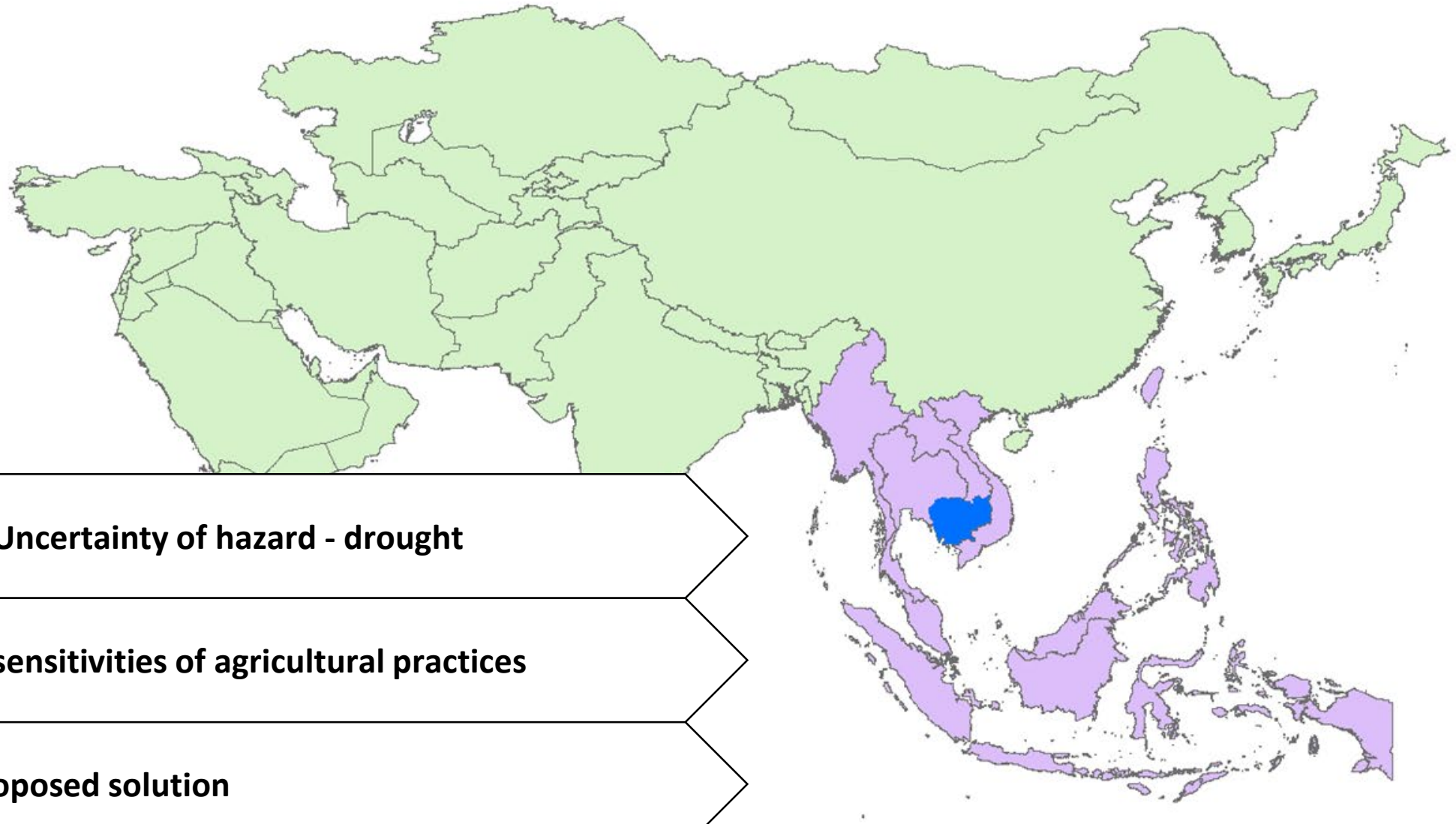
Drought risk in Cambodia and potential solution

