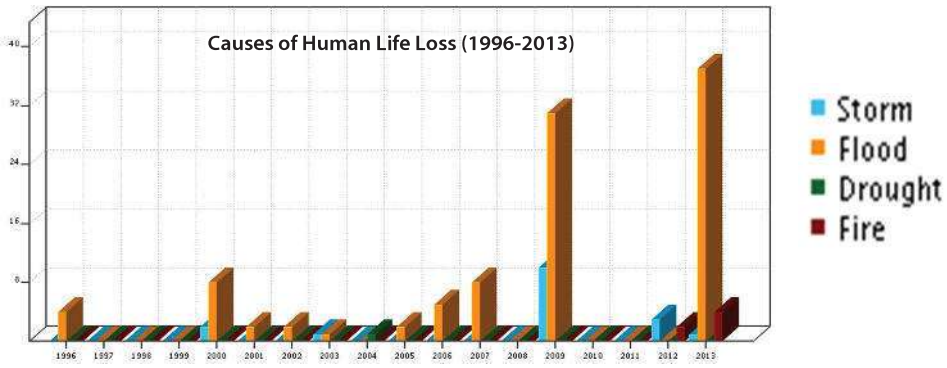
Summary: Impact of Disasters by District (1996-2013)

District	Data Cards	Deaths	Houses Destroyed	Farming Crop (Ha.) - Destroyed	Paddy Fields (Ha.) – Destroyed
Chamkar Mon	20	2	21	0	0
Dangkao	13	6	3	0	0
Doun Penh	11	0	14	0	0
Mean Chey	30	4	55	0	0
Porsenchey	17	0	16	0	0
Prampir Meakkakra	9	0	0	0	0
Ruessei Kaev	31	2	341	0	0
Saensokh	13	4	12	0	0
Tuol Kouk	17	0	117	0	0
Not assign	5	2	0	317	2,551
TOTAL	**166**	**20**	**579**	**317**	**2,551**

Note: The number '0' here denotes either absence of impact or no data at the time of data collection.

Rattank Kiri





Summary: Disaster Typology and Their Impact

Event	Data Cards	Deaths	Houses Destroyed	Hospitals/HC (Place) - Affected	Farming Crop (Ha.) - Destroyed	Paddy Fields (Ha.) - Destroyed	Rural Road (m) - Destroyed
Drought	1	0	0	0	0	6,415	0
Fire	5	1	9	0	0	0	0
Flood	93	7	29	0	2,762	36,805	44,110
Storm	14	3	35	3	0	0	0
TOTAL	**113**	**11**	**73**	**3**	**2,762**	**43,220**	**44,110**

Note: The number '0' here denotes either absence of impact or no data at the time of data collection.

Summary: Impact of Disasters by Years (1996-2013)

Year	Data Cards	Deaths	Houses Destroyed	Hospitals/HC (Place) - Affected	Farming Crop (Ha.) - Destroyed	Paddy Fields (Ha.) - Destroyed	Rural Road (m) - Destroyed
1996	1	3	0	0	1,394	0	0
1997	0	0	0	0	0	0	0
1998	0	0	0	0	0	0	0
1999	0	0	0	0	0	0	0
2000	9	1	8	0	0	2251	0
2001	2	0	0	0	0	122	0
2002	2	0	0	0	0	219	0
2003	2	0	0	0	0	0	0
2004	1	0	0	0	0	6415	0
2005	2	0	0	0	0	397	0
2006	5	0	0	0	0	1198	0
2007	8	0	0	0	0	227	0
2008	0	0	0	0	0	0	0
2009	35	6	40	3	1,364	32391	23,110
2010	0	0	0	0	0	0	0
2011	0	0	0	0	0	0	0
2012	4	1	13	0	0	0	0
2013	42	0	12	0	4	0	21,000
TOTAL	**113**	**11**	**73**	**3**	**2,762**	**43220**	**44,110**

Note: The number '0' here denotes either absence of impact or no data at the time of data collection.

Summary: Disaster Typology and Their Impact

Event	Data Cards	Deaths	Houses Destroyed	Hospitals/ HC (Place) - Affected	Schools (Places) - Affected	Farming Crop (Ha.) - Destroyed	Paddy Fields (Ha.) - Destroyed	Rural Road (m) - Destroyed
Drought	66	0	0	0	0	0	96,736	0
Epidemic	6	4	0	0	0	0	0	0
Fire	140	1	308	0	0	0	0	0
Flood	196	178	112	61	423	2,1378	85,865	132,154
Lightening	64	89	0	0	0	0	0	0
River Bank Collapse	19	0	1	0	0	0	0	100
Storm	173	6	920	0	1	0	0	0
TOTAL	**664**	**278**	**1,341**	**61**	**424**	**21,378**	**182,601**	**132,254**

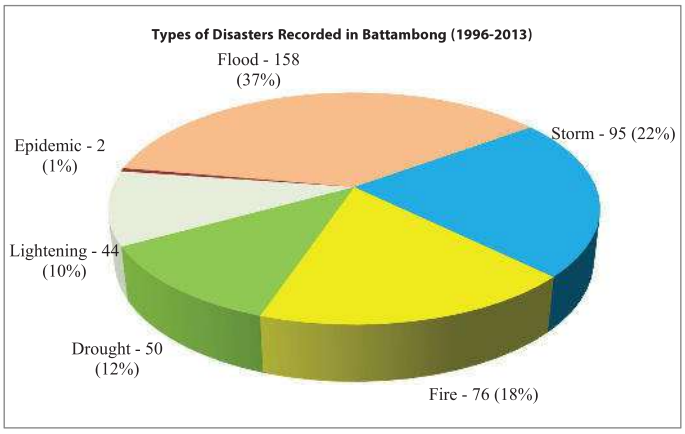
Note: The number '0' here denotes either absence of impact or no data at the time of data collection.

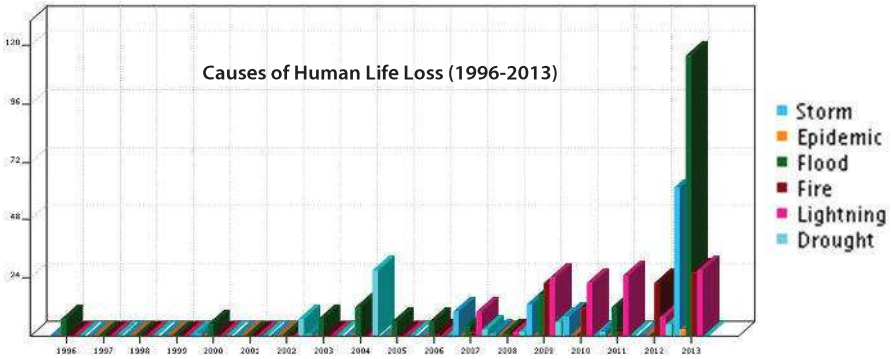
Summary: Impact of Disasters by Districts (1996-2013)

District	Data Cards	Deaths	Houses Destroyed	Hospitals/ HC (Place) - Affected	Schools (Places) - Affected	Farming Crop (Ha.) - Destroyed	Paddy Fields (Ha.) - Destroyed	Rural Road (m) – Destroyed
Batheay	49	18	98	5	18	0	14,964	300
Chamkar Leu	23	2	64	0	0	0	2,190	0
Cheung Prey	36	9	52	0	0	0	2,402	0
Dambae	32	8	45	0	0	0	4,219	0
Kampong Siem	39	8	18	2	54	0	2,492	4,130
Kang Meas	43	22	206	9	54	0	1,539	400
Kaoh Soutin	51	16	41	22	81	0	1,637	5,870
Krong Kampong Cham	13	1	11	0	0	0	124	0
Krouch Chhmar	69	11	35	5	32	0	3,987	2,280
Memot	32	2	149	0	0	0	5,622	0
Ou Reang Ov	21	3	10	0	1	10	3,919	0
Ponhea Kraek	20	6	7	0	0	0	2,414	0
Prey Chhor	37	11	261	0	2	0	2,270	0
Srei Santhor	74	12	66	14	97	0	6,294	72,257
Stueng Trang	55	10	45	3	49	6	2,392	0
Tboung Khmum	56	16	104	1	36	0	22,102	100
Not assign	14	123	129	0	0	21,362	104,034	46,917
TOTAL	**664**	**278**	**1,341**	**61**	**424**	**21,378**	**182,601**	**132,254**

Note: The number '0' here denotes either absence of impact or no data at the time of data collection.

Battambong Province





Summary: Disaster Typology and Their Impact

Event	Data Cards	Deaths	Houses Destroyed	Hospitals/ HC (Place) - Affected	Schools (Places) - Affected	Farming Crop (Ha.) - Destroyed	Paddy Fields (Ha.) - Destroyed	Rural Road (m) – Destroyed
Drought	50	0	0	0	0	0	84,214	0
Epidemic	2	1	0	0	0	0	0	0
Fire	76	12	373	0	0	0	0	0
Flood	158	35	98	26	303	36,966	0	4,050
Lightening	44	74	7	0	0	0	0	0
Storm	95	2	1,556	0	0	0	0	0
TOTAL	**425**	**124**	**2,034**	**26**	**303**	**36,966**	**84,214**	**4,050**

Note: The number '0' here denotes either absence of impact or no data at the time of data collection.

Summary: Impact of Disasters by Year (1996-2013)

Year	Data Cards	Deaths	Houses Destroyed	Hospitals/HC (Place) - Affected	Schools (Places) - Affected	Farming Crop (Ha.) - Destroyed	Paddy Fields (Ha.) - Destroyed	Rural Road (m) – Destroyed
1996	1	6	0	0	0	0	0	0
1997	0	0	0	0	0	0	0	0
1998	0	0	0	0	0	0	0	0
1999	0	0	0	0	0	0	0	0
2000	2	4	0	0	0	36,310	0	0
2001	0	0	0	0	0	0	0	0
2002	7	0	0	0	0	0	0	0
2003	8	0	10	0	0	0	0	0
2004	39	0	0	0	0	0	83,964	0
2005	6	0	0	0	0	0	0	0
2006	7	0	0	0	0	0	0	0
2007	23	6	261	0	0	0	0	0
2008	6	1	0	0	0	0	0	0
2009	55	27	183	0	0	650	250	4,050
2010	26	16	912	0	0	0	0	0
2011	21	20	14	4	77	0	0	0
2012	31	4	33	0	0	0	0	0
2013	193	40	621	22	226	6	0	0
TOTAL	**425**	**124**	**2,034**	**26**	**303**	**36,966**	**84,214**	**4,050**

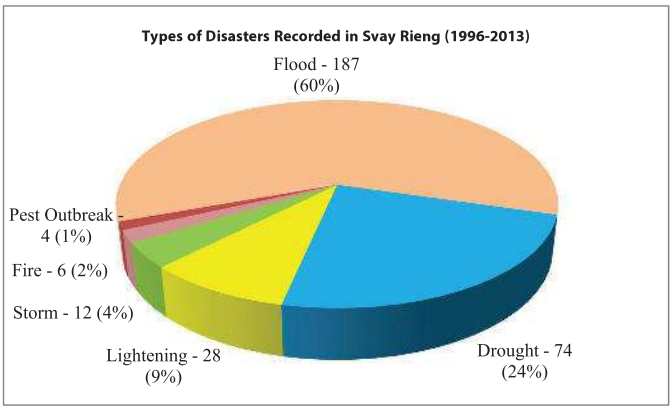
Note: The number '0' here denotes either absence of impact or no data at the time of data collection.

