Polycentric Governance as a Practical Strategy for Balanced Policing: A Cross-Cultural Analysis[*]

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ABSTRACT

Polycentricity is a normative approach to governance. It stresses the degree to which higher levels of formal governance should not crowd out self-organization at lower levels. As central government ruling may limit individual access to shared resources, participatory polycentric governance seems a feasible alternative. Under such a scheme, varied strategies combine local political segments into larger administrative systems. They help manage public goods, solve cooperator problems, and combine direct (and costly) administration with the creation of locally managed para-governmental organizations and spheres of authority to achieve cooperation goals. A federation of independent governing bodies, organized as a set of nested institutions focused on a common goal, contributes to effective, beneficial to all parties involved, sustainable well-being. Thus, I challenge the conventional wisdom that common property is poorly managed and should be regulated by central authorities or privatized. Employing the data for user-managed land, fish stocks, pastures, woods, and (ground) water, I argue that participatory polycentric governance improves communal resilience and stability. Participants became interdependent, willing, and capable of designing and following communication networks to create sustainable well-being. I conclude that the outcomes of such arrangements are often better than predicted by standard economic models.

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INTRODUCTION

Polycentric governance has several advantages, from promoting learning, trust, and adaptation to mitigating the risk of resource collapse or failure (Marshall 2009). While discussing the usefulness of polycentricity, scholars usually focus on managing the commons among small-scale, community-based resource systems (Berkes 2006; Ostrom 1990). The ideas I examine here relate to political organization and decision-making at various levels of social complexity in the context of common pool resources (CPRs). Specifically, I address the dilemma whereby the self-interest behavior of social actors would seemingly limit the potential for collective action and group cohesion. I use the logic of collective action (Olson 1965) and polycentric governance theory to analyze horizontal governance arrangements (Ostrom 1990, 2010, 2019) and their advantages. I theorize on conditions for sustainable coexistence and well-being under the schema of polycentric governance and expand on the theoretical foundations presented in my earlier research (Lozny 2011, 2013). I explore the concept of polycentric governance in-depth by examining the advantages, such as enhanced adaptability, innovation, and responsiveness to local needs. I also analyze some drawbacks of this model, such as coordination challenges and accountability issues. Furthermore, I present case studies of successful models of polycentric governance worldwide. These models demonstrate how effective polycentric governance can be in addressing complex problems that require collaboration across different levels and sectors of decision-making.

HYPOTHESES THAT GUIDE MY RESEARCH

Societies devise, adopt, and maintain cooperative arrangements under which they become interdependent, willing, and capable of following communication networks to create conditions for sustainable well-being. Thus,

1) under certain conditions, a network of communal organizations of different scales becomes a successful alternative to centralized decision-making,

2) in a polycentric structure, a federation of independent governing bodies organized as a set of nested institutions focused on a com-

mon goal contributes to effective, beneficial to all parties involved access to resources and sustainable well-being.

THEORETICAL CONSIDERATIONS: COLLECTIVE ACTION AS A STRATEGY FOR COMMUNAL WELL-BEING

Collective action theory (CAT) explains the logic of cooperative (polycentric) management of critical CPRs that enable societal resilience and stability. The premise is that individuals who share a common interest can achieve their goals more effectively by working together rather than acting independently and in competition. Collective action is an effective strategy for stimulating social change throughout history (Blanton and Fargher 2008). It does not always become a systemic approach, but people may use it to solve a pressing task. Sociologists, political scientists, and economists studied and debated it extensively. I identify four significant advantages and five challenges to collective action.

Advantages of Collective Action

The advantages of collective action include efficiency in achieving goals through pooled resources and efforts, amplifying marginalized voices, building solidarity, fostering social cohesion, and boosting mental health outcomes. Furthermore, collective action may contribute to economic benefits (Klandermans and Oegema 1987).

The four significant advantages of collective action:

1. ***Bargaining power.*** Collective action provides greater bargaining power for individuals who may feel powerless. By joining forces with others, they can exert pressure on those in positions of authority to achieve their desired outcomes.

2. ***Sense of community and solidarity.*** Collective action creates a sense of community and solidarity among participants and helps to build group cohesion. When people work together towards a shared goal, they develop a sense of camaraderie and mutual support that can strengthen relationships and foster social cohesion. This sense of community is essential in times of crisis or hardship, providing emotional support and practical assistance.

3. ***Mental health.*** Collective action positively affects mental health outcomes such as self-esteem, sense of purpose, and overall well-being. Individuals involved in collective action feel a sense of fulfillment and purpose by working towards something larger than themselves, leading them toward better mental health outcomes.

4. *Economic benefits.* There are economic benefits associated with collective action. When people work together towards a common goal – building infrastructure or starting an innovative project – they often create new job opportunities for themselves and others within their community.

Challenges to Collective Action

Collective Action Theory may seem idealistic on paper, but the reality is that there are numerous challenges to achieving collective action.

The five significant challenges to collective behavior:

1. *Free-riding.* One of the biggest obstacles is the issue of free-riding, where individuals benefit from the collective action without contributing to it. This creates a dilemma for those willing to participate in collective action, as they may feel that their efforts will go unrewarded or be taken for granted – that some individuals might benefit from the efforts of others without contributing themselves. The scalar threshold turns off the effectiveness of collective actions.

2. *Group cohesion and conflicts.* A significant challenge is maintaining group cohesion and avoiding conflicts among members. There is often a lack of trust between individuals and organizations that may have different agendas or priorities. This can lead to disputes and disagreements, making coordinating and mobilizing groups toward a common goal difficult.

3. *Scalar stress.* Another challenge is the issue of scalability, where larger groups become increasingly difficult to manage and coordinate effectively. As more people become involved in a collective action project, ensuring everyone agrees and working towards a shared goal becomes harder. This can lead to fragmentation and infighting within groups, undermining their effectiveness. Quantifying the inefficiency threshold for polycentric governance would form an interesting research problem.

4. *Power imbalances.* Societal power imbalances often make it difficult for certain groups to participate in collective action. For example, marginalized communities may lack resources or face systemic barriers that prevent them from organizing effectively. Similarly, those with substantial financial resources or political influence may have an outsized impact on decision-making processes within collective action efforts.

5. *Apathy.* Finally, there is also the issue of apathy among individuals who may not see the value or importance of participating in collective action. People may feel overwhelmed by the scale of social

problems and believe their contributions will not make a meaningful difference.

Thus, while CAT offers an appealing framework for addressing social, political, and economic issues through collaborative efforts, numerous challenges must be overcome before achieving goals. From free-riding and trust issues to scalability concerns and power imbalances within society, these obstacles require careful consideration if we hope to achieve meaningful change through collective action. Ultimately, the success of collective action initiatives will depend on navigating these challenges (Tilly and Tarrow 2015).

Effectiveness of Collective Action

Social scientists extensively debated the effectiveness of collective action. Scholars have argued that collective action can be highly effective in achieving a common goal, while others have suggested that it can be counterproductive and lead to adverse outcomes. However, it is essential to note that not all forms of collective action are effective. In some cases, group dynamics can lead to conflict and division within a movement, ultimately hindering progress toward achieving a common goal. There are also instances where collective action can be co-opted by those with ulterior motives or used for personal gain rather than achieving a shared objective.

