

*Decision-Making for  
Systemic Water Risks: Insights  
From a Participatory Risk  
Assessment Process in Vietnam*

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# Limitations of Risk = Likelihood x Consequence

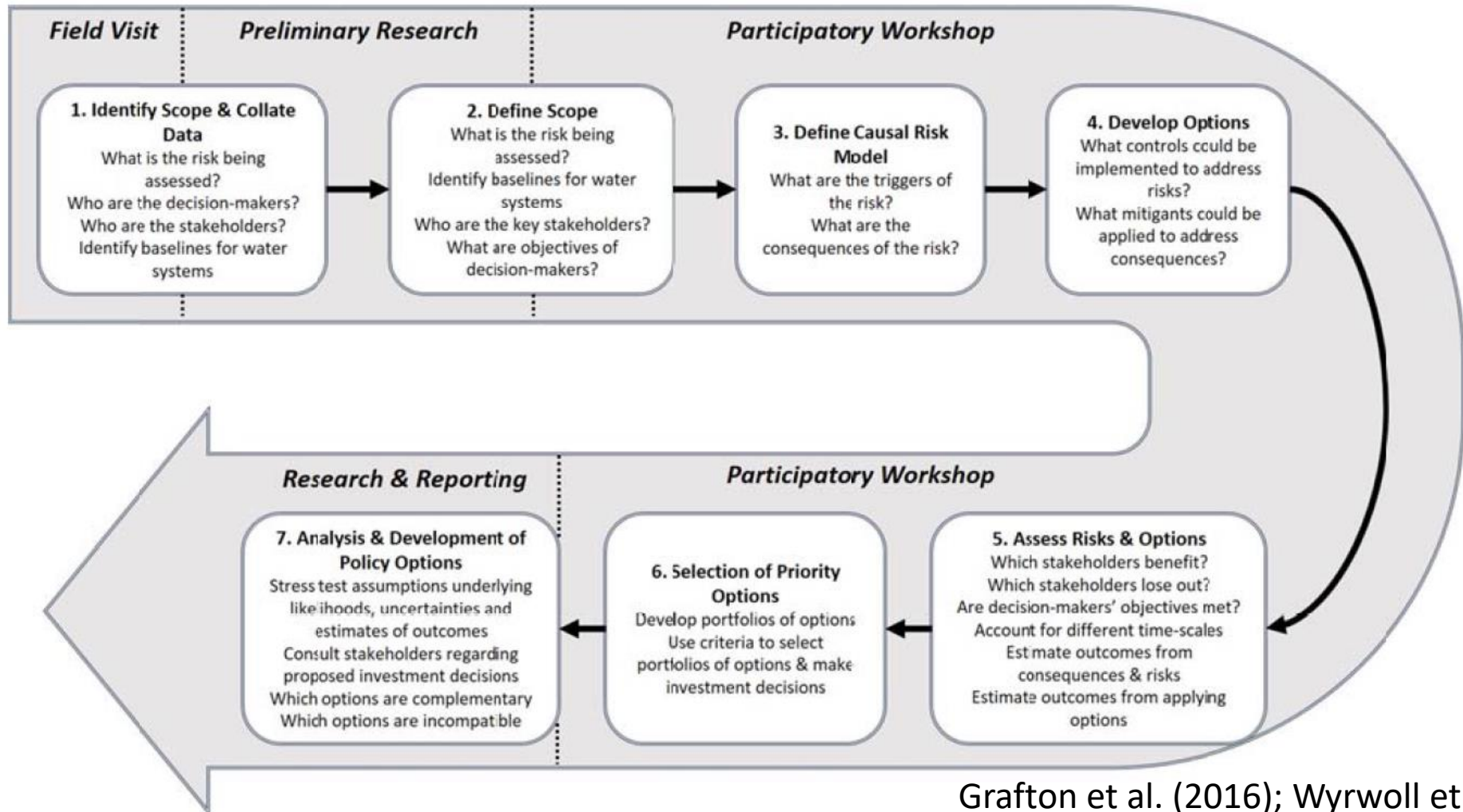
Likelihood	Almost certain				HIGH	HIGH
	Likely				HIGH	HIGH
	Possible					
	Unlikely	MINIMAL	MINIMAL			
	Rare	MINIMAL	MINIMAL			
		Insignificant	Minor	Moderate	Major	Catastrophic
Consequence Level						

- (Almost certain x Minor)  $\approx$  (Catastrophic x Rare)?
- What actions? How do they interact?
- Systems and feedback effects? Time?

