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# Gerrymandering and GIS: A Comparative Study of India and USA

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## ABSTRACT

*Partisan gerrymandering has endured its relevance for decades. The implications of gerrymandering are not confined to the clash of ideologies and voter distribution turf among numerous political parties, but they extend to the political misrepresentation of the qualified voting populace. The central ambition of the “Delimitation” process is to create equitable representation in the democratic society. With the changing population dynamics, alterations in the electoral boundaries to ensure fair representation is a crucial and recurring undertaking. Hence, digital tools can be an extremely potent source for executing electoral boundary redistricting or appropriate distribution of voting precincts. The GIS technology can ensure that boundaries are drawn without any partisan manipulation as it is skilled at generating diverse boundary configurations on the basis of evolving population statistics which can further depoliticize the entire redistricting process carried out by the Independent Redistricting Commission or State Legislature. The technology can transform the way we work. One sole entity could easily generate countless plans and can specify using advanced spatial software the presence of gerrymandering, thereby developing unbiased delimitation proposals. The researcher through this study aspires to offer a detailed explanation of partisan gerrymandering and how it could be combated through the use of geo-spatial technology.*

**Keywords:** *Gerrymandering, GIS, Geospatial technology, Independent Redistricting Commission.*

## I. INTRODUCTION

The term “**Delimitation**” in its truest sense means the act or procedure of fixing boundaries of territorial constituencies in a country or a province having a legislative body.<sup>2</sup> Delimitation sets out a correlation between the population rise and a proportional increase in the number of elected representatives to its legislature. It guarantees the absence of any instances of ‘over or under-representation of representatives’. Delimitation seeks to maintain the ‘**population seat ratio**’ among multiple states within the Union. It develops balanced constituencies so as to

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<sup>2</sup> Election Commission of India, “Delimitation” (*Election Commission of India*) <https://eci.gov.in/delimitation-website/delimitation/> accessed 15 November 2023

ensure that every voter has an equal say in the democratic process.<sup>3</sup>

Delimitation is not an ongoing procedure, rather it is a periodic exercise. In India, the responsibility of delimitation has been entrusted to a high-power body, popularly referred to as the *Delimitation Commission*, which was formed four times in **1952, 1963, 1973, and 2002** under the Delimitation Act of the respective year. Due to the constantly growing population, the process of delimitation has become inevitable as it requires the equal distribution of the citizens within the state or districts to successfully implement the principle of *'One person' 'One vote' and 'One value'*.

Appointed by the President of India, the Delimitation Commission operates as an independent body. It is composed of a retired Judge of the Supreme Court or High Court (Chair), Chief Election Commissioner, and State Election Commissioner. Its orders and decisions are considered law, and hence cannot be called for question in any court of law. While the delimitation process seems to respect and adhere to the principle of *'One person, One vote'*, the inherent political vendettas generate opposite results.

#### **(A) Importance of delimitation**

India's revolutionary transition from a mere British colony to an Independent and Sovereign nation triggered a major societal alteration that witnessed its populace transformation from being subjects to eligible voters. Consequently, the supreme authority went into the hands of *"WE THE PEOPLE OF INDIA"*. In a democratic setup, especially in a representative democracy like India, there can be no real democracy without an election. This suggests that delimitation and election are the two prominent pillars of the same. The free and fair functioning of the electoral system is dependent on the delimitation process of constituencies which needs to be protected from political interference.<sup>4</sup> The delimitation process is responsible for ensuring that the number of seats in the Legislature is proportional to the population. The goal of equal representation is upheld.

It is conducted on the basis of the latest population data to guarantee that the district boundaries align accurately with the changing demographic trends. The clearly defined boundaries allow the political officials to effectively represent their constituencies. Hence, the procedure should be carried out without bias, thereby ensuring the fair and equitable demarcation of the boundaries. For an unbiased electoral system to survive within the walls of democracy, it is

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<sup>3</sup> Verma AK, 'Issues and Problems in India's Delimitation Exercise' (2002) 64 The Indian Journal of Political Science 371 <http://www.jstor.org/stable/42753697> accessed 15 November 2023

<sup>4</sup> T Arumugam, 'Indian Electoral Politics a Critical Analysis' (2015) 76 The Indian Journal of Political Science <https://www.jstor.org/stable/10.2307/26534852> accessed 11 November 2023

indispensable to follow certain procedures to ensure just representation of the voters in the society. The ultimate ambitions of delimitation revolve around attaining equality, impartiality, and proficient administration by establishing and demarcating frontiers of electoral districts.

### **(B) Gerrymandering**

One of the significant problems associated with delimitation is gerrymandering, it may seem to be an insignificant hassle considering the wide domain of election procedures, but this carries numerous practical ramifications for the existence of democracy. The gerrymander has survived even after the passionate commotion caused by moral objections. It still stands as a dominant impediment to fair representation and free elections. By prudently explaining gerrymandering, formulating equitable parameters for fair districting, and eventually proposing a method for evaluating redistricting schemes, assistance can be provided to redistricting bodies whether legislatures, unaffiliated commissions, or, if necessary, the courts in destroying the inequalities embedded in partisan gerrymandering.<sup>5</sup>

The practice of drawing boundaries for political advantage predates the Declaration of Independence. The practice is a standard procedure for securing political leverage that surpasses the party's numerical strength. Two traditional categories of contemporary gerrymandering are (1) *partisan gerrymandering*, through which the political party aims to attract ballots over the rival party (2) *racial gerrymandering* which seeks to obtain political gains for one's own race. Gerrymandering is questionable and provocative because the vote distribution through boundary mismanagement weighs heavily on the ideal notion of democratic self-governance.

Gerrymandering has a negative impact on democratic institutions. However, this impact can be easily defined but not proven. For instance, it is logical to propose that a gerrymandered legislature produces distorted constituencies, but there exists no means to substantiate a mere assumption. Gerrymandering introduces a chronic, self-perpetuating skew into the business of popular representation, no matter how the term is defined. A perversion of democratic procedure, the obstacle eludes redressal through the democratic mechanism.<sup>6</sup> The term gerrymandering has been commonly referred to as the "*pathology of democracy*" by Martin

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<sup>5</sup> Charles Backstrom, Leonard Robins & Scott Eller, 'Issues in Gerrymandering: An Exploratory Measure of Partisan Gerrymandering Applied to Minnesota' (1978) 62 Minn L Rev 1121 <https://core.ac.uk/download/pdf/217205813.pdf> accessed 11 November 2023

<sup>6</sup> Daniel D Polsby and Robert D Popper, 'The Third Criterion: Compactness as a Procedural Safeguard against Partisan Gerrymandering' (1991) 9 Yale Law & Policy Review <https://www.jstor.org/stable/40239359> accessed 12 November 2023

Shapiro.<sup>7</sup>

The result of gerrymandering is not only a reduction in electoral competitiveness but it simultaneously undermines the democracy. Effective regulation of partisan gerrymandering should be construed as justiciable as it is deeply intertwined with the goal of establishing citizen-centric and representative democracy.

