

STRONG SUSTAINABILITY TRAJECTORIES – NAVIGATING BETWEEN CONSTRAINTS, VULNERABILITIES AND OPPORTUNITIES

25th FMM Conference: MACROECONOMICS OF SOCIO-ECOLOGICAL
TRANSITION

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OUTLINE

1. DEFINING STRONG SUSTAINABILITY

1. From a biophysical perspective
2. From a socio-ecologico-economical perspective

2. STRONG SUSTAINABILITY TRAJECTORIES

1. Theoretical considerations
2. A strong sustainability indicator
3. Anticipating constraints to steer the economy

3. CONCLUSION

DEFINING STRONG SUSTAINABILITY

DEFINING STRONG SUSTAINABILITY

From a bio-physical perspective (Neumayer, 2003)

- No or little substitution among different sort of natural capital
- Multi-criteria/Multi-dimensional : avoiding monetisation and synthetic indicators
- Two examples:
 - biodiversity risk (Svartzman et al. 2021)
 - Climate damages (Espagne et al. 2021)

Extended into a Socio-Ecologico-Economic perspective

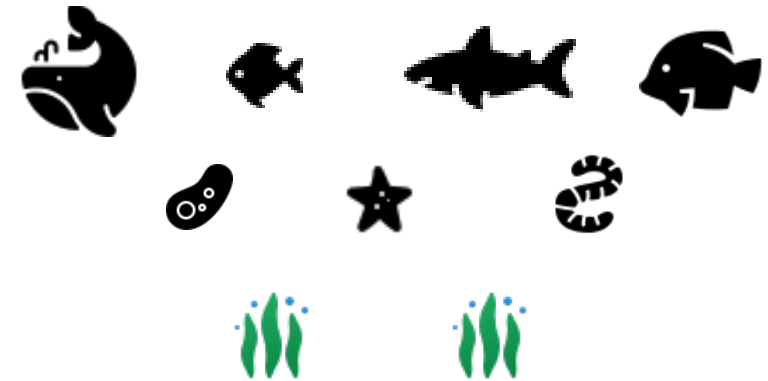
- Keep the same two principles but add socio-economic dimensions/criterias on top of bio-physical ones
- Two examples:
 - Multi-dimensional poverty analysis (David et al., 2018; Shifa et al., 2021)
 - Multi-dimensional macroeconomic vulnerabilities to the low carbon transition (Espagne et al. 2021)

“BIODIVERSITY” OR “BIOLOGICAL DIVERSITY”

“Biological diversity is the variability among living organisms and the ecological complexes of which they are part” (IPBES, 2019)

This includes:

- The diversity within species
- The diversity between species
- The diversity of ecosystems
 - The diversity of ecosystems themselves
 - The functional diversity in each ecosystem



ECOSYSTEM SERVICES : THE BENEFITS WE DERIVE FROM BIODIVERSITY AND FUNCTIONAL ECOSYSTEMS

PROVISIONING SERVICES



Examples :

- Ground water and Surface water for drinking purposes;
- Plants and animals for food;
- Genetic materials;
- Biomass-based energy

REGULATION AND MAINTENANCE SERVICES



Examples :

- Flood and storm protection;
- Water flow maintenance;
- Climate regulation
- Pest control
- Disease control

CULTURAL SERVICES



Examples

- Market and non-market recreational activities; Educational training, scientific and traditional knowledge
- spiritual, symbolic and religious dimensions;
- Cultural heritage
- Option, bequest and/or existential value

BASIC ECOLOGICAL FUNCTIONS

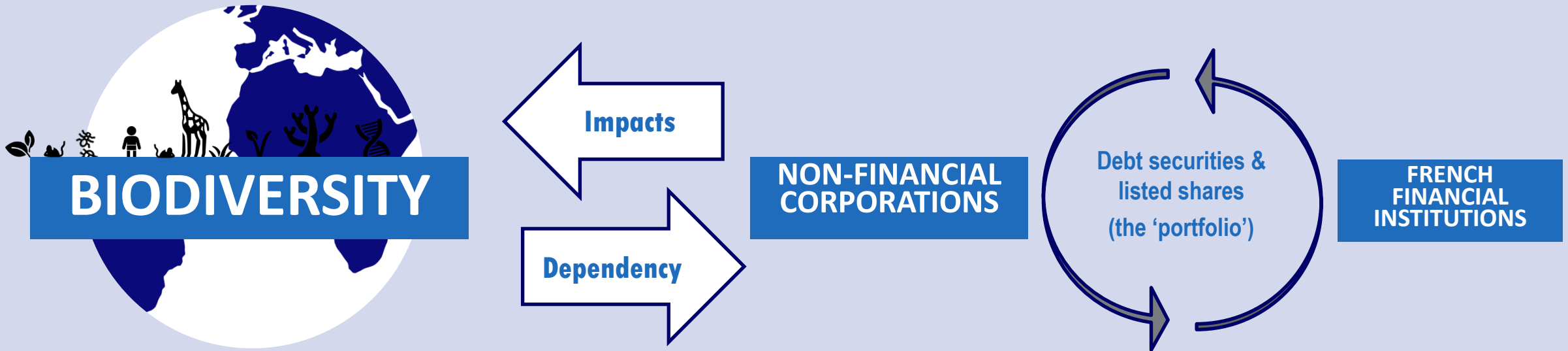


Soil formation; Nutrient cycling; Primary production (including photosynthesis); Protection of habitats and genetic resources...

