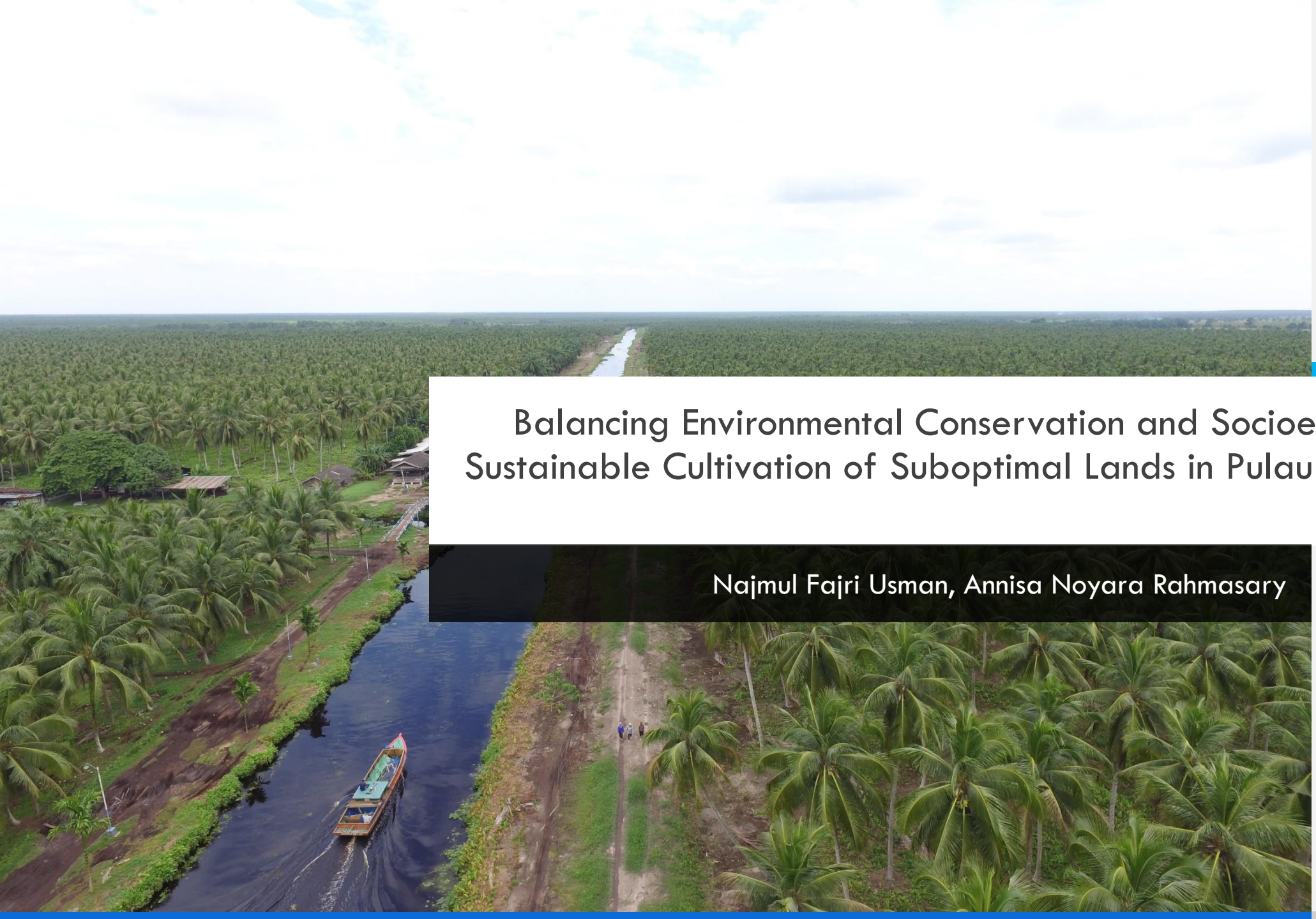

Balancing Environmental Conservation and Socioeconomic Welfare: Sustainable Cultivation of Suboptimal Lands in Pulau Burung District of Riau Province

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Content

- Problem definition
- Objective
- Methods
- Results
- Discussion

Problem definition

The world's food in 1 minute

Produced	Consumed	Wasted
7,605 tonnes	5,133 tonnes	2,472 tonnes

In 2018, 9.2% of the world population (> 700 million people) is exposed to severe level of food insecurity.