While both positive and negative aspects are associated with collective action theory, its effectiveness ultimately depends on various factors, such as leadership qualities within a group, group dynamics, and external factors influencing social movements (McAdam *et al.*, 2001). When executed effectively, collective action can be a powerful tool for achieving social change and promoting equitable outcomes.

BASIC DEFINITIONS

I distinguish between governance by multiple agencies and polycentric governance. Polycentric governance is a system of governance with numerous governing authorities at different scales that do not have a hierarchical relationship but are engaged in self-organization and mutual adjustment (Carlisle and Gruby 2017). Multiple agent governance involves hierarchically organized agents responsible for different aspects of the system (Morrison *et al.* 2019). Thus, definitions of governance, polycentricity, polycentric governance, and their organizing rule system to sustain and reinforce governance clarify my approach.

Governance

Governance (function), as opposed to government (structure), is a process that indicates interdependence in governing. Governance exists in all levels of social complexity and relates to decision-making and implementation of policies. Effective governance ensures the allocation of resources efficiently to promote sustainable well-being and economic growth while also addressing issues relevant in complex societies, such as poverty and inequality. It also plays a crucial role in modern industrial societies in protecting the environment by regulating industries and promoting sustainable practices.

Polycentricity

Polycentricity refers to structural arrangements of independent, equal status, multiple power centers, and societal decision-making. The centers form a network of decision-making hubs organized according to the following simplified formula:

$N = \Sigma_{C1, C2, C3...Cn}$, where network N is a cluster of independent, cooperating centers.

There are benefits and drawbacks associated with such a structure, and it is crucial to consider them when evaluating the effectiveness of polycentricity as a political strategy. Nevertheless, it remains the essential feature of many successful political systems, for instance, federations of states, and should be studied carefully by scholars and policymakers alike, as it has enabled different cultures and economies to interact.

Cultural Differences and Their Impact

Cultural differences are one of the most significant aspects of polycentricity. They refer to how people from different regions, ethnicities, or religions view the world. These differences affect various areas, such as communication styles, values, beliefs, and attitudes, leading to misunderstandings or conflicts if not handled appropriately. They can manifest in language barriers, political practices and customs, and variations in preferences and behaviors. Understanding cultural differences is crucial for successful polycentric decision-making. Successfully navigating cultural nuances enables building solid relationships with local partners while avoiding potential missteps that could damage the reputation or hinder opportunities.

Political and Economic Benefits and Drawbacks

Scholars often discuss polycentricity in the context of economic and political development. The most significant benefit is:

1. Greater political and economic diversity. Polycentricity can lead to greater political and economic variety by facilitating trade and promoting economic growth.

However, there are potential drawbacks:
1. Information-flow congestion. One primary concern is that it may lead to increased information-flow congestion and longer time for decision-making as ideas are negotiated between different centers of activity. This could negatively impact pressing issues such as defendability or diffusion of economic hardships. Additionally, higher costs may be associated with maintaining infrastructure across multiple centers.
2. The propensity for conflicts. Polycentricity can also lead to conflicts between different power centers, resulting in gridlock in implementing ideas or even violence.

Despite these potential drawbacks, polycentricity offers significant benefits when implemented effectively. This approach can help reduce inequality, promote regional cultural diversity, and help insulate local economies from external shocks or downturns in specific activities.

Whether polycentricity is effective depends on various factors, including local resources and economic conditions, political will, and public support. While there are certainly challenges associated with implementing polycentricity successfully, the potential benefits make it an option worth considering for societies looking to promote sustainable growth over the long term.

Polycentric Governance

I want to discuss polycentric governance and its structure as a sphere of authority (SOA). Polycentric governance refers to the distribution of power and decision-making among multiple, equal centers of authority. It recognizes the importance of local communities in managing their affairs and encourages them to participate in decision-making across different levels, actors, and institutions, leading to more effective decision-making based on different viewpoints and compromises. It promotes decentralization, which can increase efficiency and responsiveness to local needs (Ostrom *et al.* 1961; Ostrom 2005).

This approach has gained popularity in recent years as a more effective way of addressing complex problems that require collaborative efforts. Polycentric governance has gained attention as a potential al-

ternative to traditional hierarchical systems that rely on centralized authority. The decision-making units often overlap because they are nested at multiple jurisdictional levels (*e.g.*, local, state, and national) and include special-purpose governance units that cut across jurisdictions (Ostrom 2005; McGinnis and Ostrom 2011). This multilevel configuration means that governance arrangements exhibiting polycentric characteristics may be capable of striking a balance between centralized and fully decentralized or community-based governance (Imperial 1999). While the existence of multiple semi-autonomous decision-making centers may be sufficient to characterize a governance arrangement as polycentric, it does not guarantee that there will be adequate coordination among the decision centers such that the arrangement functions as a polycentric governance system (Marshall 2015). A polycentric governance system may exist if the decision-making centers consider each other in competitive and cooperative relationships and can resolve conflicts (Ostrom *et al.* 1961; Marshall 2015).

Advantages for Local Communities

Polycentric governance offers numerous advantages for local communities (Sabel and Zeitlin 2012), including increased participation in decision-making processes; competition among centers of power; responsiveness to local needs; promotion of sustainable development practices; and stronger regional connections between neighboring municipalities. These benefits constitute an attractive alternative to traditional top-down governance models and one worth consideration by policymakers.

Here are the five most significant benefits:

1. *Participatory decision-making power*. Polycentric governance allows for greater participation and decision-making power for local stakeholders, leading to more effective solutions tailored to their specific needs and practical solutions. With multiple centers of power, there is less risk of a single entity becoming too powerful and abusing its position.

2. *Competition among centers of power*. Polycentric governance promotes competition among different centers of power. Competition can drive innovation and efficiency as each center strives to attract investment and improve its services.

3. *Responsive to local needs*. Polycentric governance can be more responsive to local needs than traditional top-down approaches. Local decision-makers are often better equipped to understand their commu-

nities' unique challenges and develop tailored solutions that address those challenges effectively.

4. *Sustainable development.* Polycentric governance promotes sustainable development practices at the community level by giving local stakeholders more control over development decisions.

5. *Connections between neighboring communities.* Polycentric governance can help build stronger connections between neighboring communities by encouraging collaboration and coordination across jurisdictional boundaries. This can foster a sense of regional identity and shared purpose that transcends individual municipal borders.

Limitations and Challenges

There are also drawbacks to polycentric governance.

1. *Coordination problem.* Coordinating efforts among different power centers is challenging, as actors may have competing interests or priorities. This can lead to inefficiencies and delays in implementing policies or initiatives.

2. *Power imbalance.* Another challenge is the potential for power imbalances between different centers. Specific centers may have more resources or influence than others, leading to unfair decision-making processes or outcomes. The lack of a centralized authority means there may be no precise mechanism for resolving disputes between different centers.

3. *Conflict.* Another issue is the potential for conflict between different power centers. When each center has its interests and priorities, it can be difficult to reconcile conflicting views or find common ground on specific issues. This can lead to gridlock or even outright hostility between different centers.

4. *Lack of standardization.* One of the primary challenges is the lack of standardization across different power centers. Each center operates independently and has its own rules and regulations that may or may not align with those of other centers. This can lead to confusion and conflict when implementing policies that affect multiple centers.

