CANTHO UNIVERSITY

CLIMATE CHANGE IMPACTS ON THE VIET NAM MEKONG RIVER DELTA

Dr. NGUYEN VAN SANH

Research Institute for Climate Change
(DRAGON institute – Mekong – CTU)

E-mail: nvsanh@ctu.edu.vn

CONTENT

1. About the Viet Nam Mekong Delta
2. Prediction of climate change impacts
3. Adaptation strategies?

CANTHO UNIVERSITY

1. ABOUT THE MEKONG DELTA

Bản đồ vị trí các tỉnh

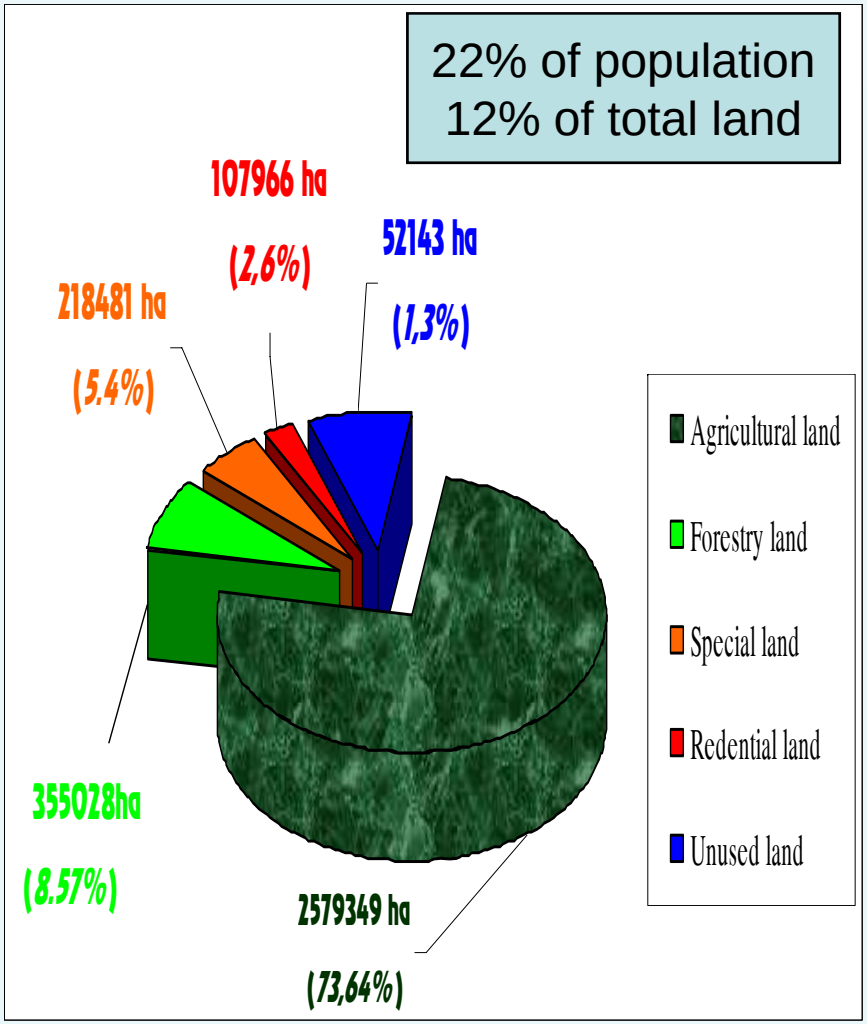
VÙNG ĐỒNG BẰNG SÔNG CỬU LONG

The Delta is considered as a large wetland with rich biodiversity for food security and fishery production for Viet VN .

CANTHO UNIVERSITY

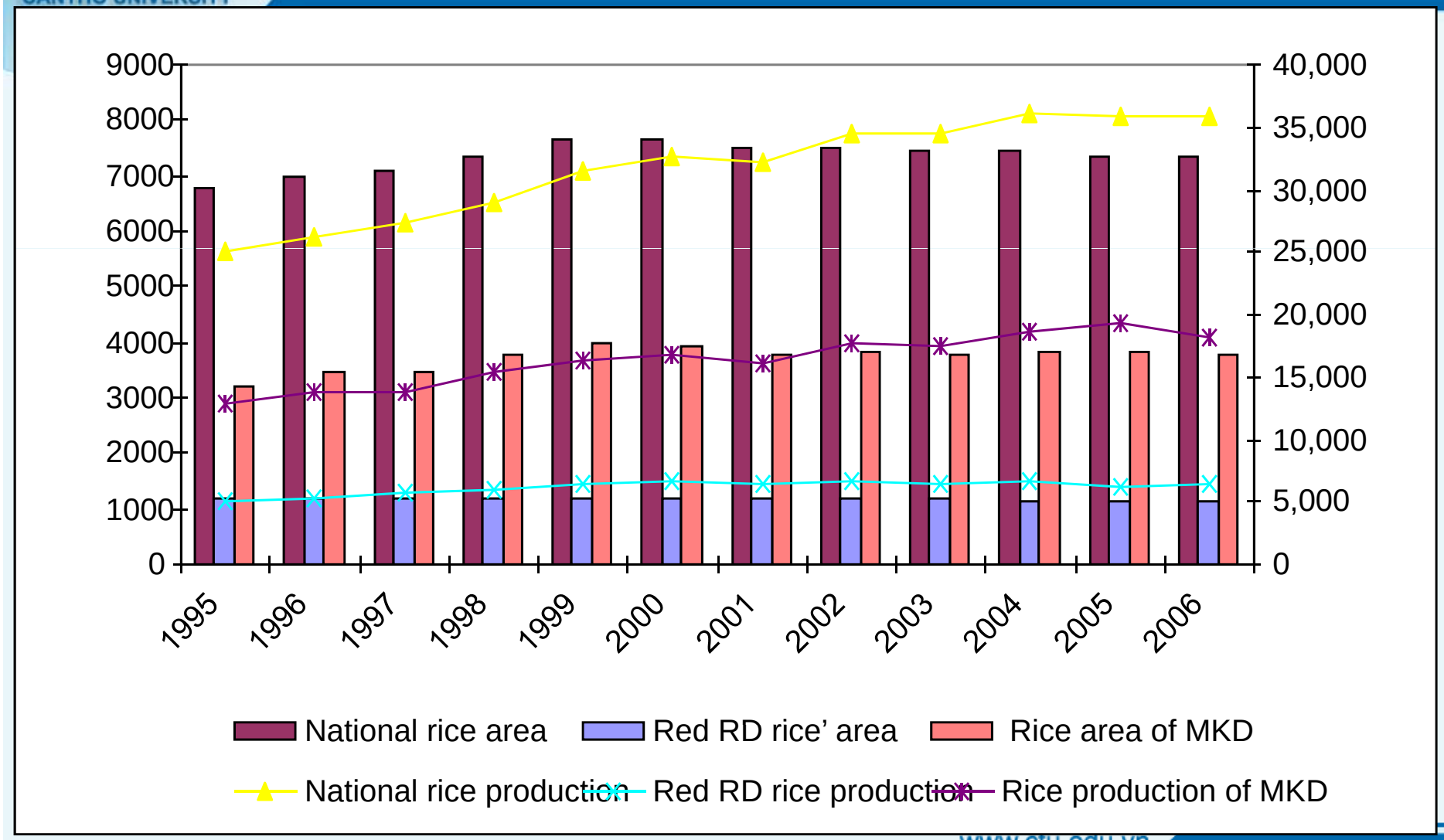
Agriculture production

- 40% of National Agro-sector GDP
- 50% total paddy outputs
- 90% rice outputs for export
- 60% total fishery outputs
- 75% total fishery export value
- 50% meat and eggs production supplying to other regions
- High Q fruits:>70% national production .....



