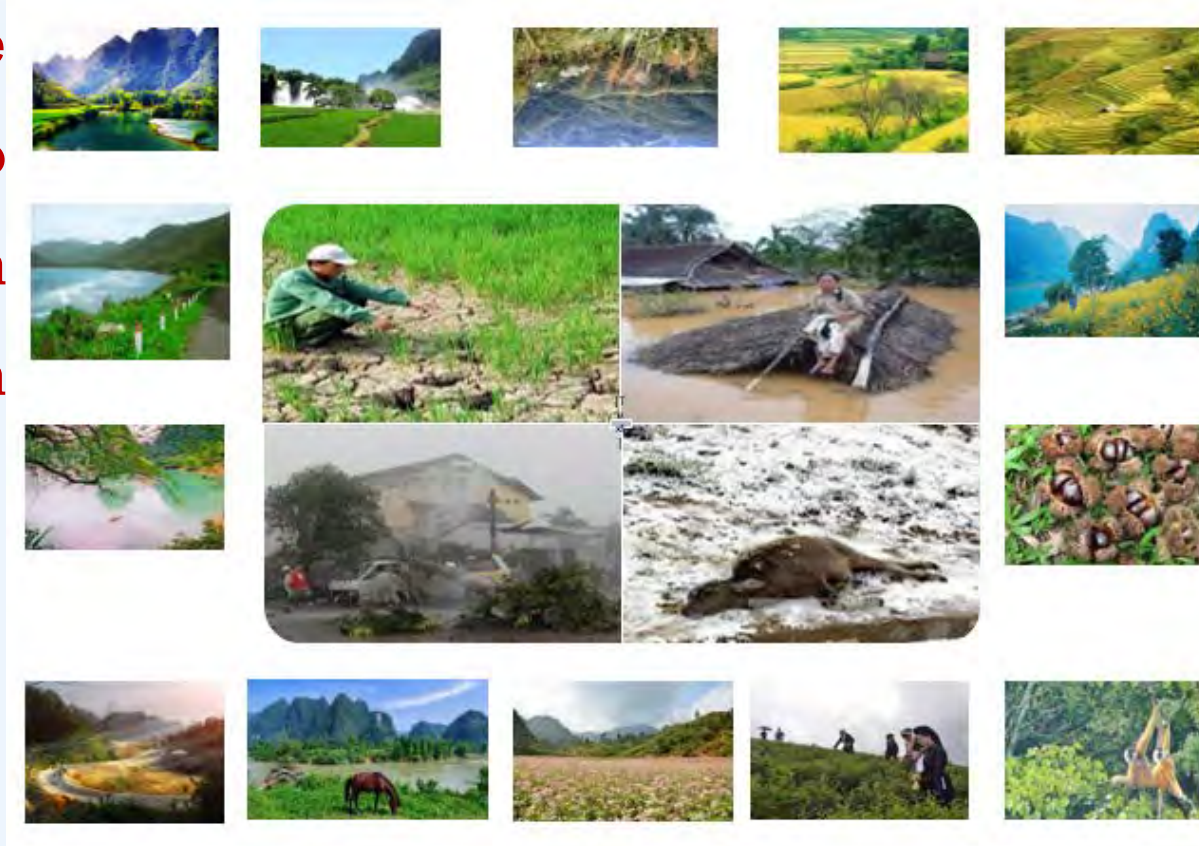




**Integration of Climate
Change Adaptation into
Bio-conservation, with
focus on Caovit Gibbon
Species, in Cao Bang
province, parts of
Sino-Vietnamese Karst
Landscapes**



