Tourism growth and environmental sustainability: trade-off or convergence?

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Motivations

➢ Human activities exacerbate the deterioration of environment

   ❖ Land degradation (Li *et al.*, 2016)

   ❖ Ecosystem damaging (Mahmoud and Gan, 2018)

   ❖ Pollution (Rajé *et al.*, 2018)

   ❖ Overexploitation of natural resources (Dong *et al.*, 2014)

   ❖ Biodiversity loss and habitat destruction (Mona *et al.*, 2019; Tian *et al.*, 2020)

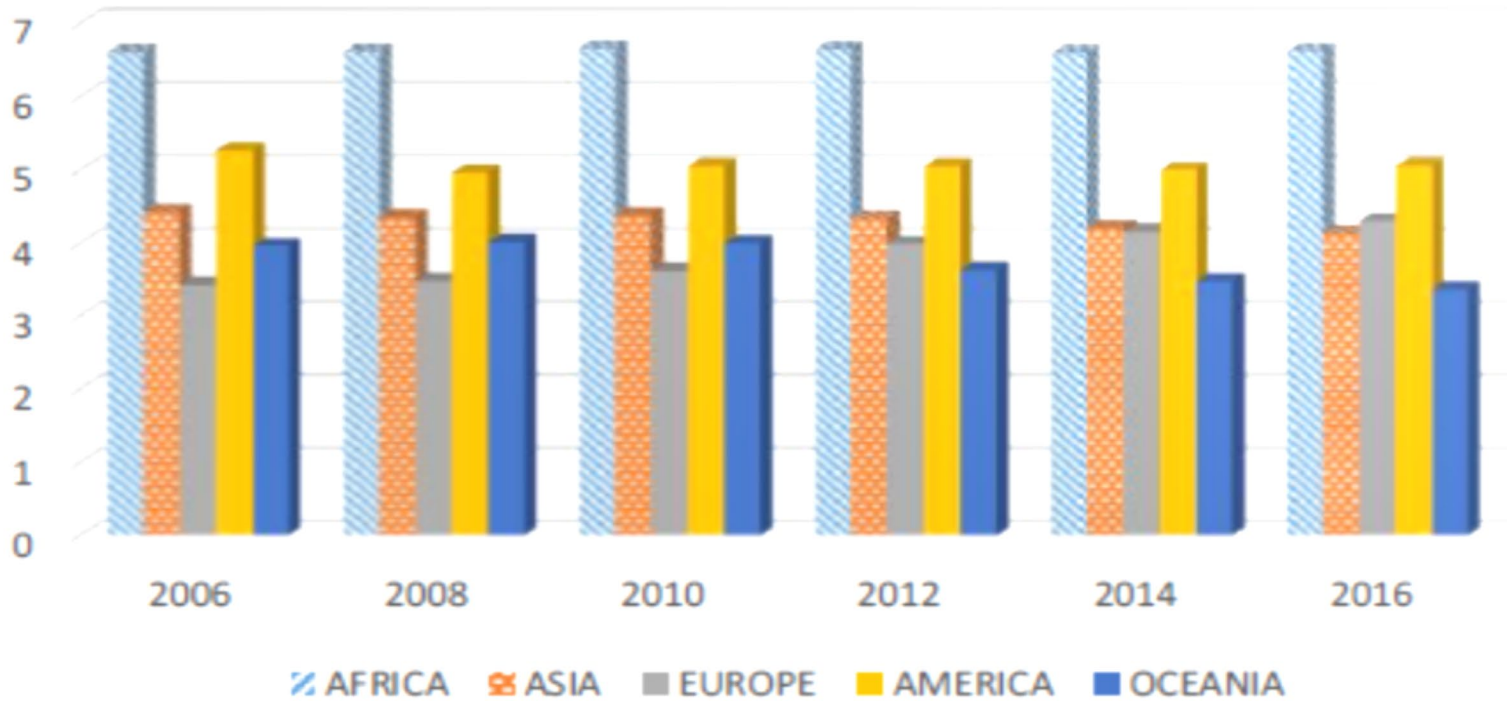➢ Channels through which human activities affect Environment
(Brahmasrene and Lee, 2017; Ehigiamusoe and Lean, 2019; Akadiri et al., 2019; Ehigiamusoe et al., 2020a among others)