5. *Accountability.* Challenges include ensuring accountability among all actors involved. With multiple centers operating independently, it can be challenging to trace responsibility for decisions or actions taken by any one center. This lack of accountability can make it difficult to hold individuals or organizations responsible for any negative consequences that arise from their actions.

6. *Effectiveness.* Finally, there is also the concern that polycentric governance may not be effective in addressing issues that require col-

lective action on a large scale. Polycentric governance may not always be appropriate for all situations. Sometimes, a centralized approach may be more effective at achieving desired outcomes.

Despite challenges and limitations, scholars argue that polycentric governance still holds promise as an alternative approach to traditional centralized forms of government (Young, King Jr., and Schroeder 2008). By allowing for greater participation and decentralization of power, polycentric systems have the potential to foster more significant innovation and creativity in problem-solving processes. It is crucial for policymakers and scholars alike to carefully consider the strengths and weaknesses of polycentric systems to determine when and where they may be most effective. Ultimately, whether polycentric governance is an appropriate approach will depend on various factors, including the specific context and goals and the level of coordination required among different centers of power involved in making policy and resource allocation decisions. The success of polycentric governance will also depend on its flexibility and ability to adapt and evolve in response to changing circumstances and new challenges.

Rule Systems

Governance, like government, consists of rule systems that regulate steering mechanisms through which authority is exercised to preserve coherence and achieve desired goals. In any society, rule systems are in place to create a level playing field for everyone by setting clear expectations and consequences for those who violate them. However, despite their noble intentions, these rule systems can sometimes be inherently unfair due to enforcement issues.

One of the most common examples of unfairness in rule enforcement is when certain groups or individuals receive preferential treatment over others. This could be due to race, gender, socioeconomic status, or political affiliation and manifest in various ways, such as harsher punishments for certain groups of people or leniency towards others who have committed similar offenses. Such inconsistencies undermine the legitimacy of the entire rule system and create a sense of injustice among those affected. Overall, we must examine rule systems closely and work towards ensuring that they are fair and justly enforced for all members of society regardless of their background or circumstances.

The problem with unfairness in rule enforcement goes beyond just individual cases; it has broader implications for society. When people feel like they cannot trust the system because it does not treat every-

one equally regardless of their background or status, they become disengaged from civic life and may even resort to violent means to express discontent with the status quo. Furthermore, there is also an issue of mistrust toward the government when people feel like those in power are unfairly targeting them, which leads to a breakdown in communication between citizens and their elected representatives, making it difficult for policymakers to address the needs of all members of society.

Function vs. Structure in the Ruling System

In any ruling system, two fundamental components determine its success: structure and function. The rule systems of governments are structures, while those of governance are social functions or processes that can be performed and implemented in various ways at different times and places by multiple organizations. Whether structural or functional, rule systems acquire authority in various ways, from informal created through processes and repeated practices regarded as authoritative that contribute to institutionalizing customs and traditions to formal constitutionally or otherwise executed. The structure refers to the framework of a government or organization, including its hierarchy, rules, and regulations. Function, conversely, refers to how these structures operate and how effectively they accomplish their goals.

Efficiency of Structure and Function

One key aspect to consider is the efficiency of structure and function. A well-designed structure should facilitate efficient decision-making processes and allocate resources appropriately.

Effectiveness of Structure and Function

Another crucial factor is the effectiveness of both elements in achieving desired outcomes. Effective functioning should enable leaders to make decisions quickly while minimizing errors or delays. For instance, an excellent organizational structure may be ineffective if it does not lead to tangible results or societal improvements. On the other hand, a poorly structured government can still achieve positive outcomes if it has strong leadership and functional mechanisms in place. Ultimately, this debate boils down to finding the right balance between structure and function in any ruling system. While an ideal balance may be challenging to achieve in practice due to the various complexities involved in governance structures, policymakers and citizens must recognize the vital role played by both elements in shap-

ing societies' future direction. The effectiveness of a ruling system depends on the interplay between its structure and function.

In practice, though, many ruling systems struggle with balancing structural design with functional effectiveness. For instance, some countries may have sound constitutional frameworks but lack adequate resources or political will to implement them effectively. Others may prioritize short-term political gains over long-term planning or disregard public opinion. Thus, it becomes clear that both structure and function are critical components for effective governing systems; they are mutually reinforcing rather than competing entities. Therefore, any attempt at reforming a ruling system must consider both aspects holistically rather than focusing on one at the expense of the other.

CASE STUDIES OF SUCCESSFUL MODELS

Examining case studies of successful models is crucial in evaluating the practical application of polycentric governance. Here, I present selected cross-cultural examples ranging from political structure to arrangements in the communal use of critical resources. These cases justify the logic of collective actions, which contribute to sustainable well-being across social sectors.

Selected Data on Polycentric Governance and Cooperative Management of Common-Pool Resources

I discuss cross-cultural evidence of polycentric governance (cooperation) under specific ecological stress. My examples include political arrangements to defend territories viewed as CPRs, access to pasture in strenuous environments (high altitude, arid environment), access to scarce resources that require regulations, *etc*.

Political Schema to Govern Territorial Units

I present three examples of polycentric governance related to managing non-state-level territorial units.

The pre-Tornow and Tornow Sphere of Authority
I researched questions regarding the causes of social and political integration and the nature of the incipient political organization in North Central European Plains 500–800 CE and concluded the existence of two phases of political integration: the pre-Tornow phase with scattered forts and fortified villages (600–700s CE), and the Tornow

phase with a well-organized network of standardized forts (800s CE). Politically, both territorial units followed the polycentric scheme.

During the 600s and early 700s CE, the first fortified enclosures appeared across the North Central European Plains. Their function was to protect the wealth of the territorial communities. In the late 700s–800s CE, some of the villages and fortified villages were rebuilt into Tornow-type forts, forming a region-wide network along with newly built Tornow forts. This territorial political and economic unit expanded beyond the local scale polities (Lozny 2013). Each fort and surrounding village formed an independent decision-making center. The social network analysis revealed that the entire network consisted of equal status centers, which shared similar architectural features and material culture. No evidence suggests that any of the centers had a regionally dominant political role. This short-lived sociopolitical system declined at the end of the 800s–early 900s CE.

Chiefdoms of the American Southeast
Jacob Lulewicz (2019) examined political changes in the American Southeast during the Late Woodland Period. He employed social network analysis to compare the relational structures and organizations of sociopolitical landscapes traditionally characterized as chiefdoms.

The results of Lulewicz's analyses contribute insights to studying small-scale political organizations. The author concluded that the bottom-up network approach to political organization and activity allows for a finer-resolution interrogation of the heterogeneity of social and political structures through time. When the Spanish encountered southern Appalachian societies, the political landscape was composed of autonomous communities linked together through loose political ties, and such open networks of information and resource flows characterized the sixteenth-century political landscape.

Inter-tribal comanagement of resources, Fort Irvin,
the Great Basin, USA
Jelmer W. Eerkens (1999) examined inter-tribal CPR systems consisting of land and other resources jointly used (managed) by distinct ethnic and linguistic groups in the Mojave Desert, the Great Basin, USA. This type of land tenure differs from reciprocal access arrangements. Ethnographic, archeological, ethnohistoric, and ecological data support this position. Ethnographic work shows that native groups practiced joint land ownership.