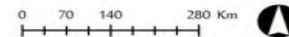
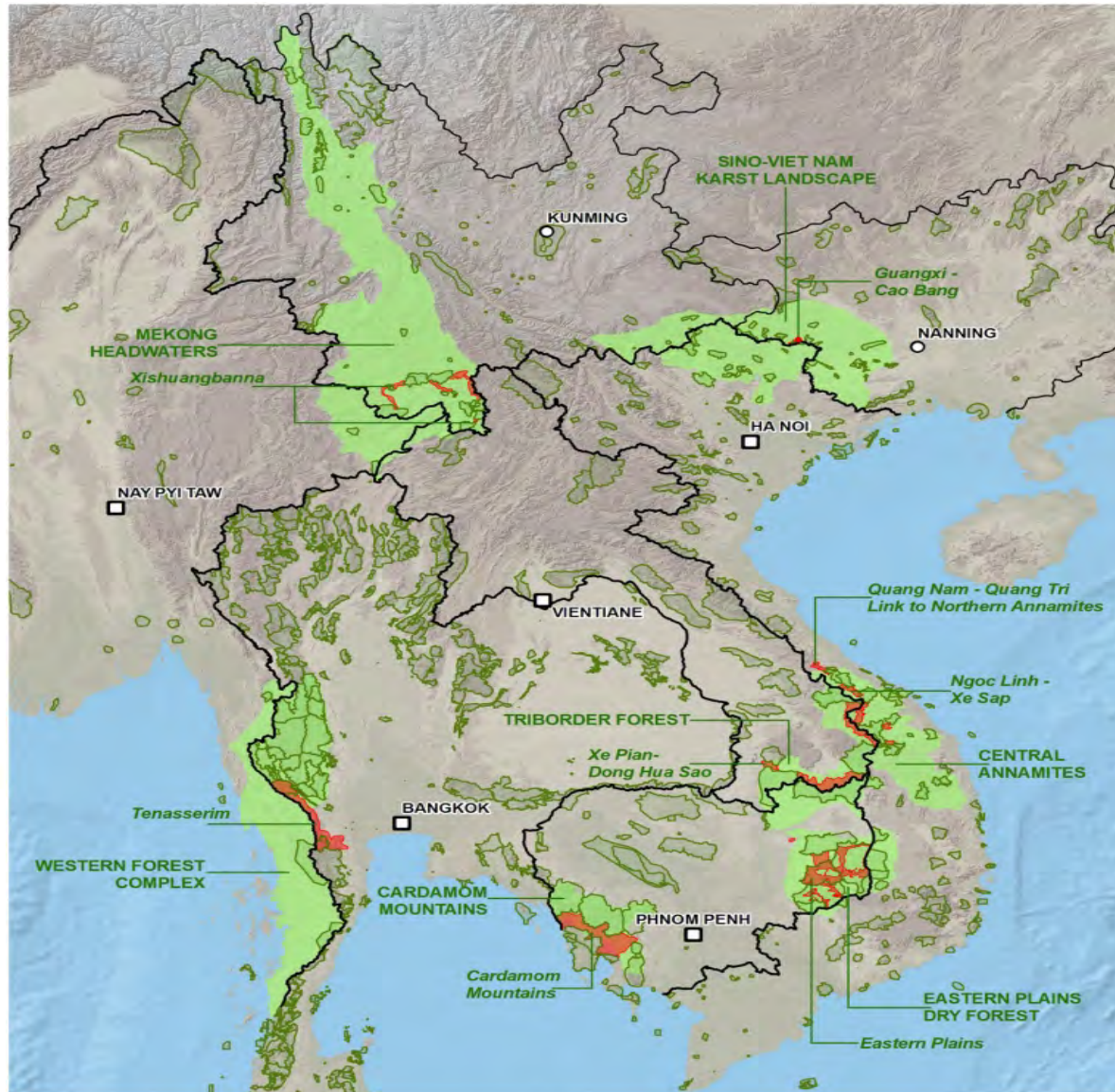
*Prepare by Nguyen Thanh Vinh
EOC Environment Policy Specialist*



Overview

1. Background and Objectives
2. Key findings
3. Recommendations for Future Actions
4. Conclusions

I.1. Background



- Parts of Sino-VN Karst
- One of three priority TBLs,
- Need actions/plans for CCA and integration into TBL for better conservation and management in response to the CC

I.1. Background



- Complex topography & impressive landscape
- **High biodiversity:** Many niche habitats for rare species, including the Cao-Vit Gibbon.

