



Land-Cover and  
Land-Use Change Program

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and Agriculture in South/Southeast Asia**

**Productivity, damages, and losses of rice in  
Cambodia: past, present and future trends in the  
Mekong and Tonle Sap regions**

by

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# Background

- Agriculture remains a catalyst for the national economy and food security, ensuring equity and promoting rural socio-economic development.
- The country's economy and rural livelihood have relied on agriculture, contributing 20.7% of the GDP and employing 31.2% of the total population in 2021.
- Approximately **60.6% of the total population live in rural areas**, more than 90% of whom are dependent on agriculture as the primary source of food security.
- The Agricultural Sector Strategic Development Plan (2014-2018) has encouraged the private sector's participation and household cultivation for commercial.
- The RGC has put its strong commitment to **modernizing the agricultural sector** based on a new approach and changed scope and pace to shift growth in this sector, primarily depending on expanded use of available resources, land, and traditional agricultural inputs and income.

# Objectives

To estimate rice production between 1998 and 2018 and the potentials in 2030. by taking a close look upon:

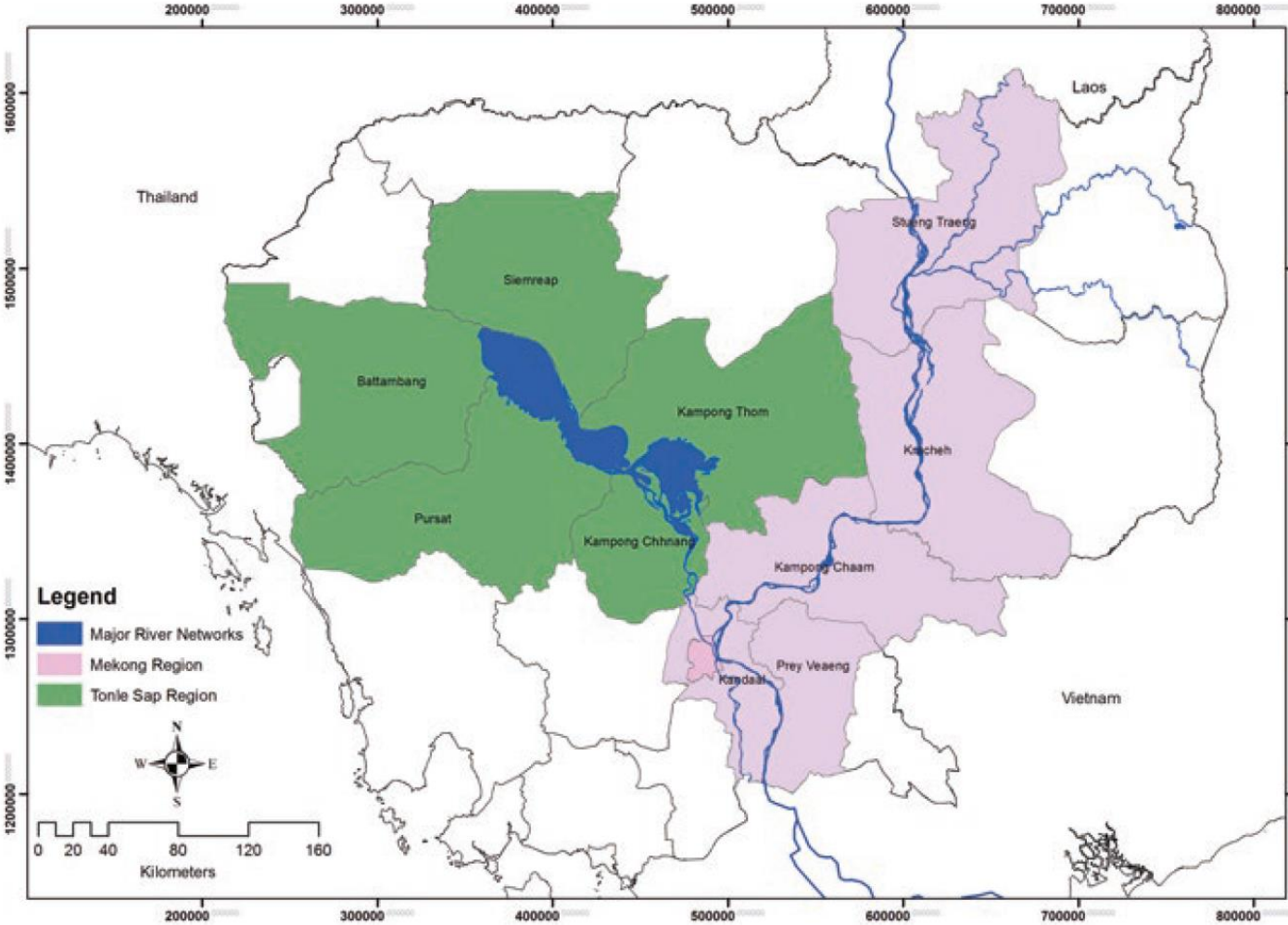
- ✓ (1) rice production trends between 1998 and 2018,
- ✓ (2) the causes of loss and damage in rice production, and
- ✓ (3) future trends of rice production in the Mekong and Tonle Sap regions.



