

Controlled seasonal flooding in the Vietnamese Mekong delta

The Mekong delta is the low-lying region of the Mekong river basin, where numerous rivers and canals release water into the sea. The delta is to a large extent located within Vietnamese territory. Flood water drains into the Gulf of Thailand [or West Sea] via a number of large canals, and into the South China Sea [or East Sea] via a number of distributaries. The Mekong's Sino-Vietnamese name, Cửu Long, popularly translates as 'nine dragons', referring to the Mekong's nine historical branches conveying water towards the sea. A 'tenth dragon', however, could consist of sediment-laden flood water overflowing embankments during flood season. While in large parts of the delta this dynamic is prevented or reduced due to embankment construction, policy plans now propose to restore this form of controlled flooding in the upper regions.

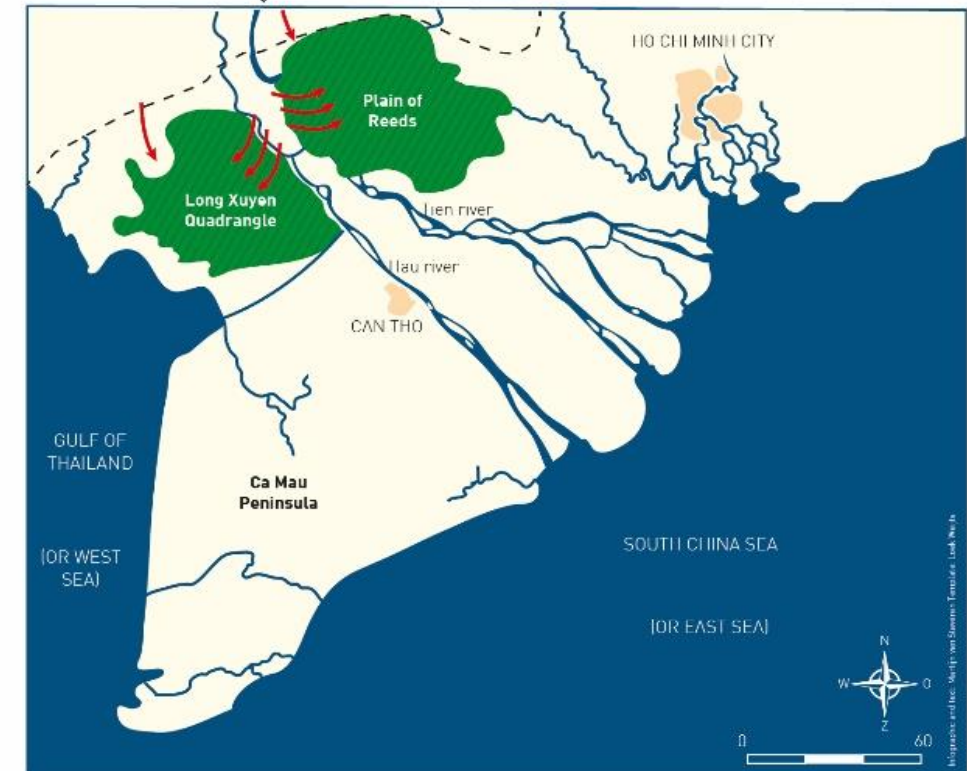


Mekong Delta: controlled seasonal flooding

Dr. Van Kien Nguyen

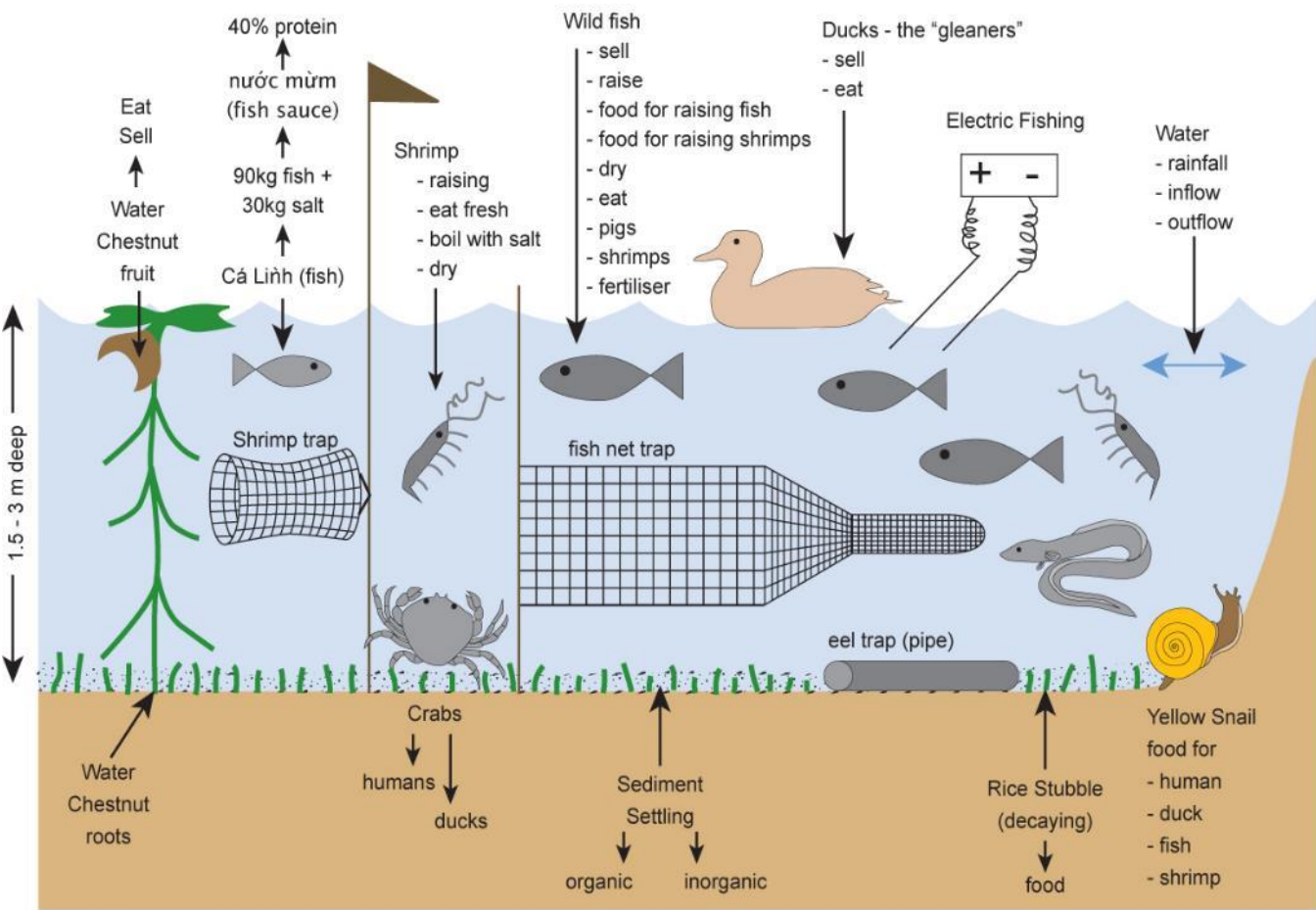
Mekong Organics & An Giang University

26 May 2021



Floods and its benefits in the Mekong Delta

Paddy Field - flooded from August to November/December



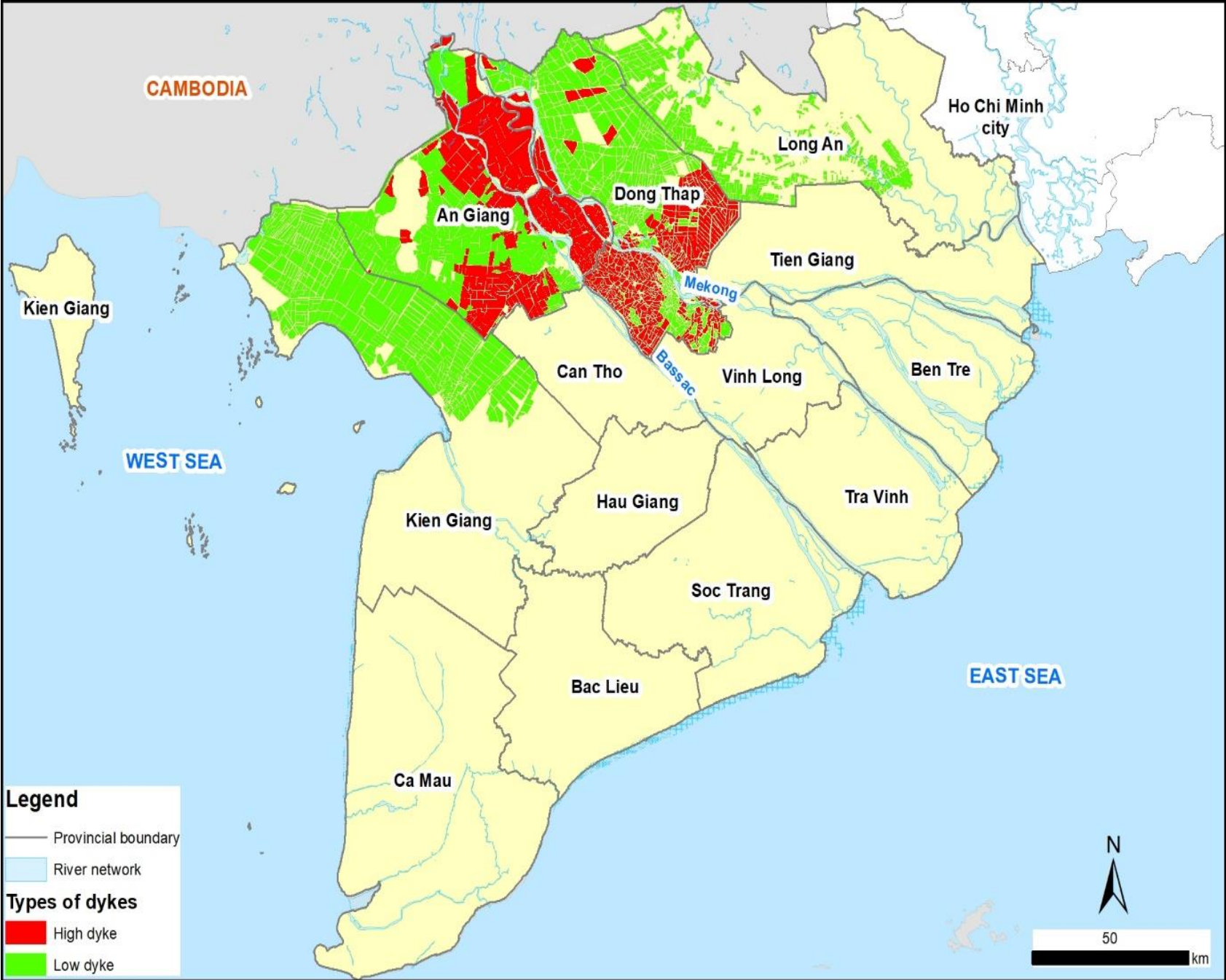
A floating rice field during the flood event 2013

Aquatic plants and animals in the flood plains

However, dikes were built to control the flood in the Mekong Delta?

