Introduction to Public Health
Module # 20

Climate change and public health.

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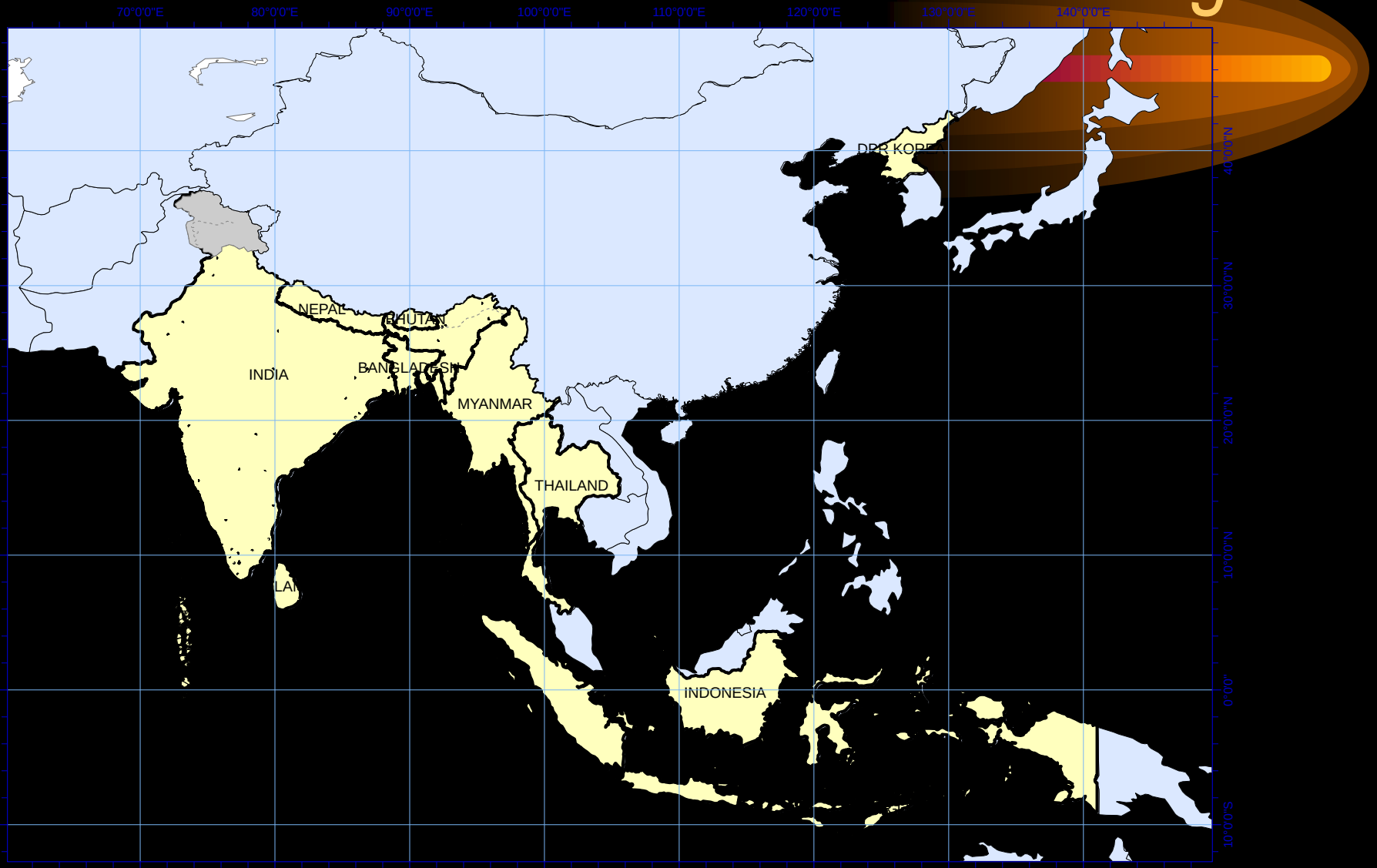
Outline

- South East Asia is disaster prone
- The most vulnerable
- Climate-sensitive health outcomes
- Exacerbating current burden of disease

- Weather – conditions of the atmosphere over a short period of time
- Climate – conditions of the atmosphere over long periods of time (30- year standard averaging period)

South East Asia Region



The Region is Vulnerable to Climate Sensitive Health Stressors

- 44% of all disasters, globally
- 1996-2005: 57% of people killed globally in natural disasters were from SEAR countries
- Indonesia, 2007: 3 flood events; 4 landslides; 2 tornadoes
- Maldives, May 2007: high tide floods
- Bangladesh November 2007: Super cyclone SIDR: 4,000 dead, millions affected
- Myanmar, May 2008: Cyclone Nargis, 135,000 perish

Photo: http://cache.daylife.com/imageserve/02fAd1d1tWeAW/340x.jpg

Population Estimates for 2025 in Southeast Asia

Country	2025 (thousands)	% of world population
Bangladesh	206,024	2,6
Bhutan	819	0,01
Democratic People's Republic of Korea	25,228	0,3
India	1,447,499	18,5
Indonesia	271,227	3,4
Maldives	411	0,005
Myanmar	55,374	0,7
Nepal	38,855	0,5
Sri Lanka	20,328	0,3
Thailand	68,803	0,9
Timor-Leste	2,011	0,03
SEA total	2,136,579	27,1

UN Department of Economic and Social Affairs, 2009

“Adverse health impacts will be greatest in low-income countries. Those at greater risk include, in all countries, the urban poor, the elderly and children, traditional societies, subsistence farmers, and coastal populations (high confidence).” (IPCC AR4, 2007)

Global Warming Impacts on Climate and Risk Factors

- More extreme weather events: storms, cyclones
- Heat waves: more frequent, more intense, and longer
- Air pollution: increase in levels of ground ozone, more allergens
- Rapid glacier melting: landslides, flash floods, and reduced water availability
- Disturbed rainfall patterns: more droughts, more extreme precipitation events, floods, and disrupted water supply
- Warmer temperatures: warmer minima
- Sea-level rise: inundation, saltwater intrusion, loss of land

Climate Change Impacts on Health: Increase in Climate Sensitive Health Outcomes

- Injuries, disability, drowning
- Heat stress
- Water and food-borne dis
- Malnutrition
- Vector-borne diseases
- Psychological stress

