

Building an Evaluation Model for Hard Power, Soft Power and Climate Change Based on Geopolitical Influence

Amit Dalal*

Research Scholar, Department of Geography, NIILM University, Kaithal

Abstract – Climate change is shaping the new example for future geopolitics with extraordinary drive. Climate change has outperformed the category of unadulterated condition issue and become a central issue in international relations Based on residential and international research on geopolitical influence; this investigation built an assessment model that examined the components of hard power, delicate power, and climate change on geopolitical influence. In the wake of choosing records for every one of these components, a Factor Analysis was utilized to figure the geopolitical influence of 30 nations, accounting for the impact of climate change influence. The outcomes appeared: Climate change affects the shifting scene of geopolitical influence, however moves in global power can even now be to a great extent identified with previous elements of influence. There are clear contrasts in the degrees of influence among the 30 surveyed nations, and these distinctions can be partitioned into four dimensions. 3. Members in the three climate arranging bunches likewise have their very own progressive systems of influence; for instance, EU nations have three particular dimensions, and members in the Umbrella Group fluctuate significantly, as does their position on climate change. This is even more genuine for states that are members of the G77 and China gathering.

-----X-----

1. INTRODUCTION

In the present world, climate change has outperformed the category of unadulterated condition issue and become a central issue in international relations. The politicization of climate change has had significant influence on division and restructuring of international relations. Set apart by the UN Climate Change Conference COP15 in Copenhagen, climate change is shaping the new example for future geopolitics with extraordinary drive. With globally further quality on climate change, the influence brought about by climate change on world vitality creation and utilization, sustenance generation and supply, international economy and exchange is increasing more noteworthy. As needs be, driving mechanism to the evolution of geopolitical example has in this way changed profoundly, conflict for carbon emission licenses, rivalry of new vitality system and markets, and new factors like carbon tax and low-carbon exchange hindrance, are especially influencing the present geopolitical example. The influence of climate change on geopolitics is ending up consistently striking, climate change; vitality wellbeing and geopolitics are interlaced together. Issues particularly around engineering of post-Kyoto international climate arrangements, global allotment of carbon emission grants, bit by bit advanced climate change into the focus of international governmental issues.

At present, look into on climate change and climate administration is separated into two general classes: science and legislative issues. The Intergovernmental Panel basically drives the logical side of this activity on Climate Change (IPCC). This board conducts investigation and assessment of logical issues identified with global climate change. The focus of the IPCC's examination is to find the logical premise of climate change, to comprehend the connection between human activities and climate change, and to lead endeavors to influence and adjust to climate change. The political side of climate change investigate is for the most part the space of countries' climate-related political arrangements in the United Nations Framework Convention on Climate Change. The undertaking of the Convention is to set up systems and bargains for future global exchanges on climate change. Their examination focuses on designating duty regarding emission mitigation, dispersing international carbon emission stipends, stipulating the requests of each body's climate arranging position, interests, and approach changes, and analyzing the job climate change plays in the evolution of geopolitics.

1.1 New features of geopolitical evolution

Driven by the climate change, principle assemblages of geopolitical gambling put on

division and restructuration, focuses of geopolitical conflict created new changes, likewise, measures and tools of geopolitical dispute become progressively enhanced

- Field and area augmentation in geopolitical conflict
- Diversification of geopolitical conflict tools
- Restructuration of geopolitical gambling principle bodies

1.2 Influence path of climate change on geopolitical pattern

- Influence way of "Input activity
- Influence way of "Follow activity
- Influence way of "Swell activity

Assessing geopolitical influence has for quite some time been a worry of the academic world. Traditional ways to deal with doing as such have focused on estimating a country's general quality. These rubrics gave extraordinary load to hard power factors, for example, political stability, military expert, and economic quality, and ignored delicate power factors like innovative aptitudes, social influence, and enlightening resources. As of late, new research has catalyzed a move from these straightforward assessments of by and large national solidarity to a more nuanced thought of geopolitical influence, just as a more top to bottom investigation of specific kinds of geopolitical influence.