The insatiable desires of lawmakers to acquire and sustain political and personal dominance at the expense of voters is a common sight. Gerrymandering yields biased votes ballot which infringes on the right to vote of a genuine citizen and threatens the foundation of representative democracy. As the tools and techniques to redraw the state's boundaries have become more refined and productive, individual rights are at a greater exposure to potential harm.<sup>8</sup>

### **(C) Role of computers**

Computer technology holds the potential to substantially transform the redistricting process by facilitating the legislators to quickly define political boundaries in a few minutes. While computer mapping packages have existed for numerous years, they were costly, difficult to learn and use, or not so advanced in their graphics capabilities. On the other hand, microcomputer programs are comparatively affordable, less technical, easy to learn, capable of generating high-quality graphics, and are also compatible with a variety of commonly available microcomputers.<sup>9</sup>

The GIS technology can ensure that boundaries are drawn without any partisan manipulation as it is skilled at generating diverse boundary configurations on the basis of evolving population statistics which can further depoliticize the entire redistricting process carried out by the Independent Redistricting Commission or State Legislature. The technology can transform the way we work. Keeping in view, the menace of partisan politics, the human element should be completely purged out of the process of redistricting. This implies that the procedure should be mechanical in its entirety, leaving no inch of space for human intervention.<sup>10</sup>

## **II. HISTORICAL ORIGIN OF GERRYMANDERING**

The term '*Gerrymandering*' is as ancient as America. Gerrymandering in the United States

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<sup>7</sup> Martin Shapiro, 'Gerrymandering, Fairness, and the Supreme Court' (1985) 33 UCLA L. REV file:///C:/Users/user/Downloads/fulltext.pdf

<sup>8</sup> Girardeau A Spann, 'Gerrymandering Justiciability' (2020) 108 Geo LJ 981

<sup>9</sup> Anderson, Arthur J, and William S. Dahlstrom, 'Technological Gerrymandering: How Computers Can Be Used in the Redistricting Process to Comply with Judicial Criteria' (1990) 22 *The Urban Lawyer*, <http://www.jstor.org/stable/27894648> accessed 8 November 2023

<sup>10</sup> William Vickrey, 'On the Prevention of Gerrymandering' (1971) 76 *Political Science Quarterly* <http://www.jstor.org/stable/2145973> accessed 25 October 2023

continued even after the American Civil War and then into the late 19<sup>th</sup> century. The republican party with the ulterior motive of adding more friendly states into their territory used its control of Congress for such admission. The US democracy witnessed rivalries between Federalists and Democratic-Republicans in the founding era of politics. Since the beginning as the State legislature was responsible for redrawing the boundaries, it made sure to bend and mould districts in their favour. They were quick enough to alter the boundaries to gain unfair advantage in national and state elections.

Gerrymandering as a concept has been an entrenched convention in the United States political system. One could speculate if this problem had its roots since the outset, why did the drafters of the constitution not establish appropriate legal architecture to address the same? A preliminary response to this could be that the notion of partisan gerrymandering was a fresh creation in its era.

In the Massachusetts elections of 1811, *Elbridge Gerry*, a democratic-republican, was re-elected as the governor, and hence the party established its supremacy in the legislature. During this period, redistricting was unfolding simultaneously on the basis of the 1810 Census. As the Republicans controlled the legislation formation competence, and passed the state Senate redistricting laws in 1812, Elbridge Gerry signed the reapportionment legislation in the same year, with a view to redrawing the state’s boundaries for favorable advantage during the election.



The *Boston Gazette* in March 1812, produced an iconic and ridiculed sketch that resembled a creature with claws, an elongated tail, a long neck, wings, and other characteristics of an amphibian. The illustrator **Elkanah Tisdale** concocted a dragon-shaped creature depicting an uncommonly contoured district, notably in the form of a ‘*salamander*’ as shown in the above picture labeled as *Figure 1*. Hence, a hybrid of Elbridge **Gerry** and **Salamander**, the term

<sup>11</sup> Duignan B, “Gerrymandering | Definition, Litigation, & Facts” (*Encyclopedia Britannica*, November 21, 2023) <<https://www.britannica.com/topic/gerrymandering>>

**‘Gerrymander’** was constructed. Precinct maps with bizarre shapes have been the hallmark of partisan gerrymandering for ages.

Gerrymander can best be apprehended in the light of two basic techniques commonly referred to as **‘Cracking’** and **‘Packing’**. The term **‘cracking’** refers to the splitting of voters belonging to a particular demographic or party affiliation in multiple districts to diminish their control and influence in each district. As the voting strength is distorted, the voters group struggle to elect their preferred party representative.

Whereas the term **‘packing’** leads to the gathering of voters in as less districts as possible. The packed groups can choose their political representative in that district, thereby weakening the voting strength in the surrounding areas. Cracking and packing frequently presents and creates regularly shaped districts that look significantly fascinating to the naked eye but nonetheless skew heavily in favour of one party.<sup>12</sup>

The most notable demonstration of gerrymandering is called as partisan gerrymandering. It is exceedingly prevalent, yet often goes undetected. Further, the evolution of computers and amplifying rift amongst eligible voters have escalated its significance. However, the intricacies involved in political gerrymandering preserve it from judicial intervention. Courts have been cautious while handling these matters. Gerrymandering, hence is nothing but a well-practiced craft.<sup>13</sup>

Irrespective of the party’s accountability, it is the citizens who bear the brunt of gerrymandering. The manipulation of the state or district boundaries generates less electoral competitiveness and fairness, making the voters feel powerless. However, the process of gerrymandering has changed since its inception. The transformation from manual to computer-based mapping has allowed politicians to commit to redistricting with enhanced precision. The critics believe that through the use of computer algorithms, parties can generate numerous maps and select the most suitable plan to win the elections.

The irony is that gerrymandering facilitates the political parties to pick and choose their voters, rather than the voters electing their leaders. This transpires usually when redrawing is left to the hands of the legislatures and one out of several political parties dominates the entire process.<sup>14</sup>

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<sup>12</sup>Kirschenbaum J and Li M, ‘Gerrymandering Explained’ (*Brennan Center for Justice*, August 2021) <https://www.brennancenter.org/our-work/research-reports/gerrymandering-explained> accessed 20 October 2023

<sup>13</sup> Charles Backstrom, Samuel Krislov and Leonard Robins, ‘Desperately Seeking Standards: The Court’s Frustrating Attempts to Limit Political Gerrymandering’ (2006) 39 *Political Science and Politics* <https://www.jstor.org/stable/20451775> accessed 15 October 2023

<sup>14</sup> Same as 11

Gerrymandering continues to persist in the Twenty-first Century as one of the gross transgressions of democratic elections where districts are used. Despite numerous reform endeavours, the literature reports modern-day instances of the spatial manipulation of districts, scales, and cultural settings. Notwithstanding that nearly two centuries have passed since the inception of the term gerrymander, novel information has arisen every now and then which supplements the understanding of its derivation and the establishment.<sup>15</sup>

### III. CASE STUDY- UNITED STATES OF AMERICA

Article 1, Section 2, Clause 3 of the United States Constitution pertains to the ‘Proportional Representation in the House of Representatives.’<sup>16</sup> The United States Representatives and legislators are elected from the districts. The apportionment is done with the motive to ensure that the districts contain nearly equal populations to ensure fair representation.