Photo: http://southasia.oneworld.net/ImageCatalog/climate-picture.jpg

More Injuries, Disabilities, and Drowning from Extreme Weather Events

Photo: ©Abir Abdullah/Still Pictures

Photo: ©Abir Abdullah/Still Pictures

Adding to the Existing Burden

India: "Super-cyclone" 1999 shattered lives

and livelihoods of 12 million people in Orissa

Bangladesh: Cyclone SIDR, 2007

Photo: xanthis.wordpress.com

Myanmar: Nargis 2008

http://media.economist.com/images/20080906/3608AS2.jpg

More Heat Waves and Heat Strokes

- 2003 Andhra Pradesh, India heat wave, with temperatures of up to 54°C, took a toll of at least 3,000 lives
- The number of heat strokes was not recorded

Refugee Study Centre (RSC), http://www.rsc.ox.ac.uk

More Respiratory Infections

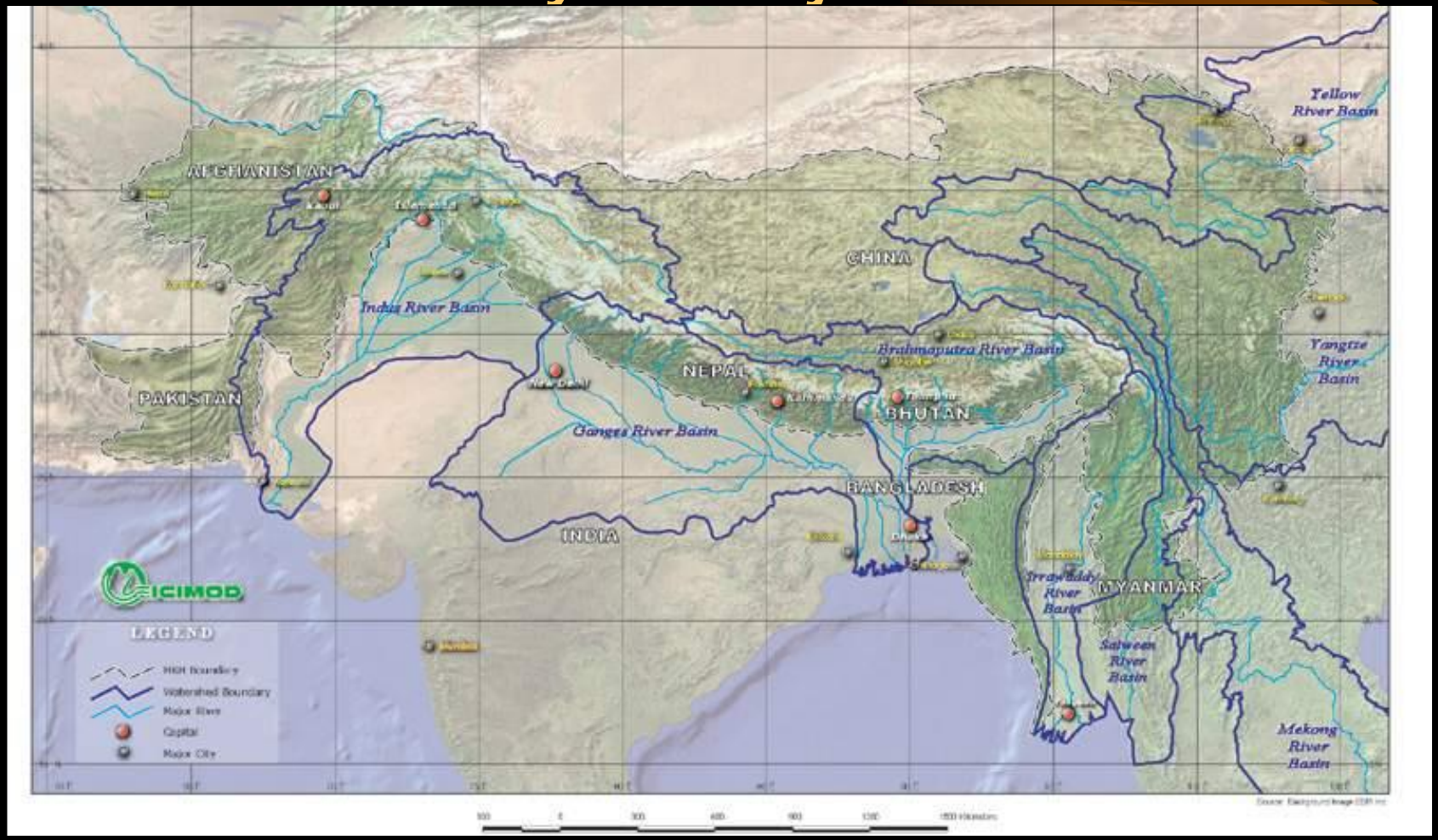
- Air pollution: Meeting increasing energy demands by greater use of fossil fuels will increase in ground ozone levels and allergens

Photo: © Deb Kushal -UNEP / Still Pictures

Rapid Glacier Melting = Less Freshwater

http://msnbcmedia3.msn.com

Himalayan Major River Basins



Glacial Retreat Example

Source: Laboratory of Cryosphere Variation, Nagoya University http://snowman.hyarc.nagoya-u.ac.jp

Rapid Melting of Imja Glacier, Nepal

1956

(Photo: Fritz Muller; courtesy of Jack Ives)

www.unforum.org

2006

(Photo: Giovanni Kappenberger courtesy of Alton C Byers)

Glacial Lake Outburst Flood

- Excess melt water leads to Glacial Lake Outburst Flood (GLOF) or “mountain tsunami”
- In 2007, two hundred glacial lakes in the Himalayas were at risk of bursting