Chhinh Nyda

Lecturer, Royal University of Phnom Penh



1. The Uncertainty of hazard - drought
2. The sensitivities of agricultural practices
3. A proposed solution

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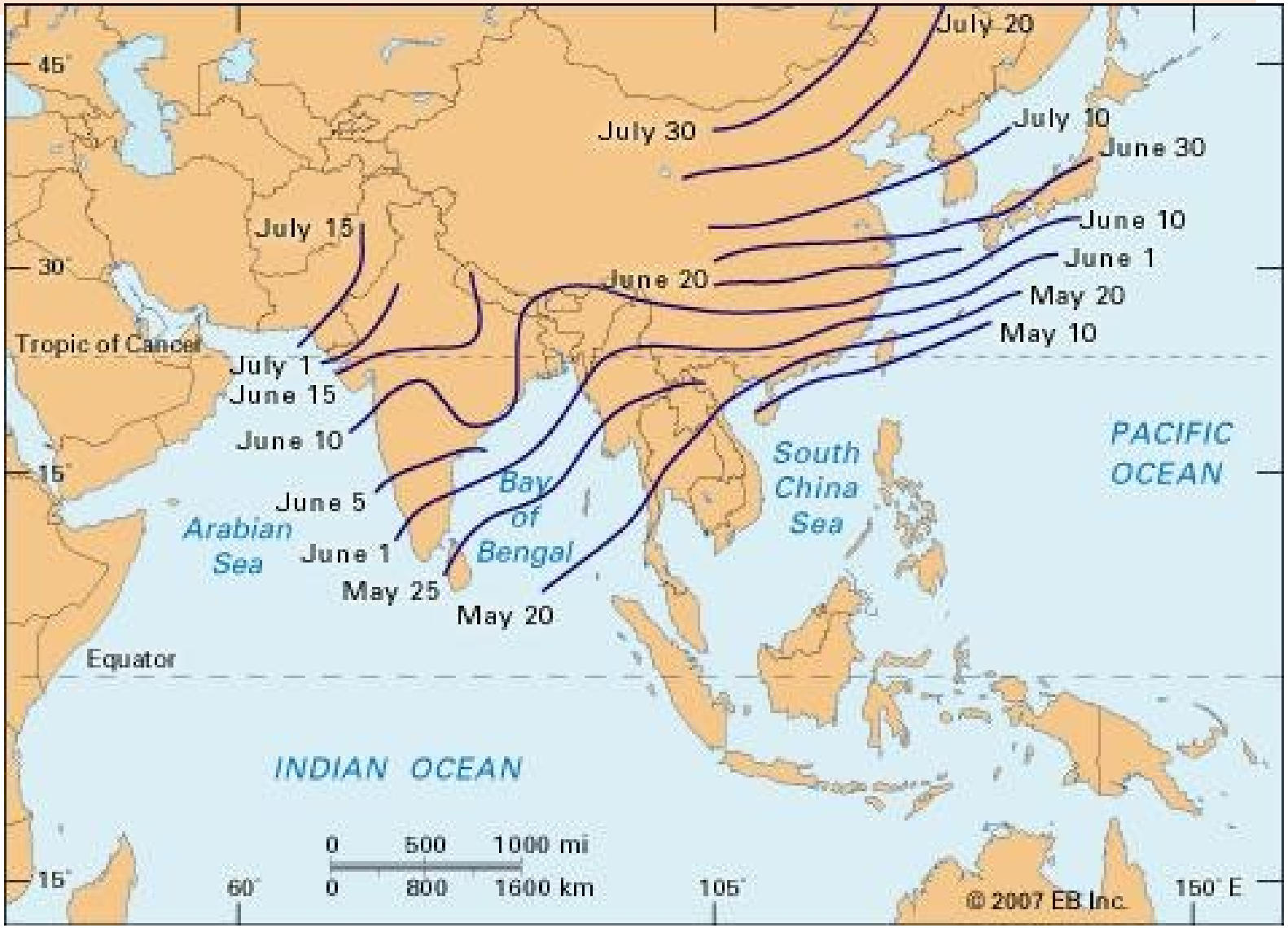

Tanaka, M. (1992). Intraseasonal oscillation and the onset and retreat dates of the summer monsoon over east, southeast Asia the western Pacific region using GMS high cloud amount data. *Journal of the Meteorological Society of Japan. Ser. II, 70(1B), 613-629.*

