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UTokyo Online Education Academic Frontier Lecture Series 2022

Lü Zhi

Living in Harmony with Nature: Is It Possible and How? - Cases from China

人与自然共存的中国案例

吕植

北京大学自然保护与社会发展研究中心,

山水自然保护中心

Lü Zhi

Peking University Center for Nature and Society

Shanshui Conservation Center

2050 Vision, Conversion of Biological Diversity, Aichi, 2010

Living in harmony with nature.

By 2050, biodiversity is valued, conserved, restored and wisely used, maintaining ecosystem services, sustaining a healthy planet and delivering benefits essential for all people.

1992





人民摄影

保护大熊猫就是保护人类自己

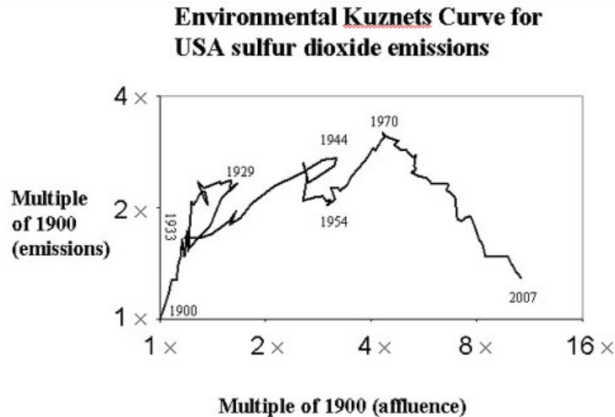
本报记者 袁惠

“Protecting the panda
is protecting our own life.”

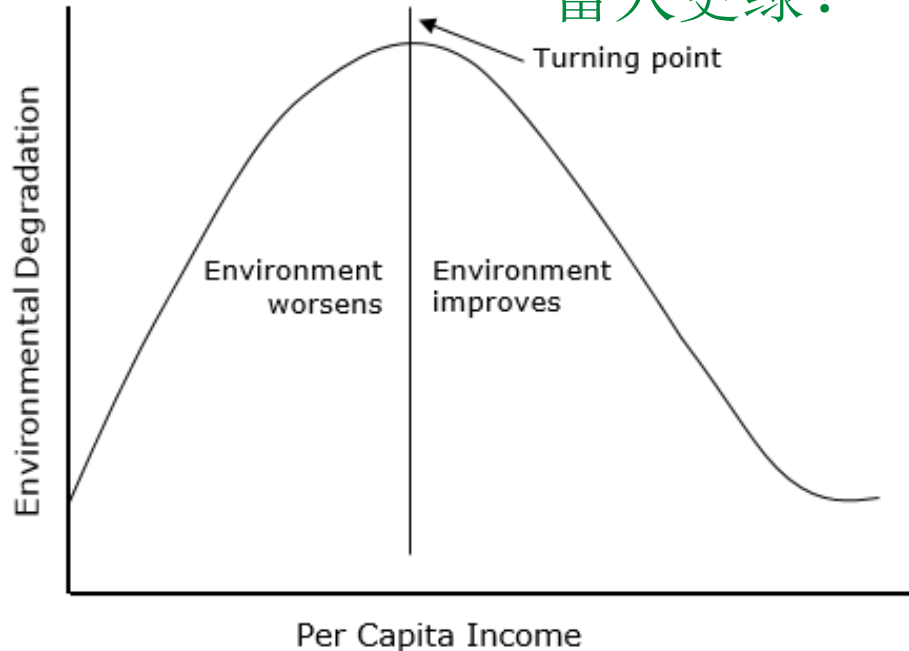
The slogan: on walls not minds.



Richer are greener?
富人更绿?

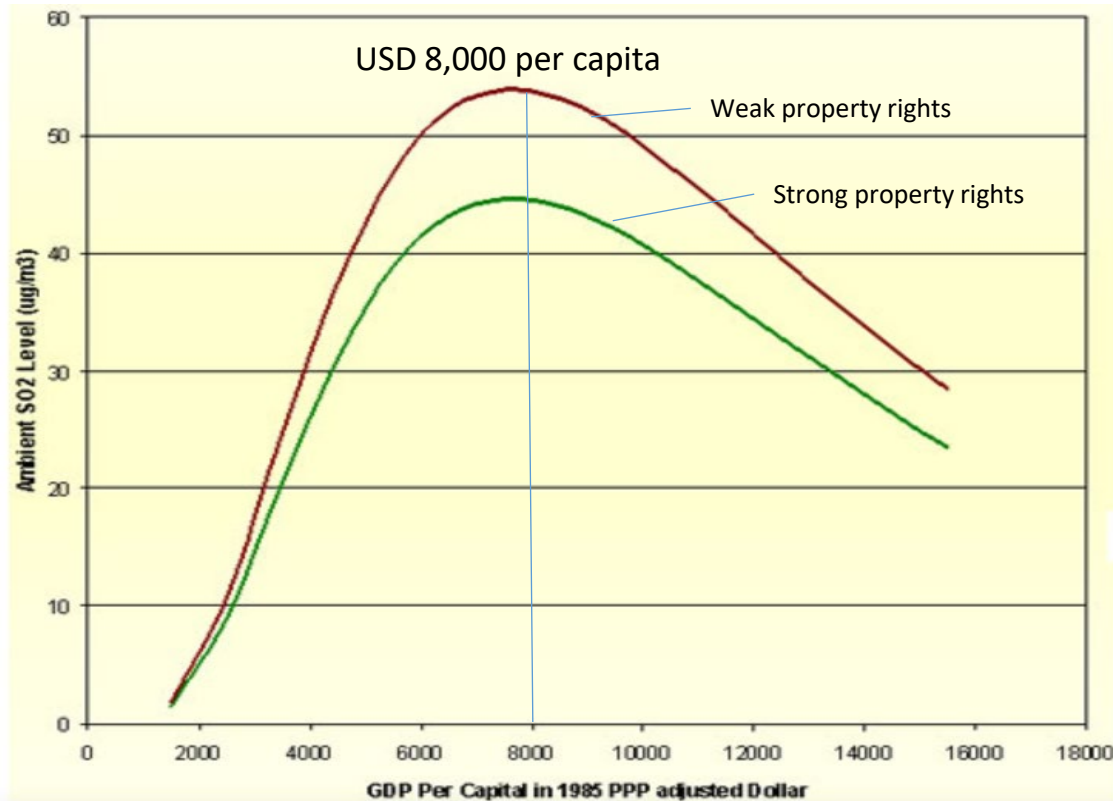


P. Waggoner and J. Ausubel, "Rise and Fall of SO₂ emissions in USA", CDIAC, EIA, US EPA. 2009
<https://phe.rockefeller.edu/news/2009/04/20/rise-and-fall-of-so2-emissions-in-usa/>



环境库兹涅兹曲线 Environmental Kuznets Curve
suggests that "the solution to environment is economic growth."

