

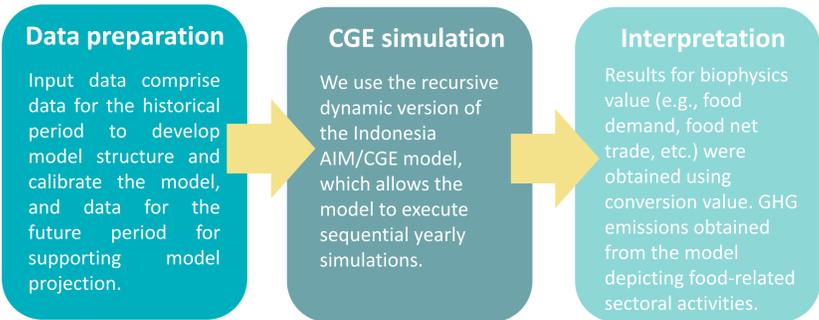
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INTRODUCTION

- For developing countries like Indonesia, of which the land-based sector is the main source of the country's GHG emissions, food issues could either be complementary or the bottlenecks for mitigation activities (Fukase & Martin, 2020; Interagency Agricultural Projection Committee, 2024; OECD & FAO, 2023).
- While issues on food loss and food waste have been mentioned multiple times in Indonesia's Long-Term Strategy (LTS), issue on sustainable diets has not yet been addressed in the LTS plan.
- Therefore, we attempted to assess environmental and socioeconomic impact from shifting food consumption preference under Indonesia's Long-Term Strategy scenario on Low Carbon and Climate Resilience.

METHOD

- This study utilizes the Asia-Pacific Integrated Model/Computable General Equilibrium (AIM/CGE) model for Indonesia's country case to accommodate the assessment of socioeconomic impacts.
- We utilize the 2016 Indonesia IO table, which we reclassify into food sectors, energy sectors, and others.
- The future growth of household demand for food products was adjusted yearly following the socioeconomic projections obtained from the model by using behavioral parameters of price elasticity and income elasticity.



Scenarios	Business as Usual (BaU)	Low Carbon Compatible with Paris Target (LCCP)	LCCP + Sustainable and Healthy Diet
Features			
Mitigation activities	No mitigation activities	Similar scale and magnitude	
Food demand	Similar scale and magnitude		Sustainable healthy consumption*

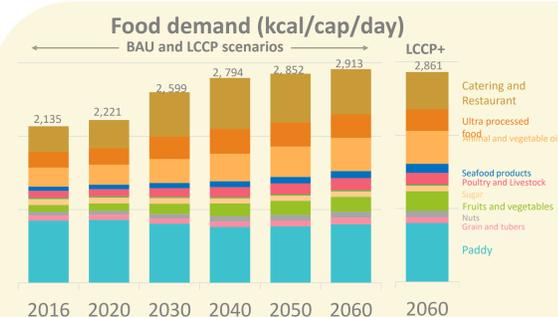
*Increasing high-nutrient food (e.g., fruits and vegetables) but with slower growth of processed food and non-home cook. The diet is mainly sourced from whole food. Lower food demand per capita with lower calorie structure for animal-source food compared to the BaU and LCCP.

REFERENCES

Fukase, E., & Martin, W. (2020). Economic growth, convergence, and world food demand and supply. *World Development*, 132, 104954. <https://doi.org/10.1016/j.worlddev.2020.104954>
 Interagency Agricultural Projection Committee. (2024). *USDA Agricultural Projections to 2033*. <https://www.usda.gov/sites/default/files/documents/USDA-Agricultural-Projections-to-2033.pdf>
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Food demand projection

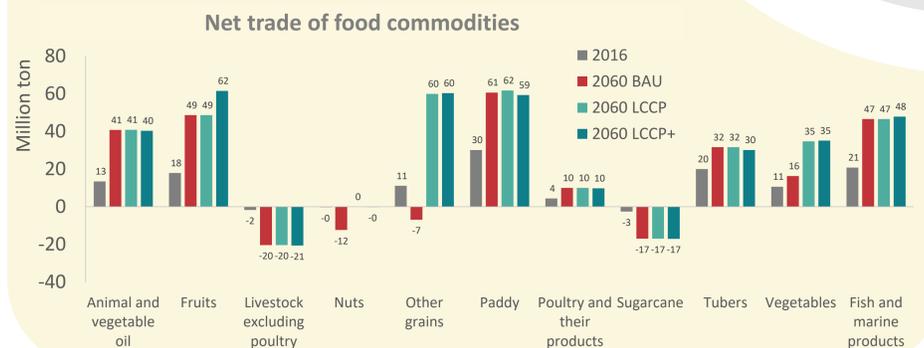


Under BAU and LCCP projection, food demand will increase from 2,135 kcal/cap/yr to 2,913 kcal/cap/yr. Under LCCP+ scenario, food demand in 2060 will reach 2,861 kcal/cap/yr. LCCP+ scenario offers higher portion of high fiber foods and seafood products.