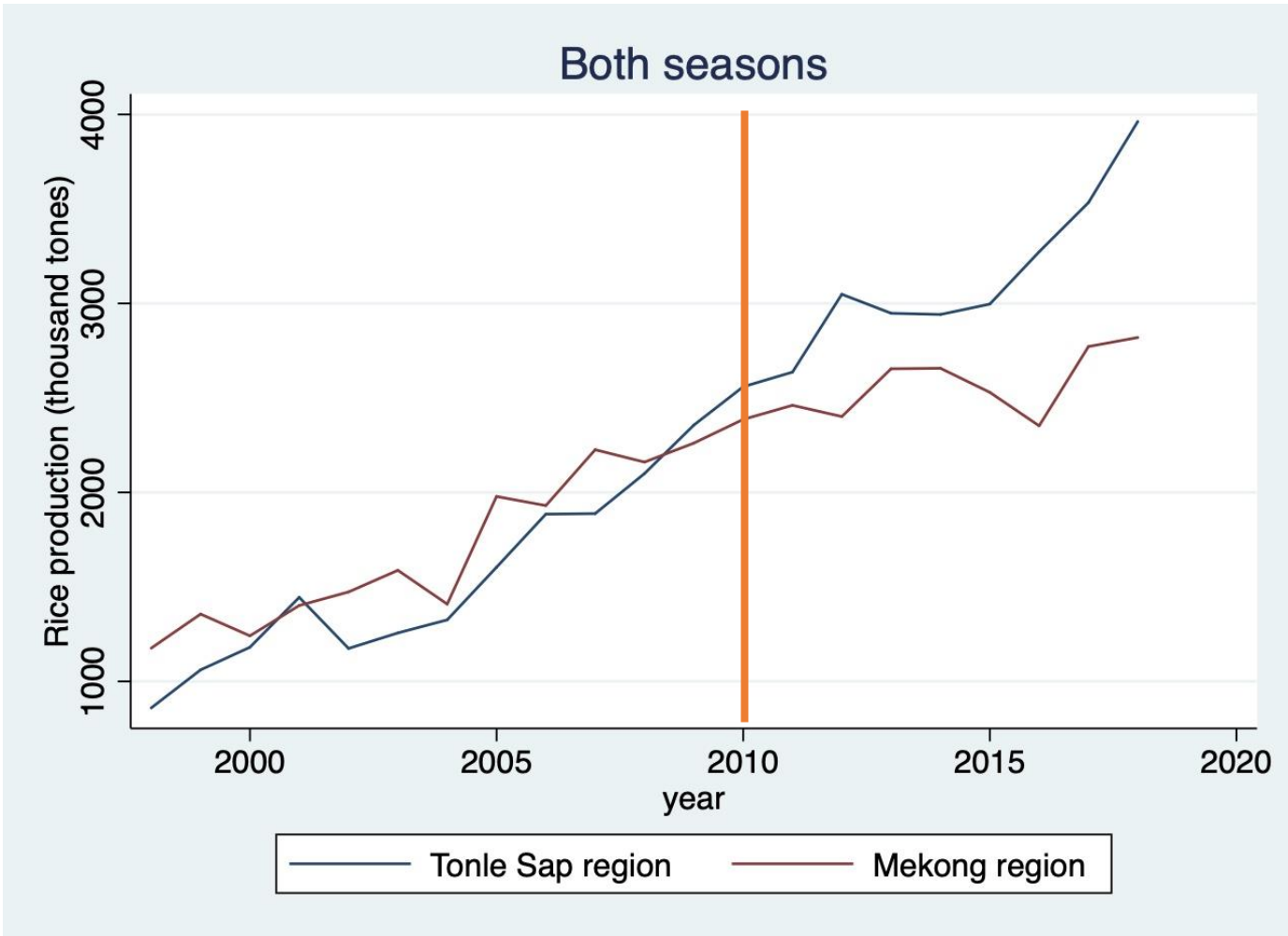
# Study Areas and Methodology

- **Study Areas:** Tonle Sap region (i.e., Battambang, Kampong Chhnang, Kampong Thom, Pursat, and Siem Reap provinces), the Mekong region (Kampong Cham, Kandal, Kratie, Prey Veng, and Stung Treng)
- **Type of Data :** raw data collected from the Ministry of Agriculture, Forestry, and Fishery (MAFF) were employed to analyze rice production, rice production by seasons.
- In Cambodia, rice is cultivated twice a year in both wet-season and dry-season. Dry-season rice is only cultivated in some areas where water is available.
- Typically, the cultivated land of wet-season rice is higher than dry-season rice, but dry-season rice produces a higher yield than wet-season rice.