Govinddelhi This diagram was created with Microsoft Word.,
CC BY 3.0, via Wikimedia Commons



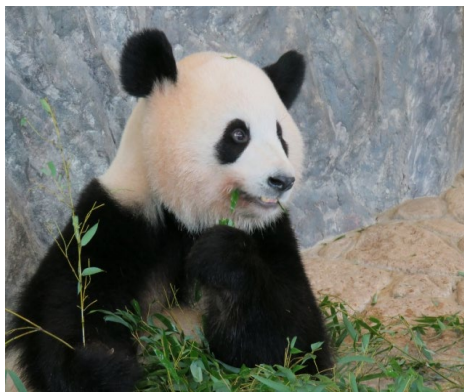
China in 1992:
USD 366 per capita

GDP per capita in different countries, 1985

Xiangdong Qin, 1998



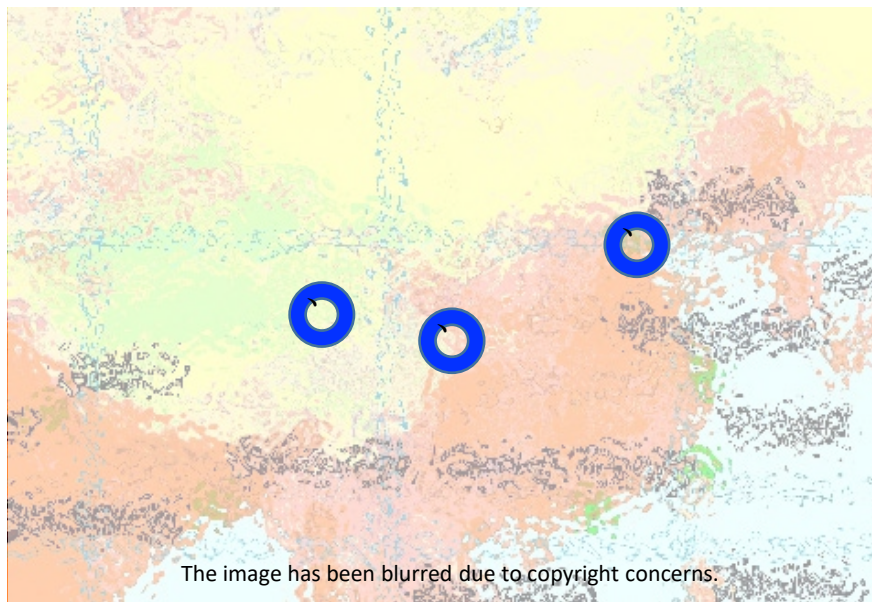
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M.Nishimura, CC BY-SA 3.0, via Wikimedia Commons