Without a doubt, climate change is driving movements in the global geopolitical condition. Nations and nation bunches still need logical clarifications and replies on a few facets of this wonder, including inquiries concerning the nature and level of the impact that climate change will have on the geopolitical scene. Climate change is another variable in this unique that will substantially affect the world's geopolitical circumstance. Emission mitigation, for instance, might be utilized to restrict the economic advancement of creating nations. Specifically, it tends to be utilized to legitimize limitations on oil utilization and exportation, which will have significant economic repercussions on oil exporting nations. Energy innovation pioneers will increase expanded international talking rights. Carbon charges and carbon trading will likewise convey change to international trade and budgetary markets.

Table 1 List of the study samples

Category	Country (30)
EU Countries (10)	Germany, Britain, Italy, France, Poland, Spain, Holland, Czech, Belgium, Greece
The Umbrella Group (8)	U.S.A., Russia, Japan, Canada, Australia, Ukraine, Norway, New Zealand
Basic Countries (4)	China, India, Brazil, South Africa
Representative of other typical countries (8)	Iran, Saudi Arabia (OPEC), Egypt, Kenya (African countries) Cuba (the union of small islands), Indonesia (ASEAN), South Korea, Mexico (EIG)

This paper accepts traditional geopolitical influence as a benchmark, and picks a few key indexes from environmental, conciliatory and economic territories that influenced by climate change. These key indexes were added to traditional measurements for deciding geopolitical influence, and the nature and level of their impacts on traditional geopolitical components were assessed. The determination of these new factors ought not abrogate traditional geopolitical influence indexes, yet rather are intended to contribute a more prominent dimension of specificity to climate change examine.

2. RESEARCH METHODOLOGY

2.1 Research sample

The administration of international climate change is basically executed through climate arrangements. Through the span of long stretches of dealings, major nations gradually combine into gatherings, an aftereffect of thinking about their very own requirements, benefits, and power challenges in exchange. These incorporate political unions just as intergovernmental associations with clear political agendas, for example, the European Union (EU) and the Group of 77 (G77). They likewise incorporate associations, for example, the Umbrella Group, the Rainforest Alliance, and the Environmental Integrity Group (EIG), which are inexactly sorted out around normal interests to manage climate change. The performing artists in climate exchanges have accordingly changed from individual nations to climate gatherings, for example, the EU, the Umbrella Group, and the G77 in addition to China. In choosing study samples for this review, these were the three major arrangement bunches were considered, alongside a cross-area of the rest of the nations outside of these three major gatherings. Absolutely 30 nations were chosen (Table 1).

2.2 Index selection and data source

In light of a thought integrating hard power, delicate power, and climate change influence, 24 indexes were chosen. Hard power alludes to military power, economic power, innovative power, and the quality of assets, for example, land territory, populace, and natural stores. Delicate power incorporates political power, social power, and strategic power. In choosing indexes, the investigation additionally blended indexes that have been presented in past examinations that included different components, for example, weapon fares and international association, into arrangements of hard and delicate power. The indexes for climate change impact were chosen dependent on the criteria of ecological impacts, conciliatory influence, and economic impact. See Table 2 for specific portrayals and information hotspots for the evaluation indexes.

Note: 1. At the season of accommodation, various 2014 information pointers for few nations had not yet been determined; to represent this, the nations referenced in this paper were liable to regression examination in the course of the most recent five years of accessible information.

The International Organization Influence (M16) list utilized International Monetary Fund Voting Number, Member of the United Nations Security Council Y/N, and Officials work in the WTO or WHO Y/N as three variables for scoring and evaluation.

The Government Climate Diplomacy (M18) list utilized Core Countries of Negotiating Group Y/N, Proposals or Initiatives for Constructive Negotiations Y/N, and Hinder conduct in Negotiation Process Y/N as three variables for scoring and evaluation.

