

Coordinating adaptation in the Mekong Region

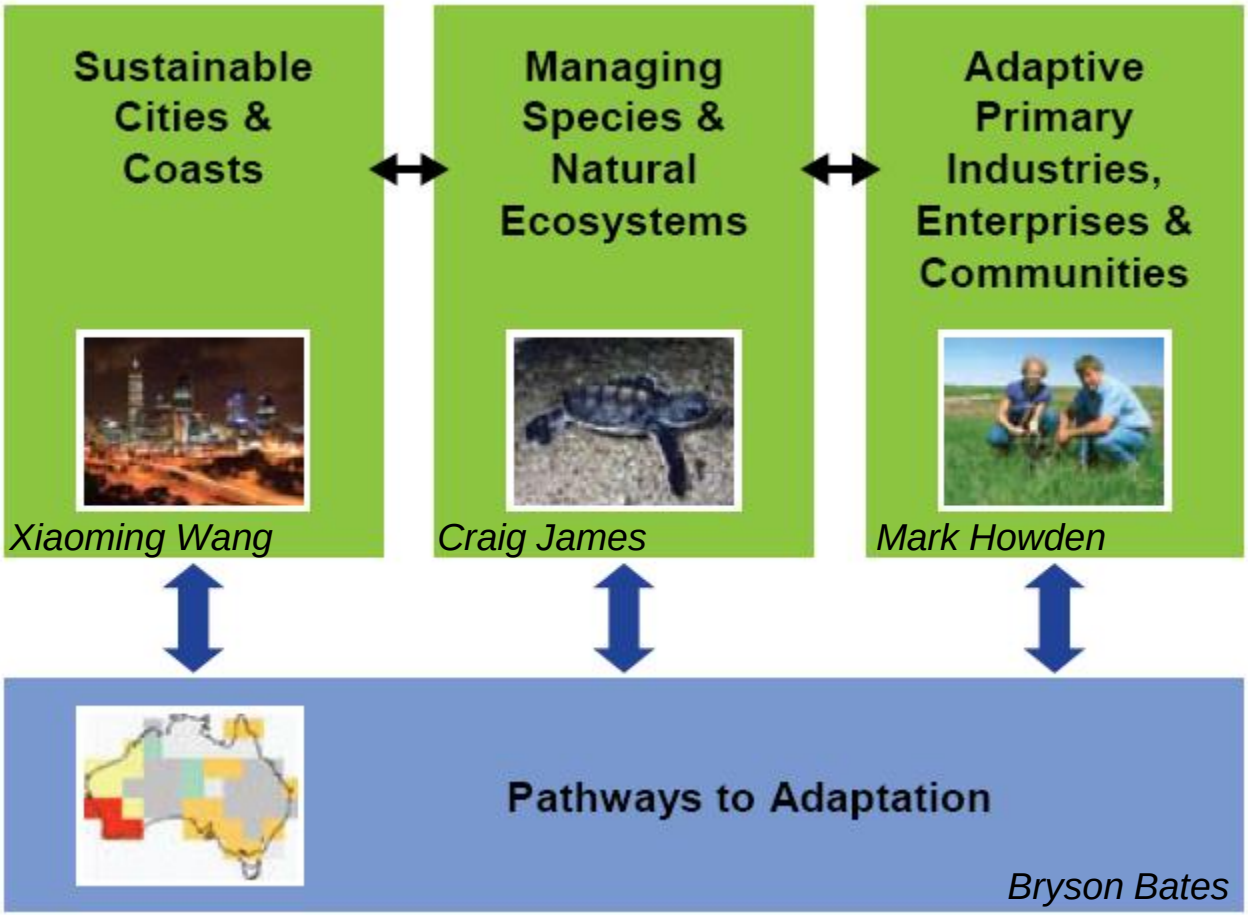
Dr Alex Smajgl
18 March 2013

CSIRO ECOSYSTEM SCIENCES/CLIMATE ADAPTATION FLAGSHIP
www.csiro.au

Climate Adaptation Flagship Goal

To equip policy makers, industries and communities with practical and *effective adaptation options* to climate change and *variability* and, in doing so, create in the national interest *$3 billion* per annum in net benefits by 2030.

Research strategy delivers to sectoral clients

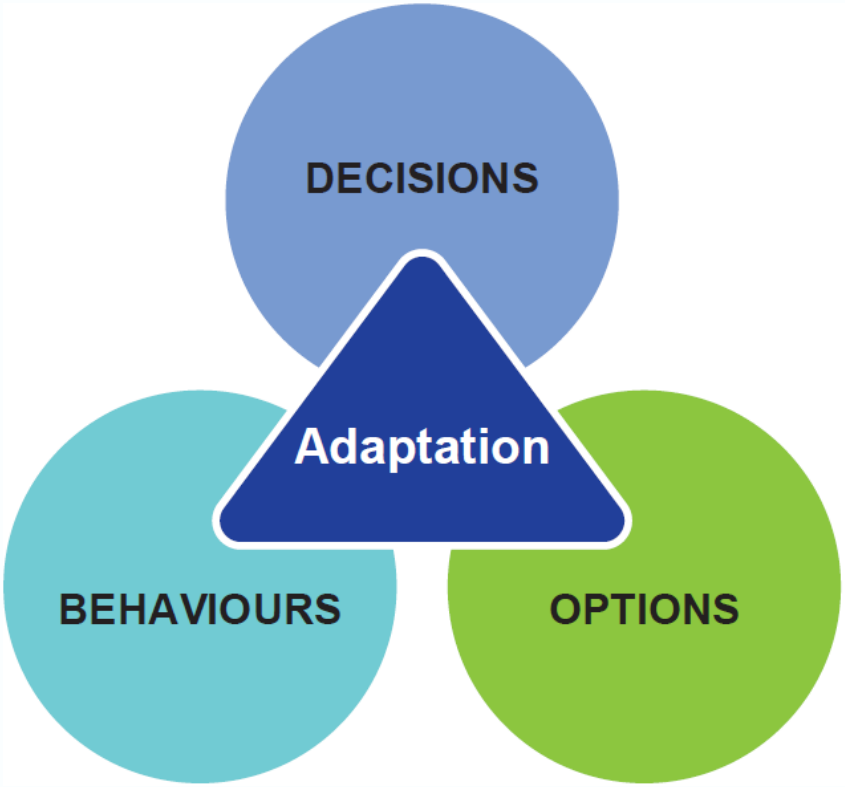


~150 full time equivalents across ~300 staff members
Operating since 2008, now ~$40m/y budget, ~35% external
(Water issues in *Water for Healthy Country Flagship*)

Adaptation science: 3 perspectives, all needed

Adaptation information
and decision-making

Evaluation, adaptation
pathways, future scenarios,
risk management modes, etc



Adaptive
behaviours
and institutions

Behaviours, incentives,
barriers, adaptive capacity,
vulnerabilities, etc

Adaptation
options and
technologies

Cultivars, materials,
farming systems, urban
planning, etc

AusAID CSIRO Research for Development Alliance – Overarching purpose

Conduct research on complex systems interactions

- to help avoid unintended consequences of development,
- minimise trade-off losses and maximise synergies in the domains of
- climate change adaptation,
- water resources,
- sustainable urban development and
- food security.

The Alliance: Some key principles

Addressing significant challenges [Relevance]

Research that is cross-sectoral, multi-scale, transboundary, complex and involves trade-off decisions.

CSIRO comparative advantage [Efficiency]

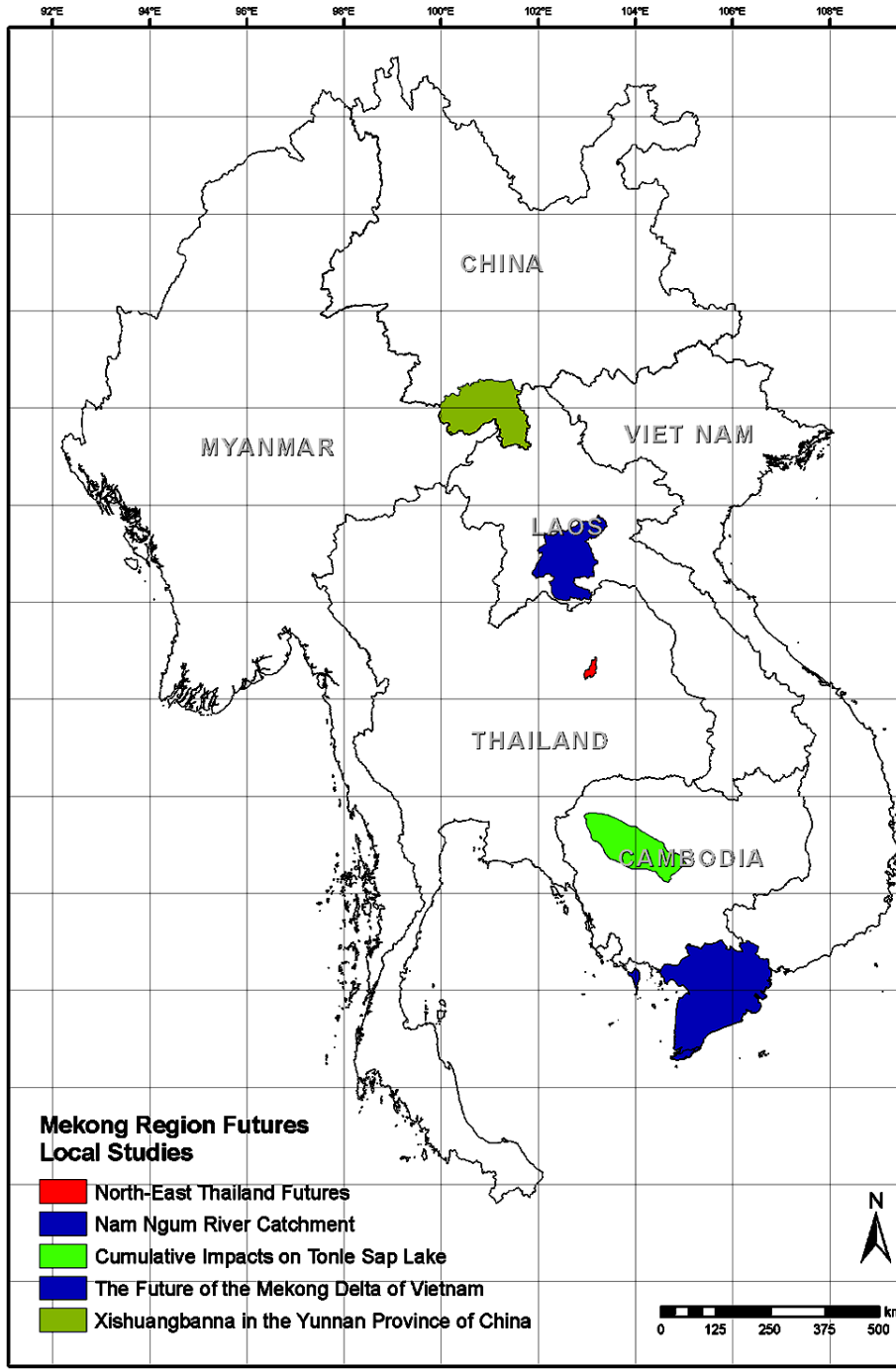
Research for which **CSIRO is best placed** to harness the right skills, has good visibility (increasingly underpinned by local presence), where the **partnership modality** will be most effective, that lends itself to a Team Australia approach and allows for **participatory design**.

Current portfolio of projects

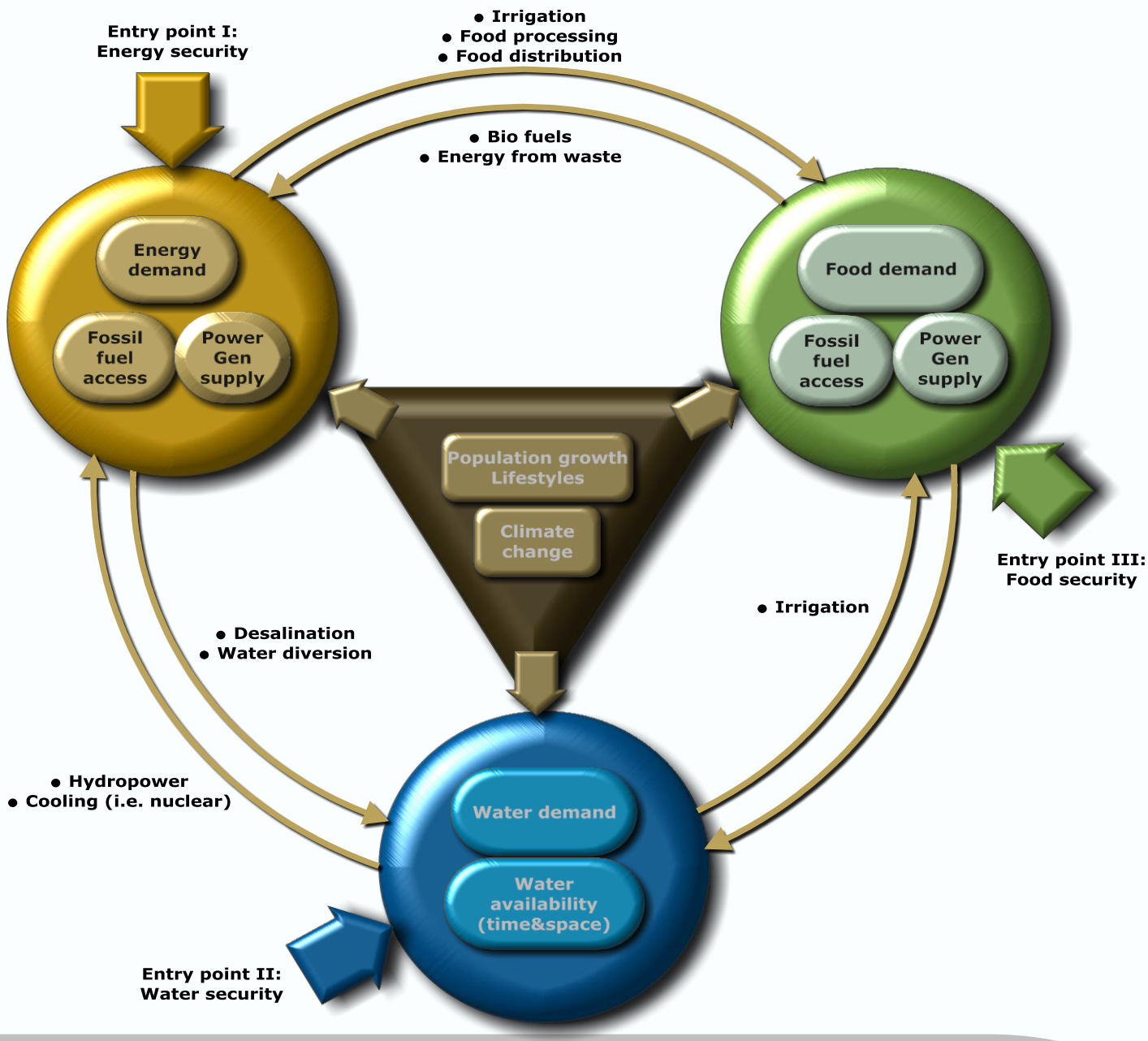
1. **Exploring Mekong Region Futures**
2. Climate Adaptation through Sustainable Urban Development
3. Climate projections: high resolution downscaling for Vietnam
4. Climate Adaptation Strategies for Rural Livelihoods in Indonesia
5. Bangladesh Integrated Water Resources Assessment
6. Food security through food system innovation