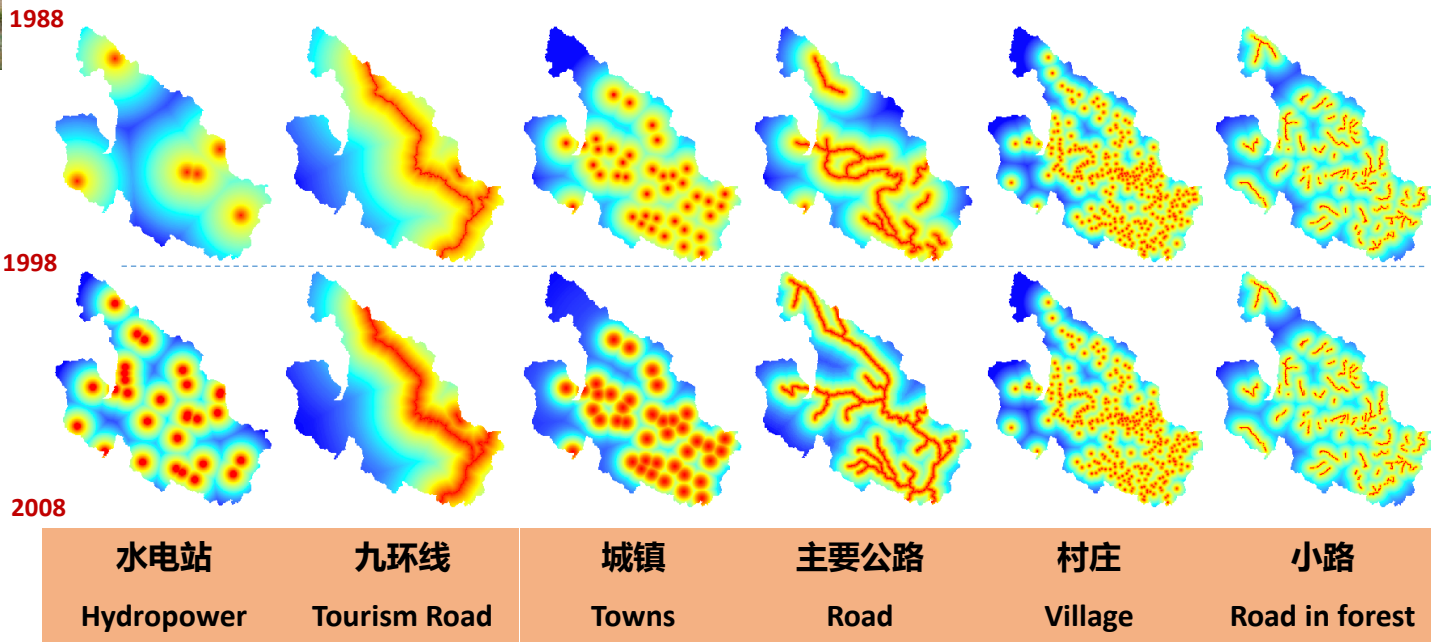


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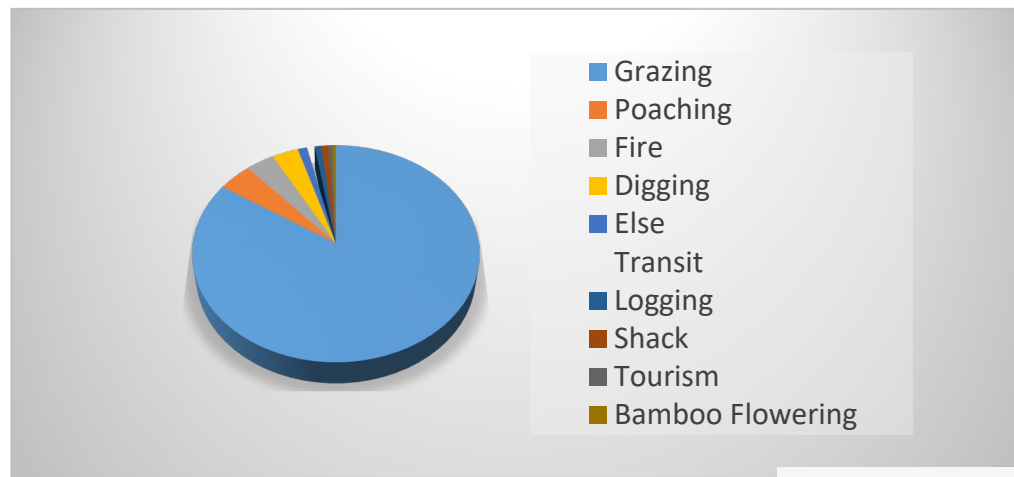


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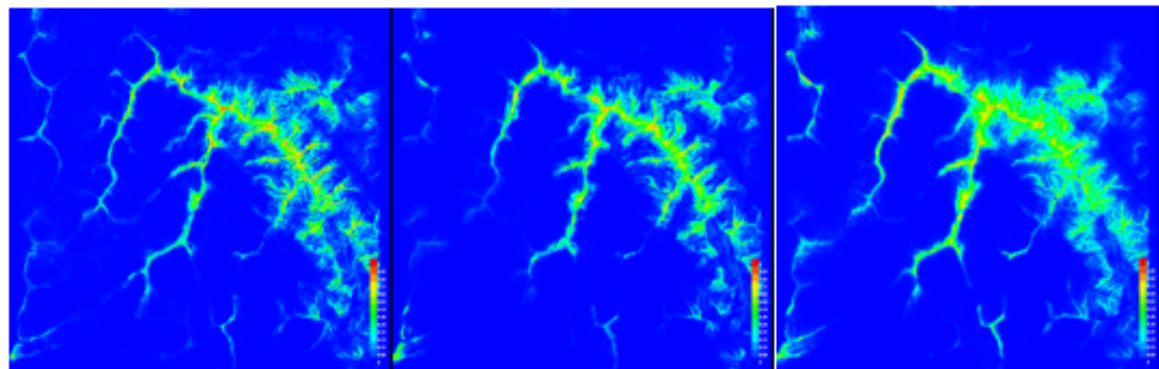
People and panda.



Changes of anthropogenic impacts the in Pingwu County, Sichuan 1988-2008 (chen Ai, 2010)



生物多样性 Biodiversity Science, "Volume 27 Issue 6, 20 June 2019 - Original Papers: Animal Diversity", https://www.biodiversity-science.net/EN/volumn/volumn_2041.shtml



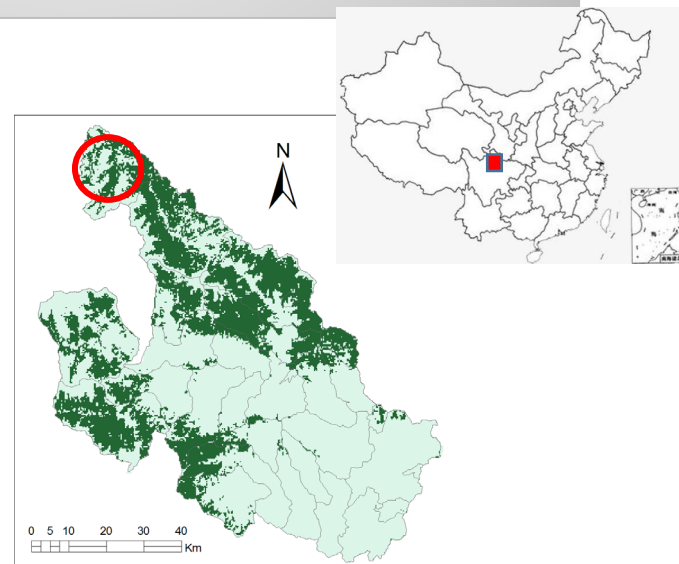
2003-2006

2007-2011

2012-2015

Impact of grazing in the Wanglang Nature Reserve 2003

(Zhang Di, 2016)





Panda Honey: triggered changes

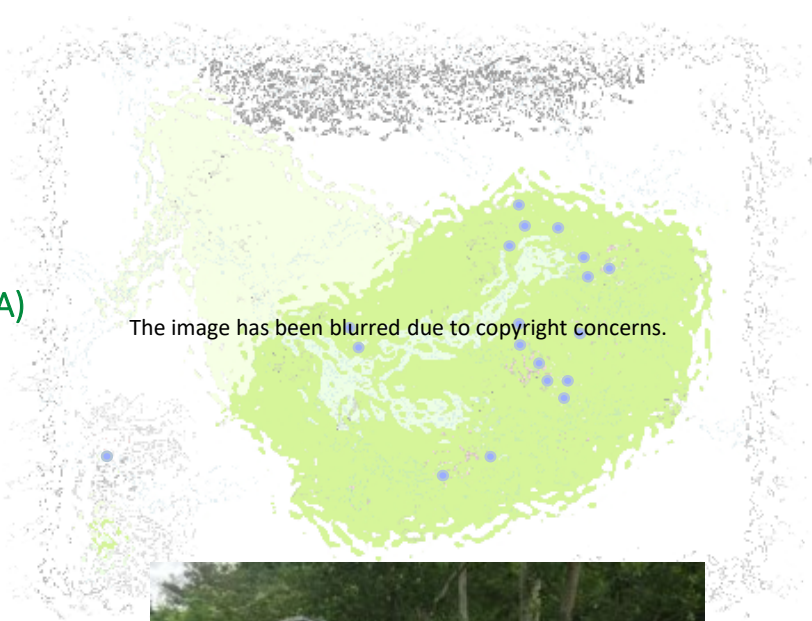
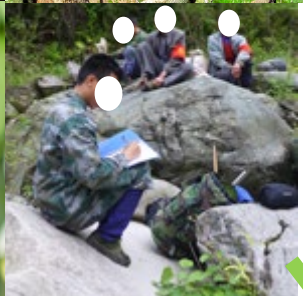
A Coop on honey