Considering all the significant challenges to democracy, especially in the USA, the most terrible among them is gerrymandering. Gerrymandering results in districts with unnecessarily visually complex structures.<sup>17</sup> Although there exists a legal framework at both the state and federal levels to shield the rights of citizens during the redistricting procedure, in practice these laws have minimal effect on partisan gerrymandering.<sup>18</sup>

An attempt to replace manual redistricting with a computational method would change legislative redistricting deliberation from a mere line-drawing battle to a solid discussion of representational goals. To put this differently, the role of a human would be to clearly lay down the criteria to be considered during the redistricting mechanism and the job of the computer would be to present the optimum alternative without human meddling.<sup>19</sup>

The need to regulate partisan gerrymandering should be considered as justiciable as it is finally connected to fostering representative democracy. It should not be an unjustifiable political dilemma. With the aim of maintaining political dominance, the legislators will be blinded towards the interest of the voters, to win the election again, and remain in power till time immemorial. Hence, the facade created by partisan politics should be brought within the purview of the Supreme Court, so as to protect the integrity of fair representation.

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<sup>15</sup> Martis K, ‘The original gerrymander’ (2008) 27(8) Political Geography <doi:10.1016/j.polgeo.2008.09.003> accessed 19 October 2023

<sup>16</sup> United States Constitution s 2(3)

<sup>17</sup> Guest O, J Kanayet, F and C Love B, “Gerrymandering and Computational Redistricting” [2019] (*Journal of Computational Social Science*) 119

<sup>18</sup> Samuel Issacharoff, ‘Gerrymandering and political cartels’ (2002) 116 (2) Harvard Law Review Association <https://www.jstor.org/stable/1342611> accessed 19 October 2023

<sup>19</sup> Browdy, Michelle H, ‘Computer Models and Post-Bandemer Redistricting’ (1990) 99 The Yale Law Journal <https://doi.org/10.2307/796740> accessed 10 November 2023.



The Supreme Court's argument that delving into the menace of gerrymandering is outside their jurisdiction as it is mostly a political question stands outdated because it incorporates a broader question of equitable representation. Let's understand the role of judiciary on this matter in detail.

### (A) Courts and gerrymandering

In 1946, the US Supreme Court dealt with a matter wherein it was alleged by three voters from Illinois that the state's congressional district boundaries were irregular and the population within the district was not equally divided, thereby violating the United States Constitution in the case of *Colegrove v. Green*.<sup>20</sup> The Supreme Court affirmed the decision of the lower court on the ground that that the complaint needs to be dismissed as no stipulations concerning the compactness, approximate equality of population, etc were enshrined within the federal legislation

The famous Supreme Court's decision in *Baker v Carr*,<sup>21</sup> pronounced in 1962 led to the origination of the '*Political Question*' doctrine. The case confronted the dilemma of whether fluctuations in the population within the districts in a map, resulting in 'malapportionment' which simply means that the 'voters in low-density districts have more voting power as compared to those in more densely districts' can be challenged constitutionally as violative of the equal protection clause guaranteed by the Fourteenth Amendment of the U.S. Constitution. The Tennessee voters petitioned that the redistricting of the state legislature neglected demographic variations, which was a violation of the Fourteenth Amendment as provided under the United States Constitution. The judges overruled the decision pronounced in the case of *Colegrove v. Green*.

The majority judgment pronounced by Justice William J. Brennan rejected the contention that this question needs to be viewed in a political setup and federal courts should refrain in answering them. The court stated that the district population should be apportioned in a manner that guaranteed the notion that every person's vote carried equal weightage during the election. Equal representation of every individual is a key element of the 'One person, One vote' theory. The Supreme Court of the USA has mostly avoided answering the questions concerning partisan gerrymandering as otherwise it would appear to have been favouring either of the political parties. The court in *Bandemer*<sup>22</sup> and *Juberlirer*<sup>23</sup> declared that partisan

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<sup>20</sup> *Colegrove v. Green*, (1946) 328 US 549

<sup>21</sup> *Baker v Carr* [1962] 369 US 186

<sup>22</sup> *Davis v. Bandemer* [1986] 478 US 109

<sup>23</sup> *Vieth v. Jubelirer* [2004] 541 US 267

gerrymandering might be justiciable, but no clear stance was taken.

The High Court in the case of *Davis v. Bandemer*, held that the redistricting proposals of Indiana were not in violation of Gerrymandering laws. However, the court additionally confirmed that such partisan Gerrymandering challenges are subject to judicial review under the Equal Protection Clause.

Similarly, in 2004, the US Supreme Court in *Vieth v. Jubelirer*, a case of Pennsylvania Democrats alleged that the Republicans had generated a congressional district map that truly classified as a political manipulation, gave no clear judgment about gerrymandering qualified as a subject of judicial review or not.

By the year 2014, a new tool was developed by Nicholas Stephanopoulos and Eric McGhee which was called the 'Efficiency Gap', it measured the percentage of 'wasted votes' in each district. This method concluded that the larger the wasted votes within districts and between parties, there exist more chances of partisan gerrymandering.<sup>24</sup>

In the decisions concerning *Rucho v. Common Cause*<sup>25</sup> and *Lamone v. Benisek*<sup>26</sup>, the court held that owing to partisan gerrymandering association with the political domain, it is outside the purview of the federal court system. The majority believed that partisan gerrymandering is to be declared unconstitutional but it is the duty of the legislative bodies to fulfill such obligation, probably by introducing the concept of independent commissions for redistricting.

The constitutional validity of the Maryland Congressional District map was challenged by seven state Republicans in the case of *Benisek v. Lamone* who asserted that modification of the boundaries took place in the hands of state legislators with the ulterior motive to weaken the significance of the voters supporting the Republic Party. They believed that the strategy adopted was purposeful and intentional, and helped them achieve the desired outcome.

The Court ruled that the plaintiffs were unable to substantiate that they would be subjected to irreversible damage on the failure to grant an injunction. The Court did not handle the overarching concern related to partisan gerrymandering being a fit subject to fall within the domain of the judiciary.

Justice Kagan, while writing a dissenting judgment in the case of *Rucho v. Common Cause* laid down that, 'For the first time, a court has neglected and refused to remedy a constitutional

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<sup>24</sup>Kean S, 'The Flaw in America's 'Holy Grail' Against Gerrymandering' (*The Atlantic*, January 2018) <<https://www.theatlantic.com/science/archive/2018/01/efficiency-gap-gerrymandering/551492/>> accessed 4 October 2023

<sup>25</sup> *Rucho v. Common Cause* [2019] 588 US

<sup>26</sup> *Benisek v. Lamone* [2019] 588 US

violation on the premise that it is beyond their capabilities. The gerrymandering wrong-doers in the present case have deprived citizens of the most pivotal fundamental right: the right to equally participate in the political procedure, and also to freely choose their political representatives as a new government. Free, Fair, and Periodic elections are central to the federal system. And partisan gerrymandering renders it meaningless. The pick-and-choose procedure covered in the political superiority to ensure re-election rests the power in the hands of the government rather than the people.

