Impact Assessment of BRI Green Development

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BRI Green Development

- BRI green development is **a comprehensive scientific ecological system** covering green policy, green finance, green trade, green production, green infrastructure, green energy, green consumption, green transportation, green supervision, ecological compensation, and green evaluation.
- It is committed to **achieving coordinated economic, social and ecological development** of countries along the "Belt and Road", and **following green, low-carbon and sustainable development path** in the "Belt and Road" construction.

Impact Assessments of Green Development of BRI Countries

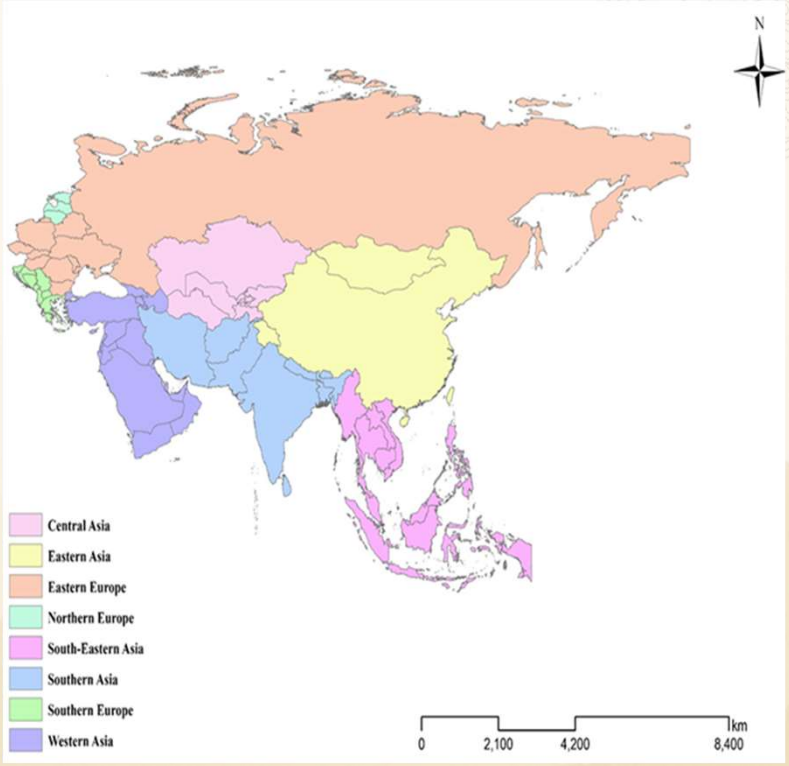
Aims: 65 countries and regions

Methods:

- **Rating:**
  - **Match Indicators:** Environment, Society and Economy
  - **Normalization**
  - **Threshold** (Red, Orange, Yellow, Green)
  - **How to aggregate?** Using the Multiplier Welfare Function to Integrate the Rating

- **Trending**

The changing trend is divided into four categories: red, orange, yellow, and green, which correspond to the opposite development state from the decreasing goal trend, stagnating trend, moderate improvement trend and maintaining trend.



Impact Assessments of Green Development of BRI Countries

Rating Index: Environment

	Environmental quality			Environmental governance			Resource usage			
Environmental impacts:	Air	Land	Water	Resource reservatio	low-carbon development	pollution control	Energy	land	water	materials
	Annual mean concentration of particulate matter of less than 2.5 microns of diameter (PM2.5)	Forest area	Water quality	Carrying capacity of different types of Land	carbon intensity	Ocean Health Index Goal - Clean Waters (0-100)	Energy consumptions	net forest depletion	Fresh water withdraws/ Water productivity	materials footprint
	Energy-related CO2 emissions		Mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene	Energy intensity and efficiency	Renewable energy: Renewable electricity output		Energy depletion	Plant species (higher), threatened	Rainwater harvesting	E-waste generated
	particulate emission damage			Terrestrial and marine protected areas	Access to electricity					
	Nitrogen production footprint			Safely managed water and sanitation services	Renewable energy R&D investment					
	Imported CO2 emissions, technology-adjusted				Electricity production from renewable sources, excluding hydroelectric					
	Production-based SO2 emissions (kg/capita)				Renewable energy generation capacity					
					Sustainable infrastructure					