A community conserved area (CCA)

A NGO by young people

The recognition by the society

A vision toward a better life

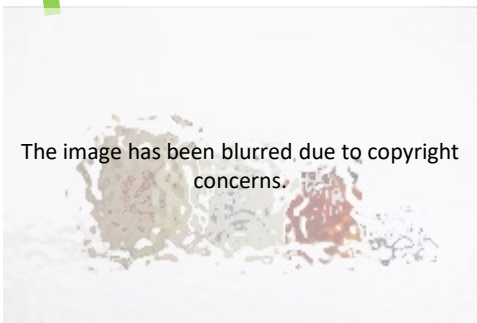


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Urban consumers



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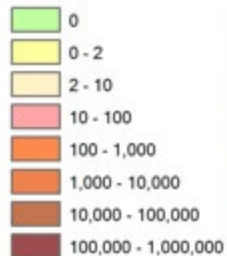
Sanjiangyuan: sources of three rivers



photoAC



2010 世界人口密度
人/km²



(数据来源www.worldmap.harvard.edu/maps/new)



The ecosystem remains relatively intact

> 35
carnivore
species



Wolf

Chris Muiden, CC BY-SA 3.0,
via Wikimedia Commons

Snow leopard



photoAC

Brown bear



Denali National Park and Preserve, Public domain, via
Wikimedia Commons



Tibetan antelope

Freddy Weber, Public domain,
via Wikimedia Commons



Wild yak

Jim, the Photographer, CC BY
2.0, via Wikimedia Commons



Tibetan wild ass

Bodlina, CC BY 3.0, via Wikimedia
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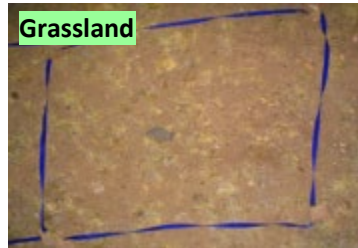
Blue sheep

Dibendu Nandi, CC BY-SA 4.0,
via Wikimedia Commons

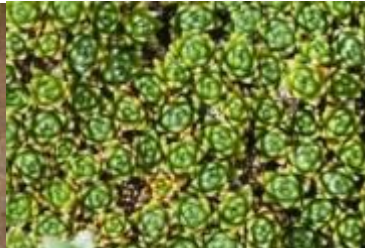


livestock

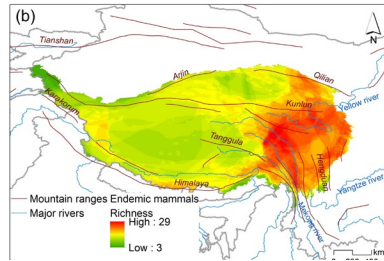
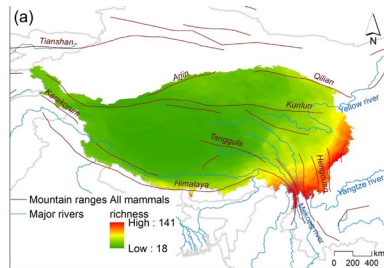
W.carter, CC0, via
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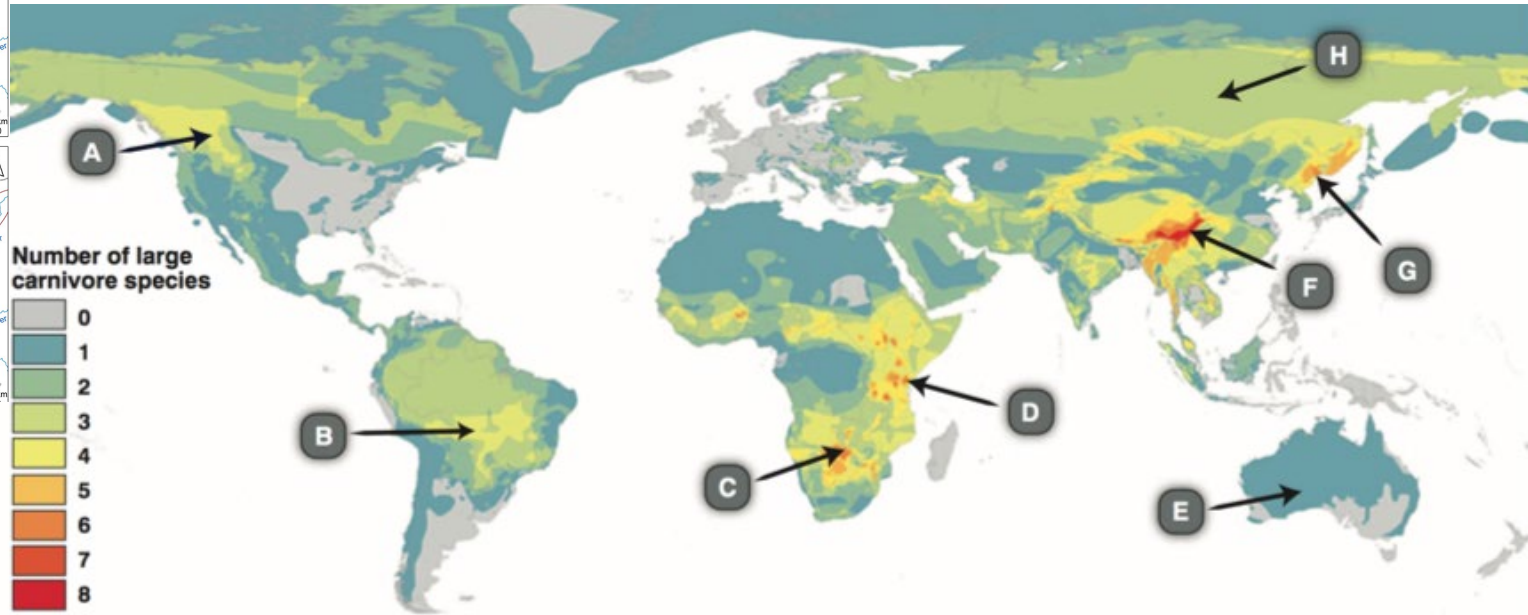
Grassland



Distribution of large carnivores (Ripple et al. 2014)



Mammals on the
Tibetan Plateau
(Li Juan et al, 2018)



