

Impact of Agriculture Practices on Environmental Health: A Comparative Analysis in India



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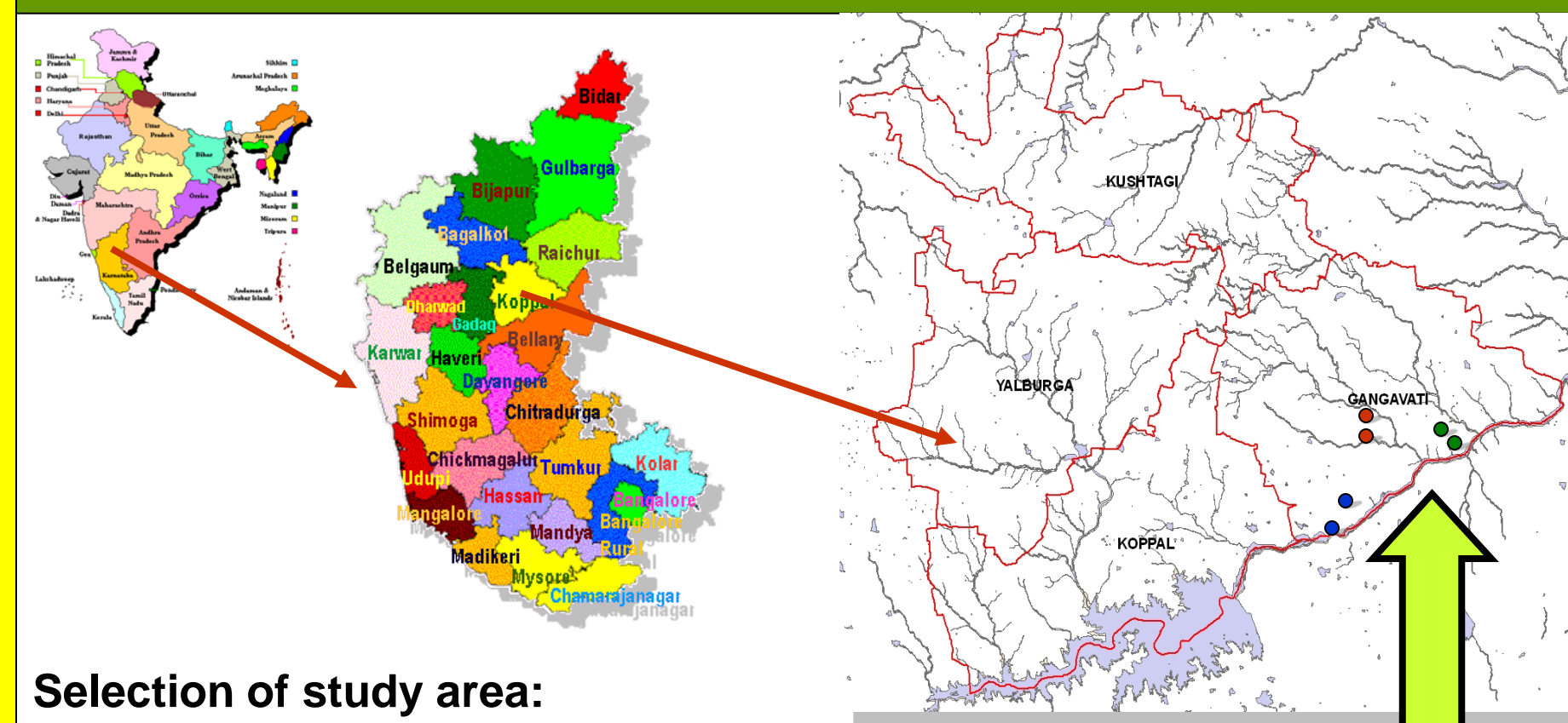


Objectives

- 1) To compare high-input and low-input agricultural practices and the consequences for environmental health
- 2) To examine the differences with regard to the adaptation strategy needed to tackle the uncertainty and serious negative consequences related to the agricultural practices
- 3) To recommend policy initiatives that support best practices in agriculture required to promote sustainable good health and wellbeing



Methods



- Sources of data:**
- Interview of households (40 households - 10 each from landless, small, medium and large landholders, from each village. Total 240)
 - Interview of physicians, care givers, scientists, farmers, traders
 - Focus group discussion with farmers, women
 - Laboratory testing: a) water for NO₃⁻, F b) rice & straw for pesticides
 - Secondary data: health, agriculture, socio-economy, ecology
- Field survey period:**
May to August (2009)

Results

General Observation (agriculture practice, socioeconomic):

