

IMPACTS OF NATURAL DISASTER AND CLIMATE CHANGE ON THE LIVELIHOOD OF THE PEOPLE IN CENTRAL HIGHLANDS : CASE STUDY – KONTUM PROVINCE

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Socio-economic and natural characteristics

- Consisted of 5 provinces: Kon Tum, Gia Lai, Đak Lak, Đak Nong and Lam Dong
- Natural area: 54,474 km², **accounted** for 16.8% of the country's total area, Kon Tum has the fourth biggest area
- Population: 5,115,135 people
- There are 54 ethnic groups in Vietnam (Kinh: 64.7%; 12 original ethnic minority groups: 26.6%; 40 **newly emerging** ethnic minority groups: 8.7%)
- Steep and diverse terrains, the alternation of highlands and lowlands is complex -> creating favorable conditions for washout, erosion, landslides, creating flash floods and floods with unpredictable and large magnitude

Socio-economic and natural characteristics (2)

- Climate:
 - Having features of sub- tropical monsoon climate
 - Kon Tum has tropical monsoon climate of Central Highland with two seasons: the rain season lasts from May to October; the dry season lasts from November to April the **following** year.
 - Rainfall is unevenly distributed in the areas
 - Consequence: rainy season: floods, dry season: shortage of water, drought.

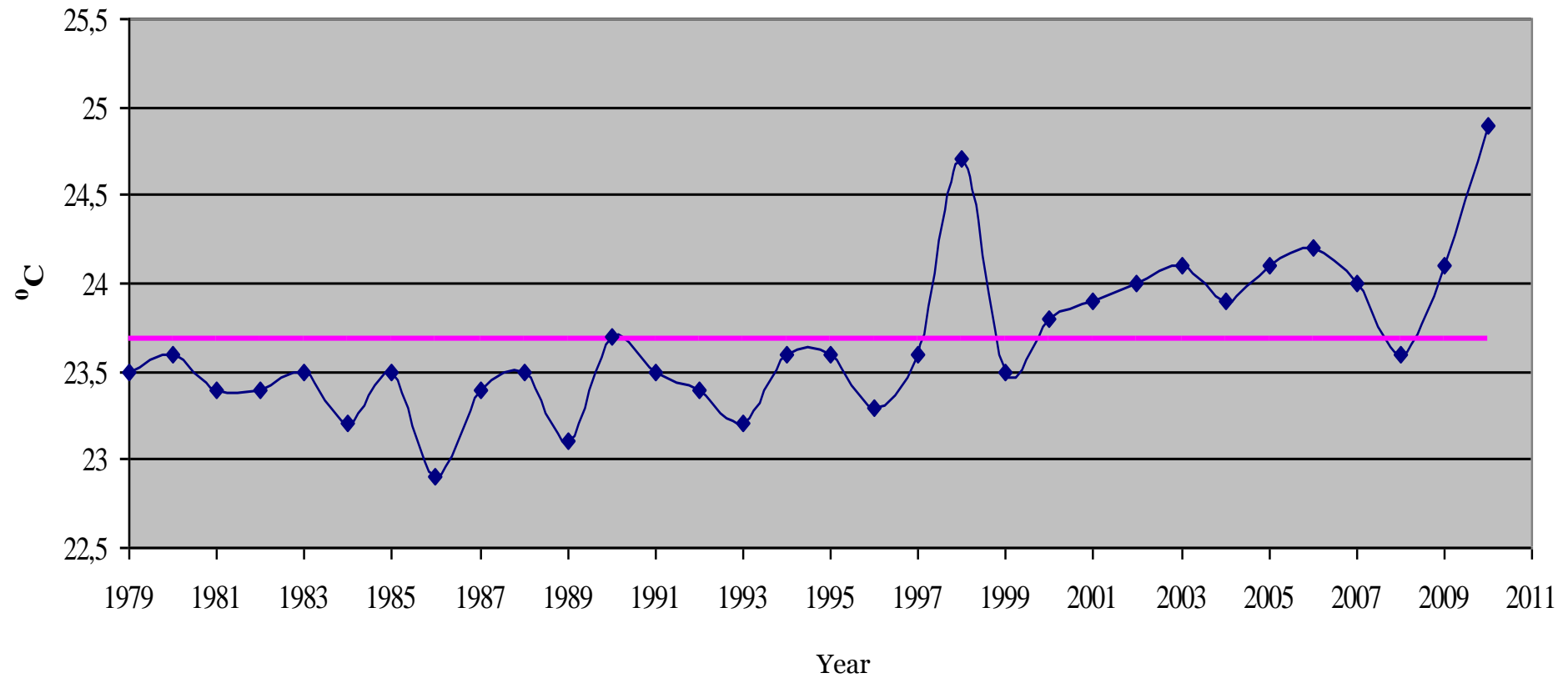
Socio-economic and natural characteristics (3)

- In terms of economy, Kon Tum is a province with high economic growth in Central Highlands
 - Agriculture is the main sector
 - During the previous period, the economic growth of the province was characterized by mainly wide developments
 - In terms of infrastructure: transportation and irrigation system are limited and inadequate → ability to respond to climate change
 - People's education level is low because there are 35 ethnic minority groups
 - The healthcare system is slowly **modernized**, failed to adapt to the development of the market economy; the quality of healthcare services failed to meet people's demands
- Socio-economic and natural characteristics analyzed above show that Central Highlands in general and Kon Tum province in particular are vulnerable to natural disaster and climate change, especially the ethnic minorities.
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Natural disaster and climate change in Kon Tum

- Flash floods, landslides
- Hot and drought
- Floods, flash flood: historical flood in 2009 on Dak Bla river
- Some signs of climate change have been recognized in the province
- Dangerous weather problems such as thunderstorms, tornadoes, hail occur more frequently and unpredictably