A

gray wolf
puma
brown bear
American black bear

B

maned wolf
jaguar
puma
giant otter

C

African wild dog
lion
cheetah
leopard
spotted hyena
brown hyena
Cape clawless otter

D

African wild dog
lion
cheetah
leopard
spotted hyena
striped hyena
Cape clawless otter

E

dingo

F

gray wolf
dhole
snow leopard
clouded leopard
leopard
Eurasian lynx
brown bear
Asiatic black bear

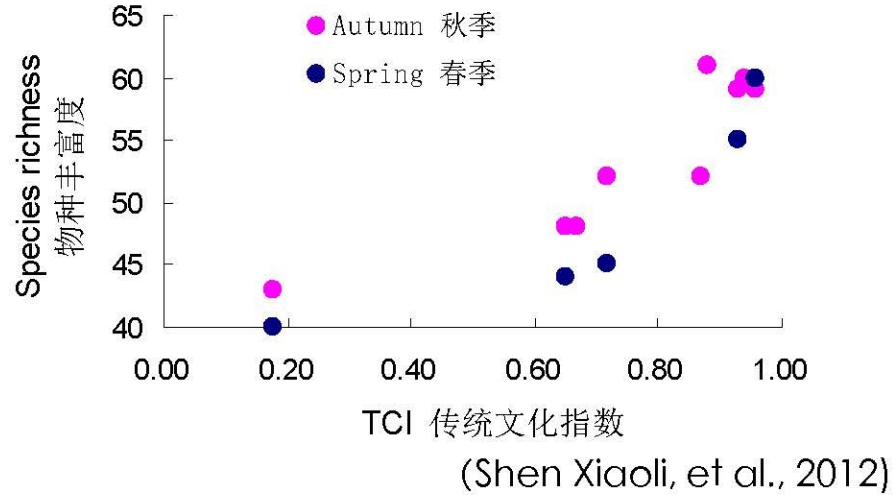
G

gray wolf
dhole
tiger
leopard
Eurasian lynx
brown bear
Asiatic black bear

H

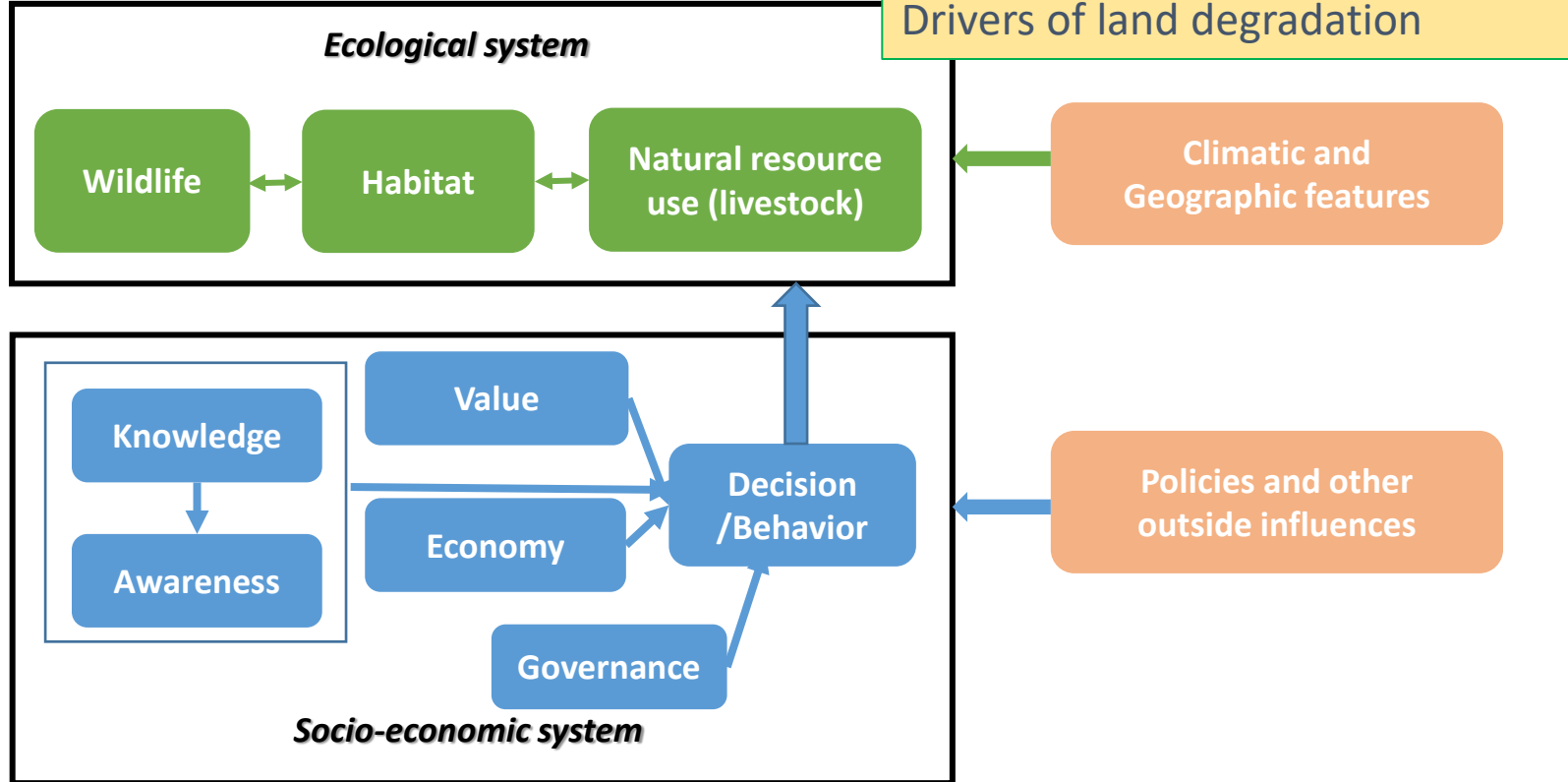
gray wolf
Eurasian lynx
brown bear

Cultural Value



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RESEARCH FRAMEWORK

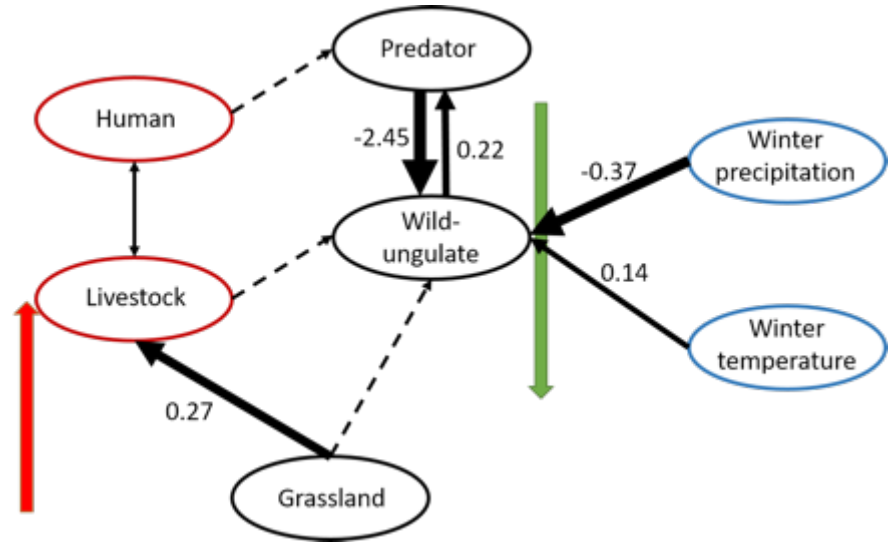




Back: Terry Townshend, "Valley of the Cats 2018", Wild Beijing, <https://birdingbeijing.com/2018/11/30/valley-of-the-cats-2018/>
Left: Shanshui Conservation Center, "走进另一个世界，人与神的三江源", <http://www.shanshui.org/information/2991/>

Population regulation :top-down or bottom-up ?

Snow leopards-blue sheep-grassland vs. human-livelihoods-grasslands



- Blue sheep regulated by snow leopards
- Livestock regulated by grasslands
