

# Integrating Climate Change Adaptation (CCA) into Thailand's Agricultural Sector



**PARALLEL SESSION III.A – AGRICULTURE AND FISHERIES**  
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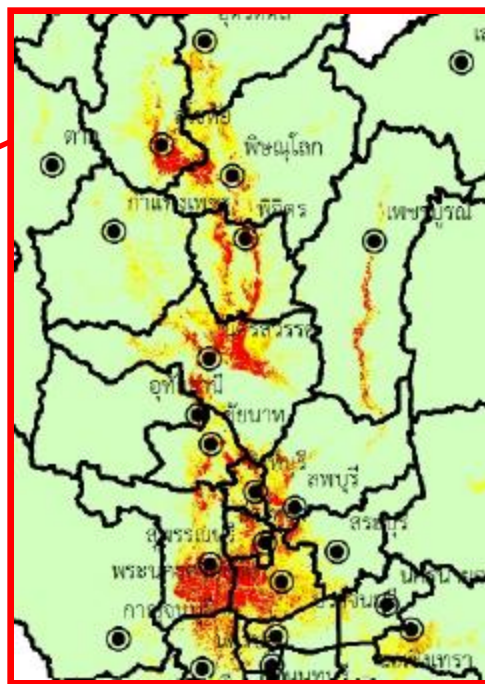
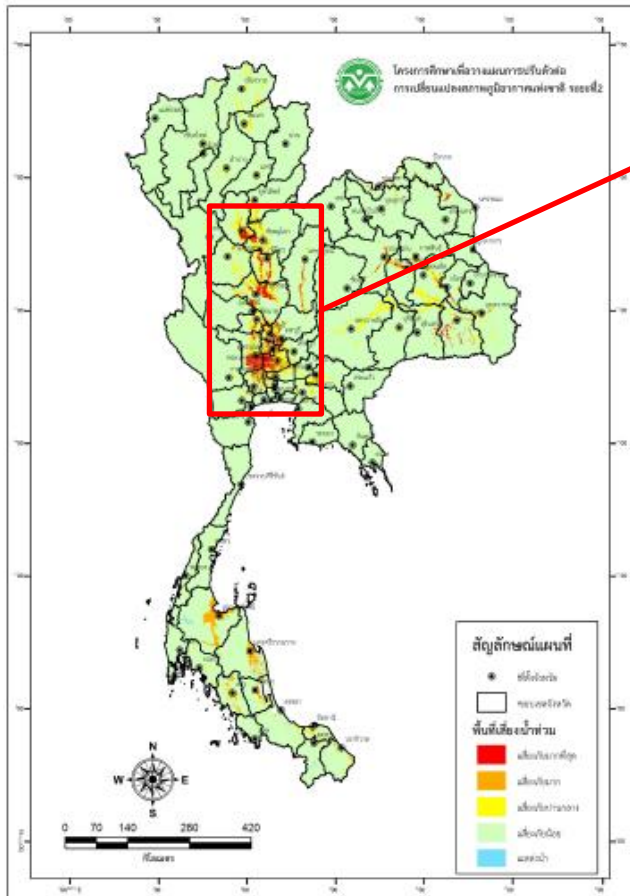
# Presentation Outline

- **Key vulnerabilities and risks in Agricultural Sector**
- **Agriculture Strategic Plan on Climate Change 2017-2021**
- **Integrating Climate Change Adaptation (CCA) into Agricultural Development Plan**



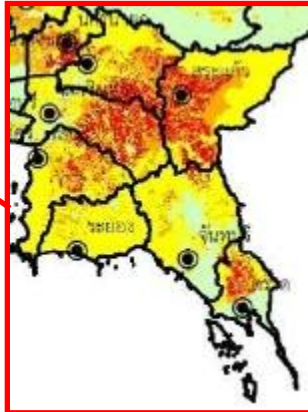
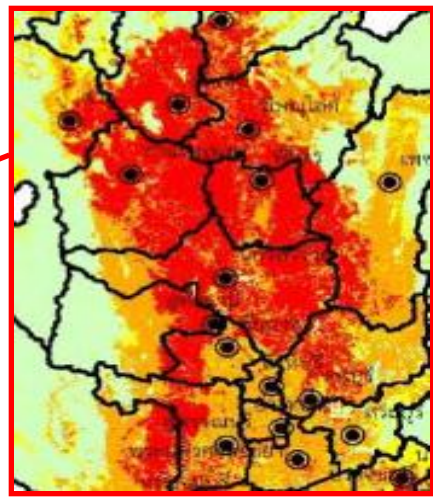
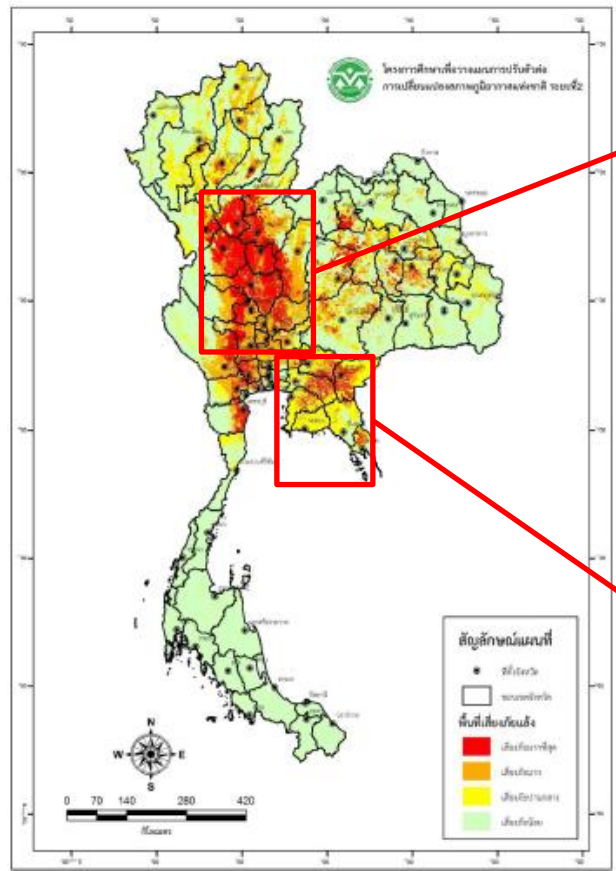
# Key risks and vulnerabilities in Agricultural Sector