Exploring Mekong Region Futures

- **Yunnan (ICRAF)**
  Rubber-Reforestation-Biodiversity
- **Lao PDR (IWMI/WREA)**
  Water use in Nam Ngum catchment & Vientiane plain
- **Thailand (SEI/RBO)**
  Irrigation for north-eastern Provinces & climate change
- **Cambodia (Aalto/TSA/SNEC)**
  Impacts of mainstream dams on Tonle Sap
- **Vietnam (Can Tho Uni/Prov)**
  Mekong Delta adaptation to sea-level rise

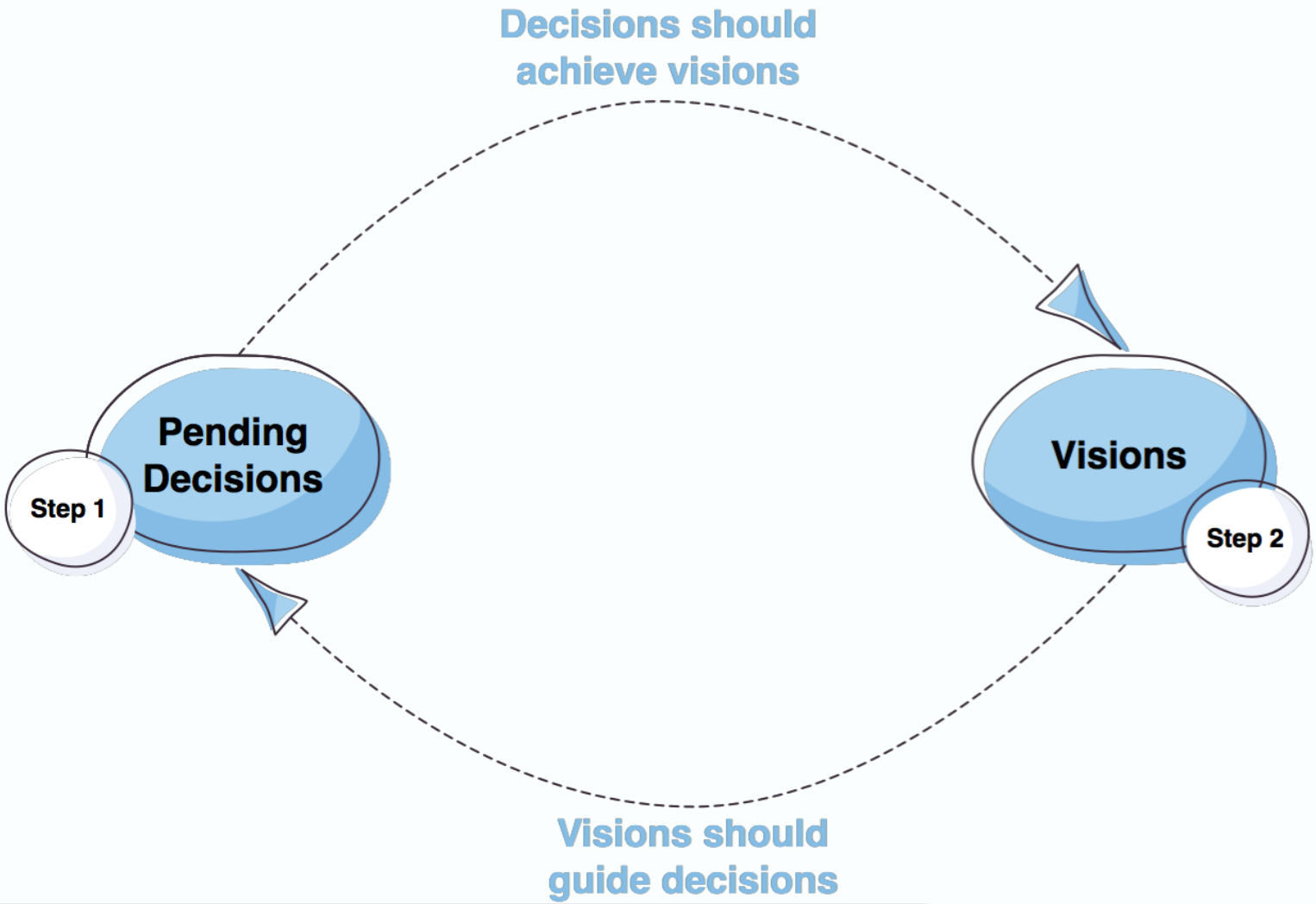


http://www.csiro.au/science/MekongFutures

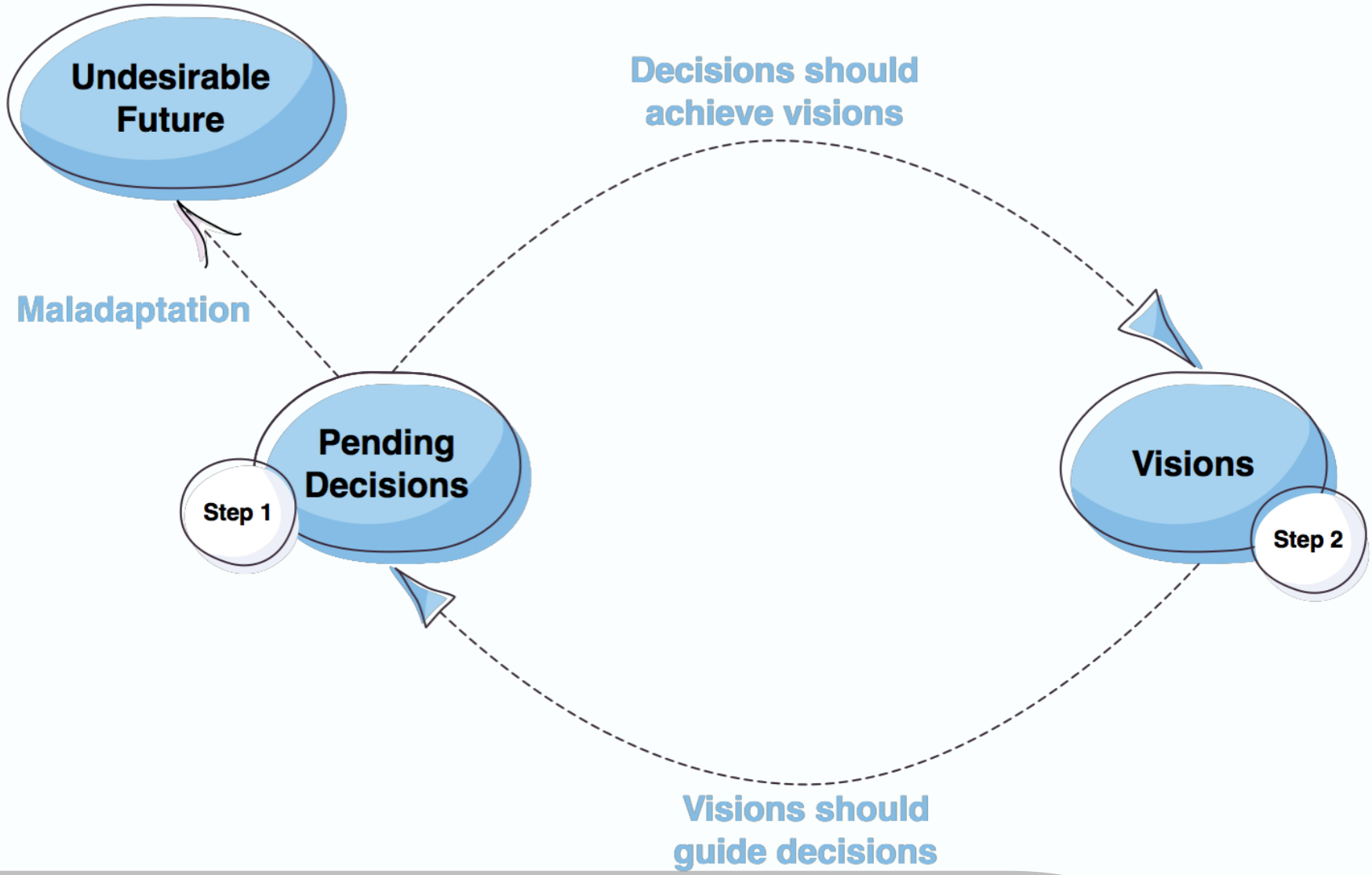


http://www.csiro.au/science/MekongFutures

Challenge and Reconstruct Learning (ChaRL)

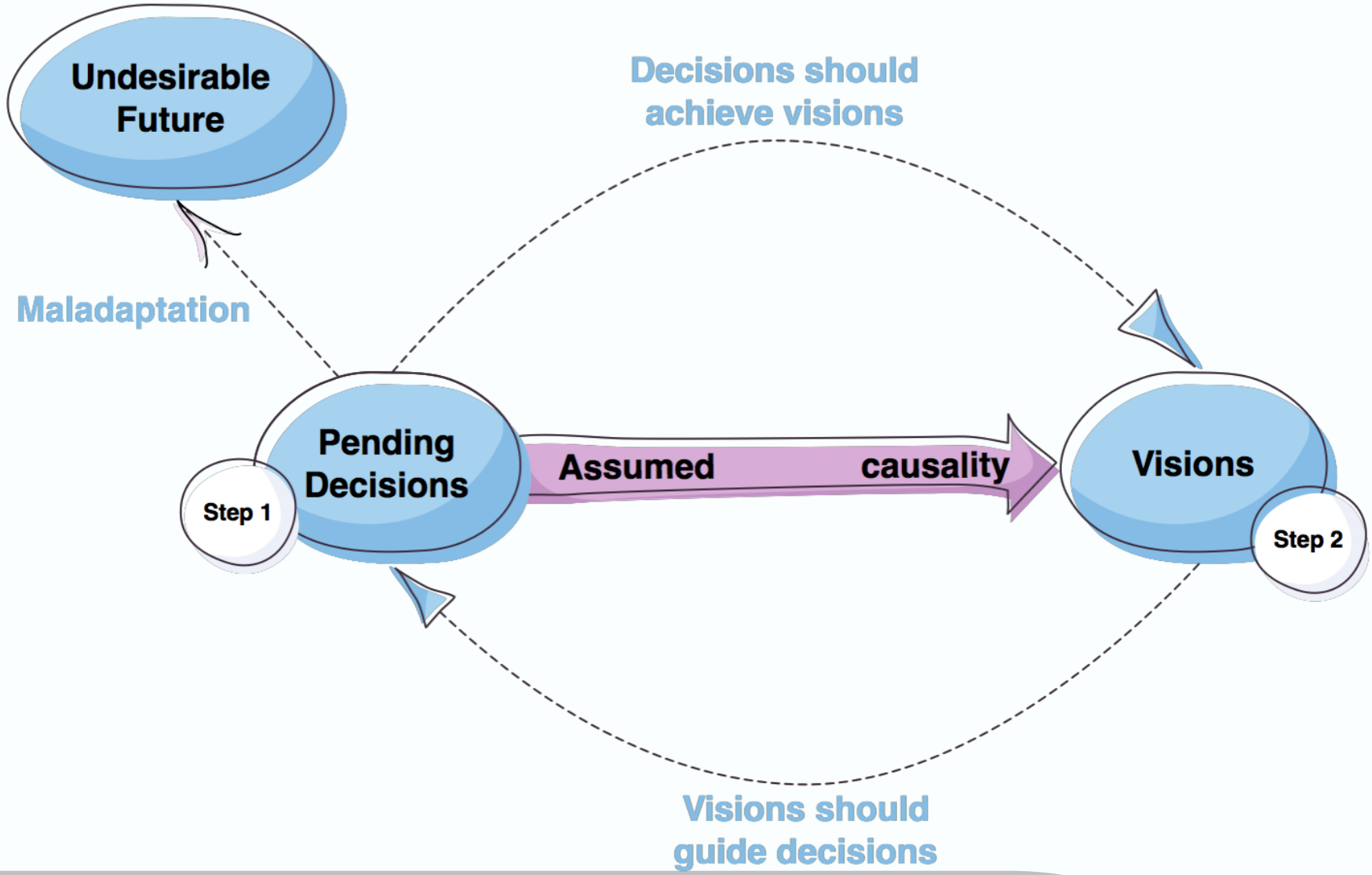


Challenge and Reconstruct Learning (ChaRL)