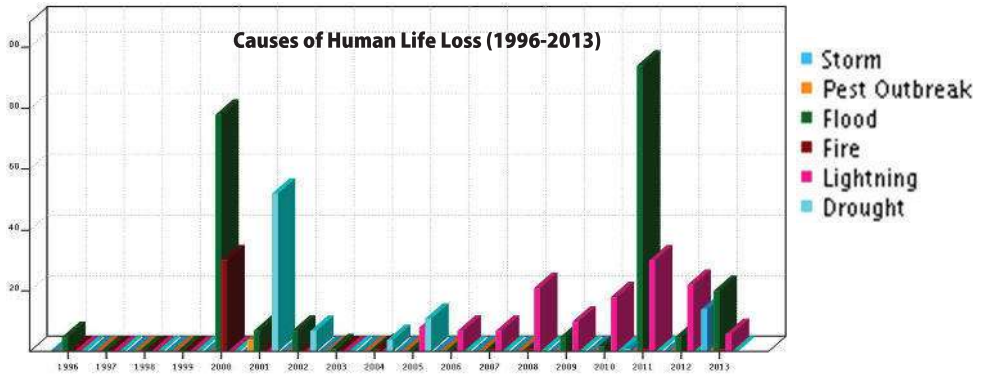
Summary: Impact of Disasters by District (1996-2013)

District	Data Cards	Deaths	Houses Destroyed	Hospitals/HC (Place) - Affected	Schools (Places) - Affected	Farming Crop (Ha.) - Destroyed	Paddy Fields (Ha.) - Destroyed	Rural Road (m) – Destroyed
Aek Phnum	16	4	44	1	58	0	290	0
Banan	36	6	74	1	18	0	1,808	0
Bavel	40	4	140	10	72	0	6,638	0
Kamrieng	41	8	208	0	11	487	0	3,000
Koas Krala	20	4	84	0	0	0	0	0
Krong Battambang	26	2	35	0	0	0	1,087	0
Moung Ruessei	41	13	85	1	41	0	18,483	0
Phnom Proek	24	0	162	0	10	163	0	1,050
Rotonak Mondol	20	5	39	0	0	0	0	0
Rukhak Kiri	23	4	21	1	5	0	0	0
Samlout	21	2	49	0	0	0	0	0
Sampov Lun	14	3	91	0	9	0	0	0
Sangkae	43	13	32	6	52	0	4,950	0
Thma Koul	37	9	30	6	27	6	5,200	0
Not assign[2]	23	47	940	0	0	36,310	45,758	0
TOTAL	**425**	**124**	**2,034**	**26**	**303**	**36,966**	**84,214**	**4,050**

Note: The number '0' here denotes either absence of impact or no data at the time of data collection.

Svay Rieng





Summary: Disaster Typology and Their Impact

Event	Data Cards	Deaths	Houses Destroyed	Schools (Places) - Affected	Farming Crop (Ha.) - Destroyed	Paddy Fields (Ha.) - Destroyed	Rural Road (m) - Destroyed
Drought	74	0	0	0	0	24,611	0
Fire	6	29	113	0	0	0	0
Flood	187	37	76	3	1,594	106,696	13,345
Lightening	28	101	0	0	0	0	0
Pest Outbreak	4	0	0	0	0	1,128	0
Storm	12	3	49	0	0	0	0
TOTAL	**311**	**170**	**238**	**3**	**1,594**	**132,435**	**13,345**

Note: The number '0' here denotes either absence of impact or no data at the time of data collection.

Summary: Impact of Disasters by Year (1996-2013)

Year	Data Cards	Deaths	Houses Destroyed	Schools (Places) - Affected	Farming Crop (Ha.) - Destroyed	Paddy Fields (Ha.) - Destroyed	Rural Road (m) - Destroyed
1996	1	4	0	0	252	17876	0
1997	0	0	0	0	0	0	0
1998	0	0	0	0	0	0	0
1999	0	0	0	0	0	0	0
2000	50	58	0	0	1,111	51,832	0
2001	63	0	0	0	0	12,947	0
2002	14	0	0	0	0	15,517	0
2003	1	0	0	0	0	0	0
2004	5	0	26	0	0	6,839	0
2005	12	7	0	0	0	0	0
2006	1	6	0	0	0	0	0
2007	2	6	2	0	0	0	0
2008	2	20	42	0	0	0	0
2009	6	9	0	0	0	0	0
2010	3	17	0	0	0	285	0
2011	104	22	92	1	228	27,139	13,345
2012	13	14	0	0	0	0	0
2013	34	7	76	2	3	0	0
TOTAL	**311**	**170**	**238**	**3**	**1,594**	**132,435**	**13,345**

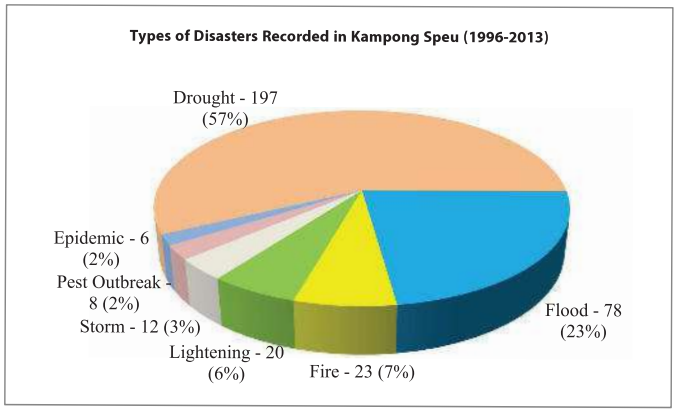
Note: The number '0' here denotes either absence of impact or no data at the time of data collection.

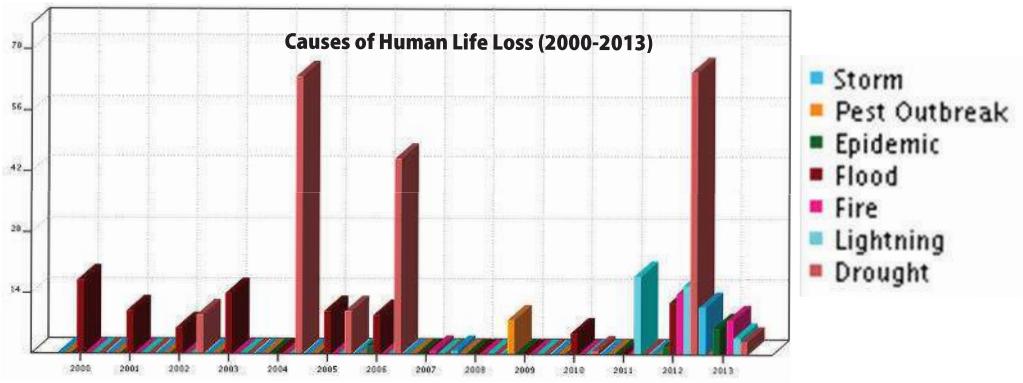
Summary: Impact of Disasters by District (1996-2013)

District	Data Cards	Deaths	Houses Destroyed	Farming Crop (Ha.) - Destroyed	Paddy Fields (Ha.) - Destroyed	Rural Road (m) - Destroyed
Chantrea	35	1	0	80	10,314	0
Kampong Rou	64	2	8	140	28,212	8,315
Krong Bavet	8	1	0	0	186	0
Krong Svay Rieng	36	1	8	193	2,723	0
Romeas Haek	51	2	2	47	10,421	500
Rumduol	22	3	27	25	1,639	0
Svay Chrum	57	7	69	264	26,015	4,530
Svay Teab	16	2	6	35	4,786	0
Not assign	22	151	118	810	48,139	0
TOTAL	**311**	**170**	**238**	**1,594**	**132,435**	**13,345**

Note: The number '0' here denotes either absence of impact or no data at the time of data collection.

Kampong Speu Province





Summary: Disaster Typology and Their Impact

Event	Data Cards	Deaths	Houses Destroyed	Schools (Places) - Affected	Farming Crop (Ha.) - Destroyed	Paddy Fields (Ha.) - Destroyed	Rural Road (m) - Destroyed
Drought	197	0	0	11	214	35,535	62
Epidemic	6	4	0	0	0	0	0
Fire	23	0	22	0	0	0	0
Flood	78	5	37	2	925	9,839	161,882
Lightening	20	18	0	0	0	0	0
Pest Outbreak	8	0	0	0	0	1,128	0
Storm	12	0	85	0	0	0	0
TOTAL	**344**	**27**	**144**	**13**	**1,139**	**46,502**	**161,944**

Note: The number '0' here denotes either absence of impact or no data at the time of data collection.

Summary: Impact of Disasters by Year (2000-2013)

Year	Data Cards	Deaths	Houses Destroyed	Schools (Places) - Affected	Farming Crop (Ha.) - Destroyed	Paddy Fields (Ha.) - Destroyed	Rural Road (m) - Destroyed
2000	14	3	34	0	468	3,755	105,000
2001	8	2	0	0	281	1,876	0
2002	15	0	0	0	38	2,996	0
2003	14	0	0	0	0	254	46
2004	64	0	0	0	0	31,396	0
2005	20	0	2	0	0	0	37,355
2006	55	1	1	0	0	1,036	18,919
2007	1	0	4	0	0	0	0
2008	1	0	0	0	0	0	0
2009	8	0	0	0	0	1,128	0
2010	6	0	0	13	352	3,309	124
2011	9	9	0	0	0	0	0
2012	101	8	11	0	0	722	500
2013	28	4	92	0	0	30	0
TOTAL	**344**	**27**	**144**	**13**	**1,139**	**46,502**	**161,944**

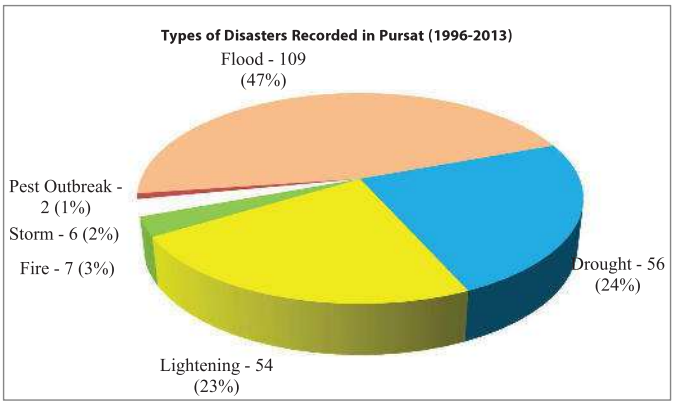
Note: The number '0' here denotes either absence of impact or no data at the time of data collection.

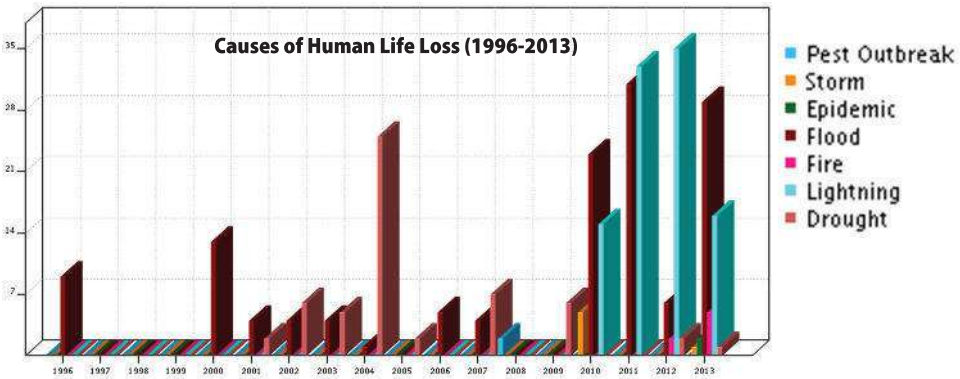
Summary: Impact of Disasters by Districts (1996-2013)

District	Data Cards	Deaths	Houses Destroyed	Schools (Places) - Affected	Farming Crop (Ha.) - Destroyed	Paddy Fields (Ha.) - Destroyed	Rural Road (m) - Destroyed
Aoral	35	3	26	0	193	3,732	10,048
Basedth	50	3	6	0	32	3,543	10,600
Kong Pisei	32	3	12	0	61	1,239	32,000
Krong Chbar Mon	15	3	20	0	147	364	21,640
Odongk	60	8	21	2	25	2,819	9,200
Phnum Sruoch	36	0	38	0	96	2,037	61,310
Samraong Tong	72	4	20	0	371	9,428	7,584
Thpong	39	3	1	0	38	1,236	9,500
	5	0	0	11	176	22,104	62
TOTAL	**344**	**27**	**144**	**13**	**1,139**	**46,502**	**161,944**

Note: The number '0' here denotes either absence of impact or no data at the time of data collection.

Pursat Province





Summary: Disaster Typology and Their Impact (1996-2013)

Event	Data Cards	Deaths	Houses Destroyed	Schools (Places) - Affected	Farming Crop (Ha.) - Destroyed	Rural Road (m) - Destroyed
Drought	56	0	0	0	0	0
Epidemic	1	1	0	0	0	0
Fire	7	0	10	0	0	0
Flood	109	24	79	58	1,687	23
Lightening	54	45	2	0	0	0
Pest Outbreak	2	0	0	0	0	0
Storm	6	0	17	0	0	0
TOTAL	**235**	**70**	**108**	**58**	**1,687**	**23**

Note: The number '0' here denotes either absence of impact or no data at the time of data collection.