Adapted from Cices, 2021

A “SILENT SPRING” FOR THE FINANCIAL SYSTEM? - KEY FIGURES FOR FRANCE

130,000 MSA.km²: static (or accumulated) terrestrial biodiversity impact of the portfolio (equivalent to the artificialization of **24% of metropolitan France**)

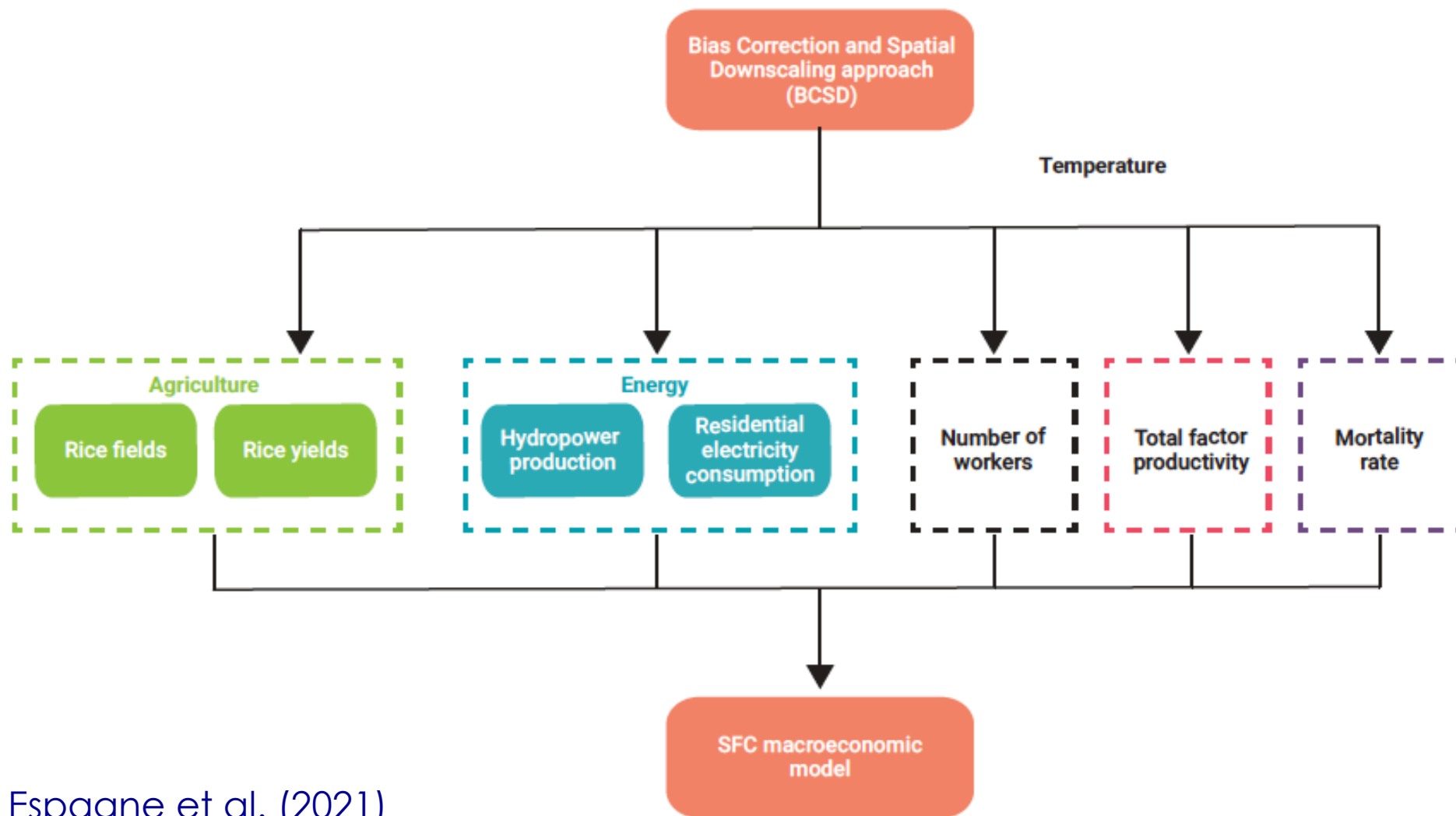


42%: amount of securities in portfolio that comes from issuers that are highly or very highly dependent on at least one ecosystem service

Source: Svartzman et al. (2021)

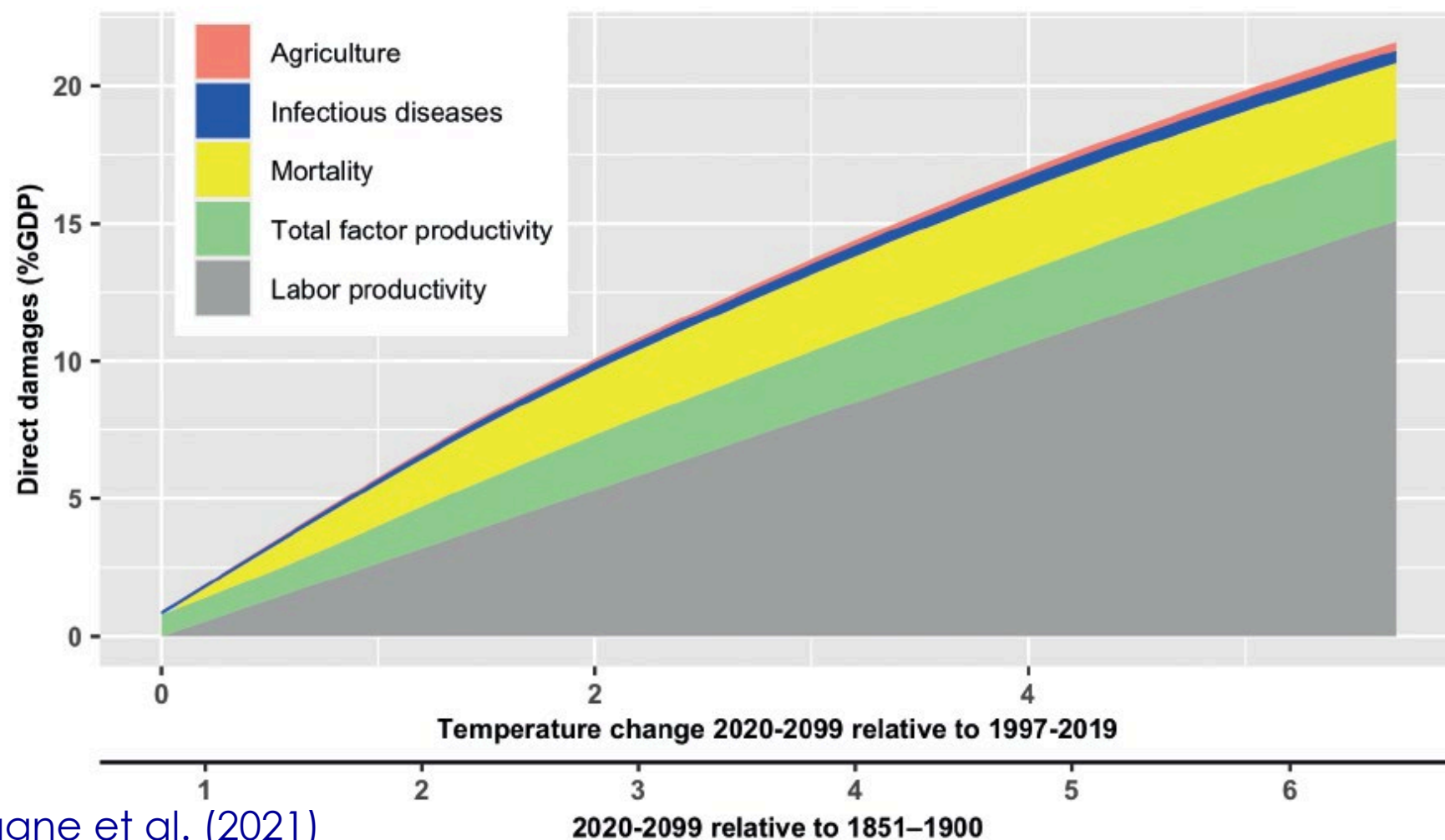
CLIMATE CHANGE IN VIETNAM: IMPACTS AND ADAPTATION

