

Implications of the world aiming for
decarbonized society for global sustainability
- Integrated analyses of climate policies for simultaneous realization of
the Paris Agreement and the SDGs -

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TKP Garden city Premium Akihabara

20 November 2019

持続可能な開発目標 Sustainable Development Goals



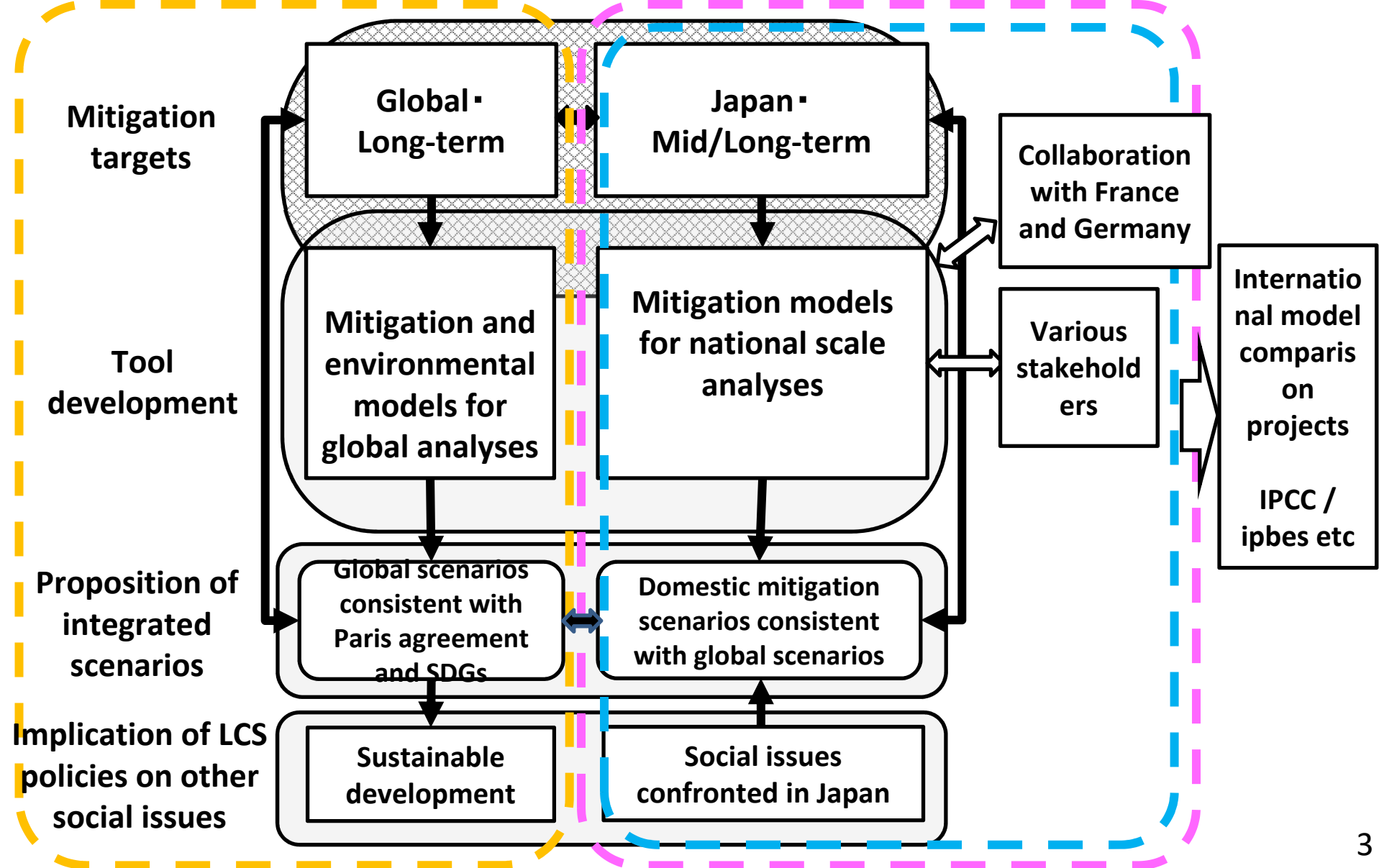
トレードオフ関係? 共便益関係?