Summary: Impact of Disasters by Year (1996-2013)

Year	Data Cards	Deaths	Houses Destroyed	Schools (Places) - Affected	Farming Crop (Ha.) - Destroyed	Rural Road (m) - Destroyed
1996	1	8	0	0	1,168	0
1997	0	0	0	0	0	0
1998	0	0	0	0	0	0
1999	0	0	0	0	0	0
2000	5	8	0	0	0	0
2001	6	0	0	0	0	0
2002	10	0	0	0	0	0
2003	9	0	11	0	0	0
2004	26	0	0	0	0	0
2005	2	0	0	0	0	0
2006	5	0	43	0	0	23
2007	11	0	0	0	0	0
2008	2	0	0	0	0	0
2009	6	0	0	0	0	0
2010	36	7	19	0	0	0
2011	43	21	6	31	519	0
2012	30	15	6	0	0	0
2013	43	11	23	27	0	0
TOTAL	**235**	**70**	**108**	**58**	**1,687**	**23**

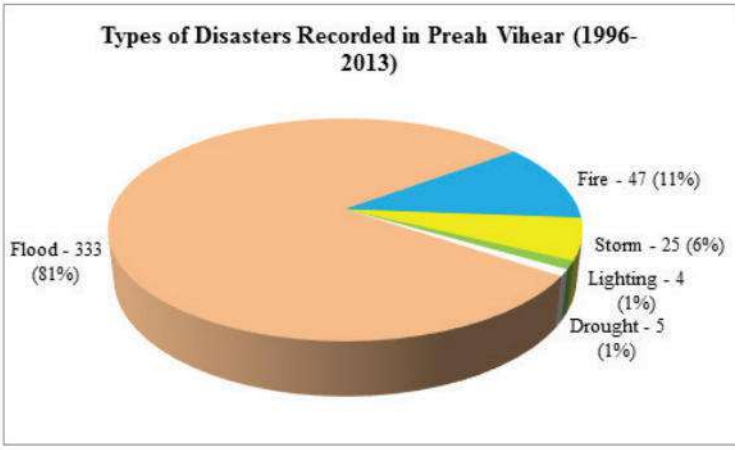
Note: The number '0' here denotes either absence of impact or no data at the time of data collection.

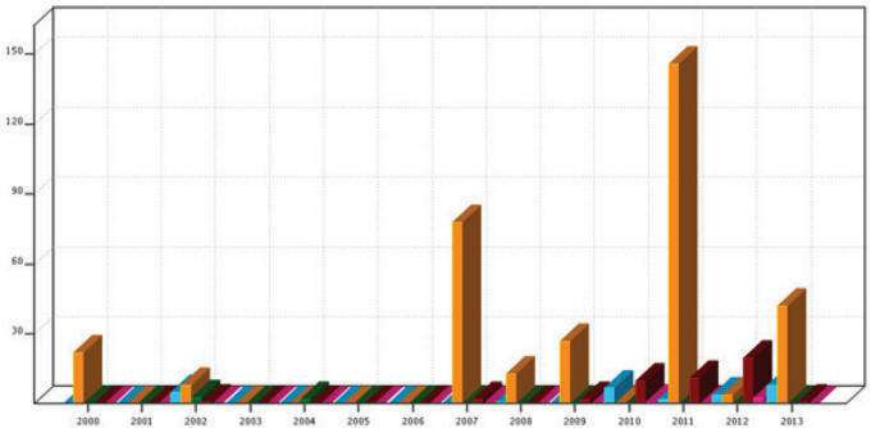
Summary: Impact of Disasters by District (1996-2013)

District	Data Cards	Deaths	Houses Destroyed	Schools (Places) - Affected	Farming Crop (Ha.) - Destroyed	Rural Road (m) – Destroyed
Bakan	55	22	16	27	200	0
Kandieng	54	11	27	17	289	23
Krakor	43	8	15	6	30	0
Krong Pursat	32	5	2	6	0	0
Phnum Kravanh	29	6	0	2	0	0
Veal Veaeng	19	2	48	0	0	0
Not assign	3	16	0	0	1168	0
TOTAL	**235**	**70**	**108**	**58**	**1,687**	**23**

Note: The number '0' here denotes either absence of impact or no data at the time of data collection.

Preah Vihear Province





Summary: Disaster Typology and Their Impact

Event	Data Cards	Deaths	Houses Destroyed	Farming Crop (Ha.) - Destroyed	Paddy Fields (Ha.) - Destroyed	Rural Road (m) - Destroyed
Drought	5	0	0	0	3,007	0
Fire	47	0	149	0	0	0
Flood	333	7	44	1,170	40,193	97,327
Lightening	4	0	1	0	0	0
Storm	25	2	364	0	0	0
TOTAL	414	9	558	1,170	43,200	97,327

Note: The number '0' here denotes either absence of impact or no data at the time of data collection.

Summary: Impact of Disasters by Year (2000-2013)

Year	Data Cards	Deaths	Houses Destroyed	Farming Crop (Ha.) - Destroyed	Paddy Fields (Ha.) - Destroyed	Rural Road (m) - Destroyed
2000	22	0	0	0	434	44,800
2002	17	0	72	0	2,184	0
2004	2	0	0	0	888	0
2007	78	2	71	3	7,172	31,162
2008	14	0	0	0	1,885	105

2009	29	0	0	0	12,284	19,031
2010	18	0	318	0	0	0
2011	155	4	73	1,158	18,353	2,214
2012	31	0	0	0	0	0
2013	48	3	24	9	0	15
TOTAL	414	9	558	1,170	43,200	97,327

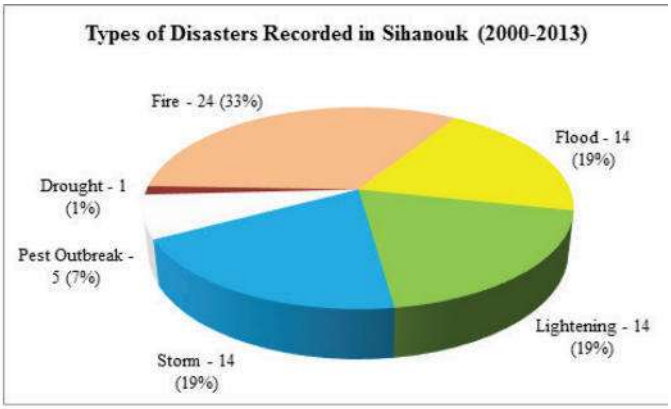
Note: The number '0' here denotes either absence of impact or no data at the time of data collection.

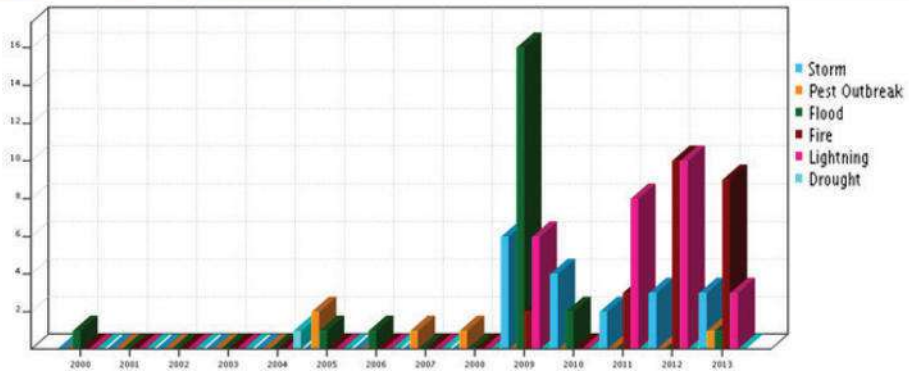
Summary: Impact of Disasters by Year (2000-2013)

District	Data Cards	Deaths	Houses Destroyed	Farming Crop (Ha.) - Destroyed	Paddy Fields (Ha.) - Destroyed	Rural Road (m) - Destroyed
Chey Saen	39	0	14	68	10,062	38,992
Chhaeb	43	3	12	982	1,831	11,772
Choam Khsant	74	4	32	0	5,619	8,231
Krong Preah Vihear	44	2	26	53	673	3,293
Kuleaen	68	0	269	0	10,913	4,031
Rovieng	34	0	27	63	739	10,470
Sangkum Thmei	41	0	13	4	741	8,472
Tbaeng Mean Chey	45	0	30	0	715	12,020
Not assign	26	0	135	0	11,907	46
TOTAL	414	9	558	1,170	43,200	97,327

Note: The number '0' here denotes either absence of impact or no data at the time of data collection.

Preah Sihanouk Province





Summary: Disaster Typology and Their Impact

Event	Data Cards	Deaths	Houses Destroyed	Farming Crop (Ha.) - Destroyed	Paddy Fields (Ha.) - Destroyed	Rural Road (m) - Destroyed
Drought	1	0	0	200	0	
Fire	24	0	81	0	0	
Flood	14	8	0	1,292	755	
Lightening	14	13	0	0	0	
Pest Outbreak	5	0	0	50	0	
Storm	14	4	3	83	0	
TOTAL	72	25	84	1,625	755	

Note: The number '0' here denotes either absence of impact or no data at the time of data collection.

Summary: Impact of Disasters by Year (2000-2013)

Year	Data Cards	Deaths	Houses Destroyed	Farming Crop (Ha.) - Destroyed	Paddy Fields (Ha.) - Destroyed	Rural Road (m) - Destroyed
2000	1	0	0	950	0	
2001	0	0	0	0	0	
2002	0	0	0	0	0	
2003	0	0	0	0	0	
2004	1	0	0	200	0	
2005	3	0	0	157	0	
2006	1	0	0	112	0	

2007	1	0	0	0	0	
2008	1	0	0	0	0	
2009	14	16	11	0	755	
2010	6	0	0	156	0	
2011	9	4	16	0	0	
2012	19	4	49	0	0	
2013	16	1	8	50	0	
TOTAL	72	25	84	1,625	755	

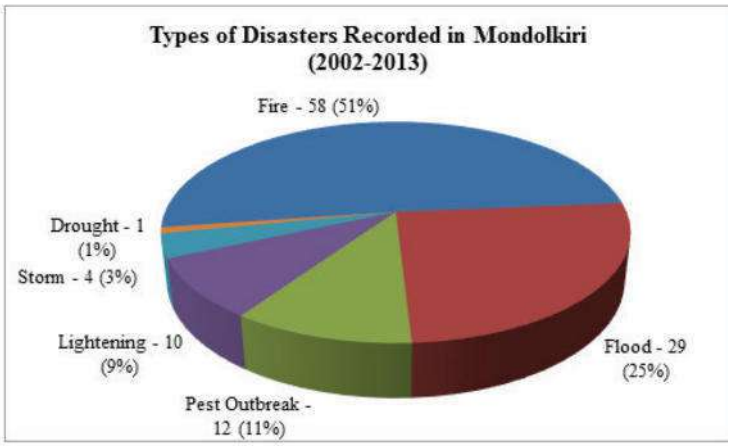
Note: The number '0' here denotes either absence of impact or no data at the time of data collection.

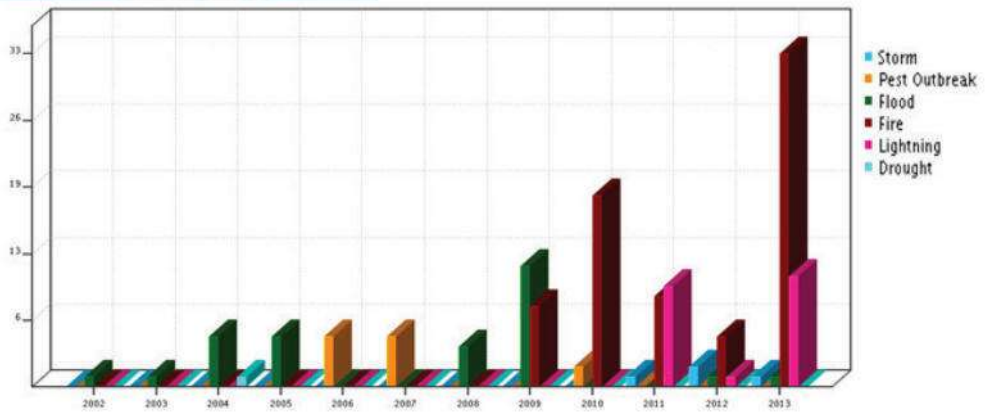
Summary: Impact of Disasters by Year (2000-2013)

District	Data Cards	Deaths	Houses Destroyed	Paddy Fields (Ha.) - Destroyed	Rural Road (m) – Destroyed
Kampong Seila	11	1	7	269	0
Krong Preah Sihanouk	17	1	63	0	0
Prey Nob	31	19	9	186	755
Stueng Hav	8	0	5	0	0
Not assign	5	4	0	1,170	0
TOTAL	72	25	84	1,625	755

Note: The number '0' here denotes either absence of impact or no data at the time of data collection.

Mondulkiri Province





Summary: Disaster Typology and Their Impact

Event	Data Cards	Deaths	Houses Destroyed	Farming Crop (Ha.) - Destroyed	Paddy Fields (Ha.) - Destroyed
Drought	1	0	0	0	10,099
Fire	58	16	88	0	0
Flood	29	1	15	3,516	15,875
Lightening	10	12	2	0	0
Pest Outbreak	12	0	0	0	656
Storm	4	0	26	0	0
TOTAL	114	29	131	3,516	26,630

Note: The number '0' here denotes either absence of impact or no data at the time of data collection.