MACROECONOMIC IMPACTS FRAMEWORK



Source: Espagne et al. (2021)

CLIMATE CHANGE IN VIETNAM: IMPACTS AND ADAPTATION ESTIMATED DIRECT DAMAGES



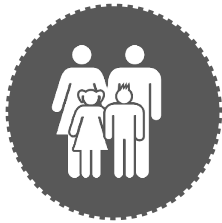
Source: Espagne et al. (2021)

DEFINING STRONG SUSTAINABILITY

Extensions to socio-ecologico-economic
aspects

INEQUALITY TRENDS IN SOUTH AFRICA: A MULTIDIMENSIONAL DIAGNOSTIC OF INEQUALITY – MAIN RESULTS

Multidimensional inequality



The multidimensional nature of inequality has shown that in some aspects inequality has decline while in others it has increased.

Economic inequality



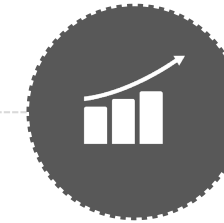
In the economic domain, almost all the inequality measures showed that economic inequality decreased between 2006 and 2015, but remained relatively high.

Expenditure and income



Inequality in the distribution of expenditure and income, especially between sexes and population groups has somewhat widened.

Economic inequality



Economic inequality was mainly driven by within-group rather than between-group dynamics. There was an increase in the number of assets households owned which reflects a decline in asset inequality between groups.

Source: David et al. (2018)

INEQUALITY TRENDS IN SOUTH AFRICA: A MULTIDIMENSIONAL DIAGNOSTIC OF INEQUALITY – MAIN RESULTS

Access to services



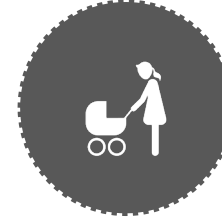
Black Africans had improved access to most services, such as electricity and improved sanitation.

Access to services



Limpopo, Eastern Cape and KwaZulu-Natal made progress in access to education and some basic services.

Female-headed households



Households headed by females made notable gains in terms of access to basic services.

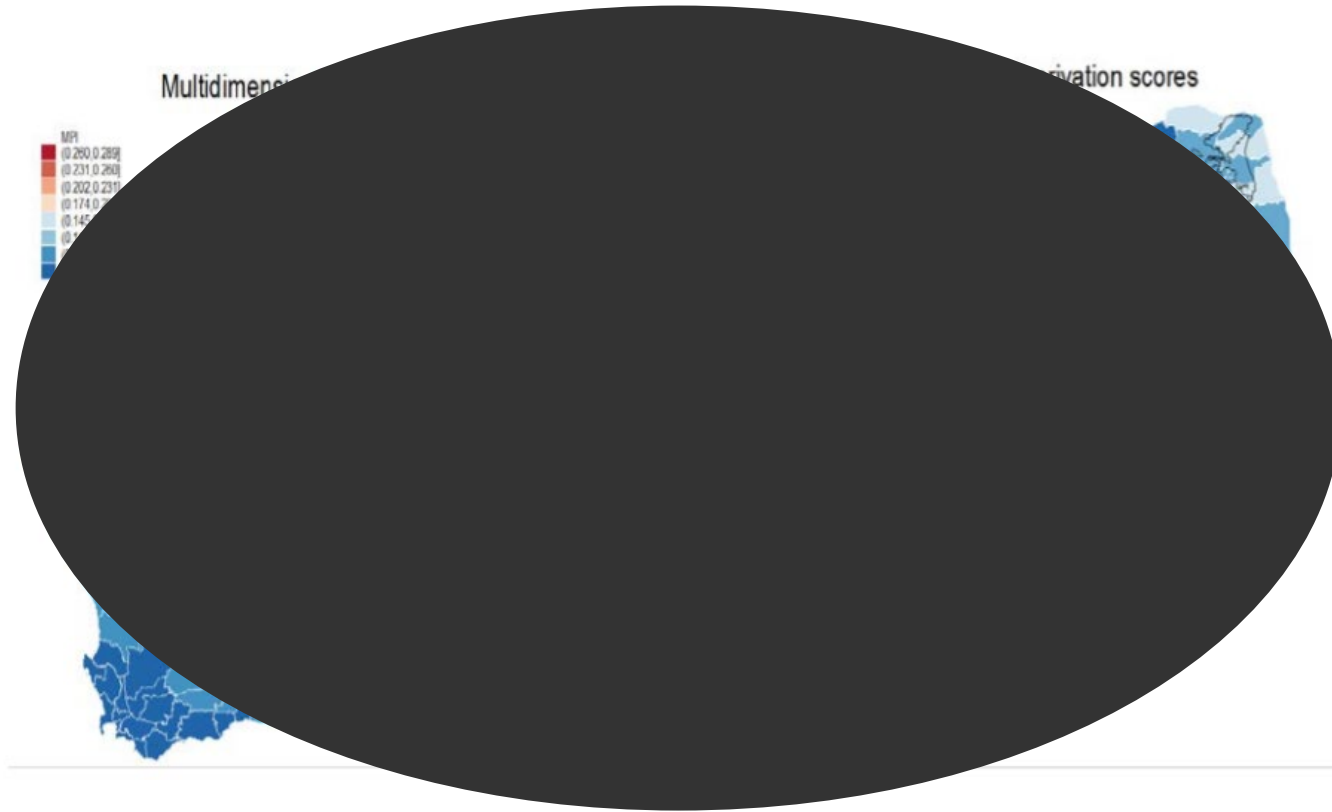
Labour market trends



Inequality in the South African labour market is very high and has increased in the recent past.