Eerkens' study answers the question: How and why do CPR management systems develop among small-scale societies? The author concluded that defendability, environmental risk buffering, and social

conflict buffering suggest that joint-use lands are social buffers among groups.

Bifurcated Governance: State vs. Customs and Tradition

The Pyrenees, Comanagement of Grazing Rangelands in Pyrenean Transhumance: Polycentric Land Management
(EU, State Governments, and Communal Rule Systems)
The questions that guided my research on high-altitude pastures (Lozny 2016, 2019) related to the most effective arrangements to use scarce resources. Differences in high-altitude architecture and other characteristics of pastoral lifestyle exist from valley to valley, and a distinctive cultural signature represents each to identify the 'ownership' or rights to use high-altitude pastures. Access and their use were traditionally organized and managed in a collective/cooperative manner that persisted for hundreds of years until now. According to the communal rule system, villagers from Spain and France cross the national administrative borders and share designated grazing ranges. Despite cultural, ecological, and political boundaries, the currently existing communal land management system follows the grazing pattern modeled after the medieval agreements dating back to the kingdom of Navarra.

I concluded that the case presented here contributes to a better understanding of the interconnection between human decisions and the environment from a historical perspective. The typical pastoral set in Hautes-Pyrénées included a cabana, sheep/cowshed, and enclosure. Since the eighteenth century, clusters of such sets were identified as *courtau*, collectively shared landscape structures.

Agdal: a Cooperative System to Share Grazing Lands
The Berbers of the Mesiuoa tribe of the High Atlas follow the traditional, coded in their religious beliefs, cooperative custom (*agdal*). However, individual attitudes are distorted due to new economic ideas from elsewhere, mainly France. Pablo Dominguez *et al.* (2010) examined diverse roles of the *agdal* system, a several centuries-old traditional Berber form of environmental management prohibiting access to communal natural resources during a specific period, to enable the regeneration of natural resources.

The *agdal* system is an inherently Moroccan type of gardening that has shaped the Moroccan landscape for hundreds of years; it is an element of social identity. A survivor of the past but still adaptable to

climatic variations and social changes, the landscape of the *agdals* continues to resituate and determine nature in the present.

The authors concluded that the communal management system of the *agdal* benefits local communities as socio-culturally resilient, economically sustainable, and ecologically enriching land use.

Multiple Levels of Interclan Cooperation to Regulate Access to Pastures in Eastern Ethiopia

Fekadu Beyene (2010) explored institutional arrangements governing reciprocal grazing resources shared among eastern Ethiopia's pastoral and agro-pastoral clans. He described and compared multiple institutional arrangements that define non-exclusive property rights to increase the social and economic efficiency of grazing resource uses in a risky environment. Results indicate that social capital explained using lineage as a proxy, plays a crucial role in facilitating the establishment of and negotiation for non-exclusive rights to grazing resources.

The author concluded that an important lesson from this study is the mismatch between interclan cooperation to manage ecologically induced risk and the state's political interest in controlling herders. Flexibility in granting rights embedded in interclan cooperation is not only influenced by the physical attributes of resources. Legal constraints and socio-political factors are disrupting extended mobility and reciprocal resource access. The insecurity of group rights to communally used land and the national policy measures that override traditional systems are two critical constraints to the success of reciprocal arrangements.

Centralized vs. Localized Management of Fishing (Zambia)

Tobias Haller and Sonja Merten (2008) argued that the presence of centralized government thwarted a successful local collective action toward a shared resource. Locally developed institutions for fisheries existed in Africa before colonial and state rules were imposed. Traditional Batwa and Ila/Balundwe fishery institutions reduced transaction costs and regulated fishing in a common property regime. The result seemed to have been sustainable. Local chiefs retained power even with the influx of 'foreigners,' the Lozi fishermen, who were encouraged to settle there by the central Zambian government. They enlarged the chiefs' spheres of authority by setting up participatory, subsidiary control mechanisms by forming fishery committees to implement some regulations.

The authors concluded that open access is most profitable for commercial users and mobile traders. Some local interest groups

would be more interested in combining local and state-enforced rules, limiting access to the fisheries to obtain better distribution in favor of small-scale fishing.

Polycentric Rules for Aboriginal Berry Harvesting (Canada)
Brenda Parlee and Fikret Berkes (2006) discussed joint property arrangements that govern the subsistence harvest of berries in the Gwich'in region of the Northwest Territories, Canada, including rules for resource access, sharing information, and harvest sharing. The rules change in response to year-to-year variations in the abundance and distribution of the species, spatially and temporally across the region. One problem discussed is how common property rules are modified by knowledge about variability in the abundance and distribution of commons. The authors researched several dimensions of 'sharing' and rules for accessing cranberry, blueberry, and cloudberry picking areas. Extended family ownership regimes appear to have developed around many cranberry patches, particularly those near cabin sites along the Peel River and the Mackenzie River Delta.

The authors concluded that institutions or rules-in-use governing commons resources develop in many indigenous and other communities to prevent what has been called the tragedy of the commons.

Polycentric Governance in Andean Water Management
Amber Wutich (2009) presented a study on water regulations at times of scarcity in the Cochabamba region of Bolivia. As a result of social protests, water management was not privatized and remained in public control.

Water is extremely scarce in the southern region of Cochabamba, occupied by urban migrants, making urban common pool water institutions unsustainable. The author examined three questions: (1) How does a common pool water resource function in urban Cochabamba? (2) Are its rules sustainable during severe water scarcity? and (3) Are the underlying institutions (including those for collective choice and operational rules) also sustainable during severe water scarcity?

The author concluded that the system is managed according to the principles of uniformity, contiguity, and proportionality, which ensures that all eligible community members receive fair and equal access to water. These rules are enforced via monitoring and sanctioning, yet a small amount of free-riding is tolerated to help some households meet short-term subsistence needs. The system follows the principle of regularity to prevent overexploitation and ensure that water cutbacks are apportioned to all community members equally.

Polycentric Schema to Manage CPRs in Modern Society

Social Behavior Toward Nested CPR (Australia)
Ashutosh Sarker and his collaborators (2008) investigated the interdependence of nested CPRs in the Lockyer, the Brisbane River, and Moreton Bay catchments in Southeast Queensland, Australia. They showed that the catchment (watershed) has several interdependent CPRs, linked through ecological processes and mediated by human actions that create positive or negative externalities for many resource users.

The authors examined three interrelated propositions: (1) that sets of CPRs can be interconnected within a landscape (*i.e.*, they are ecologically interdependent) so that natural assets formerly considered as single CPR can be recognized as influencing each other; (2) that users of one CPR have interests in the management of other CPRs, which if depleted, affect their collective well-being (*i.e.*, the CPRs are socially and socio-ecologically interdependent); and (3) that the management of such CPRs becomes more complex as ecological and social processes intersect because it potentially brings together several groups of users (and regulators) of both single and multiple use of CPRs. They termed inter-connected CPRs 'interdependent CPRs.'

The authors concluded that different CPRs, connected by ecological processes and often by externalities arising from human interventions, can be interdependent within a catchment and that their users are also interdependent.

Wildland Fire Control in the American West
Jesse Abrams and colleagues (2017) presented research on community engagement related to resilient and adaptable community coexistence with fire. The authors examined a unique institutional model in the remote US West in which rural community members actively respond to wildland fires under state-sanctioned Rangeland Fire Protection Associations.