   ❖ Energy production and consumption

   ❖ Urbanization

   ❖ Industrialization

   ❖ Globalization

   ❖ Economic growth

   ❖ Financial development

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Environmental Sustainability

Better environmental performance in less developed regions
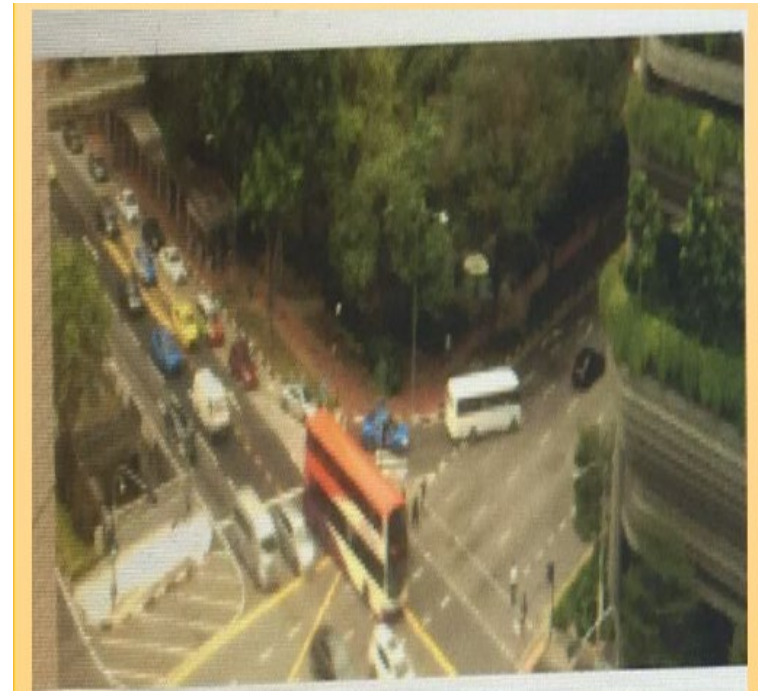
Motivations

➤ Tourism is one the world's largest industries
  - ❖ Employment
  - ❖ GDP
  - ❖ Investment
  - ❖ Trade

➤ Environment is not only a constraint but also an opportunity as well as a resource for tourism (Pigram, 1980)
  - ❖ Tourism activities can lead to the degradation of the environment
  - ❖ Tourism can contribute to the environmental sustainability

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Motivations

Tourism activities can lead to the degradation of the environment

➢ Stress the ecological sustainability of the touristic site (Nicholas and Thapa, 2010)

❖ Visitors' behavior
❖ Visitors' attitude toward environment

➢ 50% of the ecosystem productivity loss are estimated to result from physical infrastructure required for the development of tourism industry (Blersch and Kangas, 2013)

❖ The direct effect of tourists
❖ Land clearing

Urban greening helps fight urban crime (air and noise pollution, flood, habitat and wildlife loss...)
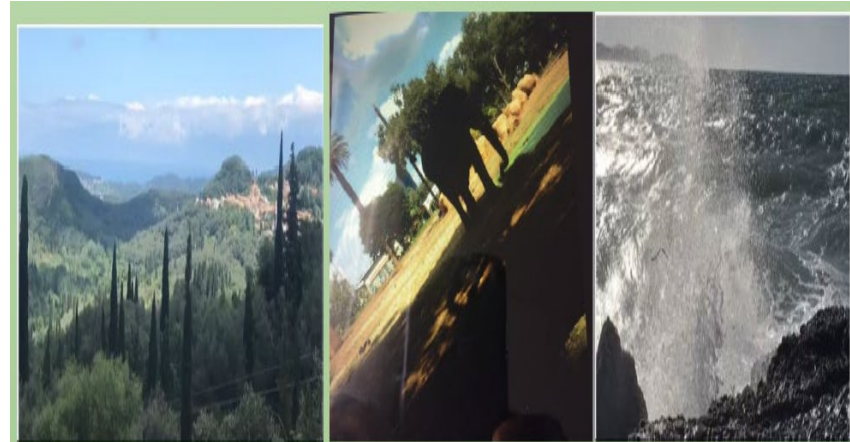
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Motivations

Tourism can contribute to the environmental sustainability

➢ Long-term environment enhancing effects from large-scale tourism

  ❖ Economic proceeds from large-scale tourism can support livelihood diversification (Guha and Ghosh, 2007)

  ❖ Raise living standard and mitigate poverty through employment and entrepreneurship (Ramasamy and Swamy, 2012)