Source: David et al. (2018)

SPATIAL INEQUALITY THROUGH THE PRISM OF A PANDEMIC: COVID-19 IN SOUTH AFRICA



- There are stark spatial inequalities in lockdown readiness and in COVID vulnerabilities in South Africa
- There is a strong positive wealth effect in lockdown readiness and vulnerability to COVID-19
- Regardless of where poor households live, their living conditions makes them more vulnerable to COVID-19 infection through their exposure to an infected person
- Poorer households are also less ready to be able to cope with strict lockdown policy.

Source: Shifa et al. (2021)

DEVELOPING COUNTRIES' MACROECONOMIC EXPOSURE TO THE LOW-CARBON TRANSITION

Low-carbon transition and structural change

- It is unique type of structural change, where low-emission industries grow and high-emission industries decline
- The process is led by deliberate policies, changes in preferences and technological changes
- Countries are impacted differently according to their structure of production, trade and finance

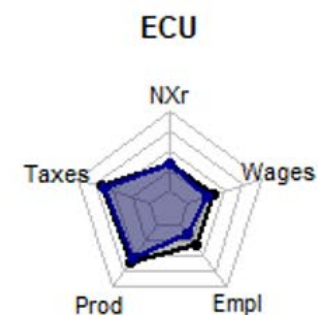
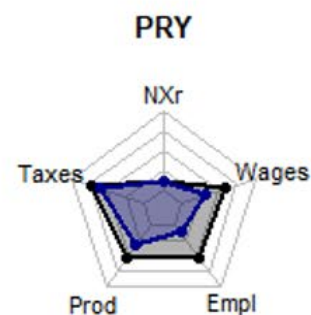
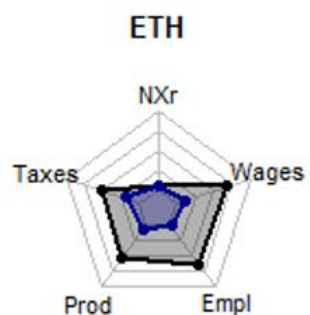
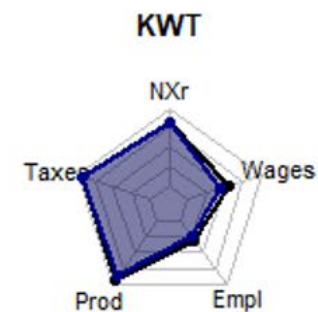
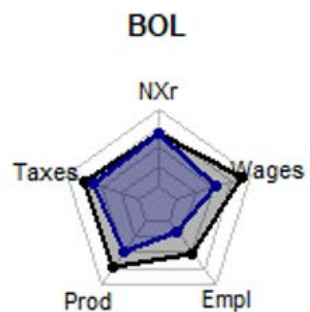
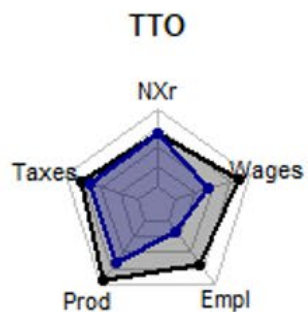
Transition risks: change in world demand impacts countries that depends on sunset industries; they are important for

- Raising foreign currency and avoiding BoP constraints, especially because the transition demands imported inputs
- Avoiding fiscal imbalances, especially because the transition demands relevant public investments and expenses
- Guaranteeing employment and wages – even though the impact is positive, it is not homogenous

Source: Espagne et al. (2021)