# Climate Risk Assessment: Flood





# Climate Risk Assessment: Drought



# Crop Suitability Assessment

## Current climate suitability

Item	Principal Factor	High suitability zone	Correspondence with Current cultivation area	Other potential factor explaining distribution
Cassava	Rainfall	Central dry area	+	
Maize	Rainfall	Central dry area	+	
Rice KDML 105	Rainfall	Strip around centre	-	Water Management
Rice (others)	Rainfall	Strip around centre	-	Water Management
Sugarcane	Rainfall and temperature	No	-	Water Management

- The cultivation areas of **rice and sugarcane** are located in LOW suitability zones while **cassava and maize** are located in HIGH suitability zones
- Water management is the main reason behind **rice and sugarcane** distributions in LOW suitability zone.
- Vulnerability in **rice and sugarcane** depends on water management efficiency

Source: CIAT (2012)



# Uncertainty and changes of suitability to 2050

Items	Uncertainty	Suitability change
Cassava	Low	Stable
Maize	Moderate	High and Low suitability stable
Rice KDML 105	High	High and Low suitability stable
Rice (others)	High	High and Low suitability stable
Sugarcane	Low	Stable
Durian	High	High and Low suitability stable
<b>Longan</b>	<b>Moderate</b>	<b>Decease</b>
Lychee	Low	Stable
Mango	Low	Stable
Mangosteen	Moderate	High and Low suitability stable
Oil Palm	Moderate	High suitability stable
<b>Orange</b>	<b>Low</b>	<b>Decease</b>
<b>Pineapple</b>	<b>Low</b>	<b>Decease</b>
Rubber	Low	Stable
Rambutan	Moderate	High and Low suitability stable
Soybean	High	High suitability stable

- The suitability changes of **rice and maize** are random while **cassava and sugarcane's** suitability will be unchanged in 2050.
- **Orange, pineapple and longan** are more vulnerable to climate change.

Note: Using the A1B emission scenario (A balanced emphasis on all energy sources)



## Climate Change (Accumulative) Impact Estimation

Item	Change in yields (2010-2050)	Economic Impact; Direct calculation (Thousand baht)	Economic Impact; Surplus analysis (Thousand baht)
Cassava	2.67%	277,270	15,002
Maize	-11.28%	-1,850,799	-694,636
Rice KDML 105	3.60%	651,688	177,867
Rice (others)	0.48%	430	207,900
Sugarcane	-4.33%	-2,209,014	-2,493,207
<b>Total</b>		<b>-3,130,425</b>	<b>-2,787,074</b>
Durian	-49.36%	-2,697,929	-4,372,572
<b>Longan</b>	<b>-98.22%</b>	<b>-1,281,148</b>	<b>-5,259,612</b>
Lychee	-19.07%	-106,586	-130,615
Mango	-0.63%	-894,657	-80,000
Mangosteen	-7.92%	-180,947	-64,135
Oil Palm	-4.80%	-83,024	-32,895
<b>Orange</b>	<b>-13.37%</b>	<b>-57,032</b>	<b>-16,025</b>
<b>Pineapple</b>	<b>-17.44%</b>	<b>-374,780</b>	<b>-122,834</b>
Rubber	-125.64%	-1,123,283	-1,120,898
Rambutan	-0.70%	-76,173	-11,713
Soybean	2.40%	116,618	23,228
<b>Grand Total</b>		<b>-9,889,366</b>	<b>-13,975,145</b>

- The total economic impact of CC is between **9.8 to 13.9 thousand million bath**
- Projected yields of **Maize and sugarcane** will decline by 11.28% and 4.33%
- Projected **rice KDML 105** yield will increase by 3.6% BUT the study from FAO (2013) indicates that projected **rice** yield will decline by between 5% and 15%.

Source: CIAT (2012)

Note: <sup>1</sup> Direct calculation assumes only yield has changed in the calculations while others remain unchanged.

<sup>2</sup> Surplus analysis measures the total change in welfare of producers and consumers. In estimation, a partial equilibrium model with dynamic prices is used.





# **Agriculture Strategic Plan on Climate Change (ASPPCC) 2017-2021**



# Development and CC Policy Context (Hierarchy and Linkages)

## Climate Change Plans

CC Master Plan 2015-50  
(แผนแม่บทรองรับการ  
เปลี่ยนแปลงภูมิอากาศ  
ปี 2558-93)

Thailand's NDC  
(การมีส่วนร่วมที่ประเทศ  
กำหนด)

Thailand's NAP  
(แผนการปรับตัวแห่งชาติ)

## Development Plans

12<sup>th</sup> National Economic and  
Social Development Plan  
2017-2021 (แผนพัฒนาฯ จ.12)

Agricultural Development Plan  
2017-2021 (แผนพัฒนาการเกษตรฯ)

Agricultural Climate Change  
Strategic Plan 2017-2021  
(ยุทธศาสตร์การป.ภูมิอากาศด้าน  
การเกษตร)