The U.S. Supreme Court, in numerous disciplines, has corroded the value of the Rule of Law, but its indifference towards partisan gerrymandering is perhaps, catastrophic. The court has itself affirmed that state officials are constantly violating the Constitution, but still, has failed to provide any federal judicial remedy. From their viewpoint, it is puzzling to define rules for differentiating legal and illegal actions. The failure to address the issue of gerrymandering suggests that it is constitutional to some extent to influence the power of some voters while diminishing others.

The case of *Moore v. Harper*<sup>27</sup> relates to the '*Independent State Legislature Theory*', which denotes that the exclusive power solely rests with the State Legislature to enact laws specifically governing the federal elections within their own district, and the same is outside the purview of judicial review. The issue arose when the legislature decided to redraw the boundary lines of North Carolina as per the 2020 US Census. The State Court declared the map drawn for the above-mentioned purpose to be biased and fabricated. This depicted a severe case of partisan gerrymandering benefitting the Republicans.

As a premise for his conclusion, Chief Justice John G Roberts of the US Supreme Court, illustrated that a certain level of partisan influence while redrawing districts is neither inescapable nor beyond the limits of permissibility. As a consequence, an acceptable standard to constantly monitor partisan bias should be implemented to avoid its encroachment into the territory of unconstitutionality.<sup>28</sup>

### **(B) Independent redistricting commission**

The districts of the state should be approximating each other in terms of populations. On every occasion of reconfiguration, the menace of gerrymandering tops the list of election difficulties. Diverse fixes have been carved out to minimize the control and effect of gerrymandering. One

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<sup>27</sup> *Moore v. Harper* [2023] 600 US 1

<sup>28</sup> "Timeline of Redistricting Cases Heard by the Supreme Court of the United States - Ballotpedia" (*Ballotpedia*) [https://ballotpedia.org/Timeline\\_of\\_redistricting\\_cases\\_heard\\_by\\_the\\_Supreme\\_Court\\_of\\_the\\_United\\_States#cite\\_ref-benisekopinion\\_7-0](https://ballotpedia.org/Timeline_of_redistricting_cases_heard_by_the_Supreme_Court_of_the_United_States#cite_ref-benisekopinion_7-0)

of them was the idea of *proportional allotment*, where the district would not only but elect around three to five representatives. In the electoral background, the term ‘Proportional Allotment’ meant the allocation of seats to the political party in the assembly relying on the number of votes received by the concerned party.

It is an effective method to produce fairer representation by involving various parties to represent themselves at a broader spectrum, instead of focusing only on the single winning party. However, the critics of this system are of the opinion that proportional representation results in weak governments due to the formation of numerous political factions.<sup>29</sup>

Another feasible solution could be transferring the power of redrawing the electoral boundaries to ‘**Independent Commissions**’. California, Hawaii, Arizona, New York, New Jersey, Colorado, etc are some of the states that have been using the Independent Commission Mechanism to tackle gerrymandering.<sup>30</sup>

#### **a. Example- California Commission**

The California voters passed the Voters ‘FIRST Act’ in November 2008, sanctioning the development of the *Independent Citizens Redistricting Commission* and entrusting it with the responsibility of redefining district boundaries, therefore striking out the California Legislature’s power of redistricting and passing the ownership to the citizens. The authority to redraw Congressional districts was also submitted to the Commission by the *VOTERS FIRST ACT* in 2010. There are 14 members constituting the Independent Commission.

The proceedings of the Commission are controlled as per the rules laid down in the *Open Meetings Act*. Additionally, the records, software, data, etc are all made available in the public domain. The authority has to issue public reports to provide details of their resolutions after finalizing the plans for the legislative or congressional districts.

#### **b. Example - Arizona Commission**

Arizona’s State Legislative and Congressional Districts are drawn from scratch rather than simply redrawing the existing lines by the five-member commission consisting of one independent Chairman, two Republicans, and two Democrats. The notion of ‘**one person**’ and ‘**one vote**’ demands that in population in the districts be equally divided.

The law of the State prohibits the redrawing in the middle period before the next census. It does

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<sup>29</sup> “Proportional Representation | Benefits, Types & Examples” (*Encyclopedia Britannica*, July 20, 1998) <https://www.britannica.com/topic/proportional-representation> accessed 12 October 2023.

<sup>30</sup> Rafferty JP, “What Is Gerrymandering?” (*Encyclopedia Britannica*) <https://www.britannica.com/story/what-is-gerrymandering> accessed on 21 October 2023

not prescribe a time constraint for the process of redistricting. The draft maps are strictly made available to the public for 30 days by the Commission. The States have to abide by the regulations and rules mandated under the Equal Population Requirement, Voting Rights Act, etc.

### **(C) Technology and redistricting in the USA**

The decennial census conducted by the USA was the first fully automated census in US history. The *Topologically Integrated Geographic Encoding and Referencing (Tiger) system*, which was developed in conjunction with the U.S. Geological Survey (USGS), was the first digital map that covered the entire country. It was developed with the motive of managing the substantial amount of data that the U.S. Census Bureau had to collect from the ever-changing population demographics.<sup>31</sup>

#### **a. Florida Redistricting**

The Florida House of Representatives and its Senate decided to use Esri's Redistricting Online application for the redistricting cycle of 2022. Esri Redistricting Online is a web-based application that relies on GIS mapping technology and the most recent census data to facilitate users to create and analyze numerous redistricting plans subsequent to the decennial census. Esri holds the position of a national leader in geographic information systems (GIS) products. Various jurisdictions utilize their redistricting application for the purpose of congressional and state map drawing. This user-oriented application constantly provides real-time population demographics and produces maps and statistical reports in a simplified way. The Florida Legislature has tailored this application to suit their specific needs and has made it available for public use at no cost.<sup>32</sup>

#### **b. California Redistricting**

California Citizens Redistricting Commission (CRC) has made efforts to resort to *Maptitude* for Redistricting in order to successfully accomplish the task entrusted to the commission.<sup>33</sup>

#### **c. Colorado Redistricting**

The Colorado Independent Redistricting Commission resorted to Colorado Redistricting Online, Esri's ArcGIS software platform, which allows mapmakers to create, visualize, and edit the plans developed for the purpose of redrawing the boundary lines. Not just the

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<sup>31</sup> See at 8

<sup>32</sup> "Senate Committee" <https://www.floridaredistricting.gov/pages/senate-committee> accessed 12 October 2023

<sup>33</sup> Maptitude, "Creating Transparency, Openness, and Trust: Modern Approaches to Redistricting" (October 22, 2020) <https://www.caliper.com/map-software/case-studies/california-crc-redistricting.htm>

Commission, but the masses are equally invited to create, edit, and comment on the draft maps. The US census data, political and geographical information are also provided to the public.<sup>34</sup>

It can be clearly concluded that shifting from old methods to a new revolutionary world of online redistricting, where the public can utilize, the same information used by the Independent Commissions while drawing the maps, can be a meaningful transformation in the Redistricting procedure.