# Map of the Study Areas

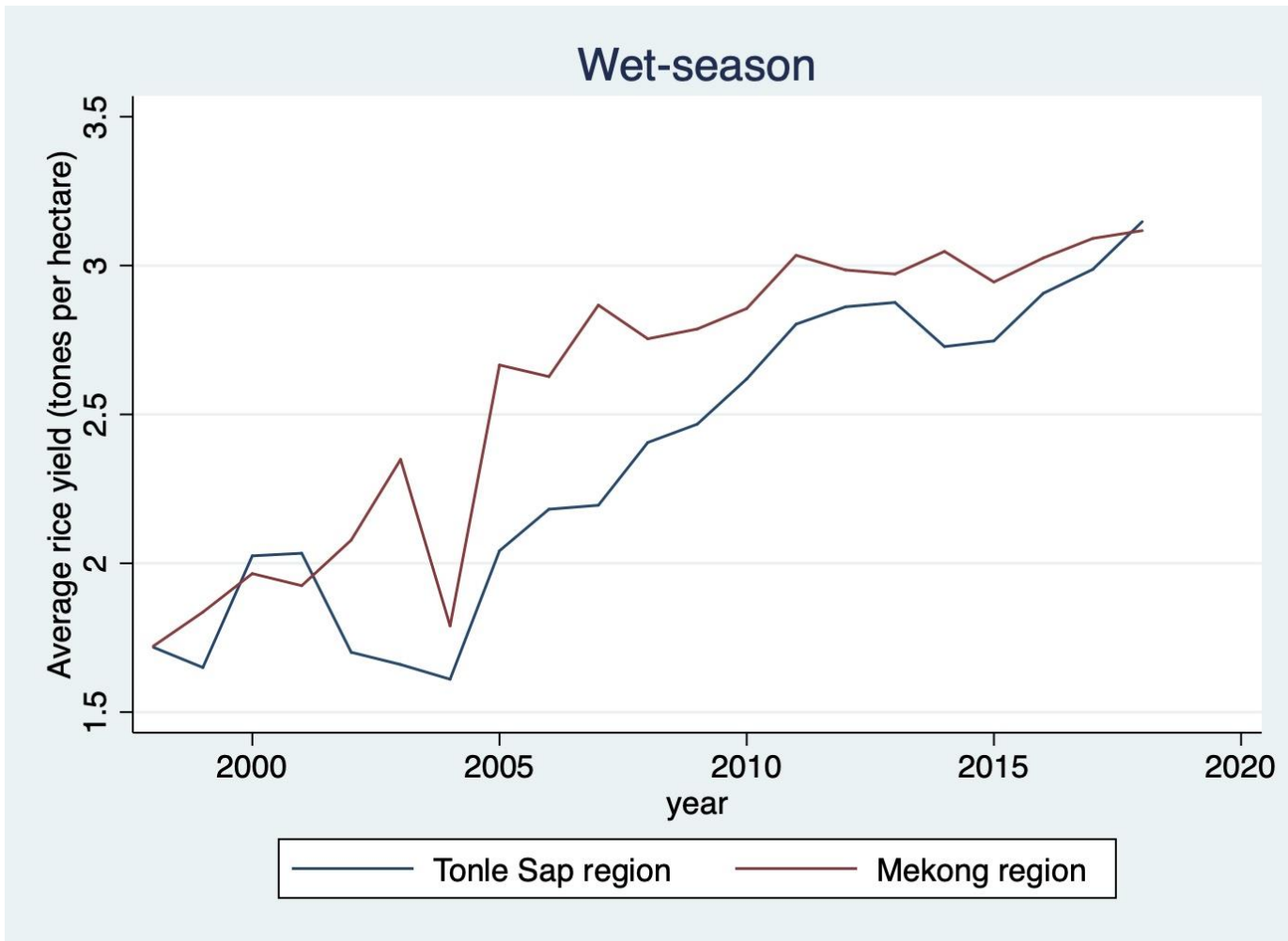


# Rice Production Trends Between 1998 and 2018



- A dramatic increase in rice production from 1998 to 2018 in the Mekong and the Tonle Sap regions.
- The lowest rice production was recorded during the **1990s**, but the highest rice production started from **2010**.
- Overall, an average rice production per annum was recorded at 2.19 million tons in Tonle Sap region and 2.06 million tons in the Mekong region.
- While the total rice production in the Tonle Sap region **increased** from 860 thousand tons in 1998 to 3,962 thousand tons in 2018, it increased from 1,176 thousand tons in 1989 to 2,820 thousand tons in 2018 in the Mekong region.

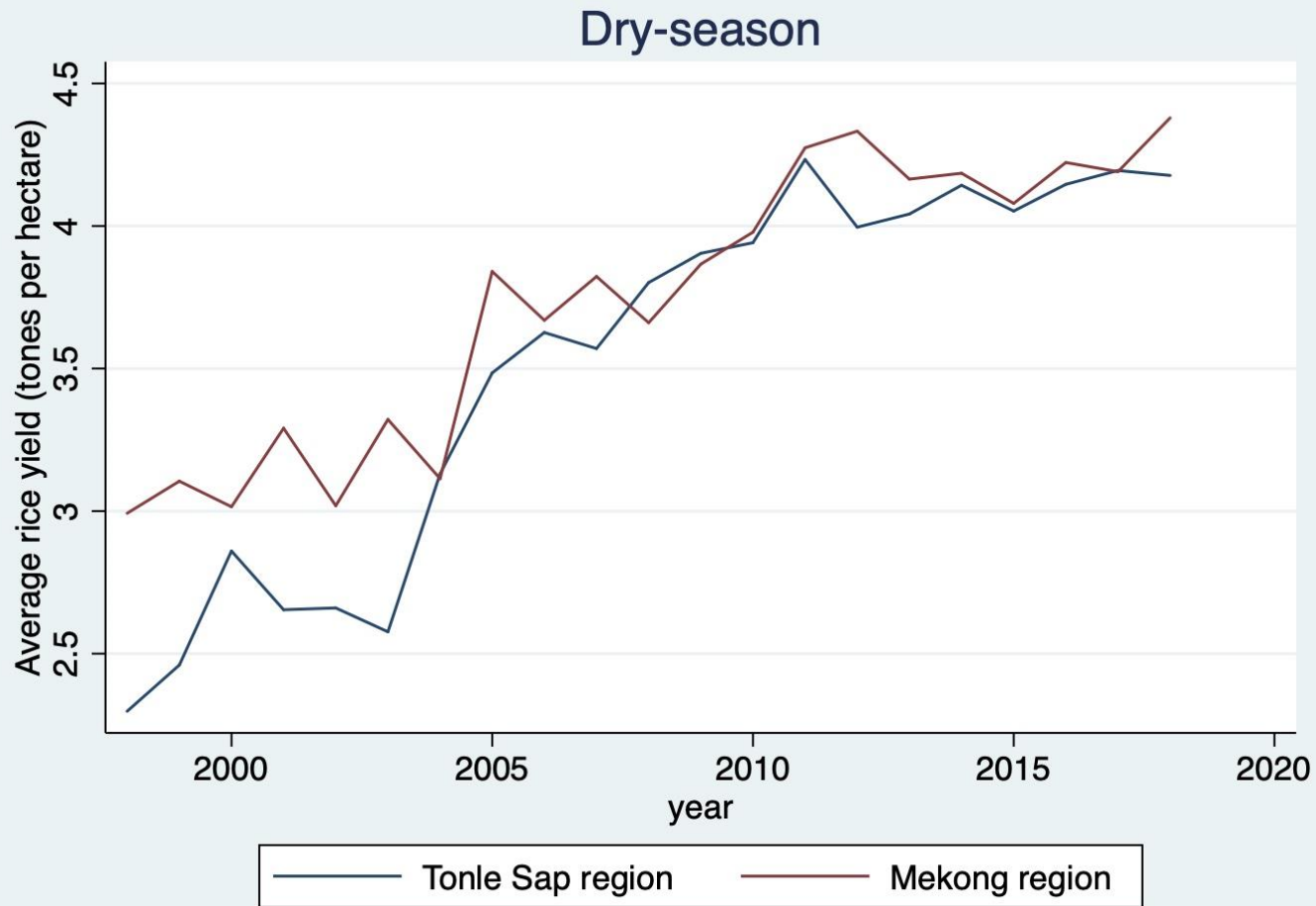
# Rice Production Trends Between 1998 and 2018