Graph 1 - Average temperature variation in Kon Tum during the years 1979 – 2010



Impacts of natural disaster and climate change on the livelihood of people in Kon Tum province (1)

- **Impacts on people's production activities**
 - Natural disaster has direct and serious impacts on people's job, especially the farmers
 - Directly affecting the productivity of most key industrial trees such as: coffee, rubber, pepper
 - **Growth of crops is affected with declining resistance, increase of disease occurrence, and crops are withered and died, and reduced productivity and product quality.**

Impacts of natural disaster and climate change on the livelihood of people in Kon Tum province (2)

- Livestock **farming**:
 - Changing the reproductive habits of animals
 - Increasing the risk and spreading of diseases, causing major damage, reducing livestock productivity ([Table 1](#))
 - Destroying or damaging livestock pens
- Forestry:
 - Reducing forest land ([Bảng 2](#))
 - Forest Structure and quality
 - Increasing the risk of wildfire
- Fishery



Summary of loss of livestock farming due to storms in 2009 (unit: animal)

Loss categories	City	Đak Ha district	Sa Thay district	Đak To district	N. Hoi district	Đak Glei district	Kon Raydis trict	Kplong district	TMR district	Total loss	Estimated loss (million dong)
Cattle	309	47	11	322	18	334	125	60	760	1,986	9,930
Poultry	8967		830	2302	100		1555	51	3417	17,222	1,722

Source: Kon Tum Committee for Flood and Storm Control



Some criteria about forests in period 2006-2010

Criteria	Unit	2006	2007	2008	2009	2010
Forest area	Hectare	656.821,0	658.668,0	655.906,0	650.297,0	648.800,0
Forest cover	%	67,8	67,8	67,3	66,7	66,6
Wildfire area	Hectare	178,40	249,90	24,03	10,19	171,00
Destroyed forest are	Hectare	94,73	60,25	140,45	114,66	101,81

Source: Kon Tum Department of Agriculture and Rural Development, 2010.



Impacts of natural disaster and climate change on the livelihood of people in Kon Tum province (3)

- Trade, services
 - Industry
 - Input materials
 - Product quality
 - Industrial infrastructure
- Labor mobility among sectors

Impacts of natural disaster and climate change on the livelihood of people in Kon Tum province (4)

- Infrastructure
 - Transportation system
 - Water resource ([Table 3](#))
 - Irrigation infrastructure



Forecast changes and shortage of the total annual flow in the Se San River Basin in 2030 and 2100

Basin name	Total annual flow (10^6 m^3)			Shortage level (10^6 m^3)	
	2010	2030	2100	2030	2100
Đak Psi	1.651,92	1.529,40	1.321,42	-122,45	-330,43
Đak Bla	2.804,53	2.596,76	2.243,60	-207,66	-560,82
Po Ko	2.375,38	2.199,42	1.900,54	-176,10	-475,0
Sa Thay	1.765,82	1.635,12	1.412,63	-130,66	-353,16
Se San	9.111,53	8.436,62	7.289,41	-675,07	-1.822,27



Impacts of natural disaster and climate change on the livelihood of people in Kon Tum province (5)

- Impacts on people's lives
 - Health
 - Education
 - Properties ([Bảng 4](#))



No	Categories of loss	Unit	2006	2007	2008	2009	2010
I	<i>Human beings</i>						
1	Die	Person	5	3	1	51	1
2	Injure	Person				38	
II	<i>Houses</i>						
1	Houses were unroofed and flooded	House	247	244	3	2.851	63
2	Houses were collapsed, washed away and damaged	House	59	33	1	722	7
3	Houses had collapsed axillary construction	House				349	3
4	Concrete utility poles were broken	Pole	5	33		235	
5	Classrooms and teachers' houses were damaged	Room	44	39		343	
6	Clinics were unroofed and damaged	Room				8	2
7	Rice stores were damaged	Store				16	
8	Classrooms collapsed	Room				56	
9	Property damage	Million dong				5.516	
10	Houses were partly unroofed	House					54
11	Houses are in danger of collapsing	House					9
12	Schools are unroofed and damaged	School					9

Deployed policies, programs , and some proposals and recommendations

- Policies and programs aiming at developing sustainable livelihood for people under the impacts of disaster and climate change that local authorities have **implemented**;
- Programs and action plans to implement the strategy of disaster control and mitigation in Kon Tum province during period 2008-2020
- General scheme to recover from the consequences of storm no.9 (2009) to develop social economy in Kon Tum province during period 2010-2015.
- Scheme to raise community awareness and disaster management **based on** the community in the province
- Action plan to respond to climate change of Kon Tum province in 2020 and orientation in 2030.

Proposals

- **Policies and legal documents**

- Having a **policy** to encourage scientific and technological activities, attracting investment and cooperation among localities, international cooperation, mobilizing human resources for disaster and climate change control and mitigation.
- Promulgating policies to support the areas **frequently** affected by disasters.
- Providing disaster risk insurance in some areas.
- Having a policy to invest and support the evacuation of people in the disaster area;
- Policy to support production: Support plants and breeds; Provide investment to widen new production area; support to recover barren fields...to recover the production in the area affected by disasters and epidemics.
- Having a policy to solve the problem of land for production and **livelihood**; providing vocational training for rural workers.
- Integrating people's livelihood development programs in the economic development strategy of the province.

- **Raising the community awareness**

- Strengthening communication and education, raising people's awareness and responsibility, especially ethnic minority communities about the response and mitigation of disaster and climate change impacts in many ways, such as: television and radio programs, school education, propaganda in localities.
- Organizing training programs to enhance the qualification of managers and specialized staff. Enhancing knowledge and experience in the production development



Thanks for your listening.