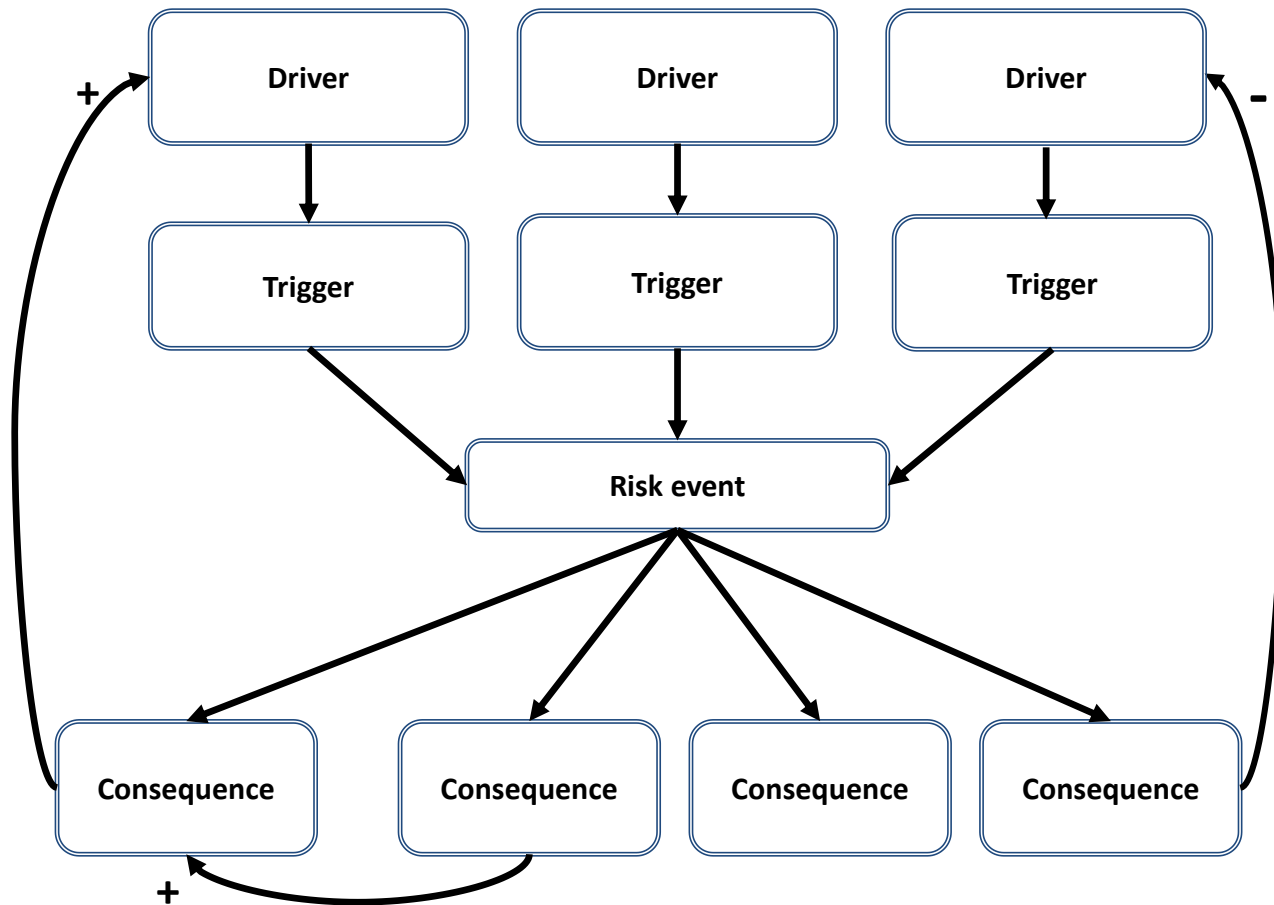
Element	Description	Example from water resources management
Threshold effects	Unexpected transition or systemic shifts	Freshwater eutrophication
Randomness in a strongly coupled system	Mean approximations provide inaccurate forecasts of system behavior; strong correlations between performance of linked systems	Unpredictable hydrological variability
Positive feedback	Dynamic instability and amplification effect, equilibrium or stationary state cannot be maintained	Policies for water-use efficient irrigation infrastructure causing a ‘rebound effect’ in water consumption and reducing return flows to ecosystems
Wrong timing (mismatch of adjustment processes)	Over-reaction, growing oscillations, or loss of synchronization	The disruption of downstream environmental flows by hydropower operations
Strong interaction, contagion	Cascade effects	Droughts in hydropower-dominated energy sectors causing blackouts & impacting groundwater extraction for irrigation