The authors concluded that the Rangeland Fire Protection Association model presents opportunities to leverage ranchers' motivations, skills, and knowledge to inform effective fire response and create opportunities for learning and adaptation. At the same time, this coproduction model presents challenges to integrating formal and informal institutions. The findings suggest that fire adaptation may be enhanced by moving away from the guardianship model toward models based on greater levels of resident engagement in fire planning and response,

allowing for better integration between formal/high-level and informal/local-level institutions.

Adaptive Comanagement of a Wetland Landscape
Around Kristianstad, Sweden
Thomas Hahn *et al.* (2006) investigated ecosystem management and assessment focusing on social capacity to enhance ecosystem resilience and the services it sustains using the small, flexible municipal organization, Ecomuseum Kristianstads Vattenrike (EKV) in southern Sweden, has identified win-win situations and gained broad support and legitimacy for ecosystem management among a diversity of regional actors.

The authors concluded that the EKV approach to adaptive comanagement had enhanced the social capacity to respond to unpredictable change and developed a trajectory towards the resilience of a desirable social-ecological system.

DISCUSSION

Overall, these examples illustrate that polycentric governance is a valuable tool for addressing complex societal challenges that promote cooperation across sectors and the complexity of governance (Johnson and Johnson, 2013). While not without its challenges or limitations – including issues related to power dynamics or coordination – it offers a promising alternative to traditional top-down or market-based approaches that may not consider the complexities of local contexts or diverse stakeholder interests.

Political Schema to Govern Territorial Units. How and why
Do Polycentric Systems Develop among Small-Scale Societies?
Theories on state formation suggest that factors such as population growth, warfare, and ecological circumscription were crucial in altering social organization and creating governance rules. The data I discussed do not corroborate either of these causes; therefore, other conditions are presumed as the force that mobilized local societies to change their political organization. All three cases, from North Central Europe, the American Southeast, and the Southwest, contribute clues to understanding how social-political complexity happens in small-scale societies.

In North Central Europe, the lack of convincing evidence for centralized (coercive?) power between the 600s–late 700s CE suggests a segmentary rather than hierarchal form of political organization, and that further suggests a possibility that cooperative behaviors have been

practiced with a pattern of nested polycentric governing institutions to manage local CPRs. It appears that the makers of Feldberg pottery initiated the social change related to the pre-Tornow manorial organization with isolated, fortified settlements and accompanying villages.

If the pre-Tornow political schema operated under cultural and economic provisions related to the circulation of the Feldberg pottery, the Tornow Sphere of Authority was an outcome of political pressure inflicted by the rivalry between the Carolingians and the Vikings, which ended in the early 900s CE. If the Tornow polycentric polity was Carolingian-inspired, internal self-organization could have been among the principal mechanisms behind its emergence. However, invasion and cultural diffusion were behind its onset if it emerged as a Carolingian-supported military buffer zone. The end of this political competition in Northwestern Europe correlates with the collapse of the Tornow political organization. The polycentric organization of pre-Tornow and Tornow territorial units suggests that defendability was the primary objective. I identified the Tornow phase as neither chiefdom nor state, but the Tornow Sphere of Interaction (TSI), designed to promote political cohesion within its domain (Lozny 2013).

Scholars recognized the Late Woodland Period's southeastern US political entities as chiefdoms. The results of Jacob Lulewicz's analyses contribute insights into studying small-scale political organizations. His key findings are: (i) as chiefdoms developed, leaders drew on preexisting social and political conditions; (ii) while networks of chiefly interaction were defined by instability, wider networks of interaction were much more durable; and (iii) quantitative network analyses and qualitative ethnohistoric accounts can articulate with one another to shed light on indigenous political organization.

In the Great Basin case, social conflict buffering suggests that joint-use lands serve as social buffers among groups. Although adjoining groups have exclusive access to their respective core areas, space among the groups may serve as a buffer against social friction. Such 'no-man's-lands' have been described by several ethnographers to exist among band-level and tribal societies. Permission-seeking was commonly observed among the Great Basin communities when gathering outside their home territory. Sporadic use of the region by small and ethnically diverse groups as they dispersed from their winter villages in spring best accounts for the ethnographic, ethnohistoric, and archaeological information.

The presented data suggest three main scenarios for why polycentric governance emerges in small-scale societies:

1. ***Defendability*** or cost-benefit suggests that polycentric systems developed because areas are not worth claiming and defending as private; limiting access and its control was too expensive (pre-Tornow, Great Basin, Southeast US).

2. ***Environmental risk buffering*** emphasizes that groups have unconstrained access to more extensive and diverse territories and resources pooled and jointly owned (Great Basin, Southeast US, pre-Tornow).

3. ***Social conflict buffering*** suggests that joint-use lands serve as social buffers among groups. Although adjoining groups have exclusive access to their core areas, space among them may serve as a buffer against social friction (Great Basin, Tornow TSI).

Bifurcated governance: State vs. Customs

My research in the Central Pyrenees (Lozny 2019) demonstrates that formal (the EU and national governments) and informal (communal customs and traditions) contribute to local governance regarding the access and use of highland pastures. I focused on a case of rational cooperation under forced conditions to share a limited resource, high-altitude pastures, and theorized on the relevance of a bifurcated governance system, centralized and local, to regulate access to scarce resources in complex (post)industrial societies.

Historically, the Pyrenean valleys comprised independent political and economic territorial units with their own rules to manage pastures. According to the communal rule system, villagers from Spain and France cross the national administrative borders and share designated grazing ranges. Despite cultural, ecological, and political boundaries, the currently existing communal land management system follows the grazing pattern modeled after the medieval agreements dating back to the kingdom of Navarra. Localized diversities in transhumance-related material culture and social arrangements to use high-altitude pastures have been noticed in medieval texts. Access to pastures and their use was traditionally organized and managed in a collective/cooperative manner that persisted for hundreds of years until now. The current fast-paced socioeconomic changes cause severe threats to local, sustainable development and well-being. Centralization of decision-making weakens communal cooperatives and contributes to local economic and social crises. A participatory, polycentric governance scheme of scarce resources seems a viable alternative. I applied a softer version of Hobbes' view to suggest that people cooperate due to rational self-interest. Rational cooperation is not morally motivated

but based on economic calculations (a cost-effective approach). People do not need to be nice to each other to cooperate rationally.

Agdal is a fundamental tool of extensive gardening and territorial management. A survivor of the past but still adaptable to climatic variations and social changes, the landscape of the *agdals* continues to resituate and determine nature in the present. *Agdals* and their probably millenary cultural heritage are very important for the durability of the current agro-pastoral activity and ecosystems. Agro-pastoral land rotation based on several *agdals* and closely linked to a complex and evolving cosmology represents values for the conservation of the environment, contributes to the sustainability of the local economy, and the maintenance of social cohesion and cultural continuity.

Promoting sustainable livelihoods and achieving food security in a livestock-dependent pastoral economy in the drylands of eastern Ethiopia require policy measures to safeguard the customary systems and remove the barriers associated with formal governance structures that constrain the mobile pastoral production systems. Because private ownership is expensive and impedes access to various pastures, communal, polycentric pasture management defines interclan cooperation in eastern Ethiopia. Multiple institutional arrangements define non-exclusive property rights to increase the economic efficiency of resources in a risky environment.