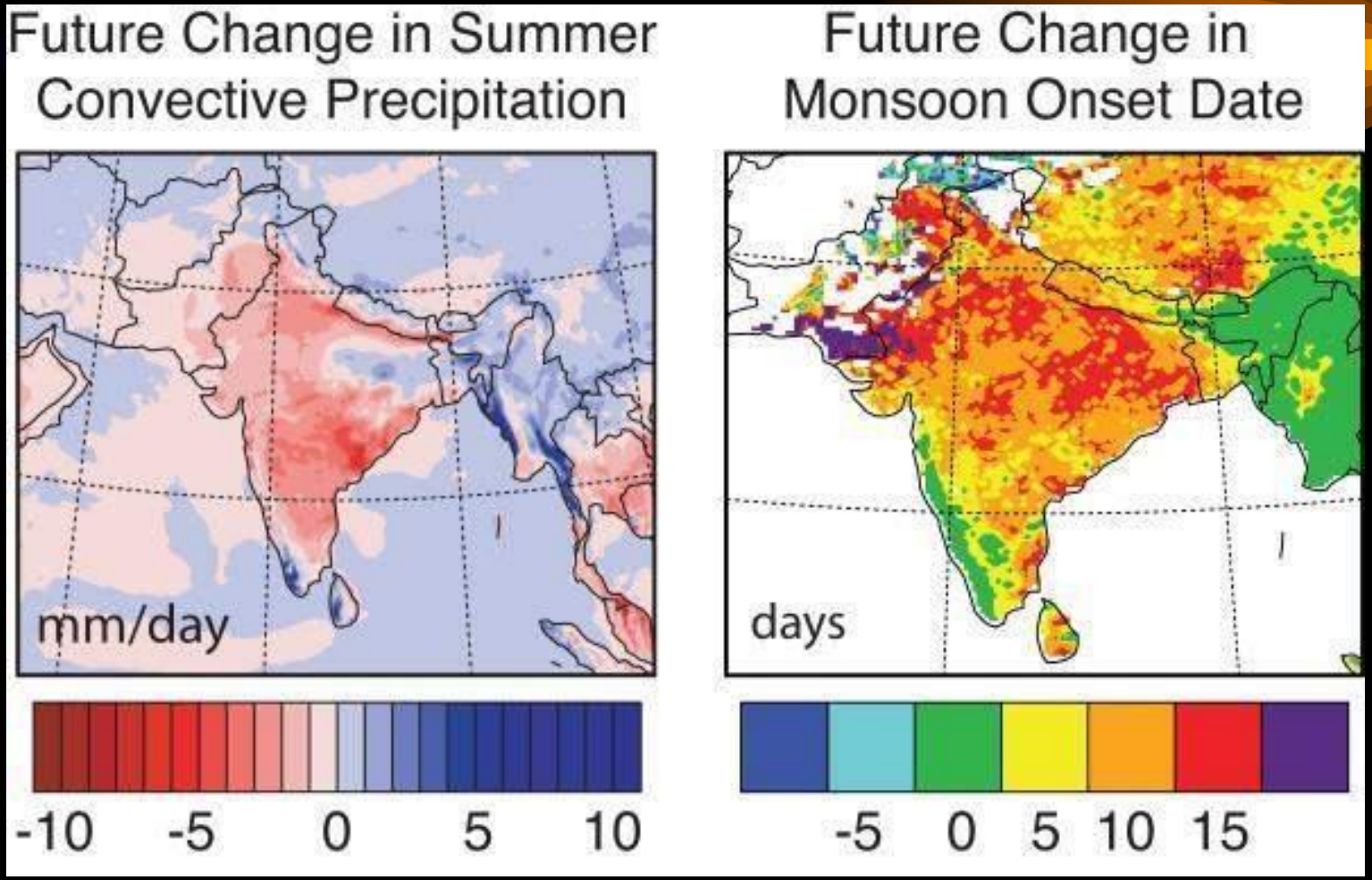
Photo: Nare glacier GLOF hits Pangboche village, Nepal, 1977

More Water Borne Diseases

- In 2005, diarrhoeal diseases accounted for 20.1% of deaths in children less than five years