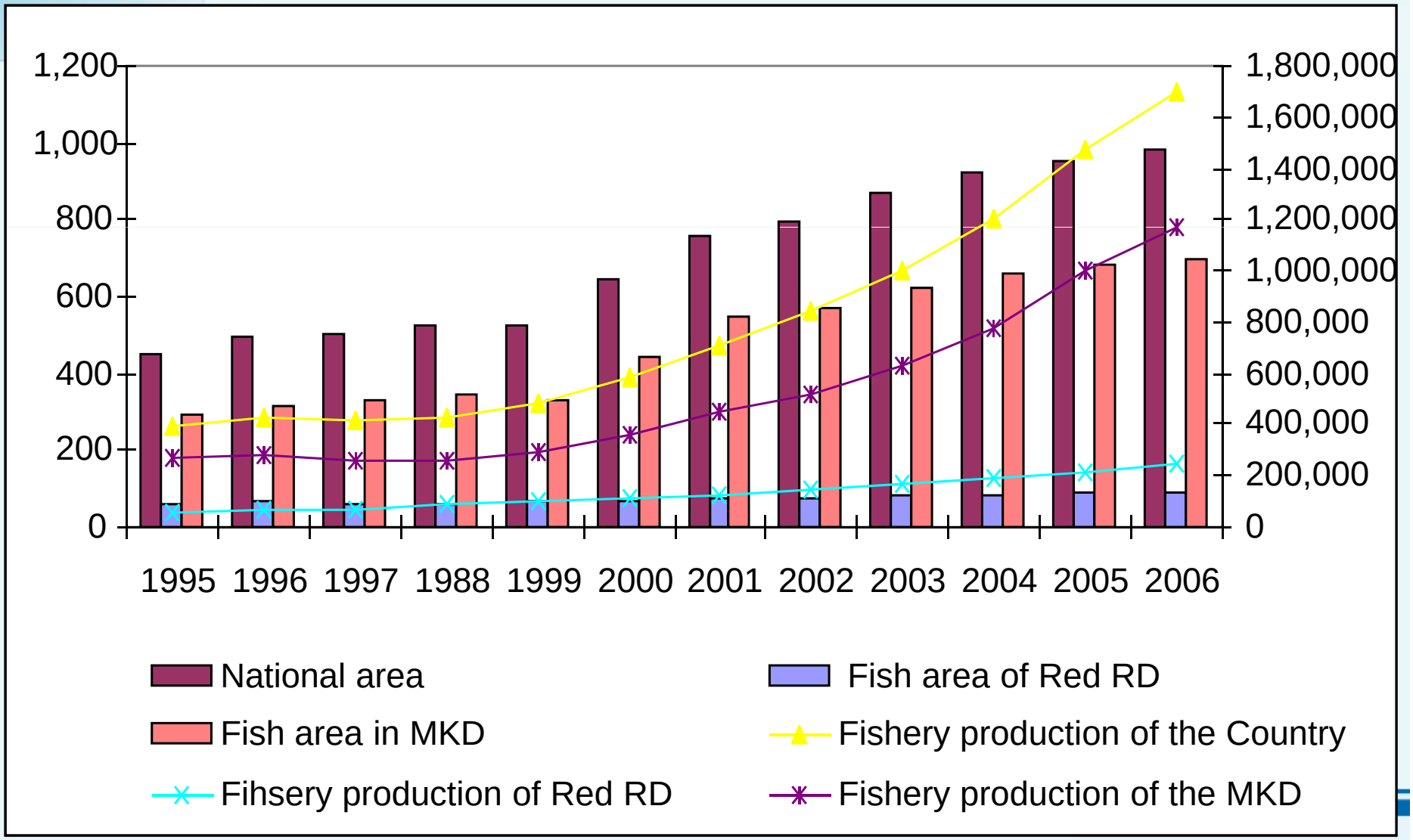
CANTHO UNIVERSITY

Food security for the country



CANTHO UNIVERSITY

Fishery production



CANTHO UNIVERSITY

But highly vulnerable - Population density

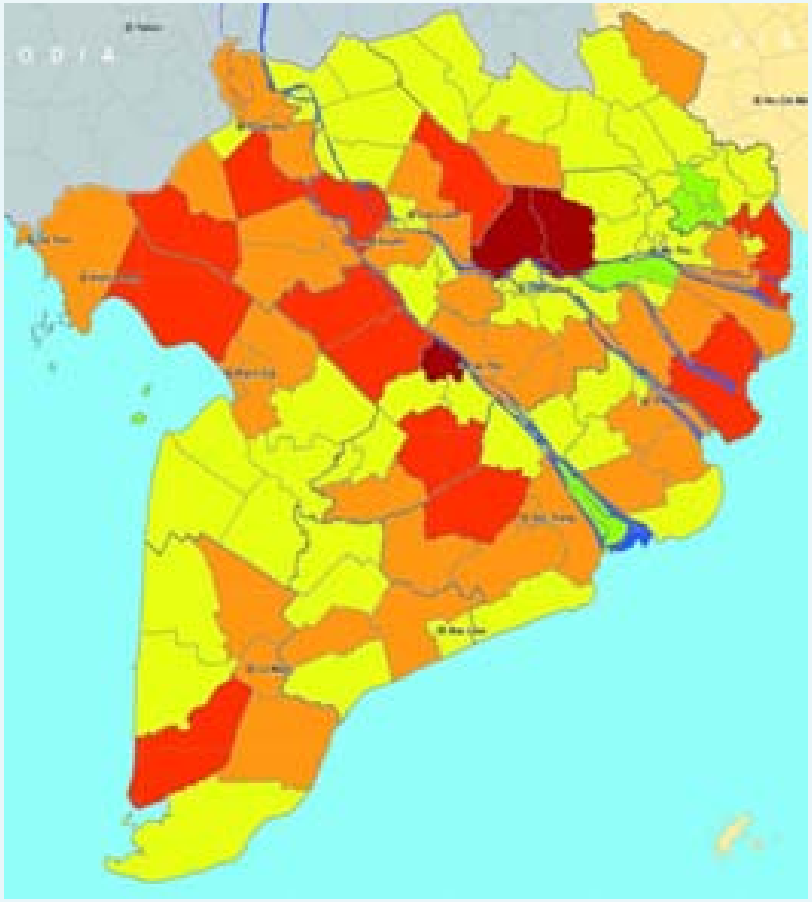
0 – 50.000

50.001 – 150.000

150.001 – 250.000

250.001 – 350.000

350.001 – 400.000



High population density in major cities and towns, especially along rivers and canals. These might create high costs by soil erosion or river water level rise.

