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**USAID Mekong Adaptation and Resilience to Climate Change**



Asia-Pacific Climate Change  
Adaptation Forum **2014**

1-3 October 2014 Kuala Lumpur, Malaysia



## **Nexus 4.2: Adaptation, aquaculture and fisheries**



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Deputy Director of Asian Management and  
Development Institute (AMDI)***



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## Nexus 4.2: Adaptation, aquaculture and fisheries.



2000 © World Aquaculture Society

Q: How do smallholder aquaculture and fisheries respond to climate-related risks?

Q: What efforts have been undertaken in the fisheries sector to adapt to climate change?



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# Presentation Overview

- USAID Mekong ARCC Project overview
- Climate projections for Kien Giang province, Vietnam
- Introduction to Thuan Hoa commune
- Overview of livelihoods and small-holder aquaculture, and how they are impacted by CC
- Lessons learned
- Upcoming activities
- Discuss research/methodology/approach in the Q&A



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# Project Overview

- Title: USAID Mekong Adaptation and Resilience to Climate Change
- Time: Jan 2014-Dec 2015 (2nd Phase of Mekong ARCC – 5 years project)
- Donor: USAID
- Partners: DAI; Vietnam: AMDI, Vietnam Red Cross; Cambodia: WFP; Thailand IUCN; Laos IUCN
- Goal: Vulnerable communities in Kien Giang increase resilience to current and projected impacts of CC



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# Objectives

- Increase capacity to develop and implement climate change adaptation (CCA) plans and strategies
- Reduce vulnerabilities to climate change impacts
- Strengthen policies, tools, methodologies and practices
- Demonstrate and scale-up model actions