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Rating Index: Economy

	Economic development			Economic growth engine		
Economic impacts	Capital	Savings	Investment	Innovation	Transformation of industrial structure	Trading
	Resources capital	Adultswith an account at a bank	Investment in energy with private participation	Total factor productivity	Share of tertiary industry in GDP	Trading across Borders(WB)
	GDP	Property Rights	Investment in ICT with private participation	Triadic Patent Families filed		
	GDP per capita		Public private partnerships investment in energy	Research and development researchers		
	Adjusted Growth (%)		Foreign direct investment	Government Health and Education spending		
	Government Revenue excluding Grants (% GDP)		Investment in water and sanitation with private participation	Number of scientific and technical journal articles		
			Research and development expenditure			

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Rating Index: Society

	Euqality			Livability			Envionmental tolerance	
Socail impacts	Gender	Income	Education	Medical treatment& Employment		Transport	Public awareness to the environment	Environmental information transparency
	Ratio of female to male mean years of schooling of population age 25 and above	Gap in internet access by income	Enrollment in early childhood learning program	Adolescent fertility rate	Unemployment rate	Satisfaction with public transport		
	Ratio of female to male labour force participation rate	Gini Coefficient adjusted for top income	Literacy rate of 15-24 year olds, both sexes	Life Expectancy at birth		Access to public transport		
	Seats held by women in national parliaments	Gap in self-reported health by income	Net primary enrolment rate	Prevalence of wasting in children under 5 years of age				
	Gender wage gap	Percentage of variation in science performance explained by students' socio-economic status	Lower secondary completion rate	Prevalence of obesity				
	Gender gap in minutes spent per day doing unpaid work		Students performing below level 2 in science	Human Trophic Level				
	Women in science and engineering		PISA score	Maternal mortality rate				
				Neonatal mortality rate				
				Incidence of tuberculosis				

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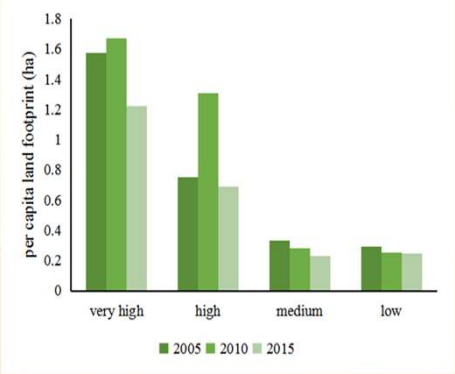
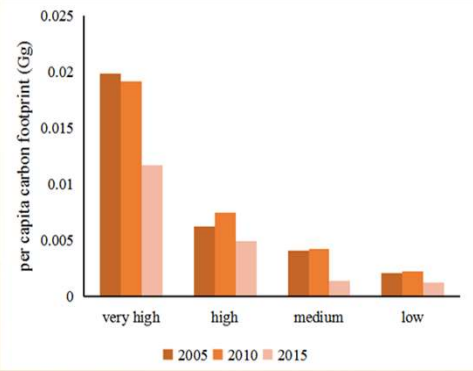
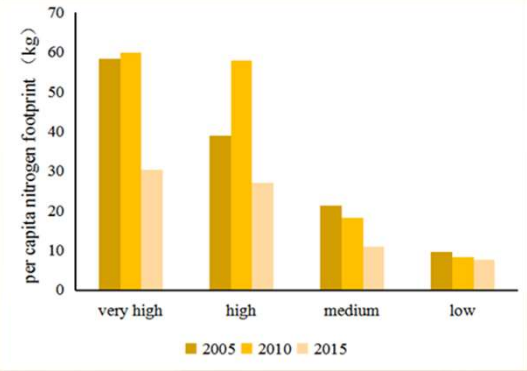
Comparison of green development:

- **Comparison of Environmental Impacts between Different Types of BRI Countries**

From the perspective of per capita environmental footprint, it has obvious categorical characteristics. The higher the level of development of the country, the higher the per capita footprint.