Table 2 Index summary

First order index	Second order index	Third order index	Number	Index description	Index data source
Hard Power	Resource Bases	Human Resources	M1	Total Population	World Bank Data
		Energy Resources	M2	Proven Reserves of Fossil Fuels (million tons of standard coal)	BP Statistical Review of World Energy 2014
	Economic Strength	Domestic Economic Activity	M3	GDP (constant dollars 2005)	World Bank Data
			M4	Per Capita GDP (constant dollars 2005)	World Bank Data
		Foreign Economic Activity	M5	Exports of Goods and Services (constant dollars 2005)	World Bank Data
			M6	Total Reserves (including gold, US\$)	World Bank Data
	Military Force	Military Base	M7	Military Expenditure (\$Million 2011)	Global firepower United States global military network
		Military Industry	M8	Arms exports (\$M)	Stockholm International Peace Research Institute (SIPRI) Database
	Technological Strength	Technological Investment	M9	R&D Expenditure (% of GDP)	World Bank Data
		Technology Export	M10	High-technology exports (% of manufactured exports)	World Bank Data
Soft Power	Government Capacity	Government Regulation and Control Ability	M11	General Government Final Consumption Expenditure (constant dollars 2005)	World Bank Data
		Public Relation Department Corruption Rating	M12	Global Corruption Perceptions Index	Corruption Perceptions Index
	Cultural Strength	Cultural Attraction	M13	World Cultural Heritage	UNESCO Database
		Strength of Cultural Productive	M14	International Tourist Entry Number	World Bank Data
	Diplomatic Strength	Participation in International Activities	M15	Intergovernmental International organization (IGO) Participation Rate	«YearBook of International Organization»
		Influence Among International Organizations	M16	International Monetary Fund Voting Number	Scoring and Evaluation
Climate Change Impact	Climate Change Ecological Impacts	Climate Change Adaptation Abilities	M17	Climate Change Vulnerability Index (EVI)	Secretariat of the Pacific Community (SPC)
	Climate Change Diplomacy	Government Climate Diplomacy	M18	Evaluation of Government in Climate Change Negotiations	Scoring and Evaluation
		Non-governmental Organization Influence	M19	Number of Nongovernmental Organizations Involved in Climate Negotiations	IPCC Official Website data
		Indirect Impact on Negotiation Skills	M20	Number IPCC Authors	IPCC Report Related Documents
	Climate Change Economic Impact	Emission Reduction Pressure and Cost	M21	Per capita Carbon Emissions	World Resources Institute CAIT Database
		Traditional Industry Impacts	M22	Export Value of High Carbon Industry	United Nations Commodity Trade Statistics Database
Emerging Industry Development		M23	The Cleantech Innovation Index	Joint efforts of the world natural foundation (WWF) and Cleantech Technology Group	

2.3 Evaluation method

Indexes chose in this paper may have complex relationships with each other, along these lines, for lucidity, it is ideal to pick a select number of complete indexes that incorporate a large portion of the data in the first file framework. What's more, the relationship among the general indexes ought to be limited. A Factor Analysis can take care of this issue great. The basic thought of a Factor Analysis is that variables that are firmly related are grouped into similar classes, and connections among various types of variables are weighted less intensely. Variables inside a similar category are comprehended to be influenced by a typical factor that is exceedingly related with every one of the variables, and this is known as a typical factor.

At the point when the inborn arrangement of an issue isn't clear, Factor Analysis can be utilized to consolidate watched variables into basic factors. Give every normal factor a chance to represent a measurement. After a symmetrical or angled turn is

played out, the dimensions can be viewed as uncorrelated with one another. At that point these dimensions can plainly portray the framework structure of the examination objects.

3. RESULTS AND DISCUSSIONS

3.1 Process analysis

The statistical software PASW Statistics 18 was received to remove 4 basic factors from 23 indexes; these were named and clarified through the analyses of basic factors of different indexes with bigger loadings.

The principal factor mirrors the indexes of fossil energy holds, all out GDP, military spending, weapons trades, government spending, IMF casting a ballot rate, the quantity of non-legislative associations partaking in climate exchanges, and the quantity of IPCC report scholars. All these are identified with a nation's hard power.

The second factor mirrors the indexes of per capita GDP, R&D consumptions and rate, cutting edge sends out, corruption discernments record, and a perfect innovation list. These indexes are identified with dimensions of social improvement and innovation.

The third factor mirrors the indexes of all out populace and absolute stores. These are identified with human assets.

The fourth factor mirrors the indexes of world cultural heritage, global IGO support rate, and administrative climate arrangement conduct. These are identified with a nation's conciliatory action.

This article identifies the four basic factors as economic gross factor, advancement level factor, human asset factor, and cultural diplomacy factor, individually. These four factors can be utilized to clarify the impact of climate change influence in the geopolitical scenes of the thirty surveyed nations.