Strategic Issues: Green and  
Sustainable growth

Strategic Issues: **Climate  
Resilience** and Green and  
Sustainable growth

**Climate Change  
Framework** in  
Agriculture Sector



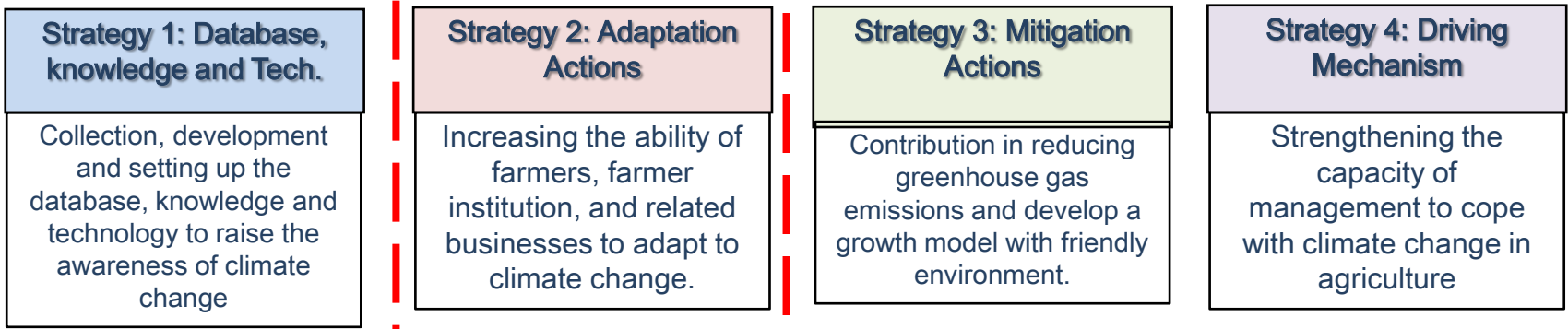


# Agriculture Strategic Plan on Climate Change (ASPCC) 2017-2021



**Vision** *“Thailand’s agriculture has climate resilience and contributes to mitigate climate change problems under the sustainable development pathways”*

- Missions**
- 1) Raising awareness of the impacts and convey information, knowledge and technology to development parties at all levels to enhance the readiness for climate change-related policies
  - 2) Develop the database, knowledge and technology under the cooperation from all sectors to support the adaptation to climate change
  - 3) Participate in mitigation of greenhouse gas emissions in the level consistent to the context of the agricultural sector and enhance a sustainable low-carbon growth
  - 4) Pushing for the integration of adaptation measures and guidelines to cope with climate change in all sectors and at all levels levels





# Climate Change Adaptation Priorities in ASPCC 2017-2021

## Priority 1: Water management

- Integrated and Participatory Water Resources Management
- Increasing water use efficiency
- Expanding irrigation areas
- Increasing number of farm ponds for water storage.

## Priority 2: Sustainable Soil Management

- Preventing soil degradation (such as planting cover crops, and crop rotation)
- Rehabilitating degraded soils (such as soil condition analysis and organic fertilizer promoting)
- Optimizing agricultural land use through agricultural zoning (by using Agri-Map tools)



# Climate Change Adaptation Priorities in ASPCC 2017-2021 (Cont.)

## Priority 3: Strengthening farmers' climate resilience

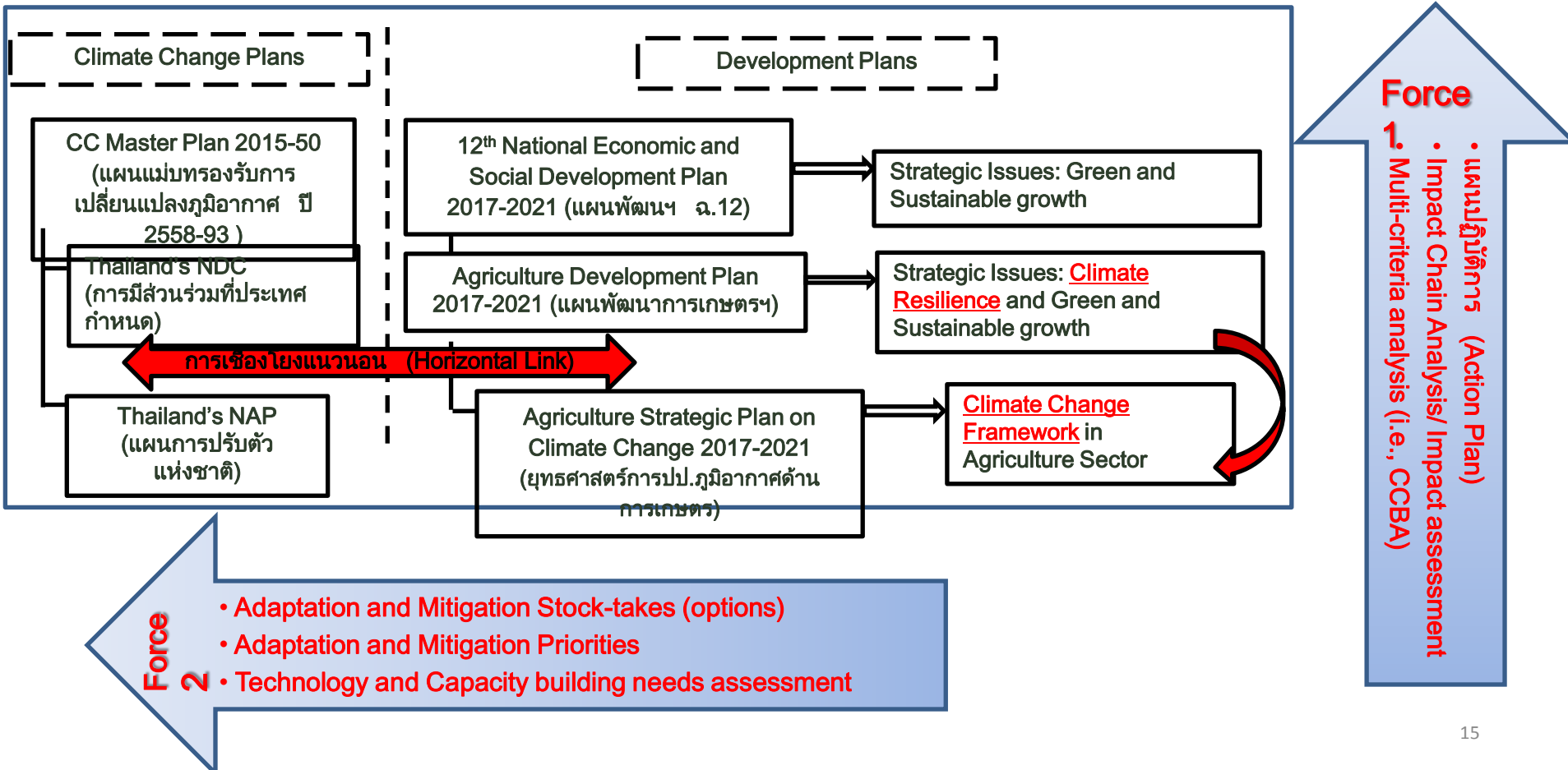
- Climate change risk map for all main crops
- Promoting climate-risk insurance (Index –based insurance)
- Developing the climate-resilient index for the agricultural sector
- Promoting integrated farming and sustainable agriculture (organic farming and New Theory Agriculture)
- Promoting technology transfer on precision farming and biotechnology
- Developing early warning system (EWS) for agricultural sector
- Promoting market-based policies and economic incentive for climate action.