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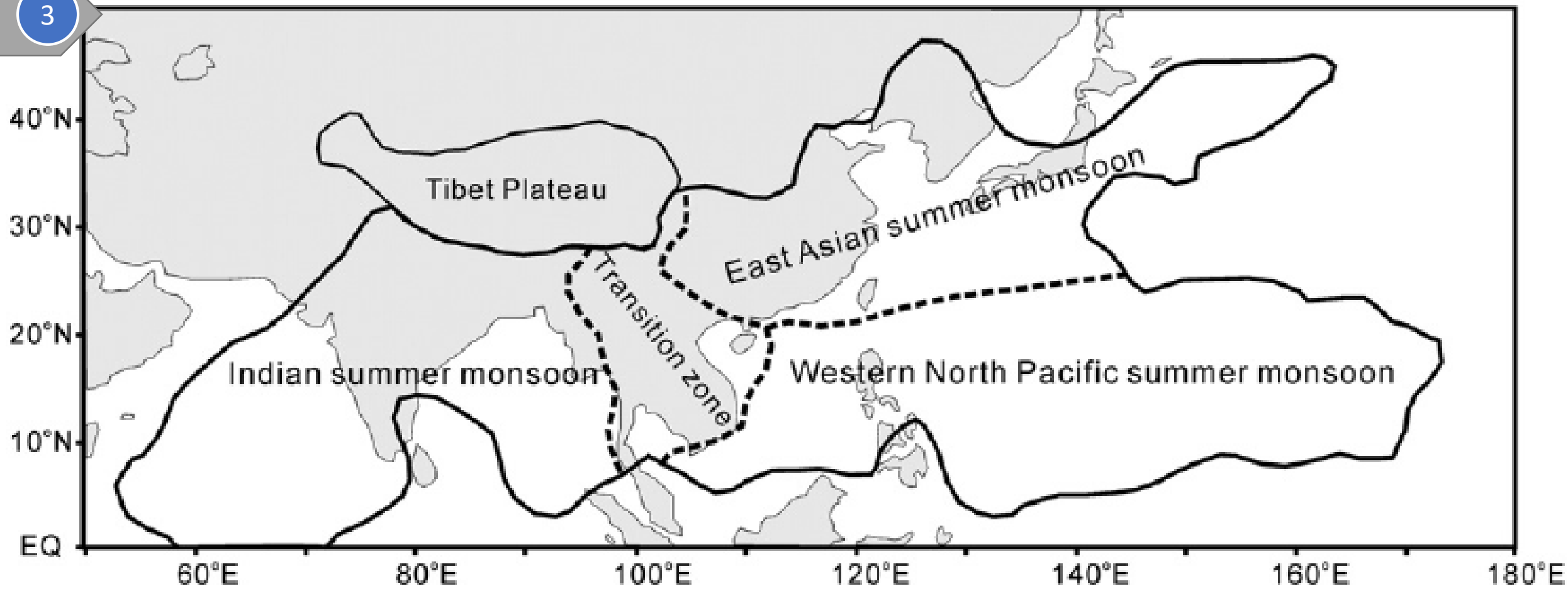

Wang, B., & Lin, H. (2002). Rainy Season of the Asia-Pacific Summer Monsoon*. *Journal of Climate, 15(4), 386398.*