Trade-off? Co-benefit?

ERTDF 2-1702 Framework of “Integrated Analyses of Climate Policies for Simultaneous Realization of the Paris Agreement and the SDGs”

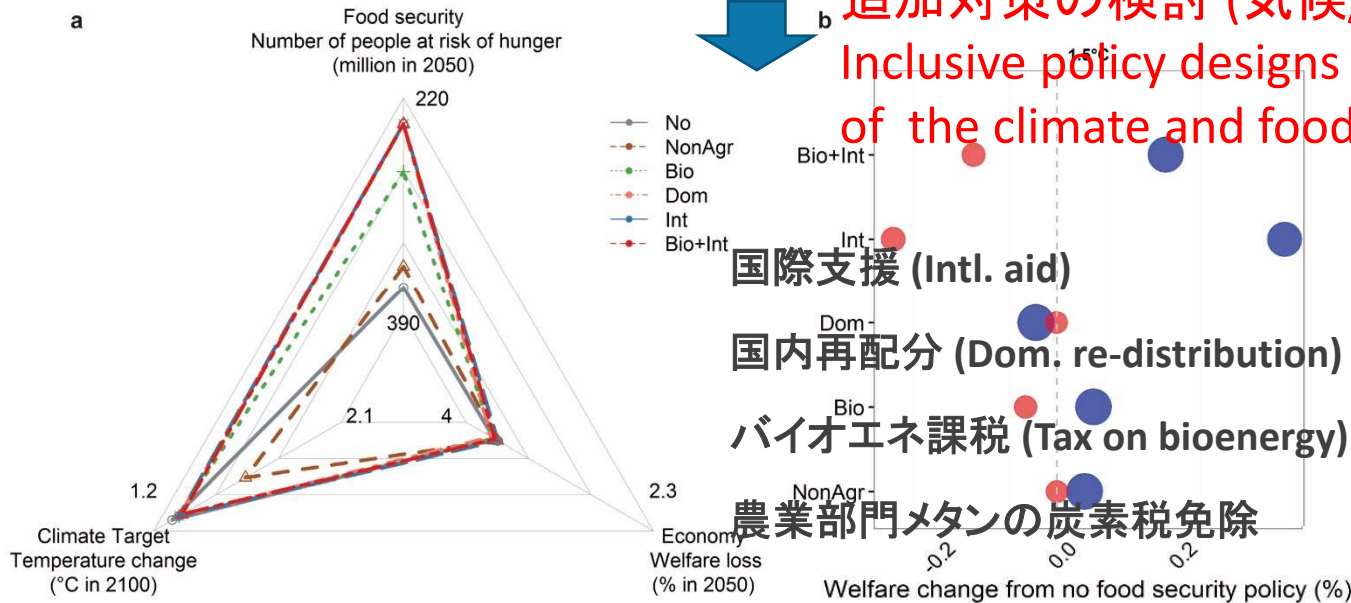
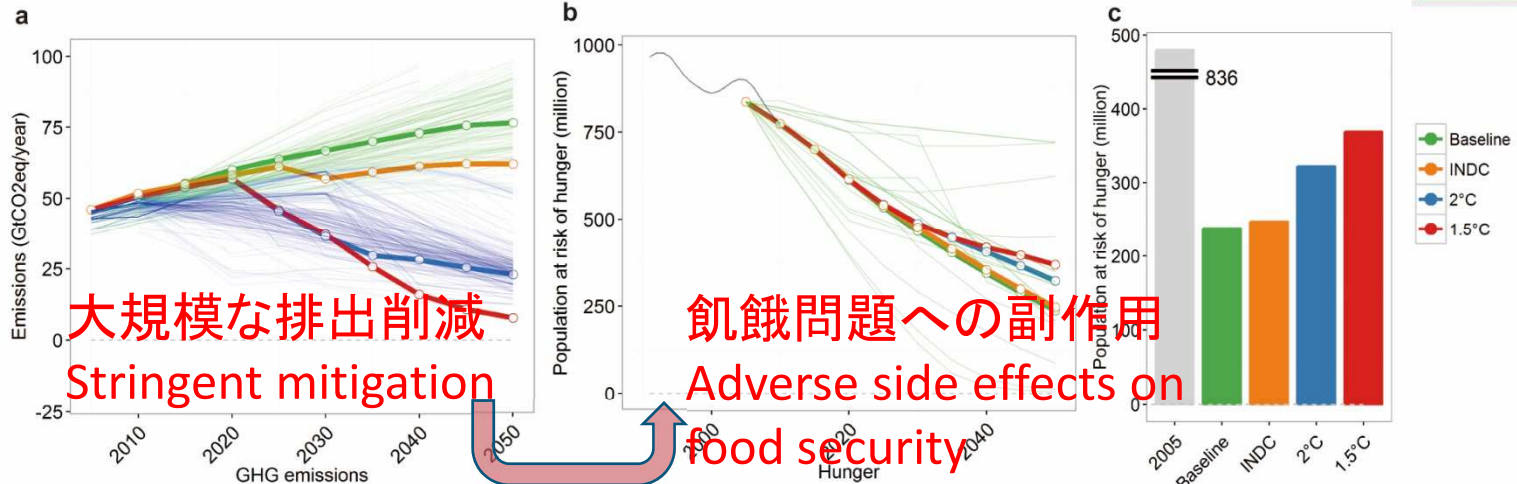
Theme1: Global climate policy analyses

