Unification of Sub-communities within Geographic Communities

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On my honor as a University Student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments

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I. Introduction

In this investigation, the differences between Chinese and American community dynamics are clarified and studied. More specifically, the degree of unification of Chinese sub-communities that are a part of the same geographic communities is investigated and compared. For the sake of convenient reference, a geographic community, which may be defined by partitioning using landmarks or generalized geographic regions, consists of several sub-communities. For example, Charlottesville as a whole could be viewed as a singular sub-community a part of the James River watershed. In the setting of Charlottesville, Virginia, sub-community separation has proven to be a major problem for several reasons, namely in those that negatively further problems faced by the greater geographic community.

Geographic problems are overbearing issues faced by larger geographic communities as a whole; these geographic communities need not be limited by a single label, and may (and often) consist of several sub-communities also determined by geography. Geographic problems are well understood by the general population and well-explained through research and science. However, tackling said geographic problems has proven to be a more difficult task. The prime example of a high-profile geographic problem is stormwater management. It does not take an expert to understand that run-off water as a result of poor drainage has the potential to distribute harmful chemicals and sediment to nearby rivers, thus in turn transferring these harmful substances deeper throughout a given watershed and connecting larger bodies of water. The primary reason geographic problems are relatively difficult to tackle is that cooperation between the existing relevant sub-communities within the geographic community is required. When taking the perspective of different stakeholders, the lack of cooperation among sub-communities is easily explained by the disproportionate weighing of burdens.

This investigation questions, through a comparative analysis of successful and unsuccessful examples: how can governing bodies better *environmental governance* to improve efficacy of policies that tackle geographic problems? As later discussed, the enforcement of policies and/or incentives alone is not enough; policymakers must consider the *non-human* actors involved. Provided that *human* actors alone do not sufficiently explain success vs. failure, environmental governance will be analyzed using Actor Network Theory (or ANT). In addition, the strategies of implementing environmental governance differ greatly depending on the governing body itself and the size and interconnectedness of geographic communities.

Geographic problems have an inherent connection and dependence on *environmental governance*. More specifically, environmental governance is the idea that sustainable development is the top priority in managing social, economic, and political systems in a society (Armitage et al., 2012). Although the idea itself appears almost obvious, one key point in environmental governance is that the environment and its natural resources behave as public goods. For example, even if one owns a factory that heavily pollutes the air, and makes millions of dollars, through the simplified scope of environmental governance, they are harming themselves and everyone in their community. Although such a simplification seems unfair, as in reality, such dynamics are more complicated, it offers a framework by which governing bodies may simplify societal problems based on clear priorities. Successful environmental governance, as later discussed, is one that adds societal pressure to tackle geographic issues in a way that minimizes the overall burden on participating geographic communities.

II. Aside: Community

What is a community? Although most likely know the basic definition of what a community is, upon deeper thought, it is hard to come up with a comprehensive description. Some have attempted to stab at the "outdated" definition of community, claiming it should be defined as a "group of people that care about each other and feel they belong together" (Pfortmüller, 2017). Others have taken deeper dives, concluding that community is often determined by the individual now, as opposed to their surrounding circumstances; in a way, synonymous with identity (Garber, 2017).

Then, there exists the more obvious case of community: geographic communities. Geographical communities are not defined by the self or identity. It is simply based on spatial and physical criteria. While it seems rather simple, the question of geographical identity itself is complex. How large is one geographical community? Where do we draw the lines? This abstraction of geographic communities, while partially semantic, often has important implications. The proper organization and identification of communities is paramount to sufficient communication and efficient collective cooperation between these communities.

III. The Rainwater Tax

One significant geographic problem faced by Albemarle County in Virginia is an excess of watershed pollution stemming from the lack of sufficient stormwater management. According to the U.S. Environmental Protection Agency, 762 million pounds of sediment from polluted runoff from impervious surfaces enters the Chesapeake Bay every year from the Rivanna and James Rivers (Savage and Street, 2018). Tackling such a large geographic problem would

require the cooperation between various key sub-communities within Albemarle County. However, encouraging such cooperation has proven to be a difficult task.

One solution proposed by Albemarle County in 2014 is the imposition of a 'rain tax', which would tax residents based on the area of owned impermeable surfaces that hold potential to contributing to stormwater runoff. Said taxes would be utilized to improve local stormwater infrastructure, which would then hopefully reduce the pollution caused by stormwater runoff. The utilization of a rain tax would essentially force the individual sub-communities to abide by a strict pressure that would in turn effectively 'synchronize' the geographic community to better combat pollution from stormwater runoff. However, it should be noted that such a solution does not constitute a cooperation of sub-communities within a geographic community. In fact, this rain tax caused a controversy, where it pressured specific sub-communities like rural farmers, whose multi-acre properties had many impermeable surfaces. Communities of farmers within Albemarle County, who were affected by the rain tax, felt indirectly targeted, as they would suffer less profit with the presence of a direct tax burden, in comparison to city residents (Baars, 2018). When representing the communities, various environmental issues, and solutions as actors in a larger network, it is simple to see that the stormwater runoff is an actor that brings negative impacts to local communities. However, the rainwater tax, which is intended to act in opposition to stormwater pollution, also acts in opposition to rural farmers. This highlights a key difficulty in encouraging inter-geographic cooperation in that often intended solutions often result in an uneven distribution of burden on the actors involved.