Photo credit: © Shehzad Noorani/Still Pictures

Weaker Monsoons



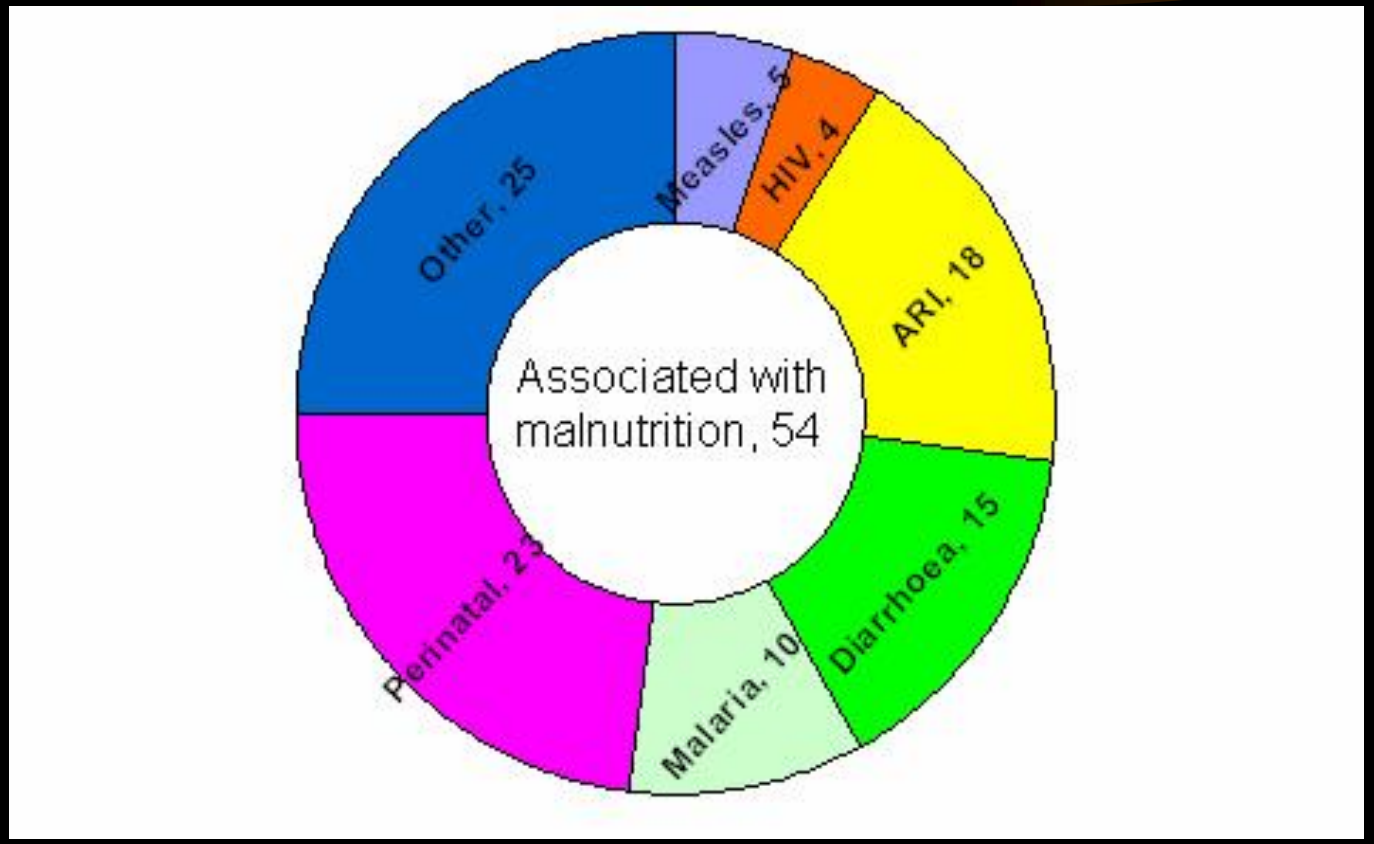
Science Daily, 2009

Scarcity of Food = Malnutrition

Photo credit: © Shehzad Noorani / Still Pictures

Malnutrition: First Cause of Children Mortality

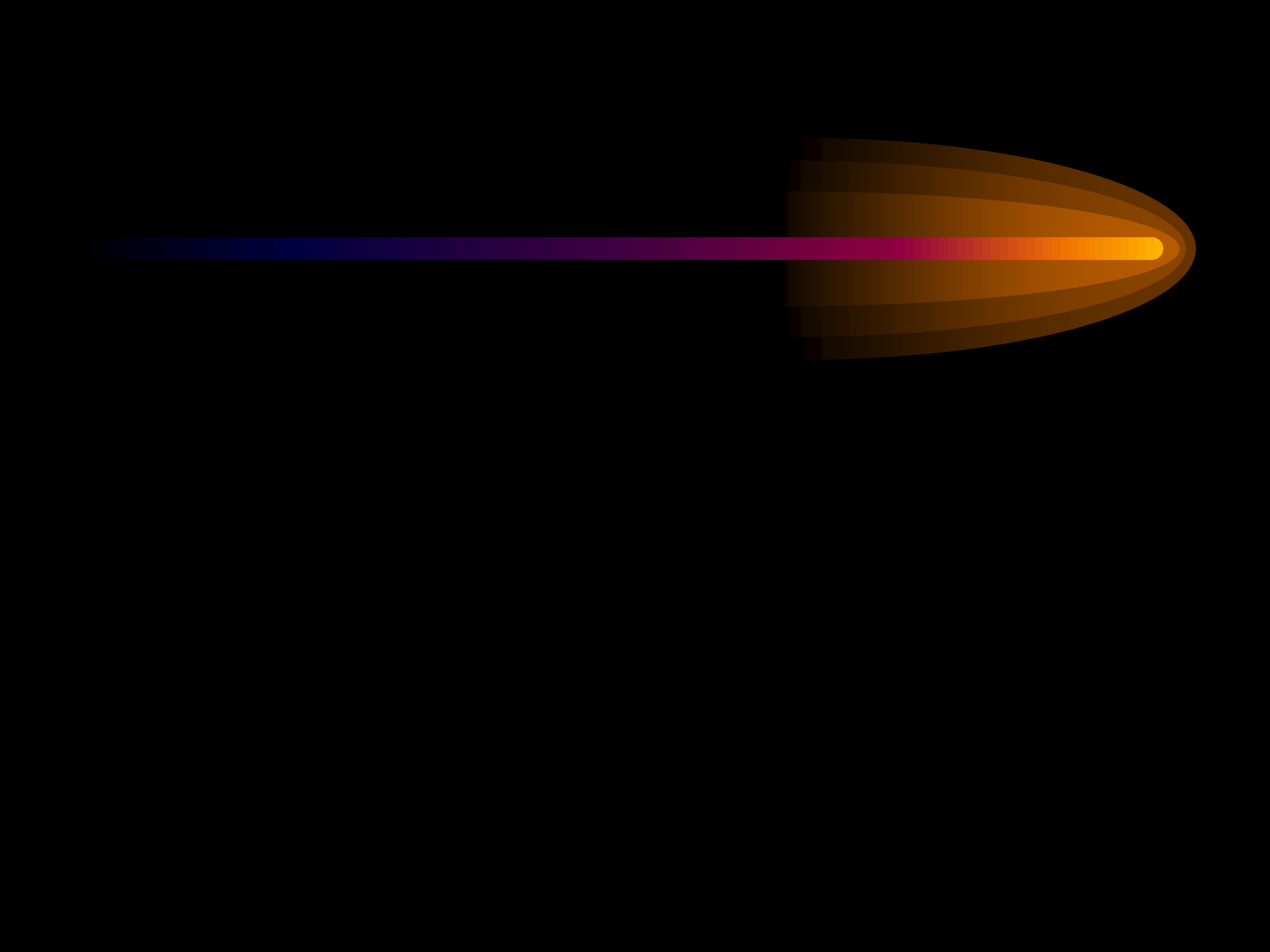
Proportional mortality among children under five years of age – World 2002



Spread of Vector Borne Diseases

- Warmer temperatures and disturbed rain patterns could alter the distribution of important disease vectors
- Combined with altered rainfall patterns, hotter conditions may increase the spread of disease, such as malaria, dengue, and chikungunya, to new areas