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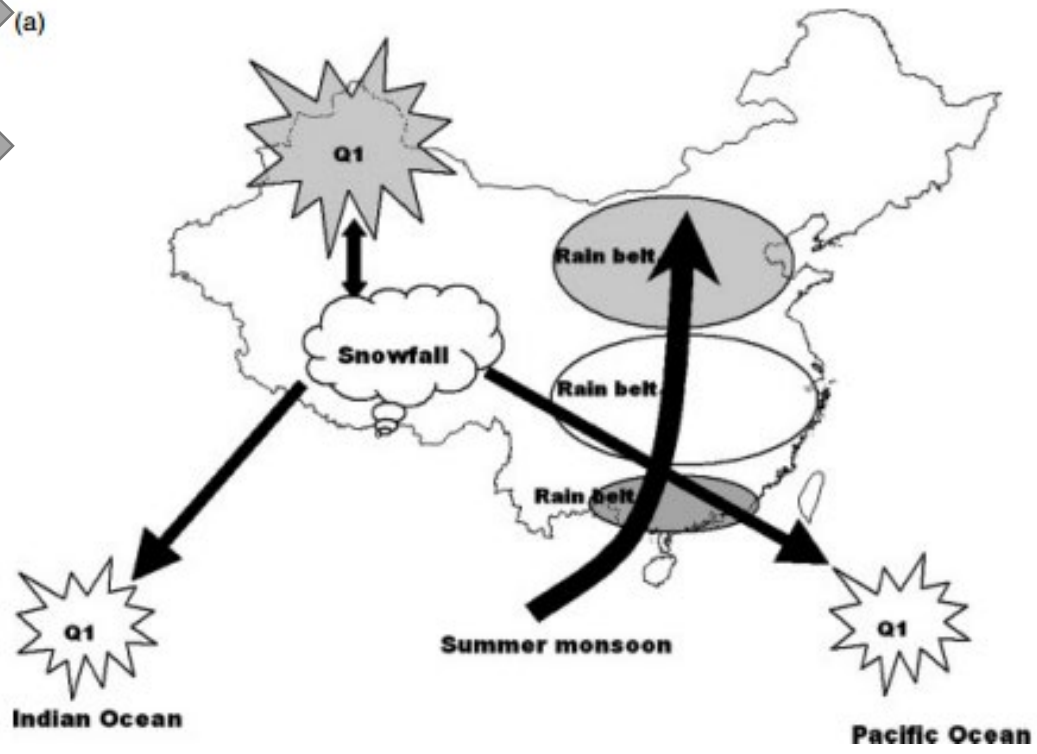
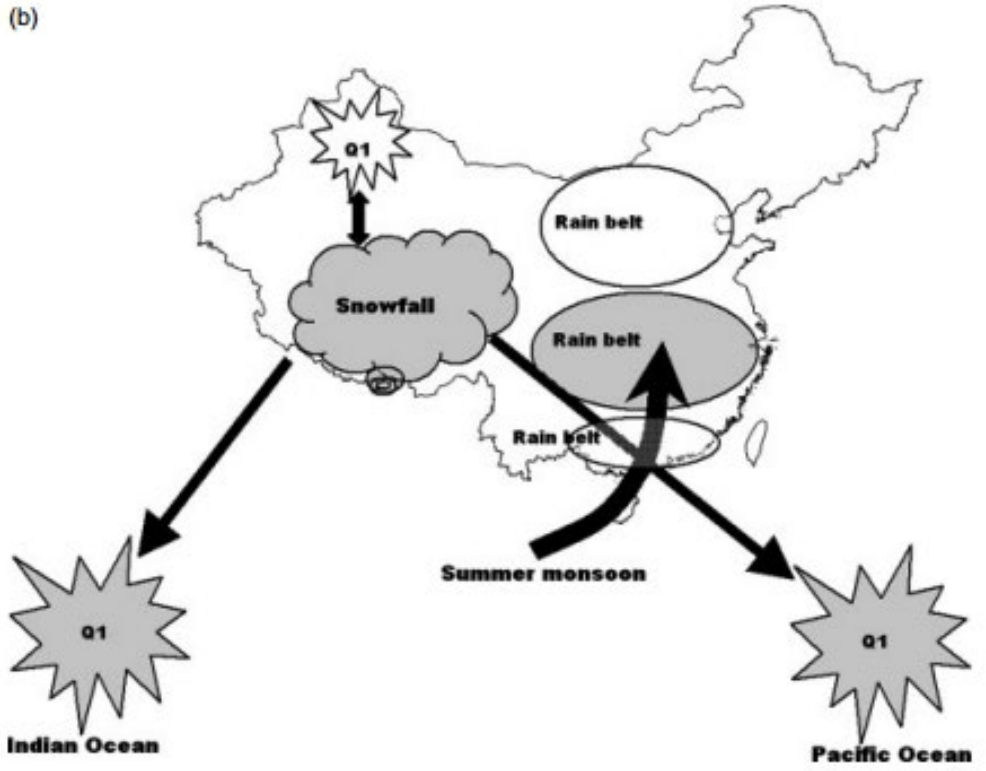
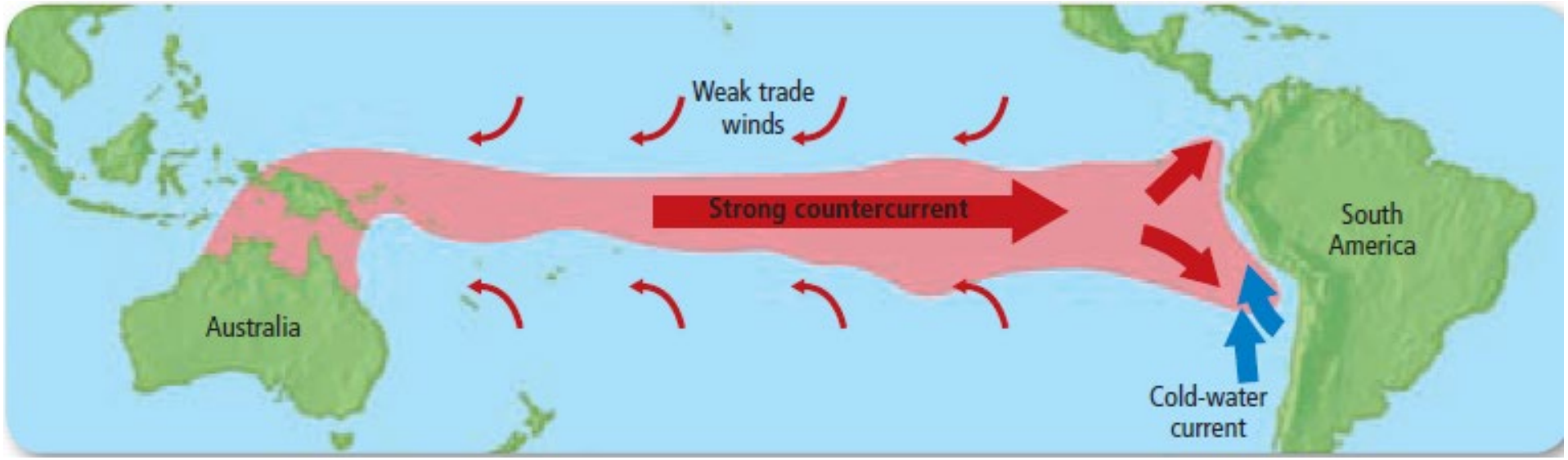