Summary: Impact of Disasters by Year (2000-2013)

Year	Data Cards	Deaths	Houses Destroyed	Farming Crop (Ha.) - Destroyed	Paddy Fields (Ha.) - Destroyed
2002	1	0	0	0	1,635
2003	1	0	0	1,713	0
2004	6	0	0	1,803	18,943
2005	5	0	0	0	1,035
2006	5	0	0	0	436
2007	5	0	0	0	209
2008	4	0	0	0	114
2009	19	1	23	0	1,605
2010	21	0	42	0	11
2011	13	7	9	0	0
2012	9	0	27	0	2,642
2013	25	21	30	0	0
TOTAL	114	29	131	3,516	26,630

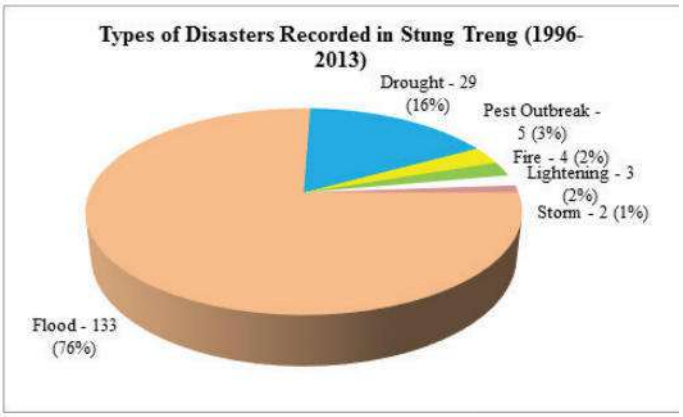
Note: The number '0' here denotes either absence of impact or no data at the time of data collection.

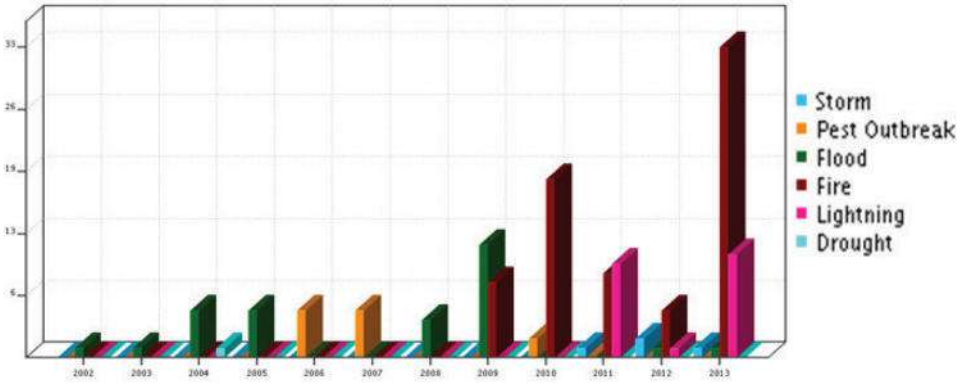
Summary: Impact of Disasters by Year (2002-2013)

District	Data Cards	Deaths	Houses Destroyed	Farming Crop (Ha.) - Destroyed	Paddy Fields (Ha.) - Destroyed
Kaev Seima	29	3	58	385	1,708
Kaoh Nheaek	25	1	21	54	9,145
Krong Saen Monourom	20	14	17	38	870
Ou Reang	12	6	3	13	1,122
Pech Chreada	25	5	32	1,313	2,051
Not assign	3	0	0	1,713	11,734
TOTAL	114	29	131	3,516	26,630

Note: The number '0' here denotes either absence of impact or no data at the time of data collection.

Stung Treng Province





Summary: Disaster Typology and Their Impact

Event	Data Cards	Deaths	Houses Destroyed	Hospitals/HC (Place) - Affected	Schools (Places) – Affected	Farming Crop (Ha.) - Destroyed	Paddy Fields (Ha.) - Destroyed	Rural Road (m) - Destroyed
Drought	29	0	0	0	0	0	6,494	0
Fire	4	0	4	0	0	0	0	0
Flood	133	9	18	5	36	528	18,942	99,071
Lightening	3	2	0	0	0	0	0	0
Pest Outbreak	5	0	0	0	0	0	938	0
Storm	2	0	0	0	0	0	0	0
TOTAL	176	11	22	5	36	528	26,374	99,071

Note: The number '0' here denotes either absence of impact or no data at the time of data collection.

Summary: Impact of Disasters by Year (1996-2013)

Year	Data Cards	Deaths	Houses Destroyed	Hospitals/HC (Place) - Affected	Schools (Places) – Affected	Farming Crop (Ha.) - Destroyed	Paddy Fields (Ha.) - Destroyed	Rural Road (m) - Destroyed
1996	1	3	0	0	0	0	5,958	0
1997	0	0	0	0	0	0	0	0
1998	0	0	0	0	0	0	0	0
1999	0	0	0	0	0	0	0	0
2000	5	3	7	0	3	238	2,854	12,100
2001	6	0	3	0	0	219	3,137	0

2002	7	0	3	0	0	0	0	0
2003	10	0	0	0	0	0	3,724	0
2004	10	0	0	0	0	0	1,596	0
2005	1	0	0	0	0	0	1,504	0
2006	10	0	0	0	0	0	370	0
2007	10	0	0	0	0	0	420	0
2009	38	0	0	0	0	5	5,477	40,806
2010	10	0	0	0	0	0	426	0
2011	26	1	0	0	0	0	908	22,030
2012	3	1	0	0	0	0	0	0
2013	39	3	9	5	33	66	0	24,135
TOTAL	176	11	22	5	36	528	26,374	99,071

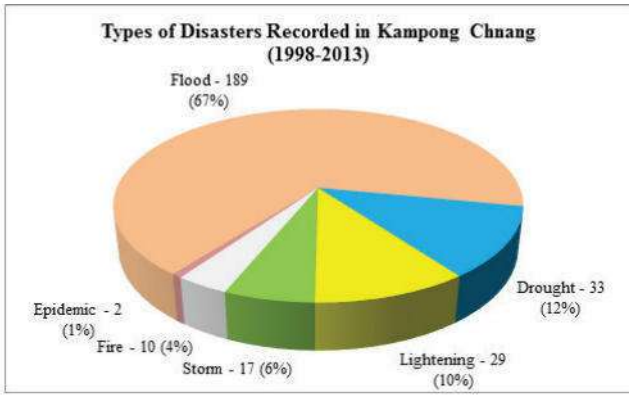
Note: The number '0' here denotes either absence of impact or no data at the time of data collection.

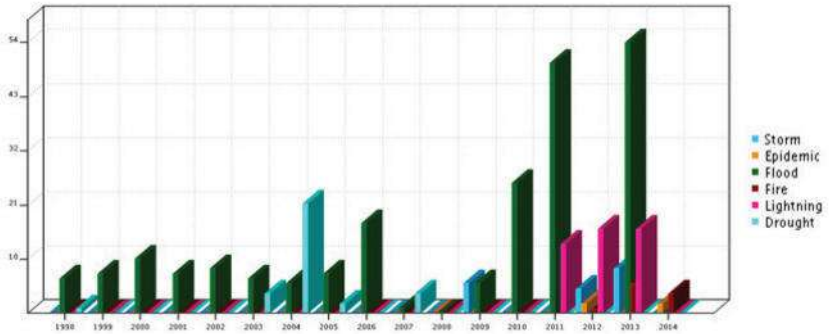
Summary: Impact of Disasters by Year (1996-2013)

District	Data Cards	Deaths	Houses Destroyed	Schools (Places) - Affected	Farming Crop (Ha.) - Destroyed	Paddy Fields (Ha.) - Destroyed	Rural Road (m) - Destroyed
Krong Stueng Traeng	26	3	3	10	152	1,499	22,768
Sesan	53	0	6	10	55	5,942	36,570
Siem Bouk	28	1	5	1	110	2,596	18,570
Siem Pang	26	1	0	13	109	3,778	13,998
Thala Barivat	37	3	5	2	102	3,501	7,165
Not assign	6	3	3	0	0	9,058	0
TOTAL	176	11	22	36	528	26,374	99,071

Note: The number '0' here denotes either absence of impact or no data at the time of data collection.

Kampong Chhnang Province





Summary: Disaster Typology and Their Impact

Event	Data Cards	Deaths	Houses Destroyed	Schools (Places) - Affected	Paddy Fields (Ha.) - Destroyed	Rural Road (m) - Destroyed
Drought	33	0	0	0	20,525	0
Epidemic	1	1	0	0	0	0
Fire	7	0	3	0	0	0
Flood	189	30	40	48	38,744	860
Lightening	29	19	0	0	0	0
Storm	17	3	210	0	0	0
TOTAL	276	53	253	48	59,269	860

Note: The number '0' here denotes either absence of impact or no data at the time of data collection.

Summary: Impact of Disasters by Year (1998-2013)

Year	Data Cards	Deaths	Houses Destroyed	Schools (Places) - Affected	Farming Crop (Ha.) - Destroyed	Paddy Fields (Ha.) - Destroyed	Rural Road (m) - Destroyed
1998	8	0	0	0	0	1,042	0
1999	8	0	0	0	0	505	0
2000	9	2	0	0	0	16,417	0
2001	8	0	0	0	0	5,720	0
2002	9	0	0	0	0	2,065	0
2003	11	0	0	0	0	11,647	0
2004	28	0	0	0	0	18,263	0
2005	10	0	0	0	0	27	0
2006	18	0	0	0	0	38	563
2007	5	0	0	0	0	70	0
2009	10	2	139	0	0	437	0
2010	25	1	23	7	0	3,033	7
2011	41	23	0	0	0	5	290
2012	18	7	25	0	0	0	0
2013	68	18	66	41	0	0	0
TOTAL	276	53	253	48	0	59,269	860

Note: The number '0' here denotes either absence of impact or no data at the time of data collection.

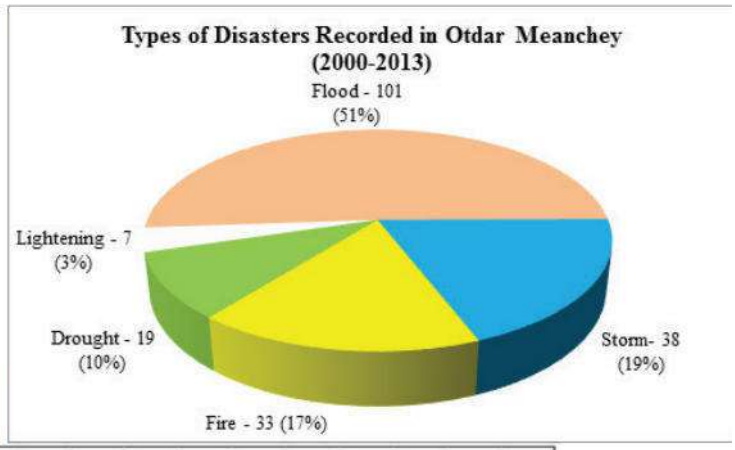
Summary: Impact of Disasters by Year (1998-2013)

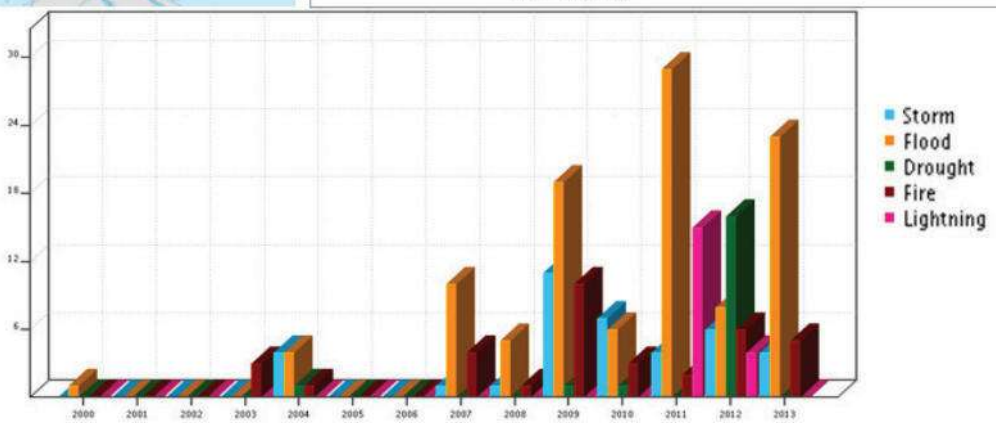
District	Data Cards	Deaths	Houses Destroyed	Schools (Places) - Affected	Paddy Fields (Ha.) - Destroyed	Rural Road (m) - Destroyed
Baribour	46	8	33	4	12,936	290
Chol Kiri	33	10	154	15	3,528	0
Kampong Leaeng	36	8	23	2	5,562	0
Kampong Tralach	34	10	17	16	6,795	423
Krong Kampong Chhnang	26	2	2	1	313	0
Rolea B'ier	43	8	22	10	5,843	75
Sameakki Mean Chey	21	0	1	0	2,818	10

Tuek Phos	30	3	1	0	3,871	62
Not assign	7	4	0	0	17,603	0
TOTAL	276	53	253	48	59,269	860

Note: The number '0' here denotes either absence of impact or no data at the time of data collection.