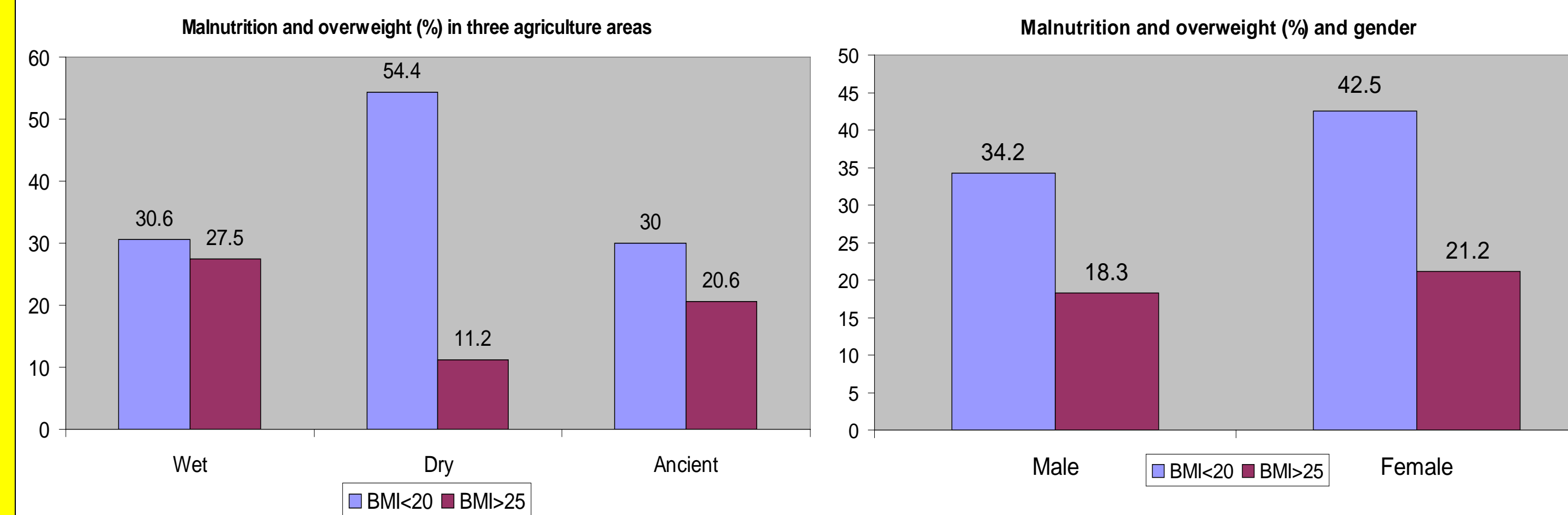
	Wet	Ancient	Dry
Agriculture	Extensive mono-crop (paddy), high input of agrochemicals, machines, and water	Essentially paddy and banana, moderate use of agrochemicals	Traditional coarse cereals (sorghum, maize, millet), sunflower, pulses, less inputs
Literacy	58.4%	52.3%	41.1%
Women's work force participation	27.6%	32.3%	29.9%
Migration	Low	Medium	High

Pesticide, fertilizer & average dose (% above or below the recommended dose)

	Pesticide		Fertilizer			NO ₃ ⁻ in groundwater		
	Dose	95% CI	Area	N	P	K	mg/L	
Monocrotophos	-26.8	-45.4 — -8.2	Wet	+129.8	+102.2	+190.4	Wet	28.5
Buprofezin	+71.3	+41.5 — +101.1	Dry	-21.0	-0.4	-11.7	Dry	38.6
Imidacloprid	+73.0	+14.8 — +131.2	Ancient	-11.8	+5.8	+84.3	Ancient	7.13
Endosulfan	-24.3	-38.6 — -10.0						
Buprofezin+Deltamethrin	-28.1	-46.3 — -9.9						
Carbendazim	+78.6	+46.0 — +111.3						

Nutrition and food safety:

- Change of diet (less coarse cereals, more polished rice, and oil)
- Rising trend of ischemic heart diseases, and diabetes (in wet area)
- Pesticides detected in rice, straw (Buprofezin, Chlorpyrifos, Propiconazole, Endosulfan)(3-4 months after harvesting)
- Average fluoride – 2.13 mg/L (95% CI 1.4 – 2.8)



Peoples' perspective of agriculture and ecology:

- ~40% believe deterioration of soil health due to pesticide and fertilizer
- More than 90% believe agriculture practice caused unnatural death of snake, and frog and 70% believe agriculture practice similarly affected natural insects, birds, and rat population
- Modern agriculture is responsible for hotter climate (85.5%), drought (55.2%), water shortage (21.5%) and deforestation (21.5%)
- Mosquito population is mostly due to water logging (77.4%), rice cultivation (77.8%), and animal rearing (58.9%)
- 92.5% believe mosquito population is rising (water logging, rice cultivation, and animal rearing)