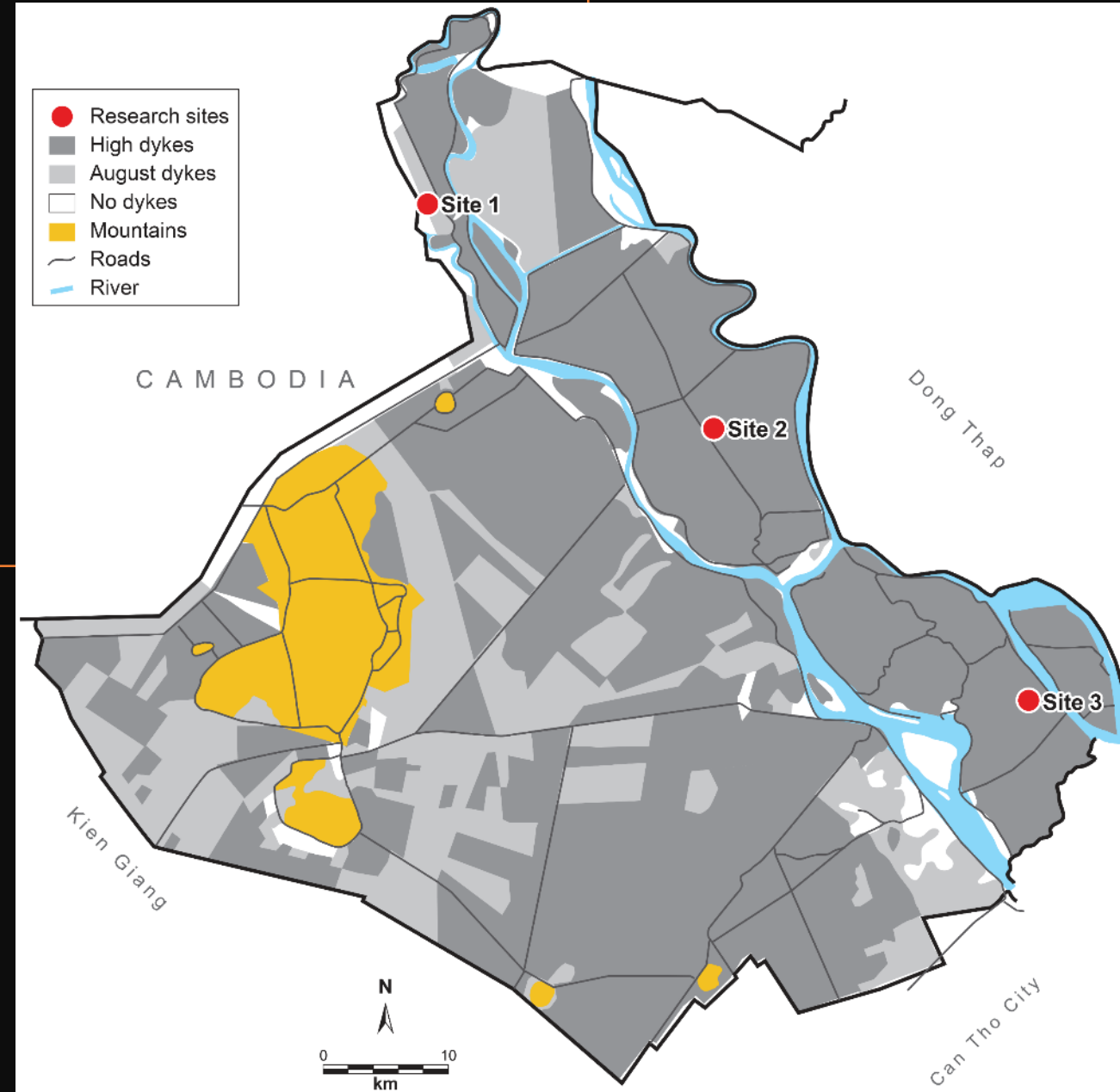


A sample of high dike in Vinh Phuoc-Tri Ton district, An Giang province at the peak flood 2013