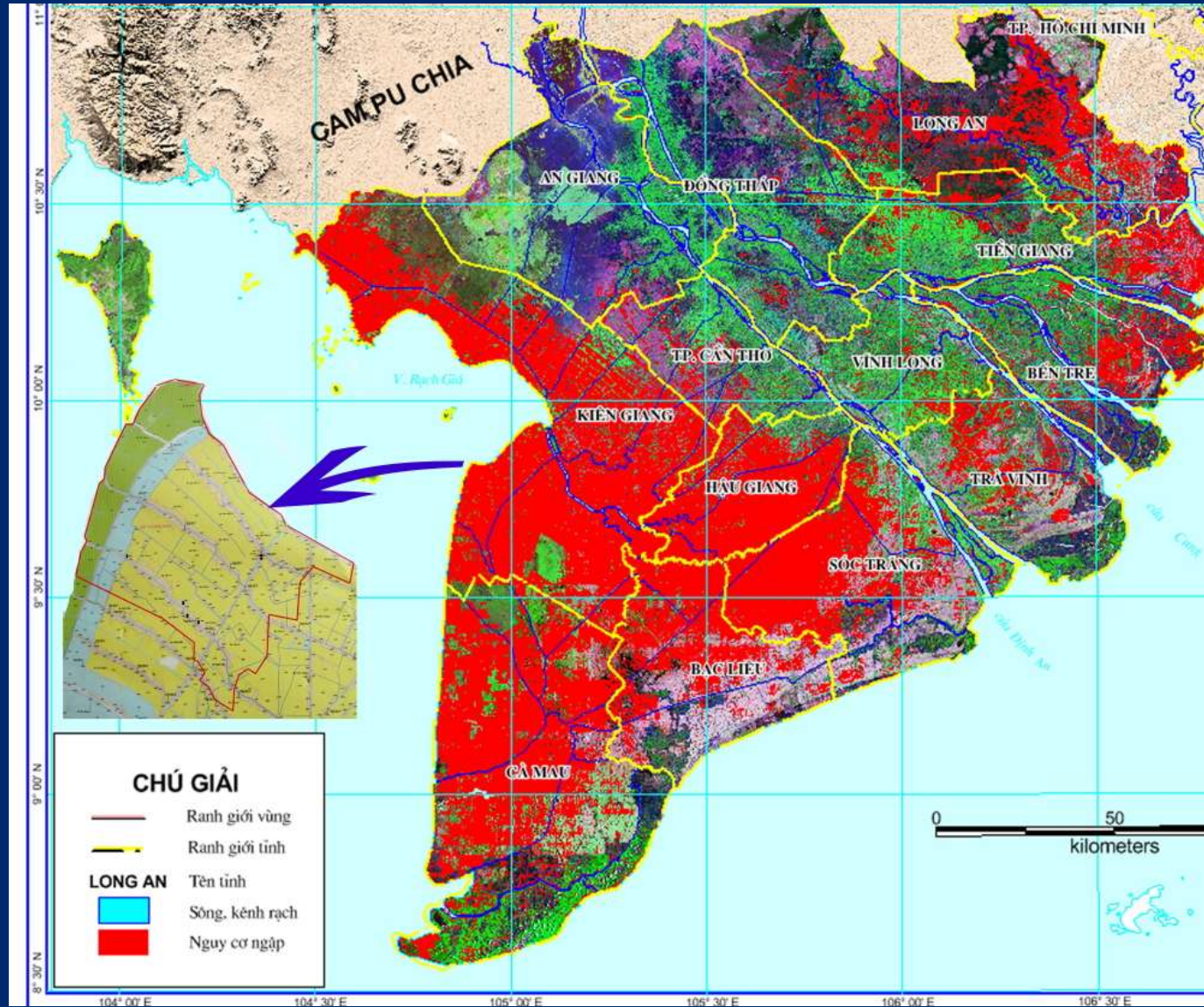


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Vietnam  
MONRE  
2012  
projection  
of a one-  
meter SLR  
by the  
year 2100