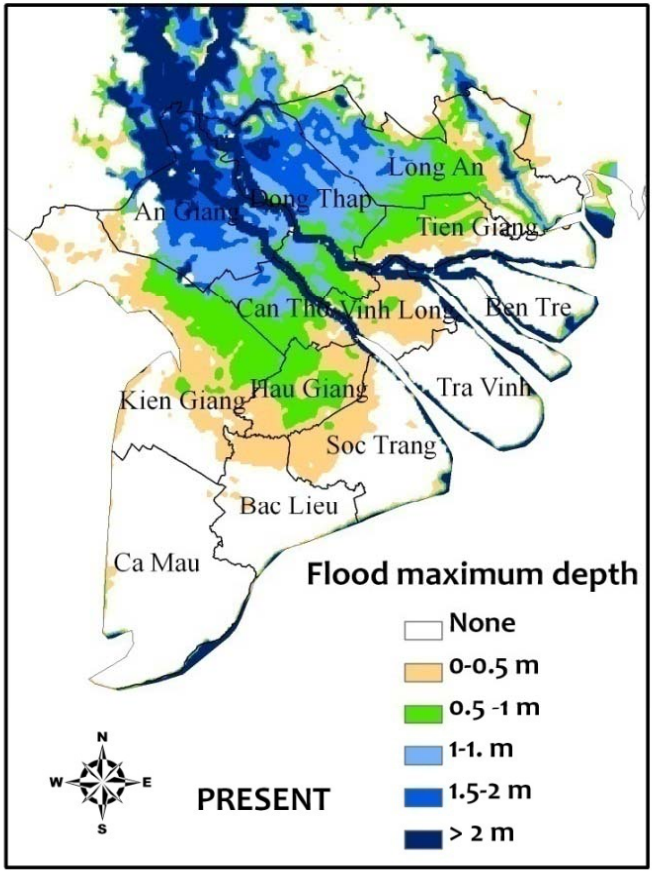
CANTHO UNIVERSITY

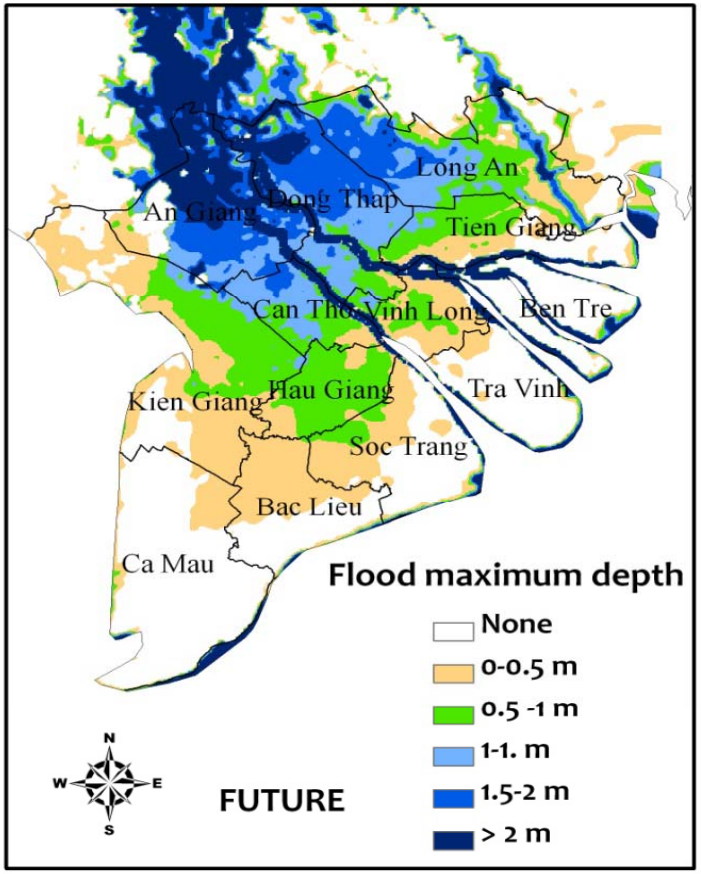
High level of landless, low income and low education

Sub Zones	Average Gross income /capita /year (million)	Average expenditure/ Capita /year (million VND)	Rate of Saving HH (%)	Iliterate (%)	Primary school (%)	Socon dary school (%)	High scho ol (%)
Fresh water area	8.2	6.2	68	2	26	39	32
Salinity & acid soils	6.4	5.0	47	20	55	21	4

Sources: Household surveys. MDI-CTU, 2008

2. PREDICTION OF CLIMATE CHANGE IMPACTS – SEA LEVEL RISE

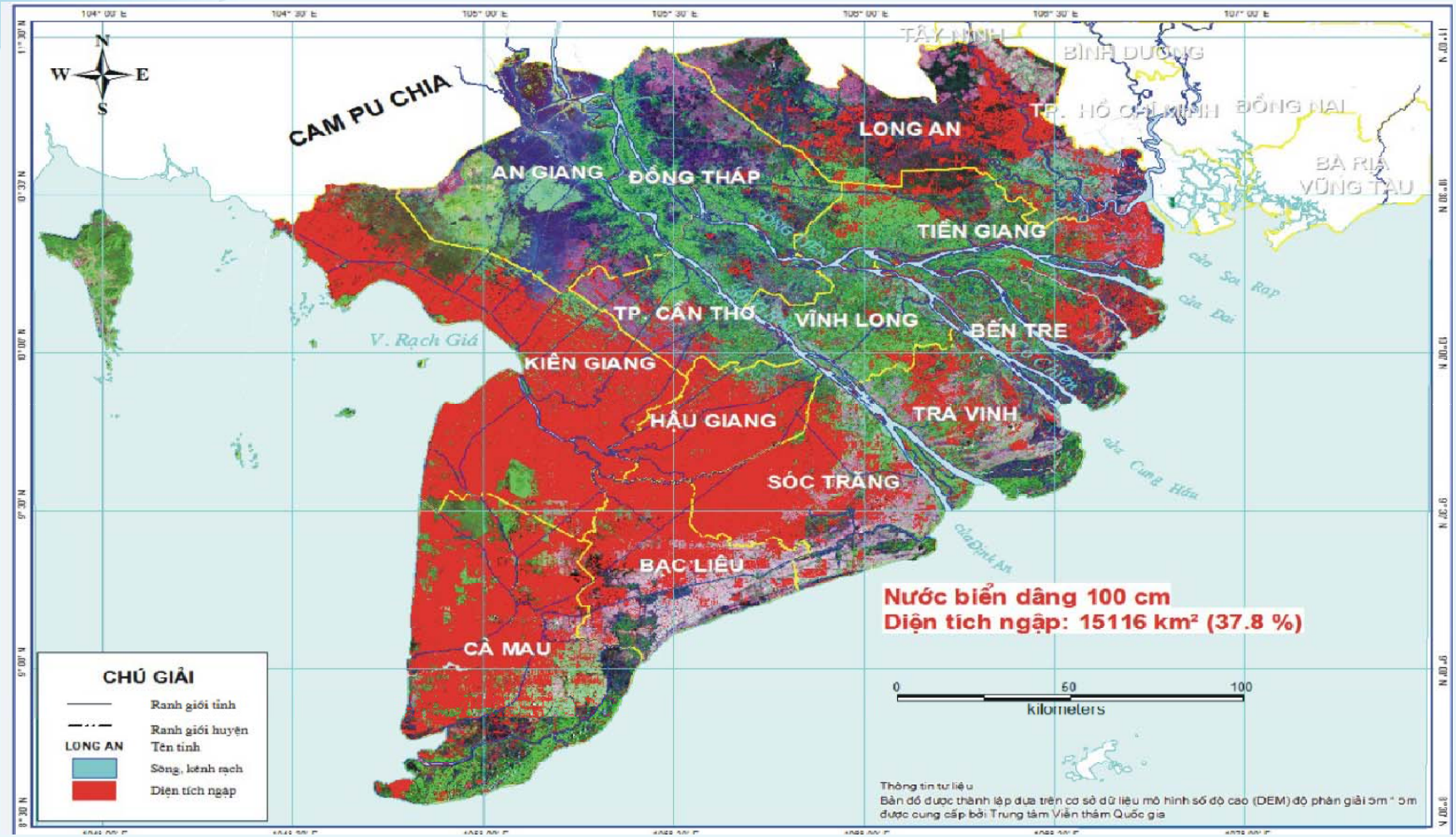




Flood boundary may expand in the future.