➢ Nature-based tourism is conducive to sustainable environment
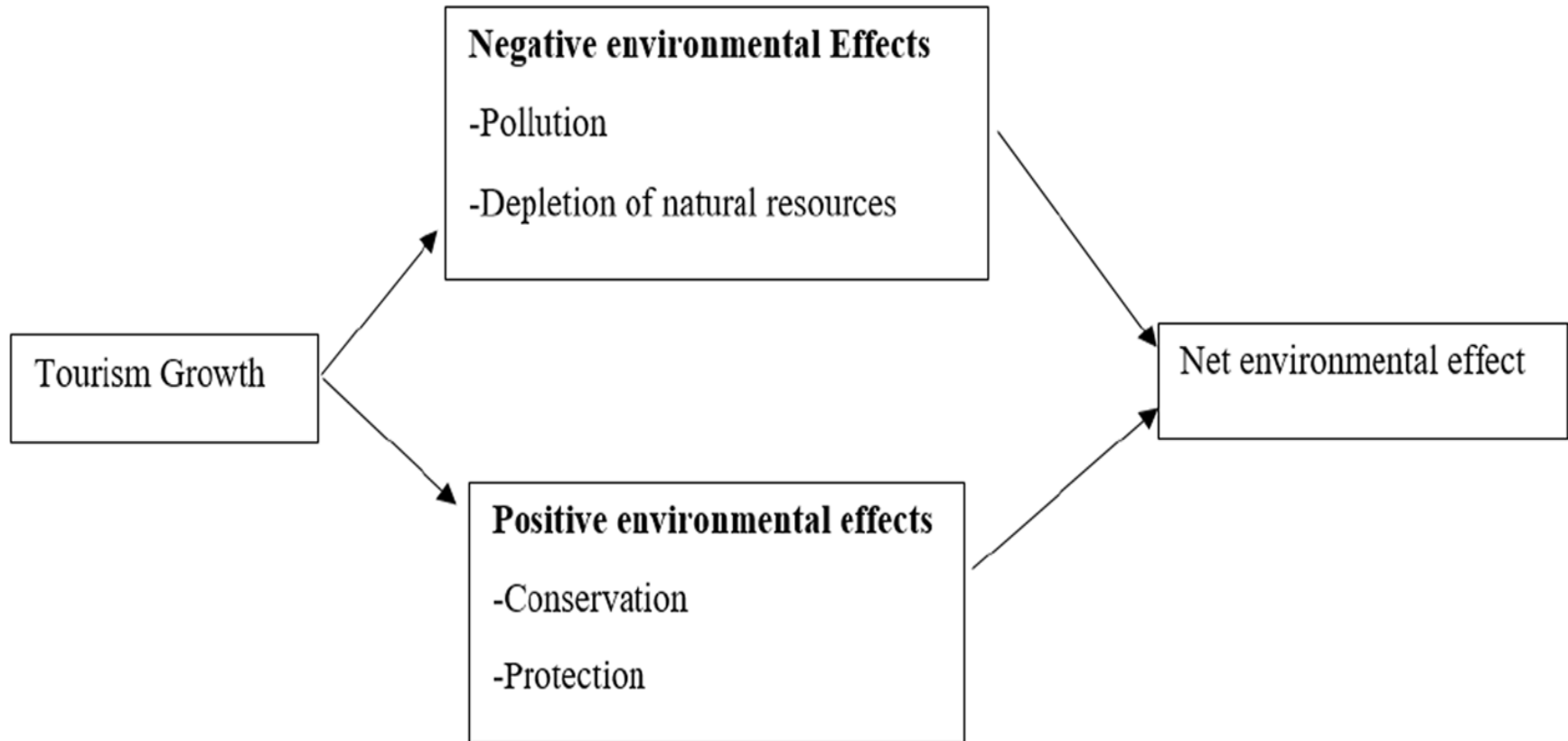
  ❖ Protection of biodiversity

  ❖ Conservation of natural resources

Nature tourism contributes to environmental protection and conservation

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Problem

What has been the join dynamics between tourism growth and environmental sustainability?