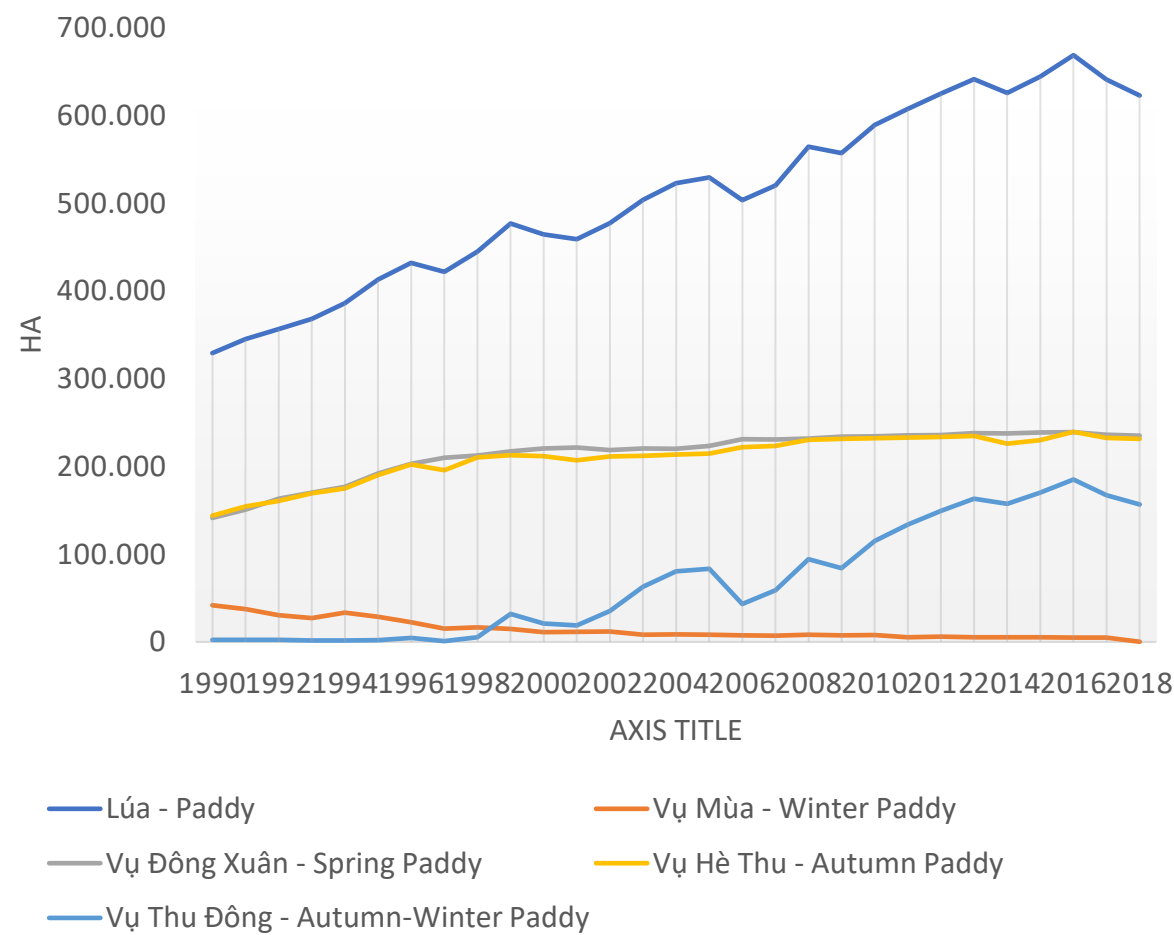
A map of dike area in the Mekong Delta

Dikes in An Giang province and land use changes

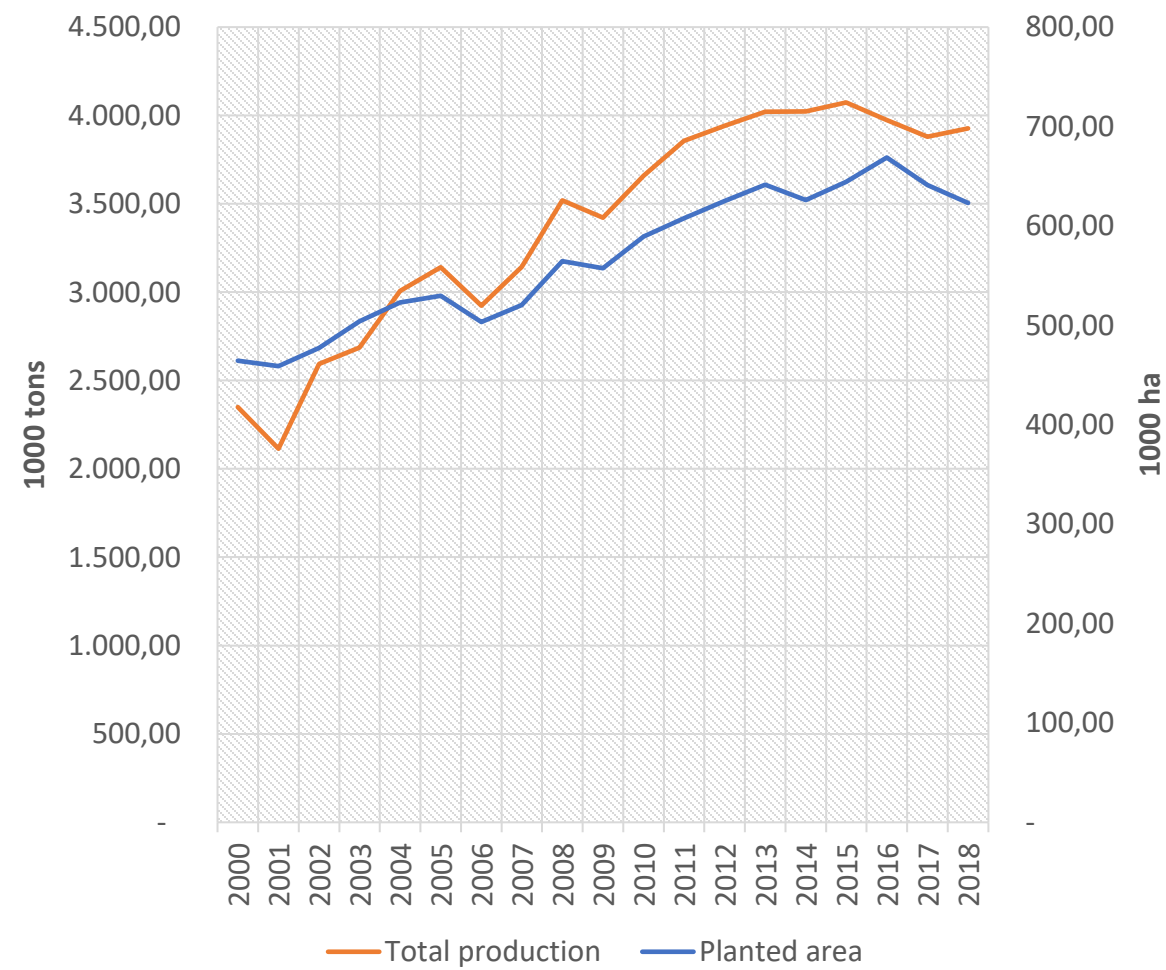


Benefits of dikes: total rice production increased