In 2050, there will be 10-billion people who will not spread evenly across the nation.

Population in 2050:

10 billion

Needed resources:

50%

Food and energy

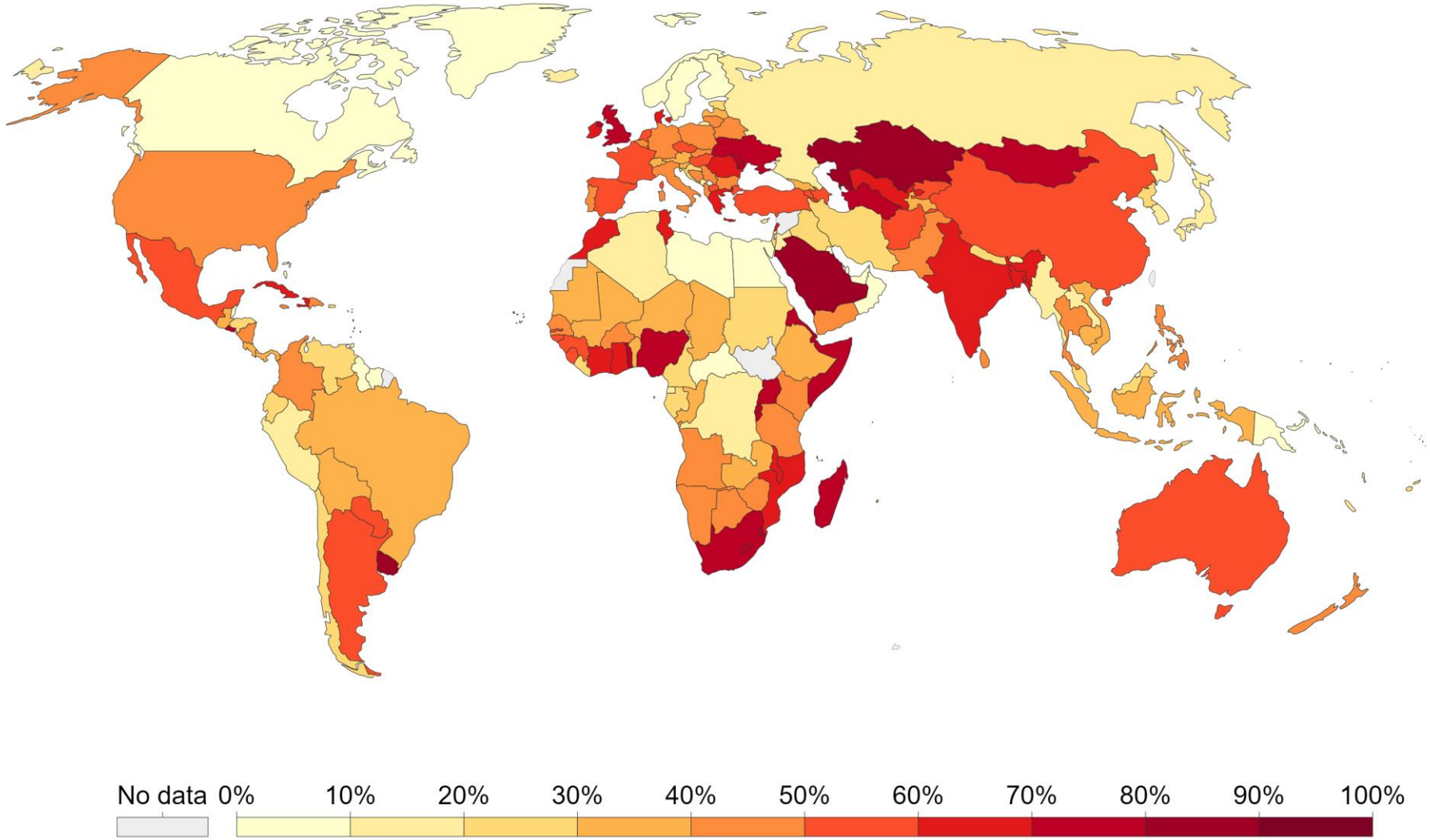
21%

Water

Share of land area used for agriculture, 2014

The share of land area used for agriculture, measured as a percentage of total land area. Agricultural land refers to the share of land area that is arable, under permanent crops, and under permanent pastures.