Nonetheless, socio-political factors, such as clan politics and regulations restricting cross-border herd mobility, limit the role of customary institutional arrangements in sustaining interclan cooperation. Increased threats from climate change (rainfall variability) and the absence of insurance for the livestock increase the necessity to sustain interclan cooperation over the reciprocal sharing of the grazing commons. This suggests the need for a policy shift in favor of reinforcing customary resource governance systems to ameliorate interclan cooperation to respond to these challenges.

There are two critical intractable issues. On the one hand, state recognition of group rights is seen as a means of enhancing resource-sharing arrangements. On the other hand, the state political system challenges the smooth functioning of the customary system as it affects local interclan relationships. Hence, customary institutions must cope with these emerging formidable challenges to ensure the continuity of traditional production practices. The game-theoretical model indicates that as herding communities face increased threats from climate change (rainfall variability) and where market mechanisms to ensure livestock keepers do not exist, the need to sustain interclan co-

operation in the reciprocal sharing of the grazing commons remains a necessity rather than a choice.

The centralized government's involvement in local small-scale fisheries in Zambia thwarted successful local collective action toward a shared resource. In a combination of local and state-enforced rules to obtain better distribution in favor of small-scale fishing, traditional institutions face more free riding as they hinder critical livelihood gains in the new state-controlled context. New statutory initiatives address the chiefs as the local groups' prominent representatives but recognize the chiefs' contested position and try to incorporate as many different fractions as possible, including male and female fish traders. The link to identity was crucial, for it legitimized the bargaining power of the actors involved to transform or maintain institutional regimes. The significant positive aspect is that a process of participatory consent seems possible.

Common property arrangements characterize the harvest of berries in the Gwich'in region of the Northwest Territories, Canada. They include rules for resource access, sharing information, and harvest sharing. Formal institutions such as the Gwich'in Renewable Resources Board and other comanagement boards limit non-Gwich'in access to local resources. Established under this agreement, institutions, such as the Gwich'in Renewable Resources Board and other comanagement boards, primarily limit non-Gwich'in access to local resources. There are also a variety of informal institutions within Gwich'in communities (nested institutions) that shape local resource use, as in the case of berries and fish.

In the Andes water arrangement schema, while the function of the CPR institution was stable, the social structures underlying it were noticeably more sensitive to external events. Activity in the nested institutions that organized collective choice (the Neighborhood Council) and oversaw operational rules (social networks) fluctuated in patterned ways, and there is some evidence that seasonal water scarcity played a role in those fluctuations.

The results suggest that while institutions with historical solid precedents for contingencies under resource stress can endure periods of scarcity intact, the nested institutions that organize collective choice and operational rules may not be as resilient to external stressors. This indicates that a well-organized CPR institution may remain ecologically and socially sustainable during periods of stress and uncertainty. Andean CPR management principles are embedded in cultural knowledge passed down through generations; the findings indicate that such

knowledge is passed from rural to urban communities. However, there are likely thresholds at which disruptions in polycentric and nested institutions begin to affect CPR institutions directly.

The presented data suggest five main reasons why customary polycentric arrangements work better than centralized ruling in the use of shared resources:

Rational self-interest – relates to rational cooperation under forced conditions to share a limited resource. Rational cooperation is not morally motivated but based on economic calculations (pastures in the Pyrenees and Ethiopia, water management in the Andes).

Environmental management – agro-pastoral land rotation based on several *agdals* and closely linked to a complex and evolving cosmology represents values for the conservation of the environment, contributes to the sustainability of the local economy, and the maintenance of social cohesion and cultural continuity (Morocco).

Cost mitigation – because private ownership is expensive and impedes access to various pastures, communal, polycentric pasture management defines non-exclusive property rights to increase the economic efficiency of resources in a risky environment (Ethiopia, Pyrenees).

Social bonding – relates to rules for resource access, sharing information, and harvest sharing to incorporate as many different fractions as possible. The link to identity is crucial, for it legitimizes the bargaining power of the actors involved to transform or maintain institutional regimes. (Gwich'in, Zambia).

Risk management – prevents the tragedy of the commons. A well-organized CPR institution may remain ecologically and socially sustainable during periods of stress and uncertainty. Institutions with historical solid precedents for contingencies under resource stress can endure periods of scarcity intact (Gwich'in, water management in the Andes)

A Polycentric Schema in the Modern State
The study of nested catchments – the Lockyer, the Brisbane River, and Moreton Bay – demonstrates that socioecological interdependencies exist. However, there is a paucity of theoretical debate and practical approaches to understanding and addressing such interdependencies' nature and consequences. Nevertheless, collective action is necessary for the multiple uses of individual CPR and socioecological interdependencies associated with managing CPRs.

A unique institutional model in the remote US West to control fire demonstrates that rural community members actively respond to

wildland fires under state-sanctioned Rangeland Fire Protection Associations. Widespread concern with the negative impacts of wildfire on human communities has spurred calls to foster more resilient and adaptable forms of community coexistence with fire. However, numerous institutional barriers perpetuate maladaptive individual and collective behaviors in many communities. Case studies from Idaho and Oregon suggest that the Rangeland Fire Protection Association model presents opportunities to leverage ranchers' motivations, skills, and knowledge to inform effective fire response and create opportunities for learning and adaptation. At the same time, this coproduction model challenges the integration of formal and informal institutions.

Navigating the existing legal-political framework, Ecomuseum Kristianstads Vattenrike (EKV) has built a loose social network of local stewards and critical persons from organizations at municipal and higher societal levels. This network allows for knowledge generation of how to respond to environmental feedback and change. As a bridging organization, EKV has created arenas for collaborative learning and knowledge generation, trust building, preference formation, creating meaning, and solving conflicts among actors concerning specific environmental issues arising in the area. It is a dynamic system where ad hoc projects are formed for each issue arising, mobilizing individuals from the social network. Ad hoc projects are developed as issues arise by mobilizing individuals from the social network. Kristianstads Vattenrike (KV), in southern Sweden, is an example of successful collaboration for ecosystem and landscape management and illuminates many theoretical concerns of adaptive comanagement and social and ecological system resilience. By being sensitive to the concerns within non-environmental sectors, the small, flexible municipal organization EKV has identified win-win situations and gained broad support and legitimacy for ecosystem management among various regional actors. The EKV approach to adaptive comanagement has enhanced the social capacity to respond to unpredictable change and developed a trajectory towards the resilience of a desirable social-ecological system. Organizational flexibility and participatory approaches to learning and knowledge generation for responding adequately to environmental change have been highlighted but not critically assessed.

Socioecological interdependence – CPRs are socially and socioecologically interdependent; collective action is necessary for the multiple uses of individual CPR and socioecological interdependencies associated with managing CPRs (Australia, Sweden).

Spontaneous action to increase resilience and adaptability – away from the guardianship model toward models based on greater levels of resident engagement in fire planning foster more resilient and adaptable forms of community coexistence with disasters such as fire (Oregon, Idaho, Sweden, and Australia).

Adaptive comanagement – the EKV approach to adaptive comanagement has enhanced the social capacity to respond to unpredictable change and developed a trajectory towards the resilience of a desirable social-ecological system. This network allows for knowledge generation of how to respond to environmental feedback and change (Sweden, Australia).

What Justifies Polycentric Decision-Making?