CANTHO UNIVERSITY

Serious flooded areas



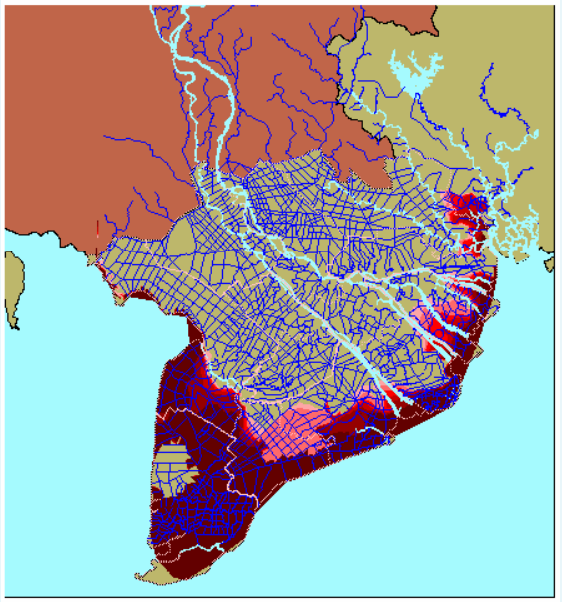
Source: Ministry of Natural Resource and Environment-2009

CANTHO UNIVERSITY

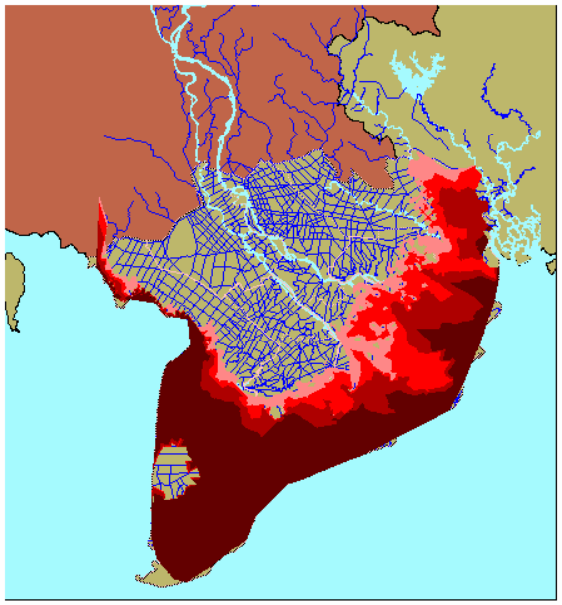
Increased salinity's intrusion

Salinity boundary

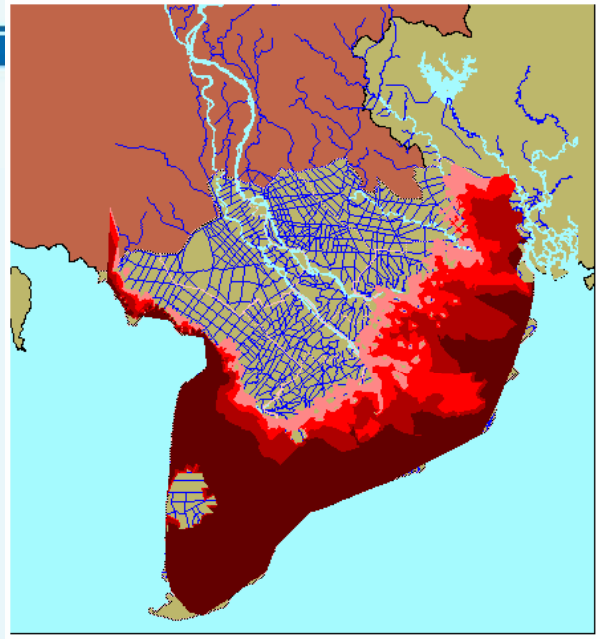
- < 1 g/L
- 1 - 4 g/L
- 4 - 15 g/L
- > 15 g/L