Our World in Data



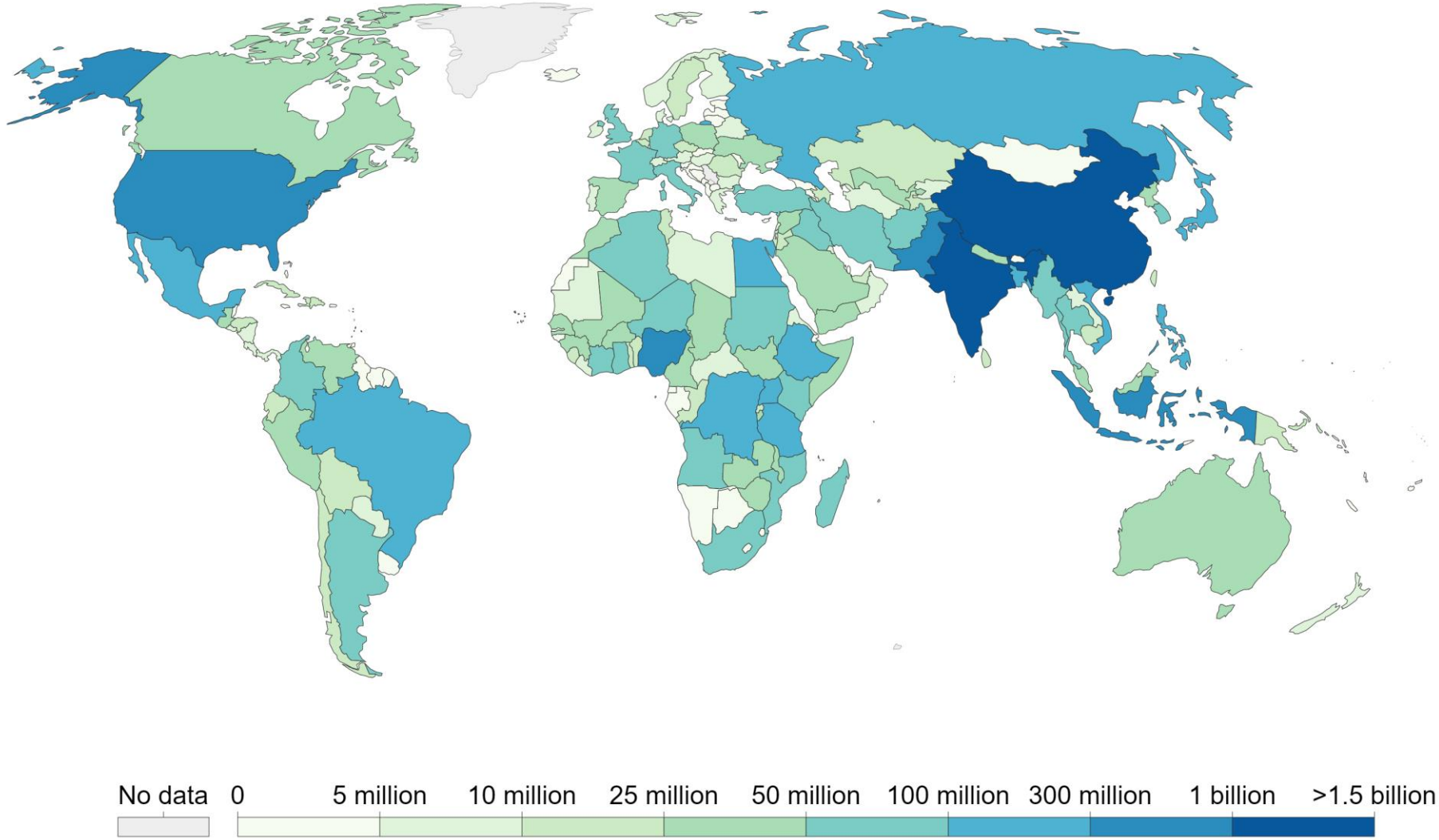
Source: World Bank

OurWorldInData.org/yields-and-land-use-in-agriculture/ • CC BY

Population projection by the UN, 2050

Shown is the total population since 1950 and the Medium Variant projections by the UN Population Division until 2100.