Country's resilience to food scarcity

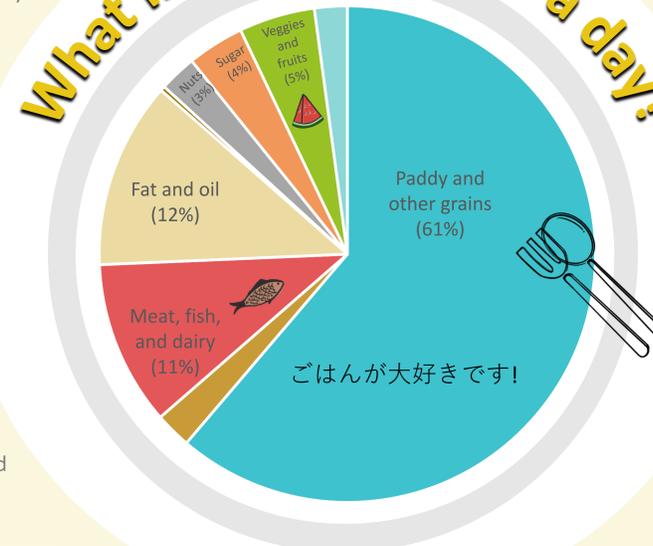
Future projection of food net trade indicates low country's self sufficiency on meat products, grains, and sugarcane. Land use optimization and productivity boost (under LCCP and LCCP+ scenarios) results in a more resilience food supply compared to BAU scenario.



RESULTS AND DISCUSSION

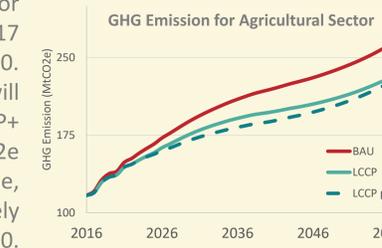
Under BAU and LCCP scenario, non-home cook contribution to daily calorie intake per capita is higher (32%) than LCCP+ scenario (28%).

What Indonesia eat in a day?



Under BAU scenario, GHG emission for agriculture sector will increase from 117 MtCO₂e in 2016 to 279 MtCO₂e in 2060. Slower emission growth will occur in LCCP and LCCP+ and reach 245 MtCO₂e and 241 MtCO₂e, respectively in 2060.

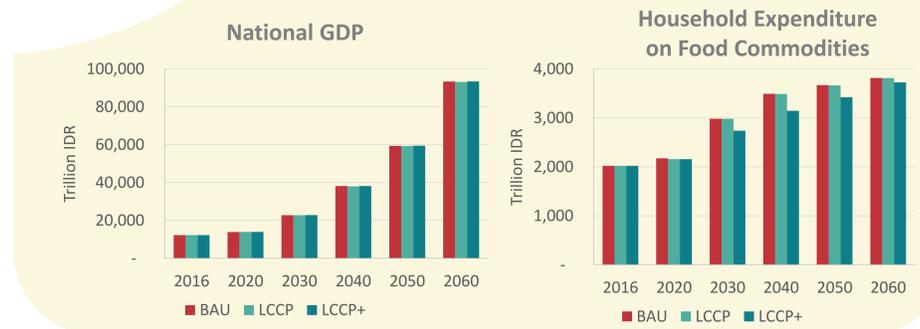
GHG emission trajectory



Mitigation activities in agriculture sector comprises adoption of low emission variety in 24% of total rice field and improved water use efficiency in irrigated rice field, improvement of livestock feed supplement, the effort to improvement in crop productivity and cropping intensity, and optimizing the use of unproductive land.

Socioeconomic impacts

The national GDP will reach IDR 93,348 trillion under the BAU projection. Under the LCCP scenario, national GDP was slightly lower than BAU, meanwhile, the LCCP+ scenario results in a slightly higher GDP. Regarding household expenditure on food products, the LCCP+ scenario offers a more wholefood-oriented diet and lower share of high price protein; therefore, resulting in a lower expenditure on food.



CONCLUSIONS

- Following the conventional trajectory of food consumption, there will be an increasing food demand in the future. Mitigation activities on agriculture sector may reduce the emission of production process; however, the demand on emission intensive food commodities were still remain.
- This study offers an alternative pathway of Indonesia Long-Term Strategy towards Net Zero Emission target under the behavioral changes on food consumption preference. Adopting a sustainable healthy consumption may results in a lower GHG emission trajectory and a more efficient spending on food products.