#### IV. CASE STUDY - INDIA

The first-ever Delimitation Commission was brought into the picture in 1952 under the leadership of Justice N Chandrasekhara Aiyar, a retired judge of the Supreme Court. The second and third ones were in 1962 and 1972 respectively. The latest was done in the year 2002 after the 2001 census under the chairmanship of Justice Kuldip Singh.

Till 1976, the seats mentioned in the House of People, Rajya Sabha, and Legislative Assemblies were distributed according to the census throughout the country so as to ensure equitable representation. Nevertheless, in the midst of an emergency crisis, the Forty-Second Constitutional Amendment introduced by the government froze the parliamentary and assembly seats till the 2001 census.<sup>35</sup>

This initiative was taken with the endeavour to promote a family planning drive. It added provisos to Articles 82 and 170 (3) which laid down that no fresh readjustments would be conducted until the figures of the census taken after the year 2000. Later, the 84<sup>th</sup> Constitutional Amendment Act put another freeze on the delimitation till the year 2026. Given the progress made in the field of family planning, the government, as a part of the National Population Policy Strategy made the decision to suspend freezing till 2026 so as to ensure the population can be stabilized.<sup>36</sup>

The Delimitation Commission scrutinizes the changes in the population with the motive to redraw the electoral boundaries. It then publishes its proposal for the delimitation of the constituencies, along with the dissenting recommendations of any associate member who wishes to publish the motions in the Official Gazettes of all the States concerned as well as in the main one.<sup>37</sup> Simultaneously, the proposal is published in two vernacular newspapers and

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<sup>34</sup> “Colorado Independent Redistricting Commissions” <https://redistricting.colorado.gov/content/redistricting-online> accessed 12 October 2023

<sup>35</sup>Venkatesan V, “A Bill with Limitations” (*Frontline*, August 17, 2001) <https://frontline.thehindu.com/the-nation/article30251636.ece>

<sup>36</sup> Constitution of India (Eighty Fourth Amendment Act) 2001

<sup>37</sup> Delimitation Act 2002, s 9(2)(a)

publicized using various media technologies such as television, radio, etc.<sup>38</sup>

With time, after publication in the Official Gazette, the concerned order becomes a law that is not questionable before the judiciary. The two prominent functions undertaken by the Delimitation Commission in India are, *first*, determining the boundaries of Lok Sabha constituencies based on the available census data, and *second*, the seats are distributed and calculated according to the population data. The Constitution provides for redrawing the boundary lines every 10 years, by taking into account demographic variations.<sup>39</sup>

#### **(A) Delimitation provisions in the Indian constitution**

According to *Article 82* of the Indian Constitution,<sup>40</sup> “Upon completion of each census, the parliament by law is entrusted with the responsibility of the allocation of seats in the House of People to the States and the division of states into territorial constituencies as per the population census”. The Delimitation Act is enacted by the parliament after which the government establishes the commission and the President appoints the member of the commission.

*Article 170* of the Constitution<sup>41</sup> pertains to the composition of the Legislative Assembly and additionally specifies that the state shall be divided into territorial constituencies in such a fashion that the number of seats allotted should be proportional to the population figures.

*Section 10(2) of the Delimitation Act, 2002* provides that:<sup>42</sup>

“Upon publication in the Gazette of India, every such order shall have the force of law and shall not be called in question in any court”.

The prominent provision of the Delimitation Act is in harmony with *Article 329(a)* of the Indian Constitution, which states that “*the validity of any law relating to the delimitation of constituencies or the allotment of seats to such constituencies, made or purporting to be made under Article 327 or Article 328, shall not be called in question in any court*”.<sup>43</sup>

Certain obstacles revolve around the delimitation process, and the one that has created greater trouble is the fact that delimitation has resulted in a negative effect on the states which have stopped making substantial efforts to lower their population as more population gives way for more seats.

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<sup>38</sup> Delimitation Act 2002, s 10(1)

<sup>39</sup> Jha N, “Delimitation of Constituencies : A plea for some effective criteria” (1963) 24 The Indian Journal of Political Science <https://www.jstor.org/stable/41853967>

<sup>40</sup> Constitution of India 1949, a 82

<sup>41</sup> Constitution of India 1949, a 170

<sup>42</sup> Delimitation Act 2002, s 10(2)

<sup>43</sup> Constitution of India 1949, a 239A

### (B) Delimitation and Indian judiciary

Various academicians have supported the idea that the Delimitation Commission decision cannot be called challenged before the judiciary as they believe that “If the order of the delimiting authority is not treated as final and brought before the court, then any eligible voter can indefinitely cease the elections by raising the issue of delimitation”.<sup>44</sup>

The same occurred in the case of *Meghraj Kothari v Delimitation Commission and Ors*<sup>45</sup> wherein a voter from Ujjain felt aggrieved by the Delimitation Commission order in 1962. The Supreme Court held that the order of delimitation cannot be challenged in the court of law as after publication in the official gazette it becomes a law. According to Section 10 of the Delimitation Act 1962, the Commission passing the order is exactly like the law made by the parliament itself. *Meghraj Kothari v Delimitation Commission and Ors*

Article 329(a) not only makes the law made by the parliament but also that could be made by it free from the purview of judicial review. The reservation of seven out of twelve constituencies in Surat by delimitation was challenged before the High Court of Gujarat in the case of *Vallabhbhai Kushalbhai Patel v State of Gujarat and Ors*.<sup>46</sup> The High Court denied interfering in any allegations and contentions, stating that its jurisdiction was barred by the law. It laid down that “*Article 329(a) is a constitutional device for a legislative provision and hence the election infrastructure would collapse if the voters were allowed to keep challenging the order of the Delimitation Commission.*”

A writ petition was filed to challenge the establishment and delimitation process by the Commission for the Union Territory of J&K. The Supreme Court held that there is nothing that can be termed as ‘illegal’ with respect to the commission’s constitution or their action in the Union Territory. Article 170 cannot be applied to a UT as it concerns only the State Legislature. The assemblies of the Union Territory were to be governed as per the law made by the Parliament under the ambit of Article 239A. Additionally, the court also declared that the delimitation exercise or readjustment of the territories into 90 new constituencies is fair and cannot be declared illegal. This was held in the case of *Haji Abdul Gani Khan v Union of India*<sup>47</sup>.