Aedes aegypti

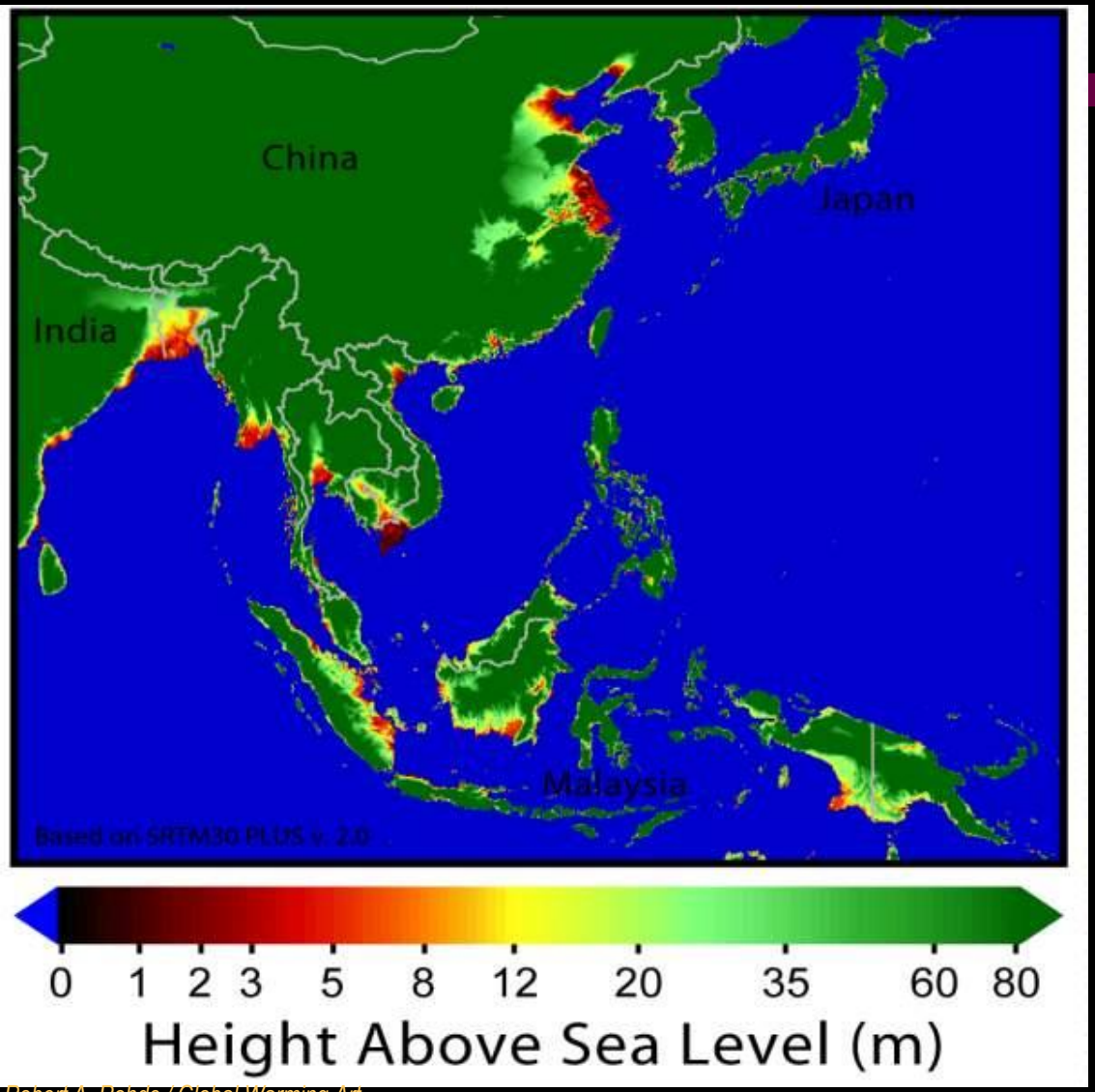


Dengue

Photo credit: © Shehzad Noorani /Majority World / Still Picture

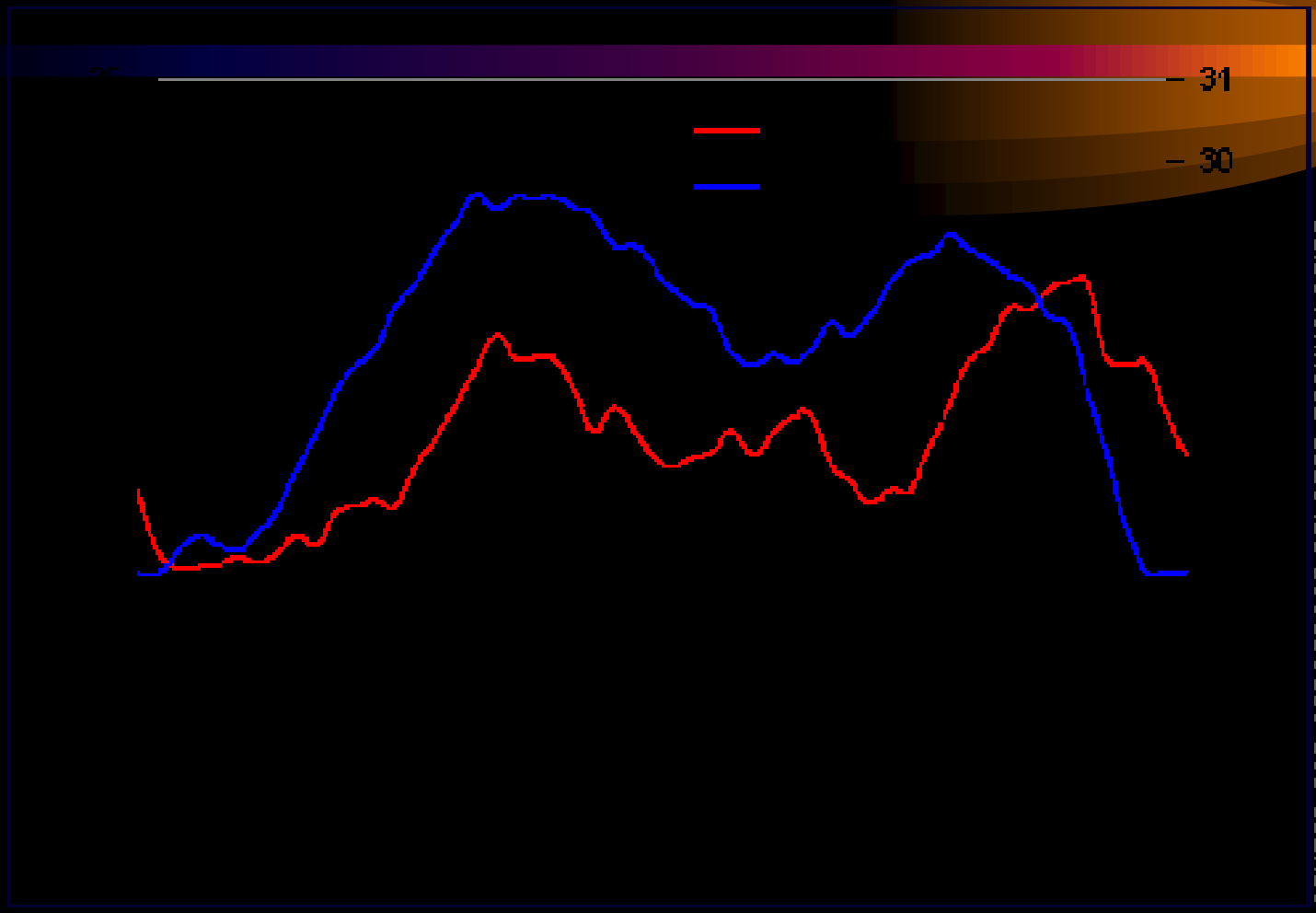
- In 2005, the estimated number of population at risk from dengue in the South East Asia Region was 1.3 billion
- This is 52% of the global estimated
  2.5 billion at risk.