- An average rice production in the **wet season** per hectare of the Mekong region (2.59 tons) was slightly higher than in the Tonle Sap region (2.35 tons)



# Rice Production Trends Between 1998 and 2018

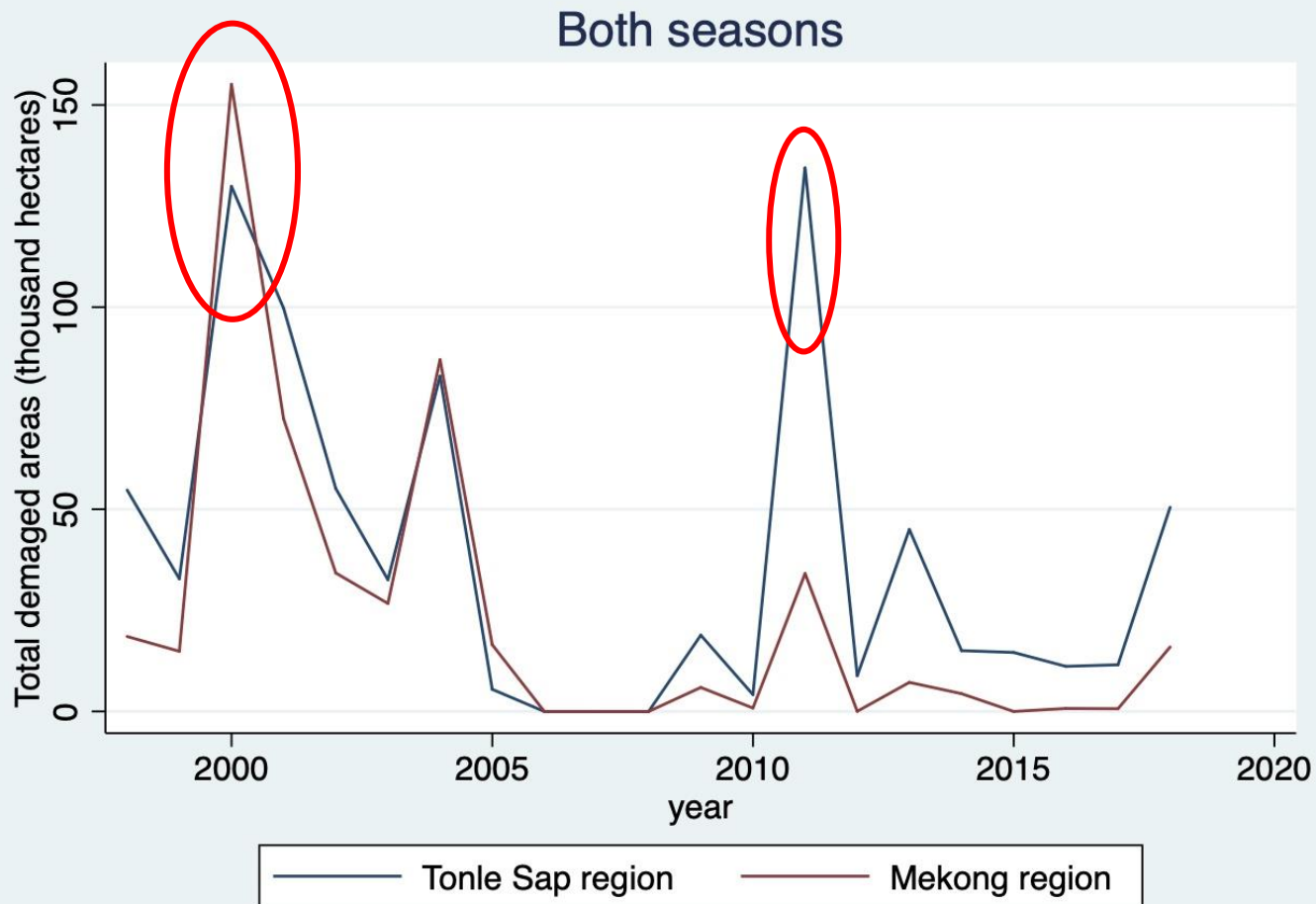


- An average rice production in the **dry season** per hectare of Tonle Sap region (3.52 tons) shared a higher proportion than those in Mekong region (3.74 tons)