Theme2・3: Japanese mitigation policy analyses



気候政策の食料安全保障への副作用を回避する追加対策

Adverse side effects of climate policy on food security and inclusive climate policy designs to solve them



Fujimori et al. (2018) *ERL.*, 13, 074033

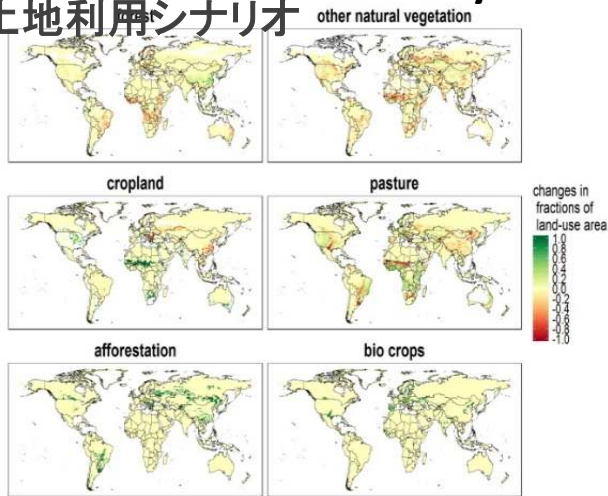
土地利用変化と気候変化による生物多様性への影響

Biodiversity loss through climate and land-use changes



SSP-Landuse scenarios by AIM

土地利用シナリオ

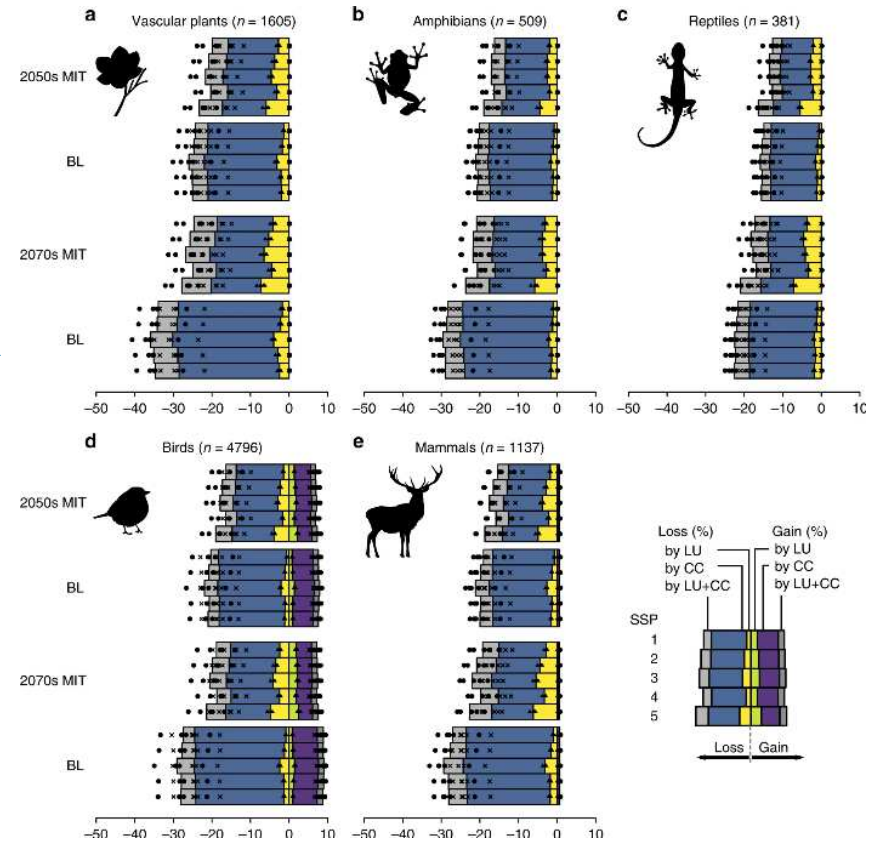