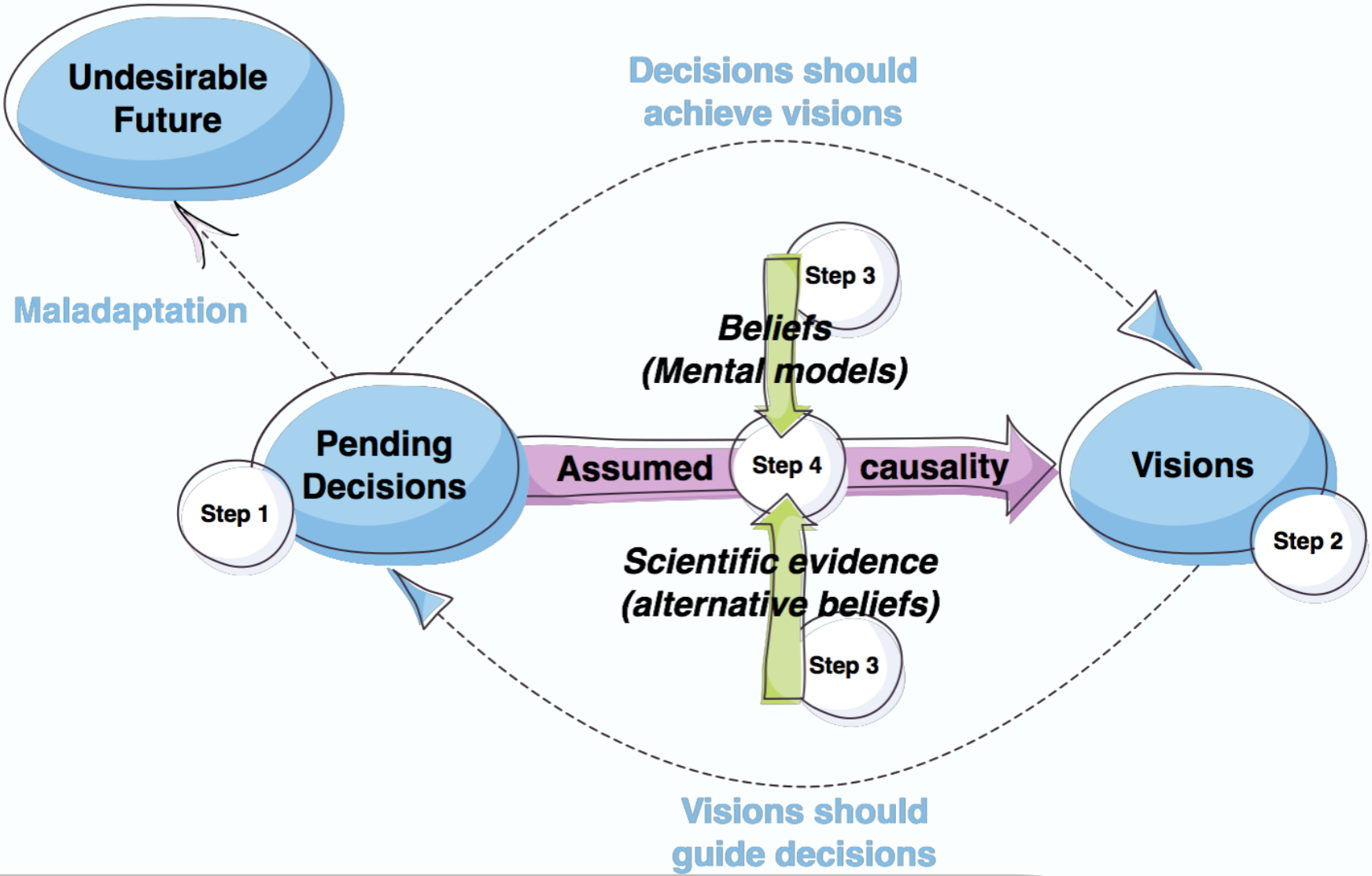
http://www.csiro.au/science/MekongFutures

Challenge and Reconstruct Learning (ChaRL)



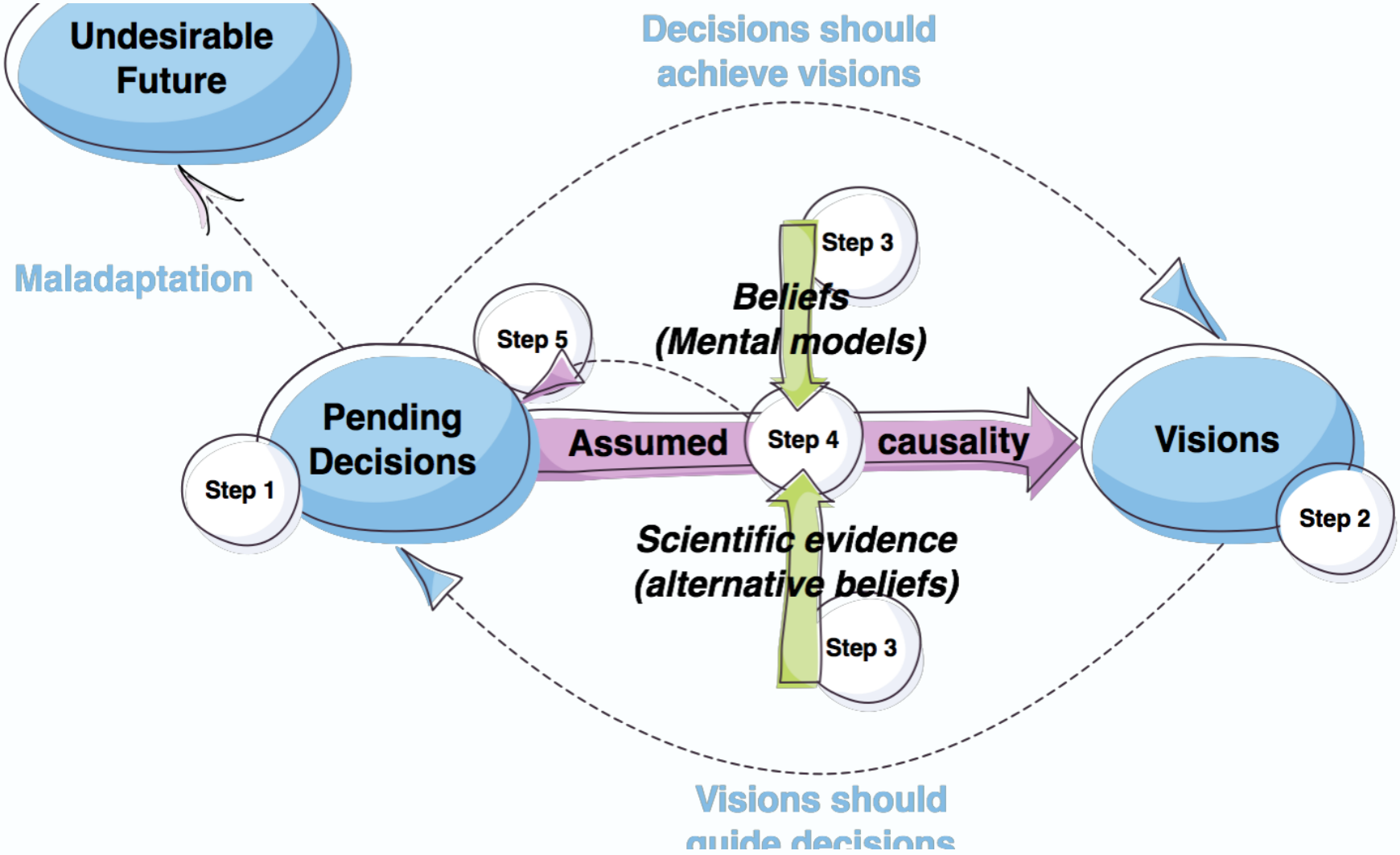
http://www.csiro.au/science/MekongFutures

Challenge and Reconstruct Learning (ChaRL)



http://www.csiro.au/science/MekongFutures

Challenge and Reconstruct Learning (ChaRL)



http://www.csiro.au/science/MekongFutures

Thailand – Belief 4:

IF
inter-basin water diversions existed

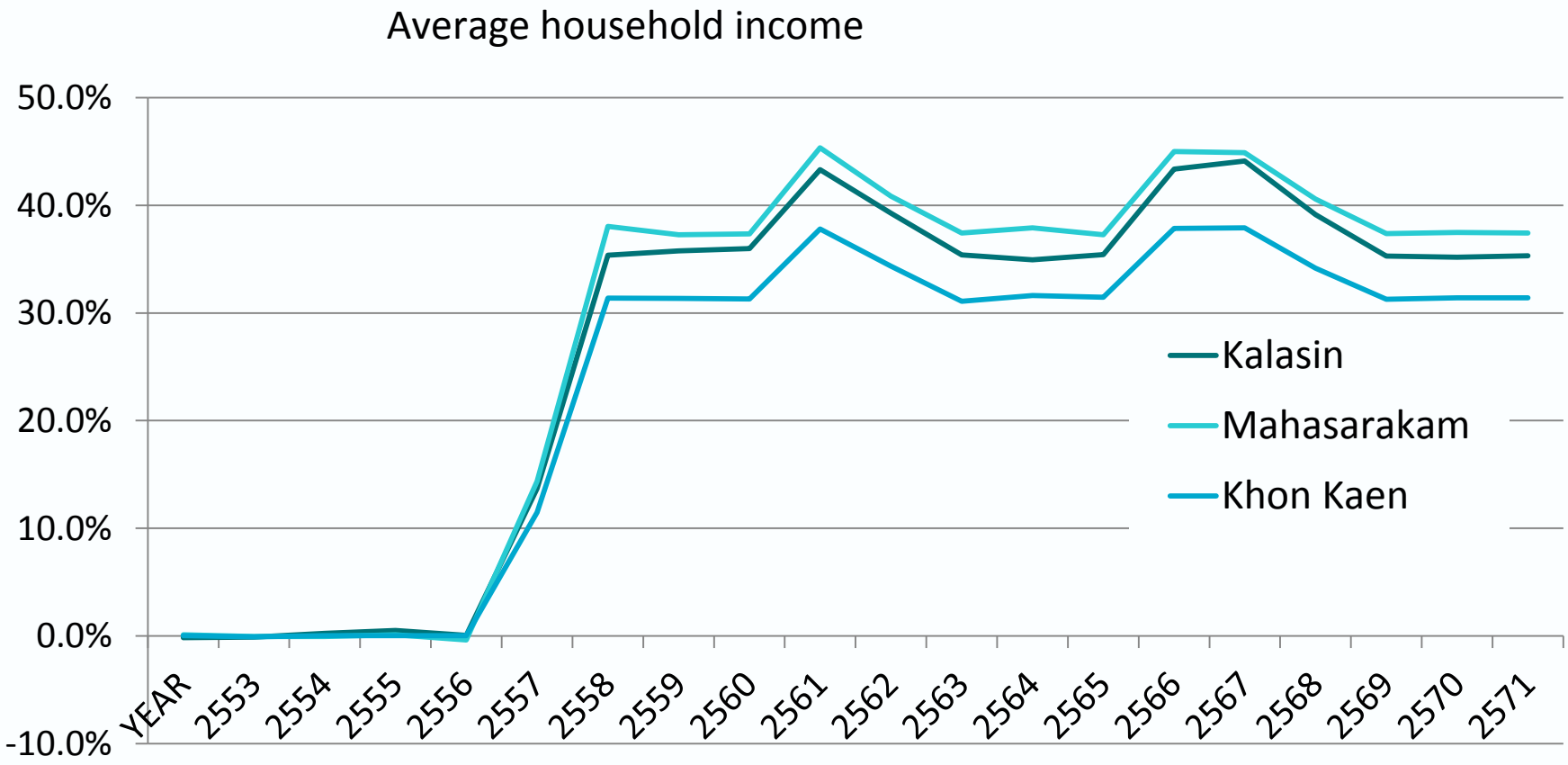
THEN
income would increase

Thailand – Belief 2:

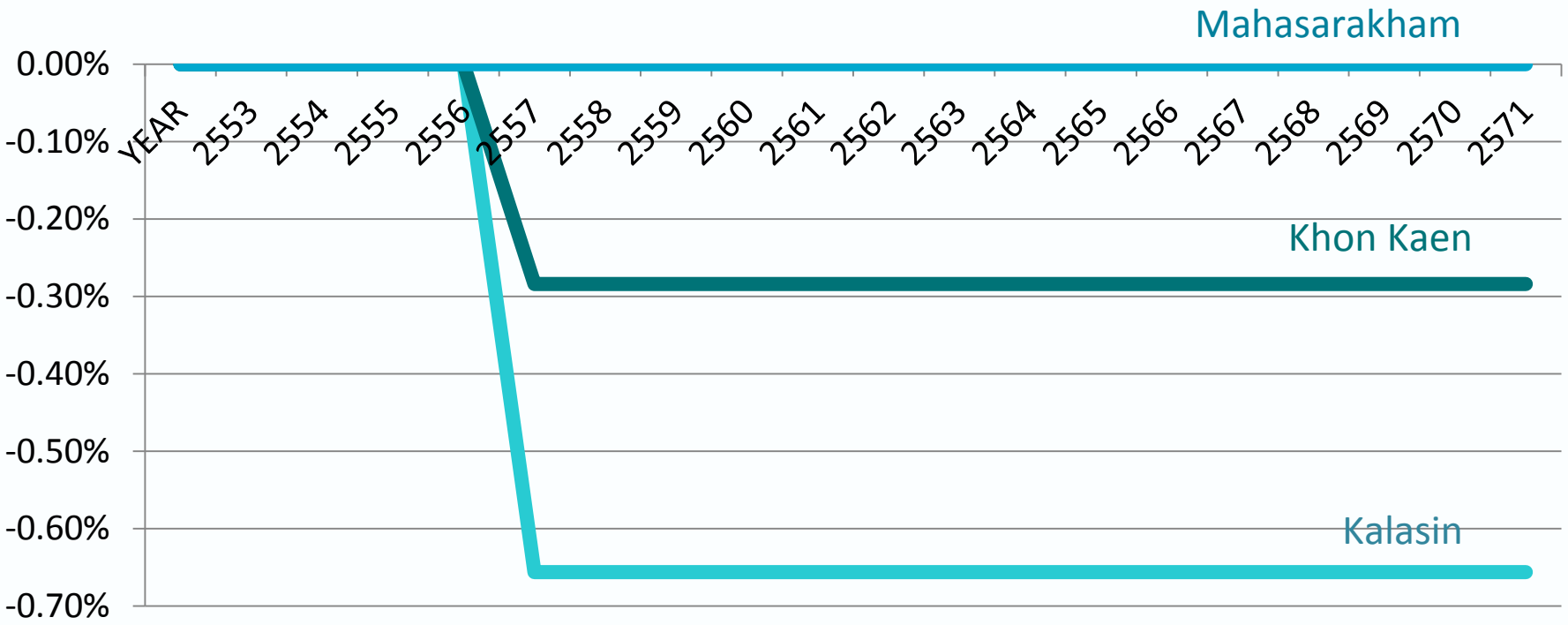
IF
we invest in large-scale irrigation

THEN
poverty will decrease

Substantial impact of irrigation on income



Marginal impact of irrigation on poverty



Vietnam – Belief 2:

IF
soft policies are implemented

THEN
livelihoods improve

Vietnam – Belief 3:

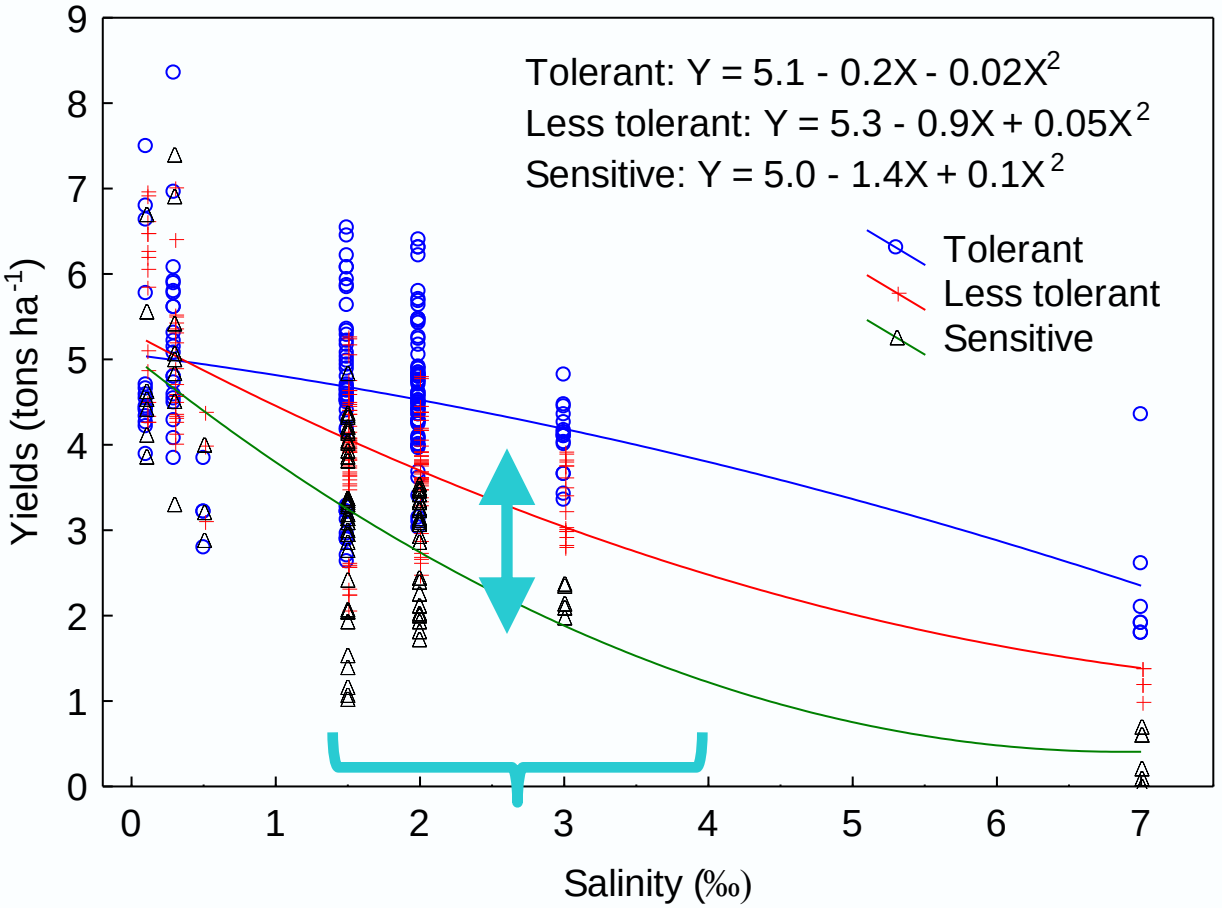
IF

hard policies are implemented

THEN

rice production increase and livelihoods will improve

Modern rice crops improve livelihoods



Rice production response and technological measures to adapt to salinity intrusion in the coastal Mekong delta

Dang Kieu Nhan[1], Vu Anh Phap[2], Tran Huu Phuc[2] & Nguyen Hieu Trung[3]

[1] Agricultural Systems Department, Mekong Delta Development Research Institute, Can Tho University (CTU)

[2] Crop Resources Management Department, Mekong Delta Development Research Institute, CTU

[3] College of Environment and Natural Resources Management, CTU

Shrimp can increase income by 50%

In million Vietnamese Dong

Farming systems	Total variable costs		Gross return		Gross margin	Benefit -cost ratio
	Rice	Shrimp	Rice	Shrimp		
Two rice crops (n = 46)	25.3 ± 1.1		46.8 ± 2.0		21.6 ± 1.9	0.9 ± 0.1
Rice – shrimp (n = 48)	6.0 ± 0.6	24.1 ± 7.9	16.3 ± 2.1	50.4 ± 9.5	36.8 ± 5.1	1.2 ± 0.3

Cailon/Caibe + Hamluong/Cochien

SLR 30 cm

Upstream hydropower

Irrigation extension

Fresh	< 2 g/l	< 2-4 g/l	< 4-10 g/l	< 10-20 g/l	>20 g/l
329	26	-82	-79	-8	-186

in 1,000 ha

THE MEKONG FUTURE PROJECT FIRST DRAFT REPORT ON THE HYDROLOGICAL SIMULATION

To Quang Toan[1], Nguyen Hieu Trung[2], Dang Kieu Nhan[3]

[1]Southern Institute of Water Resources Research

[2]Research Institute for Climate Change, Can Tho University

[3]Mekong Delta Research Institute, Can Tho University.

Impact of droughts

SLR 30 cm

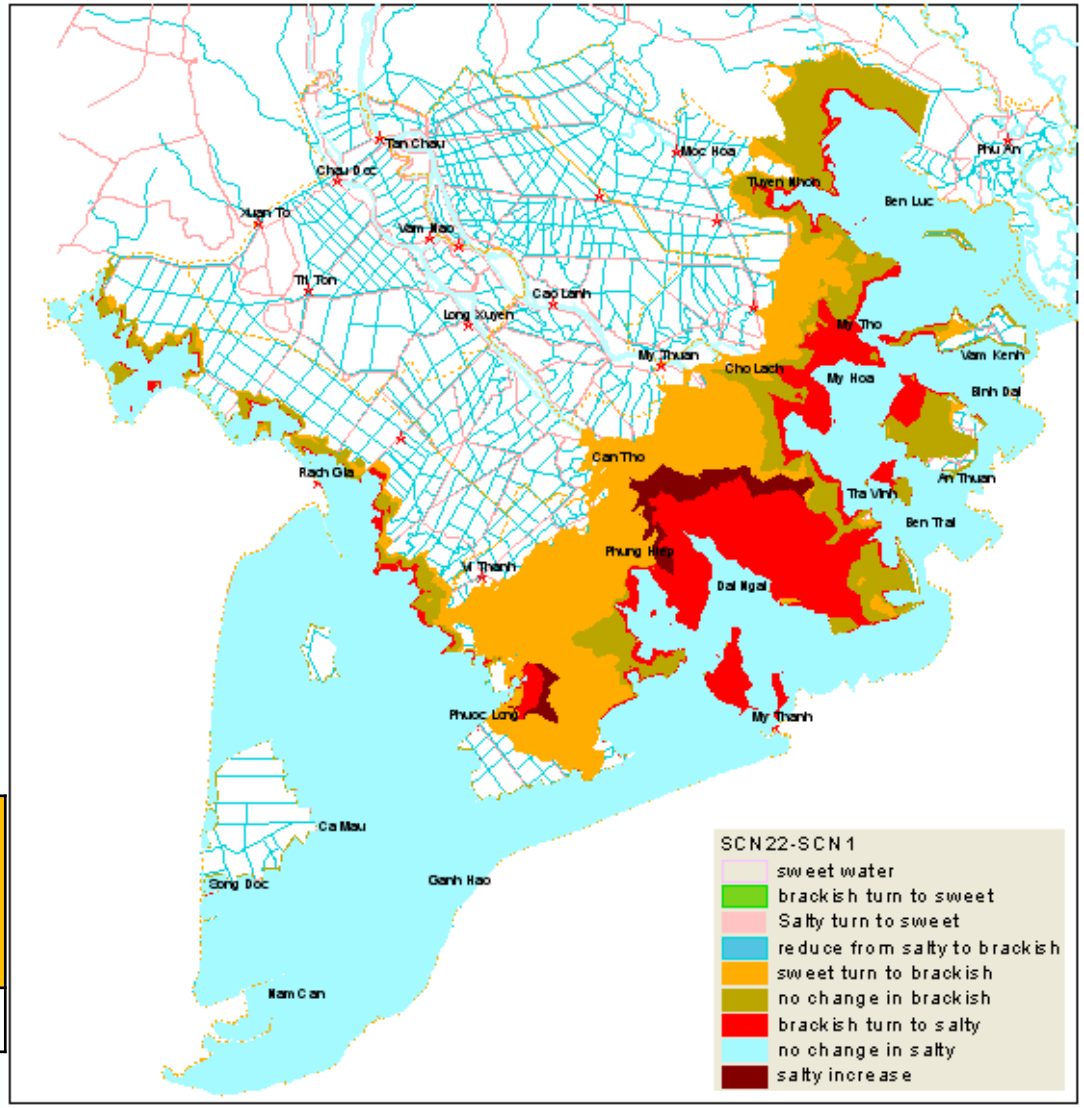
Upstream hydropower

Irrigation extension

Climate change (droughts)

Fresh	< 2 g/l	< 2-4 g/l	< 4-10 g/l	< 10-20 g/l	>20 g/l
-306	-148	180	163	87	23

in 1,000 ha



THE MEKONG FUTURE PROJECT FIRST DRAFT REPORT ON THE HYDROLOGICAL SIMULATION

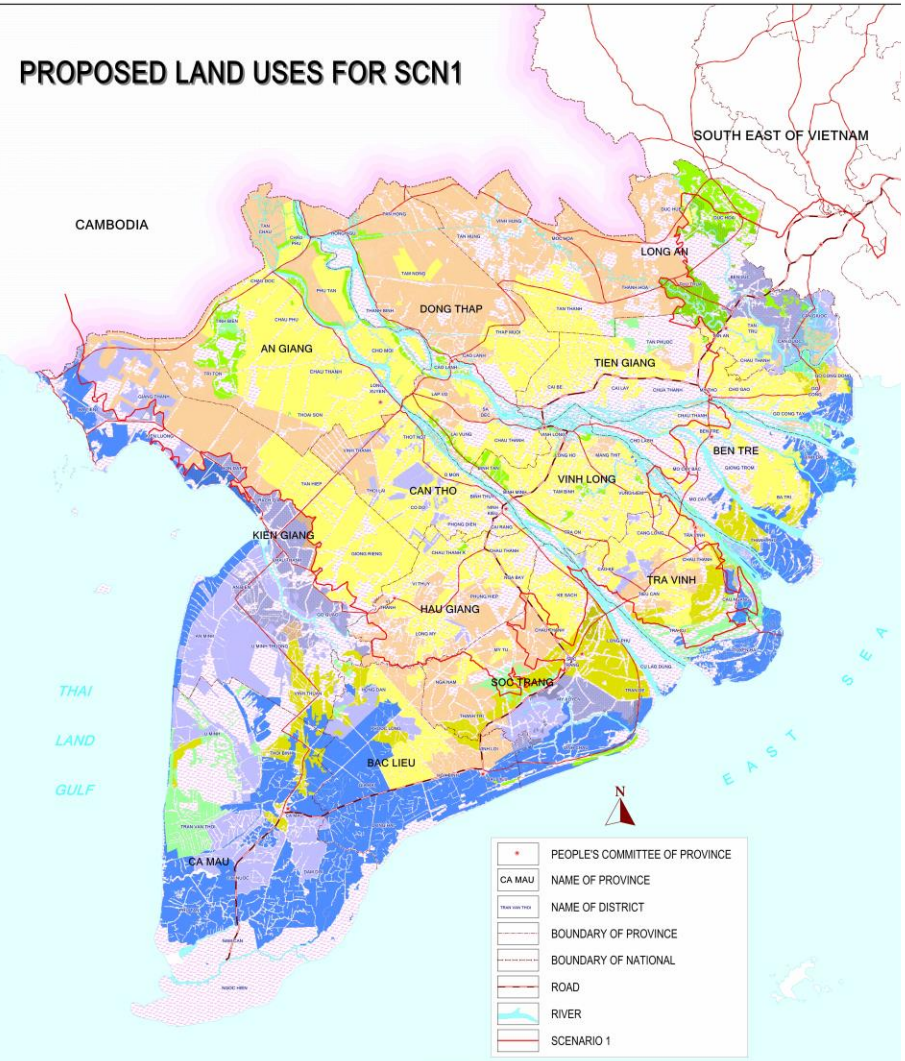
To Quang Toan[1], Nguyen Hieu Trung[2], Dang Kieu Nhan[3]

[1]Southern Institute of Water Resources Research

[2]Research Institute for Climate Change, Can Tho University

[3]Mekong Delta Research Institute, Can Tho University.