Unknown from existing studies

➢ Qualitative or static analysis

  ❖ Exploratory

  ❖ Static correlation study (cross sectional modeling, Structural equation modelling)

➢ Partial impact assessment with little or no attention to the net environmental effect of tourism

  ❖ Pollution and natural resource depletion impacts of tourism

  ❖ Conservation and protection effects of tourism

Contributions

  ❖ Net environmental effect

  ❖ Dynamics: Short term and long term effect

  ❖ Country-level and Panel effects

  ❖ Cross countries and cross regions comparison

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Data

➢ Sample

  ❖ 148 countries

  ❖ Time. 2006 to 2016

  ❖ Available data

   ✓ Tourism data were obtained from the World Travel and Tourism Council (WTTC) at the yearly frequency

   ✓ Environmental sustainability indices were drawn from the Sustainable Society Foundation (SSF) at the biennial frequency

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Data

Variables	Description	Source
Tourism Growth (TG)	Author's built index from five tourism growth indicators, namely contribution to GDP, contribution to employment, visitors exports, capital investment and government spending on travel and tourism	Author
Total contribution to GDP	GDP generated by direct Travel and Tourism industries plus indirect and induced contributions, including the contribution of capital investment spending (percentage of GDP)	WTTC
Total contribution to employment	The number of jobs generated directly in the Travel & Tourism industry plus indirect and induced contributions (percentage share of total employment)	WTTC
Visitors Exports	Spending within the country by international tourists for both business and leisure trips, including transportation spending (percentage of exports)	WTTC
Capital Investment	Capital investment spending by all sectors directly involved in the Travel & Tourism industry. This also constitutes investment spending by other industries on specific tourism assets such as new visitor accommodation, passenger transportation equipment, as well as restaurants and leisure facilities for specific tourism use (percentage of total investment)	WTTC
Government expenditure	Government spending on travel and tourism (percentage share of total government individual expenditures)	WTTC
Environmental sustainability (EVWB)	Environmental well-being score comprising of two main indicator categories: (i) natural resource and (ii) climate and energy	SSF
Natural resource	Environmental indicator capturing biodiversity, renewable water resources and consumption	SSF
Climate and Energy	Environmental indicator capturing energy use, energy savings, greenhouse gases and renewable energy	SSF

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Methods

➤ Composite proxy

 ❖ Environmental well-being: Given

 ❖ Tourism growth: Principal component analysis

➤ Cross region classification

 ❖ Geographical location: Given

 ❖ Socio-economic classification: Cluster convergence method

➤ Short-term and long term effects

 ❖ Panel unit roots

 ❖ Panel cointegration

  ✓ Dynamic fixed effects (DFE)

  ✓ Pooled Mean Group (PMG)

  ✓ Mean Group (MG)

  ✓ Common Correlated Effects (CCE)

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Panel Unit root test

	Level	First Difference	Decision
Panel A. All countries			
TG	− 0.800	− 2.741***	I(1)
EVWB	1.528	− 2.964***	I(1)
Panel B. Africa			
TG	− 1.830	− 2.762***	I(1)
EVWB	− 1.678	− 2.281***	I(1)
Panel C. America			
TG	− 1.795	− 2.610***	I(1)
EVWB	− 1.416	− 1.698	I(2)
Panel D. Asia			
TG	− 1.726	− 2.502***	I(1)
EVWB	− 1.572	− 2.388***	I(1)
Panel E. Europe			
TG	− 1.864	− 2.328***	I(1)
EVWB	− 1.176	− 2.783***	I(1)

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Long versus short term effects

	Biennial data based estimates			Annual data based estimates		
Panel A. Long-term	Model 1 PMG	Model 2 MG	Model 3 DFE	Model 4 PMG	Model 5 MG	Model 6 DFE
TG	-0.201*** (0.00276)	-0.471 (0.893)	-0.112** (0.0556)	-0.123*** (0.019)	-0.660 (0.438)	-0.049** (0.059)
Panel B. Short run						
ECT	-0.595*** (0.0565)	-0.683*** (0.128)	-0.539*** (0.0374)	-0.313*** (0.024)	-0.410*** (0.029)	-0.270*** (0.020)
ΔTG	0.216** (0.0961)	-0.00789 (0.222)	0.0417* (0.0230)	-0.024 (0.047)	0.010 (0.061)	-0.004 (0.0140)
Constant	3.066*** (0.338)	3.454*** (0.600)	2.670*** (0.1844)	1.654*** (0.3141)	2.002*** (0.190)	1.338*** (0.983)
Observations	740	740	740	1480	1480	1480
Hausman Test				0.02 Pr=0.8803		