The scores of the four regular factors were weighted and included. The variance extent was utilized as loads in this paper. The variance contribution rates of the four normal factors after rotations were 33.707%, 19.384%, 14.574% and 13.415%, separately. Permitting X1~X4 to be the four basic factors, the recipe for computing national geopolitical influence is:

$$W1=33.707\%*X1+19.384\%*X2+14.574\%*X3+13.415\%*X4$$

The software's capacity of 'transformation → variables' estimation and information variables as indicated by the above recipe was utilized to acquire factor scores for national climate geopolitical

influence, in general score, and positioning I, of which X1~X4 are: economic gross factor, advancement level factor, human asset factor, and cultural diplomacy factor.

3.2 Result analyses

In light of the outcomes in Table 3, various ends can be drawn.

3.3 Comprehensive influence level analysis

Subsequent to making a thorough examination of all scores of the nations in Table 4, nations are partitioned into four dimensions dependent on their level of influence:

The primary dimension comprises of the United States, China, Germany, France, the United Kingdom, and Japan (nations with scores over focuses). The scores of most factors in these four nations are a lot higher than those of different nations, demonstrating that they have solid geopolitical influence. This is on the grounds that, from one viewpoint, these nations have a hearty in general national power, and then again, on the grounds that they demonstrate their administration to the created and creating nations in climate exchange and the board. Indeed, even inside this dimension, nonetheless, extraordinary nations have diverse qualities and shortcomings in specific factors; for instance, the United States had higher scores in economic gross and natural asset factors, while China had higher scores in human asset and cultural diplomacy factors.

The second dimension comprises of Italy, Holland, Spain, South Korea, India, Canada, and Belgium (nations with scores from 0-0.3 focuses). Nations in this gathering had higher scores in at least two factors. Despite the fact that they don't have as solid of a geopolitical influence as China or the United States, regardless they have power in the geopolitical field, and they ought not be neglected. In climate change exchanges, they likewise have certain effects in their very own gathering.

The third dimension comprises of the Russian Federation, Australia, Norway, Brazil, Mexico, Poland, Greece, South Africa, the Czech Republic, and Indonesia (nations with scores from 0.3-0 points).

Table 3 Comprehensive score and ranking of the geopolitical influence of various countries around the world

Country	X1	X2	X3	X4	Score	Ranking
U.S.A.	4.80511	0.53656	-0.31442	-0.61247	1.5957	1
China	0.3777	-0.18201	4.70999	0.15498	0.7993	2
Germany	0.47459	1.13307	-0.22199	1.28744	0.5200	3
France	0.19281	0.65169	0.11178	2.18451	0.5007	4
U.K.	0.52329	0.59611	-0.94814	1.60948	0.3697	5
Japan	-0.17003	1.64795	0.88461	-0.42895	0.3335	6
Italy	0.06883	-0.45323	-0.15465	1.61213	0.1291	7
Netherlands	-0.60583	1.44048	-0.34632	0.4035	0.0787	8
Spain	-0.02087	-0.2759	-0.50857	1.5749	0.0766	9
Korea	-0.8551	1.5869	0.8771	-0.54155	0.0746	10
India	-0.03091	-0.96635	0.92361	0.87305	0.0540	11
Canada	0.02643	1.21525	-0.2903	-1.28798	0.0294	12
Belgium	-0.60647	0.94947	-0.39176	0.60962	0.0043	13
Russian Federation	1.07168	-1.26823	-0.33065	-0.7677	-0.0358	14
Australia	-0.03904	1.17568	-0.47501	-1.49408	-0.0549	15
Norway	-0.70557	1.42092	-0.6222	-0.12598	-0.0700	16
Brazil	-0.10413	-0.62005	-0.25324	0.51301	-0.1234	17
Mexico	-0.25701	-0.79031	0.41856	-0.19025	-0.2043	18
Poland	-0.45879	-0.40181	-0.23468	0.392	-0.2141	19
Greece	-0.42075	-0.52819	-0.69124	0.63861	-0.2593	20
South Africa	-0.15732	-0.72959	-0.59361	0.11392	-0.2657	21
Czech Republic	-0.63188	0.0425	-0.05062	-0.48296	-0.2769	22
Indonesia	-0.30695	-1.16867	0.24105	-0.03695	-0.2998	23
New Zealand	-0.57997	0.90583	-0.35328	-1.76973	-0.3088	24
Saudi Arabia	0.0417	-0.63279	-0.29433	-1.4442	-0.3452	25
Cuba	-0.73413	-0.40853	0.2669	-0.69645	-0.3812	26
Egypt	-0.29419	-1.17022	-0.42951	-0.03115	-0.3928	27
Iran	-0.14226	-1.2284	-0.13137	-0.7445	-0.4051	28
Ukraine	-0.16103	-1.1478	-0.37293	-0.6122	-0.4132	29
Kenya	-0.29991	-1.33032	-0.42477	-0.70006	-0.5148	30