## ‘Difficult risks’

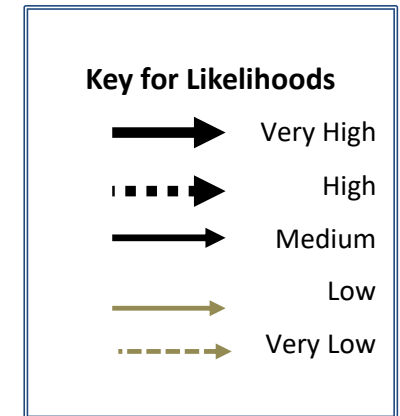
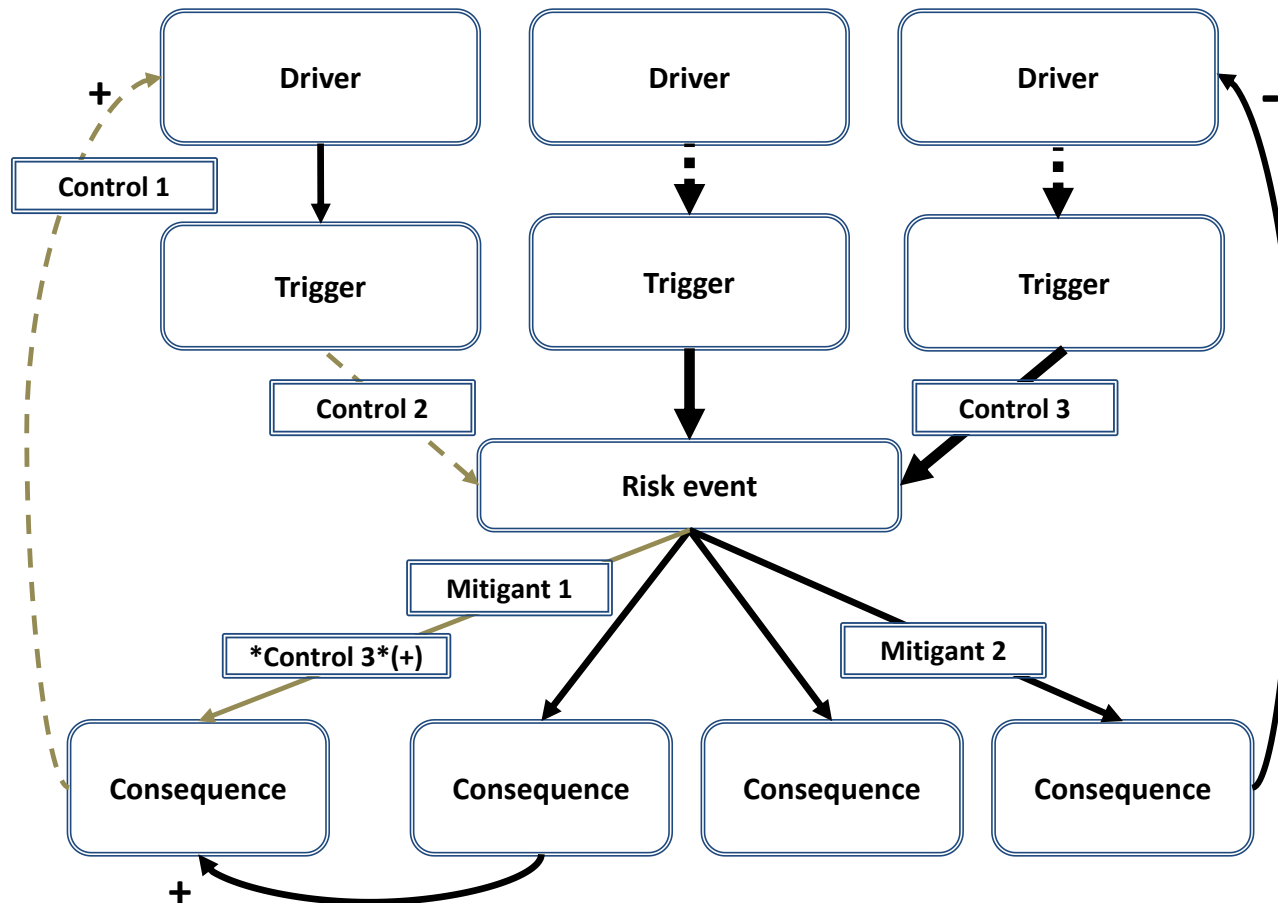
# The ROAD Process