Otdar Meanchey Province





Summary: Disaster Typology and Their Impact

Event	Data Cards	Deaths	Houses Destroyed	Schools (Places) - Affected	Farming Crop (Ha.) - Destroyed	Paddy Fields (Ha.) - Destroyed	Rural Road (m) - Destroyed
Drought	19	0	0	0	0	35,805	0
Fire	33	2	247	0	0	0	0
Flood	101	4	149	15	1,802	7,247	460,364
Lightening	7	12	0	0	0	0	0
Storm	38	0	281	0	210	0	0
TOTAL	198	18	677	15	2,012	43,052	460,364

Note: The number '0' here denotes either absence of impact or no data at the time of data collection.

Summary: Impact of Disasters by Year (2000-2013)

Year	Data Cards	Deaths	Houses Destroyed	Schools (Places) - Affected	Farming Crop (Ha.) - Destroyed	Paddy Fields (Ha.) - Destroyed	Rural Road (m) - Destroyed
2000	1	0	0	0	210	4,037	0
2001	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0
2003	0	0	0	0	0	0	0

2003	3	0	22	0	0	0	0
2004	10	0	70	0	45	3,525	0
2007	15	0	148	0	0	15	0
2008	7	0	30	0	0	0	0
2009	39	2	106	0	0	138	90,460
2010	17	0	67	0	210	1,221	0
2011	40	10	169	8	1,547	1,886	335,627
2012	38	2	29	0	0	32,230	1,471
2013	28	4	36	7	0	0	32,806
TOTAL	198	18	677	15	2,012	43,052	460,364

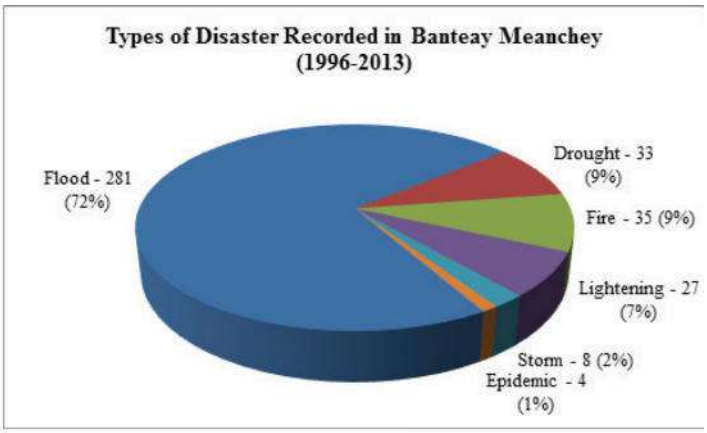
Note: The number '0' here denotes either absence of impact or no data at the time of data collection.

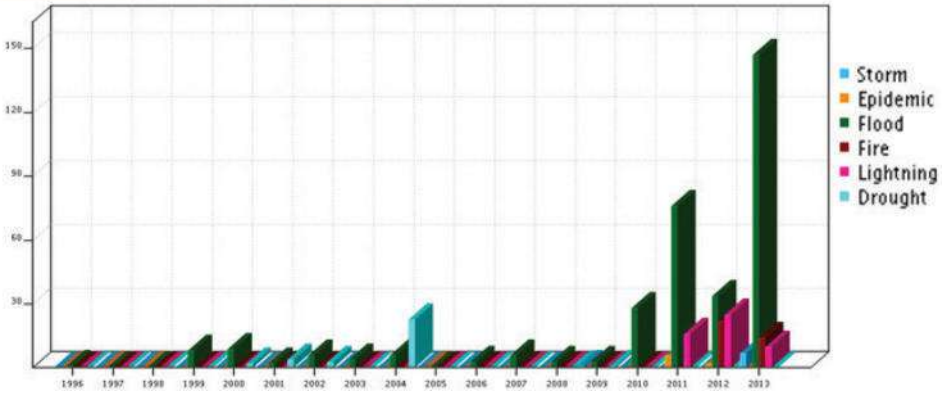
Summary: Impact of Disasters by Year (2000-2013)

District	Data Cards	Deaths	Houses Destroyed	Schools (Places) - Affected	Farming Crop (Ha.) - Destroyed	Paddy Fields (Ha.) - Destroyed	Rural Roads (m) - Destroyed
Anlong Veaeng	30	6	41	0	597	2,788	48,130
Banteay Ampil	37	0	73	0	0	2,033	53,936
Chong Kal	45	2	157	15	150	9,403	293,638
Krong Samraong	41	4	248	0	325	10,341	52,660
Trapeang Prasat	18	0	32	0	520	402	12,000
	27	6	126	0	420	18,085	0
TOTAL	198	18	677	15	2,012	43,052	460,364

Note: The number '0' here denotes either absence of impact or no data at the time of data collection.

Banteay Meanchey Province





Summary: Disaster Typology and Their Impact

Event	Data Cards	Deaths	Houses Destroyed	Hospitals/HC (Place) - Affected	Schools (Places) - Affected	Farming Crop (Ha.) - Destroyed	Paddy Fields (Ha.) - Destroyed	Rural Road (m) - Destroyed
Drought	33	0	0	0	0	0	33,765	0
Epidemic	4	4	0	0	0	0	0	0
Fire	35	1	39	0	0	0	0	0
Flood	281	55	10	5	367	4,644	128,468	100,851
Lightening	27	24	1	0	0	0	0	0
Storm	8	0	11	0	2	0	0	0
TOTAL	388	84	61	5	369	4,644	162,233	100,851

Note: The number '0' here denotes either absence of impact or no data at the time of data collection. **SumSy:**

Summary: Impact of Disasters by Year (1996-2013)

Year	Data Cards	Deaths	Houses Destroyed	Hospitals/HC (Place) - Affected	Schools (Places) - Affected	Farming Crop (Ha.) - Destroyed	Paddy Fields (Ha.) - Destroyed	Rural Road (m) - Destroyed
1996	1	0	0	0	0	214	0	0
1997	0	0	0	0	0	0	0	0
1998	0	0	0	0	0	0	0	0
1999	8	0	0	0	0	0	5,500	0
2000	9	2	0	0	0	15	42,076	0
2001	6	0	0	0	0	0	12,264	0

2002	9	0	0	0	0	0	15,089	0
2003	4	0	0	0	0	0	607	0
2004	29	0	0	0	0	0	25,804	0
2006	3	0	0	0	0	0	1,953	0
2007	6	0	0	0	0	0	17,483	0
2008	3	0	0	0	0	0	499	0
2009	5	0	10	0	0	0	7,896	0
2010	28	0	0	0	106	4,075	21,121	91,195
2011	73	25	0	0	0	300	1,202	3,625
2012	52	31	18	2	9	40	10,539	32
2013	152	26	33	3	254	0	200	5,999
TOTAL	388	84	61	5	369	4,644	162,233	100,851

Note: The number '0' here denotes either absence of impact or no data at the time of data collection.

Summary: Impact of Disasters by Year (1996-2013)

District	Data Cards	Deaths	Houses De-stroyed	Hospitals/ HC (Place) - Affected	Schools (Places) - Affected	Farming Crop (Ha.) - Destroyed	Paddy Fields (Ha.) - De-stroyed	Rural Road (m) - De-stroyed
Krong Paoy Paet	28	5	9	2	61	40	890	3,445
Krong Serei Saophoan	38	11	13	0	33	0	23,193	230
Malai	30	7	1	1	54	3,978	554	0
Mongkol Borei	54	17	5	0	66	0	30,314	0
Ou Chrov	41	9	11	1	55	40	4,678	69,380
Phnum Srok	45	8	2	0	37	300	23,494	3,429
Preah Netr Preah	57	9	4	1	46	0	29,390	17,860
Svay Chek	43	8	2	0	2	0	12,084	1,662
Thma Puok	44	8	4	0	15	57	5,909	4,845
Not assign	8	2	10	0	0	229	31,727	0
TOTAL	388	84	61	5	369	4,644	162,233	100,851

8

ANNEX EIGHT
List of Key Terms Used in the Report

8. Annex Eight: Key Terms Used in the Report

Affected persons: Number of persons who suffer indirect or secondary effects associated with a disaster. These persons, different from "victims", suffer the impact of secondary effects of disasters for reasons such as deficiencies in the provision of public services, interruptions to trade and work, isolation, or their mental health may be affected. If the information is available by family, the number of persons must be estimated based on indicators available.

Affected homes: Number of houses that suffered minor damage, other then structural or architectural, and continue to be habitable, although require basic repairs and cleaning.

Data card: A data card corresponds to the damage and loss occurred in a location as a result of a medium or large-scale disaster event.

Deaths: The number of persons whose deaths were directly caused by a disaster. When final official data is available, this figure should be included with corresponding observations, for example, when there are differences between officially accepted figures and those of other sources.

Disaster: Disaster is defined as the set of effects caused by an event (whether natural or not) on human lives and economic infrastructure on a geographical unit of minimum resolution.

Drought: Unusually dry season, without rain or with rain deficit. Generally, these are long periods (months, years and even decades) typical in limited continental areas or on regional scales.

Electrical Storm (also thunderstorm and lightening): Occurrence of atmospheric static discharges (lightening) with effects on people, cattle, domestic properties, infrastructure (power networks, for example, causing blackouts) and the environment. It is different from "storm" in that thunderstorms are not accompanied by rain and gusty winds. The key differentiator is that damage is caused explicitly by lightening.

Epidemic: Disease attacking many individuals in the same community during short periods (days, weeks, months maximum) such as cholera, typhoid, bubonic plague, etc.

Events: Event is defined by DesInventar as a phenomenon, whether natural or not, which, once triggered, produces adverse effects on human lives, health and/or social and economic infrastructures.

Fire: Urban, industrial or rural fires, but not including forest fires. Limited to those induced or highly connected to natural phenomena, such as electrical storms, earthquakes, droughts, etc.

Flood: Water that overflows river-bed levels ("riverine flood") and runs slowly on small areas or vast regions in usually long duration periods (one or more days).

Houses Damaged: The number of homes with minor damage, not structural or architectural, which may continue being lived in, although they may require some repair or cleaning.

Houses Destroyed: The number of homes levelled, collapsed or damaged to the extent that they are no longer habitable.

Pest Outbreak: A sudden increase in a pest population resulting in economic damage to the rice crop; epidemic or epiphytotic.

River Bank Collapse: Landslide of the river bank occurring when the gravitational forces acting on a bank exceed the forces which hold the sediment together.

Storm: Rain accompanied by strong winds and/or electric discharges (lightening).

Victims: Number of persons whose individual or collective property and/or services have suffered serious damage directly associated to the event. For example, total or partial destruction of homes and property; loss of crops and/or warehouses, etc. This group also includes evacuees or resettled persons, whether temporarily or not. If the information is available by family, the number of persons must be estimated based on indicators available.

9

ANNEX NINE

Report on Consultation Workshop

Workshop Report

Consultation Workshop on the Draft of CamDi Analytical Report

26 February 2014 at Khemera Angkor Hotel, Phnom Penh

1. Introduction

The implications of successive disasters, in particular the 2011 and 2013 Cambodia floods, have prompted efforts to strengthen disaster preparedness, disaster risk management and coordination for better and more effective disaster response in Cambodia. Therefore, NCDM has taken the lead in supporting the establishment and implementation of the Disaster Loss and Damage Information System (CamDi). CamDi is designed to achieve "increased capacity of analyzing disaster trends and their application in decision-making".

NCDM recognizes that disaster loss and damage data exists in various line ministries, but these datasets are not well organized in a systematic manner. It needs to be improved to ensure that data on disaster losses and damage from various disaster events can be systematically collected, organized, stored and analyzed to generate risk and vulnerability information to inform policy-level decision-making for better planning at national and sub-national levels for disaster preparedness, mitigation, response and recovery. A series of events was conducted to support the CamDi establishment, including historical data collection from NCDM, CRC, key line ministries, all PCDMs and DCDMs, consultation workshops, technical trainings and a data validation workshop.

The project team has drafted the CamDi Analytical Report. In order to analyze the CamDi system effectively, it requires collecting inputs from relevant

key stakeholders. This report is to reflect the reality of disaster events in Cambodia. Furthermore, this report presents and highlights the key findings related to the history of disaster events in Cambodia and offers an opportunity to key stakeholders to review, validate and comment on the report. In this regard, NCDM, in collaboration with UNDP organized the Consultation Workshop on the Draft CamDi Analytical Report, conducted on 26 February 2014 at Khemara Angkor Hotel, Siem Reap, Cambodia.