Biodiversity impact model

生物多様性影響モデル

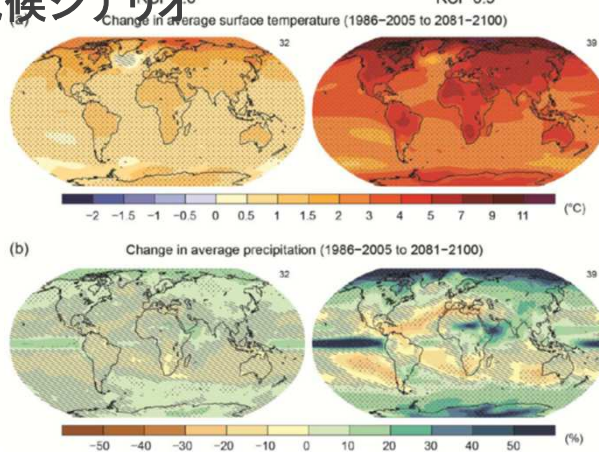
Change in Suitable Habitat for species

各生物種の生息適域の変化



RCP climate scenarios by CMIP5

気候シナリオ



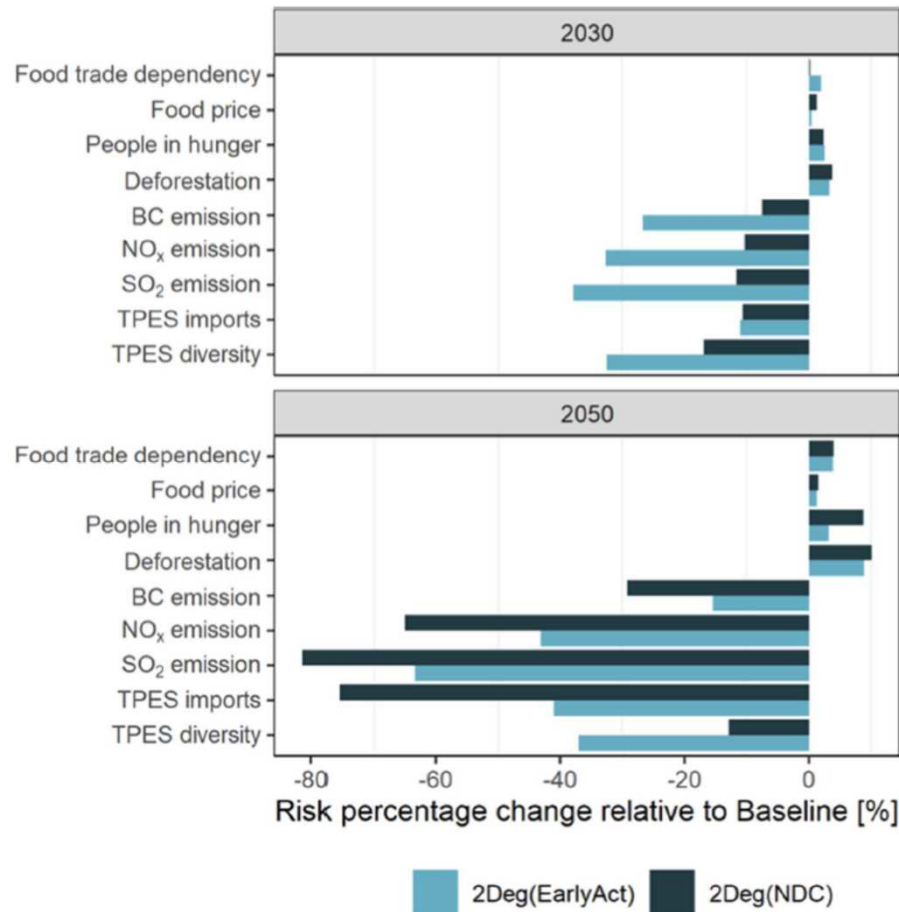
- Climate mitigation efforts would reduce the negative impacts on biodiversity even considering land-use change effect.
- 2°C目標に整合的な緩和努力により、その際に必要になる土地利用変化を考慮しても、生物多様性への悪影響を軽減できる。