- Weak links between

(Xiao, Lingyun, 2017)

Snow Leopard Diet (Li, Juan, 2012)

		Valley with high blue sheep (n = 163)		Other valleys (n = 87)	
		number	%	number	%
Wild prey	Blue sheep	126	77.3	43	49.4
	Hare	0	0.0	2	2.3
	Marmot	11	6.7	14	16.1
	Pika	8	4.9	8	9.2
	Vole	0	0.0	1	1.1
Live-stock	Yak	14	8.6	13	14.9
	Horse	1	0.6	0	0.0
	Goat	4	2.5	2	2.3
	sheep	4	2.5	2	2.3
other	Plants	31	19.0	14	16.1
		4	2.5	12	13.8



Livestock Loss to Predators

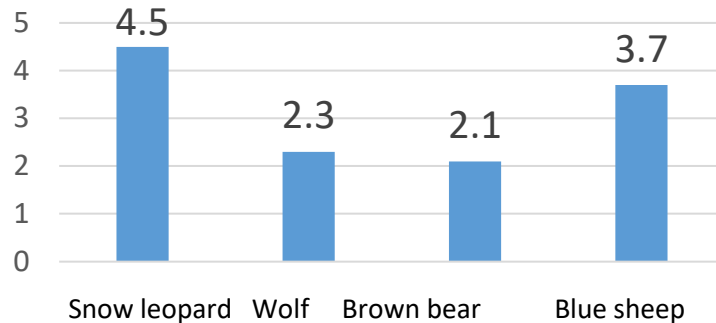
(N=144 households)

Causes	House No.	Yak		Sheep		Horse	Cost ¥ 10k
		大牛	牛犊	大羊	羊羔		
Wolf	116	321.5	142.5	510	269.5	18	257
Snow leopard	53	72	61	125.5	66	0	60
Brown bear	24	4	11	22.5	0	0	52
Feral dog	2	0	0	48	3	0	4
Fox	7	0	0	0	105	0	2
Lynx	11	0	0	8	18	0	1
Pallas's cat	2	0	0	0	5	0	0.1
Golden eagle	1	0	0	0	4	0	0.1
Unknown	4	2	3	25	0	2	4
Total	118	397.5	214.5	714	470.5	18	330
Disease	51	348	19	382	60	0	242

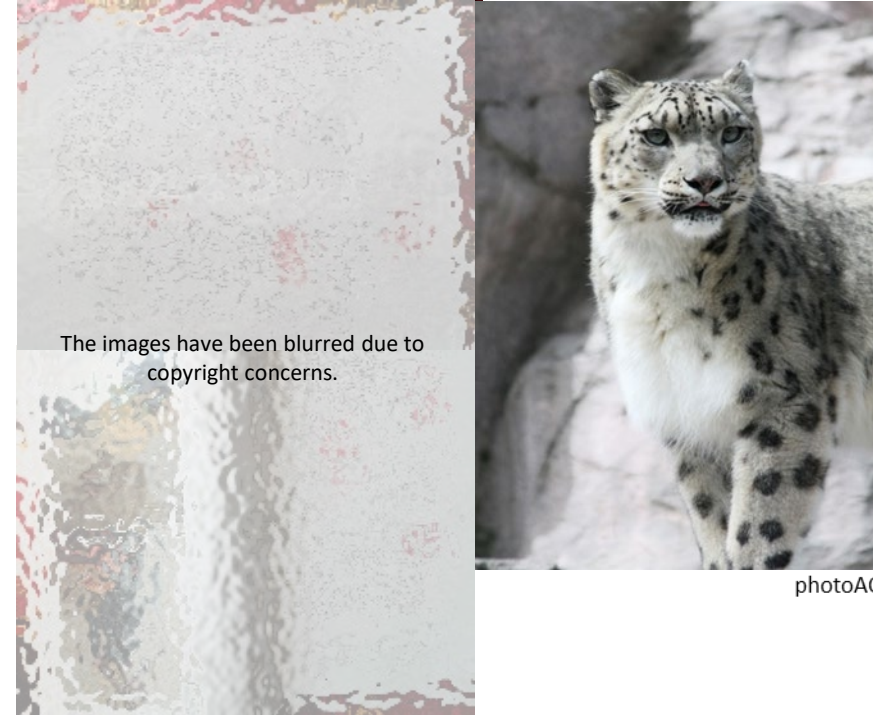
Managing Conflicts: Village Fund

- An insurance fund supported by local government, communities and NGOs (200k/year)
- Self-governance – capacity building and responsibilities
- Improved livestock management and benefits