I suggest that participatory polycentric governance (as opposed to centralized ruling) is an efficient strategy to manage common-pool resources (CPRs) and to achieve short-term societal goals that contribute to long-term strategies. It is easy to understand that centralized conservation efforts generally have failed, the resources necessary to impose top-down strategies are dwindling, and there is a growing demand for more inclusive decision-making structures.

One potential implication of polycentric governance for global development is increased crisis resilience. By empowering local communities to make decisions and act in response to environmental disasters, economic downturns, or other unforeseen events, we can create a more flexible and adaptable system that is better equipped to weather these challenges. This could be particularly important for developing countries lacking the resources or infrastructure to respond effectively.

Another potential benefit of polycentric governance is more significant equity and inclusivity in decision-making processes. By involving a more comprehensive range of stakeholders in policy discussions and planning initiatives, we can ensure that marginalized groups have a voice in shaping their futures. This could lead to a more equitable distribution of resources and opportunities and greater social cohesion overall.

However, implementing this approach will not be without challenges. One potential concern is that it may lead to fragmentation or inconsistency in policy implementation across different regions or sectors. However, to address this issue, it will be essential to establish clear guidelines for decision-making processes and ensure that all stakeholders are working towards common goals.

Overall, polycentric governance offers a promising alternative to traditional top-down approaches to global development. By embracing diversity and collaboration at all levels of society, we can create more resilient, equitable systems that empower individuals and communities worldwide. However, realizing these benefits will require careful planning and coordination among diverse stakeholders – a challenge requiring ongoing commitment and dedication.

The Critical Condition for Polycentric Governance:
Rule Systems Sustained by Cooperation

Rule systems emerge due to negotiation and consensus. They are sustained through cooperation in centralized and multi-agent or polycentric structures. Cooperative networks of different scales successfully diminish the hierarchical form of organization in favor of the horizontal flow of authority by contributing to disaggregation and forming new collectivities not founded on hierarchal principles. The proliferation of rule systems is propagated by the evolution of 'multilevel' polycentric governance that ranges from family to federation of states.

Cooperation is not a strategy of just the powerless. It becomes a viable approach to mitigate conflict in the context of scarcity of resources and to secure communal sustainable well-being. Even if it has not produced state-level societies, such a scenario has been practiced by Indigenous peoples of the Pyrenees who survived until the present but have eventually been colonized by politically complex and centrally organized, more powerful societies. Cooperative action units combine formal (costly) administration with informal locally managed para-governmental organizations (bifurcated governance) to achieve cooperation goals. They use varied strategies to link local segments into larger administrative systems to manage public goods and solve cooperator problems. Groups governed through cooperative behavior create informal spheres of authority.

In today's world, cooperation is critical to social and economic progress. Collaboration and teamwork have become increasingly important in achieving shared objectives in the workplace or in our personal lives. Cooperation is not only beneficial for individuals but also for society. Despite challenges, cooperation remains a vital component of modern society.

Benefits of Cooperation

Collaboration and cooperation are essential for the growth and development of any society – the benefits of cooperation range from social to economic benefits.

Cooperation promotes teamwork and fosters a sense of community. When people work together towards a shared goal, they develop trust in each other's abilities and build strong relationships based on mutual respect.

Cooperation also has significant environmental implications. Global issues such as climate change require collective efforts from all members of society to address them effectively. Cooperation between governments worldwide is essential for achieving sustainable environmental outcomes that benefit everyone.

International cooperation promotes peace and stability among nations by fostering understanding between cultures and promoting dialogue instead of conflict resolution through violence or war tactics. By collaborating on issues such as trade agreements or disaster relief efforts after natural disasters, nations can create more stable political environments, leading to more peaceful relations.

Cooperative efforts increase innovation levels across various fields by bringing together diverse perspectives from different stakeholders in research projects or product development processes, creating new technologies faster than if each stakeholder worked independently.

Incentives that make cooperation appealing in strategic situations when an individual's and group's success depends on decisions by others include:

1. Cooperative behavior potentially diffuses conflict.
2. Cooperation forces frequency of contacts and transparency.
3. Flexibility (opportunity to change rules) in cooperative arrangements improves adaptability.
4. Cooperation generates conditions for group resilience.

The Effectiveness of Collaborative Work

Collaborative work has been a hotly contested topic in the modern workplace. Some argue that it is an effective way to increase efficiency and creativity, while others view it as a hindrance to productivity. Recent studies have shown that collaborative work can be incredibly effective because of:

Increased efficiency – dividing tasks among multiple people can complete projects much faster than if one person were responsible for everything.

Increased creativity – when individuals come together from different backgrounds and disciplines, they bring unique perspectives and ideas. By combining these ideas in a collaborative setting, individuals can often develop solutions that otherwise would not have been possible. Additionally, working with others can provide feedback on one's ideas, which may lead to improvements or adjustments.

Opportunity for learning through collaboration – when working with others with different skill sets or knowledge bases than oneself, there is an opportunity for growth through exposure to new ways of thinking or doing things that might not otherwise be encountered in isolation.

Collaborative work can be an incredibly effective way to increase efficiency, creativity, and learning. However, it must be done correctly with clear communication and mutual respect among team members to avoid the three pitfalls of conflict or inefficiency. When done right, collaboration can lead to better outcomes than working alone.

Despite these advantages, collaborative work can hinder productivity due to disagreements over how specific tasks should be completed or how decisions should be made about project direction or goals. This can lead to conflict between team members, which, if left unchecked, could result in lower morale or even abandonment of the project entirely.

Challenges in Group Decision-Making

Group decision-making is a complex process that poses several challenges to individuals working towards a common goal.

1. *Conflicting opinions*. One of the most significant challenges in group decision-making is the presence of conflicting opinions. When individuals come together, they bring their unique experiences, perspectives, and beliefs that shape their decision-making processes. This diversity can be a strength as it enables groups to consider various options and perspectives; however, it also creates conflicts that impede cooperation and collaboration. Individuals may hold onto their ideas too tightly, making it difficult for others to express their opinions or for the group to reach a consensus.

2. *Social dynamics*. Another challenge in group decision-making is the influence of social dynamics on individual behavior. Individuals may feel pressure to conform to the group's opinion or follow the lead of more dominant members, even if they disagree with the proposed

solution. This can lead to groupthink, where individuals prioritize maintaining harmony within the group over making sound decisions based on evidence and logic.

3. ***Time constraints.*** Furthermore, time constraints can also pose significant challenges in group decision-making. When groups have limited time to make decisions, there may be pressure to rush through discussions or overlook essential details that could impact the outcome negatively. This can result in poor-quality decisions that are poorly thought out or lack sufficient consideration of all available options.

4. ***Communication breakdowns.*** Lastly, communication breakdowns are another challenge faced by groups when making decisions. Misunderstandings due to poor communication skills or language barriers can lead to confusion and frustration among team members. Technology-based communication platforms such as email or video conferencing may also create additional barriers due to technical glitches and delays.

While cooperation is essential to successful group decision-making processes, it has challenges. Conflicting opinions among team members, social dynamics influencing individual behavior, time constraints leading to rushed decisions, and communication breakdowns pose significant obstacles to achieving optimal outcomes through cooperative efforts. Therefore, effective strategies such as active listening skills training programs for teams should be implemented to help overcome these challenges and ensure that cooperation is a productive and positive force in group decision-making.