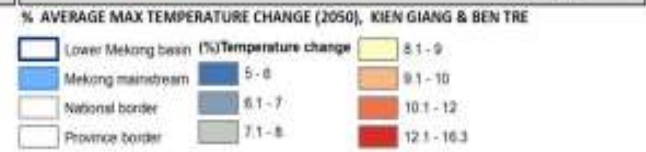
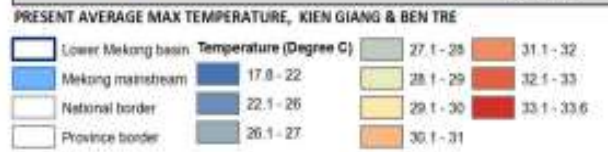
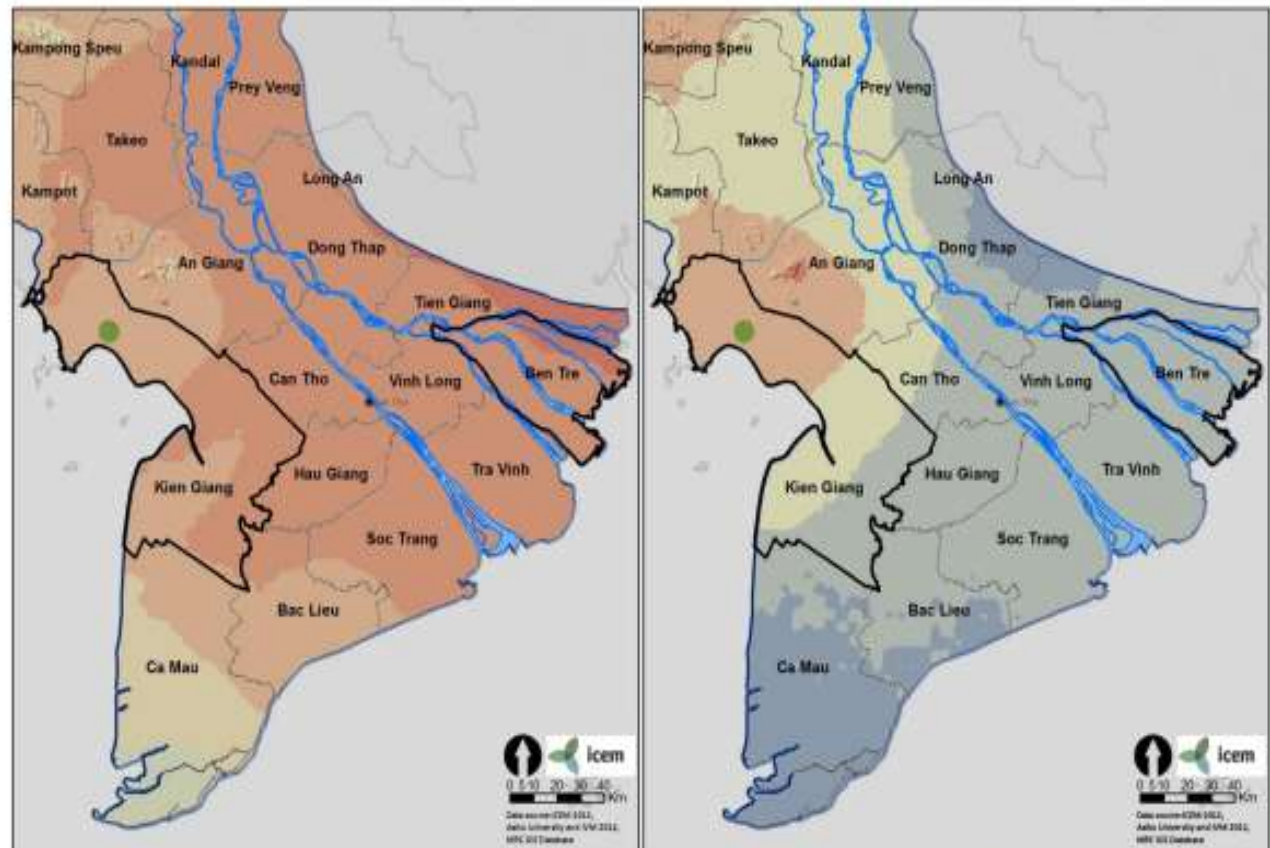
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## 2050 Projections: Mekong ARCC Study 2013