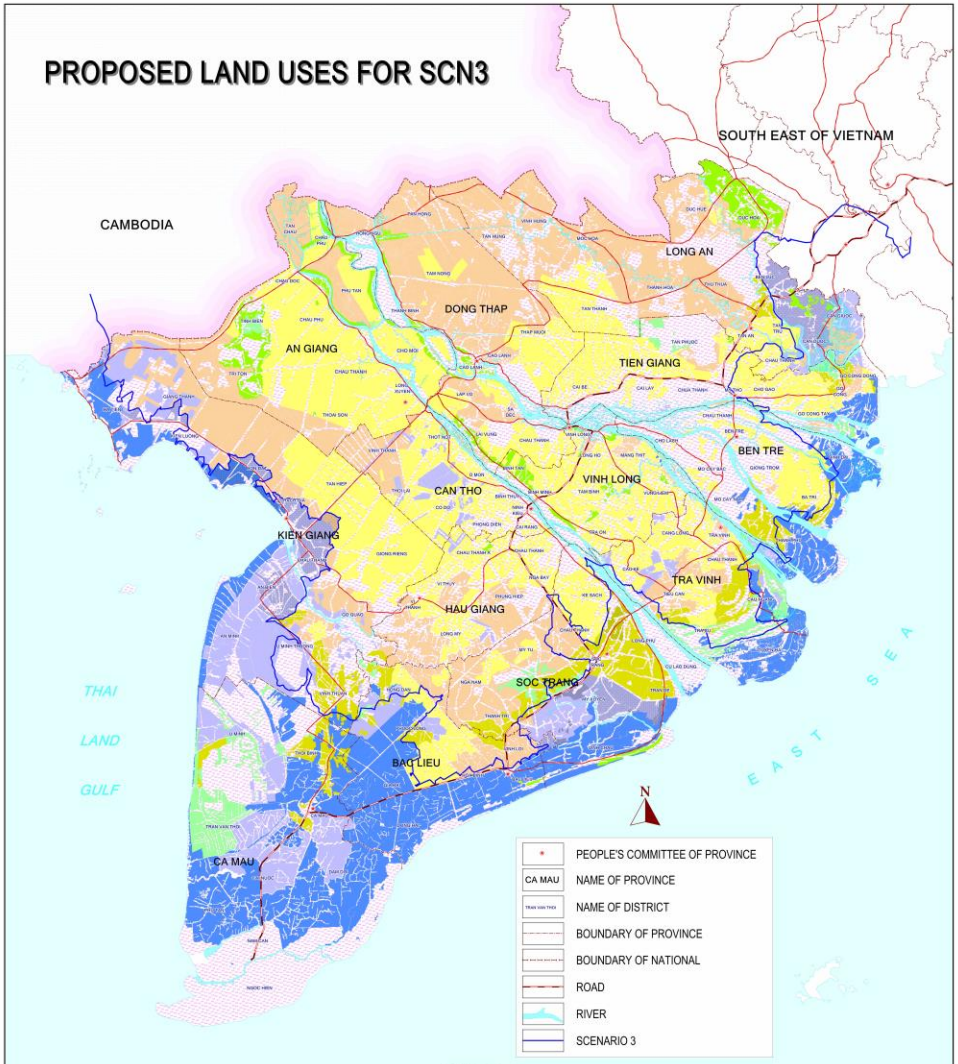
PROPOSED LAND USES FOR SCN1



LEGERD

CURRENT	CONVERSION
3 IRRIGATE RICE CROPS	
2 IRRIGATED RICE CROPS (WS - SA)	FROM 3 IRRIGATE RICE CROPS TO 2 IRRIGATED RICE CROPS (WS - SA)
2 RAINFED RICE CROPS (SA-RS)	FROM 3 IRRIGATE RICE CROPS TO 2 IRRIGATED RICE CROPS (SA-RS)
1 RAINFED RICE CROPS (RS/WS)	FROM 1 RAINFED RICE CROPS (RS/WS) TO 1 RAINY SEASON RICE - SHRIMP CULTURE
2/1 IRRIGATED RICE + 1UPLAND CROP	FROM 2 RAINFED RICE CROPS TO 2/1 IRRIGATED RICE + 1UPLAND CROP
1 RAINY SEASON RICE - SHRIMP CULTURE	FROM 2 RAINFED RICE CROPS TO 1 RAINY SEASON RICE - SHRIMP CULTURE
SHRIMP FIELD	FROM 2 RAINFED RICE CROPS TO SHRIMP FIELD
OTHER LAND USE	

PROPOSED LAND USES FOR SCN3



LEGERD

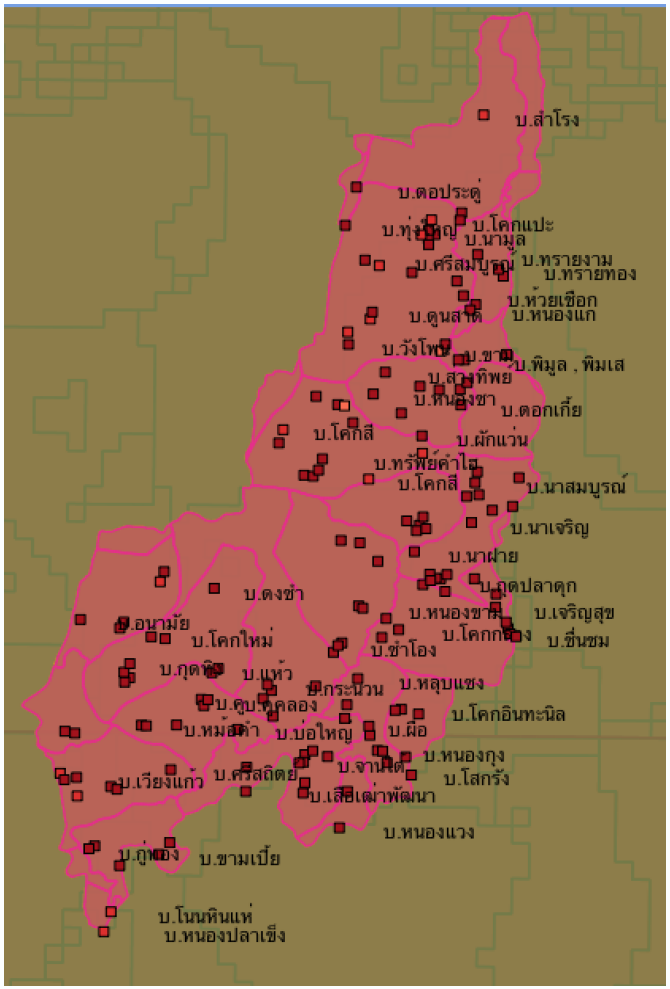
CURRENT	CONVERSION
3 IRRIGATE RICE CROPS	
2 IRRIGATED RICE CROPS (WS - SA)	FROM 3 IRRIGATE RICE CROPS TO 2 IRRIGATED RICE CROPS (WS - SA)
2 RAINFED RICE CROPS (SA-RS)	FROM 3 IRRIGATE RICE CROPS TO 2 IRRIGATED RICE CROPS (SA-RS)
1 RAINFED RICE CROPS (RS/WS)	FROM 1 RAINFED RICE CROPS (RS/WS) TO 1 RAINY SEASON RICE - SHRIMP CULTURE
2/1 IRRIGATED RICE + 1UPLAND CROP	FROM 2 RAINFED RICE CROPS TO 2/1 IRRIGATED RICE + 1UPLAND CROP
1 RAINY SEASON RICE - SHRIMP CULTURE	FROM 2 RAINFED RICE CROPS TO 1 RAINY SEASON RICE - SHRIMP CULTURE
SHRIMP FIELD	FROM 2 RAINFED RICE CROPS TO SHRIMP FIELD
OTHER LAND USE	

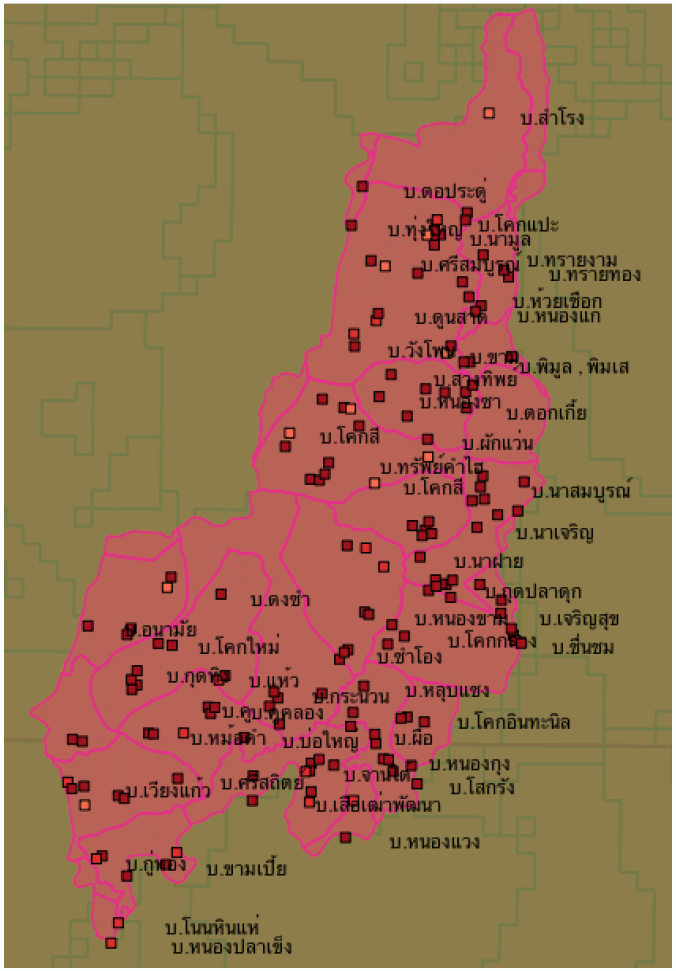
Thank you

CSIRO Ecosystem Sciences
Alex Smajgl
Senior Research Scientist

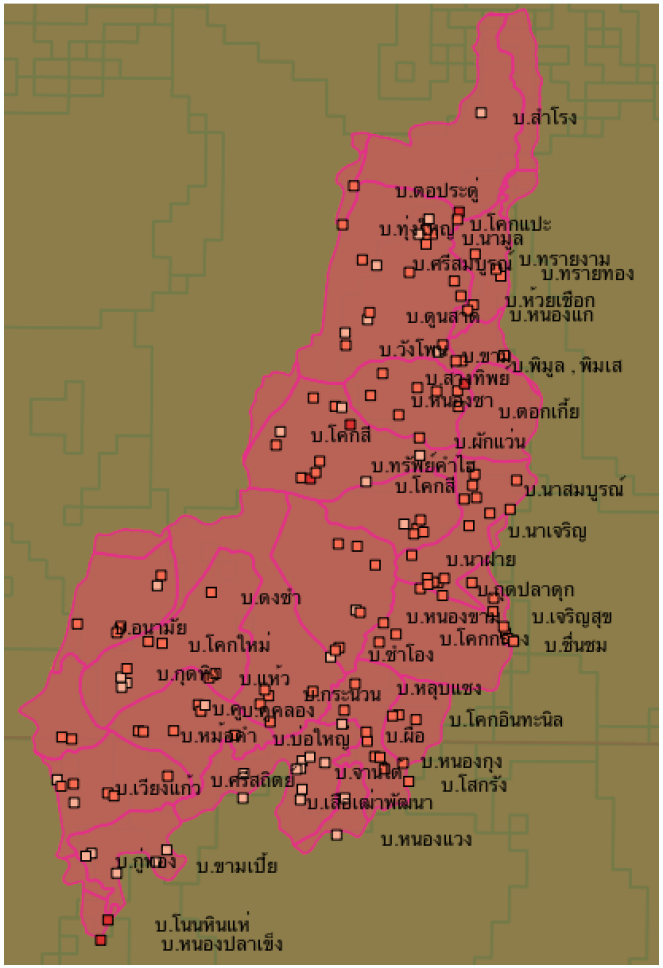
t +61 419 793439
e alex.smajgl@csiro.au
w www.csiro.au/ MekongFutures.html