Note: Umbrella Group of countries Developing country, EU countries

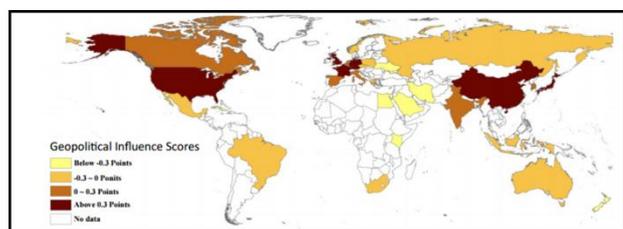


Figure 1 Climate-change-influenced geopolitical influence scores of 30 countries

These nations regularly have higher scores in a couple of factors. Their influence in their specific gathering is nonpartisan. For the most part, they pursue the positions progressed by progressively influential nations, yet they at times propose changes and step up in dealings. For instance, the proposition to survey different nations' historical responsibilities for climate change was advanced by Brazil in the Warsaw Convention; this was bolstered by the vast majority of the creating nations, improving the defensive position of the creating nations in dealings.

The fourth dimension comprises of the rest of the (nations with scores under 0.3 focuses). These nations can be partitioned into the accompanying three classifications:

Nations, for example, Saudi Arabia and Iran, which are subject to energy sends out and are impacted by climate change.

Nations, for example, New Zealand and Egypt, that stress that emission decrease necessities would hinder their economic advancement and accordingly take a negative frame of mind toward climate arrangements.

Nations that have dependably had low traditional geopolitical influence, for example, Cuba and Kenya. These nations will in general score lower on at least four factors, and their climate geopolitical influence is moderately low.

3.4 Internal influence level of national group

In light of the investigation on three climate exchange gatherings, the distinctions in influence between gathering members can be seen from their scores in Table 4.

The ten EU nations are separated into three gatherings dependent on their degrees of influence. The main gathering involves Germany, France, and Britain. These three nations are traditional geopolitical powers in Europe and are the foundation of EU initiative in climate change arrangements. The second gathering contains Italy, Holland, Spain, and Belgium. They represent Europe's moderately created nations, which have less influence in geopolitics and climate exchanges than the nations in the main gathering. Typically they pursue the lead of the main gathering. The third gathering contains Poland, Greece, and the Czech Republic. They represent created EU nations encountering economic subsidence, and Southeast European nations with a lower dimension of economic performance. Because of their national, budgetary, as well as economic structures, they remain in a generally frail position in climate arrangements, which is somewhat reflected in their lower scores.

The biggest inner distinction was found in the G77 and China gathering. The members in the main Basic 4, China, India, Brazil, and South Africa, were 2, 11, 17 and 21, separately. Contrasted and the EU gathering (Germany, 3; France, 4; U.K., 5) and Umbrella members (U.S.A., 1; Japan, 6; Canada, 12), the distinction in influence among G77 and China members was a lot bigger. The contrast between major members and different members of the gathering was likewise bigger than that inside the EU and Umbrella gatherings, showing the presence of unequal positions on arrangement making dealings in the gathering. This may reveal some insight into why it is progressively troublesome for the creating nations to frame a unified square, for example, the EU.

The United States and Japan had the most influence among nations in the Umbrella Group. Japan's negotiating position wound up more fragile in the post-Kyoto time, however despite everything it positions close to the highest point of the

Umbrella Group because of its historical geopolitical influence. Canada, Russia, Australia, and Norway make up the second level inside the Umbrella Group. The initial three nations were very comparable in asset wealth and domestic resistance to emission decrease. New Zealand and Ukraine were fringe members of the Umbrella Group.