Recent climate hazards

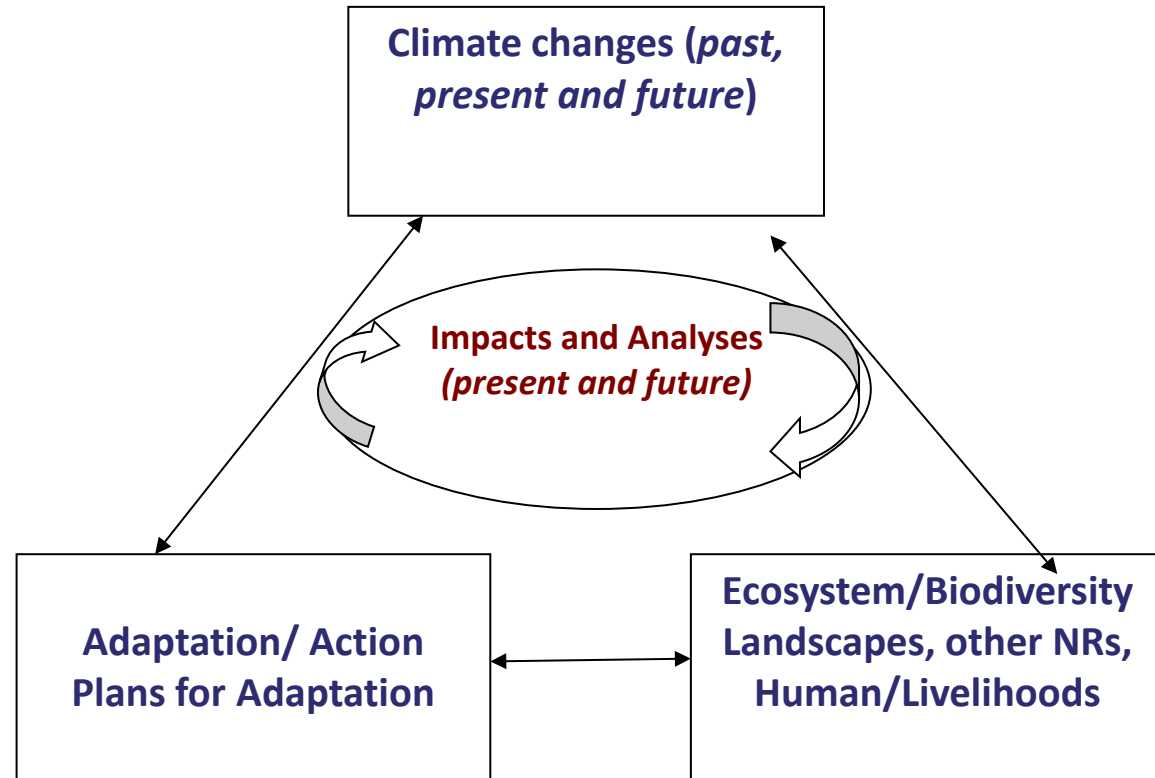
- Droughts,
- Floods,
- Typhoon,
- Snow



I. 2. Objectives



To propose practical approaches and recommendations to promote the integration of CCA into Biodiversity Landscape Management and Conservation of Caovit Gibbon species in Cao Bang province



This diagram would show practical approach and simple concepts for

- Why do we need the Adaptation and integration ?
- How to make ? And
- What the action plan should be ? and the interaction among CC, Impacts, their objects (ecosystem/BLs, human/livelihoods)

II. Key Findings



II.1. Recent Climate Change in Cao Bang

Extreme climate phenomena and hazards, before and after 1985

Station	Period	The annual avg no. of days: extreme climate phenomena and hazards occurred in Cao Bang					
		Storm	Hail	Frost	Drizzle	Dry heat	Fog
Bảo Lạc	1961–1985	–	0, 3	0, 1	5, 9	37, 5	65, 6
	1986–2012	56, 2	0, 29	0, 00	0, 04	53, 3	53, 1
Cao Bằng	1961–1985	92, 1	0, 4	0, 9	20, 3	15, 8	68, 1
	1986–2012	81, 3	0, 26	0, 22	3, 81	19, 3	69, 0
Nguyên Bình	1961–1985	–	0, 3	3, 8	30, 6	–	8, 7
	1986–2012	78, 8	0, 15	0, 37	17, 0	–	7, 6
Trùng Khánh	1961–1985	–	0, 5	5, 8	50, 4	–	11, 6
	1986–2012	66, 0	0, 11	1, 74	9, 9	–	13, 0

(Hydro-meteorological Center of Cao Bang Province- 2014)

II. Key Findings



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II.2. Recent climate hazard in Cao Bang

The two historical coldest periods:

- 38 days in 2008, and
- 36 days in 2011



Long-lasting snowfall:

- late 2015 and
- early 2016



II. Key Findings

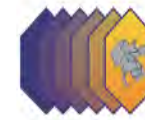


II.2. Climate Change in Cao Bang in 21st century

Changes in annual rainfall (%) and avg annual temp (°C)

Changes in	RCP4.5 scenarios			RCP8.5 scenarios		
	2016-2035	2046-2065	2080-2099	2016-2035	2046-2065	2080-2099
Annual rainfall (%)	14.2 (8.2 ÷ 19.9)	16.0 (9.8 ÷ 21.8)	22.1 (13.1 ÷ 31.4)	3.8 (4.2 ÷ 11.8)	12.8 (9.4 ÷ 16.1)	25.7 (17.0 ÷ 34.4)
Avg annual temp (°C)	0.6 (0.2 ÷ 1.1)	1.7 (1.2 ÷ 2.6)	2.3 (1.6 ÷ 3.4)	1.1 (0.6 ÷ 1.6)	2.2 (1.5 ÷ 3.5)	4.0 (3.1 ÷ 5.7)