The workshop was presided over by H.E. Dr. Nhim Vanda, Senior Minister in Charge of Special Mission and First Vice-President of the NCDM. There were 52 participants from NCDM, PCDMs, key line ministries, UNICEF and NGOs.

The objectives of the workshop were to:

- Provide an opportunity to stakeholders such as public agencies, civil society organizations and development partners to review, discuss and comment on the Cambodia Disaster Loss and Damage Report findings, and identify strategies and recommendations to manage and reduce risks/ impact of disaster events in Cambodia.
- Present the Draft of the CamDi End User Manual.
- Present the draft of disaster data collection formats at the national, provincial, district, and commune levels.

As expected, the workshop provided results as below:

- The draft of CamDi analytical report was presented by Dr. Soriya Yin, UNDP Consultant, and group discussions following the presentation were made on human life, housing, agriculture and multi-hazard. As a result, the groups accepted the CamDi analytical report and recommended to include more data on agriculture, infrastructure, water and sanitation, and irrigation systems.
- The end user manual was presented by Sophal SAM, DMIS officer and all attendees were able to practice the CamDi on the website at camdi.ncdm.gov.kh.
- The four NCDM disaster data collection formats were presented by H.E. Choup Sithan, Advisor to NCDM and a few participants provided some minor comments to improve the forms.

2. Proceedings of Workshop

2.1. Opening Remarks

Mr. Rajesh Sharma, Programme Specialist at UNDP Asia-Pacific Regional Centre in Bangkok delivered a speech congratulating NCDM for successfully completing and establishing CamDi. He said Cambodia was prone to a number of disasters such as the floods of 2011 and 2013. However, losses and damages have not been recorded systematically to better understand risks and vulnerability. CamDi is almost a complete record of losses and damages from 1996 until recently. Currently UNDP is developing a report from findings. It is predicted that climate change will worsen the impacts and will cause extreme weather events such as Typhoon Ketsana. UNDP, as a partner of Royal Government of Cambodia, is committed to supporting projects on improving capacity of disaster risk reduction and response in Cambodia.

H.E. Dr. Nhim Vanda, Senior Minister in Charge of Special Mission and Vice-President of NCDM, welcomed all the participants to the workshop. On behalf of the Prime Minster and Government of Cambodia, he was pleased to participate in the workshop in Siem Reap province. From his research and consultation, he expected that the workshop today would bring disaster risk reduction and development for better living of Cambodians, following the new policies of Governance on in-depth reform.

He highlighted that UNDP has been supporting Cambodia in many development areas, and specifically this successful development of CamDi. If we learn about CamDi, it has advantages for future disaster management. If we do not have experiences from previous disasters, it is difficult for us to work on disaster management. From historical data of disasters from 2000, we have managed well on flood response. From key line ministries, we recognize that there were many losses and damages from disasters, and that data have not been well recorded and maintained. Therefore, NCDM and UNDP, working together to record losses and damages since 1996, established CamDi. We collected documents and recorded data based on consultations. The documents are important in recording the trend of big and small events such as floods in 2000, Kethsana in 2009 and floods in 2011 and 2013. If we learn IT, we can log into CamDi and we

will we see the risk map in order to strengthen better disaster responses. We can also take 2013 data and other previous data as a reference for future predictions.

He said that Provincial Governors and Deputy Provincial Governors need to focus on technical work, disaster management and disaster risk reduction. It takes times to manage and collect information on disasters, so they can look at CamDi for data analysis for provincial development plans.

He encouraged the participants in the workshop to discuss freely the CamDi data. He said that this workshop was like a public forum and needed to be transparent and efficient. We want to have comprehensive data for analysis, making plans and policy, and Rajesh can disseminate the data in the region through the UNDP Regional Centre in Bangkok. He mentioned that in order to be resilient to climate change, data is needed to support development planning and policies. Water will be the biggest challenge in the future, and lack of water could lead to conflict. We have dams and dikes, but if there is no rain, and water from rivers cannot be reached, that will create challenges. Climate change impacts are most concerned on paddy fields.

2.2 Presentation on the Draft of CamDi Analytical Report by Dr. Yin Soriya, Consultant, UNDP Cambodia

The presentation aims to show the trend and pattern of CamDi data analysis, and requested feedback from participants. The presentation includes:

Rational:

- Cambodia is prone to natural disasters such as floods, droughts and storms
- Cambodia is prone to natural disasters such as floods, droughts and storms
- The impact is huge to human life, loss and damage of crops, property, livestock and social infrastructure
- Climate change makes these natural events worse
- As yet, no systematic data collection method
- CamDi is the first of its kind in Cambodia

Methodologies:

- Design:
  - Developed Loss and Damage Data Collection Form
- Data Collection
  - Collected data from line ministries
  - Fieldwork data collection in 24 municipalities-provinces
  - Entered > 7,800 forms
- Data Analysis
  - Composition analysis – effect with variables composed of different events
  - Temporal analysis – trend
  - Spatial analysis – distribution
  - Statistical analysis – calculate several statistical indexes

Key Results:

- Profiles of Natural Disasters
- Impact of Natural Disasters on

1) Human life

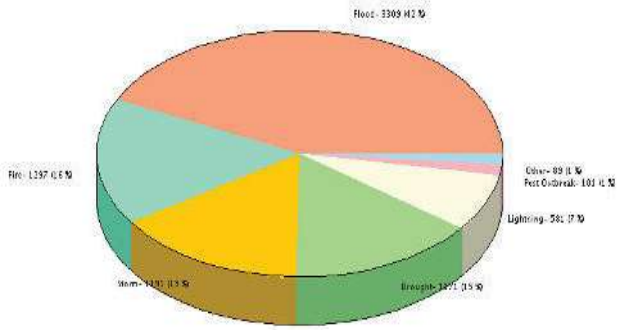
2) Damaged and destroyed housing

3) Agriculture: Farming crop and paddy field

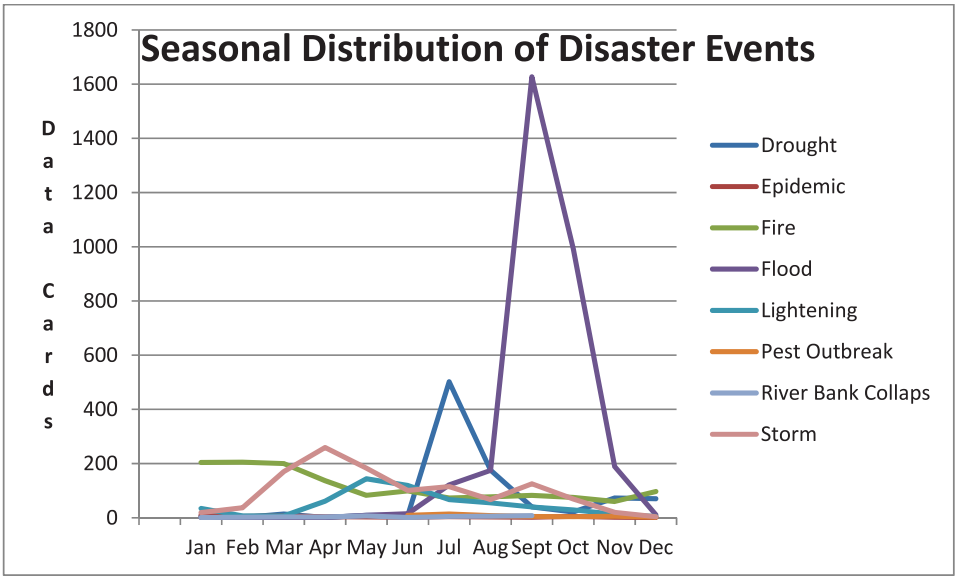
4) Health

5) Education

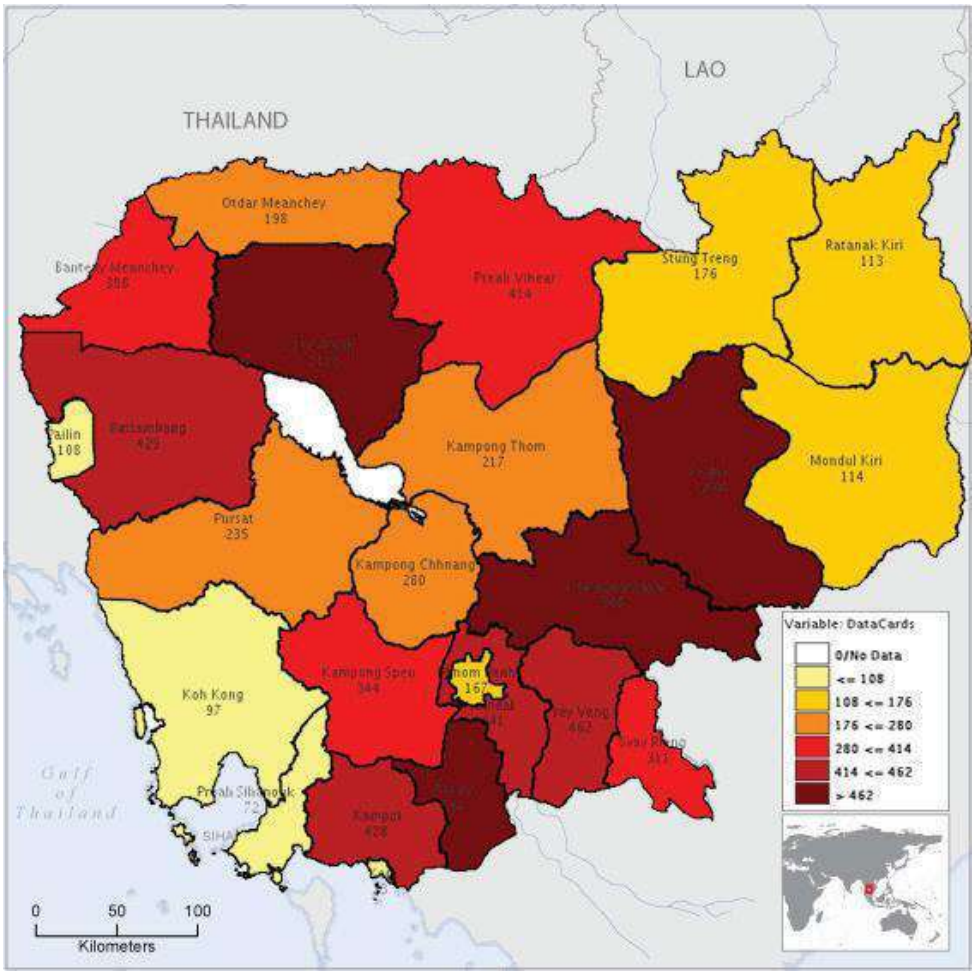
What disasters?



When do disasters happen?

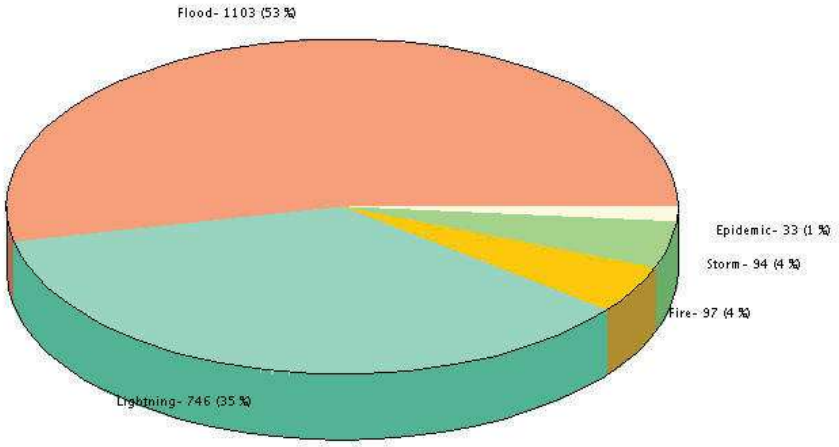


Where did disaster happen?