- Projected 3°C increase in annual mean temperature
- Droughts will occur 80% of years during April





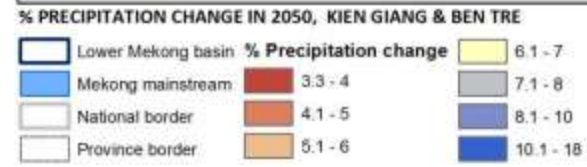
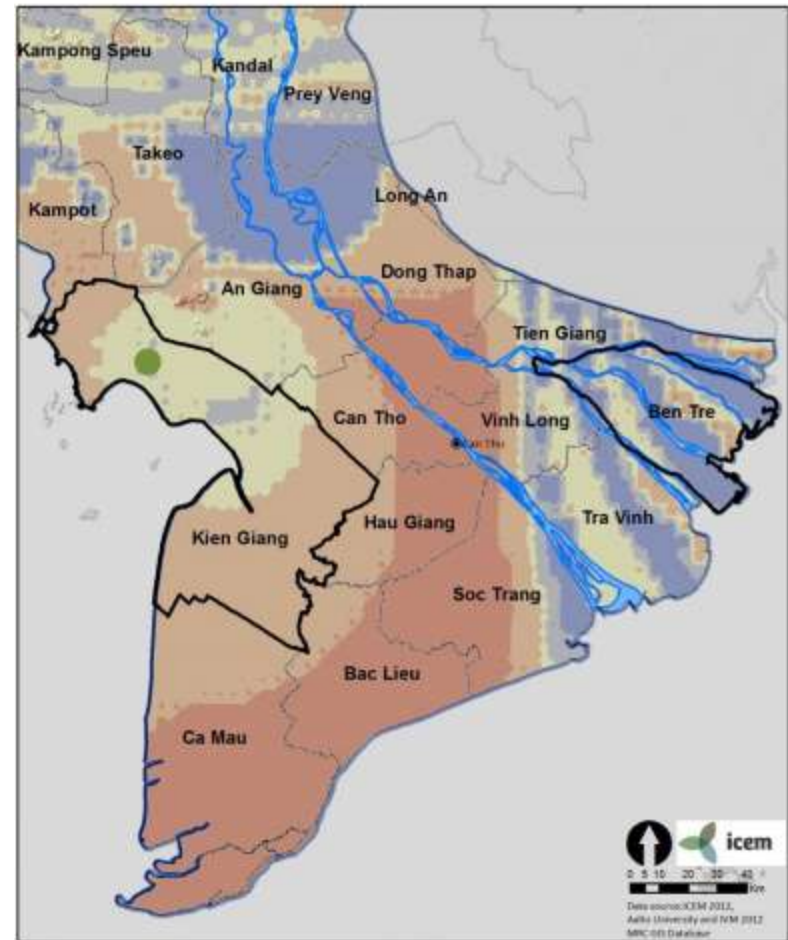
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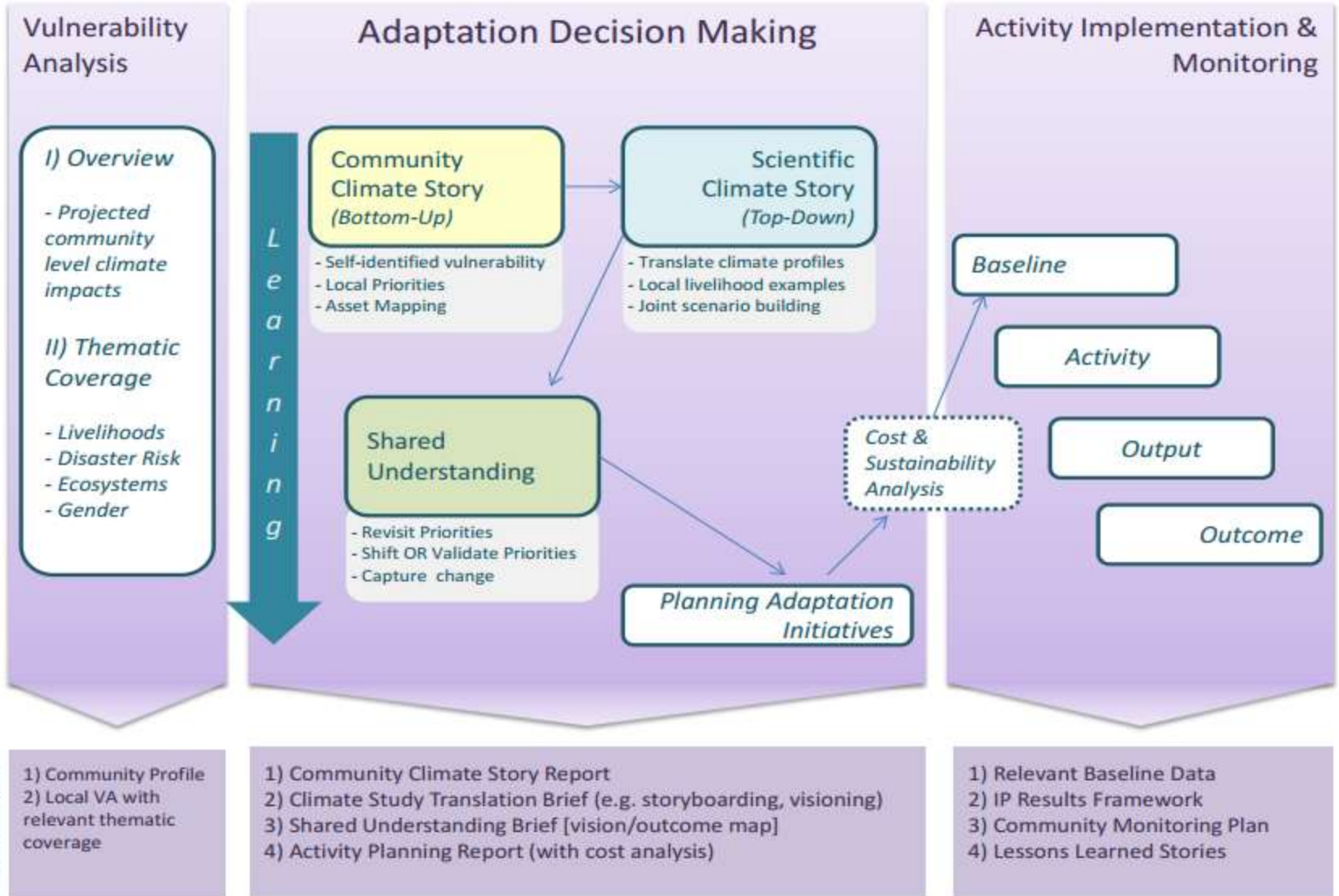
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# 2050 Projections: Mekong ARCC Study 2013

