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# DOES GREEN INVESTMENT RAISE PRODUCTIVITY?

Salifou ISSOUFOU & Nama OUATTARA



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# OUTLINE

- **Motivation and Contributions**
- **Literature Review**
- **Data and Specification**
- **Results**
- **Conclusion**

# MOTIVATION



## **Economic**

- The energy sector is directly responsible for climate change whose costs in terms of adaptation are estimated to reach US\$50-170 billion per year by 2030, half of which will be borne by developing countries, affecting the poor disproportionately.



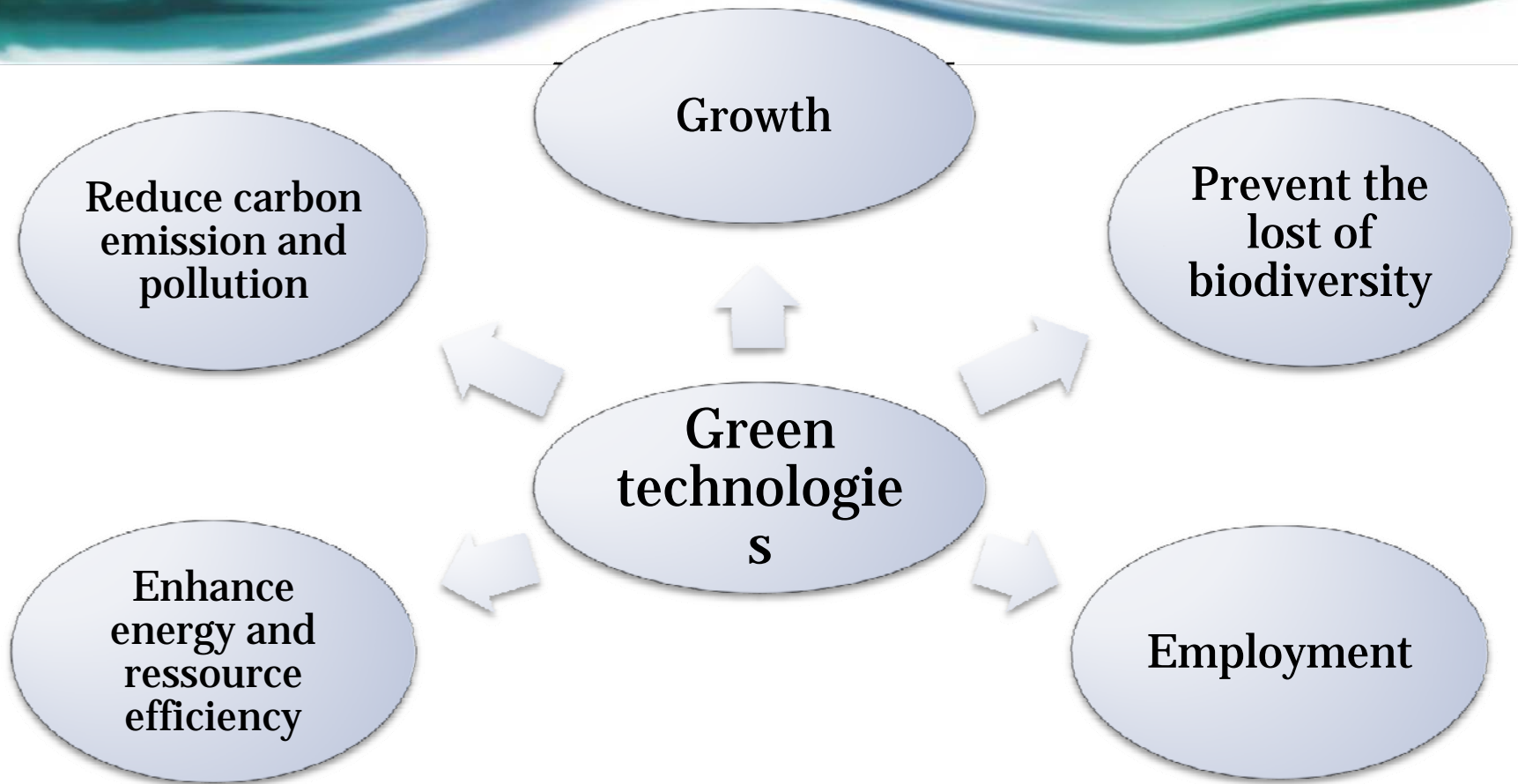
## **Environment**

- Pollution, deforestation and Climate change: Increasing green investment can make a substantial contribution to reducing carbon emissions.