4. CONCLUSION

In light of domestic and international research about the level of climate change impacts on geopolitics; this paper built an evaluation model for a mix of land factors: hard power, delicate power, and climate change influence. In contrast to traditional geopolitical influence evaluation, this evaluation model chosen a few key indexes from the ecological effects of climate change and strategic and economic influence, and made up for the hole in utilizing just traditional geopolitical influences by including climate change factors into current evaluations of geopolitical influence.

The example nations can be partitioned into four dimensions dependent on the all out scores they got from the Factor Analysis. The principal level incorporates the United States, China, Germany, France, Britain, and Japan. The second dimension incorporates Italy, the Netherlands, Spain, Korea, India, Canada, and Belgium. The third dimension incorporates the Russian Federation, Australia, Norway, Brazil, Mexico, Poland, Greece, South Africa, the Czech Republic, and Indonesia. The fourth dimension incorporates the remainder of these nations. National influence diminished logically down these four dimensions. The inside influence of members inside every one of the three climate arrangement bunches additionally justifies consideration. EU nations have evident contrasts crosswise over three dimensions. The inward hole in the Umbrella gathering is vast, and the part nations' points of view of climate change vary extraordinarily. The distinctions among the members of the G77 in addition to China amass gave off an impression of being the best. When looking at figurings of individual scores and rankings of traditional geopolitical influence for every nation, utilizing 16 indexes of hard and delicate power with positioning estimations gave in past papers, it was discovered that nations' situations inside the two positioning frameworks were roughly the equivalent. This shows the influence of current climate change exchanges on geopolitical influence is constrained.

REFERENCES

1. Kong X.H. (2010). Analyze on ways of geopolitics affecting a state's security strategy. *World Regional Studies* 19: pp. 19-26.
2. Stern N. (2006). *Stern Review on the Economics of Climate Change*. Report to the Prime Minister and the Chancellor of the Exchequer on the Economics of Climate Change.
3. Florian W. (2014). Practices, politics, performativity's, and documents in the international negotiations on climate change. *Political Geography* 40: pp. 46-55.
4. Ding Z., Duan X., Ge Q. (2009). Control of atmospheric CO2 concentration by 2050, An allocation on the emission rights of different countries. *Sci China Ser D-Earth Sci* 38: pp. 1009-1027.
5. Brande E.V. (2008). EU normative power on climate change: A legitimacy building strategy?
6. Li H. (2009). from periphery to center: the evolution of American policy toward climate change. *American Studies Quarterly* 2: pp. 20-35.
7. Zhang H. (2010). Reflections on Post-Copenhagen international climate change cooperation. *International Economic Review* 4: pp. 102-113.
8. Pan J., Wang M., Lian H. (2011). Review and outlook of Cancun climate change conference. *Journal of Graduate School of Chinese Academy of Social Sciences* 2: pp. 14-18.
9. Wang L., Li H., Gu M. (2012). Influence path and effect of climate change on geopolitical pattern. *Acta Geographica Sinica* 67: pp. 853-863.
10. Mou C. & Wang L. (2015). Evolution process and trend of climate negotiation groups. *Journal of Engineering Research* 7: pp. 232-240.
11. Gu M. & Wang L. (2015). Assessment of oil and gas geopolitical influence. *Journal of Geographical Sciences* 25: pp. 369-384.
12. Jia H. (2012) China's comprehensive national power and its world rank, theory, reality and assessment formulas. *Journal of Nanjing University of Science and Technology* 25: pp. 1-16.
13. Matthew E.K. (2013). The geopolitics of climate change, An economist's perspective. *Political Geography* 37: pp. 53-55.

14. Wang S., Ge Y., Cao Y., Hu H. (2014). Modeling China's geopolitical influence in surrounding areas, a case study of South Asia. *Progress in Geography* 33: pp. 738-747.
15. Zhuang G. (2008). Post-Kyoto international climate governance and China's strategic options. *World Economics and Politics* 8: pp. 6-15.

Corresponding Author

Amit Dalal*

Research Scholar, Department of Geography, NIILM
University, Kaithal

6980amit@gmail.com