Strong Asian Summer Monsoon



Weak Asian Summer Monsoon

Ding, Y., Sun, Y., Wang, Z., Zhu, Y., & Song, Y. (2009). Inter-decadal variation of the summer precipitation in China and its association with decreasing Asian summer monsoon Part II: Possible causes. *International Journal of Climatology: A Journal of the Royal Meteorological Society, 29(13), 1926-1944.*



Increasing drought intensity <<<<<

>>>>> increasing rainfall

SPI

-3 -2 -1 0 1 2 3

ENSO

La Nina: increasing rainfall <<<<<

>>>>> El Nino: increasing drought

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Exceptional drought		Extreme drought		Severe drought		Moderate drought	
Year	Damage (ha)	Year	Damage (ha)	Year	Damage (ha)	Year	Damage (ha)
2004	247,336	1997	100,971	2003	55,782	2014	20,289
1994	230,900	1998	92,757	2001	55,622	2012	19,420
1991	200,000	2018	78,470	2002	52,000	2006	9,347
				2015	41,469	1999	9,119
						1995	8,774
						2005	6,720
						2000	6,675
						2007	5,653
						2009	3,754
						2010	2,934
						2008	1,653

Chhinh, N., Usamah, M., Basnayake, S., Center, A. D. P., Dashora, L. K., & Clingeleffer, P. (2019). *Drought Baseline Study in Cambodia*. UNDP: Phnom Penh

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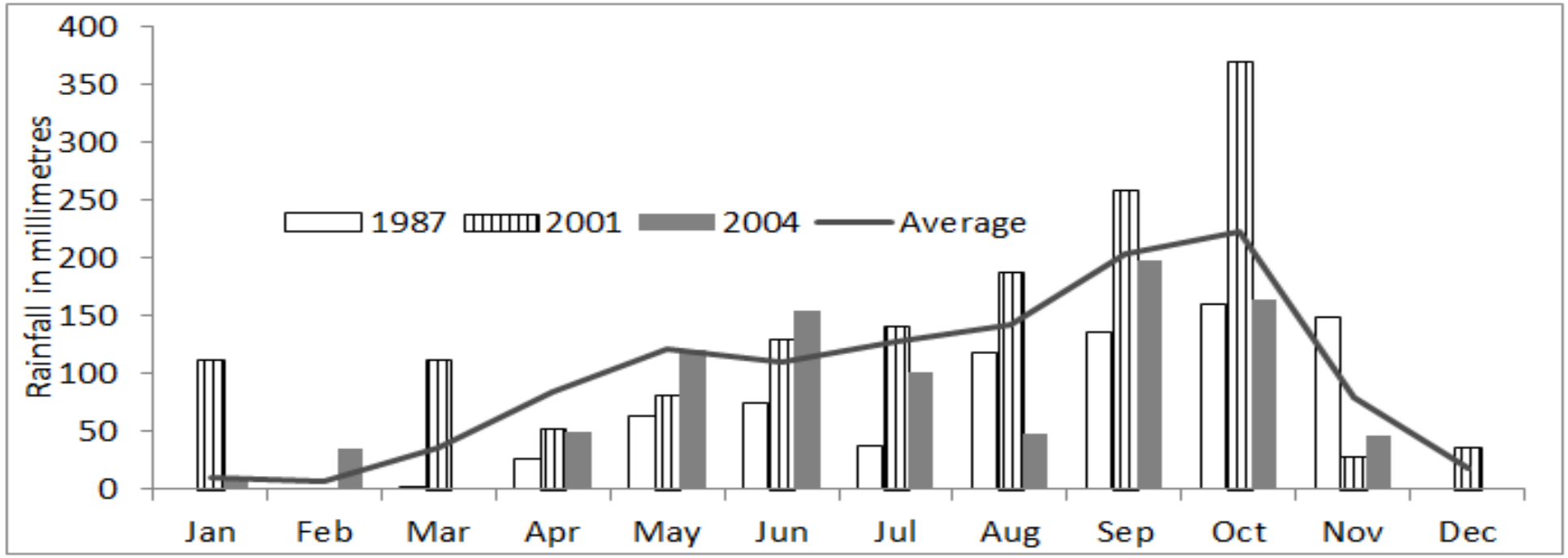