- Annual rainfall will increase from 1,280 mm to 1,370 mm (+90 mm) (5-8%)
- Large daily rainfall events will increase in size up to 50 mm.









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# Process

- Community Profile
- Awareness Survey
- Vulnerability Assessment (top-down/ expert approach)
- Participatory VCA (bottom-up approach)
- Scientific Climate Story
- Livelihoods Assessment



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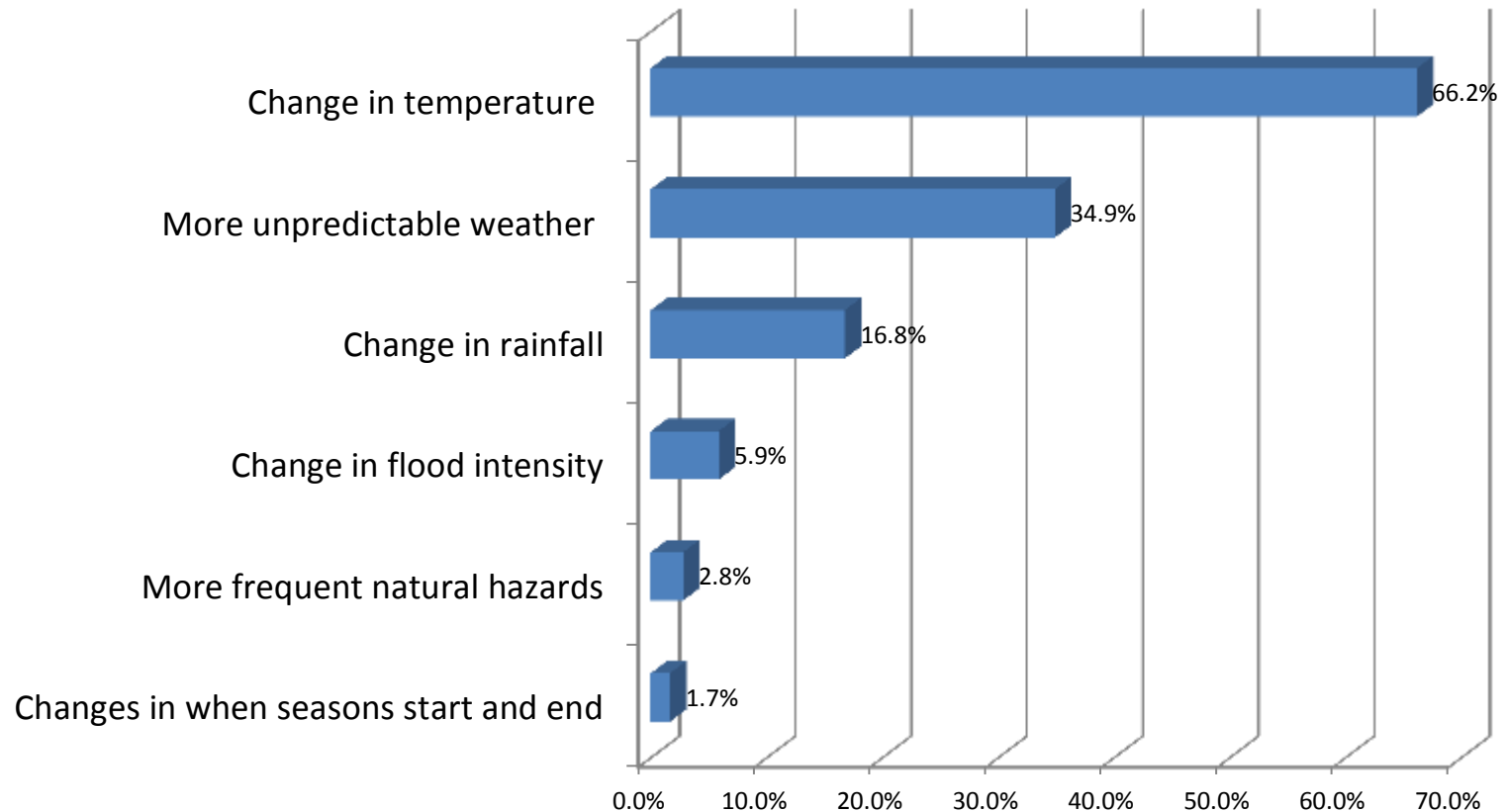
# Community Profile