Our World in Data



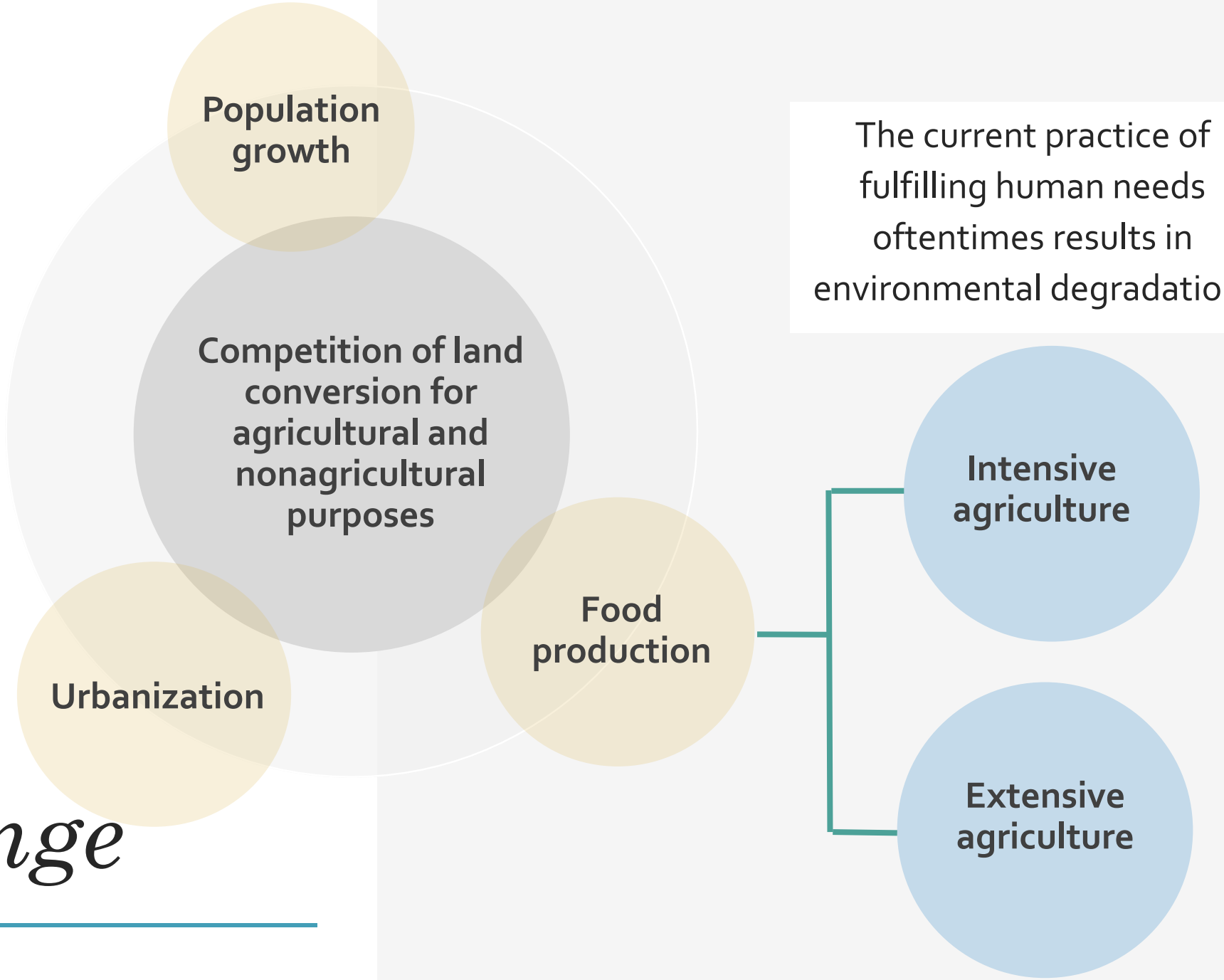
Source: UN Population Division (2017 Revision)

OurWorldInData.org/future-population-growth/ • CC BY

Where to live?

Where to produce food?

Challenge



The current practice of fulfilling human needs oftentimes results in environmental degradation.