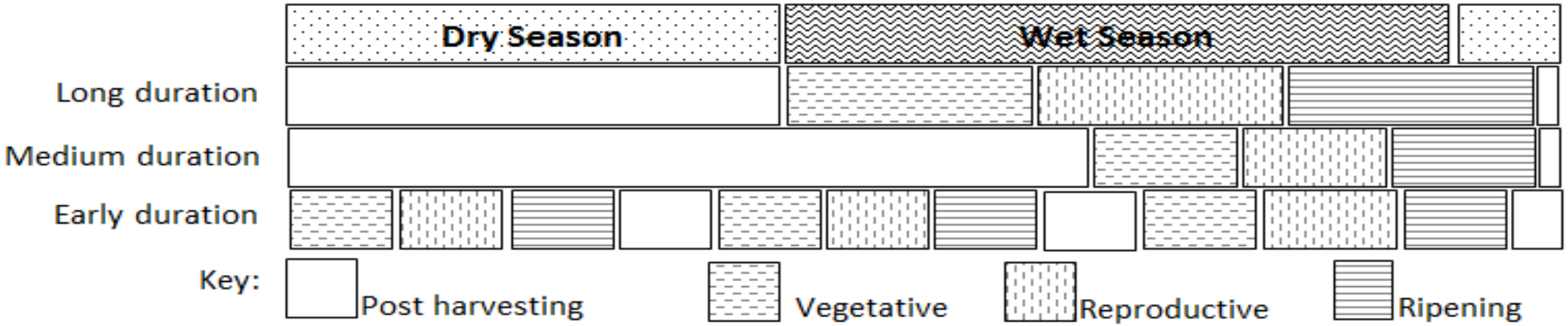

Chhinh, N., & Millington, A. (2015). Drought monitoring for rice production in Cambodia. *Climate, 3(4), 792811.*

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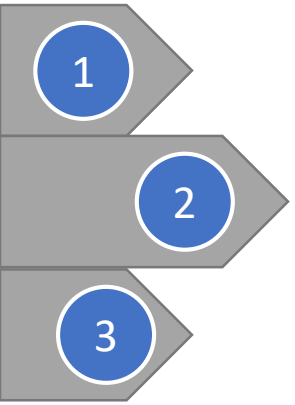

Labor shortage

- People between age 18-45, migrate to work (Cities and abroad)
- Mixture of success and failure of migration
- Lack of labor in rural communities

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Agricultural practices

Transplanting > labor intensive

Direct seedling > low yield and prone to damage and loss

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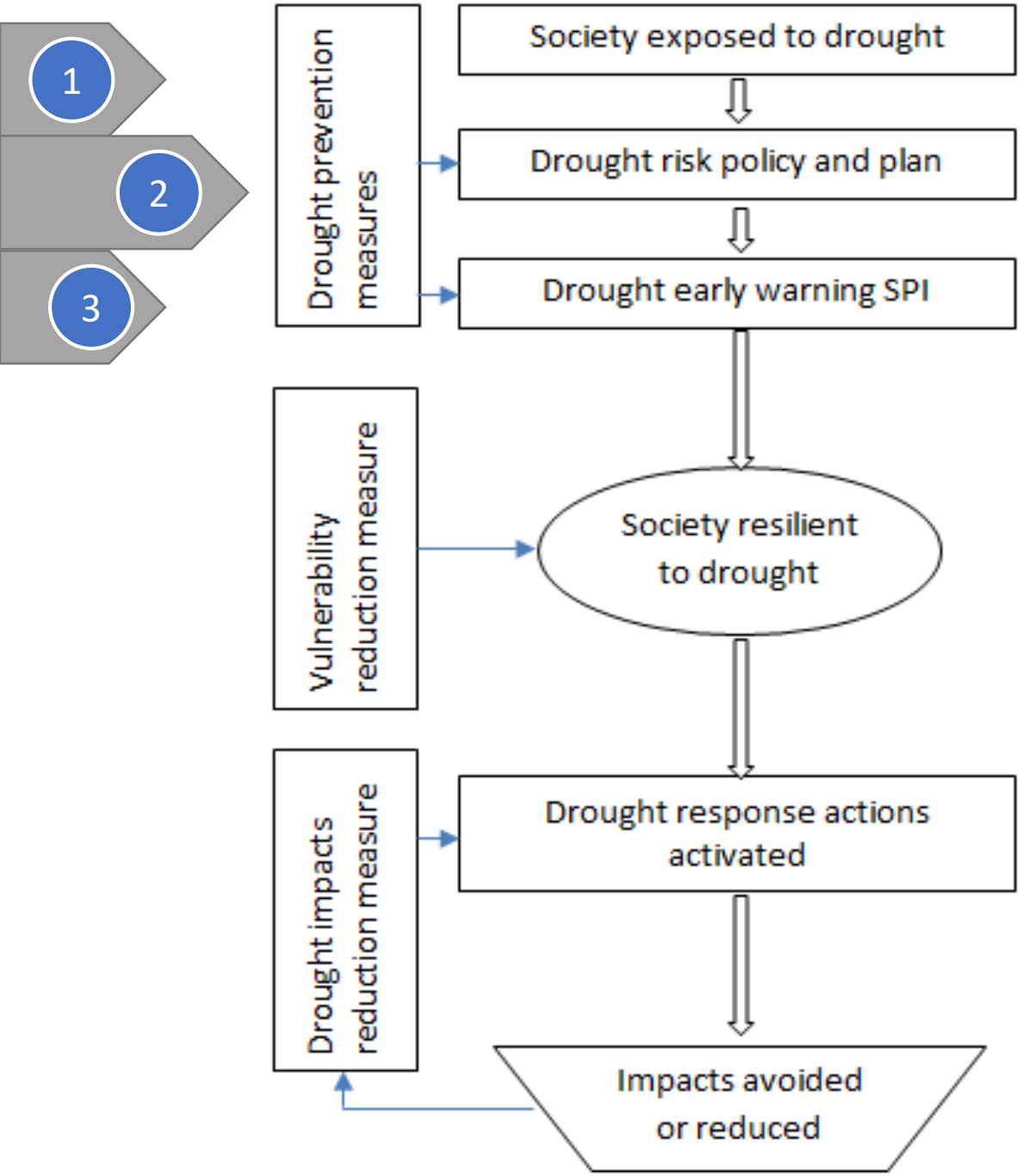
12 percent of rice cultivation is supplementary irrigated