Attitudes toward conservation of predators



Niandu Village: 222 yaks killed in 2017,
> 1 million RMB loss



Beneficial From Conservation

16000 guard jobs created

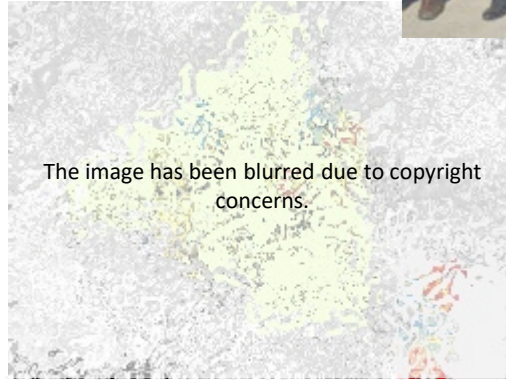
– 1 guard/household

Trained for wildlife monitoring and
patrolling

Effective monitoring and conservation

Wildlife tourism

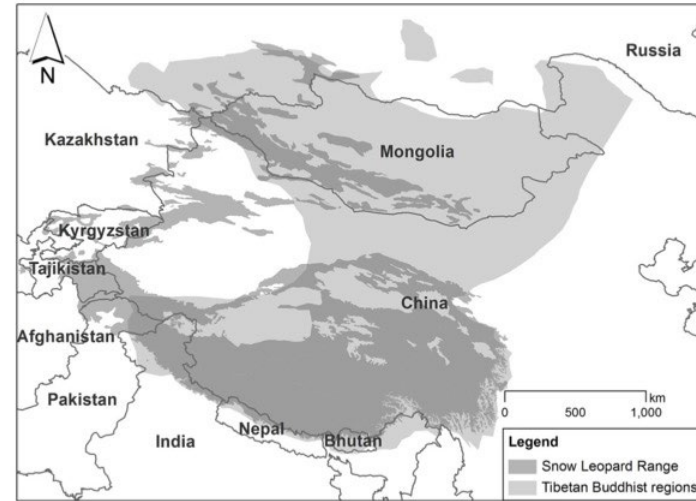
In 2019, 21 families provide
homestay and tour guides, >1
million income
- 45% to guides, 45% to the
village and 10% to wildlife fund



photoAC

Snow leopard and humans:

Transforming from conflicts to mutual benefits - manageable



Tibetan Buddhism vs. snow leopard habitats

Li Juan, et al, ."Role of Tibetan Buddhist monasteries in snow leopard conservation". Conserv Biol. 2014


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How about future?

Peking University

A campus conservancy

The image has been blurred due to copyright concerns.



An aerial photograph showing a river winding through a dense, green forest. The river is a light blue color, contrasting with the surrounding greenery. The forest appears thick and continuous, with some lighter patches that might be clearings or different types of vegetation. The river flows from the upper right towards the lower left of the frame.

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John Leighton Stuart
1876-1962



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- Plants > **500**
- Birds **217** (1/7 of China birds)
- Mammals **11**
- Fishes **26**
- Amph. & reptile **11**
- Butterflies **27**
- Dragon flies **26**
- People > **50000**

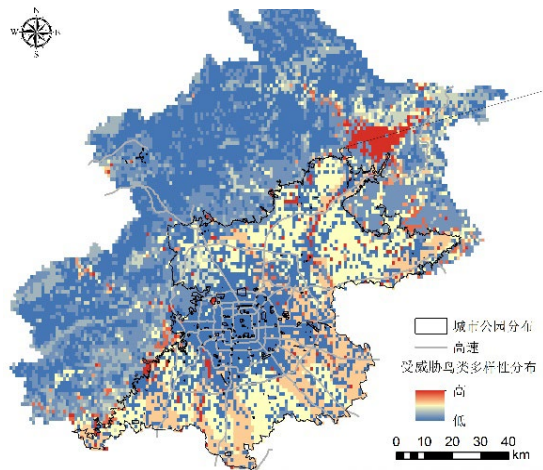
Area: 1 sq. km
Monitoring: since 2003

A campus conservancy!