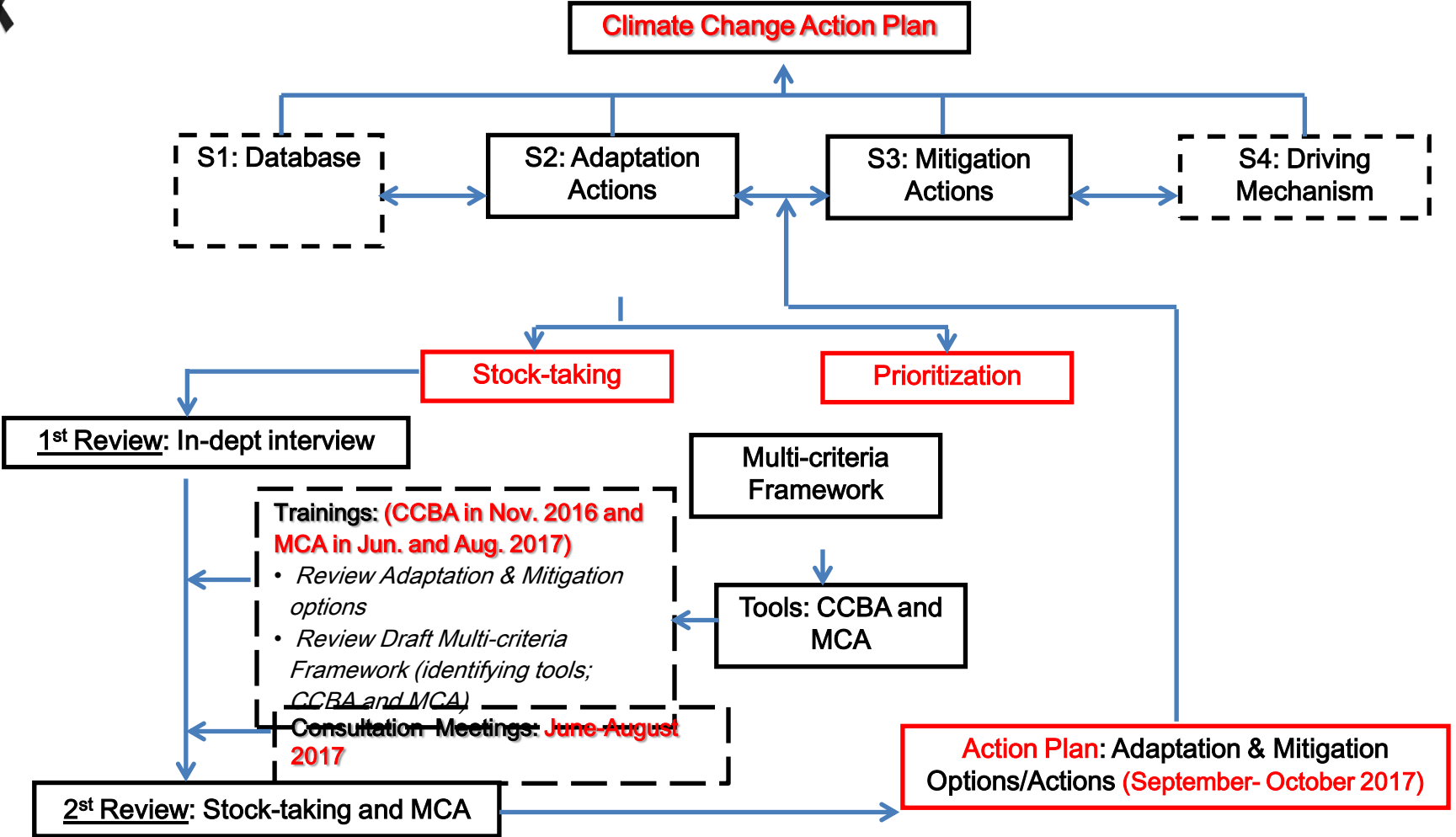


# **Integrating Climate Change Adaptation (CCA) into Agricultural Development Plan**



# Driving Forces of ASPCC 2017-2021







Agricultural Climate Change Strategic Plan (ACCSP) 2017-

2021



  
 TDR Team

CC Action Plan Framework  
 Thematic/Flagship

CC Stocktaking and CC Action Plan

Capacity building on MCA Development

MCA developing (Set of Criteria)

(The Workshop Team)