in 2000



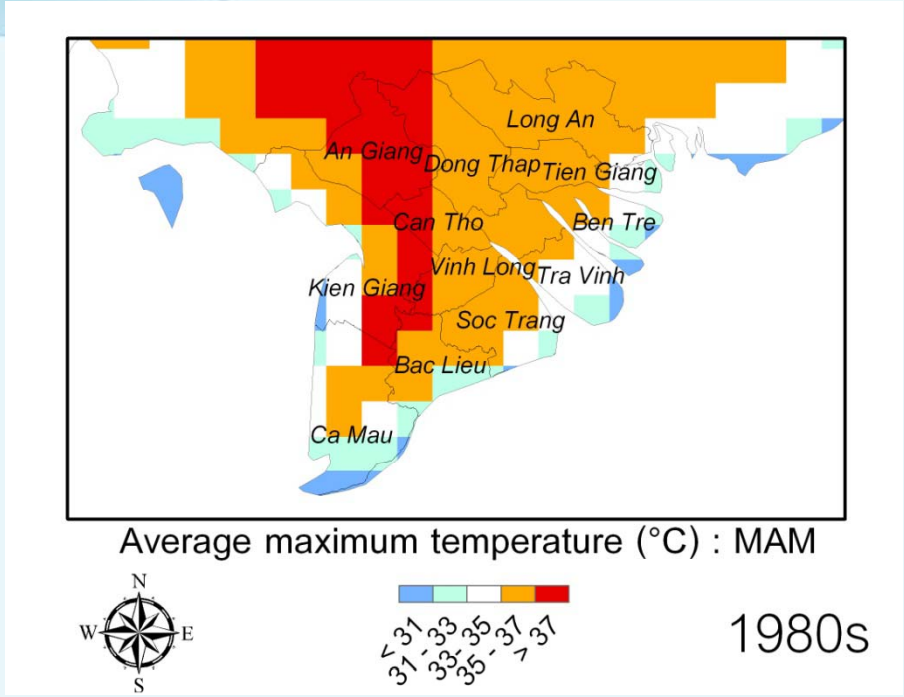
when SLR 50 cm

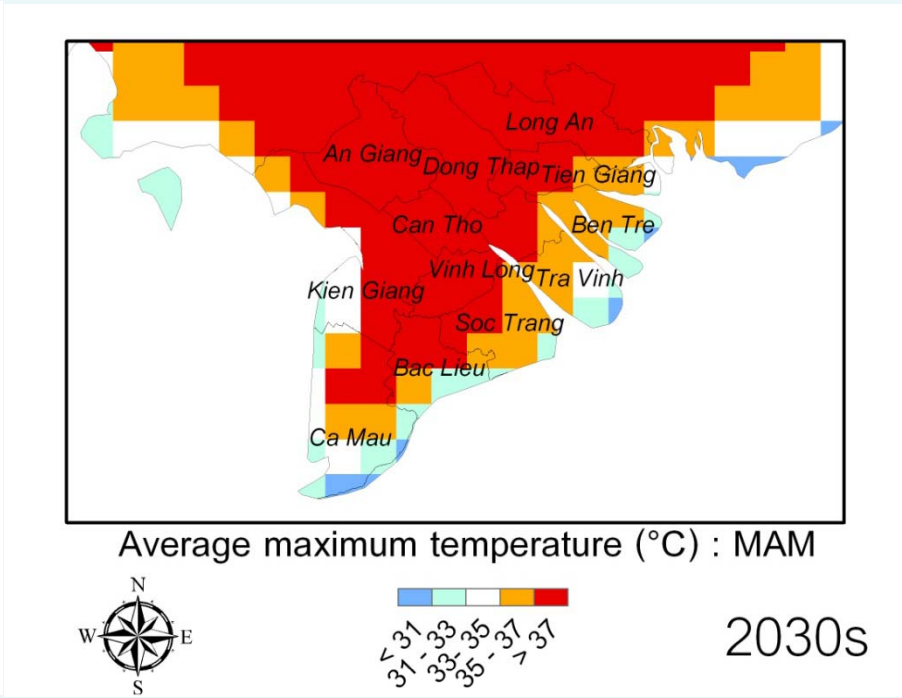


when SLR 100 cm

CANTHO UNIVERSITY

High risk of increased temperature

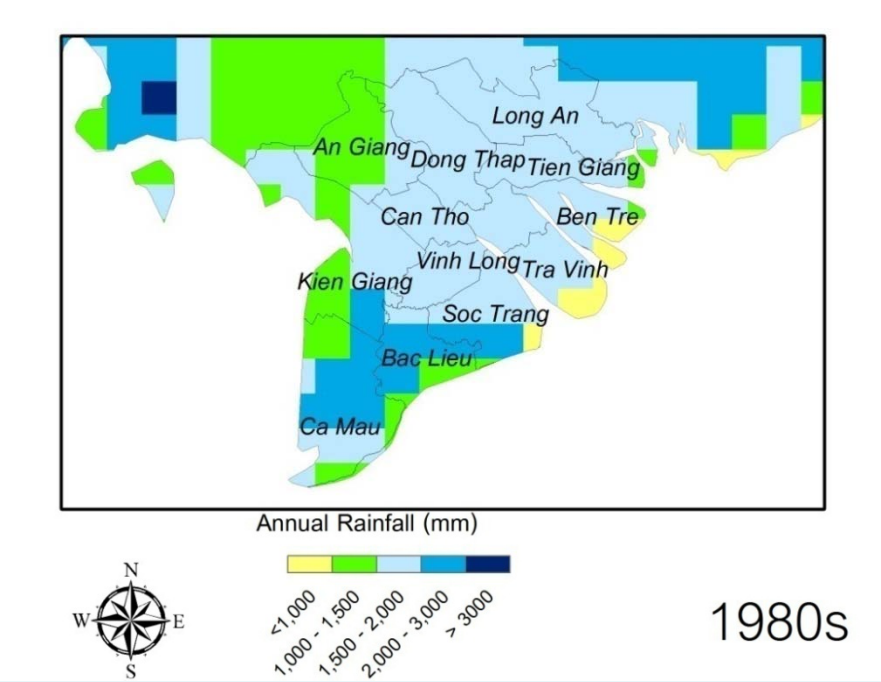


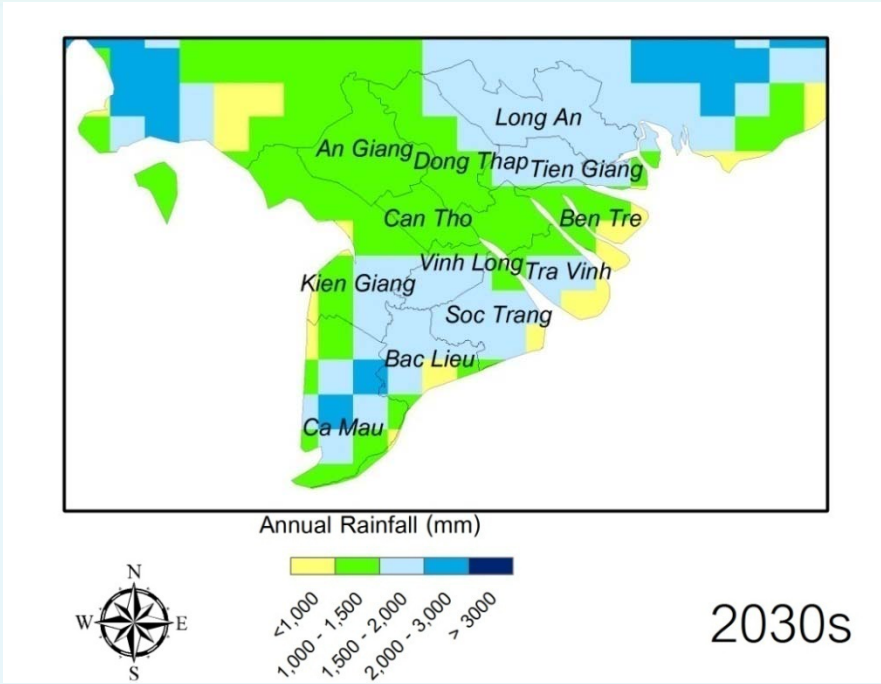


Average max. temperature will increase in March – April – May

Higher risk of heat effect on rice in early crop season!

Reduced annual rainfall distribution

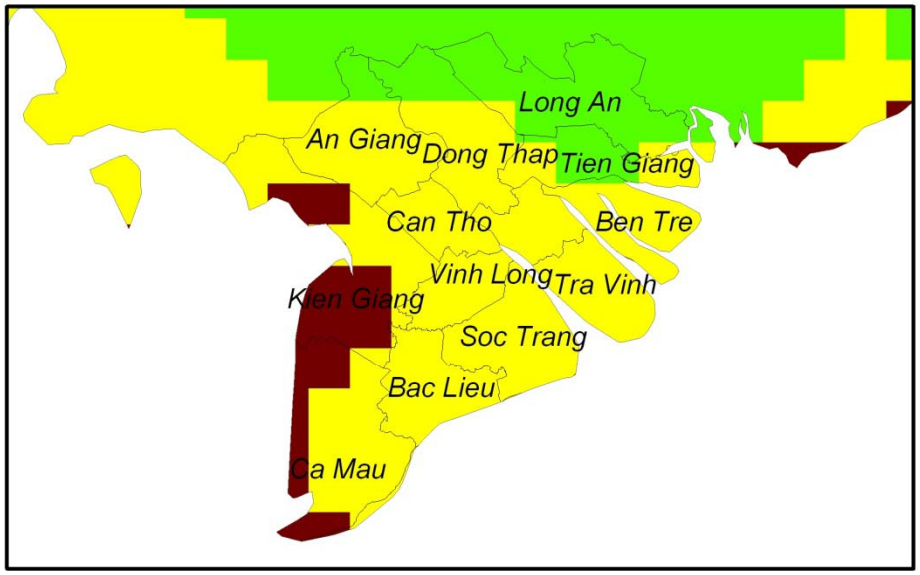




Annual rainfall will decrease !!!

CANTHO UNIVERSITY

Change of annual precipitation in the future



Annual rainfall will reduce !!!

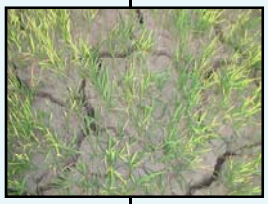
Rainy season may delay 2 weeks

CANTHO UNIVERSITY

Overview of the impacts

Jan. Feb. Mar. Apr. May Jun. Jul. Aug. Sep Oct. Nov. Dec.