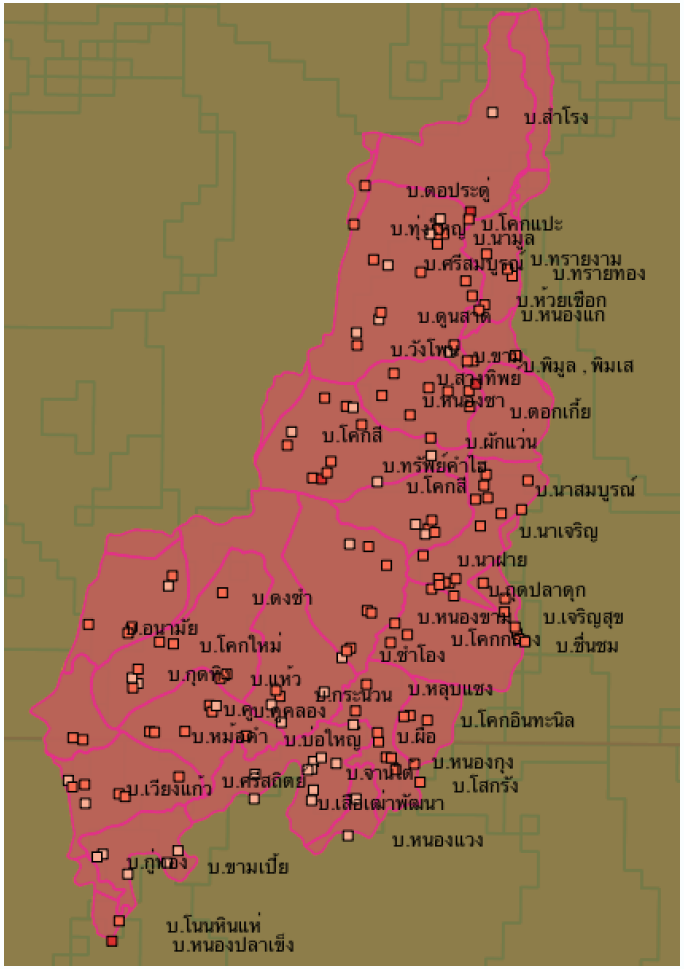
27 January 2010 Base – Scen



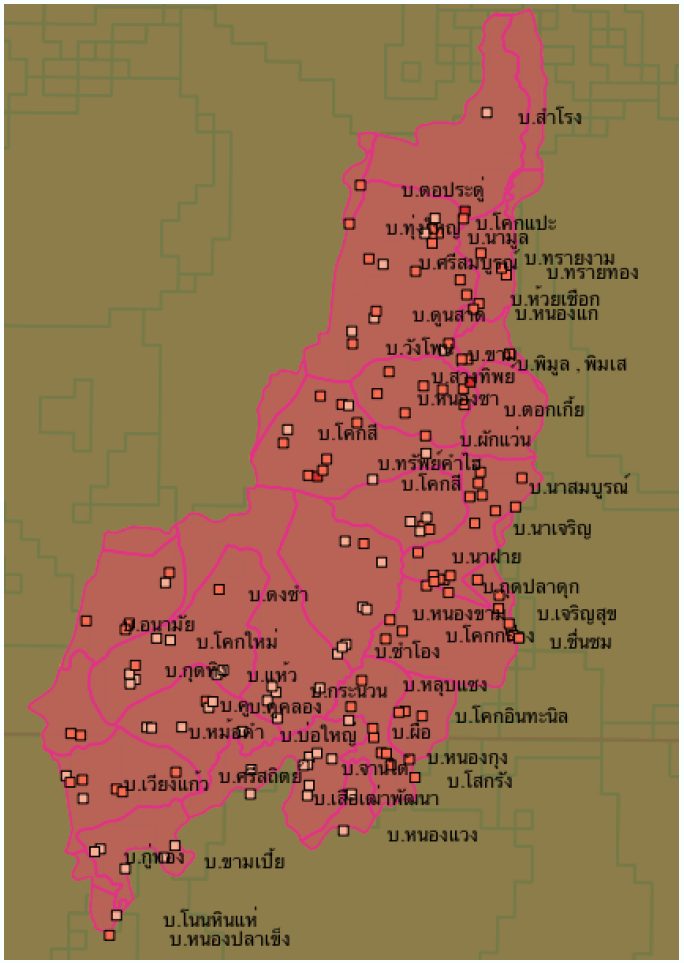


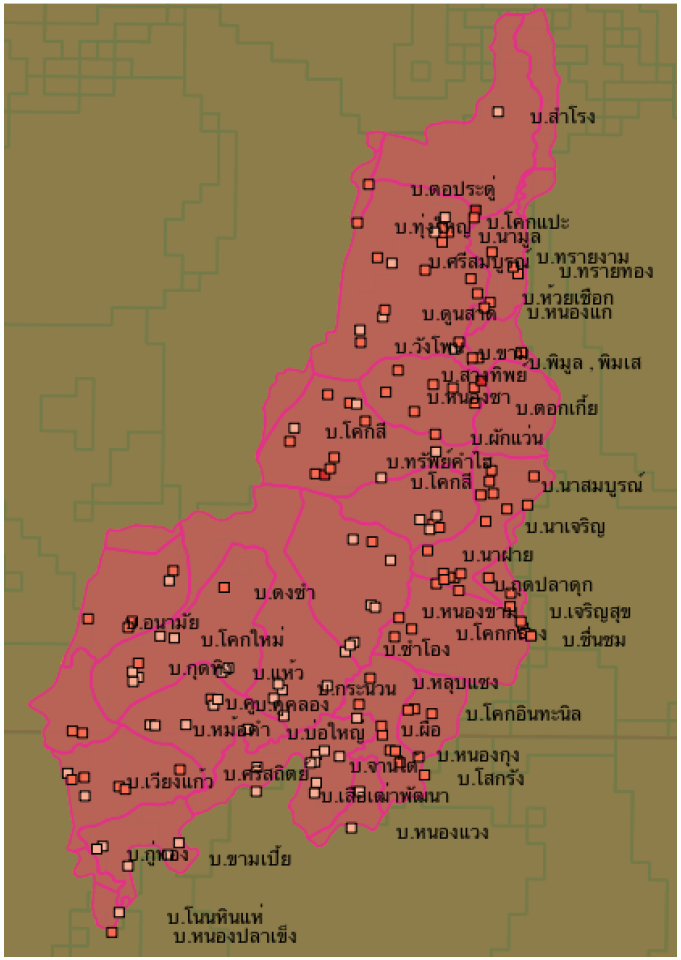
07 November 2010 Base – Scen





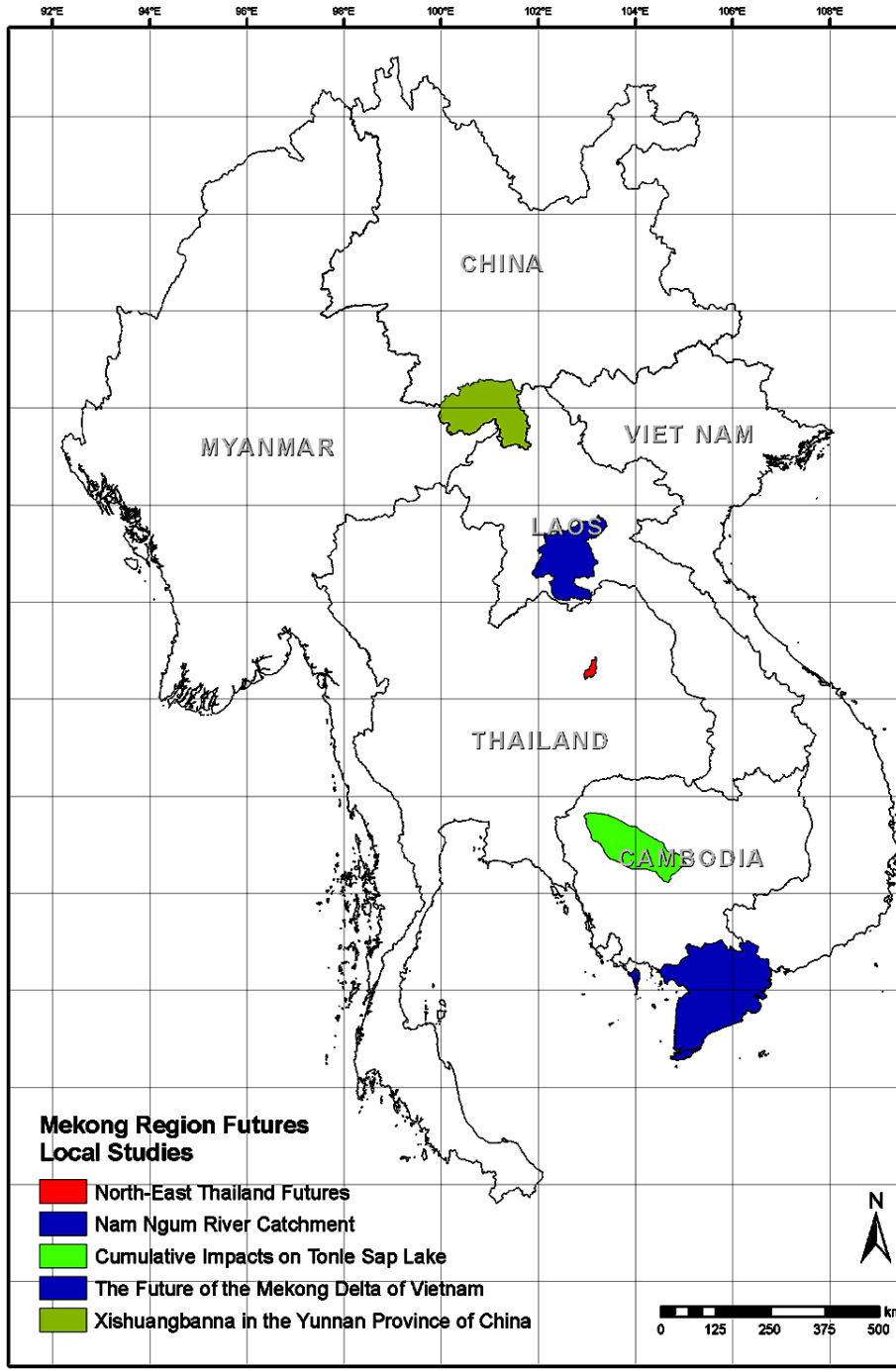
27 December 2010 Base – Scen





Pending Decisions – Nexus – transboundary impacts

- **Yunnan (ICRAF)**
  Rubber-Reforestation-Biodiversity
- **Lao PDR (IWMI/WREA)**
  Water use in Nam Ngum catchment & Vientiane plain
- **Thailand (SEI/RBO)**
  Irrigation for north-eastern Provinces & climate change
- **Cambodia (Aalto/TSA/SNEC)**
  Impacts of mainstream dams on Tonle Sap
- **Vietnam (Can Tho Uni/Prov)**
  Mekong Delta adaptation to sea-level rise



http://www.csiro.au/science/MekongFutures

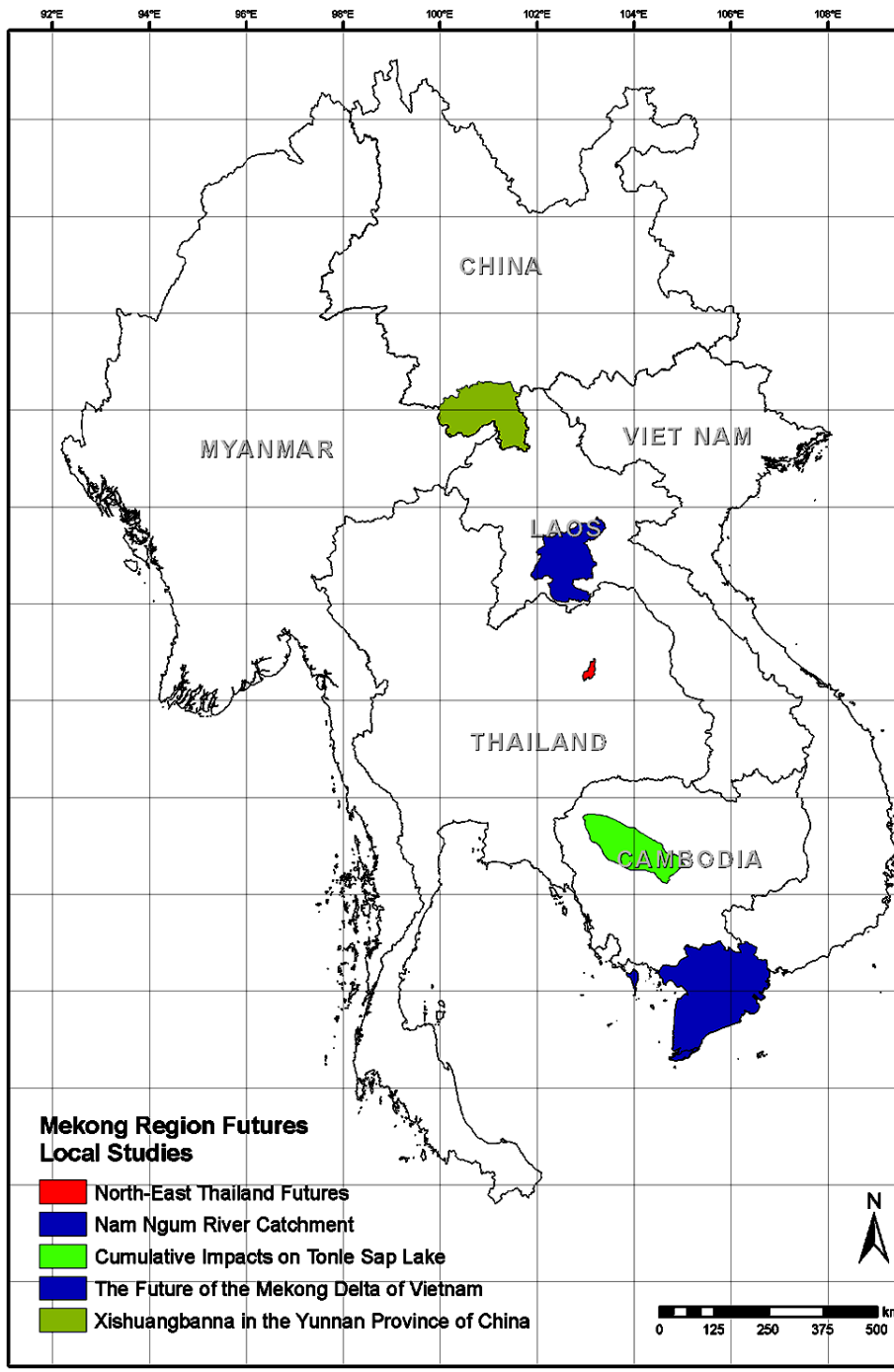
Pending Decisions – Nexus – transboundary impacts

Demanded:

Impact assessment considering

(a) cross sectoral trade-offs in

(b) trans-boundary context



http://www.csiro.au/science/MekongFutures

Pending Decisions – Nexus – transboundary impacts

Demanded:

Impact assessment considering

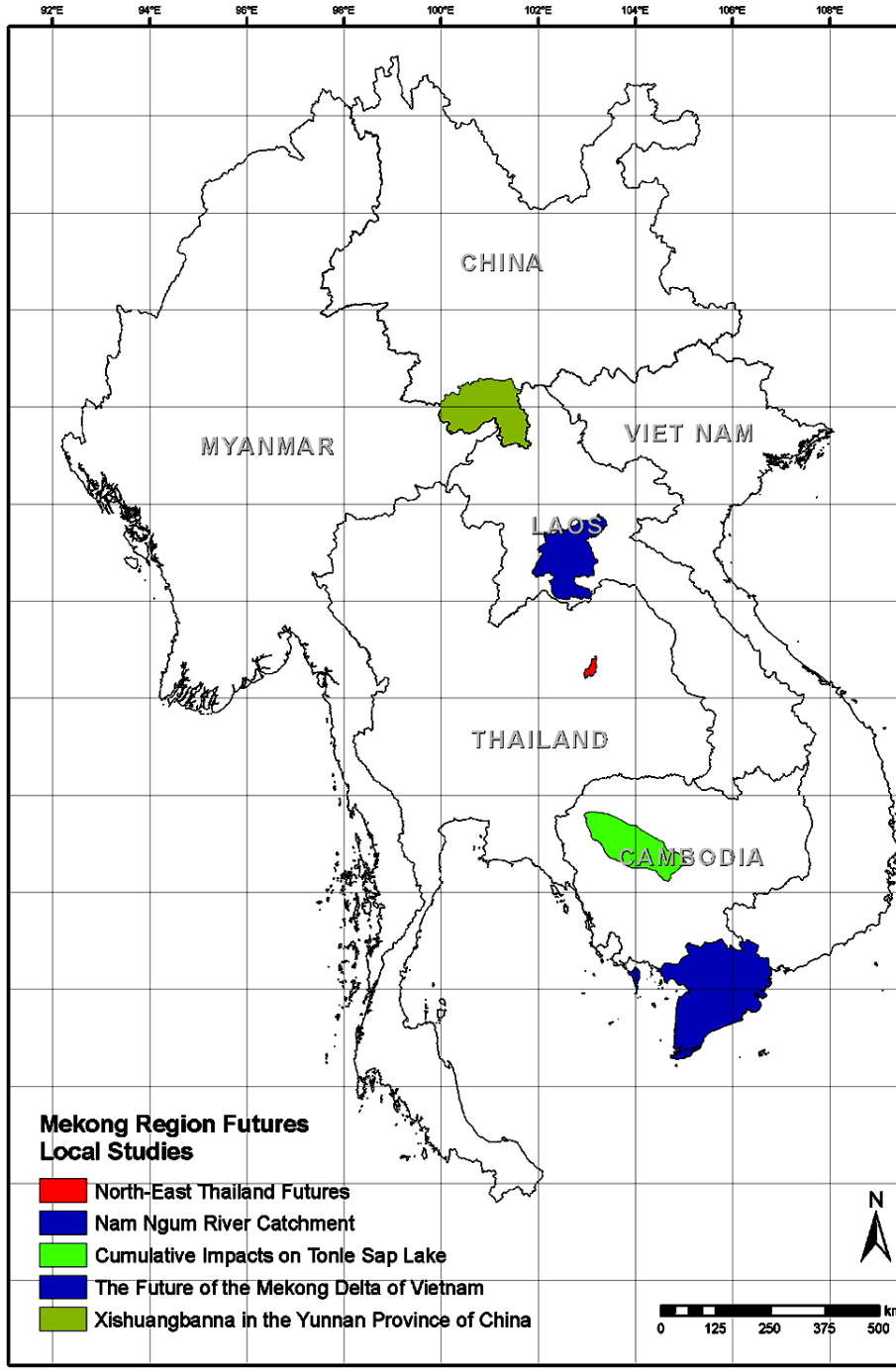
(a) cross sectoral trade-offs in

(b) trans-boundary context

BUT equally important is a process that

(a) bridges between science and decision making

(b) facilitates learning on side of decision making



http://www.csiro.au/science/MekongFutures

Lao – Belief 1:

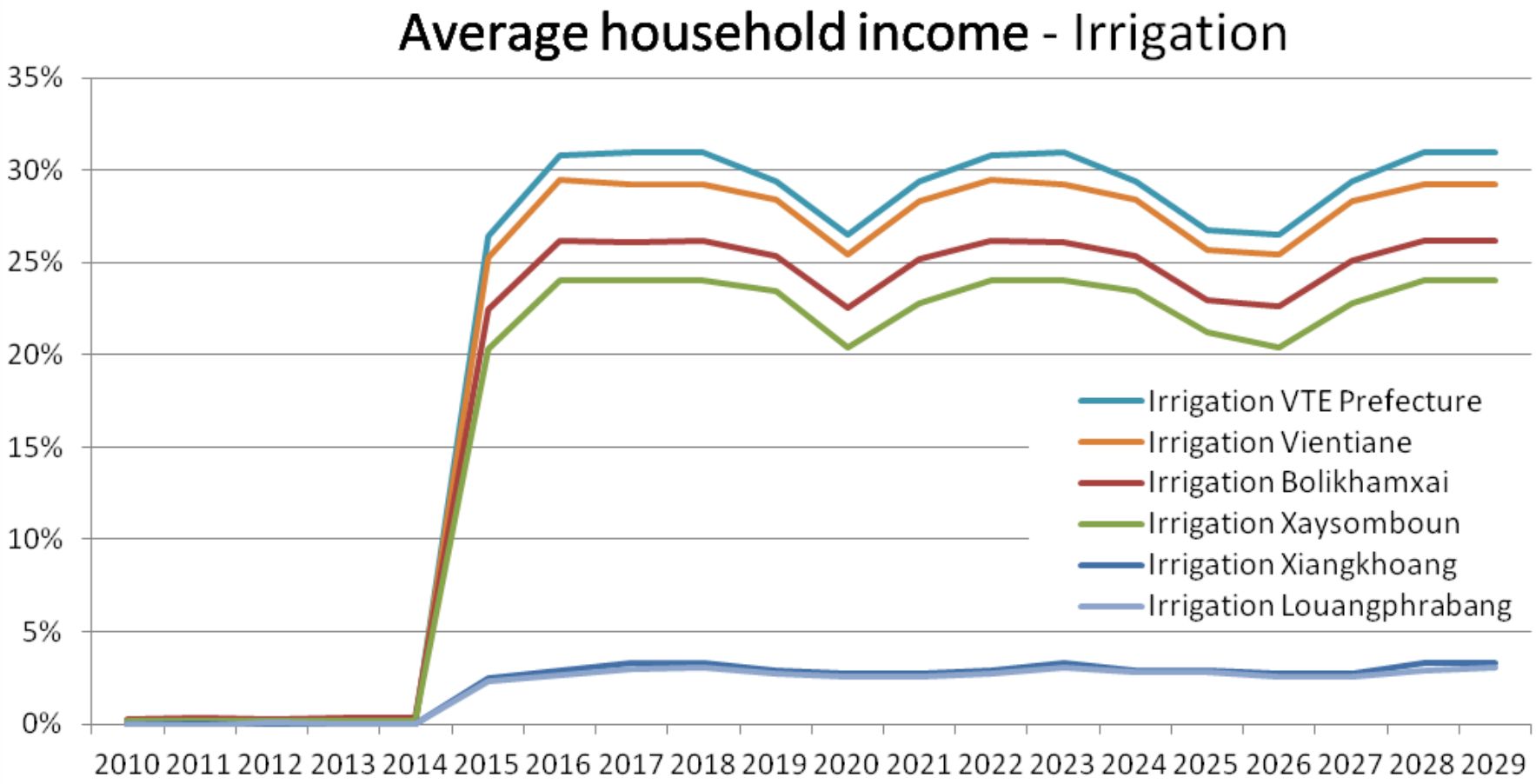
IF

Large scale irrigation schemes

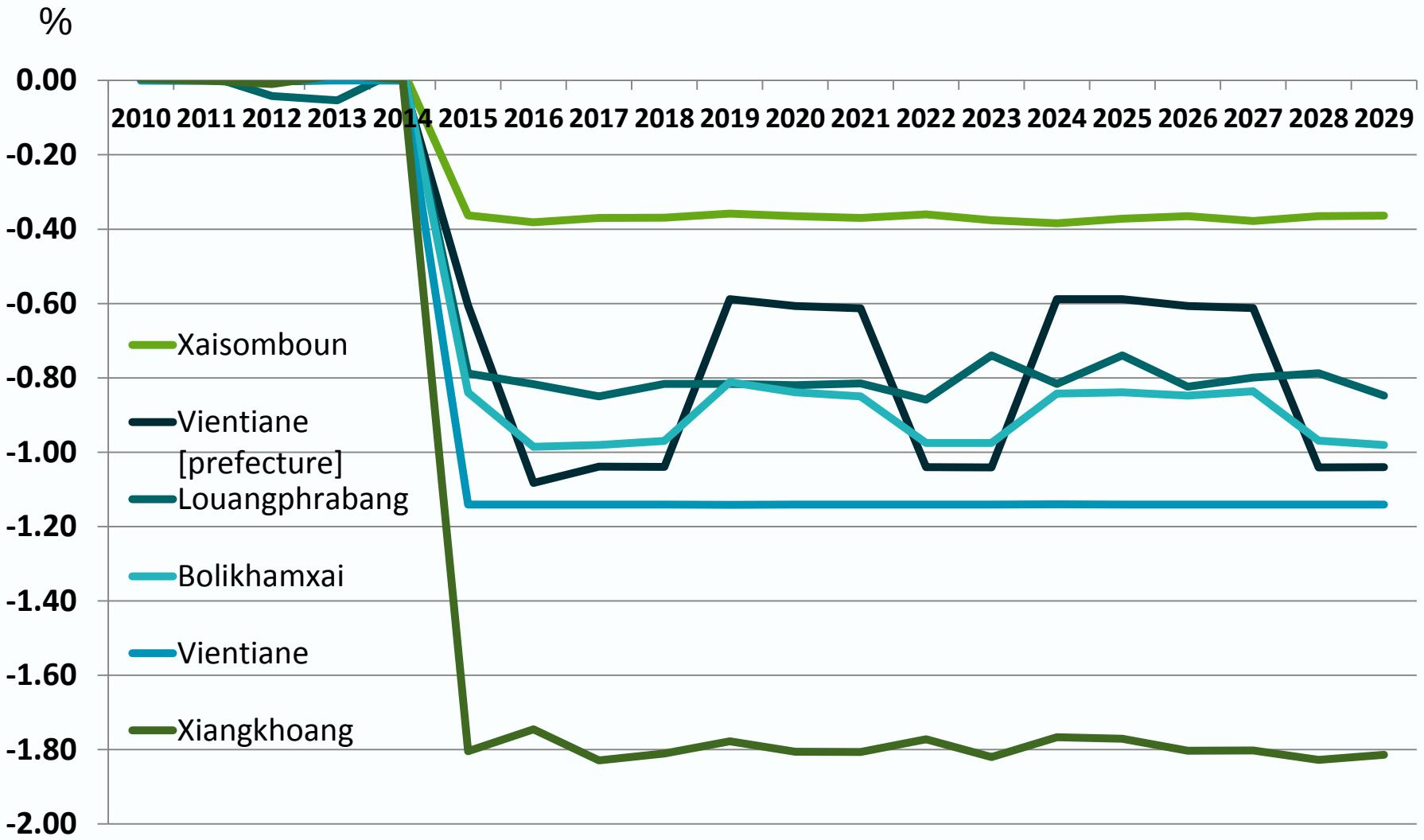
THEN

Poverty decreases

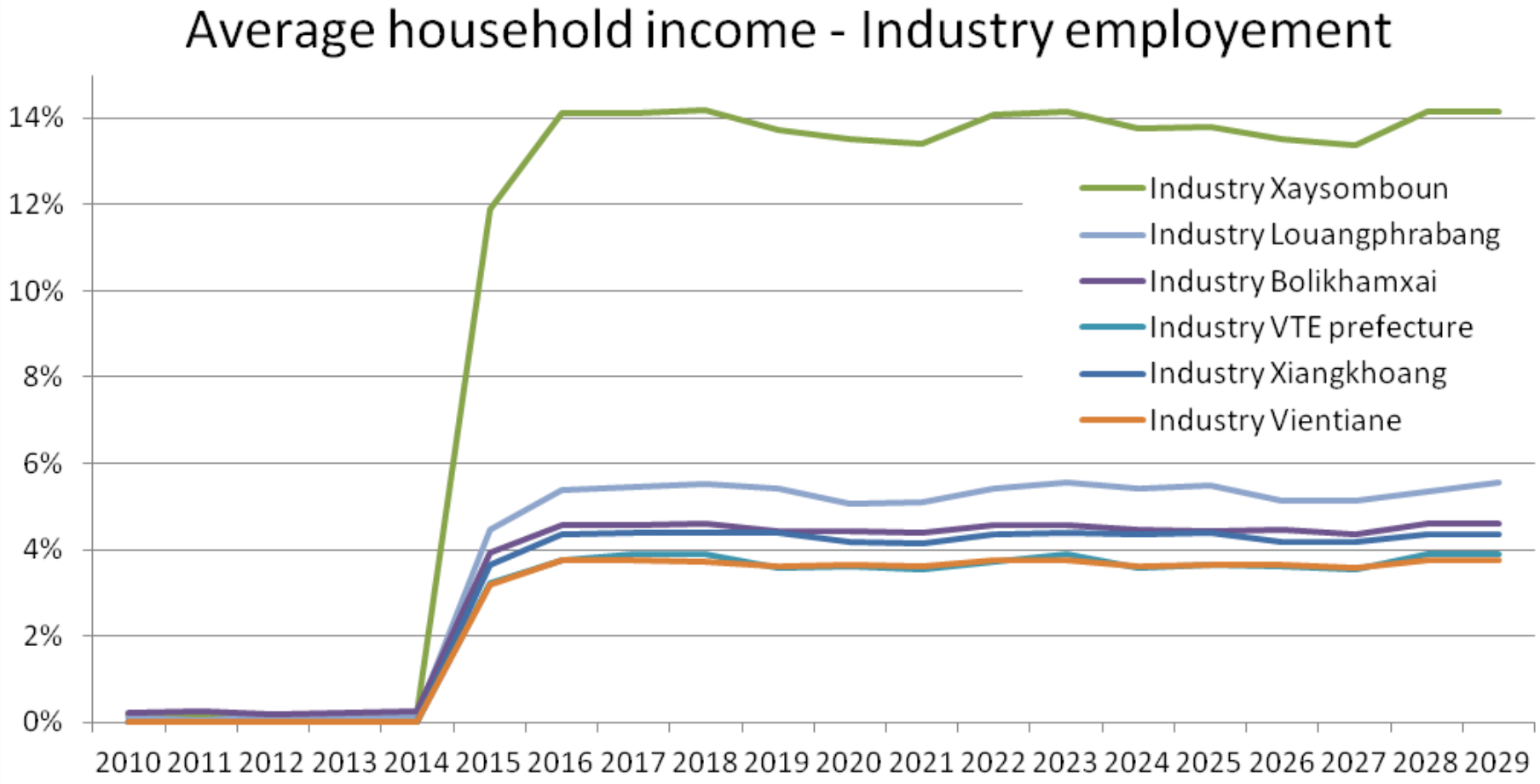
High income effects of irrigation (20-30%) except Louangphrabang and Xiangkhoang



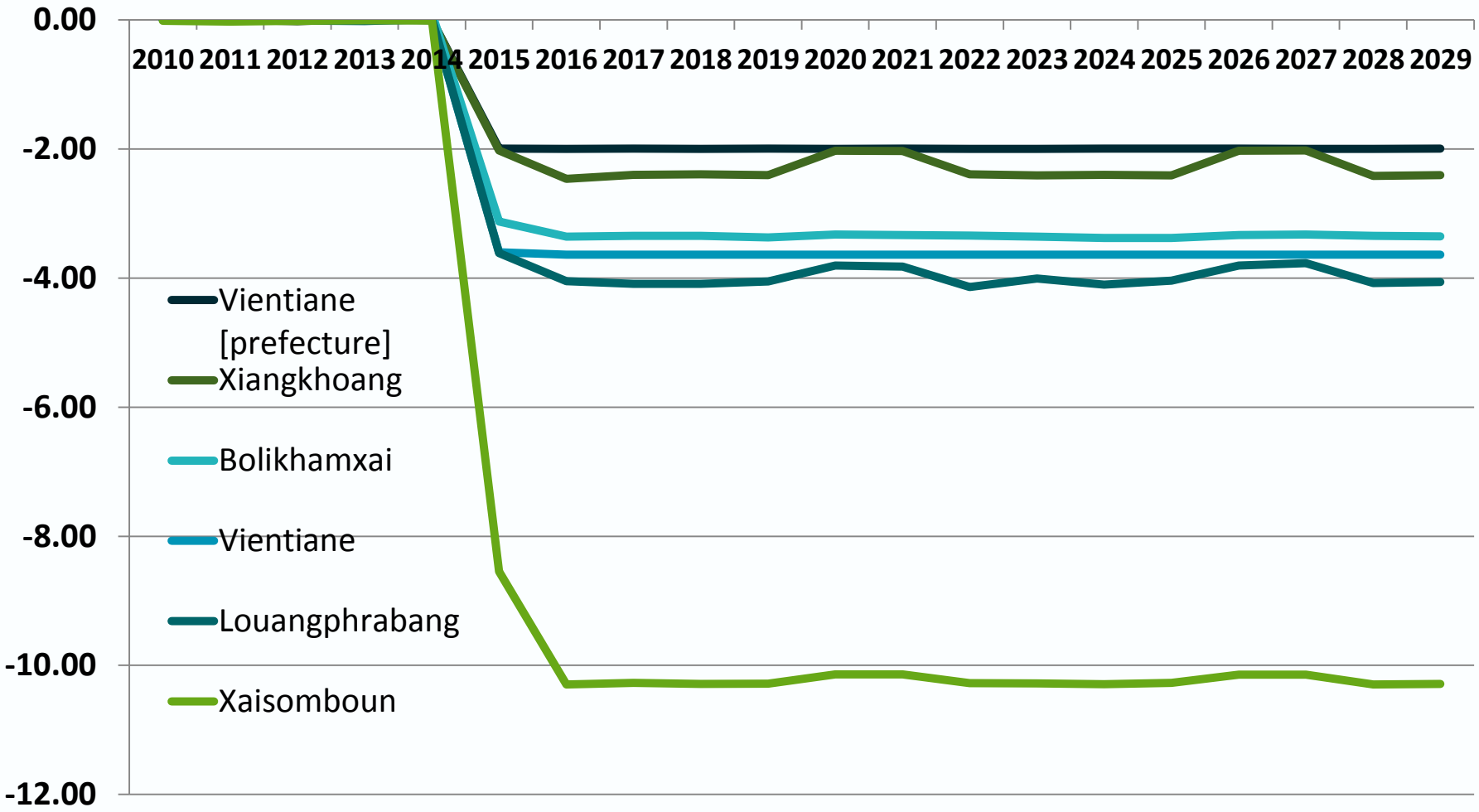
Irrigation has only marginal effects on poverty



Low income effects of industry employment (3-6%) except Xaysomboun (14%)



Industry employment effective to alleviate poverty



Thailand – Belief 2:

IF

More Sugarcane planted

THEN

Poverty decreases

Evidence from the HH survey:
Sugar cane has a greater net profit per ha than rice but NOT when debts included (p<0.05)

	main livelihood activity mean $			
	Growing rice	Growing vegetables	Sugar cane	Cassava
Debts	3659	924	4700	8627
Net Profit	896	1548	**3521**	2297
Net profit per ha	267	1641	**1020**	315
Net profit -debt	-2579	431	-957	-6330

Note: net profit per ha does NOT correlate with intention to adapt ($p>0.05$ and $R^2 <0.06$.