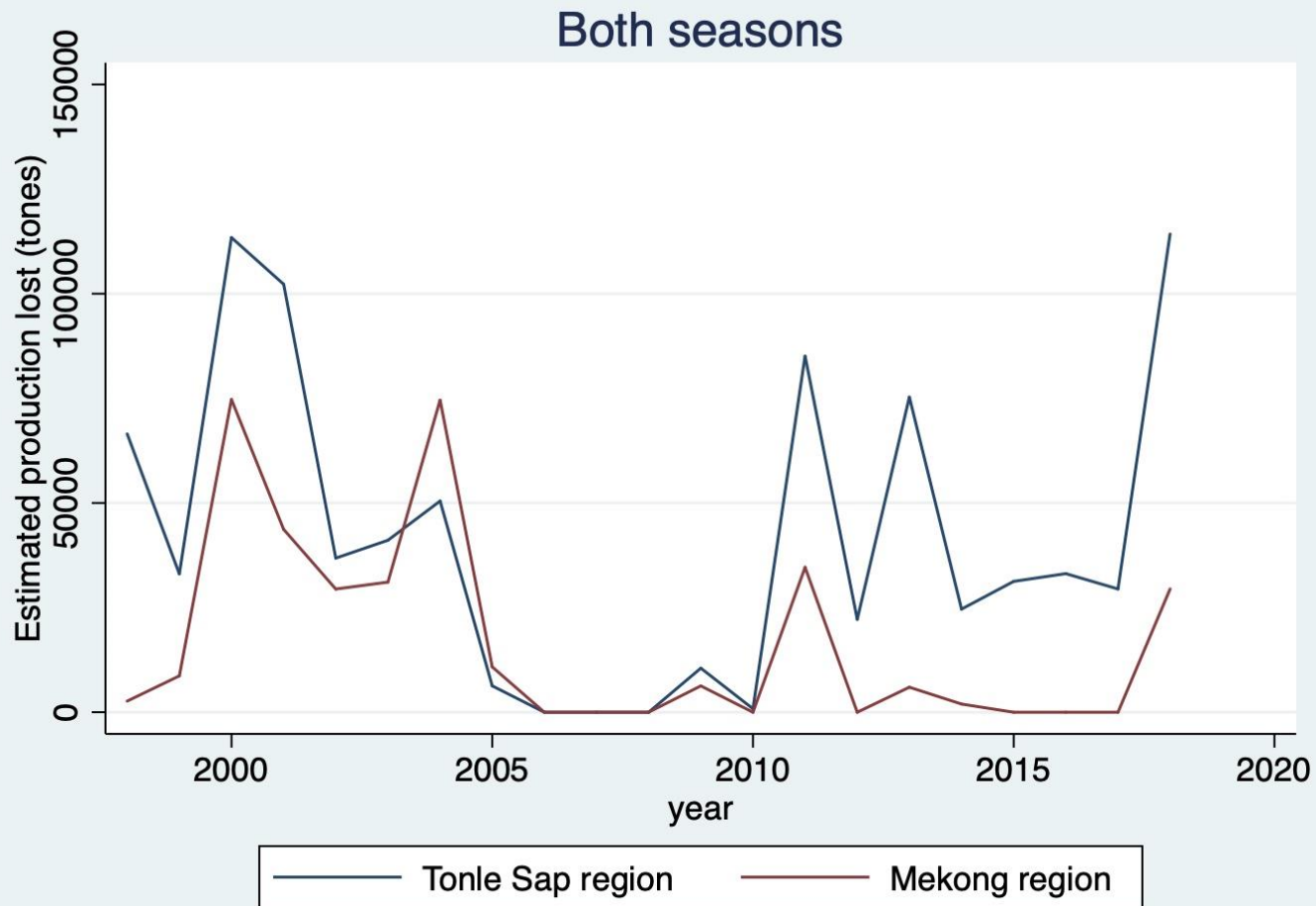


# Estimated cultivated areas damaged



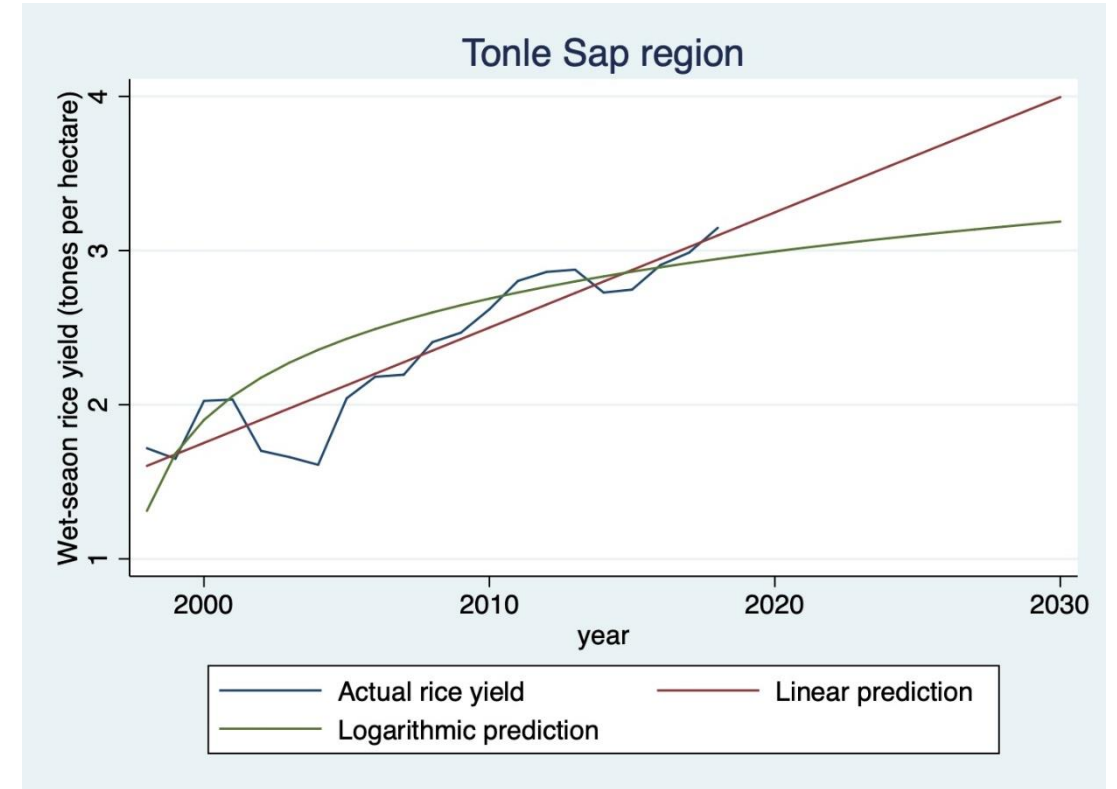
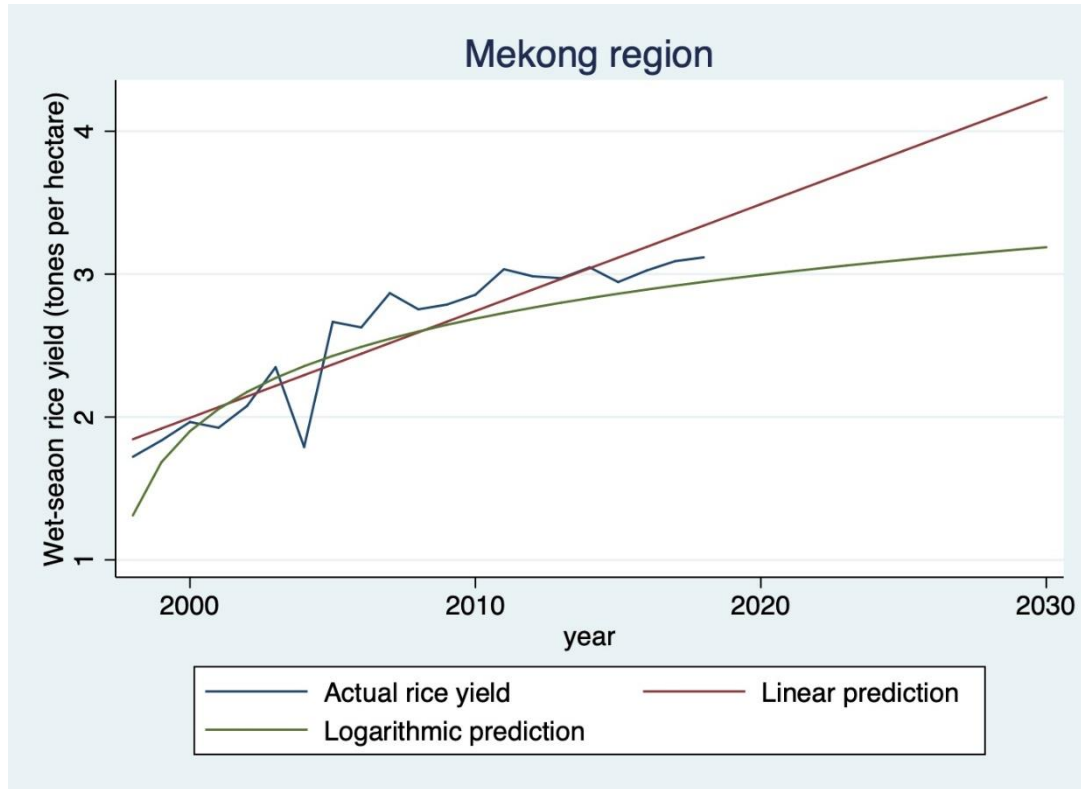
- Between 1998 and 2018, an average cultivated area **damaged** in the Tonle Sap region (38,448 hectares per year) was higher than in the Mekong region (23,584 hectares per year).
- The Tonle Sap region's cultivated area was severely affected by **both floods in 2000 and 2011**, but the Mekong region was only seriously affected in 2000.