Sea Level Rise Risks in South East Asia



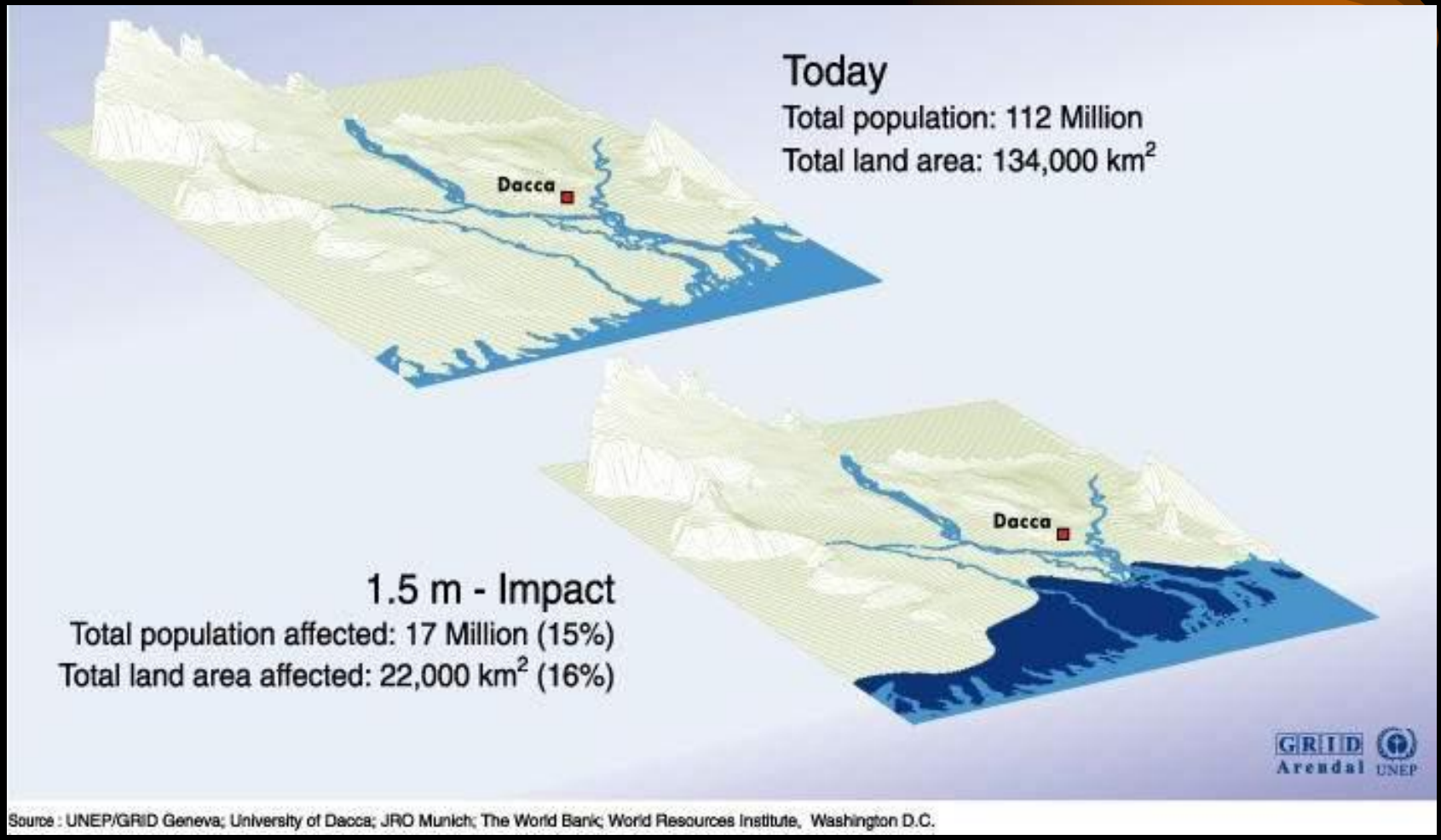
- IPCC, 2007:
  "Coastal areas, especially the heavily-populated mega deltas regions in South, East and South East Asia, will be at greatest risk due to increased flooding from the sea and, in some mega deltas, flooding from the rivers"