Hot and Dry



Drought

Dry spell

High flood

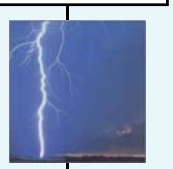
Water shortage

Acid water

Early flood

Storm

Salinity intrusion



Lightning

Erosion

Heavy rain + High tide

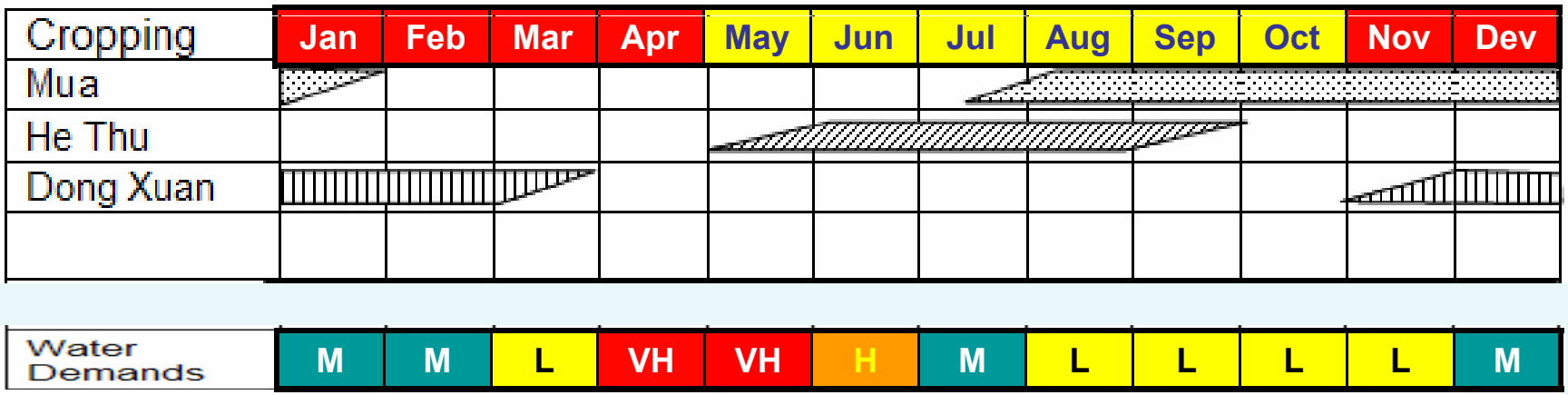
Southeast wind

Cold

CANTHO UNIVERSITY

Impacts on food security (rice production)

The dry season **The wet season** **The dry**

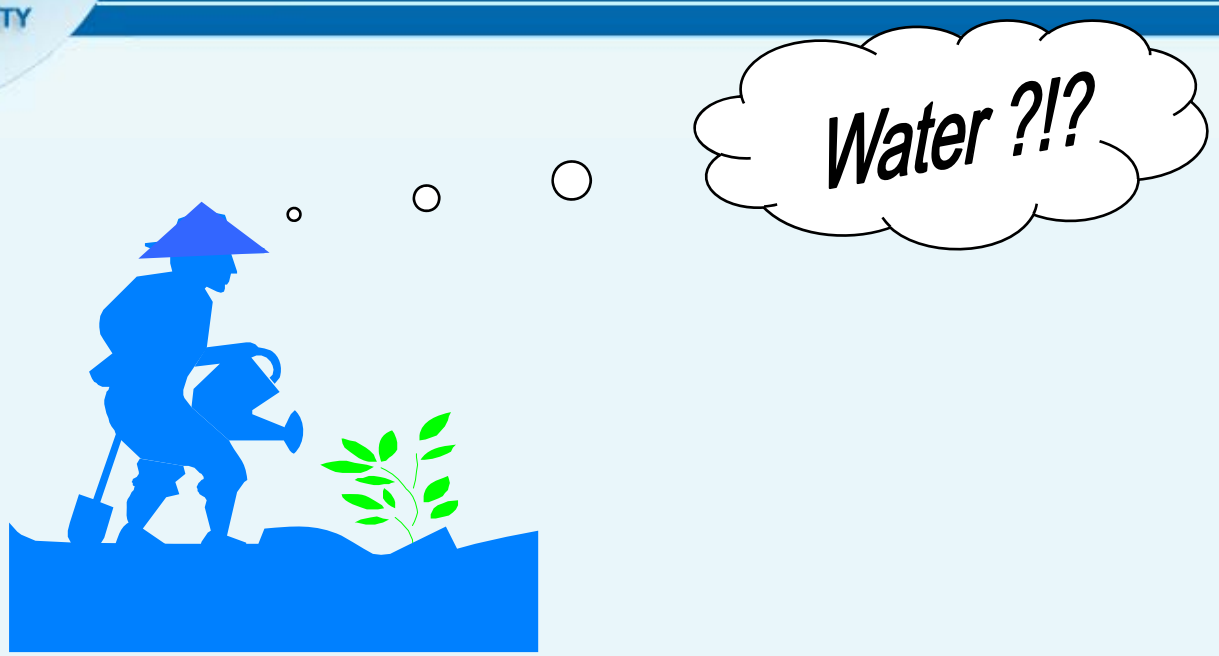


Cropping calendar and water demands in the MD

VH: very high; H: High; M: Medium; L: Low

CANTHO UNIVERSITY

Shortage of water for rice production



Higher risk in shortage of water at beginning of Summer – Autumn rice crop

In general, compared 1980s, the rainy season in 2030s:

+ starts late about 2 weeks (15/4 – 30/5)

+ total yearly rainfall amount reduces about 20%

+ in the future the farmers have to pay more for pumping water

Impacts on land use

	Area (sq.km)						Percent of total inundation area					
	Agri and aqua-culture land	Water bodies, wetlands	Forest and other natural vegetation	Settle-ments	Other land cover/ land use	Total	Agri and aqua-culture land	Water bodies, wetlands	Forest and other natural vegetation	Settle-ments	Other land cover/ land use	Share in %
An Giang	106	87	0	0	0	192	1	4.6	0	0	0	1.3
Bac Lieu	914	0	48	0	0	962	8.3	0	4.1	0	0	6.6
Ben Tre	890	202	39	0	1	1131	8.1	10.7	3.3	0	0.6	7.8
Ca Mau	650	339	186	7	0	1183	5.9	17.9	16.1	2.4	0	8.1
Can Tho	672	54	0	32	0	758	6.1	2.8	0	10.5	0	5.2
Dong Thap	351	37	0	0	2	389	3.2	1.9	0	0	0.9	2.7
Kien Giang	1499	34	182	0	42	1757	13.7	1.8	15.7	0.1	20.1	12.1
Long An	1894	78	122	0	75	2169	17.3	4.1	10.6	0	35.9	14.9
Soc Trang	1183	157	49	15	22	1425	10.8	8.3	4.2	5	10.5	9.8
Tien Giang	637	125	21	0	0	783	5.8	6.6	1.8	0	0	5.4
Tra Vinh	640	166	135	81	0	1021	5.8	8.7	11.6	26.9	0	7
Vinh Long	439	82	0	85	0	606	4	4.3	0	28.2	0	4.2
MRD	**9874**	**1359**	**782**	**221**	**142**	**12377**	**90.1**	**71.7**	**67.5**	**73.1**	**68**	**85.2**
Vietnam	**10962**	**1895**	**1159**	**302**	**208**	**14525**	**100**	**100**	**100**	**100**	**100**	**100**