Suboptimal lands

- Types: acidic dryland, dryland in dry climate, tidal swamp, lowland swamp, and peatland.
- "Label": low productivity, reduced economic return, severe limitations for agricultural use.
- In fact, suboptimal lands can be enhanced to be a productive one.

Opportunity

In Indonesia

91,9 million ha

Pros:

1. Available suboptimal lands with potential.
2. Growing research on new innovation.
3. Increasing empowerment programs for all layers of stakeholders.

"Food production and land conservation have historically been viewed as mutually exclusive."

Cons:

1. The complex characteristic of which also provide various ecosystem services.
2. Conflict of interest.
3. Inadequate implementing capacity.

Gaps

From the proposed challenges and opportunities, we want to address these following gaps:

- How to cultivate the suboptimal land sustainably?
- How to change the public perception on managing suboptimal lands?

Objective

Approach

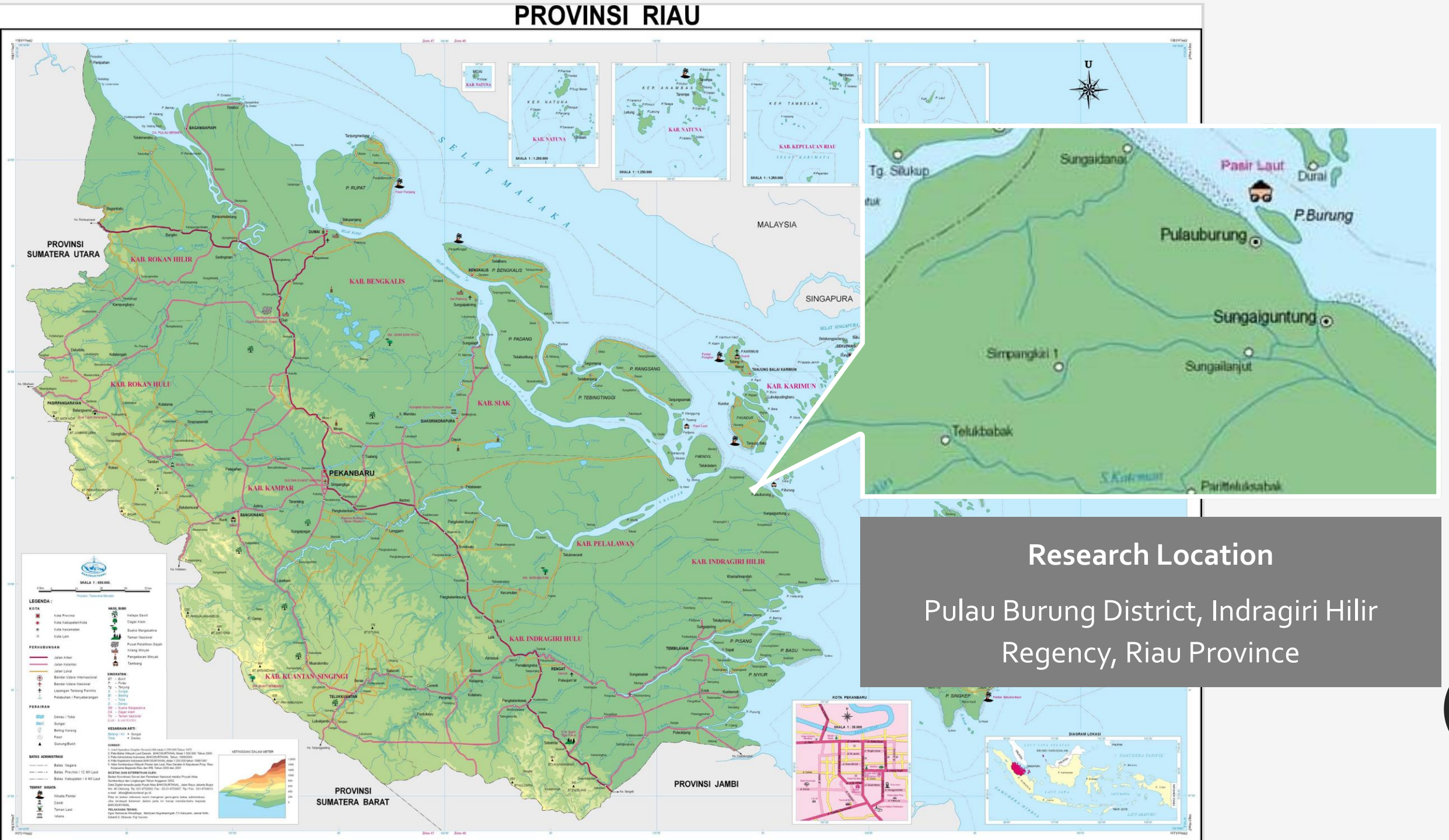
Using a case study of sustainable agricultural practice in Pulau Burung District, Indragiri Hilir Regency, Riau Province