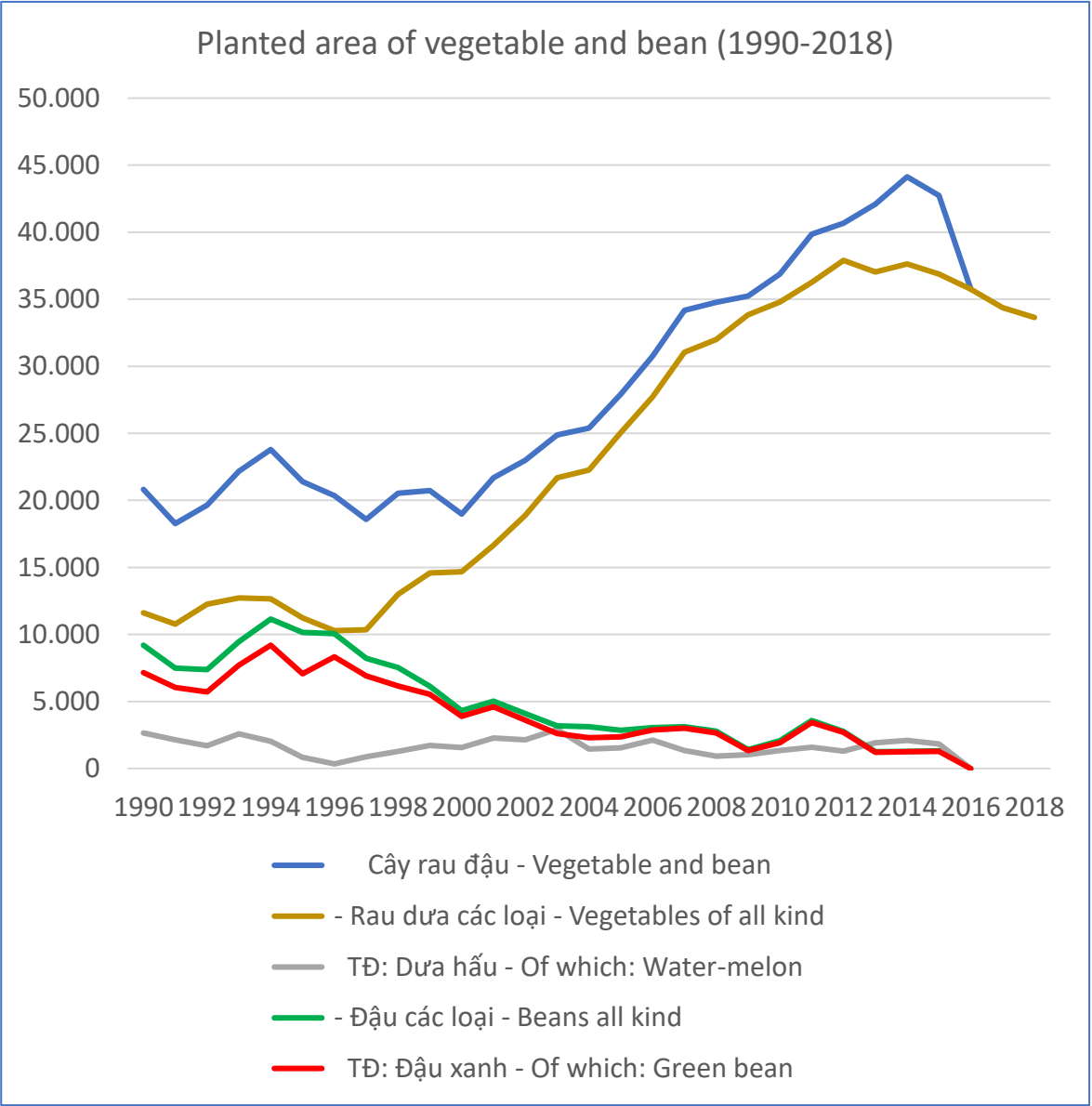
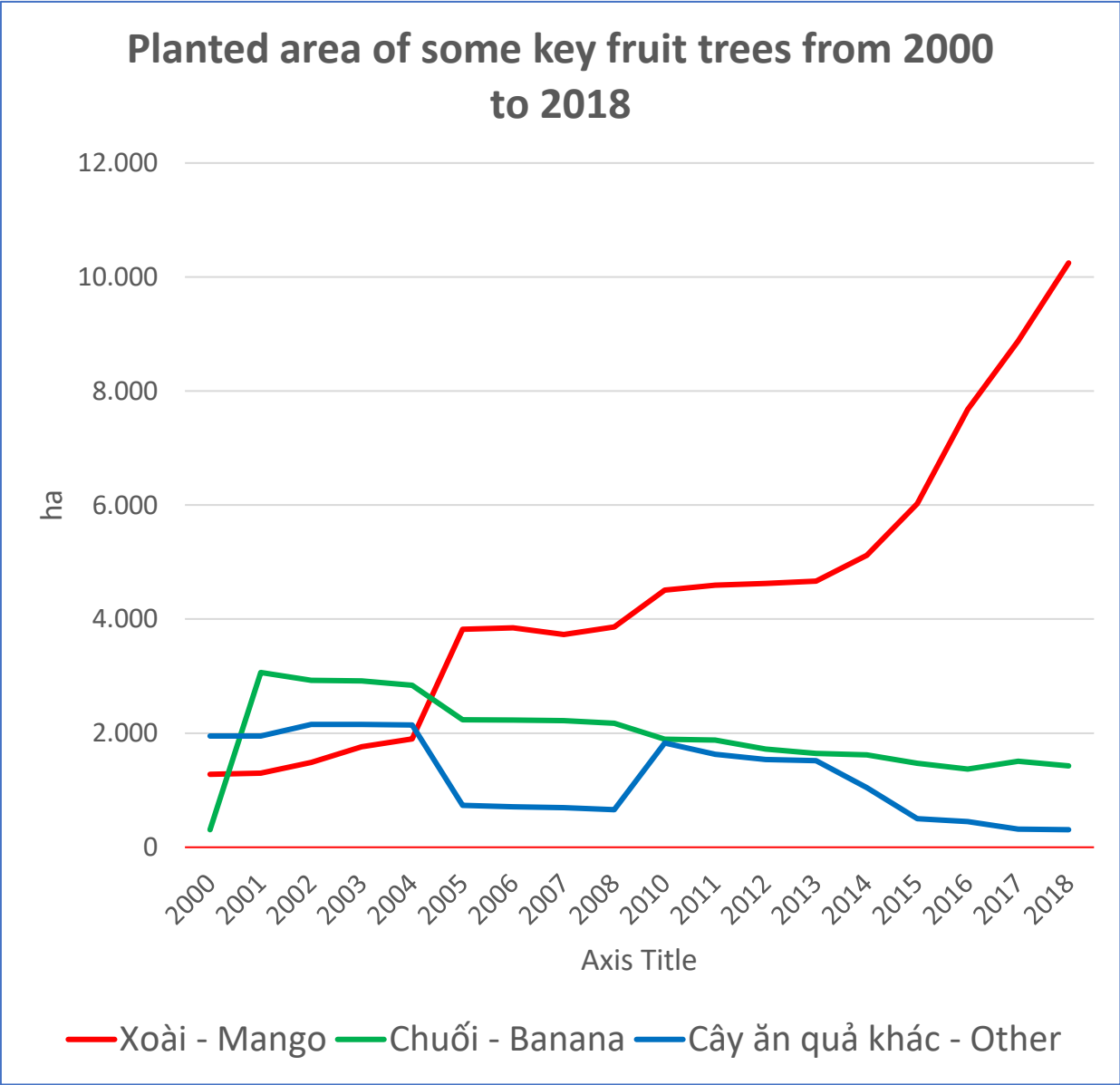
Planted area of paddy in An Giang (1990-2018)



Planted area and production of paddy in An Giang (2000-2018)