Sea Level Rise Enhances Cholera Outbreaks



Space.com, 2000

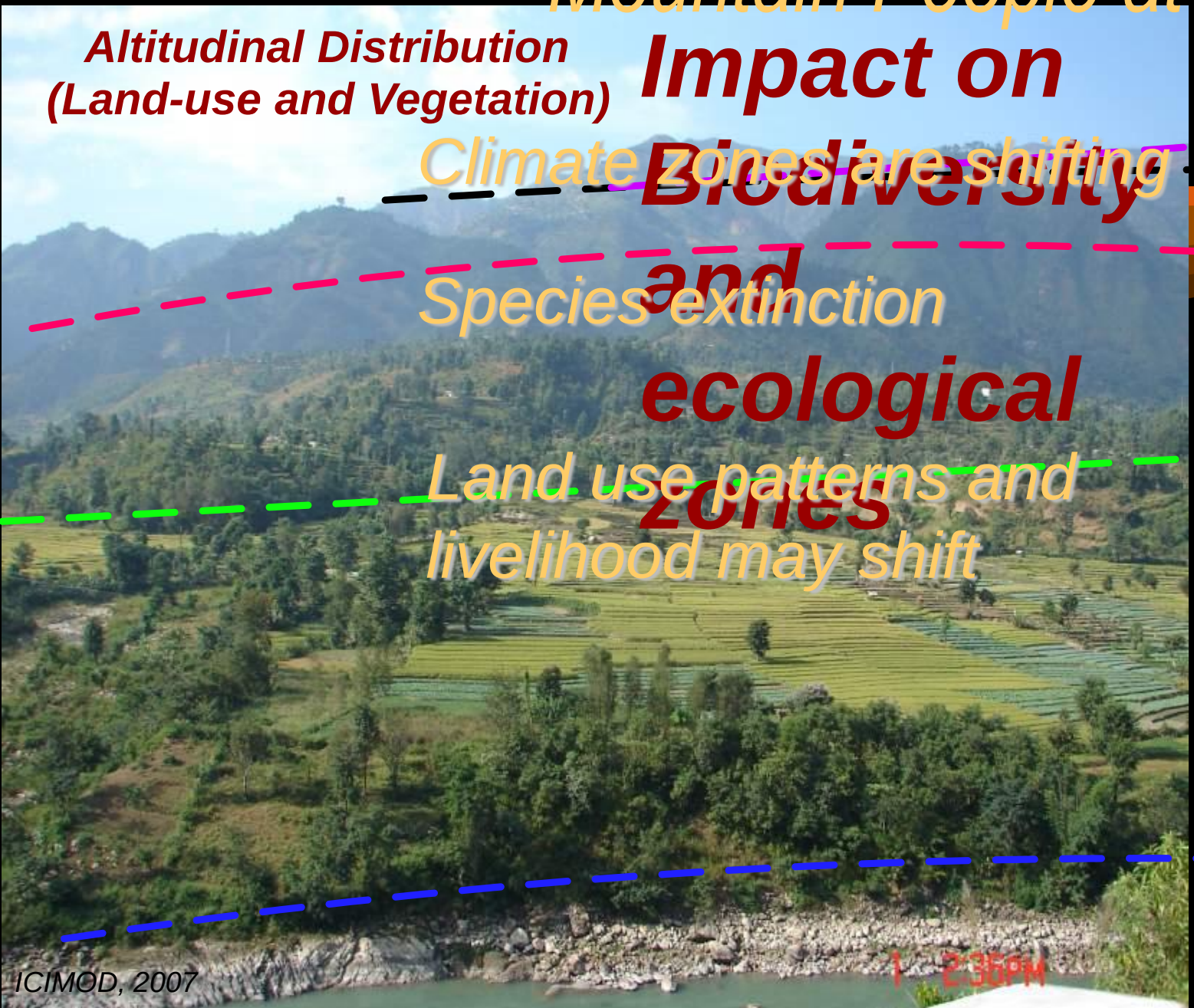
Sea Level Rise: Bangladesh



Psychosocial Stress Will Affect the Health of Communities and Individuals

Photo credit: © Gil Moti / Still Pictures

Mountain People at Risk



Land Use Change in Northern Himalaya

Dingri County, Tibet. 4300 m

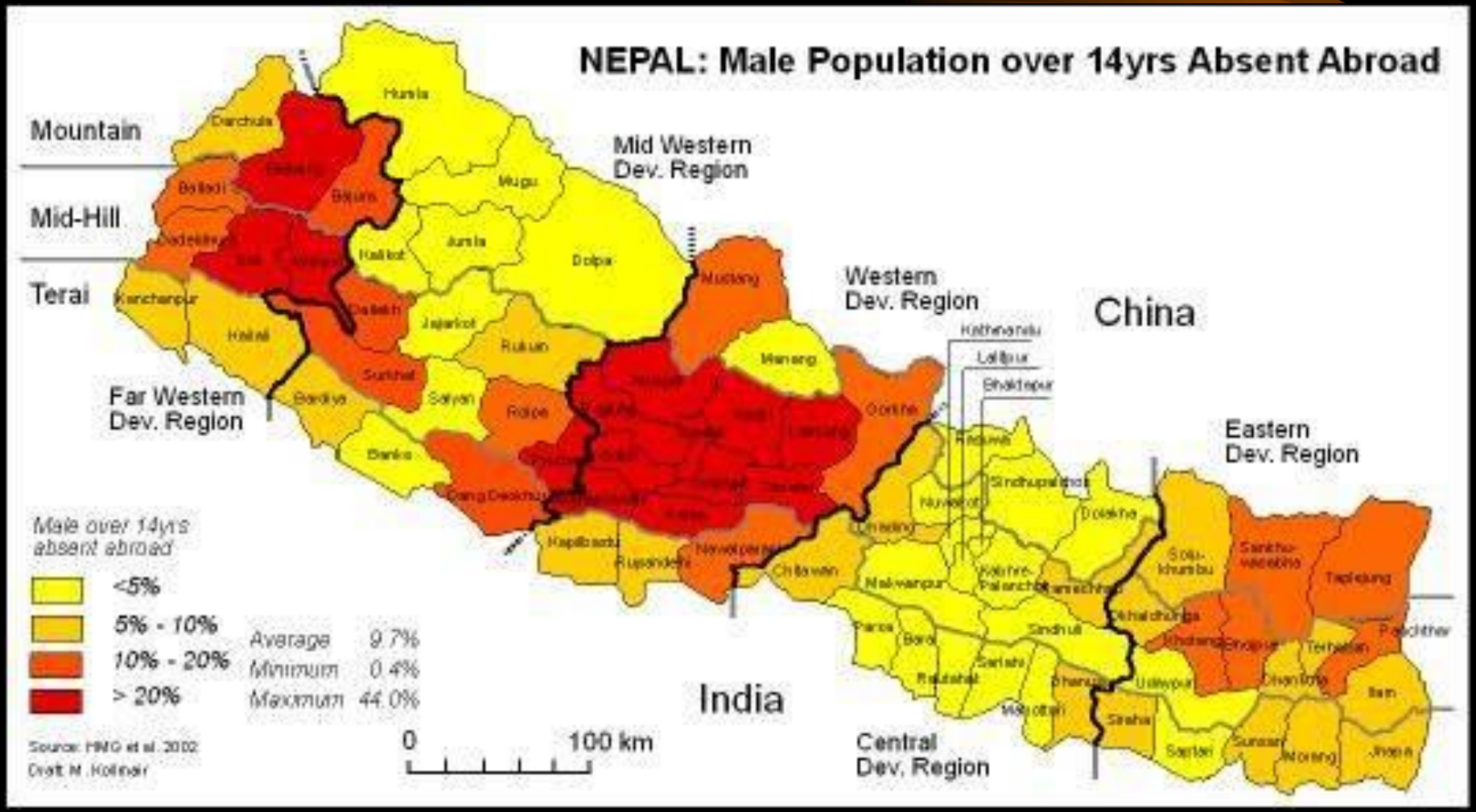
Nomad

Sedentary

Shift

Dried-up wetland

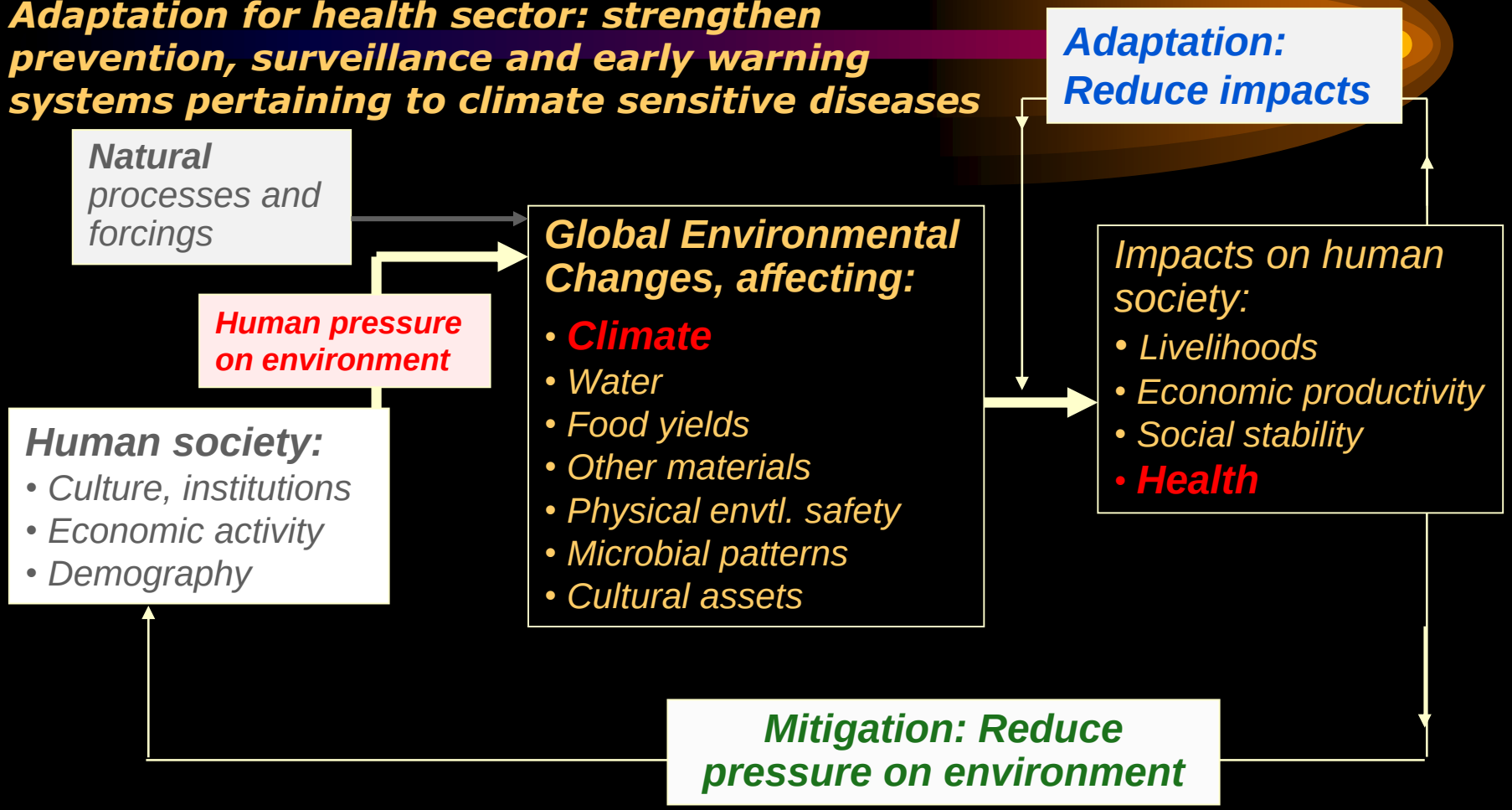
Feminisation of Rural Mountain Areas



ICIMOD, 2008

Urgent Action is Needed

Adaptation for health sector: strengthen prevention, surveillance and early warning systems pertaining to climate sensitive diseases



Mitigation for health sector: to promote and support initiatives that protect health by reducing greenhouse gas emissions

World Health Assembly adopts Global Action Plan, May 2009

- Aim: to scale up WHO's technical assistance to countries to assess and address the implications of climate change for health and health systems. It has four objectives:
- advocacy and awareness raising;
- engagement in partnerships with other UN organizations and sectors other than the health sector at national, regional and international levels;
- promoting and supporting the generation of scientific evidence; and
- strengthening health systems to cope with the health threat posed by climate change, including emergencies related to extreme weather events and sea-level rise.

Conclusions

- The SEA region has a large population that is currently vulnerable to a number of climate sensitive health stressors
- These stressors are already having a significant adverse health impacts in the Region
- Climate change is likely to increase the risks linked to these stressors, and introduce new sources of risk going forward
- Without adaptation and mitigation climate change could result in a dramatically increased health burden in the Region

- THANK YOU