Aim

This study introduces the integrated water management system and soil technology used to exert the highest benefits from a sustainable suboptimal land cultivation practice.

Methods

- Desk research
- Field visit (direct observation and secondary data acquisition)
- Semi-structured interview



Research Location

Pulau Burung District, Indragiri Hilir Regency, Riau Province

14
villages

Area of (km2)
538

Elevation (m)
~12,5

Slope (%)
<8

Rainfall (mm/yr)
~2000

PULAU BURUNG DISTRICT

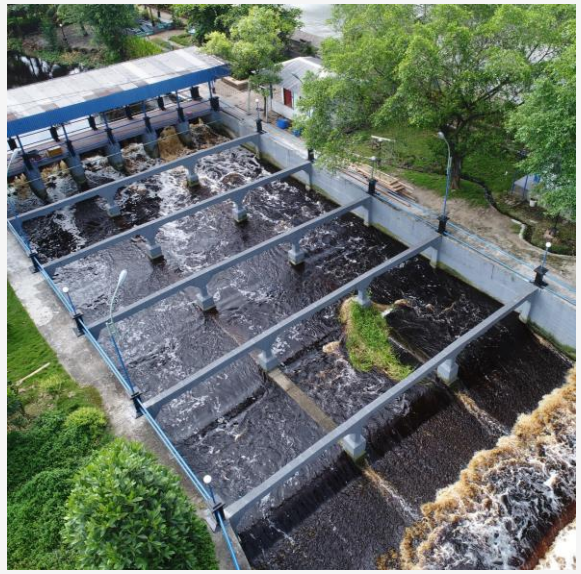
- Located in the eastern coastal area of Riau Province.
- Is a lowland, flatland, and peatland.
- Has a climate type A based on Schmidt-Fergusson.

PIR-TRANS

In 1987, thousands of people were given houses and land via this program.

SAMBU GROUP

Next to assisting the implementation of PIR-TRANS, the founder of this company built the existing water management system.



The water management trinity

- Regulates the freshwater from the precipitation events using its canal, dike, dam, and water gates
- Serves 4 main purposes: agronomy, fire risk, subsidence, and water transport.
- Cumulative canal length of more than **4000 km**.
- Designed to hold a volume of at least **45 million m³**.

Soil Technology

- Biopeat (instead of ashes application)
- Organic fertilizer
- Intercropping and multi-cropping , esp. to identify species that can grow in the land

BIODIVERSITY

Many households implement *subsistence agriculture* that adds to the list of local food crop variety

FRESHWATER

Provides more freshwater that is vital for the people.

45 Million m^3

Environmental Impact

SUBSIDENCE

Year	Rate (cm)	Year	Rate (cm)
1987-1988	3,3	2008-2009	2,3
1988-1989	3,0	2009-2010	3,0
1989-1990	4,5	2010-2011	4,3
1990-1991	1,7	2011-2012	0,9
1991-1992	1,8	2012-2013	3,2

Average rate of subsidence is **2,5 cm/year**.

FIRE RISK

By maintaining soil humidity, there is less risk of land fire.

Socio-economic Impact

On household scale

Better financial condition:

- Improved access to food
- Improved access to higher education

On regional level

Agricultural modernization:

- Improved access to public facilities
- Flourishing local economy
- Closer social interaction (i.e. *gotong-royong*)

Limiting factor

INEQUALITY

HOW TO IMPROVE THE EXISTING PRACTICE?

- Sustaining and disseminating the technical knowledge
- Promoting agents of change
- Raising people's awareness

UPSCALE

in different settings

Different environmental and socioeconomic settings will bring challenges in upscaling process.

It is **vital** to **improve governance capacity** including:

- Ensure high level of participation of all stakeholders
- Enable public and private partnership