A Natural Beijing

Birds

472 species
30 threatened
3 CR
10 EN

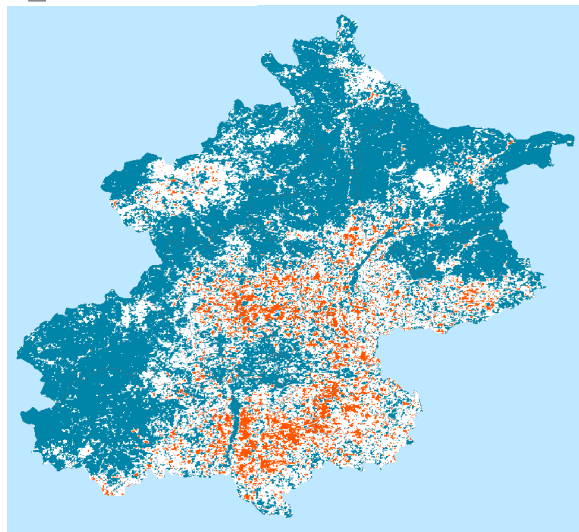


黄越等, 2018

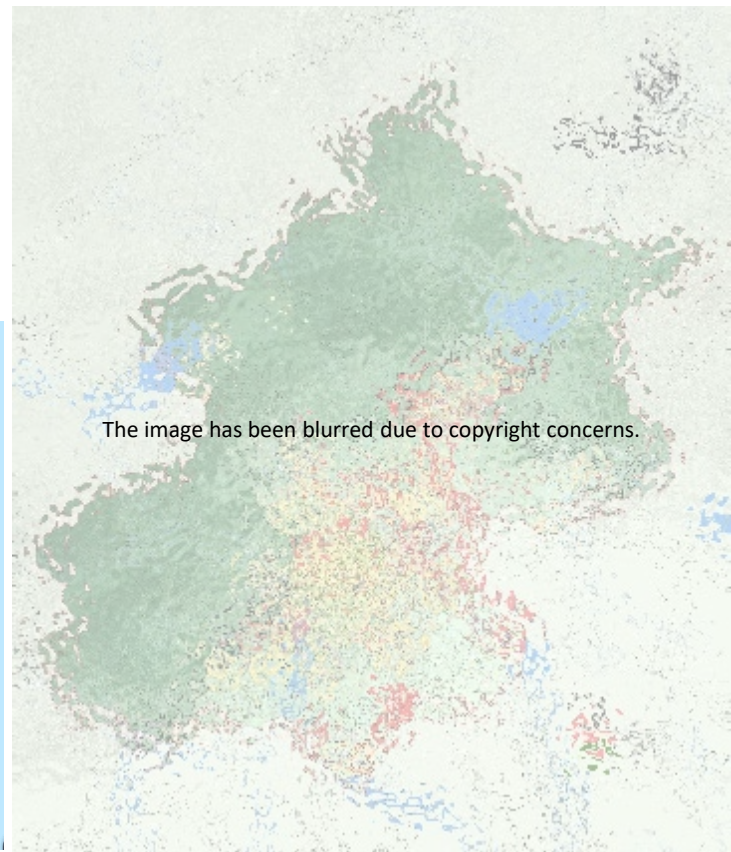
Vegetation

70% by 2035

☒ EVIBMean_CHG_SH8_2000-2017
☒ 显著降低
☒ 显著增加
☐ 变化不显著



Wang Hao, 2018



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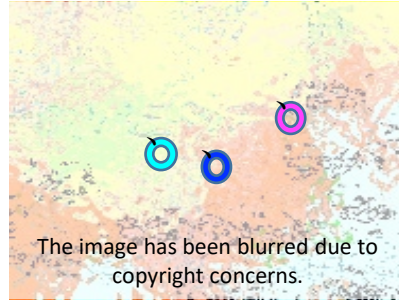
Restore the ecosystem of northern China Plains

- Natural and diversified vegetation
- Biodiversity
- Eco-friendly park management
- Citizen participation and benefit



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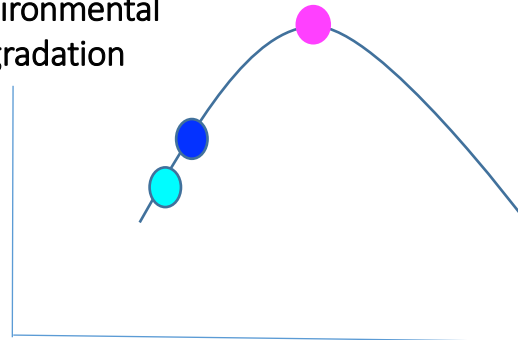




Drivers to conservation

- Environmental awareness
- A better life, with modest income and societal recognition
- Spiritual value

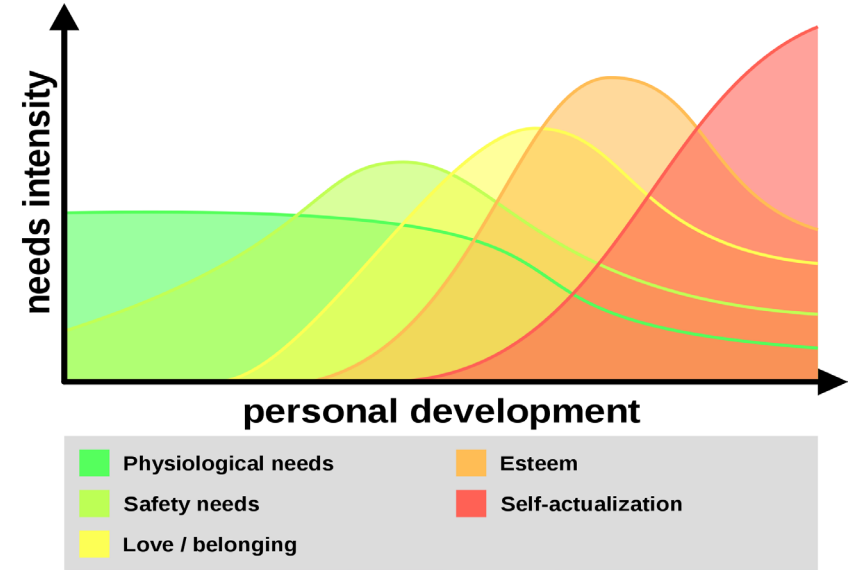
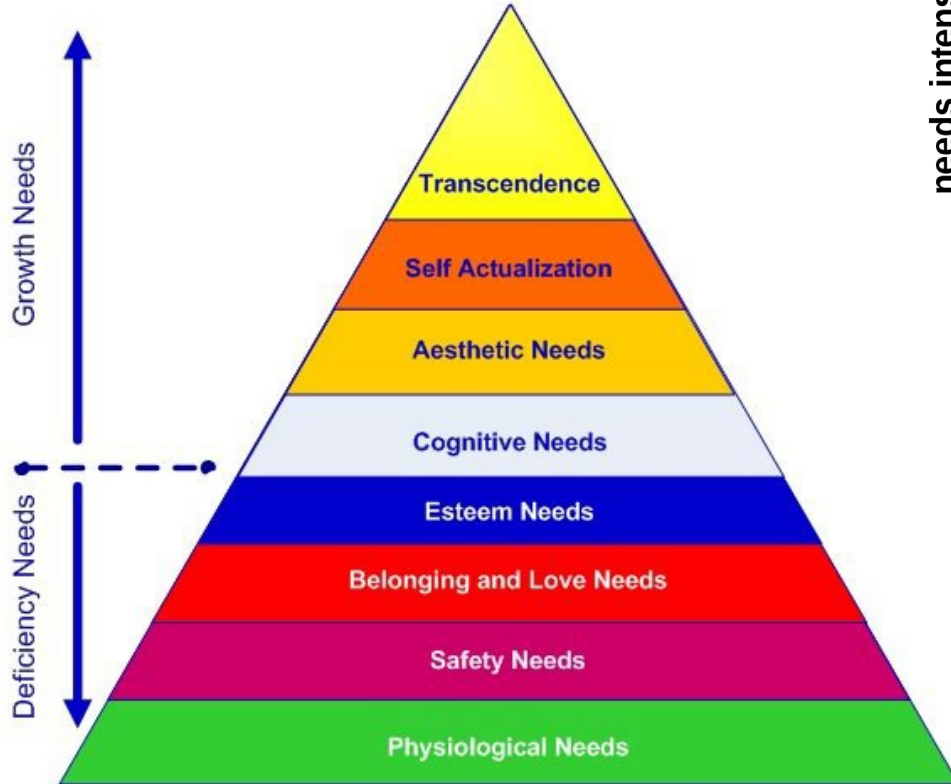
Environmental
degradation



~~GDP per capita~~

Happiness?

MASLOW'S MOTIVATION MODEL



Philipp Guttman, CC BY-SA 4.0, via
Wikimedia Commons

Poor can be green, too.

The way we measure our life may be too simplified to be accurate – need a holistic view.

When culture and social capitals are recognized and appreciated, conservation may become achievable.

A new civilization ?