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<sup>44</sup> Rama Devi VS and Mendiratta SK, *How India Votes Election Laws, Practice and Procedure* (2nd edn, Lexis Nexis India 2007)

<sup>45</sup> *Meghraj Kothari v Delimitation Commission and Ors* AIE [1967] SC 669

<sup>46</sup> *Vallabhbhai Kushalbhai Patel v State of Gujarat and Ors* 56 ELR 227

<sup>47</sup> *Haji Abdul Gani Khan v Union of India* [2023] SCC Online SC 138



### (C) Delimitation and its controversy in Kashmir

The Parliament passed the *Jammu and Kashmir Reorganisation Act, 2019 (34 of 2019)* which brought the Union Territory of Jammu and Kashmir into the picture. The last delimitation exercise in the state of Jammu and Kashmir was conducted in 1995 according to the 1981 census. The Delimitation Commission established under the Constitution of India was conferred with powers as per *Section 3* of the Delimitation Act, 2002<sup>48</sup> with the objective of delimiting the Assemble and Parliamentary Constituencies in the Union Territory of Jammu and Kashmir.<sup>49</sup> It was set up through an official notification passed on 6<sup>th</sup> March 2020.

The Commission was created under the leadership of Justice Ranjana Prakash Desai, former judge of the Supreme Court. The seats were to be allocated in accordance with the 2011 census, the Delimitation Act of 2002, and the provisions of Part-V of the Jammu and Kashmir Reorganisation Act, 2019 (34 of 2019). The Reorganisation and Delimitation Act established a broad framework within which the delimitation exercise was to be conducted.

The Commission framed guidelines and methodology for a well-coordinated operation and favorable outcomes. In consideration of different geographical layouts such as transportation, communication, public convenience, etc, the commission segregated the 20 districts into three primary categories-

- Districts primarily hilly and challenging areas,
- Districts with Hill and flat areas and
- Districts with predominantly Flat areas<sup>50</sup>

Additionally, the Commission also proposed to create new constituencies for those geographical areas that were not represented due to substandard communication and the absence of public infrastructure. The public meetings were arranged on the 4<sup>th</sup> and 5<sup>th</sup> April 2022 in the cities of Jammu and Srinagar. These sessions provided an occasion for the general public, their representatives, leaders, and others to communicate their beliefs. The opposing opinions and recommendations of the public were specifically heard.

The Secretariat of the Commission diligently recorded all the suggestions whether in written or oral format during the public meeting. At the culminating stage of the internal process, the commission in response to all the viewpoints, prepared the draft proposal. A crowd of roughly

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<sup>48</sup> Delimitation Act 2002, s 3

<sup>49</sup> Election Commission, Delimitation Commission finalizes the delimitation order today (PIB 2022) <https://pib.gov.in/PressReleasePage.aspx?PRID=1822939>

<sup>50</sup> Ibid 42

1600 candidates attended the conference and voiced their concerns. Later, the final order was published in the Official Gazette.

It took a period of two years for the Commission to complete the entire delimitation process in Jammu and Kashmir, however, it sparked numerous controversies within the territory. It was notified that out of 90 constituencies, 43 seats are allotted to Jammu (earlier it was 37), and 47 are reserved for Kashmir (raised one seat). Various political parties raised their opinion that this delimitation will significantly transform the geography of Jammu and Kashmir. The right to vote previously was restricted to the residents of Jammu and Kashmir, however with the abolition of Article 370, the right has been vested with the non-state subjects as well. It is believed that such an undertaking would disempower the people of J&K.<sup>51</sup>

The Commission has provoked substantial uncertainty not only among the intellectual elite but also the mass population with respect to the query as to why the effort of redrawing the boundaries was pursued in Jammu and Kashmir while it was suspended throughout India until 2026. The government argued that this step was taken to allow J&K to completely fuse with the mainland, whereas the opposition viewed it as a discriminatory practice to bring in delimitation only in the J&K.<sup>52</sup>

The report that was published was strongly criticized by all the political parties except the BJP. In 2002, the government of Jammu and Kashmir froze the delimitation exercise by making amendments to the J&K Representation of People's Act. The Supreme Court also upheld the freeze. Another point that created resentment in the general populace was that the commission took into account various other factors such as geographical features apart from the census data.

The notion that the delimitation process was conducted on communal and sectorial lines spread rapidly throughout the territory by the political leaders.<sup>53</sup> It has been contended by the people that this has resulted in partisan politics gaining favor in the upcoming elections by effectively reducing the Muslim population in the state. If the commission followed the population census as the only criterion while undertaking delimitation, Kashmir Valley would have gained more seats, but as the topography, communication, and other geographical attributes were

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<sup>51</sup> "With Delimitation Now Complete, J&K Politicians Allege Further Disempowerment of Kashmir" (*The Wire*) <https://thewire.in/government/with-delimitation-now-complete-jk-politicians-allege-further-disempowerment-of-kashmir>

<sup>52</sup> Bhakto A, "Jammu & Kashmir: The Hidden Agenda behind the Delimitation Exercise" (*Frontline*, April 2, 2022) <https://frontline.thehindu.com/politics/jammu-and-kashmir-the-hidden-agenda-behind-the-delimitation-exercise/article38458966.ece>

<sup>53</sup> Lina B, "India Uses Tactic of Gerrymandering to Divide Kashmir - ICNA CSJ" (*ICNA CSJ* August 6, 2022) <https://icnacsj.org/kashmir-iok-gerrymandering-bjp-hindu-nationalism-muslims-genocide-india/>

considered, the Hindu-dominated Jammu has received more seats. The constant demand for seats for socially disadvantaged groups of the Hindu community, Kashmiri Pandits (Hindus), and other tribal groups has also raised suspicion that the ruling party is trying to gather support by purposely creating a Hindu-led territory.<sup>54</sup>

The solution to such hidden instances of gerrymandering would be to resort to the idea of automated redistricting wherein geospatial technologies could be used to ensure that transparency is maintained and eligible voters get a say in the election process.

Therefore, the world of computers can be a band-aid solution for such cruel politics. Mathematicians are currently involved in generating novel algorithms that can effectively evaluate the manipulation aspect of an electoral map. Creating an atmosphere for equal cooperation of the masses and enhancing transparency by utilizing cutting-edge technologies can be a solid solution to neutralize the perils of gerrymandering.<sup>55</sup>

#### **(D) India and GIS**

Geographical Information System (GIS) technology has swiftly emerged as a driver for revolutionary changes around the globe, specifically pioneering in resource management, strategic planning, informed decision-making, strong governance, and citizen-centric services. The core purpose of the 'Digital India' initiative of the Indian Government is to expand digital literacy and strengthen public involvement. It promotes GIS-supported decision-making for strategic planning, smart Governance, and maximized resource utilization.