Collective action creates specific forms of social interaction common to nonindustrial and industrial communities. The rulers and the ruled interact according to a consensus-based incentive distribution (and redistribution). The economic benefit of collective action lies in providing CPRs through cooperative activities beyond what would be expected from individual consumer rationality (explained by zero-sum games and Pareto optimality; conflict games).

WHAT IS THE BEST STRATEGY IN A ZERO-SUM GAME: NON-COOPERATIVE BEHAVIOR OR POTENTIAL CONFLICT (SOLVED BY ALL KINDS OF EQUILIBRIUM GAMES, SUCH AS NASH EQUILIBRIUM)?

As scalar tensions intensify and commoners and officials ponder how to conduct their affairs in the face of transformative dynamics seemingly out of control, we ask critical questions at every level of the community:

How do we secure the order and authority needed to improve the human condition?

How to infuse a modicum of order, a measure of effective authority?

How can effective governance ameliorate, if not resolve, numerous problems that emerge in social groupings?

Is centralized governance the correct answer?

Can centralized governance exercise control over a variety of situations on different scales? Is it limited to the exercise of authority in certain situations?

Does it connote the sum of all the diverse efforts of communities at every level to move towards goals while preserving their coherence from one moment to the next?

Two solutions seem advisable:

• Cooperative games (partnership, consensus, *etc*.; players form binding commitments to support stable structures for as long as they accept the rules; generally, the objective is to tie the game, not to win),

• Hybrid games (coalitions, alliances, confederacies, *etc*.; a mixture of cooperative and non-cooperative behaviors to support short-term stability of otherwise dissipative structures).

CONCLUSIONS

Here are the highlights of my analysis.

Function, Structure, and Ruling System

The debate between function and structure in the ruling system is a complex issue that requires careful consideration. While both are important, efficiency and effectiveness are critical factors in determining the best approach. When it comes to efficiency, a streamlined structure can often be more effective than an overly complex one. However, this must be balanced against the need for flexibility and adaptability in changing circumstances. Similarly, focusing on function may be more critical when considering effectiveness than strict adherence to established structures. Ultimately, the best approach will depend on the specific context and goals of the ruling system in question. By considering efficiency and effectiveness, policymakers can make informed decisions about how best to structure their systems for maximum impact.

Rule systems are an essential aspect of society that helps maintain order and structure. However, enforcing rules can be unfair, negatively affecting individuals and communities. The issue of unfairness in rule enforcement is complex and requires careful consideration and

action. One way to address this problem is by increasing transparency in the rule-making process, involving stakeholders in decision-making, providing clear guidelines for enforcement, and ensuring that those responsible for enforcing rules are held accountable for their actions.

Collective Action Theory

Collective Action Theory is a powerful tool for understanding how to achieve social change. The advantages of collective action include increased bargaining power, greater visibility and legitimacy, and the ability to mobilize resources. However, there are also significant challenges to collective action, such as free-riding and coordination problems. Despite these challenges, collective action can be highly effective when properly organized and executed. By understanding the dynamics of collective action and developing strategies to overcome its challenges, activists can harness its power to achieve their goals.

Cooperation

Cooperation is essential to human interaction; it promotes teamwork, enhances productivity, and fosters a sense of belonging among individuals. Collaborative work also effectively achieves common goals as it allows for the pooling resources and expertise. However, group decision-making can be challenging due to conflicting interests, communication barriers, and power dynamics. Effective communication and compromise will mitigate these challenges.

Polycentric Governance

Overall, polycentric governance is a complex and multifaceted concept that requires careful consideration of its various components. While challenges are associated with this approach, the potential benefits for local communities make it a worthwhile endeavor. Polycentric governance, on the one hand, allows for greater participation and decision-making power at the local level, leading to more effective and efficient policies. By allowing for greater participation and decision-making power at the local level, communities can better address their unique needs and concerns. On the other hand, it can lead to fragmentation and lack of coordination between different levels of government. Other limitations and challenges associated with this approach included issues of coordination and accountability. Effective coordination among different actors is essential for success, and international organizations can play an important role in supporting these efforts (Ostrom and Hess, 2007). Case studies of successful models, such as

the European Union and Brazil's participatory budgeting, demonstrate that polycentric governance can be effective when implemented correctly. However, there are also examples of failed attempts at polycentric governance, such as Somalia's decentralized system.

In the current globalized world, international organizations play a crucial role in shaping the governance of nations. These organizations have become the backbone of polycentric governance, where power is distributed among multiple centers rather than concentrated in a single entity. The role of international organizations has become increasingly important due to nations' growing interconnectedness and interdependence. These organizations mediate between countries, promoting cooperation and facilitating trade, security, and human rights negotiations.

The concept of polycentric governance has far-reaching implications for local and global development. At its core, this approach to governance recognizes that there is no one-size-fits-all solution to the complex challenges facing our world today. Rather than relying on a single centralized authority to dictate policy and manage resources, polycentric governance emphasizes the importance of collaboration and cooperation among diverse stakeholders at all levels of society. This decentralized approach recognizes local communities' unique strengths and perspectives and actively encourages them to shape their futures.

The question was:

Is participatory polycentric governance a valuable strategy for sustainable well-being?

Following Hardin's (1968) model that if individuals act rationally but in self-interest, they will deplete common resources, we might conclude that sustainable polycentric governance is not attainable.

However, if we consider the following (based on the presented data):

1. Polycentric management contributes to resiliency.

2. Polycentric management is responsive to change (flexible).

3. Polycentric management allows stakeholders to control each other as they share investment costs and benefits and minimizes free-rider strategies.

4. Polycentric management creates conditions for collaborative behavior (described by the 'prisoner's dilemma').

5. Polycentric governance allows for frequency of contact and transparency.

I conclude that the non-zero-sum game produces cases not governed by Pareto optimality (efficiency) and that any (additional)

change to make any person better off is impossible without making someone else's condition worse. Polycentric governance, organized as collective management of CPRs, mitigates problems such as overuse or degradation and contributes to sustainable well-being.

While several scholars have examined how polycentric and nested institutions contribute to CPRs management (*cf.* McGinnis 1999; Ostrom 1999), few discussed the success of sustainable nested governance institutions. Undoubtedly, specific regulations are necessary, but central government ruling may limit individual access to common resources. Participatory polycentric governance seems a feasible alternative. Polycentricity is a normative approach to governance that stresses the degree to which higher levels of formal government should not crowd out self-organization at lower levels. The conventional wisdom that common property is poorly managed and should be regulated by central authorities or privatized is challenged. Based on the presented studies, I conclude that the outcomes are often better than predicted by standard economic theories. The polycentric approach differs from the standard economic models in two fundamental aspects: it does not favor a particular group over another and contributes to long-term strategies. None of the presently existing economic models successfully combine these two factors.

NOTE

[*] I presented the ideas discussed here in three lectures: the incipient concept at the WESIPS conference in Seville, Spain, in 2015, and a refined one at the WINIR 2022 Virtual Conference on 'Polycentric Governance & the Challenges of the 21st Century', 6–9 Sept 2022, and at the International Center of Anthropology of the Higher School of Economics University, Moscow, Russia, in February 2022. During the discussion after the lecture in Moscow, Dmitri Bondarenko asked significant questions regarding the usefulness of polycentric governance. This essay is a long answer to his question.

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