COMPARATIVE ANALYSIS

Exposure in different dimensions

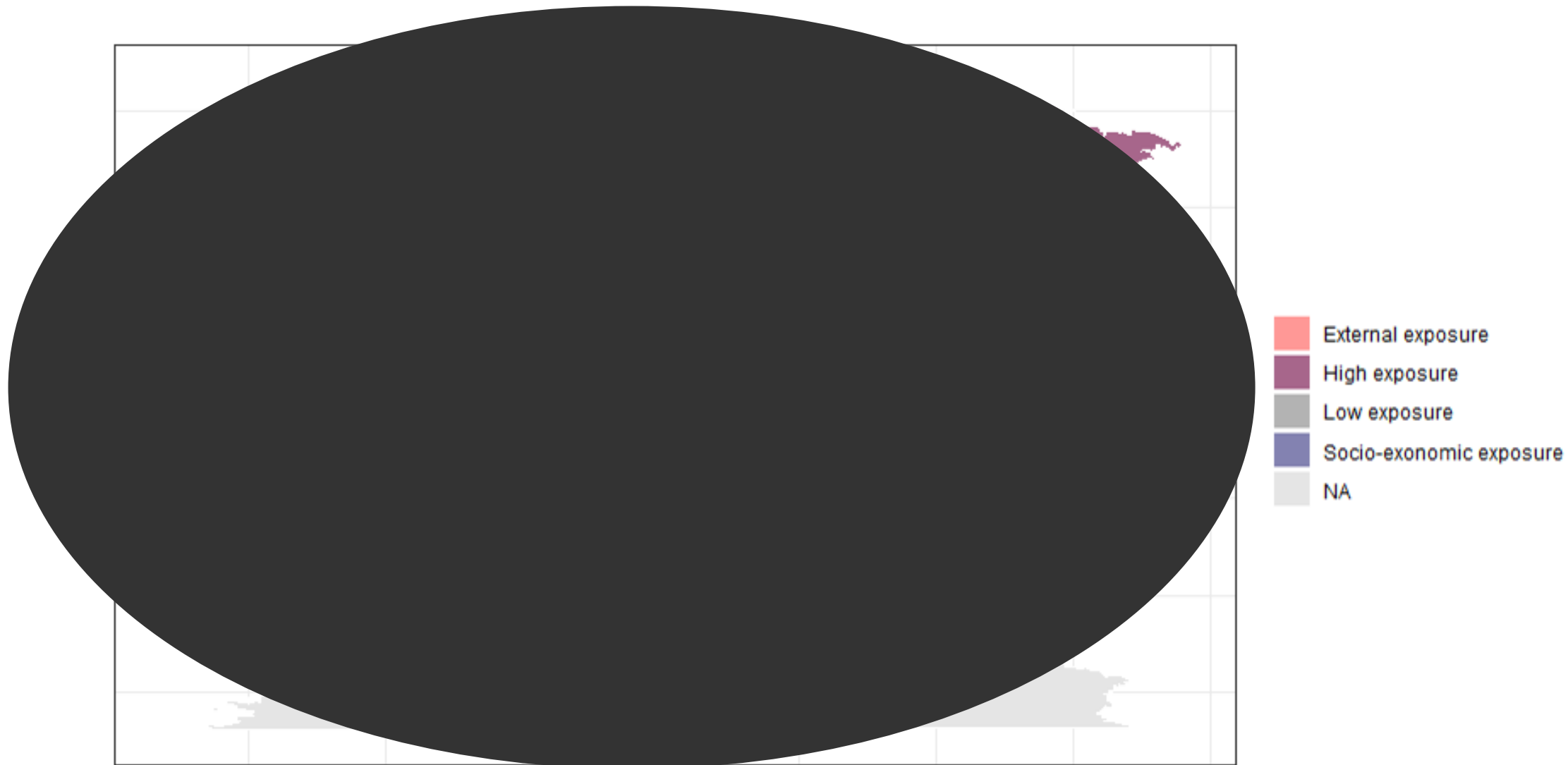


Source: Espagne et al. (2021)

● Total (Dir+Ind)

● Direct

CLUSTERING COUNTRIES



Source: Espagne et al. (2021)

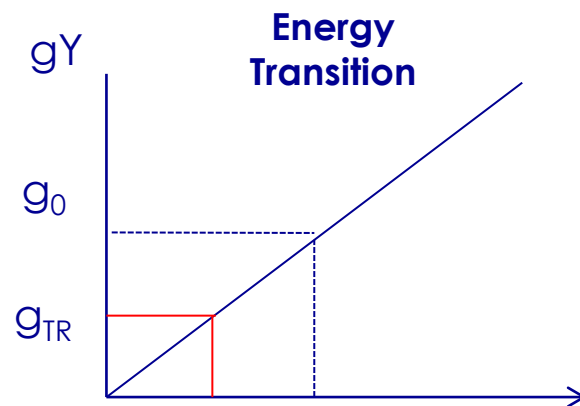
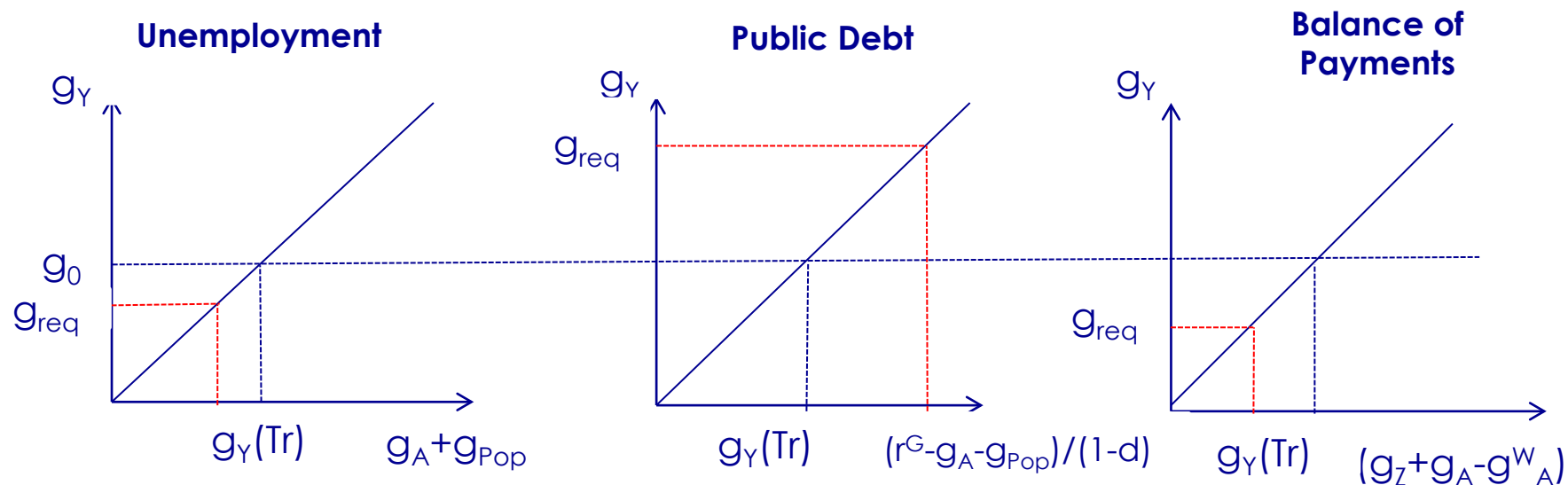
STRONG SUSTAINABILITY TRAJECTORIES

STRONG SUSTAINABILITY IN THE LONG-RUN: SQUARING THE CIRCLE?

Combining insights from many authors on balance of payments constraints, debt sustainability, or green trilemma (Valdecantos 2021).

- What if the Keynesian stability growth rate, compatible with demographics and technological change, is inconsistent with the Balance of Payment stability growth rate (Thirlwall, 1979).
- Add the constraints coming from needing to stabilize the public debt (Bhering et al., 2019), hence requiring a specific growth rate.
- Add the Kaya equation: what if this growth rate, given demographics, technological aspects -CO₂ intensity and exergy-, and a political choice -CO₂ emissions- is not consistent with the previous three ones?
- There is evidence that increasing returns from energy use seem to have reached a plateau and hence need to have higher capital goods accumulation to counter these trends (Cullen and Allwood, 2010, Brockway et al. 2019).

STRONG SUSTAINABILITY IN THE LONG-RUN: SQUARING THE CIRCLE?