中国を対象とした2°C気候政策と複数SDGsの同時達成分析

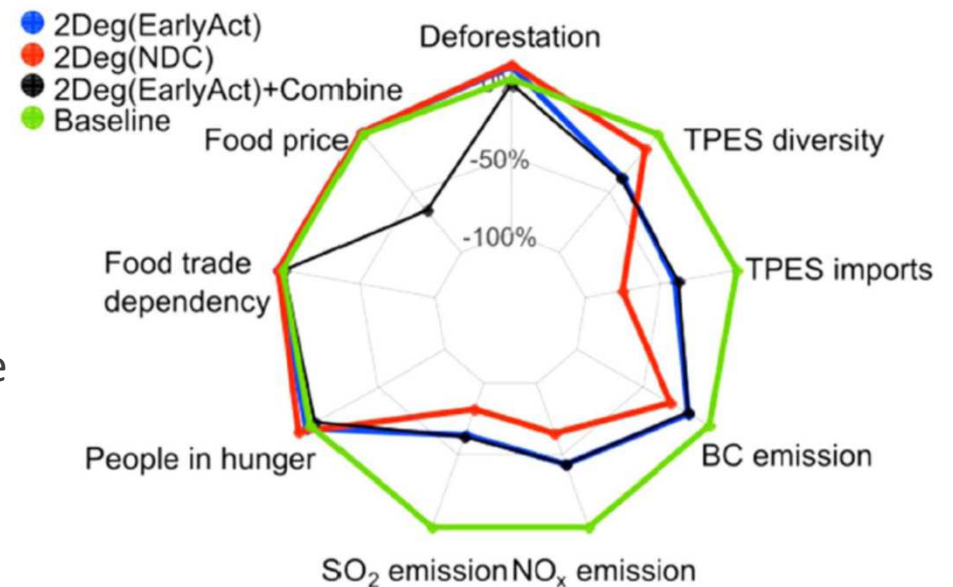
Align climate policies with multiple SDGs in China for the 2°C goal



Liu et al. (2019)
ERL, in press

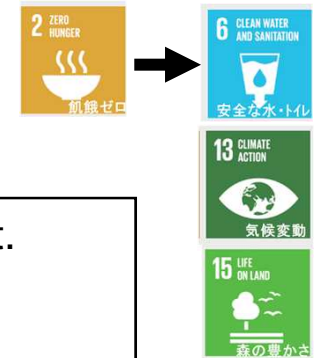


Early climate action + complementary policy package (food subsidy and forest land rent subsidy) successfully diminished the negative side effects while maintaining the co-benefits.