# Estimated cultivated areas damaged



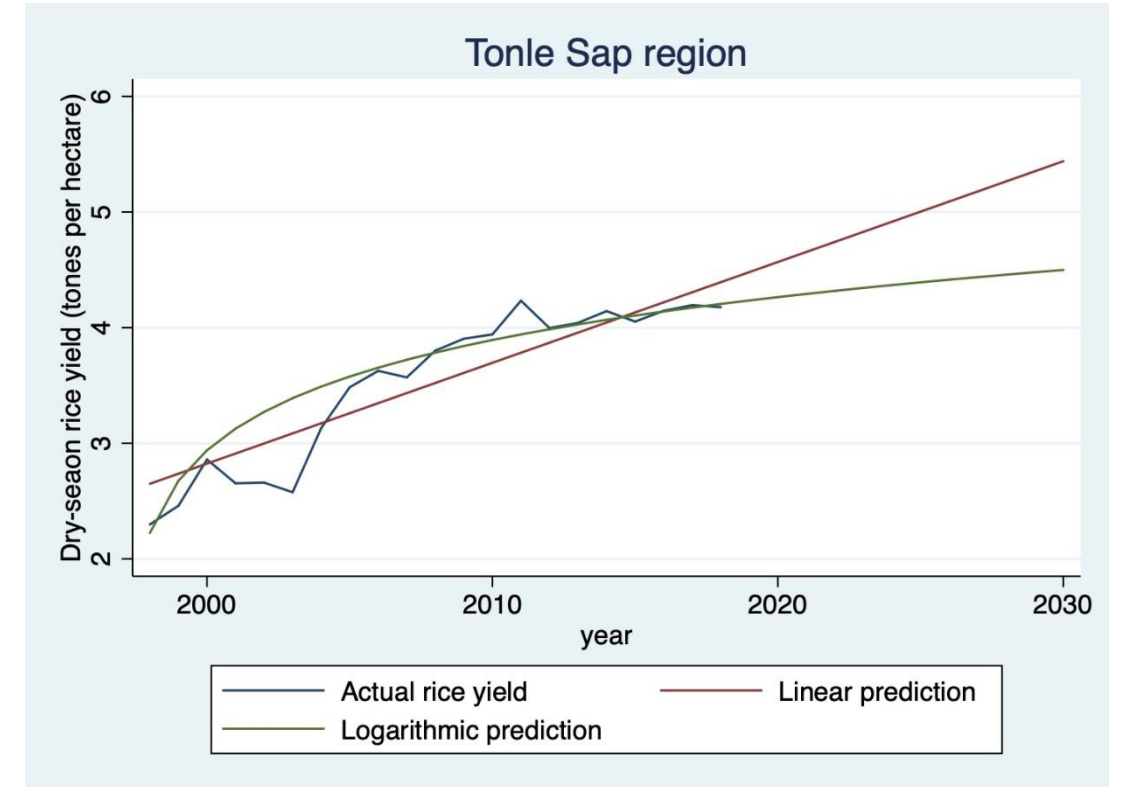
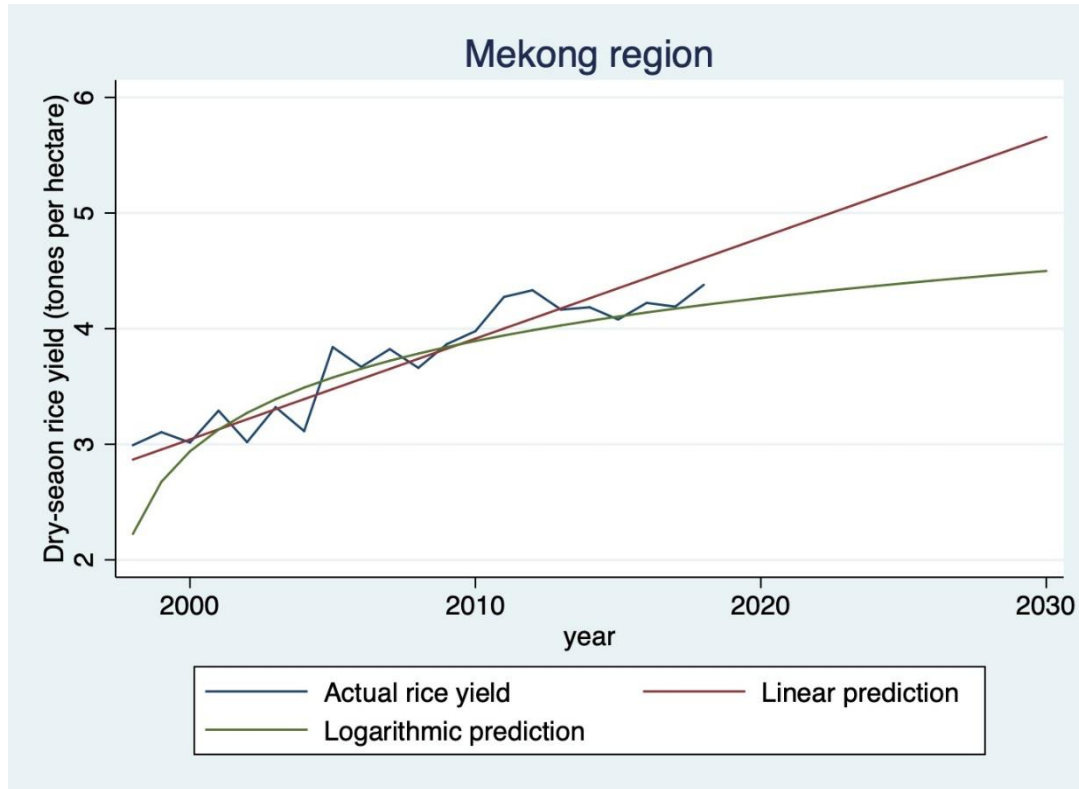
- An average estimated total annual rice production loss was greater in the Tonle Sap region of 41,741 if compared to the Mekong region of only 16,857 tons in the Mekong region.
- A record of total cultivated areas damaged peaked in 2000; it contributed 155,105 hectares in the Mekong region and 134,424 hectares in the Tonle Sap region. In the Tonle Sap region, rice production damaged was recorded at 113,423 tons in 2000, 85,068 tons in 2011, and 50,463 tons in 2004.
- **In 2004, drought** damaged about 87,007 hectares in the Mekong region and 82,938 hectares in the Tonle Sap regions.
- **Flood in 2011** severely affected the cultivated areas in Tole Sap region of 134,424 hectares than the Mekong region of 34,102 hectares.