The National Informatics Centre (NIC), which developed a GIS platform by leveraging NICMAPS services, has now been renamed as '**BHARAT MAPS**'. Bharat Maps is a multi-scale, multi-resolution, and multi-layered GIS platform service consisting of precise country-wide base maps and satellite images aligned as per the global geospatial standards. It is a vital element of the Digital India program to secure user-friendly, successful, competent, and financially viable governance. Further, it assists the central and state government departments in relying on the GIS system to make decisions in favor of the general public.<sup>56</sup>

The Ministry of Rural Development has harnessed the potential of GIS in various schemes such as the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) and Pradhan Mantri Gram Sadak Yojana (PMGSY). The data created through GIS under the Gram

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<sup>54</sup> Andrabi K and Amin Z, "BJP Gerrymandering in Kashmir Seeks to Create a Hindu Majority" *Foreign Policy* (August 11, 2021) <https://foreignpolicy.com/2021/08/11/modi-is-trying-to-engineer-a-hindu-majority-in-kashmir/>

<sup>55</sup> Ibid 49

<sup>56</sup> Ishika Garg, "J&K Delimitation: Gerrymandering to the Extreme" (*Deccan Herald*, August 20, 2021) <https://www.deccanherald.com/opinion/jk-delimitation-gerrymandering-to-the-extreme-1021869.html>

Sadak Yojna Scheme not only consists of the rural areas but simultaneously includes a national geospatial dataset including National/State highways, urban areas, etc. The Gram Panchayat has developed GIS-based GP plans.<sup>57</sup>

India, currently is harnessing the potential of GIS in numerous sectors such as health care, agriculture, industries, government departments, telecommunications, forest department, environmental sector, etc. Therefore, this raises the notion that GIS technology can be mobilized for the purpose of delimitation as well. As the technology permits spatial analysis, precise mapping, and hoards massive data, it can become a valuable apparatus for the Delimitation Commission which is constantly met with strong accusations of bias in the redistricting process.

The Geospatial technologies help in generating data based on the present population figures which can ensure fair representation of the citizens in the election process. The electoral constituencies can be equally represented provided precise maps have been developed considering all the geographical factors.

The Ministry of Science and Technology proposed the *National Geospatial Policy (NGP) 2022* with the goal of empowering the geospatial arena to foster national progress. It is focused on creating a high-definition topographic mapping and survey program by 2030. It can be said that working alongside the technologies can be a valuable asset as witnessed in myriad sectors. The delimitation Commission should utilize GIS and computers to draw maps to make the process less complicated.

## V. GEOGRAPHIC INFORMATION SYSTEM

The term *Geographic Information System (GIS)*, also referred to as ‘Geospatial Information System’ is a system designed to gather, manage, analyze, capture, or store physical environment data on the Earth’s surface. It is qualified to produce correct spatial analysis and 3D scenes by utilizing various layers of geographic data. It is a software tool that allows the user to develop interactive queries, analysis of spatial information, and data editing in maps as required by the research.<sup>58</sup>

Geographic Information System is resourceful and extensively used in diverse fields such as agriculture, urban planning, disaster management, environment planning, healthcare facilities,

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<sup>57</sup> Ministry of Rural Development, Use of GIS for projects in Rural Areas (PIB 2022) [https://rural.nic.in/en/press-release/use-gis-projects-rural-areas#:~:text=The%20Ministry%20of%20Rural%20Development,Gram%20Sadak%20Yojana%20\(PMGSY\)](https://rural.nic.in/en/press-release/use-gis-projects-rural-areas#:~:text=The%20Ministry%20of%20Rural%20Development,Gram%20Sadak%20Yojana%20(PMGSY))

<sup>58</sup>Desai M, “A Critical Appraisal for the Use of GIS Software and Its Applications” (2017) 6 International Journal of Engineering Research & Technology

defense, climate change studies, business, marketing, engineering, etc. One of the core competencies of GIS technology is the performance of accurate spatial analysis.

**Dr. Roger Tomilson**, renowned as the '**Father of GIS**' working with the Federal Department of Forestry and Rural Development in Ottawa, Canada, developed the world's first operational GIS popularly known as '**Canada Geographic Information System**' (CGIS). The system was used to gather, collect, store, and analyze data on the Land Inventory of Canada. The rationale behind the development was to measure the land capability by mapping information regarding forestry, soils, wildlife, agriculture, etc.

The term 'Geographic Information System' indicates a collection of software applications that allows for the assembling, visualizing, and scrutinizing of spatial data. Beyond simply creating maps, GIS carries the potential to compute spatial indicators.<sup>59</sup> The idea of depicting various layers of data on any surface existed even before the invention of computers when the early man used to draw pictures on the wall enumerating a detailed description. Nuclear weapon research kickstarted the creation of advanced computer hardware which led to general-purpose computer "mapping" applications by the early 1960s.<sup>60</sup>

The upgradation in geospatial science and technology has yielded precise measurements at a molecular scale. It generates a humungous amount of data that needs to be collected, analyzed, and utilized for the well-being of the populace.

#### **(A) GIS and delimitation**

Where the state-of-the-art GIS software is equipped to deal with myriad boundary controversies made by politicians, the principal roadblock - assuming that both parties are acting in good faith – is to obtain relevant and accurate georeferenced data. Such data are frequently absent, obsolete, disorganized, classified, or hotly contested by either side. The '**base map**' consists of physical geographical data concerning natural features, topography, etc that influence the delimitation process.<sup>61</sup> The map should present the data with minimal errors and challenges.

The redistricting officials and bodies are tasked to process extensive amounts of demographic, geospatial, and other election-related data to meet election and political objectives. Politicians and bureaucrats can utilize GIS to point to different variables on maps such as addresses, street intersections, specific locations, etc. Election officials are also able to see invisible lines like

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<sup>59</sup> Gleditsch KS and Weidmann NB, 'From Hand-Counting to GIS: Richardson in the Information Age' (2019) *Pioneers in arts, humanities, science, engineering, practice* [https://doi.org/10.1007/978-3-030-31589-4\\_7](https://doi.org/10.1007/978-3-030-31589-4_7)

<sup>60</sup> Geographic Information System, <https://www.manage.gov.in/studymaterial/gis.pdf> accessed 2 October 2023

<sup>61</sup> B Wood W, "GIS as a tool for Territorial Negotiations" [2000] *IBRU Boundary and Security Bulletin*

county or city borders as well as visible "lines" like streets, rivers, and railroads. They can tabulate individuals within the designated boundaries drawn like their precincts.<sup>62</sup>

Since the 1960s, computers have been presented as both a redistricting salvation and a powerful polluting force. On the one hand, computers have been suggested as a means of automating the process of establishing electoral boundaries and using statistical and geographic analysis to identify gerrymanders. However, others claim that computers make it easy for redistricting officials to carry out any evil purpose.

The system of GIS was invented to manipulate enormous geospatial data computationally. Earlier, these software toolsets were capital-intensive to build, and hence the political parties who had the resources were able to develop and squeeze out the maximum from it.<sup>63</sup> Periodically altering the boundaries of the district results in better quality representation, as says the theory, however, in a practical scenario, it is often seen, as the saying goes, redistricting results in politicians choosing voters rather than the other way around. Since first digital computer was invented, it has successfully subjugated many problems that were once viewed as a sole domain or sphere of human expertise. The idea of automated redistricting is naturally compelling as it removes the challenge of gerrymandering to the highest possible extent.<sup>64</sup>

### **(B) GIS- a potential solution to gerrymandering**

During the early years of the 1991 redistricting era, GIS technology became extensively utilized. It conveyed an inherent hope that the geospatial technology would improve the democratic framework of the redistricting process. Such powerful desktop technology possessed the capacity to promote transparency, convenience, and confidence of empowerment. Through its usage, the myriad plans could be analyzed promptly and proficiently. It would grant access to numerous groups to develop their own redistricting plans. Before the advent of this technology, the redistricting process was manually demanding and laborious. The GIS, however, has transformed the way we work. One sole entity could easily generate countless plans and can specify using advanced spatial software the presence of gerrymandering. The GIS technology carries the impression of offering a viable solution to the political redistricting conflicts. It is associated with reducing the time, cost, and effort, and