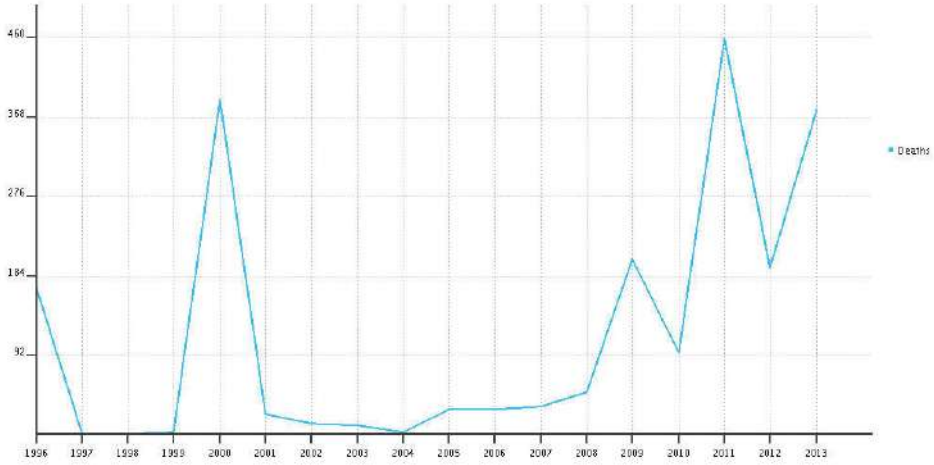


Impact of Natural Disasters on Human Life

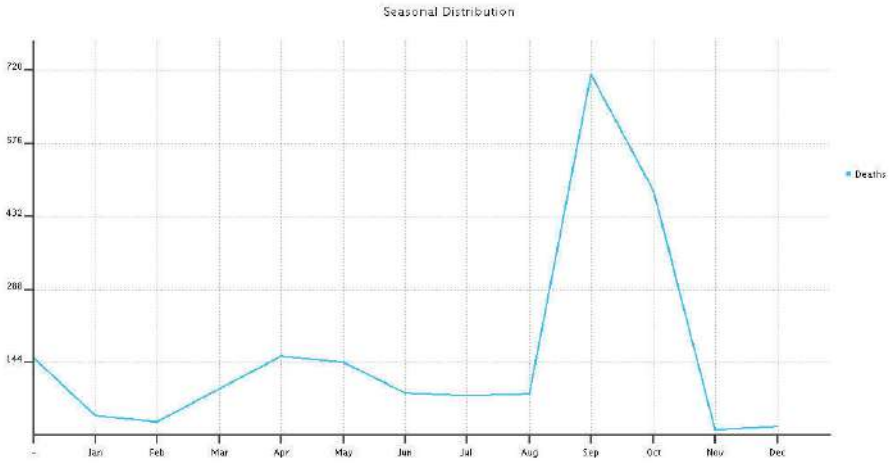
- **Cause of Death (1996 – 2013)**



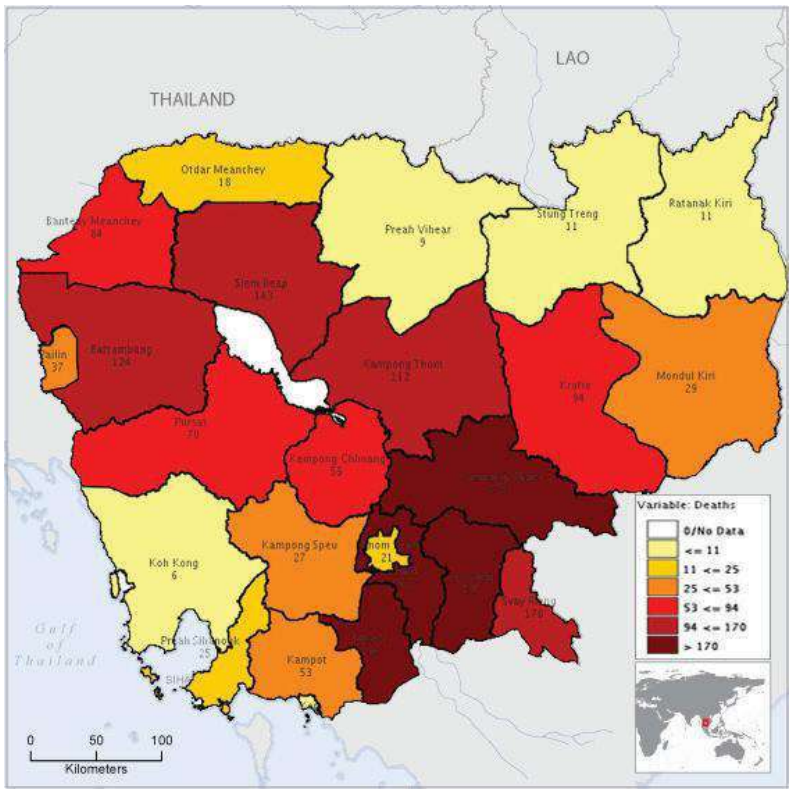
When human life lost?



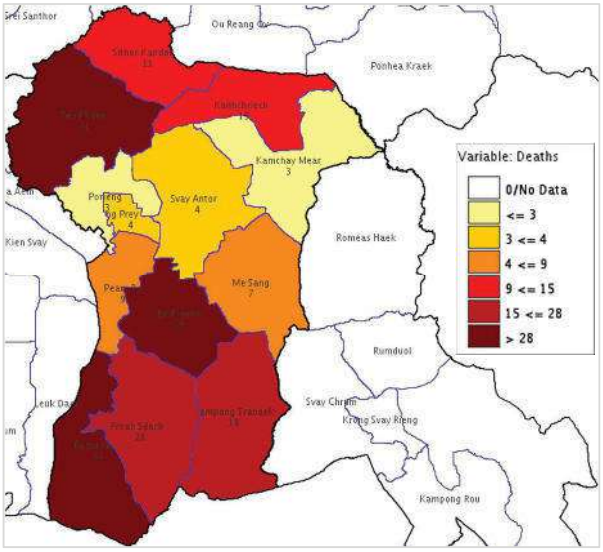
What month human lives lost?



Where human lives lost?

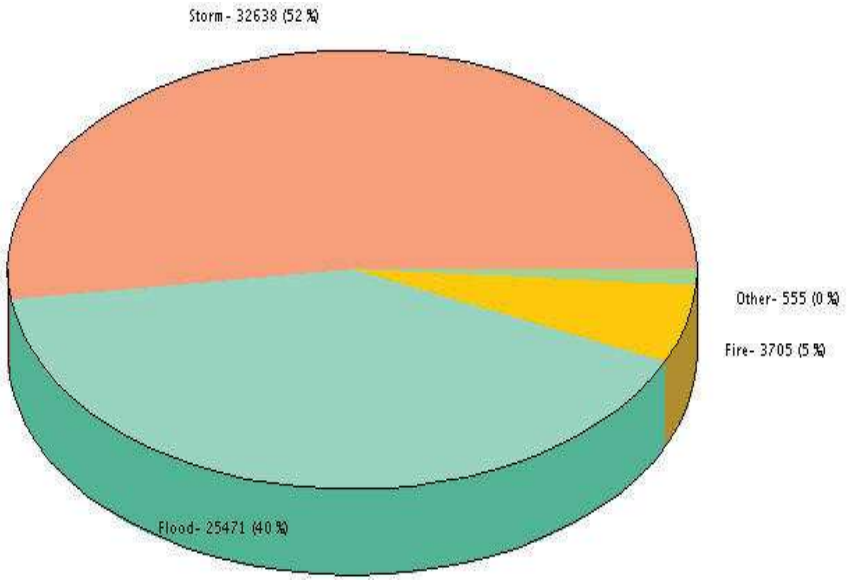


Prey Veng Province, Peam Chor District, Sambour Commune

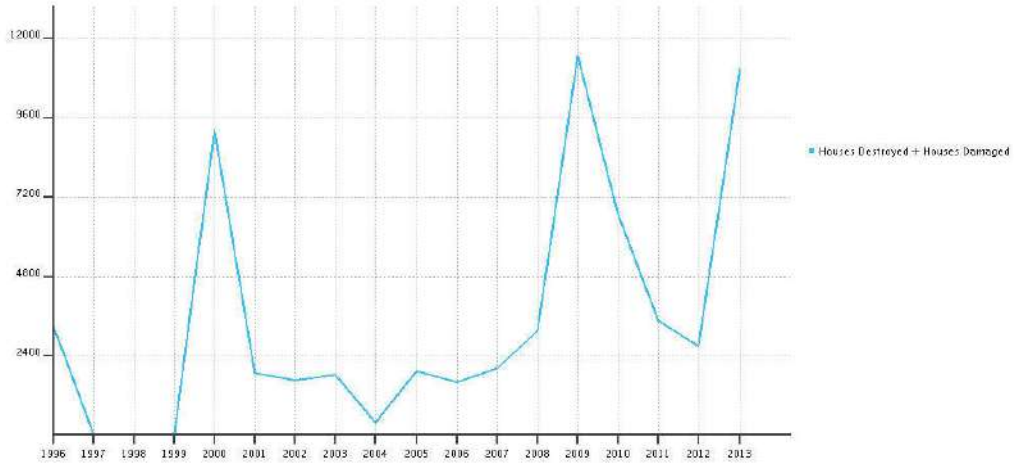


Impact of Natural Disasters on Housing

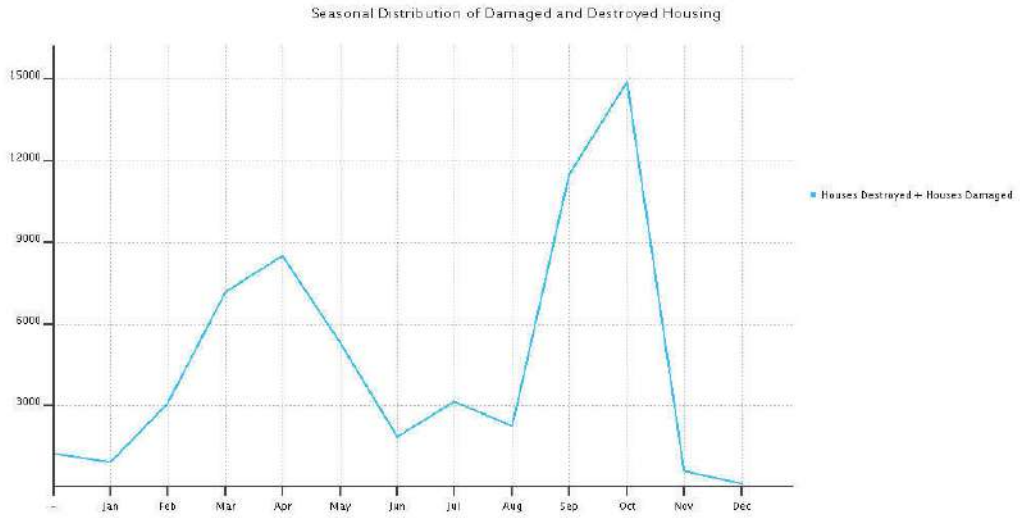
What Caused House Damage and Destruction?



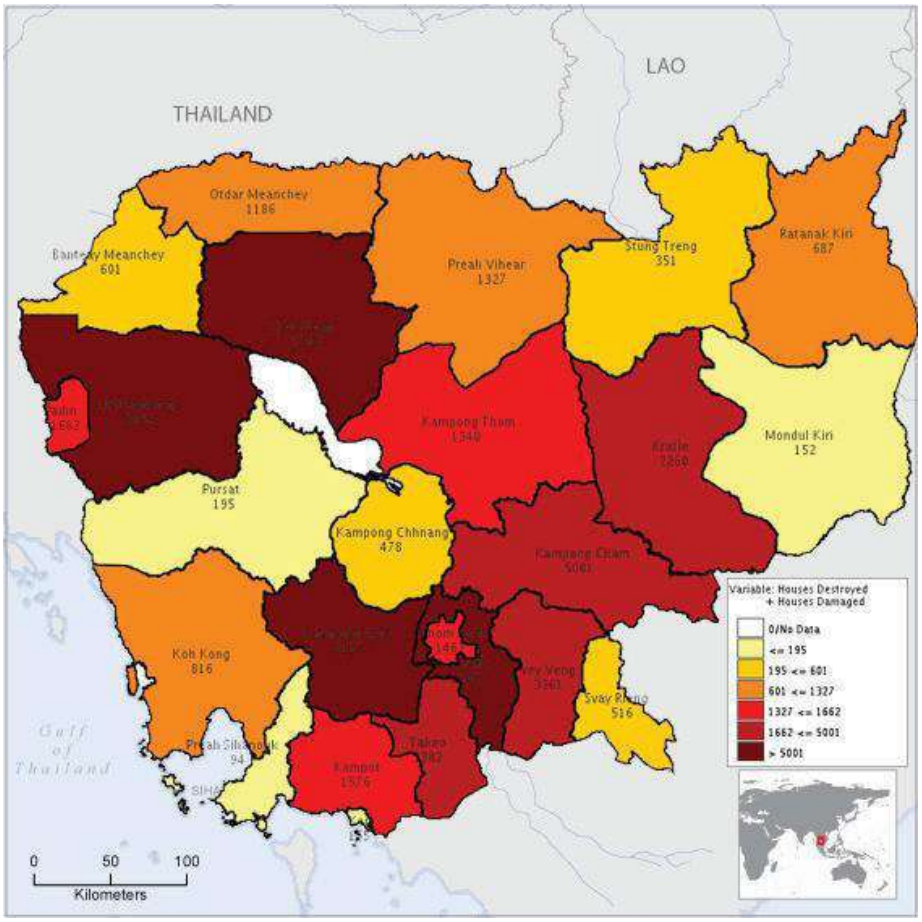
When House Damaged and Destroyed?