During 2<sup>nd</sup> workshop in Aug 2017

UNFCC  
 Financial and

Technology  
 NAR Adaptation  
 Supports  
 options in  
 Agriculture

MoAC's  
Priorities on  
 Climate  
 Change

More Efficient  
 budget  
 allocations

# CCA Action Stocktaking and Action Plan Drafting

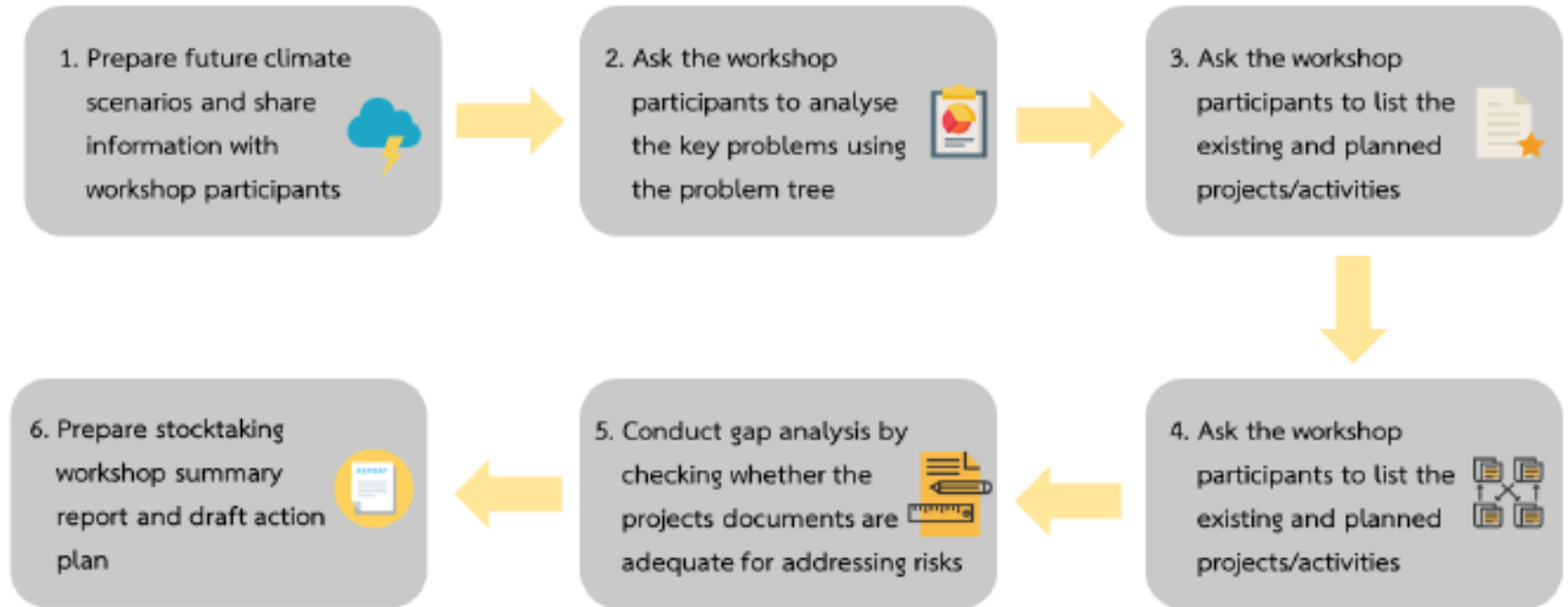


Figure 1: Steps in Stocktaking CCA Projects and Activities

Source: Thailand Development Research Institute