Source: Godin and Yilmaz (2021)

$$g_{CO2} = g_{CO2Int} + g_{EX} + g_Y$$

STRONG SUSTAINABILITY TRAJECTORIES

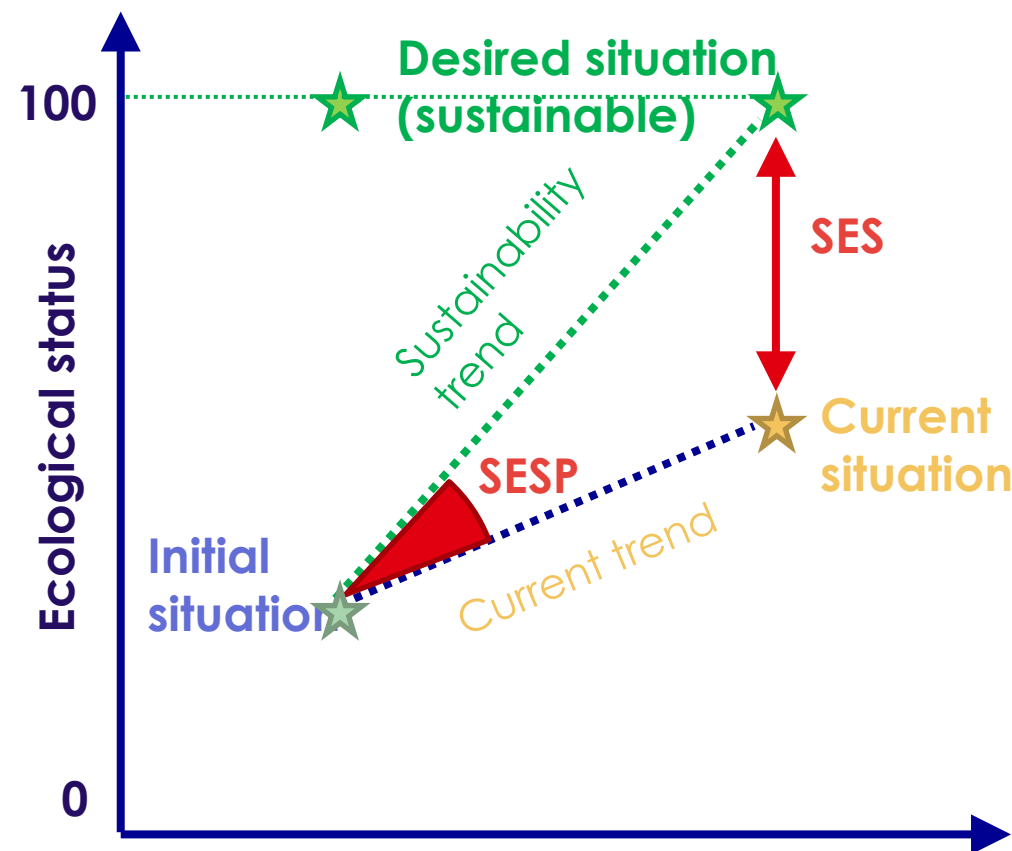
It is important for policy makers, think-tanks, civil society and other actors of the transitions to be able to anticipate dynamics

- There should be a descriptive part to these anticipations, i.e. baseline scenario
- There can be normative aspects when describing objectives, but these have to be mitigated by descriptive aspects. Importance of indicators!

Taking into consideration the constraints explained before highlight

- The emergence of tensions: need for disequilibrium modelling
- The emergence of path dependency: timing of investment matters, climate change has lots of inertia, short-term financial feedback loops have long run consequences via investment and productivity dynamics
- The importance of structural dynamics and their interconnections with institutional dynamics (Perez, 2010)

A MEASURE OF THE DISTANCE TO ENVIRONMENTAL LIMITS
THE ESGAP (USUBIAGA-LIANO & EKINS. 2021)

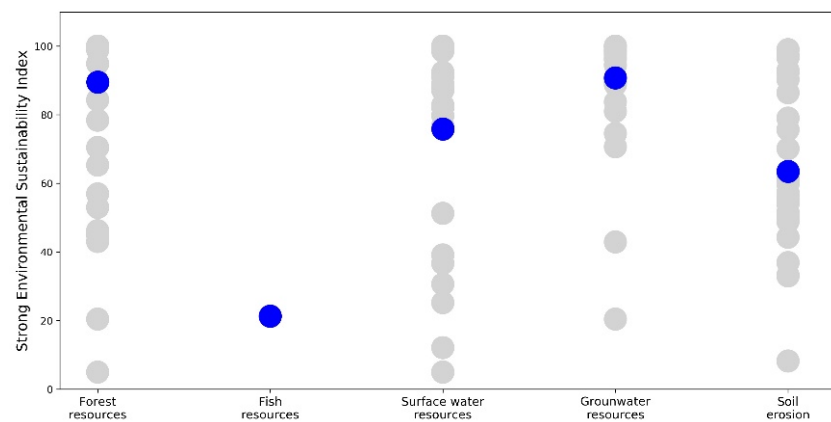


THE **SES** INDEX OF STRONG ENVIRONMENTAL SUSTAINABILITY
MEASURES THE ABSOLUTE PERFORMANCE AGAINST A GOOD ECOLOGICAL STATUS STANDARD

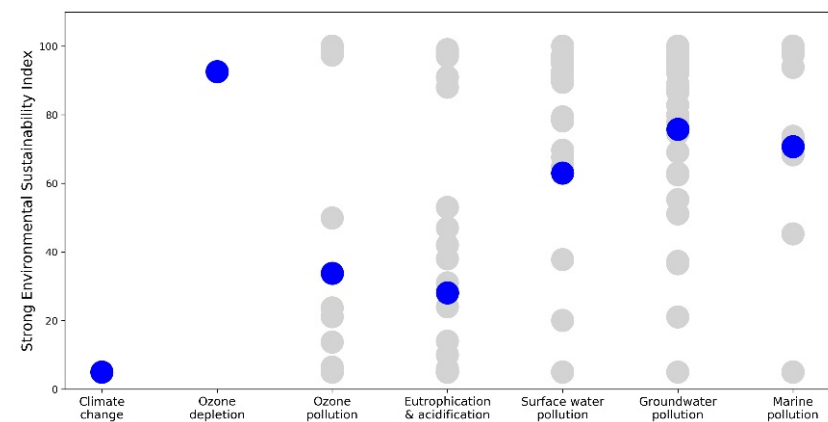
THE **SESP** SUSTAINABILITY PROGRESS INDEX
MEASURES PROGRESS OVER TIME TOWARDS SUSTAINABILITY STANDARDS