- **Trending**

	Red	Orange	Yellow	Green	
Countries	Bahrain, Israel, Kuwait, TFYR Macedonia, UAE	Belarus, India, Iran, Iraq, Kazakhstan, Mongolia, Oman, Qatar, Saudi Arabia, Serbia, Singapore, Slovakia, Syria, Uzbekistan, Viet Nam, Yemen	Afghanistan, Azerbaijan, Bangladesh, Bosnia and Herzegovina, Brunei,Bulgaria Cambodia,China,Croatia, Czech Republic,Egypt,Estonia, Greece,Hungary, Indonesia, Kyrgyzstan,Laos Latvia,Lebanon,Lithuania Malaysia, Montenegro,Myanmar, Nepal, Pakistan,Philippines, Poland, Moldova,Romania, Russia, Slovenia,Sri Lanka,	Albania, Armenia, Bhutan, Cyprus, Georgia, Maldives,	NO data

The environmental indicators of most countries along the Belt and Road are moving towards green development goals, and countries in Asia and Central Europe are constantly approaching green development expectation of goals.

Balance between Economic Development and Green Sustainable Development

- **Trade-off between Economic Growth and Energy Consumption and Carbon Footprint**

Method：Tapio Decoupling Model

Considering that most BRI countries are in a state of non-decoupling and weak decoupling, the decoupling state is divided into three categories: negative decoupling, weak decoupling and connection. The state is determined by the coefficient of decoupling elasticity, environmental pressure and economic driving force. It can be subdivided into 8 sub-categories under the three major categories.

Decoupling state between economic growth and energy consumption:

	Decoupling Categories	Countries	Quantity
2010-2013	Strong negative decoupling	Iran, Bulgaria, etc.	5
	Recession decoupling	Lithuania, Slovenia, etc.	7
	Weak decoupling	Egypt, Kyrgyzstan, Indonesia, etc.	20
	Strong decoupling	Tajikistan, Macedonia, Uzbekistan, etc.	8
	Weak negative decoupling	Croatia, Latvia, etc.	11
	Negative decoupling	Kuwait, Egypt, etc.	8
	Growth connection	Oman, Arabia, etc.	6

	Decoupling Categories	Countries	Quantity
2014-2015	Strong negative decoupling	Iran, Bulgaria, etc.	7
	Recession decoupling	Albania, Belarus, Russia, etc.	9
	Weak decoupling	Egypt, Pakistan, China, etc.	27
	Strong decoupling	Oman, Azerbaijan, Panama, etc.	11
	Weak negative decoupling	Slovenia, Estonia, etc.	8
	Strong negative decoupling	Iran, Tajikistan, South Africa	3

On the whole, countries along One Belt And One Road have changed from negative decoupling to decoupling, and the average level is in the stage of weak decoupling. Compared with the period from 2010 to 2013, the number of strongly decoupled countries increased significantly from 2014 to 2015, mainly in eastern Europe and Central Asia.

Balance between Economic Development and Green Sustainable Development

Positive Impact/ Mixed or Moderately Negative Impact/ Highly Negative Impact/ Impact Still Unclear

The Impact of the COVID-19 Pandemic on the Green Development of BRI (Take the economic dimension as an example):

	Indicators	Impacts	Paths of impacts
Economic impacts	Economic development	Highly negative impact	1. The global economy is suffering from the crisis caused by the epidemic 2. Some businesses will face bankruptcy 3. Massive fiscal deficits 4. Serious trade obstruction
	Economic growth engine	Highly negative impact	1. Reduction of industrial output 2. Services such as tourism have been severely affected by travel restrictions

Action Plans for BRI Green Developmet

- 1 Development and Utilization of Green Energy
- 2 Green Finance and Green Investment
- 3 CSR Actions
- 4 Biodiversity Protection
- 5 Climate Change Governance

Thanks !