# “Problem Tree” Tool: Problem Analysis

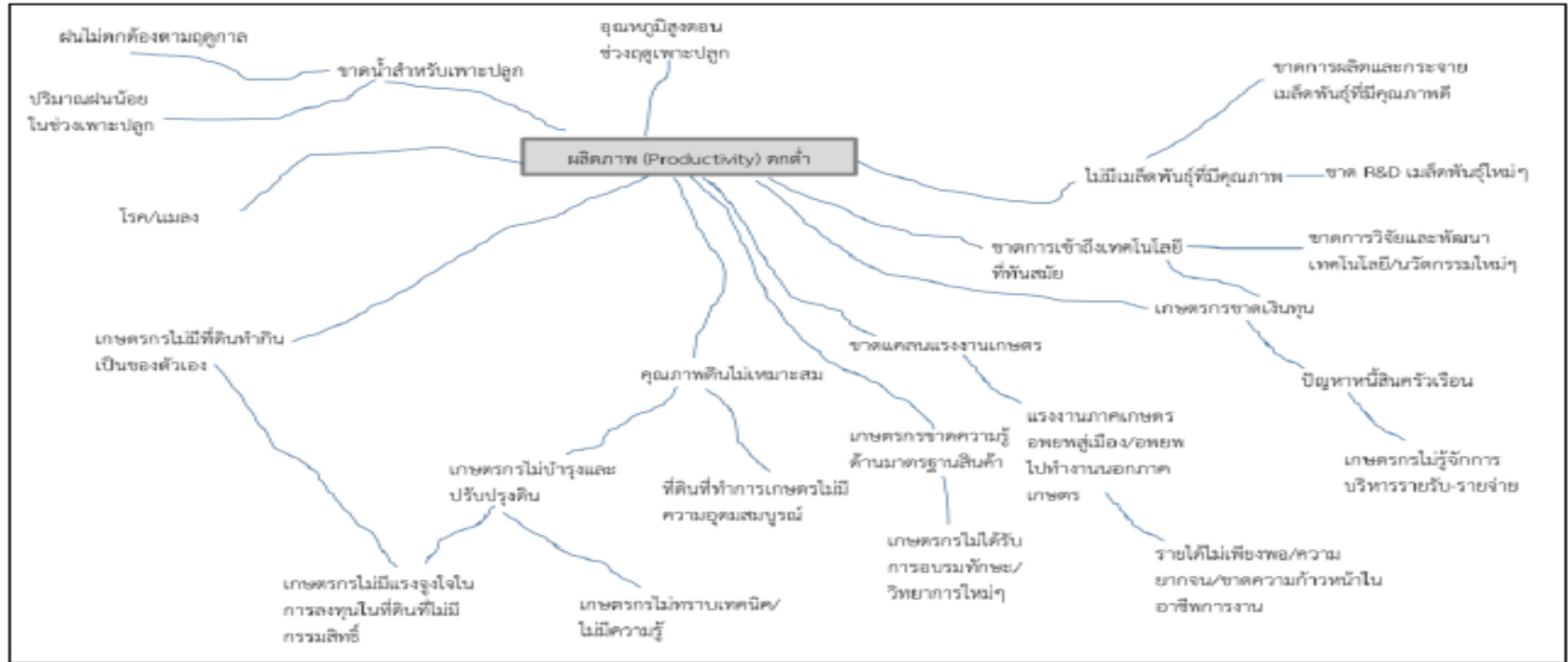


Figure 8: Problem Tree in the Agricultural Sector

Source: TDRI

# Impact Chain Analysis in Context of Thailand's Agriculture

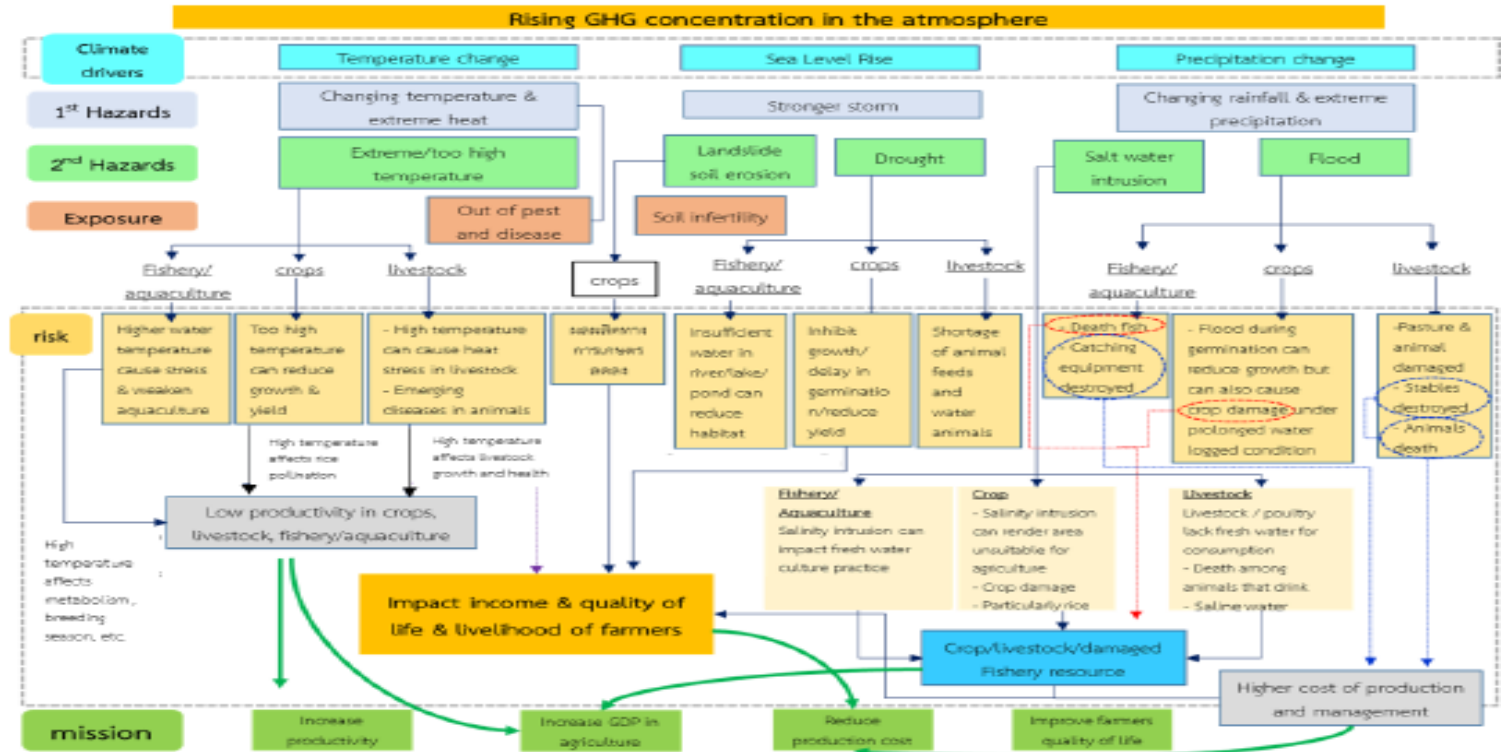


Figure 3: Impact Chain Analysis for Thailand's Agricultural Sector

Source: Thailand Development Research Institute (Adapted from the GIZ's tool)

# FORMAT: THEMATIC PROJECT



Figure 2: Adaptation and Mitigation Typologies

Source: Biagini et al. (2014)