Resources						Pollution						Life support			Health and human wellbeing						
Vietnam	97%	0%	88%		49%	0%	0%			14%		50%				23%	89%	76%		0%	
Kenya	78%	0%	51%		89%	100%	86%			31%	43%					62%	13%	53%		0%	
Nouvelle-Calédonie	100%	100%	61%		59%	0%			19%	24%			71%		75%		100%	62%	44%	75%	
France	100%	21%	87%	89%	60%	0%	100%	6%	27%		79%	75%	94%	26%	39%	63%	42%	95%	100%	81%	17%

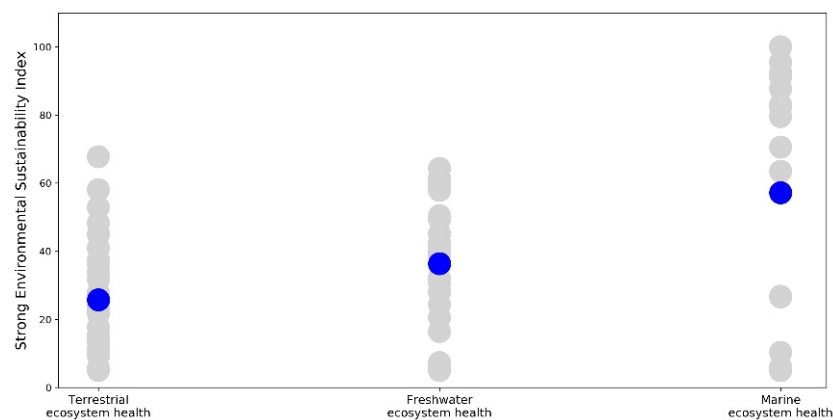
RESULTS OF ESGAP IN EUROPE (EKINS ET AL. 2021)



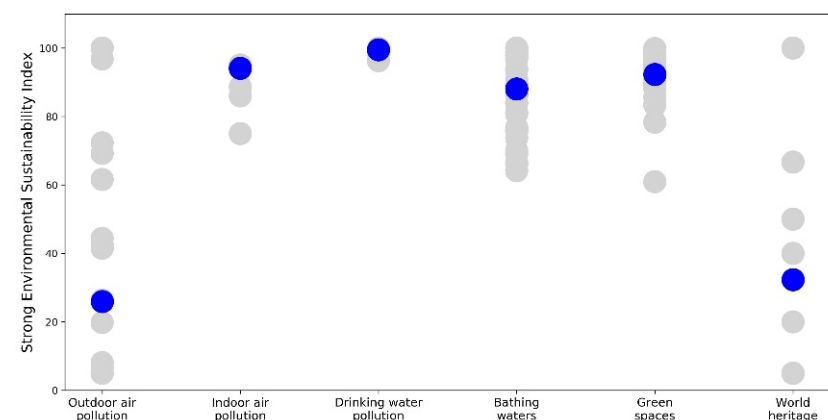
Source function



Sink function



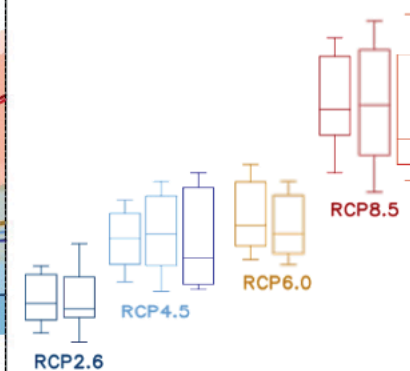
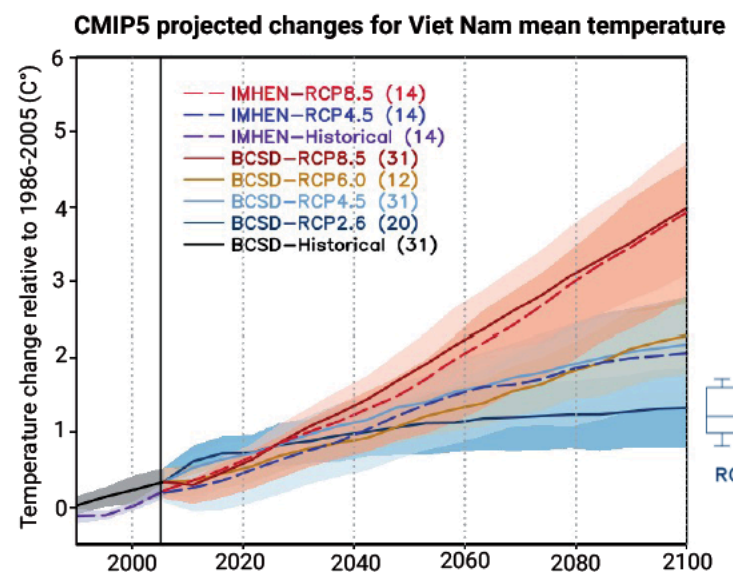
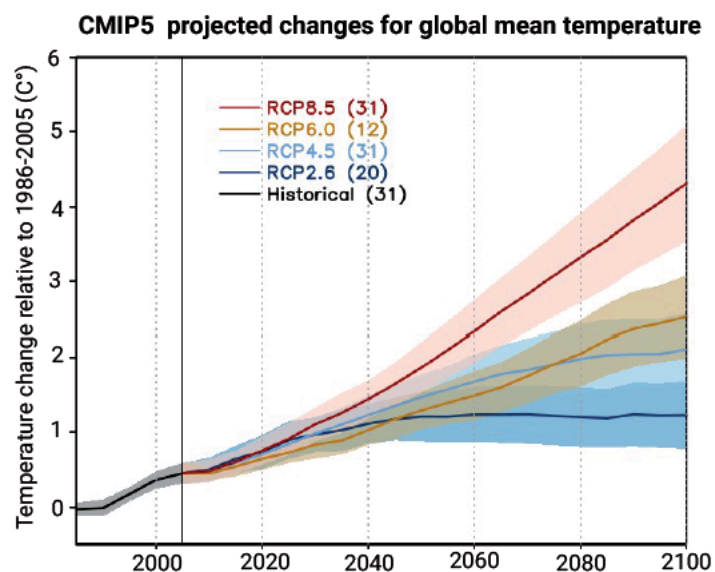
Life-support function