What Month Houses Damaged and Destroyed?

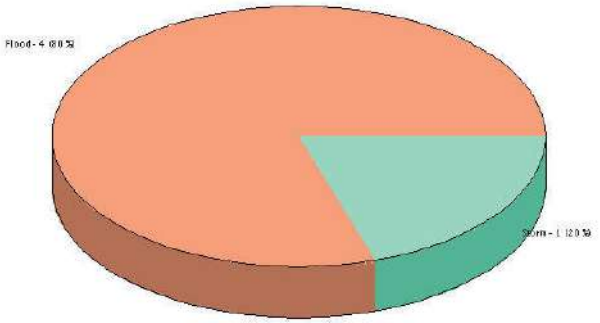


Where Houses Damaged and Destroyed?



Impact of Natural Disasters on Health Sector

- Causes of Hospital/Health Centre Affected



Similar analysis was presented on the health sector and the education sector.

Conclusions from the findings on CamDi

What: Flood is a major threat, and lightening is the second highest killer.

Where: Prey Veng, Kampong Cham, Kandal, Takeo, Siem Reap, Battambang, Banteay MeanChey

When: July, August, September and October

Impact: Human life: women and children are the most vulnerable people, loss and damage of properties, crops, livestock and infrastructure.

Recommendations from the CamDi findings

For policy-makers and planners: Water policy, design, hazard-specific prevention and mitigation strategies, integrate DRR in development plans.

For Practitioners: Building/construction code, awareness raising, adaptive capacity building

For Researcher/Community: CamDi is a good source of information.

2.3 Group Discussion on the CamDi data analysis by all participants

The group discussions provided outputs as below:

Group 1: Human Life

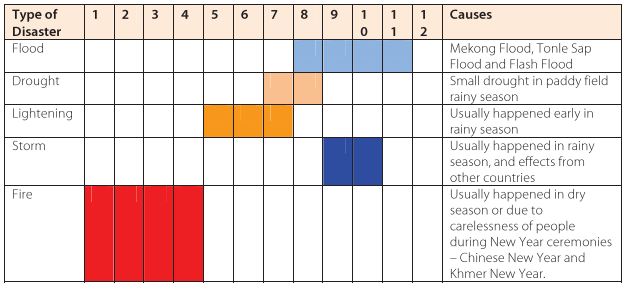
- The group found that CamDi data is good and usable because:
  - Data collection procedure is conducted through the 24 Municipalities-Provinces, has clear data collection forms, and data was collected from the national level down to the commune level.
  - Conducted technical training for national level and sub-national level.
  - Conducted data validation workshop on 4 December, 2013
  - CamDi has been hosted online since 21 October, 2013
  - On-going data cleaning and data validation
- Sector victims by disasters:
  - Social sector: victim people, evacuated people, deaths, housing, education and health
  - Economics and productivity sector: Agriculture
  - Infrastructure: National/Provincial/Town Road, Rural Road, Bridges, Water Points, Sewerage and Irrigation System

Group 2: Housing

- Agreed on the CamDi data of disaster loss and damage on housing as well as schools, hospital/ health centres, public buildings and pagodas.
- When: The disaster loss and damage on housing and buildings occurred in
  - Dry Season: from November to July because of fire and storm.
  - Wet Season: from August to October because of storm, flood, fire and river bank collapse
- Where: The province has a high ratio of loss and damage on housing and buildings including:
  - Battambong, Siem Reap, Kampong Speu and Kandal
  - Reason: Flood (climate change, and national disaster) and Fire (accidently or caused by people).
- Prevention: build high and firm buildings at flood area, build firm and low buildings for storm areas, build dams and raise trees to prevent flood effects, build dikes to reduce water while flooding, prepare a safe place for evacuating people and livestock, prevent house fires by disseminating procedures for prevention and prepare fire trucks.

Group 3: Multi Hazards

These hazards happened in Cambodia during the following seasons:



Type of Disaster	1	2	3	4	5	6	7	8	9	10	11	12	Causes
Flood													Mekong Flood, Tonle Sap Flood and Flash Flood
Drought													Small drought in paddy field rainy season
Lightening													Usually happened early in rainy season
Storm													Usually happened in rainy season, and effects from other countries
Fire													Usually happened in dry season or due to carelessness of people during New Year ceremonies – Chinese New Year and Khmer New Year.

According to CamDi, the data analysis shows that:

- Floods happened around the Mekong and Tonle Sap
- Strong winds happened in the early stages of the rainy season and storms happened at high areas and the seaside
- Drought happened at high and low areas, such as Kampong Speu, Takeo, Kampot, Svay Rieng, Prey Veng.

Recommendations:

- Strengthen CamDi system for better data analysis
- Improve irrigation system
- Improve early warning system
- Stream DRR into commune investment plan
- Disaster Management Law implemented

Group 4: Agriculture

- Agreed on CamDi data
- Should include epidemic on live stock
- Should include losses of rice (kilogram)
- When: Loss and damage on agriculture normally happens in early August, September and October because it is paddy field planting season, however some areas experience drought/lack of water
- Where: Loss and damage to agriculture happens in Battambong, Prey Veng, Rattnakiri and Takeo as it is the area around the Mekong, Tonle Sap and Tonle Basac, and low areas
- Recommendation:
  - Select rice seeds that are resilient to drought and high water levels
  - Design and follow planting calendar
  - Increase planting after water decrease
  - Improve irrigation system for water supply and water relief

2.4. Presentation on the Draft of End User Manual of CamDi by Mr. Sophal Sam, Disaster Management Information System Officer, UNDP Cambodia.

The presentation aims to: 1) bring awareness to participants on the contents of the manual and CamDi guidance structures in the manual, and 2) seek comments for improvement on the manual.

The presentation includes:

- Contents of the End User Manual of CamDi
  1) Introduction
  2) Acronyms and Abbreviations
  3) Terminology used in the CamDi: Disaster types available in CamDi and data variables available in CamDi by sector
  4) Understanding CamDi Data Cards/Records and Data Disaggregation
  5) Analysis Module: Understanding Tab Menu, Profile Tab, Query Selection for Analysis, Statistics Generation, Crosstab Statistics Generation, Thematic Maps Generation, Thematic Maps Embedding into Google Map, Charts Analysis, View Data, View Map.
- Demonstrate the manual on CamDi usage guidance structures, CamDi terminologies to be read before using the data, steps in using CamDi analysis tools and practical example
- The draft CamDi manual on creating chart analysis, statistics table and thematic maps was distributed, and practical examples were demonstrated on CamDi online: camdi.ncdm.gov.kh

2.5. Presentation on Disaster Reporting Format at the Sub-National Level, by H.E. Choup Sithan, Advisor, NCDM

The presentation aims to bring awareness to participants about the process of data reporting format development and the latest revision on the forms. The presentation includes:

Background of the NCDM Data Reporting Formats:

- Information Notice **សំ.ជ.ណ.សរ** #211, Dated 24-Feb-2012 of the Royal Government of Cambodia from the meeting between the Government and Development Partners on 17 February 2012.
- Section #10 stated that NCDM needs to strengthen information systems and methodologies for assessment on disaster loss, damages and needs. NCDM should instruct PCDMs to develop a standard reporting format consistent with assessment of damages and needs at local level.

Process of Developing the NCDM Data Reporting Formats:

- Form a technical group to develop the Data Reporting Formats.
- Issue the instruction letters for implementing the Data Reporting Format and needs, letter #280 **គ.ជ.គ.ម** Dated 29-Jun-2012 and disseminate to provincial level for official use in July 2012.

Objectives of Developing the NCDM Data Reporting Formats:

- Facilitate the sub-national level to record all data of assessment, agreed in advance before submitting at the national level, in order to send the data reporting to national level on time.
- Help government leaders or ministries/institutions to make on-time and accurate decisions to issue intervention instructions on time and efficiently.
- Help development partners consider appropriate donations for victims and rehabilitation efforts.
- Reduce-time consuming, duplicate work and suffering of the victims.
- On-time intervention and effectiveness and better collaboration between all stakeholders – national and internal.

Types of NCDM Data Reporting Format:

- 1st Form: Reporting Form Prior to Disaster
- 2nd Form: Reporting Form on Emergency
- 3rd Form: Reporting Form on Primary Effects Estimated
- 4th Form: Reporting Form of Total Effect and Damage

(See attached Appendix A – F, the NCDM Data Reporting Forms and Instructions for Use)

3. Summarizing the results of the consultation meeting by Mr. Sophon HUM, DRR-Project Coordinator, UNDP Cambodia

Mr. Sophon Hum presented the key summary results of the workshop with nine recommendations: (1) Improve data in the CamDi system, (2) EWS, (3) Risk Vulnerability Mapping, (4) Mainstreaming DRR into national and sub-national planning process particularly in CIP and CDP, (5) Irrigation System, (6) Prepare NCP and PCP, (7) DML (8) Integrated DRR into sector development plan and (9) Build resilient community to adapt to climate change.

Mr. Sophon Hum listed the key results from the workshop as below:

1) There were 52 participants from NCDM, PCDMs, Key Line Ministries, UNICEF and NGOs at the workshop.

2) NCDM took ownership on the CamDi System. CamDi is the disaster loss and damage analysis tool to record the impact of climate change. Climate change variability causes extreme weather events threatening development efforts.

3) H.E. Dr. Nhim Vanda, Senior Minister and the First Vice President of NCDM raised the benefits of CamDi, saying it would provide good data analysis for disaster preparedness, response and rehabilitation effectively. He encouraged participants to be active in participation and freely discuss during this workshop.

4) The draft CamDi analytical report was presented by Dr. Soriya Yin, UNDP Consultant and the discussions following the presentation were made on human life, housing, agriculture and multi-hazards. As a result, the groups accepted the CamDi analytical

report and recommended to include more data on agriculture, infrastructure, water and sanitation, and irrigation systems.

5) The end user manual was presented by Sophal SAM, DMIS officer and all attendees were able to practice the CamDi on the website at camdi.ncdm.gov.kh.

6) The four NCDM disaster data collection formats were presented by H.E. Choup Sithan, Advisor to NCDM and a few participants provided some minor comments to improve the forms.

4. Closing remarks by Mr. Rajesh Sharma, Regional Program Specialist, UNDP APRC

Mr. Rajesh Sharma said that the main purpose of workshop was to discuss the draft CamDi analytical report and have group discussions on the report findings. He mentioned that the data in the report had limitations. This report is to look at the whole data analysis, and this report may not answer all questions "why". This report is to show the data and analysis to researchers and development workers. Any kinds of sector losses and damages can be viewed from the Camdi. We continue to improve the analysis tools. When the report is published the reader can see the chart and thematic analysis. Mr. Sophal demonstrated the CamDi end-user manual and the participants could use the manual to do in-depth analysis by themselves. H.E. Choup Sithan presented NCDM data reporting forms which are the tools for continuing data collection for CamDi.

Mr. Rajesh Sharma thanked the participants for their contributions to the discussions at the workshop and wished them a safe trip home.

5. Closing remarks by H.E. Choup Sithan, Adivosor, NCDM

H.E. Choup Sithan thanked H.E. Dr. Nhim Vanda and said he was pleased with the workshop partial recommendations on the draft of the CamDi analytical report.

He mentioned that H.E. Nhim Vanda is happy with CamDi and he requested open recommendations. H.E. Choup Sithan said participants accepted CamDi, even though data does not cover everything as requested. The provision of data so far is much appreciated, especially data provided from commune level. The local authorities were very helpful in providing data. With CamDi tables, charts and maps, we can compare and find out more information for analysis. PCDM Phnom Penh needs more Phnom Penh data on CamDi; so far we do not have all data from PCDM Phnom Penh.

He added all participants could use CamDi as it is beneficial for institutions, and CamDi belongs to all of us. Regarding the requests, we want to include all data, however the first step may not include all data.

On behalf of H.E. Nhim Vanda, H.E. Choup Sithan would like to bless all the participants and declared workshop closed.

6. Conclusion

The full day consultation workshop was conducted successfully with delegates participating as expected. The presentations and discussions were conducted as planned in the agenda. The participants understood the topics of presentations and provided outputs from the discussions including facts on Cambodian losses and damages, on human life, housing, agriculture, and multi-hazard seasonal and most affected areas. The participants reviewed the NCDM data reporting formats with minor recommendations and revisions. They understand the CamDi Manual structure and did practical exercises on the CamDi online.

Empowered lives.
Resilient nations.