# FORMAT: THEMATIC PROJECT

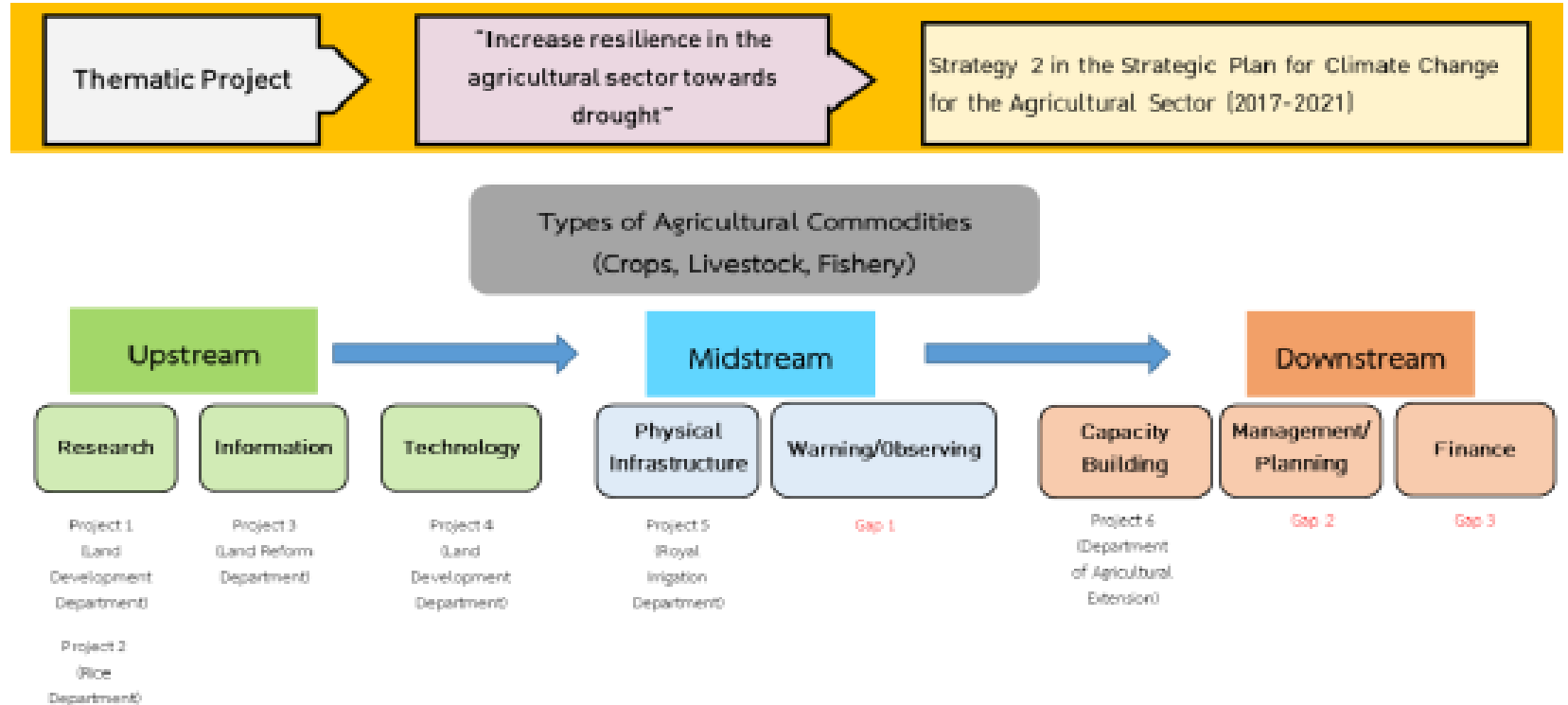


Figure 4: Thematic Project Format

# EXAMPLE OF THEMATIC PROJECT: DROUGHT

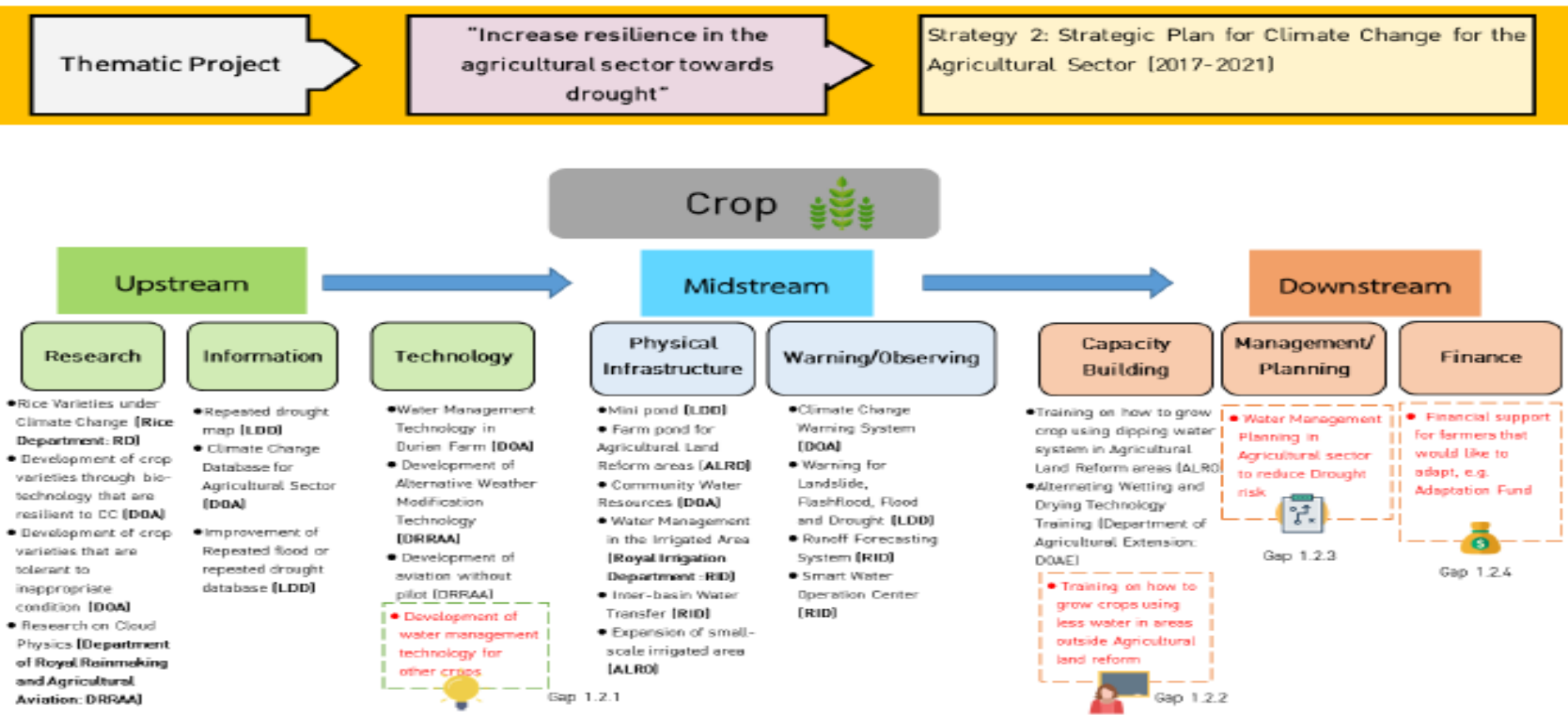


Figure 14: Increasing Resilience of Crop towards Drought

# EXAMPLE OF THEMATIC PROJECT: DROUGHT

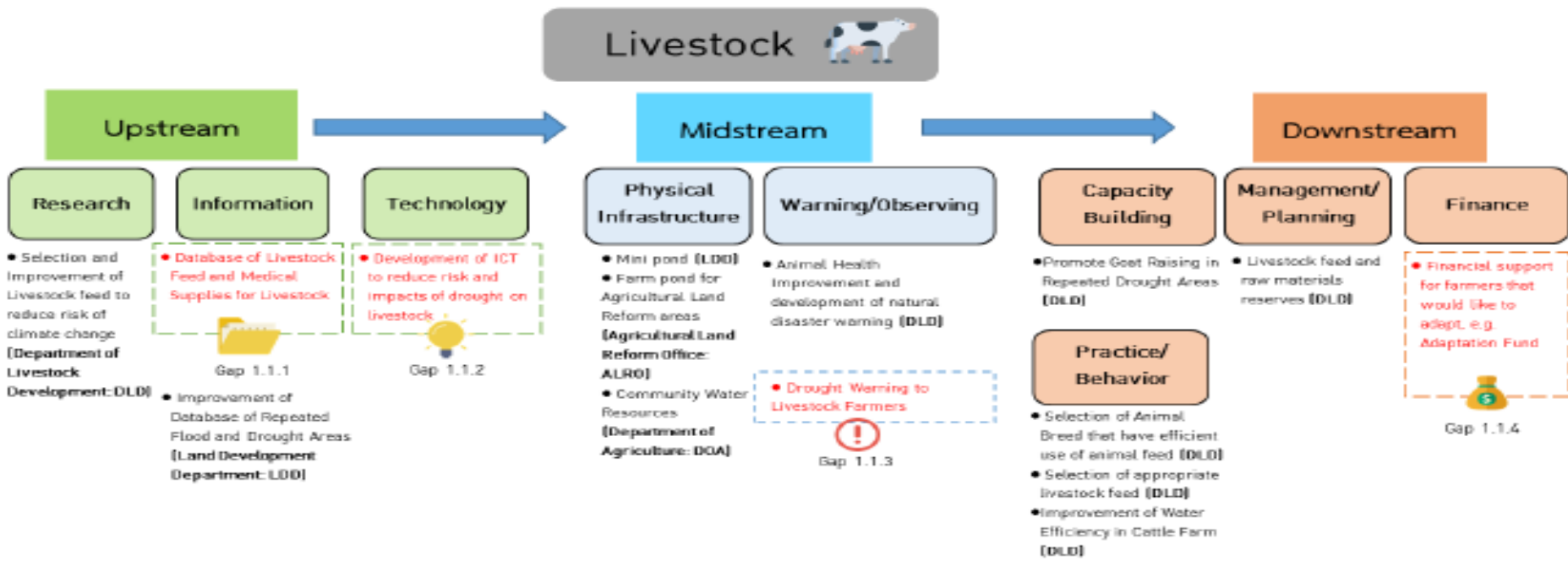


Figure 13: Increasing Resilience of Livestock towards Drought