Source: ICEM. Rapid Assessment of the Extent and Impact of SLR in Vietnam. 2008

CANTHO UNIVERSITY

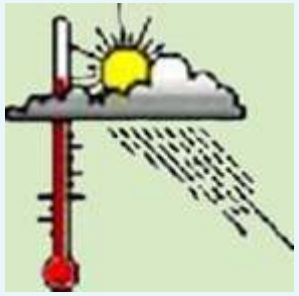
Vulnerable people

	No of people affected	Total pop of province	% of provincial pop affected	% of total pop within SLR inundation zone	No of poor	% of total affected poor people
An Giang	197,085	2,372,860	8.30	3.36	50,563	3.10
Bac Lieu	383,764	857,521	44.80	6.54	110,818	6.70
Ben Tre	759,174	1,389,730	54.60	12.94	245,310	14.80
Ca Mau	182,956	1,206,390	15.20	3.12	69,614	4.20
Can Tho	426,511	2,046,210	20.80	7.27	118,875	7.20
Dong Thap	222,289	1,662,590	13.40	3.79	71,011	4.30
Kien Giang	295,989	1,590,910	18.60	5.04	101,964	6.20
Long An	581,456	1,488,070	39.10	9.91	198,812	12.00
Soc Trang	457,821	1,307,200	35.00	7.80	133,798	8.10
Tien Giang	497,075	1,728,190	28.80	8.47	121,743	7.30
Tra Vinh	418,066	1,101,850	37.90	7.12	139,597	8.40
Vinh Long	364,414	1,152,190	31.60	6.21	123,595	7.50
MRD	**1,786,600**	**17,903,711**	**26.70**	**81.56**	**1,185,700**	**89.70**
Vietnam	**5,868,618**	**58,401,331**	**10.00**	**100.00**	**1,656,983**	**100.00**

Source: ICEM. Rapid Assessment of the Extent and Impact of SLR in Vietnam. 2008

CANTHO UNIVERSITY

WHAT WILL BE HAPPENED WHEN THE CLIMATE CHANGED???



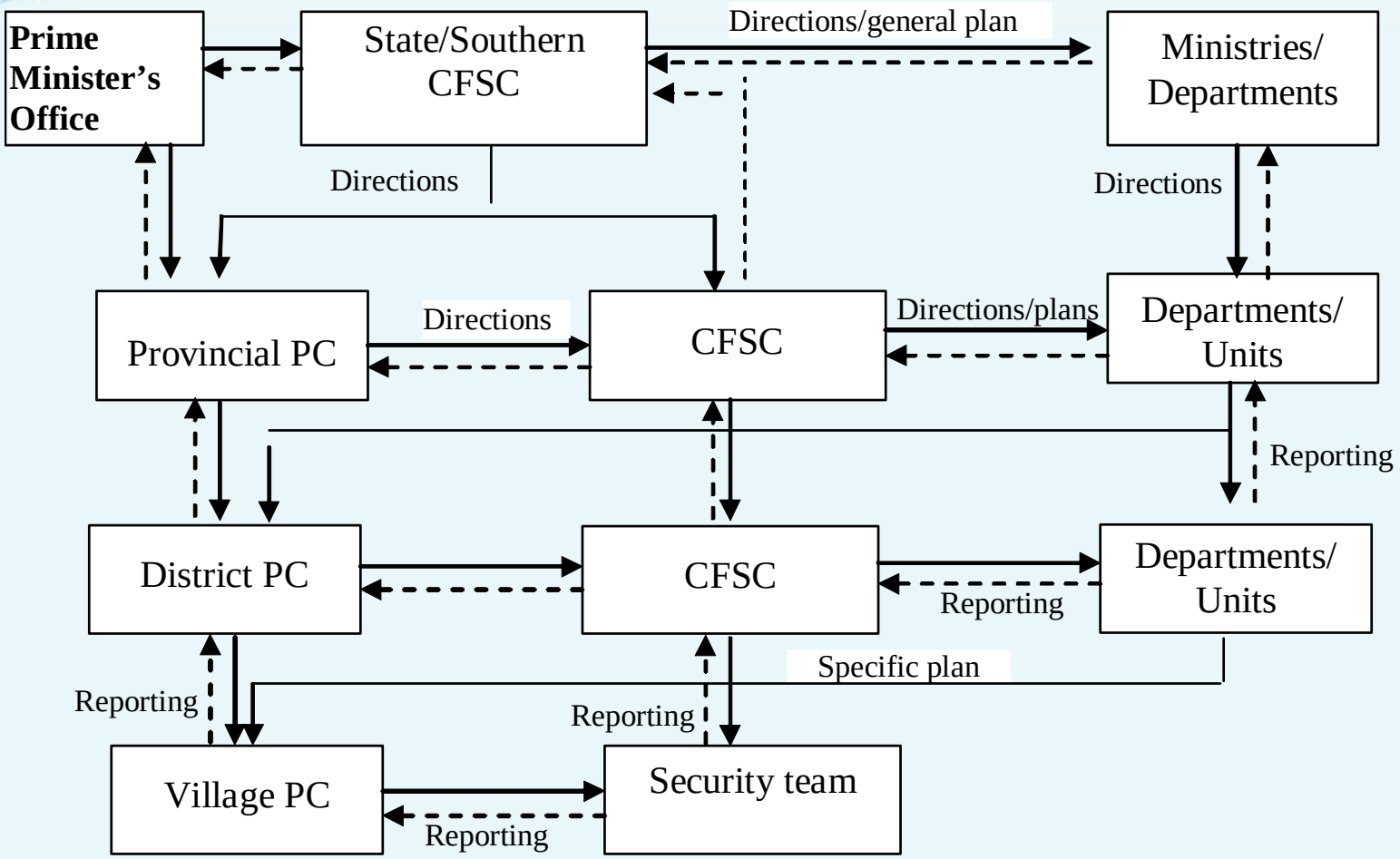
CANTHO UNIVERSITY

3. Adaptation
"Living with the flood"

- Principles: Based on "positives and negatives impacts of floods".
- Integrated planning for Socio-economic development related to the flood situation:

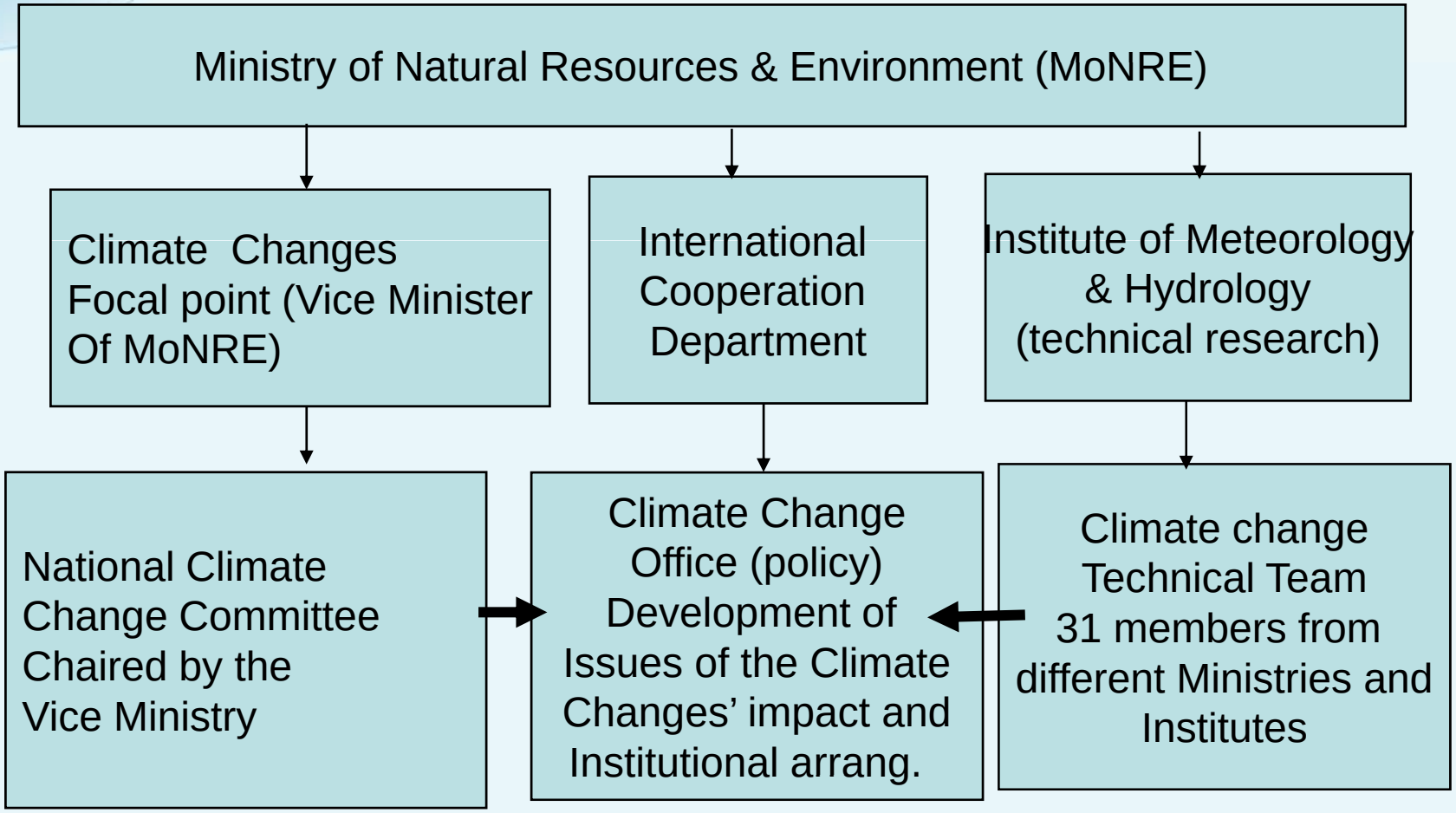
- Safety places: Cluster and dike construction
- Agricultural production's development
- Establishment of the Committees of Flood and Strom control at the different' levels
- Livelihoods' improvement & community capacity building
- Regional Approaches for Planning of Water Resource mgt for "Living with the flood"

strengthen the planning and coordination capabilities of CFSC (commities i all levels



CANTHO UNIVERSITY

Institutional Arrangements for Responding to Climate Changes (Decree 60/2007/CP)



CANTHO UNIVERSITY

Adaptation opportunities

- Researches and Forecasting
- Plan for adaptive infrastructure (roads, bridges, water supply, waste disposal, shelters)
- Community capacity building to adapt to the climate change ‘ impacts.
- Adapt to changing water regimes by conserving fresh water for both agriculture and human use
- Institute training programs to allow workers to adapt to new economic uses that recognize climate vulnerability.
- Policy dialogs by water sharing and efficiency use of Region and to the upper MK river countries.

CANTHO UNIVERSITY

Issues of adaptation

- Lack of research
- Lack of funding
- Lack of inter and intra-agency coordination
- Lack of regional approaches
  + Lack of integrated planning to adapt to CC
  + Competing priorities among provinces
  - Limited information of development ‘ impacts of water use from the up – stream of MKR
- Social and cultural
  – Changing locations may disrupt social networks

CANTHO UNIVERSITY

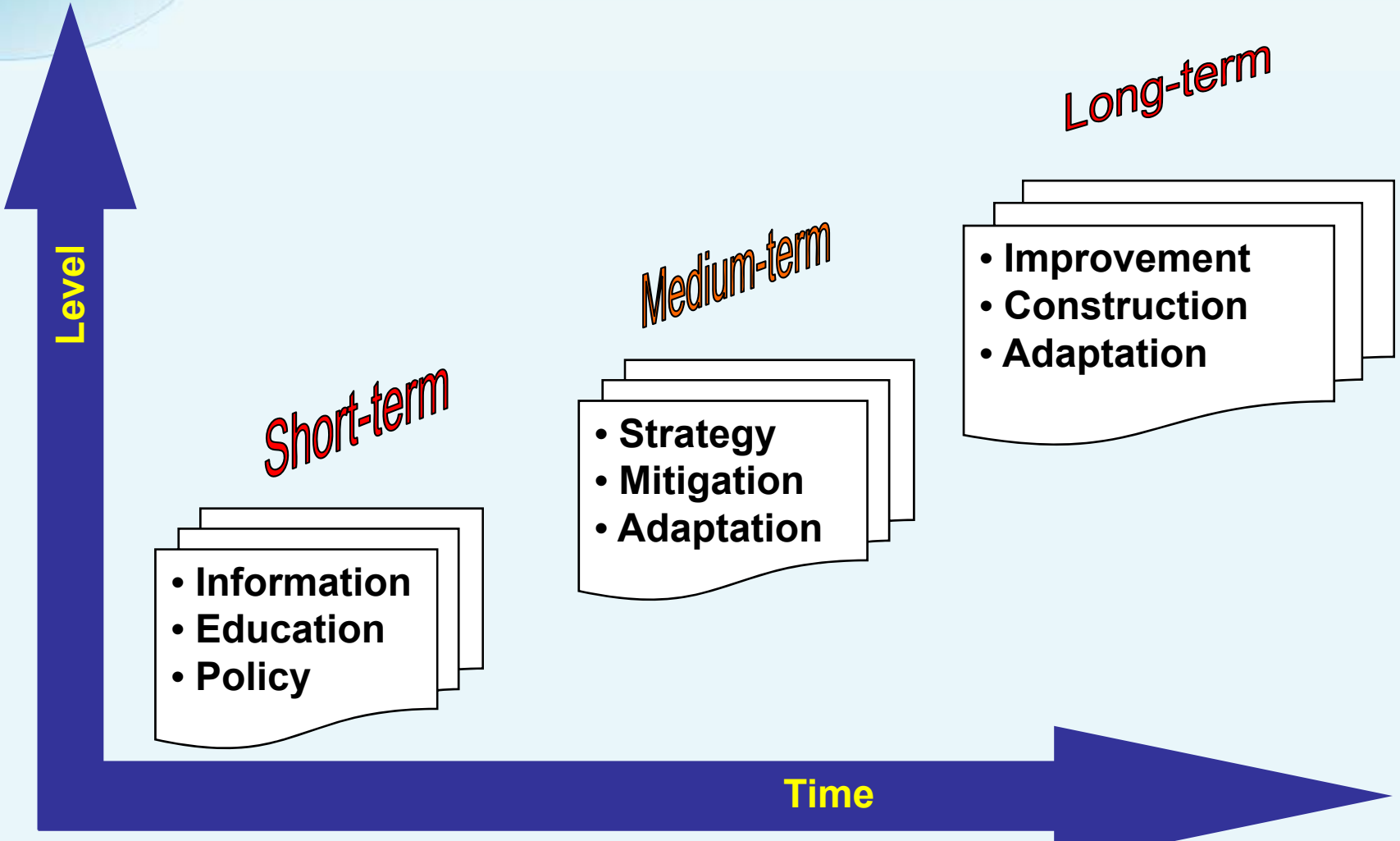
Interdisciplinary' approaches for research and adaptation
Eg the DRAGON Institute-CTU

VIỆN NGHIÊN CỨU BIẾN ĐỔI KHÍ HẬU
– ĐẠI HỌC CẦN THƠ –
DRAGON Institute – Mekong - CTU

1. Database – GIS – Modelling
2. Integrated Rural development
3. Urban Development
4. Ecology - Environment
5. Socio - Economic & adaptation

CANTHO UNIVERSITY

Thinking together?



Thank you very much for your attention