Yunnan Belief 1:

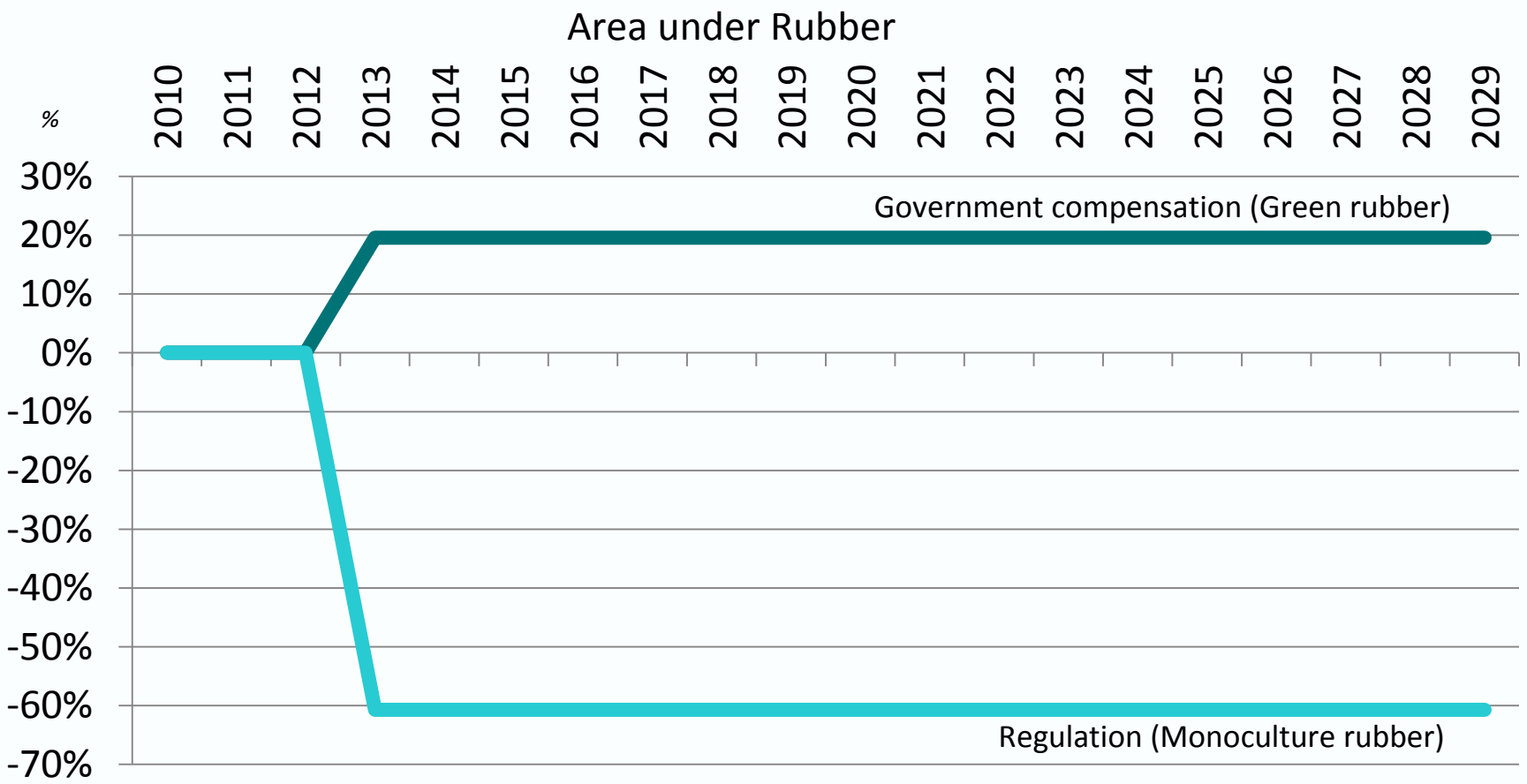
IF

Government provides payments/compensations

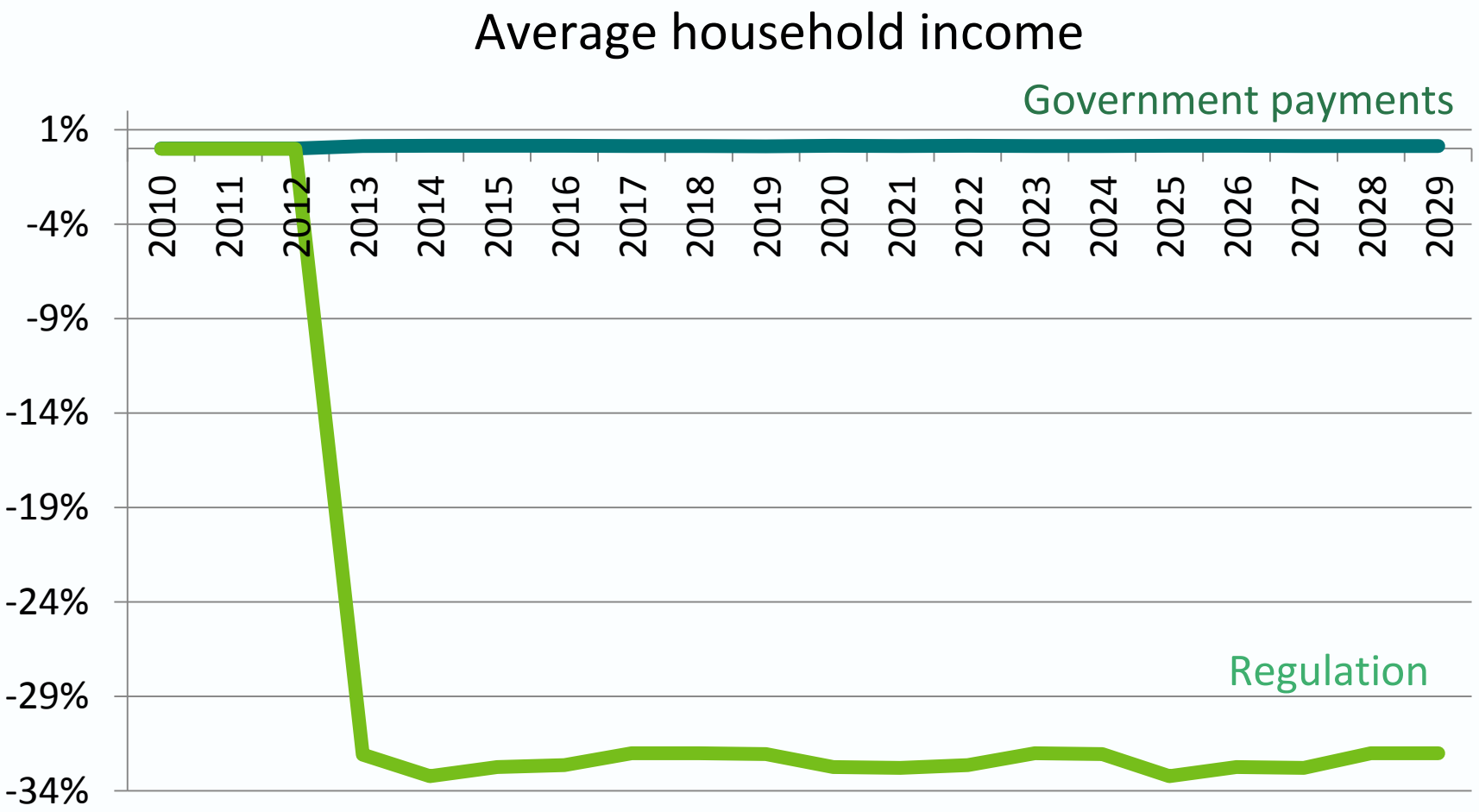
THEN

Rubber expansion can be reversed

Evidence from the model



Evidence from the model



The Alliance: Key principles - 2

Tractability [Effectiveness]

Research that has greater prospects of success because it is **less sensitive to political events** or circumstances, builds on good **capacity of in-country partners** and is supported by mature and effective **trans-disciplinary partnerships**.

Alignment with Flagship Goals

Research that generates benefits and impacts that can demonstrably be linked to achievement of **Flagship goals**. This includes **capacity building and science impacts**.

Cailon/Caibe

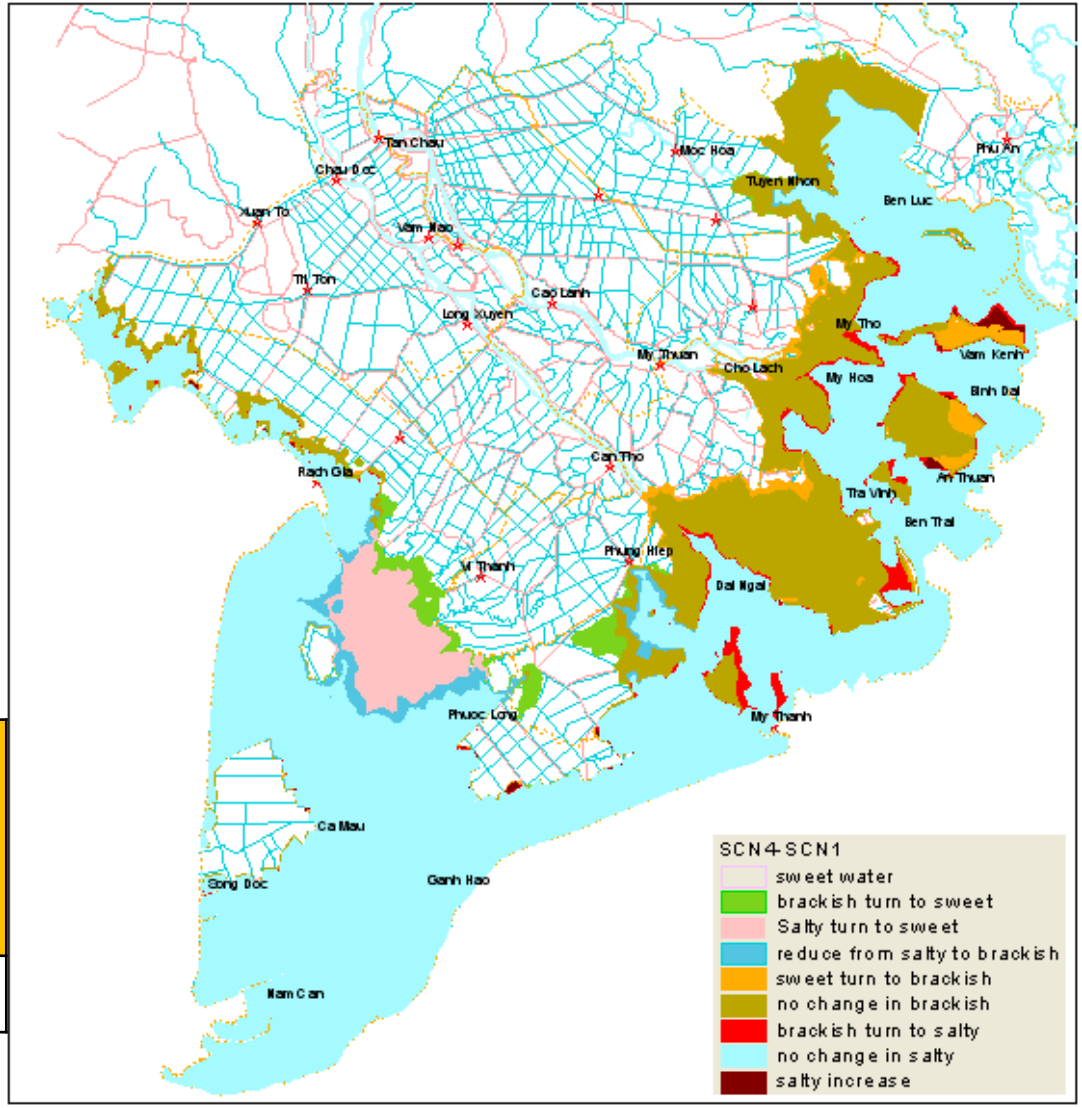
SLR 30 cm

Upstream hydropower

Irrigation extension

Fresh	< 2 g/l	< 2-4 g/l	< 4-10 g/l	< 10-20 g/l	>20 g/l
155	-74	6	36	63	-186

in 1,000 ha



THE MEKONG FUTURE PROJECT FIRST DRAFT REPORT ON THE HYDROLOGICAL SIMULATION

To Quang Toan[1], Nguyen Hieu Trung[2], Dang Kieu Nhan[3]

[1]Southern Institute of Water Resources Research

[2]Research Institute for Climate Change, Can Tho University

[3]Mekong Delta Research Institute, Can Tho University.