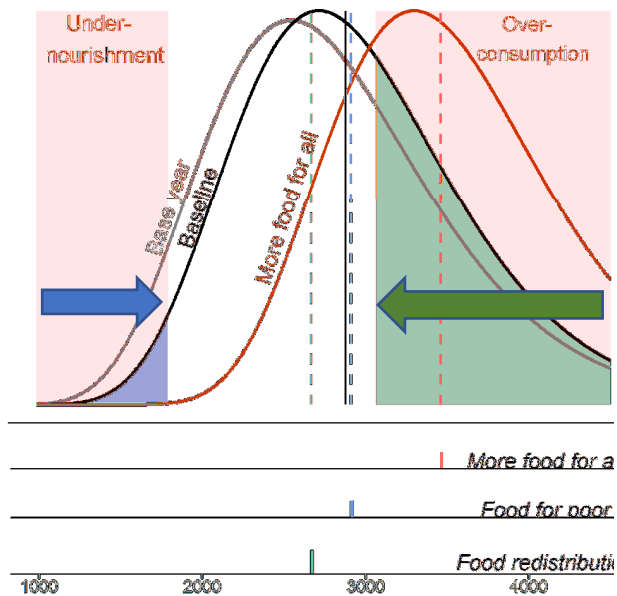


- Energy security and air pollution can have great co-benefits from climate actions
- Food security and land resources experience trade-offs.

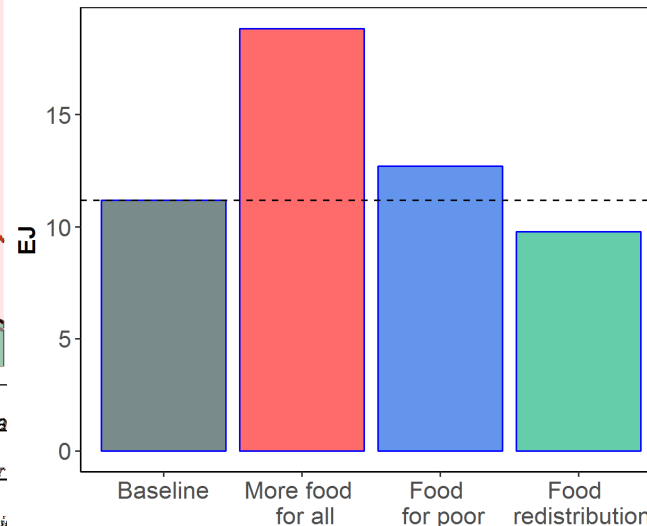
食料生産を減らしながら飢餓を撲滅する Ending hunger while reducing food production



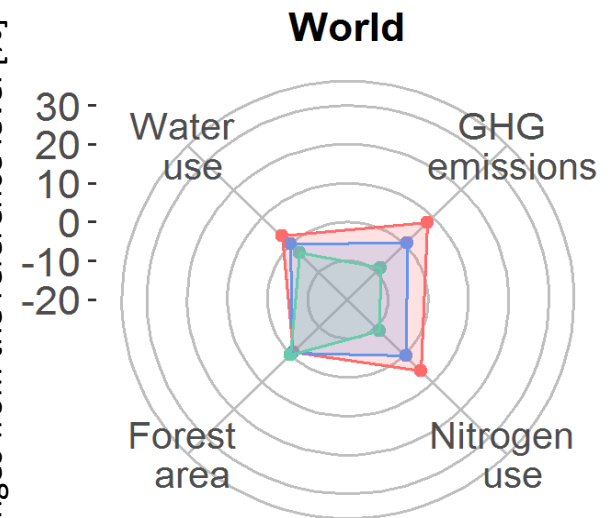
- Increased food production would lead adverse side-effects on the environment.
- Explore alternative policies toward **hunger eradications** while protecting the environment.
- If hunger policies focused on the undernourished only by targeted support, and if overeating or wasting food were simultaneously reduced, necessary food could even decrease, decreasing cropland area and GHG emissions.