- Land area of 8,300 ha
- Coastal commune, susceptible to SLR due to very low elevation (0.2-0.4 meters above sea level)
- Landscape of aquaculture ponds, rice paddies, canals and road networks
- Households typically engage in a livelihood mix of rice farming and aquaculture (shrimp and blood cockle)





# Awareness survey: what changes in weather?



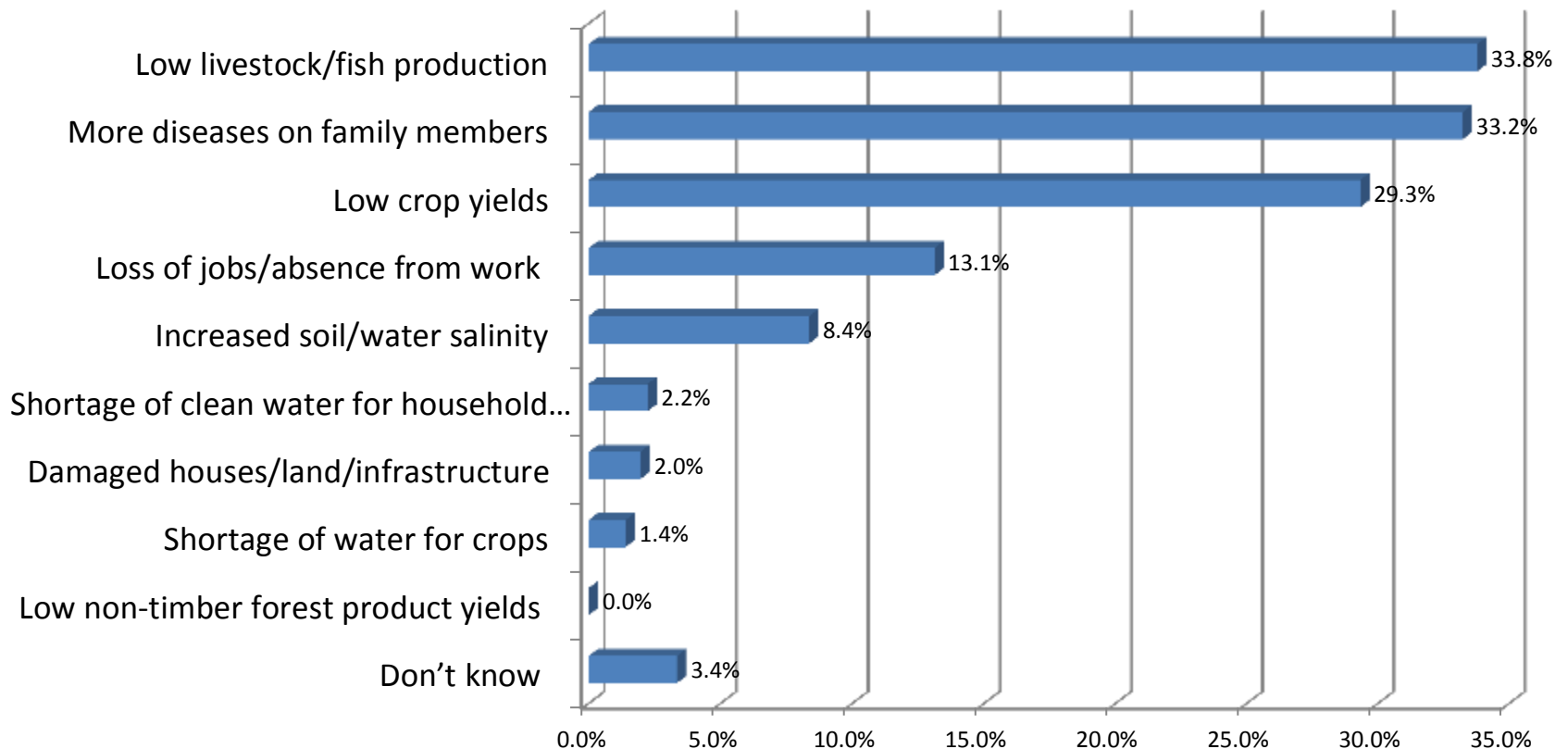


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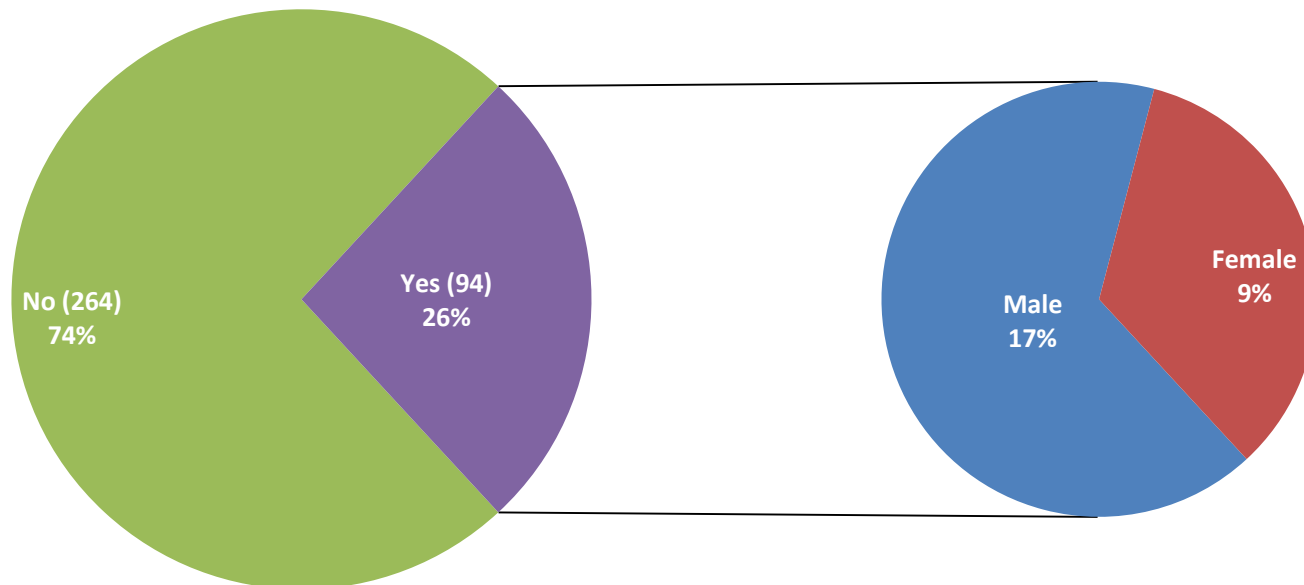
# Awareness survey: what are the impacts of weather changes?