# Rice projection in the wet season between 2000 and 2030



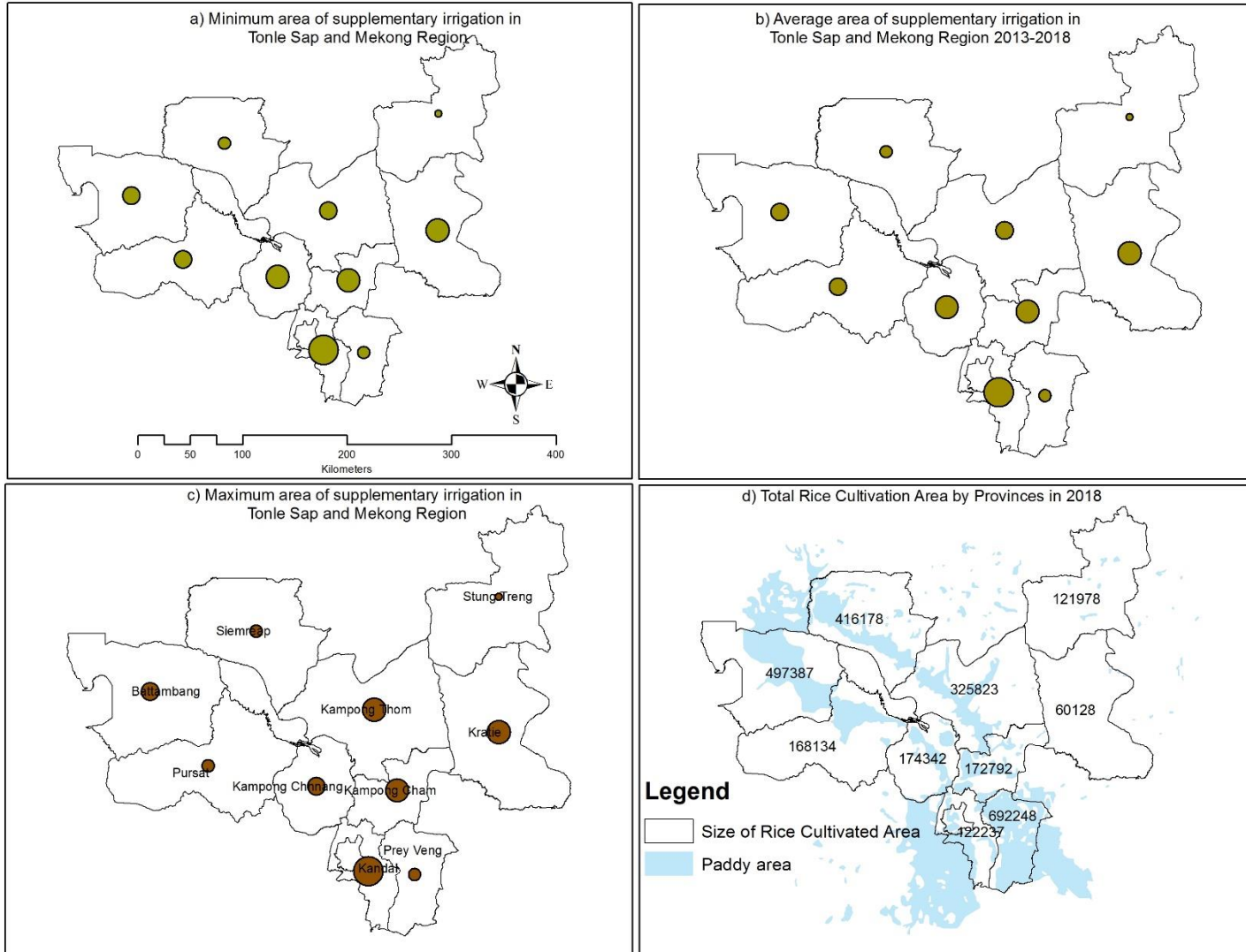
- The prediction using **logarithmic and linear** projection shows that rice production in the Tonle Sap region would be 3.20 to 4.00 tons per hectare in wet season rice and 4.50 to 5.44 tons per hectare in the dry season.
- In the Mekong region, rice production would be 3.20 to 4.24 tons per hectare in the wet season and 4.50 to 5.66 tons per hectare in the dry season.

# Rice projection in the dry season between 2000 and 2030



- The prediction using **logarithmic and linear projection** shows that rice production in the Tonle Sap region would be 3.20 to 4.00 tons per hectare in wet season rice and 4.50 to 5.44 tons per hectare in the dry season.
- In the Mekong region, rice production would be 3.20 to 4.24 tons per hectare in the wet season and 4.50 to 5.66 tons per hectare in the dry season.

# Supplementary Irrigation System



- The Tonle Sap Region, namely Kampong Chhnang, Kampong Thom, and Pursat, are very **sensitive to rainfall changes**, leading to changes in supplementary irrigation areas compared to provinces located in Mekong Region.
- Rice productions of the Tonle Sap region would experience **more fluctuation** with changing supplementary irrigation capacity

# Conclusion

- A dramatic **increase in rice production** from 1998 to 2018 and the highest rice production found in the present, starting from 2010. While the average rice in the Tonle Sap region was higher for the wet season, it was more significant in the Mekong region for the dry season.
- **Flood and drought** were the two leading causes of damaged cultivated areas. Comparatively, cultivated areas damaged in the Tonle Sap region contributed a higher proportion because flood seriously affects this region in both years of 2000 and 2011. A similar pattern in the Mekong and the Tonle Sap regions happened in cultivated areas damaged for dry and wet seasons.
- A prediction by 2030 shows that rice production in the **Tonle Sap** region would be between 3.20 and 4.00 tons per hectare in the wet season and between 4.50 and 5.44 tons per hectare in the dry season.
- In the **Mekong region**, rice production would be between 3.20 and 4.24 tons per hectare in the wet season and between 4.50 and 5.66 tons per hectare in the dry season.
- Today, rice farmers **were challenged** with the long-term use of conventional farming techniques, lacking knowledge of the rice crop water requirements, and high use of fertilizers.
- An **irrigation system including a supplementary** one would be essential to ensure water in both wet and dry seasons.

**Thank You!**