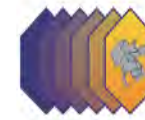
II.2. Climate Change in Cao Bang in 21st century *(Cont....)*



Monsoon and other climate extremes

- Typhoons and tropical depressions may decrease. But, strong to very strong typhoons would increase;
- Summer monsoon would start earlier and end later;
- Rainfall during monsoon activity would increase;
- Extreme cold and damaging cold days would decrease;
- Hot days ($T_x \geq 35^{\circ}\text{C}$) increase;
- Droughts become more severe because of increased temperatures and rainfall deficits in the dry season,

II.2. Increase in extreme weather events, and natural disasters in 21st century



More droughts resulted from:

- Long lasting period of cold or heat wave
- Surface water scarcity;
- Groundwater source is depleted & exhausted;

More floods, flash floods and landslides due to:

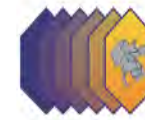
- Excesses water in the rainy season;
- Distribution of rainfall is uneven;
- High frequency of rains, with its huge water flow

II.3. Potential impacts on livelihood and biodiversity



- Tropical trees move to the North & the temperate zone decreased (**vegetation distribution and the zone changing**);
- Species more resistant to drought/floods developed, those less tolerant to this, are prone to extinction (**survival and loss**);
- **Big loss** in cultivated areas, economy and environmental damage (droughts, floods, flash floods and landslides);
- **Forestry sector** affected by forest fires. Pests, degradation

II.3. “Maxent modeling” to predict Caovit Gibbon distribution under CC impact

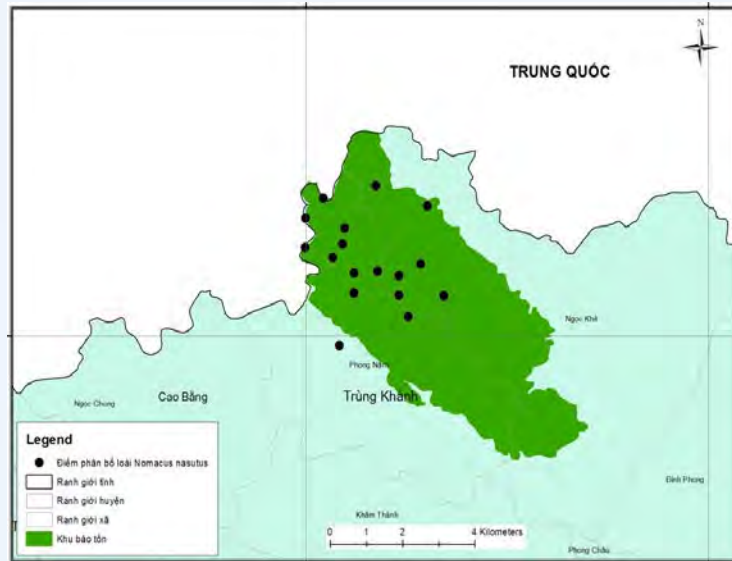
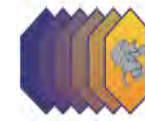


Input data:

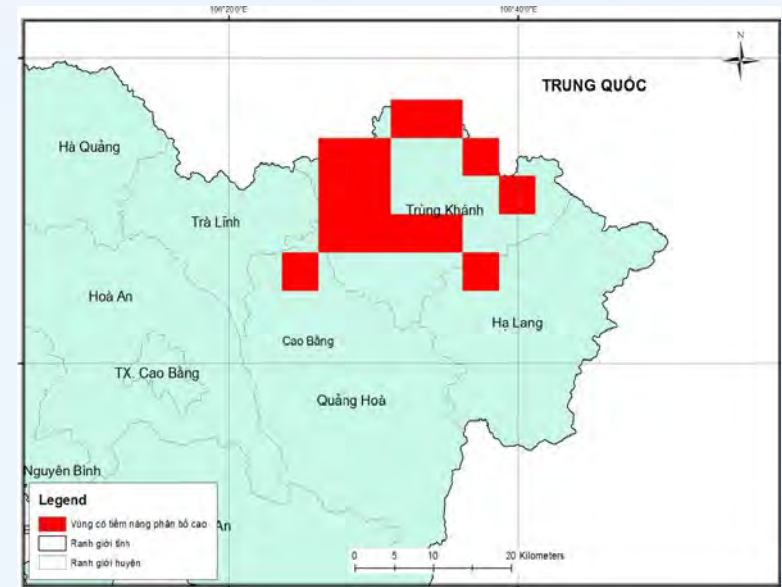
- a). 17 points gibbon species distribution
- b). Biometric factors are used for model establishment