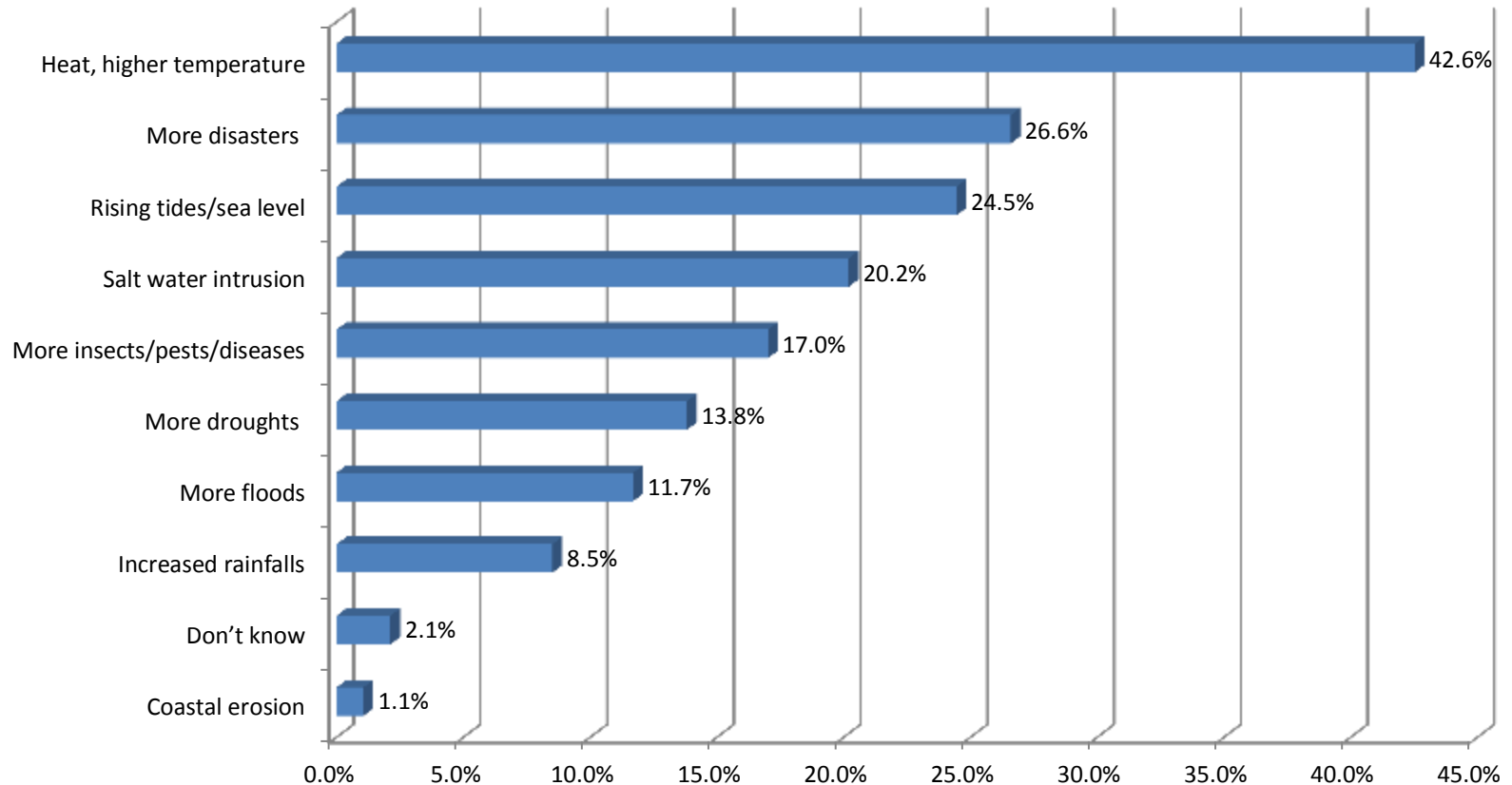
# Awareness survey: Climate Change

- Among those who know what climate change is, 81.9% confirmed that climate change had effects on their community, and the number of male respondents was 2.5 times higher than female





# Awareness survey: what are impacts of climate change?





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## **Awareness survey: some discussion**

- Most people have limited knowledge of and ability to deal with CC impacts
- Major livelihood concerns from changes in weather patterns were low aquaculture production and low crop yields → need to identify livelihood adaptation options
- The survey identified women as a particularly vulnerable group
- People do not have adaptation plans for climate change. The USAID Mekong ARCC project will help them understand the possible climate change impacts and identify adaptation options





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# Livelihood Study

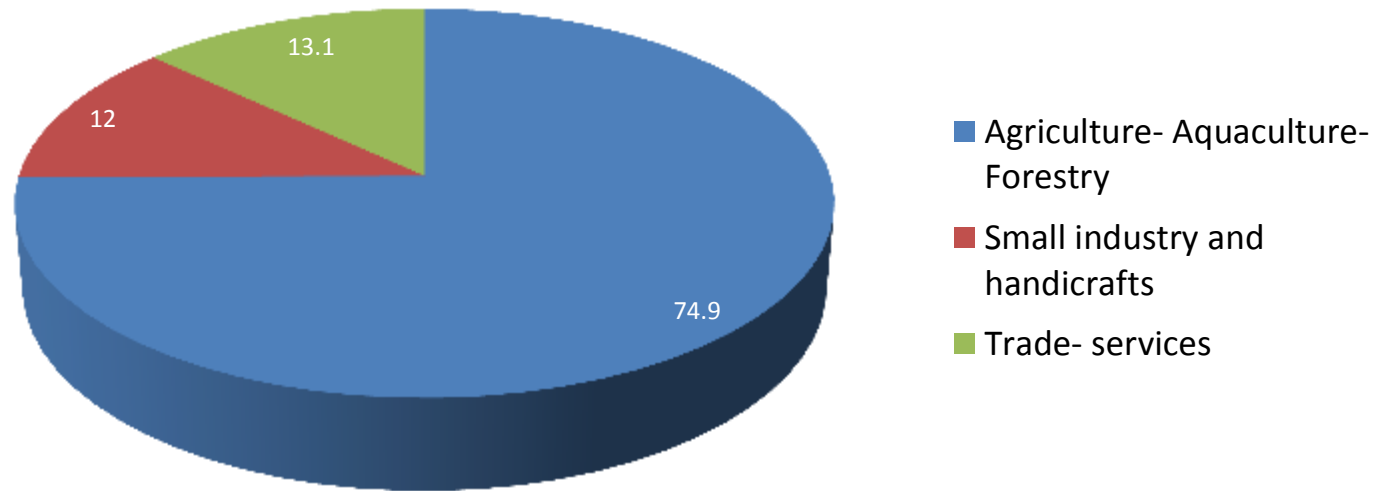
- VCA report identified need for more detailed information on farming systems and livelihood challenges faced by the commune