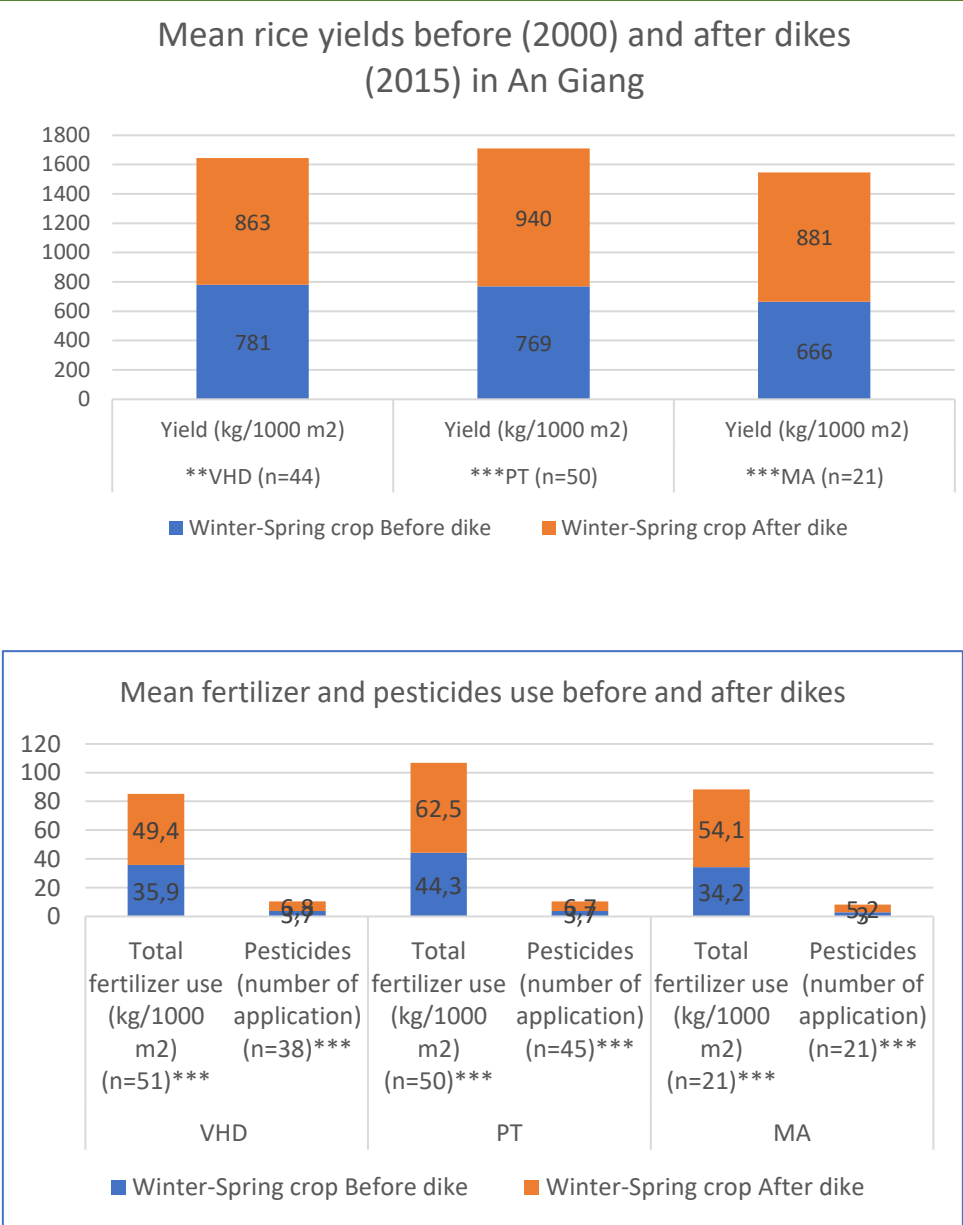


Benefits of dikes: diversifying vegetable crops/fruit trees

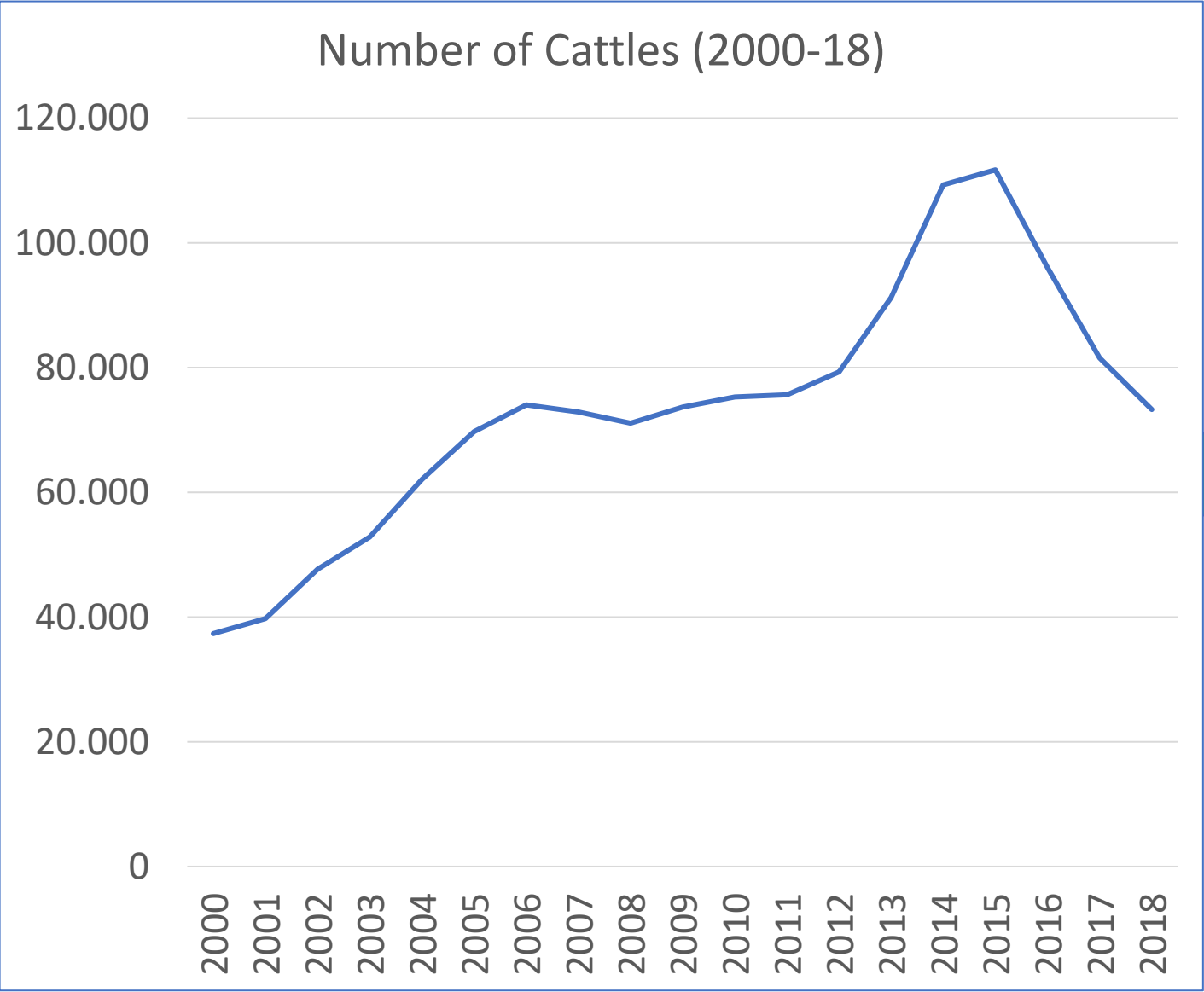


Challenges: Rice yield increased BUT input also increased

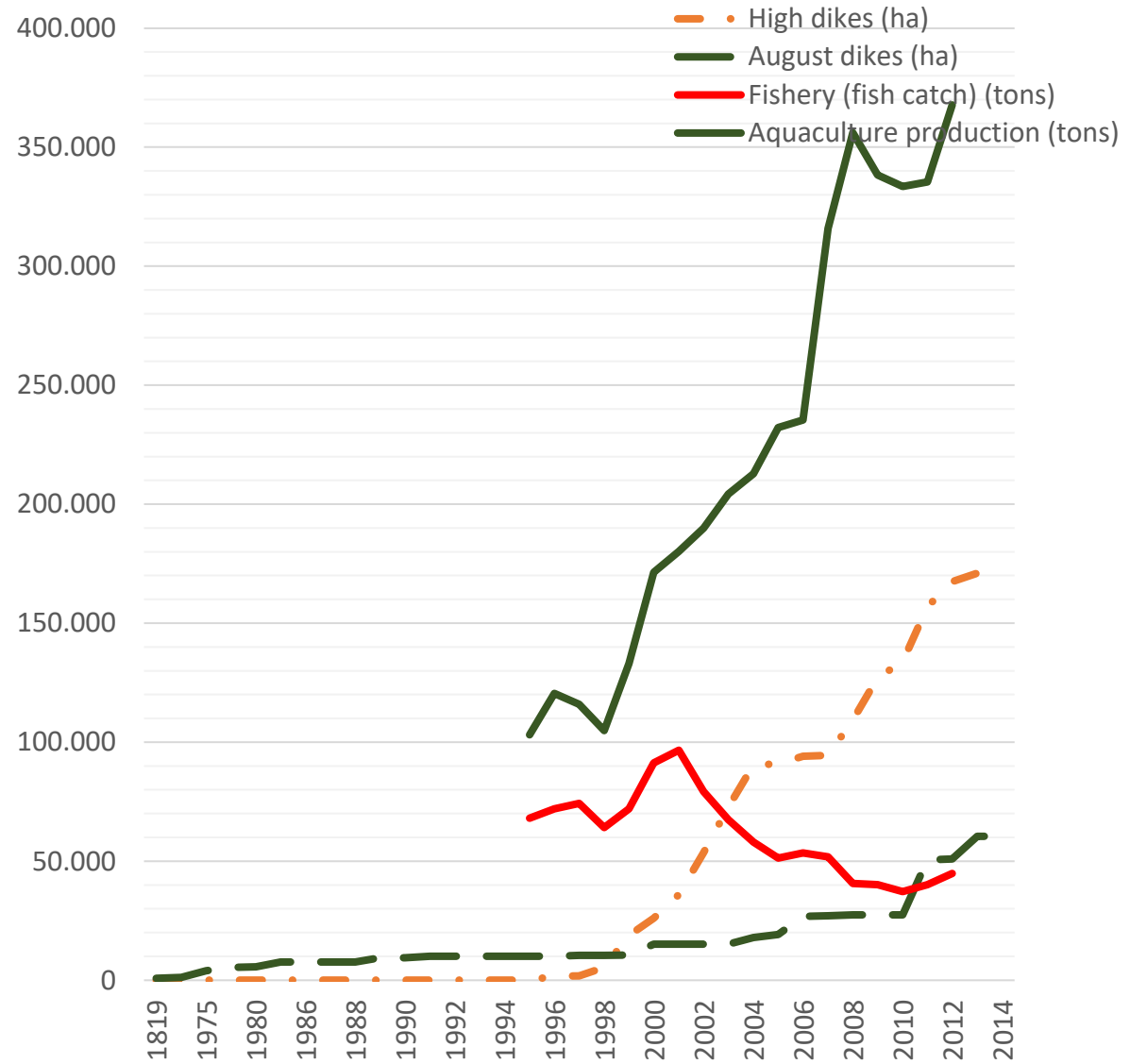
Authors (year)	Findings/ Recommendation
Nguyen et al. (2018)	Rice yields increased after 15 years of building dikes Increased use of fertilizer and pesticides after 15 years of building dikes
Dung Duc Tran et al. (2018)	the profitability of three rice crops decreases overtime due to the increase in production costs (fertilizer and pesticides), and the high dikes created environmental costs or triple crops have long-term negative impacts on environment and economic
Dung Duc Tran et al. 2019	Extensive development of high dikes on the floodplains is the least economical and most ecologically risky alternative
Tong (2017)	It is argued that planting three crops (“intensive cropping”) cannot provide a sustainable alternative to balanced cropping, either from an economic or an ecological viewpoint
Chapman and Darby 2016	Negative impacts have been associated with dike construction for rice intensification, particularly in relation to its exclusion of fluvial sediment deposition from the floodplain