# A causal approach to risk



# A causal approach to risk





# ROAD Pilot Project in Đơn Dương District, Lâm Đồng Province, Vietnam



# Lâm Đồng Province

The vision of Lâm Đồng PPC:

1. Centre of commercial agriculture in SE Asia
2. Diversified agricultural products
3. Improve water planning and management
4. Green/environmentally friendly province



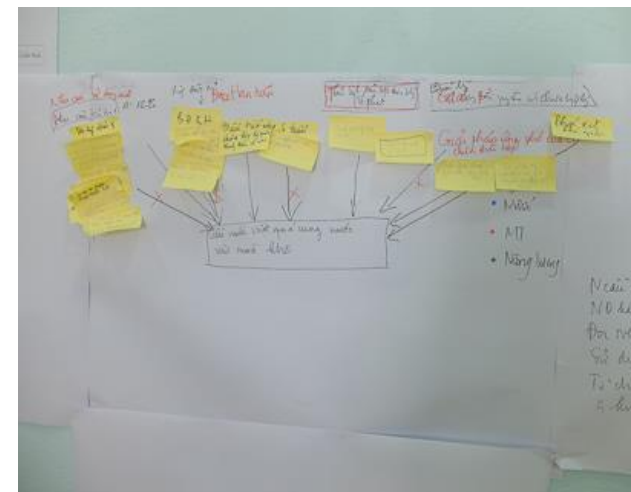




**What policy options can address the risk of water demand exceeding water supply in the dry season?**

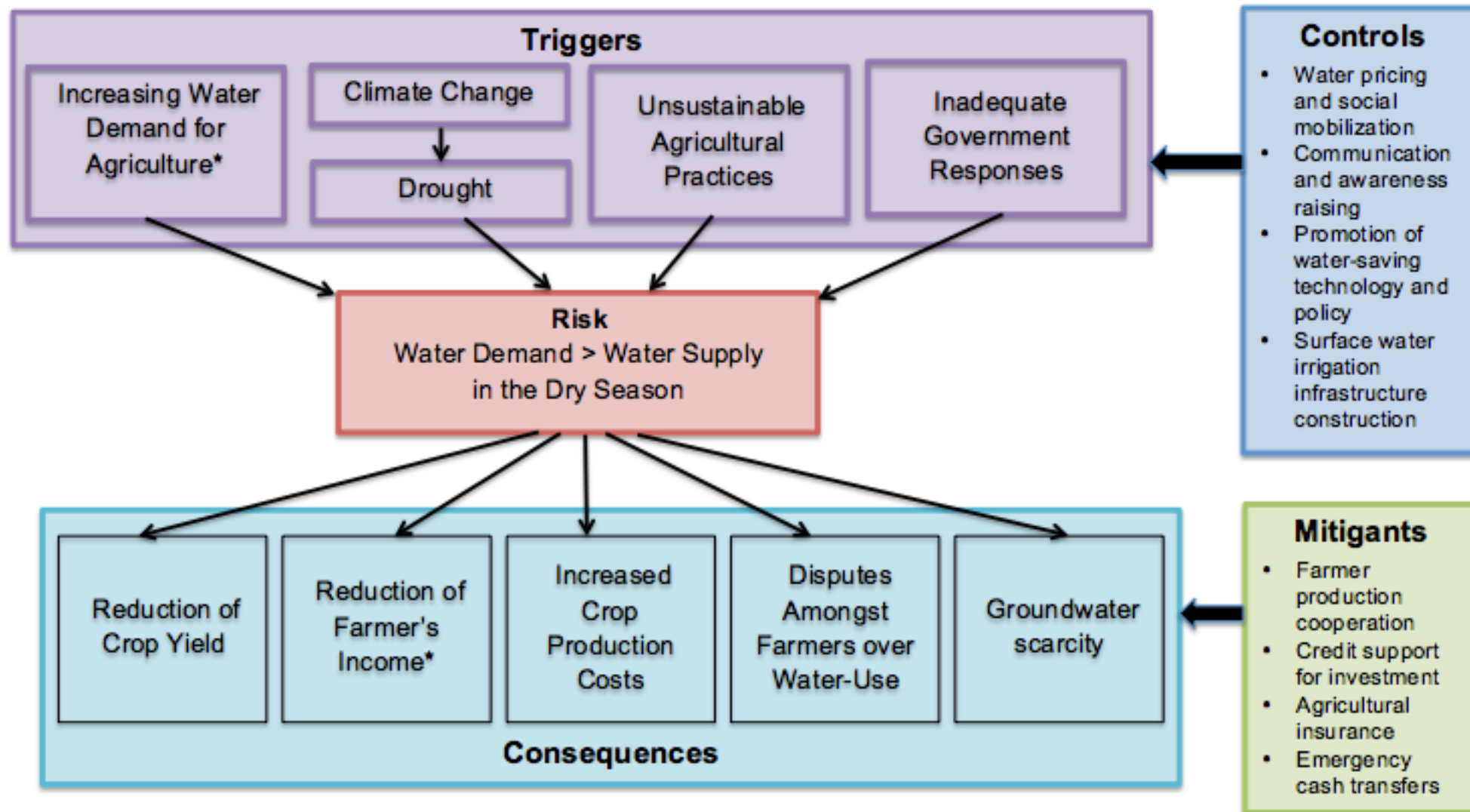


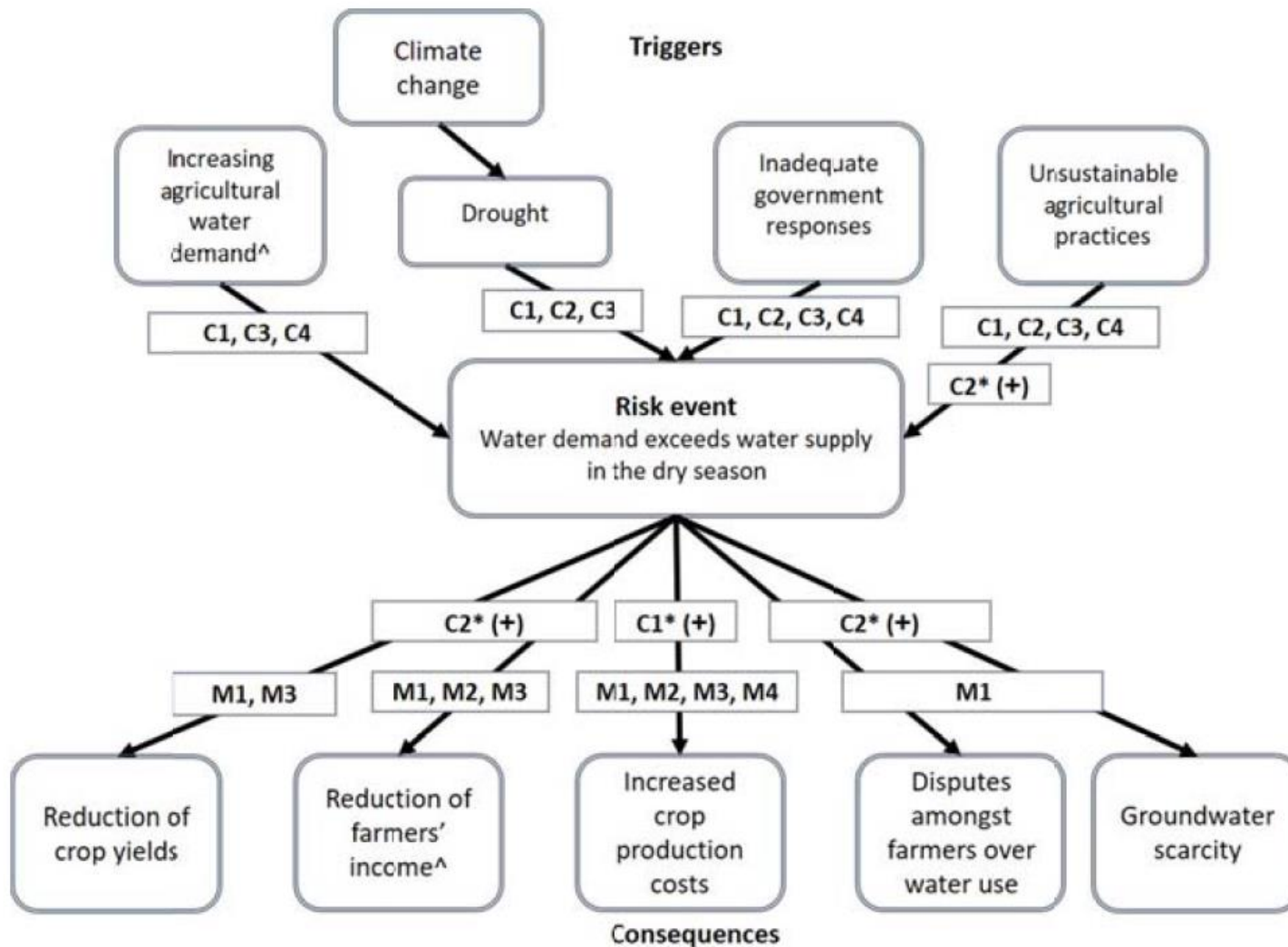
# ROAD Pilot Workshop, Đơn Dương July 2016



Yes, No, ?	Hồ sơ và	Hồ sơ SX	Bảo hiểm	diện tích x x 46