# Livelihood Study

Livelihood structure, Thuan Hoa Commune





# Livelihood Study: Challenges to aquaculture

Challenges to aquaculture	Drivers
Unseasonal rain, storms, salt water intrusion, prolonged drought, high temperatures	Climate change, climate variability, SLR, mangrove deforestation
Farmers put higher priority on shrimp production than rice	Higher prices of shrimp
Embankment overflow	SLR, storm surge and flooding.
Yield of blood cockle and crab declining	Continuous over stocking, reduced source of natural feed, pollution



## Livelihood Study: Challenges to aquaculture cont.

Challenges to aquaculture	Drivers
Limited capital to clean the ponds each year to grow rice	Lack of understanding and technical information, lack of capital
Cleaning the ponds of salt dependent on rain	Shrimp-rice rotation system
Shrimp-rice farmers have low period of 5-6 months without income	Low income diversification
Low quality shrimp seeds contributes to low shrimp yield	Lack of capital, lack of understanding of seed sources



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## **Livelihood study: Existing adaptation**

- Farmers *do have* some adaptation and coping measures

Shrimp-rice rotation model:

- Monitor weather conditions before stocking baby shrimp
- Dig ditches along the pond to create a low temperature area
- Build higher banks and pump more water into pond
- Comply with seasonal calendar
- Add Urea and DAP compost to ponds to lower water temperature

Natural shrimp-raising households in mangrove forest:

- Watch the water color to choose the least polluted water to pump into ponds
- If observing fish jumping out of water while pumping, farmers stop as this indicates water is contaminated



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## Livelihood Study: Vulnerability of aquaculture

Photo: Crab pond breached by sea

- Farmers reported coastal land erosion
- Abandoning aquaculture ponds due to direct damage from wave action and saline intrusion to ponds further inland
- Projection of SLR means that farmers need support to adapt. E.g. mangrove restoration





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# Livelihood Study

## Participatory adaptation options ranking

- Sedge grass, shade trees for ponds
- Mangrove reforestation
- Access to weather and agri/aquaculture information
- Demonstration models and technical aquaculture training for farmers

Sinh kế chọn	Thích ứng đk biến đổi khí hậu hiện tại và dự lai (1-5)	Lợi ích kinh tế (1-5)	Không làm ứ đọng môi trường (1-5)	Không phụ thuộc đk tài nguyên con người (1-5)	Hiệu quả đk tài chính lập luận (1-5)	Phù hợp với PT-KTXH địa phương (1-5)
Tạo rừng (cây nước lợ) trên ruộng lợ (hàng bắp)	5	3	5	5	5	5
Mọc khu rừng nước lợ (cây nước lợ)	5	3	5	3,5	2,5	5
Tạo rừng cây nước lợ (cây nước lợ)	5	4	5	5	3	5
Tiếp cận thông tin thời tiết khu vực (qua radio)	5	-	5	5	5	5
Thư viện thông tin nông nghiệp địa phương (qua radio)	5	5	4	5	-	5
Đưa mô hình thực hành nuôi (cá nước ngọt)	5	-	5	5	2	5
Tập huấn kỹ thuật nuôi trồng thủy sản (qua video)	5	5	5	5	3	5
Mô hình trình diễn						



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# Lessons learned

- Participatory approach: involve all stakeholders to have their buy-in, participation and develop community ownership
- Partnership: team up with VNRC in community-based activities; maintain regular contact with DAI and VNRC





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# Lessons learned

- Communication: use different means to communicate project information (network, groups, leaflets, posters, interactive games, quizzes, songs)
- Combine community and scientific knowledge (bottom-up and top-down approach)



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# Scientific Climate Story

Activities/Strategies	Short term Outcomes	Midterm Outcomes	Long term Outcomes	Vision
Education program on disaster risk reduction, construct loudspeaker system	Loudspeaker in the village	Local people have knowledge about disaster risks and responses	Local people have capacity to adapt to disasters	<b><i>...loudspeaker systems, people to have understanding and capacity to adapt to disaster risks</i></b>



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# Upcoming activities

- Aquaculture expert GAP analysis
- Work with communities to prioritize adaptation initiatives and develop a livelihood adaptation strategy
- Implement livelihood adaptation options
- Monitor adaptation implementation led by community members, e.g. salinity monitoring system, early warning system by loudspeakers



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# Contact information

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