Total calorie food demand



Changes from the reference level [%]

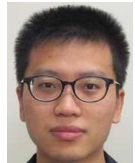


生物多様性保全と土壌侵食抑制のための土地資源の利用制約を考慮したバイオエネルギーポテンシャルの推計

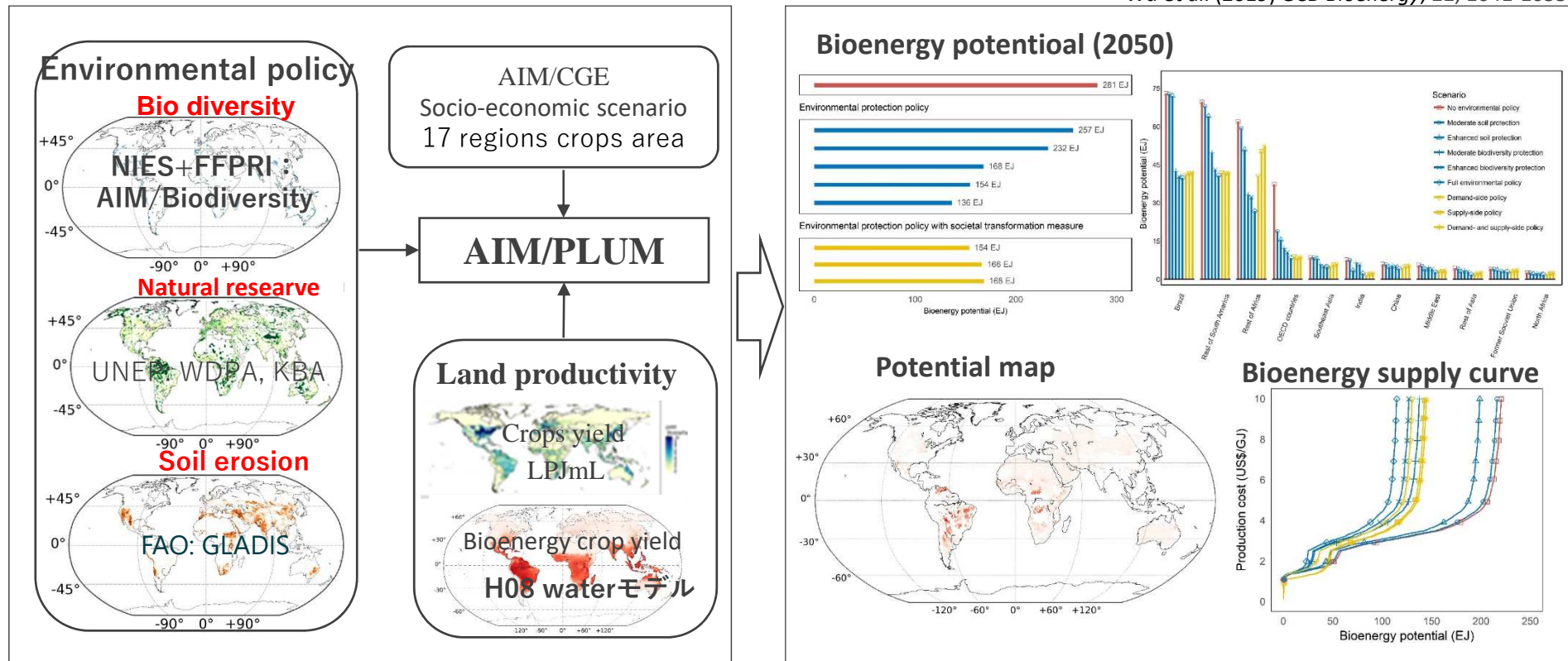
Global advanced bioenergy potential under environmental protection policies and societal transformation measures

The global advanced bioenergy potential under no policy is estimated to be 245 EJ/year and that 192 EJ/year could be produced under US\$5/GJ. These figures are reduced to be 149 EJ/year and 110 EJ/year, respectively, under a full environmental policy.

生物多様性保護の観点から優先的に保護すべき地域や、土壌劣化回避の観点から保護すべき地域を所与の制約条件として与えたうえで、炭素価格に応じた世界・地域別のバイオエネルギー供給ポテンシャルを推計し、供給曲線を描出した。その結果、保護地の制約条件を想定しない場合には245EJ/年(\$US5/GJのエネルギー価格では192EJ/年)であるバイオエネルギーポテンシャルは、保護地を考慮した場合には149EJ/年(\$US5/GJのエネルギー価格では110EJ/年)と見積もられた。



Wu et al. (2019) *GCB Bioenergy*, 11, 1041-1055



守りたいものは何か？

We need to discuss seriously what we want to keep and what we could give up.