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<sup>62</sup> Kim Brace, 'Using GIS to Improve Accuracy and Efficiency in Election Administration' in Mitchell Brown, Kathleen Hale and Bridgett A King (eds), *The future of election Administration Cases and Conversations* (Palgrave Pivot 2019)

<sup>63</sup> Altman M, MacDonald K and McDonald M, "From Crayons to Computers: The Evolution of Computer Use in Redistricting" (2005) 23 *Social Science Computer Review*, 334

<sup>64</sup> Micah Altman & Michael McDonald, 'The Promise and Perils of Computers in Redistricting' (2010) 5 *Duke J Constitutional Law & Public Policy*

simultaneously opening the entire delimitation process to diverse communities.<sup>65</sup>

The intrinsic qualities of computing imply that the process involved in automated redistricting can be subjected to scrutiny since the computer software employed to draw the plan can be accessed by the reviewers. The computer is not a mythical device that has the ability to generate precise outcomes in the redistricting process. However, considering the directness required in computer programming, the computer can be used as an instrument to render previously articulated theories of representation practicable.<sup>66</sup>

As per numerous analysts, this might be an appropriate time to remove human involvement from the redistricting process and simultaneously entrust the accountability and duty to the computer experts who are equipped solely with population statistics and standards. Utilizing the computer would undeniably be an economical choice and no interested party would be eligible to raise allegations of partiality. The machine would be responsible for drawing new districts only on the lines of criteria mentioned, and hence disregarding all other considerations.<sup>67</sup>

## VI. CONCLUSION AND SUGGESTIONS

India has always taken the lead in embracing novel technologies and deploying them. Its journey with satellite images and Geographic Information Systems goes back to the 1980s when it established the Indian Remote Sensing Satellites and GIS applications. In the early 2000s, efforts were made to develop the National Spatial Data Infrastructure. As India has been blessed with an extensive workforce of skilled experts and experienced veterans, a national movement for the GIS program was also brought into action.<sup>68</sup>

In 2013, Sam Pitroda, IT and Innovation advisor to the Prime Minister said and I quote, ***“India is on the verge of a fresh technological and developmental phase, and in its perpetual commitment towards overall growth, social equality, and all-encompassing development, a fundamental prerequisite is to revamp diverse frameworks and methodologies. Information will be referred to as the fourth pillar of democracy, and GIS will be counted upon as a crucial component of the fourth pillar—supporting the cause of synchronized information networks. National GIS is planned with a broader objective to not just provide GIS data and***

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<sup>65</sup> Benjamin Forest, ‘The Changing Demographic, Legal, and Technological Contexts of Political Representation’ (2005) 102 Proceedings of the National Academy of Sciences of the United States of America <http://www.jstor.org/stable/4143434> accessed 21 October 2023

<sup>66</sup> Michelle H Browdy, ‘Computer Models and Post-Bandemer Redistricting’ (1990) 99 The Yale Law Journal <https://www.jstor.org/stable/796740> accessed 1 October 2023

<sup>67</sup> n 8

<sup>68</sup> Esri, ‘India: A vision for National GIS (Esri 2014) <https://www.esri.com/content/dam/esrisites/sitecore-archive/Files/Pdfs/library/ebooks/india-a-vision-for-national-gis.pdf>

***applications but also operate as a platform for offering diverse e-services to every citizen—whether residents belong from the urban or rural areas—thereafter leading India’s holistic advancement and prosperity”.***<sup>69</sup>

Regardless of the extensive implementation of the GIS technology, the vast possibilities largely remain untapped. GIS has its presence in diverse fields, yet it has not been tackled to the full extent. Though creating a National GIS seems to be a daunting challenge, a calculated roadmap has already been set in motion. GIS has the ability to revolutionize the future landscape of India.

Some objections have been raised with legislative redistricting as it creates a fundamental clash of interests. Legislators entrusted with the power of redrawing the lines are guided by the motive to secure seats again in the next election. The redistricting in some states is done discreetly, with minimal participation of the public, the data is not disclosed, and no comprehensive justification is offered regarding the same, hence this curbs the power of the eligible voters to hold the leaders accountable for their malpractice. The remarkable progress in the realm of GIS technology, advancements in software, and access to public information have created unparalleled possibilities for the public to acquire information on the redistricting process from multiple outlets and engage in the drawing process itself.<sup>70</sup>

The negative effect of gerrymandering extends beyond the differences among parties' seats and vote shares. The harm also stretches up to the deformation of the representation that bureaucrats or political leaders give to their constituents.<sup>71</sup>

Nowadays, tonnes of entities are disseminating their projects and developing billions of maps to narrate stories and disclose patterns, trends, and co-relationships. As GIS keeps progressing to advance and merge technologies such as Big Data, IoT, and Artificial Intelligence, it has gained unmatched prominence in the digital metamorphosis of the country.<sup>72</sup>

Geographic information systems are analyzing and processing information which is becoming a key tactic for effective decision-making. In India, the data generated via Geospatial technology is largely a part of the initiatives undertaken by the central/state governments under the garb of its ministries and departments. They have been advised to closely work with the

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<sup>69</sup> Ibid 63

<sup>70</sup> Michael Halberstam, ‘Process Failure and Transparency Reform in Local Redistricting’ (2012) 11 Election LJ 446

<sup>71</sup> Nicholas O Stephanopoulos, ‘The Causes and Consequences of Gerrymandering’ (2018) 59 Wm & Mary L Rev 2115

<sup>72</sup> Sahu D, “GIS Has the Potential to Transform the Very Future of India” (<https://www.facebook.com/VARINDIAMagazine>) <https://varindia.com/news/gis-has-the-potential-to-transform-the-very-future-of-india> accessed 10 November 2023



Indian Space Research Organisation (ISRO) and its data center National Remote Sensing Centre (NRSC). These initiatives carry the ability to transform the very future of India.<sup>73</sup>

The delimitation exercise is a sophisticated, multi-faceted matter envisaging both social and political events which can be examined thoroughly in context with the delimitation history of the country. By putting restraints on the number of constituencies and subsequently redrawing the boundaries within this confinement, the Indian government has instigated a rift among the people and this flawed tactic does not seem to be a naive move.

The current mechanism of representative democracy is not devoid of irregularities and is undoubtedly archaic. Within this system, the political parties have the power to handpick voters. Whereas the electoral procedure remains subjugated by money and muscle power. The delimitation process is the core of the equitable and fair working of the electoral system and it merits undivided protection and safeguard as well as recognition from political intervention.

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<sup>73</sup>Datta A, "Why India Needs a Geospatial Strategy?" (*Geospatial World*, July 23, 2018) <https://www.geospatialworld.net/article/why-india-needs-a-geospatial-strategy/> accessed 13 November 2023