Results

Occupational hazards

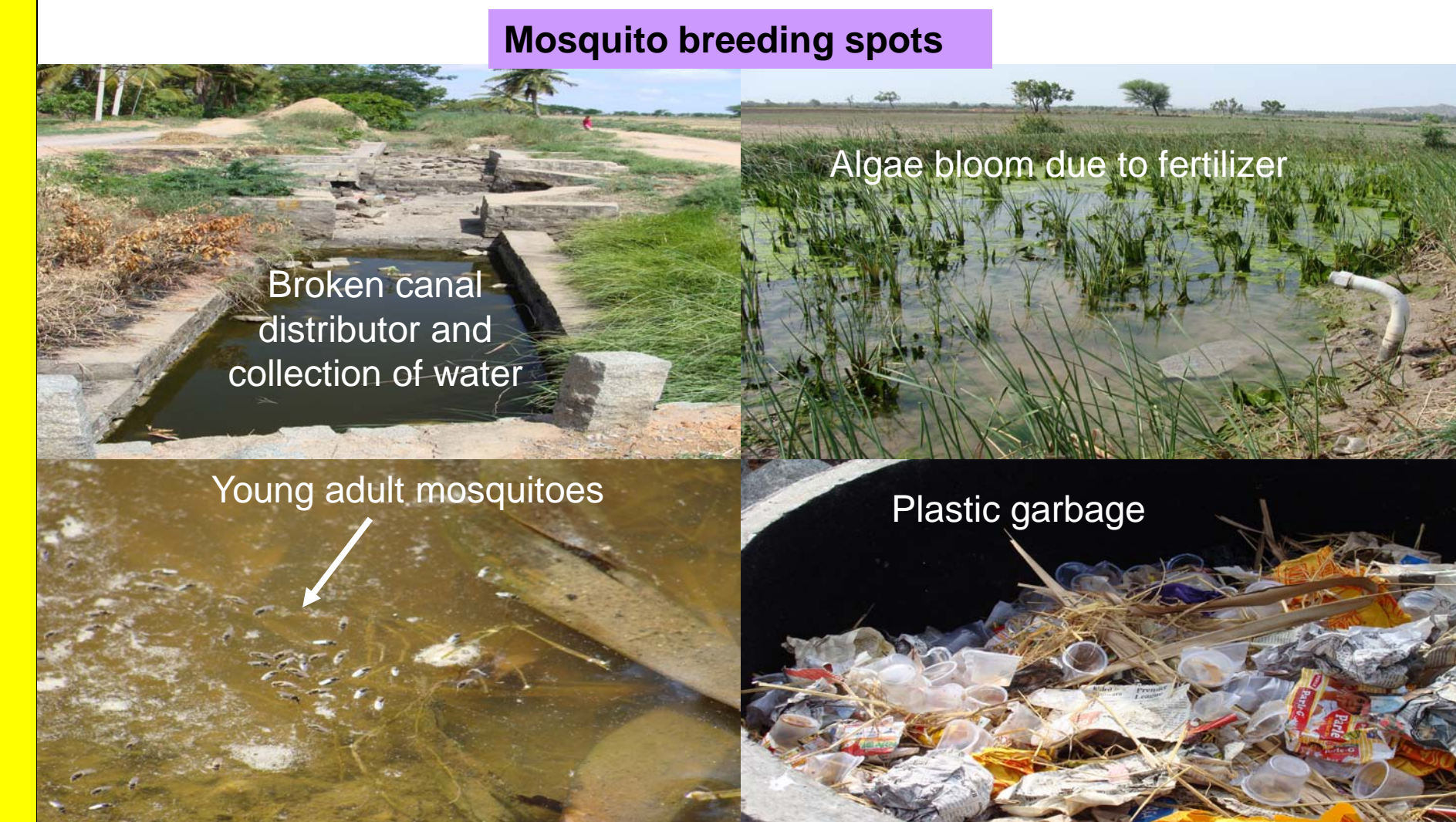
- Cut injury, accidents, sunstroke, eye injury, and animal bite
- Using pesticide, 71.9% follow limited safety procedures (ancient > dry > wet)
- Safety procedures followed – washing hands after use, child safety, and full protection (20.2%)
- Major health problems due to pesticide (skin irritation – 77.9%, giddiness/weakness – 33.3%, and breathing problem – 22.6%)

Vector-borne diseases

- Japanese Encephalitis found only in the rice cultivated areas

Livestock diseases (cattle)

- Abortion, low yield of milk, abnormal death (role of pesticide?)



Conclusion

- Modern agriculture has improved overall socioeconomic & nutritional status
- Modern agriculture has changed landscape & pattern of vector-borne diseases
- Modern agriculture has changed diet (high calories, low fiber) and increased obesity and related diseases
- High use of agrochemicals has resulted in contamination of food and water leading to health hazards for humans and animals
- There is a need to rationalize the use of agrochemicals and link ecological management in agriculture practice
- Need to introduce behavior change communication with regard to type of food intake, use of agrochemicals
- Improvement of disease surveillance and further research to monitor the environmental health impact due to ongoing agriculture practice