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Cross region versus cross cluster comparison

	Geographical region				Socioeconomic cluster	
	Africa	America	Asia	Europe	Low cluster	High cluster
Panel A. Long-term						
TG	**0.158*** (0.00276)**	**0.573*** (0.0484)**	**-0.199*** (0.0027)**	**-0.708*** (0.0301)**	**-0.667*** (0.0000)**	**0.126*** (0.0000)**
Panel B. Short run						
ECT	**-0.577*** (0.0823)**	**-0.3081** (0.1241)**	**-0.724*** (0.1499)**	**-0.334*** (0.0744)**	**-0.353*** (0.0000)**	**-0.619*** (0.0000)**
ΔTG	0.1224 (0.2059)	0.0794 (0.222)	0.260 (0.1754)	0.217 (0.1853)	**0.230* (0.1383)**	0.1234 (0.1240)
Constant	3.879*** (0.5929)	1.609** (0.6025)	3.477** (0.8878)	1.452*** (0.2938)	2.151*** (0.3963)	2.282*** (0.3686)
Biennial Observations	205	125	180	215	440	300

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Cross region versus cross cluster comparison

	Geographical region				Socioeconomic cluster	
	Africa	America	Asia	Europe	Low cluster	High cluster
Panel A. Long-term						
TG	-0.115*** (0.028)	1.620*** (0.204)	-0.144*** (0.044)	-0.110*** (0.0301)	-0.227*** (0.032)	-0.100*** (0.026)
Panel B. Short run						
ECT	**-0.411*** (0.040)**	**-0.178** (0.1241)**	**-0.385*** (0.052)**	**-0.195*** (0.047)**	**-0.293*** (0.029)**	**-0.329*** (0.040)**
ΔTG	-0.065 (0.095)	-0.186** (0.080)	-0.079 (0.086)	0.020 (0.101)	-0.045 (0.068)	0.028 (0.058)
Constant	2.751*** (0.288)	0.625** (0.228)	1.699*** (0.333)	0.809*** (0.162)	1.894*** (0.198)	1.159*** (0.138)
Annual Observations	410	250	360	430	880	600

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Robustness analysis: cross section dependence

	World	Africa	America	Asia	Europe	Low cluster	High cluster
Panel A. Long-term							
TG	**-0.972*** **(0.570)**	0.103 (0.340)	-0.215 (0.909)	1.029 (0.855)	**-0.765**** **(0.327)**	**-1.334*** **(0.799)**	0.157 (0.450)
Panel B. Short run							
ECT	**-0.372***** **(0.030)**	**-0.456***** **(0.046)**	**-0.331***** **(0.061)**	**-0.463***** **(0.068)**	**-0.720***** **(0.084)**	**-0.307***** **(0.040)**	**-0.398***** **(0.040)**
ΔTG	0.015 (0.062)	-0.096 (0.100)	-0.095 (0.128)	0.083 (0.158)	0.155 (0.148)	-0.037 (0.089)	0.083 (0.081)
Annual Observations	1480	410	250	360	430	880	600
CD Test	**10.91 (Pr=0.000)**	1.44 (Pr=0.149)	0.32 (Pr=0.748)	-0.75 (Pr=0.456)	**19.47 (Pr=0.000)**	**9.06 (Pr=0.000)**	0.97 (Pr=0.332)

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Key messages

➢ Unsustainable tourism practices put harmful pressure on environmental assets

➢ Meagre development performance help conserve natural reserves and biodiversity favourable to ecotourism

➢ Countries with high social and economic profiles adjust faster to deleterious effects of human activities on the environment

➢ Eco-tourism exhibits environmental enhancement effect indispensable to the sustainability of the tourism sector

➢ Unlike traditional economic goals targeting nature tourism is a critical approach to tourism development

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Policy implications

➢ The departments of environment and urban planning around the world should promote green urbanism

➢ Tourism departments should promote continuous development of natural touristic attractions

➢ Economic policy makers should integrate green industrial policies

➢ Government should incentivise eco-friendly tourism practices while discouraging environment-harmful practices in the tourism sector

➢ Tourism practitioners should improve their eco-friendly training skills

➢ Tourists should have environmentally responsible behaviours when choosing their destination and during their tour

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Eco-friendly tourism practices improves environmental asset, which is conducive to sustainable tourism

Let us switch to eco-friendly tourism practices

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Thank you