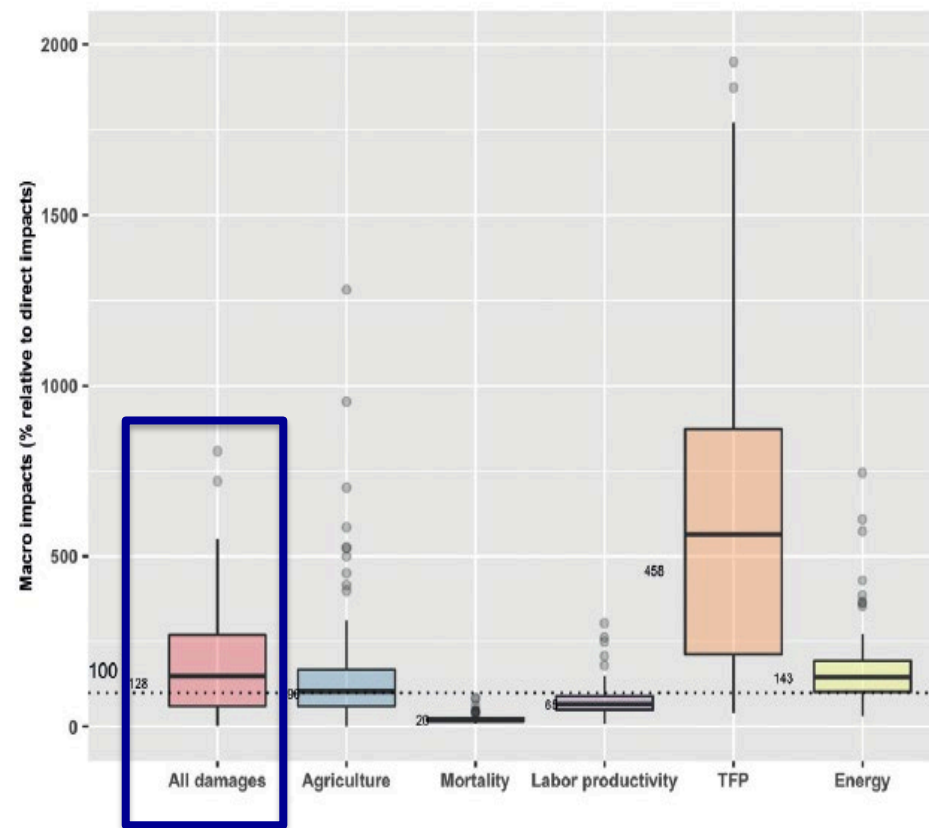
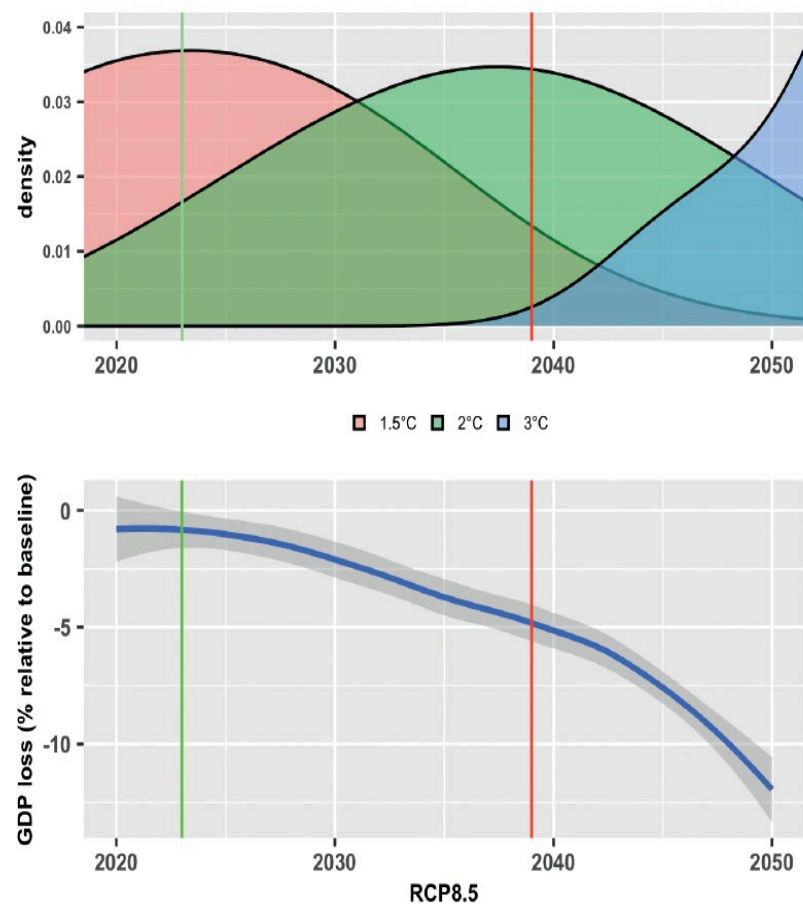
Human health and welfare function

The blue dot represents the EU28 as a whole. The grey dots represent the performance of the

CLIMATE CHANGE IN VIETNAM: PAST, PRESENT AND FUTURE



MACROECONOMIC IMPACTS OF CLIMATE CHANGE IN VIETNAM



CONCLUSION

WHAT ABOUT OPPORTUNITIES ?

It is possible to benefit from transitions:

- Employment creation (e.g. ILO 2019, Saget et al. 2020)
- Green products (Mealy & Teytelboym 2020; Romero & Gramkow 2021)
- Developing economies are rich in natural resources (old wine in new bottle)
- Environmental big push (CEPAL)
- Emergence of actual practices, reinforcement concepts such as just transition or the commons (Land Tenure and Development Technical Committee, 2017)

CONCLUSION

We should talk about **trajectories** and **transitions**, each will be different and based on local and global contexts. This highlights the importance of **multidisciplinary indicators, scenarios and models**.

- The strong sustainability approach developed here seeks to explicit as much as possible the **constraints, vulnerabilities and opportunities**.
- Beware of magical thinking
 - **technological**: CCS, afforestation;
 - **ecological**: damages, biodiversity;
 - **political**: Green Growth, Green Finance
- **The polycentric and multidimensional nature** of these transitions require to think of governance structures (local, national and global) and their interactions, **the commons** can be of help here (Ostrom, 2010).

THANK YOU!

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