# EXAMPLE OF THEMATIC PROJECT: DROUGHT

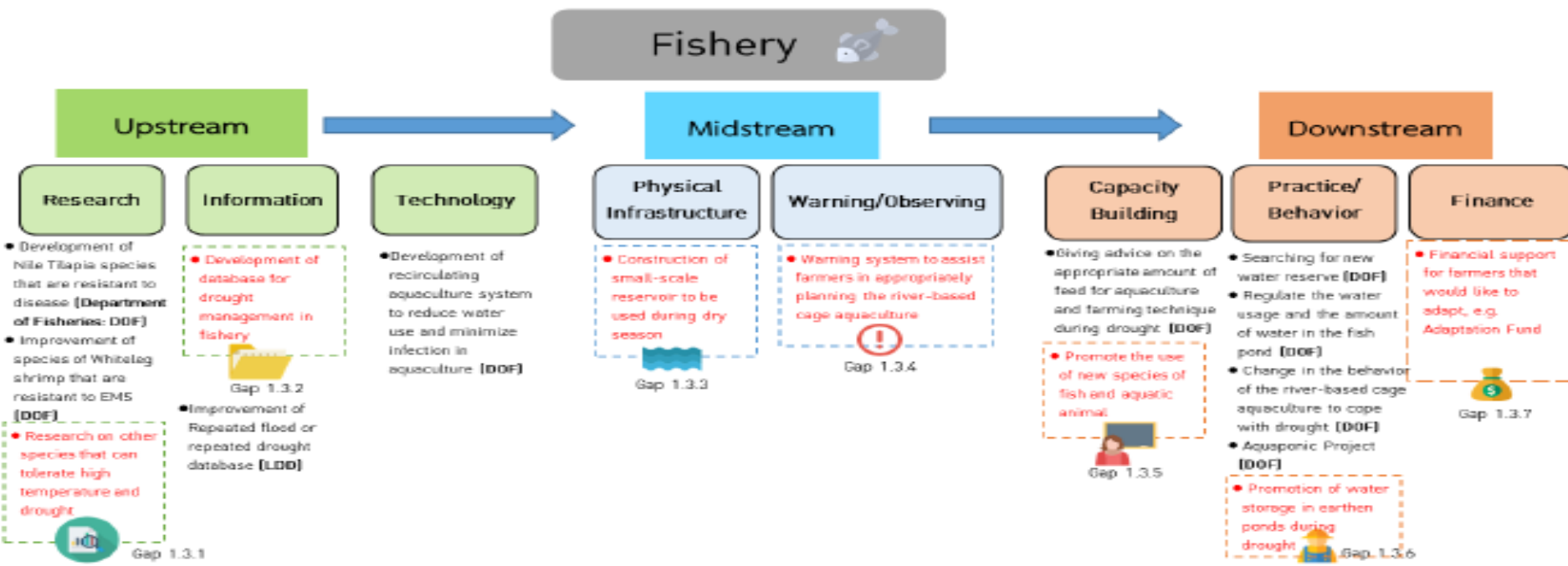


Figure 15: Increasing Resilience of Fishery towards Drought



*Empowered lives.  
Resilient nations.*



Food and Agriculture  
Organization of the  
United Nations



สำนักงานเศรษฐกิจการเกษตร  
Office of Agricultural Economics

**TDRI**



# Thank you

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