Giảm NS công trợ	Y	Y	?	Y
Giảm thuế nhập	Y	Y	?	Y
Khảo sát nước ngầm	Y	Y	?	Y
Thành lập nước	Y	Y	?	Y
Tạo chỉ phí SX	Y	Y	?	Y
NO	Y	Y	Y	Y
DN	Y	Y	Y	Y
↑ thuế nhập NO	Y	Y	Y	Y
Ưu đãi người nước ngoài	Y	Y	Y	Y
BV và MT trong SXNN	Y	Y	Y	Y







**Controls**

- C1. Social mobilisation (water pricing & PPPs in irrigation) (17 + 1)**
- C2. Surface water irrigation infrastructure construction (7 + 2)**
- C3. Communication & awareness raising (1 + 2)**
- C4. Promotion of water-saving technology & policy (5 + 1)**

**Mitigants**

- M1. Farmers' production cooperation (10 + 1)**
- M2. Credit support for investment (0 + 1)**
- M3. Agricultural insurance (0 + 1)**
- M4. Emergency cash transfers (0 + 1)**

## Insights

- Generating knowledge: farmer production groups
- Sharing knowledge: contrast between district officials' views on water pricing and not engaging with farmers on the issue
- Identification of feedback effects: the role of research
- Limitations of knowledge transfer: power asymmetries and replication of process across levels and scales

## Insights

- Developing the credibility of risk assessment process: Cascade of consent
- Balancing reductionism and completeness: Facilitation and future design of ROAD (thresholds, key variables, anticipating critical transitions)