Mechanism to reduce slow-onset impact yet to establish

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CBA: Analytical framework

Cost and Benefit of changing crop (USD): to be studied

	Drought	Normal
Rice	500	800
Alternative crop (Taro)	1000	600

- We believe that early warning about drought and provide options for alternative crop for farmers will optimize the benefits during drought and normal year.
- Drought forecasting should come with suggested crops and technology for a certain locality for farmer communities and markets.

See for example: Chhinh, N., Cheb, H., Chea, B., & Heng, N. (2014). Drought Risk in Cambodia: Assessing Costs and a Potential Solution. *Asian Journal of Agriculture and Development, 11(2), 16.*

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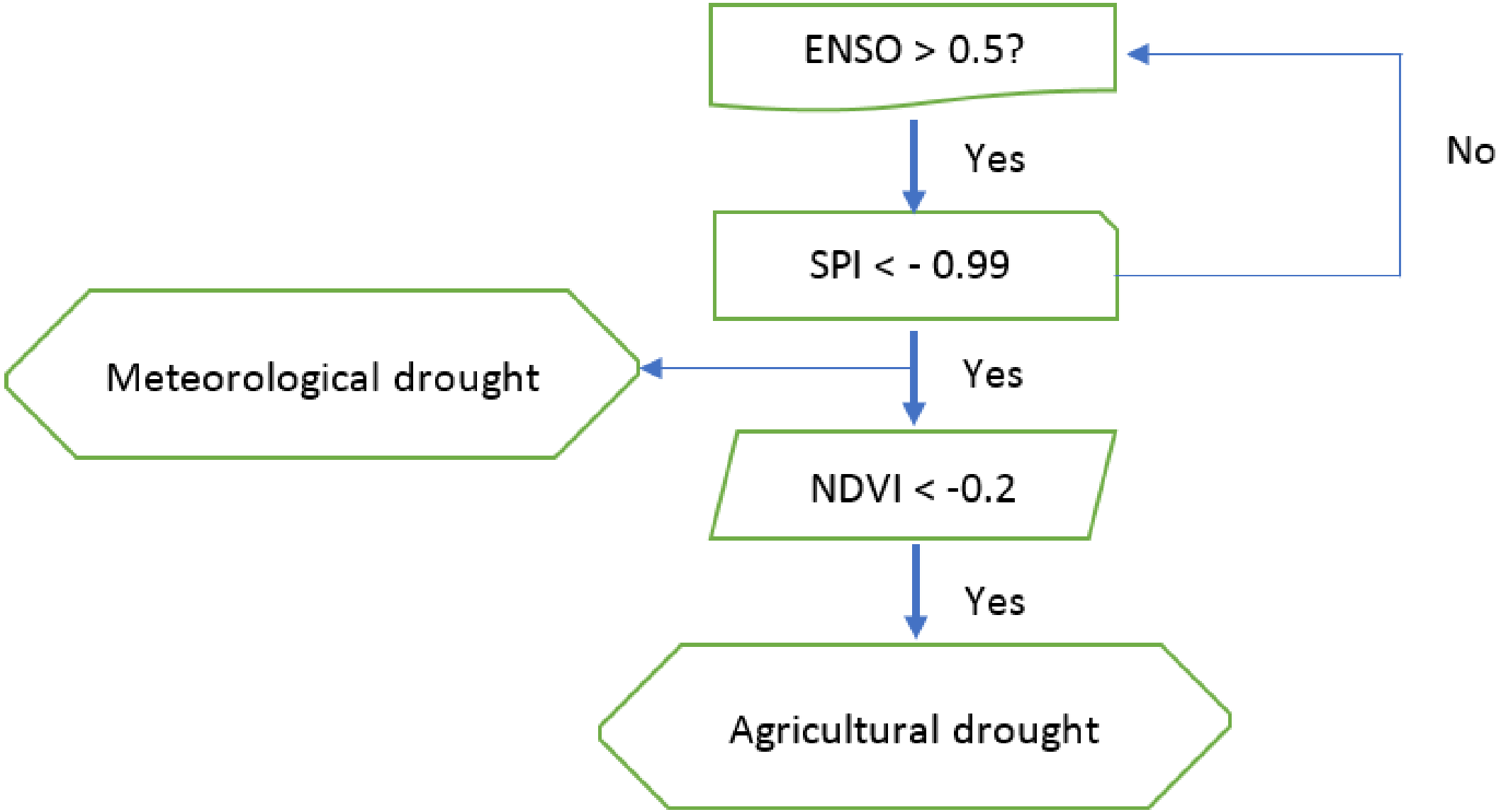
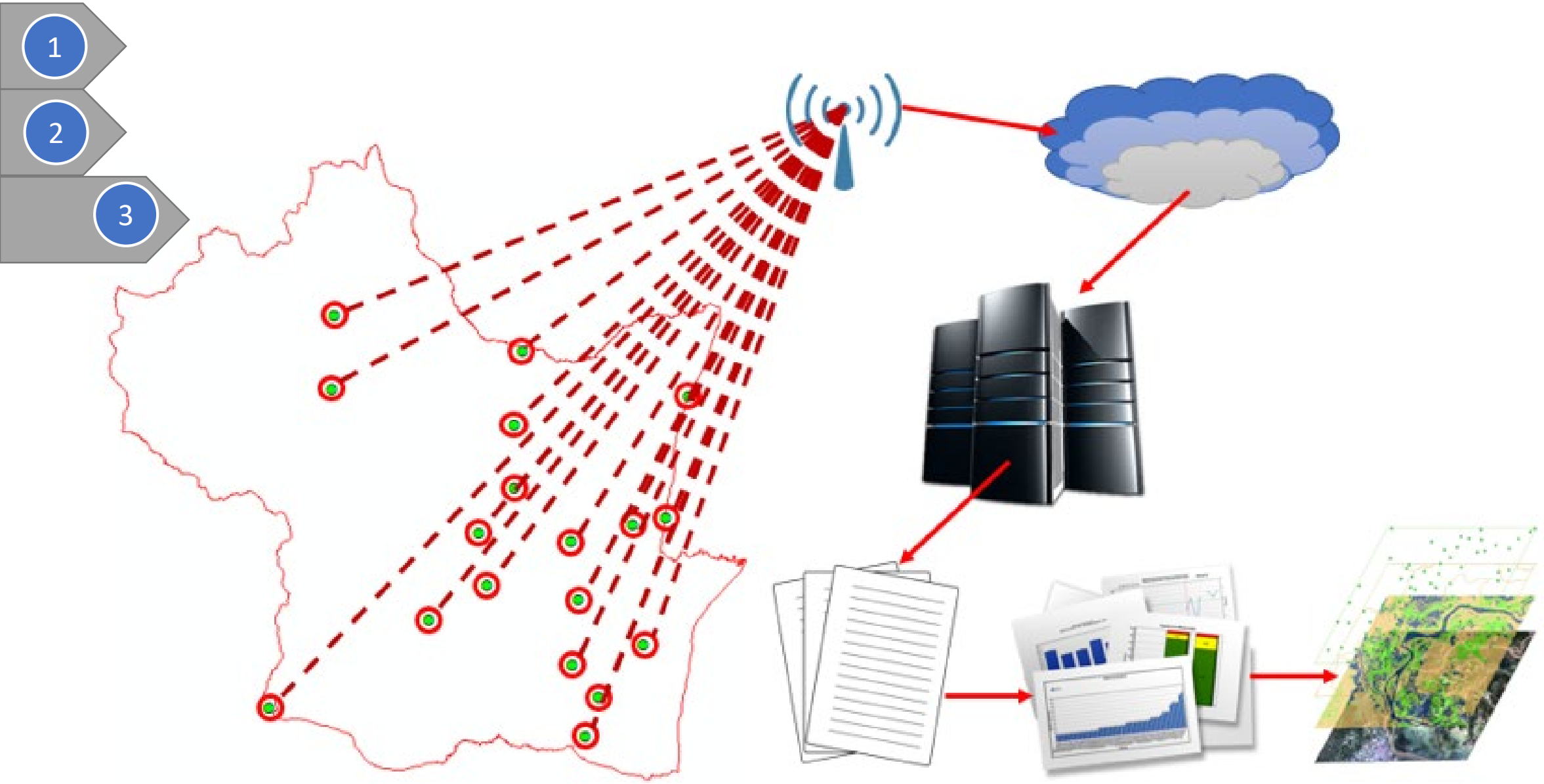

ENSO > 0.5?
Yes
No
SPI < - 0.99
Meteorological drought
Yes
NDVI < -0.2
Yes
Agricultural drought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Thanks so much!