IV. Emission Compliance

In a land farther west, much different culturally and politically in comparison to central Virginia, lies Eastern Asia. Although the geography itself is quite different, the same community interaction framework may be applied: there exist larger geographic communities that consist of multiple sub-communities. Recently and historically, Chinese geographic communities have demonstrated outstanding sub-community coordination towards solving larger geographic issues.

China met its emission-reduction goals for the year 2020 well before its due date. Reaching such a goal, provided its rapidly-emerging economy and substantially large geographic communities, is an impressive achievement. More specifically, China's coal-fired power plant emissions of sulphur dioxide, nitrogen oxide, and particulate matter dropped by 65%, 60%, and 72% respectively (Tang et al, 2019). In comparison to the stormwater pollution issue in Albemarle County, combating a nationwide issue that involves *many* geographic communities is extremely impressive. China's top-down approach to achieve its emission goals ahead of schedule is fascinating in consideration of its provided incentives to the many sub-communities within the larger geographic communities.

China's excess air pollution has posed a public health risk, not only for Chinese residents within cities, but all inhabitants of surrounding geographic communities, most of all, the environment. In this case, the haze is a harmful actor to many inhabitants of China, especially to those in cities. Researchers in China first determined the main three types of units where enhanced ultra-low emission compliance would best reduce pollution. To achieve these goals, simply forcing strict regulations on various sub-communities would be insufficient, especially considering the prevalence of manufacturing in China. To beat its emission goals far ahead of

schedule, China utilized “strict emission supervision system, effective economic incentive mechanisms, and [nationwide applications and upgrades of ultra-low emission] technology” (Nannan, 2019). Further complicating policymaking, it was found that the highest contributor of pollution often varied widely between different models, and on top of that, often changed seasonally (Tao et al, 2016).

There exist many more examples as to how China’s top-down approach has expedited cooperation between sub-communities to tackle larger, overarching geographic problems. A key factor in tackling decade’s worth of air pollution was the addition of incentives between stakeholders. In the previous case, economic incentives were provided to coal-fired units in Western China, namely in Beijing, concurrently to the introduction of ultra-low emission standards (Nannan 2019). To say China’s handling of regulations and incentives was challenging is an understatement — to introduce such strict regulations whilst maintaining incentives to all stakeholders within the geographic communities is a herculean task. Such a sheer difference in successful environmental governance between cities like Beijing and Albemarle County cannot be explained by *human actors* alone. It is clear that, to understand environmental governance, we must consider the *non-human actors* involved in the creation and execution of these environmental policies/incentives. This begs the question: how does environmental governance differ in China vs. the United States?

V. A Closer Look

With the flunking of the rainwater tax in Virginia, it is not difficult to see how Albemarle County failed to apply basic principles of effective environmental governance. From the lens of ANT, we discussed the uneven weighing of burdens on different geographic sub-communities,

which *further* discouraged the cooperation of more rural sub-communities for a problem that requires total cooperation. The Chinese ultra-low emission compliance brought a national pressure on top of all industries within China. Although it most definitely disadvantaged certain industries, it did not divide any sub-communities or induce any unnecessary pressures between them.

Even beyond China's enforcement of ultra-low emission compliance, one less-spoken component of China's environmental governance is the difference in culture. More specifically, society's perceived impact of climate change. This matters because China's ability to educate its citizens on climate change and its adverse effects is a critical step for China's ultra-low emission standards to be accepted by its society itself. A survey conducted in 2017 found that 96.8% of citizens interviewed were in support of the Paris agreement, and 98.7% supported having climate change education implemented in a standard curriculum in schools (Energy Foundation China, 2017). If such results could be achieved in the United States, its environmental governance would be much more complete, thus leading to more synchronized geographic communities.

VI. Conclusion

Albemarle County's difficulty with handling inter-community pressures as a result of the rain tax is only one example of a lacking environmental governance. Although the comparison was made between a small geographic community in Virginia and China, the same concepts apply, as both geographic communities faced geographic problems that could only be solved through near-total cooperation. China's environmental governance proved to be more effective, not only in the policymaking stage, but also in its successful emphasis on environmental health being an *essential* resource for its society.

For future study, further literature regarding the policymaking process in China and artifacts containing the societal impact on communities affected by the ultra-low emission standards is necessary. In addition, more examples of successful and unsuccessful environmental governance in countries with similar policymaking structure would add further clarity. More specifically, one challenge in comparing two different cases of environmental governance in action is determining whether or not certain results are met due to strict differences in government structure.

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