Livestock/animals development



Dikes
diminished fish
catch, but
increased
aquaculture
product



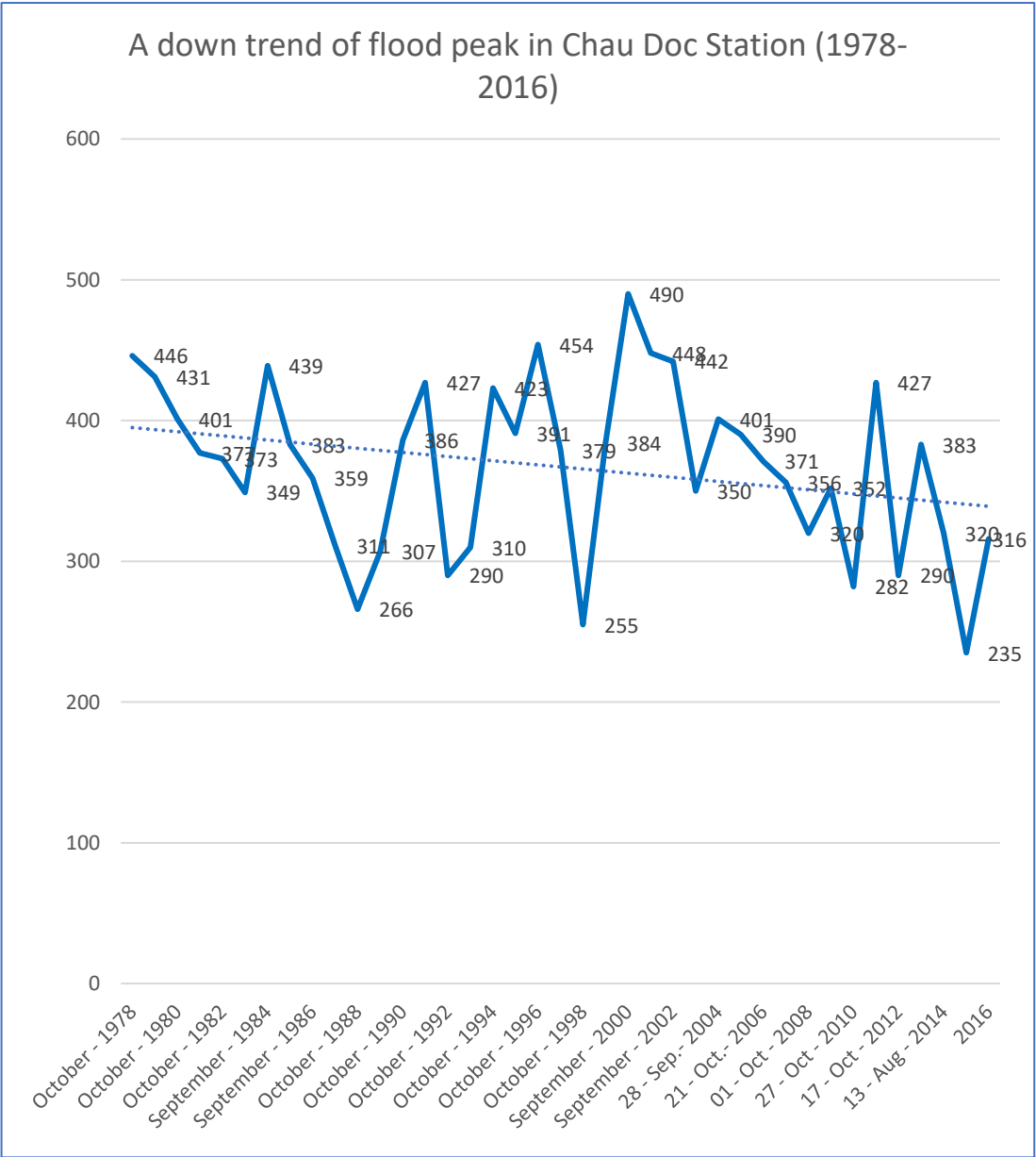
The benefits of the flood recovery/retention

Locations	Farming Systems	Net return (VND/1000m ²)	Benefit/Cost Ratio
Chau Phu district (High dike)	3 rice crops/year(*)	4,827,200	0.71
Thanh My Tay commune (August dike)	2 rice crops/year	2,484,363	0.62
	2 rice crops + one cattle/year	13,959,780	0.56
	Chili + one cattle/year	15,685,217	0.54
	Chili + one Sesbania sesban crop	7,858,700	0.62
	2 rice crops + one Sesbania sesban crop	6,133,263	0.71
My Phu Commune	2 rice crops	2,620,881	0.57
	2 rice crops + one cattle/year	11,960,101	0.50
	Maize – Mung bean	11,047,000	1.07
	Mung bean-pumpkin-rice	4,496,826	0.40
	Maize- maize	21,014,000	1.75
Tri Ton district (Flood retention)	Floating rice - cassava	4,425,000	1.81
	Floating rice - leeks	24,895,000	1.68
	Floating rice - chili	17,745,000	2.68
Thanh Binh district – Dong Thap	Floating rice - chili	16,763,314	1.12
Cho Moi district	Floating rice – sticky corn- baby corn- baby corn- cattle (**)	18,557,500	0.48
	Floating rice – sticky corn- baby corn- baby corn	11,025,000	1.24



Externalities from flood controlled

Authors (year)	Findings
1. Duc Tran et al. 2018	Model results indicate that extensive construction of high dikes on the upstream floodplains has had limited effect on peak river water levels downstream in Can Tho. Instead, the model shows that the impacts of dike construction, in terms of peak river water levels, are concentrated and amplified in the upstream reaches of the delta.
Le et al. (2007)	Dikes built in the Mekong increased flood in non-flood areas, North Western part of the delta, Long An province





**Emerging challenges in governance
of flood retention inside and
between dike compartment**

Thinking of flood retention in the future