Name of layers	
Bio 1	Annual Mean Temperature
Bio 2	Mean Diurnal Range (Mean of monthly (max temp - min temp))
Bio 3	Max Temperature of Warmest Month
Bio 4	Min Temperature of Coldest Month
Bio 5	Annual Precipitation (year)
Bio 6	Precipitation of Wettest Month
Bio 7	Precipitation of Driest Month

II.3. Potential Distribution of the Caovit Gibbon in 2070



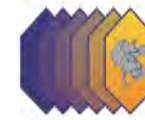
Distribution in 2016



Potential Distribution in 2070

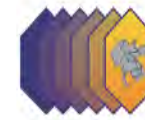
- Trung Khanh and Ha Lang are the suitable areas for gibbons living in the year of 2017
- Maintaining habitats, limiting habitat loss and human impact essential factors for the preservation and conservation of the Caovit Gibbon

III. Recommendation for future actions



1. Knowledge generation;
2. Capacity building, institutional and policy development;
3. Ecosystem and biodiversity landscape resilience enhancement;
4. Income/revenue generation
5. Special focus for Caovit Gibbon adapting to climate change;

III. 1. Knowledge generation



Step
1

- Relevant physical and socio-economical survey and data collection

Step
2

- Downscaling future CC scenarios, at district and communal level (max/min temp; rainfall, precipitation, etc)

Step
3

- GIS dataset establishment of the physical, socio-economical data and CC scenarios

Step
4

- Technically GIS based analyses for CC vulnerabilities

Step
5

- Adaptation plan development with CBA, consultation and participation of relevant stakeholders

Step
6

- Integration of the adaptation plans into socio-eco development & bio-landscape management plan and implementation

III.2. Capacity Building, Institutional and Policy Development



- Improve capacity for professional staff in management, scientific research and management units in nature reserve areas;
- Promote community co-management based models of various types of nature reserves;
- Develop regulations management tools for Bio-Conservation and Corridor;
- Establish cross-border nature reserves, with joint management measures, with Quangxi province, China.

III.3. Ecosystem and biodiversity landscape resilience enhancement



- Maintaining and restoring the biodiversity at all scales
- Maintaining and enhancing carbon pool and sink of forest the means of REDD+ and landscape restoration
- Protected area network establishment and maintenance into provincial and national planning
- Biodiversity corridor establishment and sustainable management, including:
 - A transboundary biodiversity corridor linking Trung Khanh district with Quangxi province of China
 - A provincial biodiversity corridor linking the Ha Lang Conservation Area with the Trung Khanh Conservation Area

III. 4. Income/revenue generation



Climate smart livelihood development & bio-trade promotion:

- Review of valuable traditional resources (bio-genetic resources/local crops/domestic animals');
- Investigate, traditional knowledge of cultivation, breeding techniques, processing in traditional bio-medicine and bio-food;
-
- Value chain assessment to Identify market opportunity;
- Branding; marketing and market for the bio-products.

Development of bankable project proposal:

- Develop a financial model to estimate the cashflow and financial profit;
- Analyze financial sensitivities to avoid any financial risk of

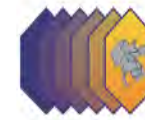
III.5. Special focus for Caovit Gibbon in response to CC



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- Research collaboration with Guangxi on future projection for distribution/habitat & population dynamics of the Caovit Gibbon for the whole area of natural distribution
- Establishment of cross border biodiversity corridor with Quangxi for landscape connectivity, habitat improvement and resilient enhancement;
- Ecosystem and habitat restoration and maintenance for the Caovit Gibbon conservation Reserve of 8,000 ha;
- Establishment of a Competence Research Center for the Caovit Gibbon conservation and management.

IV. Conclusion



- The mentioned recommendations should be reviewed in five years' time for update of new climate change information generated by ICCP and MONRE to adjust or improve the action needed accordingly;
- The recommended actions involve the further development of the concept note or (bankable) project proposal for funding consideration.



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谢谢

Thank you!