## **social**

- Famine and poverty can be simultaneously addressed by applying green agricultural methods. There are approximately 2.6 billion people who depend on agriculture for livelihood, a vast majority of them living on small farms and rural areas on less than US\$1 per day.



Green Economy: “improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities. [...] is low carbon, resource efficient and socially inclusive.” **PNUE**



# KEY QUESTION



**DOES GREEN INVESTMENT RAISE  
PRODUCTIVITY IN AFRICAN  
COUNTRIES**





# CONTRIBUTIONS

- Analyze the impacts of green investment on productivity.
- Use an innovative measure (ecological footprint) as a proxy for green investment to estimate its impact on economic activity.
- Macro-level focus.
- Differs from micro and case studies.



# LITERATURE REVIEW

Two Literature Strands on this topic:

1. Green Investment (or environmental friendly regulations) is detrimental to productivity:

- Denison (1979).
- Chritiansen and Haveman (1981); Gollop and Roberts (1983); Dufour, Lanoie and Patry (1992).

2. Green investment is favorable to growth :

- Porter and Linde (1995)
- Turkey (2003)



# SPECIFICATION AND DATA

Key Question: **Does Green Investment Raise Productivity?**

To answer this question we posit the following:

$$y_{i,t} = \alpha + \beta_0 y_{i,t-1} + \sum_{i=1}^K \beta_i X_{k,i,t} + \gamma Glnv_{it} + \varepsilon_{it} \quad (1)$$

$$\varepsilon_{i,t} = \vartheta_i + \mu_{i,t} \quad (2)$$

$$\Delta y_{i,t} = \beta_0 \Delta y_{i,t-1} + \sum_{i=1}^K \beta_k \Delta X_{it}^k + \gamma \Delta Glnv_{i,t} + \mu_{i,t} \quad (3)$$



## SPECIFICATION AND DATA (continued)

To estimate equation (3), we apply the GMM estimator using the following data:

- The World development indicators ( Real GDP per worker, trade openness, foreign direct investment, female labor force participation, primary completion rate, government expenditures and inflation).
- The Environment Outlook from United Nations Environment programme (CO<sub>2</sub> emission and **ecological footprint**).
- The data spans 46 African countries over the period of 1985 through 2007.



# RESULTS

- We find green investment to be detrimental to productivity growth.
- This result is significant at the 10% level.
- More specifically, and on average, a 1% decline in a country's ecological footprint from the continent's average level will lead to a 2.3 percentage point decrease in productivity growth

<b>Dependent Variable: Productivity Growth</b>	
	Dynamic GMM
	(1)
Lagged Productivity Growth	0.71***
	(0.0436)
Openness	-0.00
	(0.0256)
Government Expenditures	-0.12
	(0.0877)
Foreign Direct Investment	0.16
	(0.1171)
Inflation	-0.06*
	(0.0329)
Labor Quality	0.15**
	(0.0493)
Female Participation	0.78**
	(0.2895)
Institutional Quality	0.42
	(0.2871)
Green Investment	0.23*
	(0.1334)



# CONCLUSION

- Main question: Does green investment raise productivity?
- Main finding: green investment is detrimental to productivity growth
- Implications:
  - Industrialization requires ignoring climate change issues
  - Needed: targeted public capital expenditures and targeted regulations.
  - To dampen the potential negative impacts of green investment, absorptive capacity and investment efficiency should be addressed first.
  - African countries should be cautious in adopting green technologies.



**THANK YOU!**

**We welcome comments and suggestions!**