Environmental regulation and policy instruments: Where are we now, 20 years after the stick, carrot and sermon typology?

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Abstract

In 1998, Evert Vedung posited what became one of the most popular typologies of policy instruments, based on the analogy of governing with a conversation with a donkey (also picked up by Kathryn Harrison). Regulatory (sticks), economic (carrots) and information-based (sermons) instruments became wildly popular in the environmental policy literature. While Harrison's "Talking with the Donkey" piece focused on pollution control, the Vedung typology (which is based on an increasing degree of coerciveness) has gained enormous popularity and remained quite central to the work on environmental policy instruments broadly defined. In particular, work on "New Environmental Policy Instruments" (NEPI) led to a disinterest in regulatory mechanisms and an increase in attention to information-based and economic instruments. In this paper I examine the state of the art regarding regulation as an environmental policy instrument and situate current scholarship within the broader landscape. I argue that, if there's something that experiments with various models of environmental policy instruments have shown us throughout the past 20 years is that policy instrument mixes work best under conditions of uncertainty and governance complexity. I offer examples of policy instruments aimed at governing drinking water and solid waste, though my analysis could easily be extended to other areas of environmental policy. I trace the literature on these two areas of environmental policy and planning research and focus on its implications for the broader field.

A paper prepared for the 25th anniversary celebration of the Journal of Environmental Policy and Planning (JEPP)

Berlin, Germany. Sep 8-10, 2019

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Introduction

Governing the environment requires a broad range of strategies that offer flexibility and adaptability towards an increasingly turbulent context. Rapid climatic change, disasters, and socio-political and economic uncertainty can all have deleterious and negative impacts on society, not only on specifically impacted individual and community livelihoods but also on a much broader scale. As a result, it is more important than ever to reflect on the types of policy instruments we have used to protect the environment, all the while making reasonable use of resources. Environmental policy instruments are part of the toolkit that governments have at their disposal precisely for this purpose.

Hood indicated that policy instruments are "the tools of government", the "unobservable" functions of governance that, all integrated and mixed, can combine and produce technical and effective results (Hood 1983). At the core, Hood was interested in understanding and answering the question "*what exactly does the government do?*", but even more importantly, "*how does the government do what it is supposed to do?*". Decision-making processes, planning strategies, resource allocation and budgeting, all these activities are part of what governments do, and changing the way in which we think about them, describe them and frame them helps us better analyze the workings of government. For Hood,

> "we can imagine government as a set of administrative tools – such as tools for carpentry or gardening or anything else that you like. Government administration is about social control, not carpentry nor gardening. But there is a tool-kit for that, just like anything else. What government does to us – its subjects or citizens – is to try to shape our lives by applying a set of administrative tools, in many combinations or contexts, to suit a variety of purposes" (Hood, 1983, p. 2).

It's important to remember that Hood's approach to the tools of government comes from the intellectual tradition of public administration as the core discipline, where public policy scholarship and policy studies are considered to have evolved from the more administrative approach to governing. Governments are comprised of public organizations and public officials whose duty is to manage and engage in social control and administration of societal activities using specific government tools. This public administration/public management approach centers the governance function on governments as public organizations and individuals/society as the actors over which these governments have influence, responsibility, and authority. But policy instruments are much more than authority, and governments have a duty to provide specific public services. Because of this, it is important that we reconsider how we think about policy instruments, beyond the public administration/public management tradition. An approach that is rooted more in the policy sciences is the one taken by Vedung and collaborators, and upgraded by Howlett, Bennett, Harrison, and many other authors who have shifted the way in which we think about policy instruments. These authors have contributed to reconsidering policy instruments as core elements of the policy process. Through the lenses of policy formulation,

policy design and policy implementation, we've began to witness a shift in how we rethink "the tools of government".

In 1998, Evert Vedung posited what became one of the most popular typologies of policy instruments, based on the analogy of governing with a conversation with a donkey (also picked up by Kathryn Harrison). Regulatory (*sticks*), economic (*carrots*) and information-based (*sermons*) instruments became wildly popular in the environmental policy literature, with one of the most well-read and cited applications through Kathryn Harrison's "Talking with the Donkey". Even though Harrison focused on specifically on instruments for pollution reduction and control comparing the Canadian Advanced Reduction of Emissions of Toxics (ARET) program and the United States' Environmental Protection Agency's 33/50 Program (Harrison 1998), the Vedung typology gained enormous popularity and remained quite central to the work on environmental policy instruments broadly defined. Vedung argued that we could classify policy instruments along a continuum of an increasing degree of coerciveness, from less coercive (information-based and voluntary) to more coercive (regulatory command-and-control). This framework is cognitively simple as it facilitates classification of each type of instrument along the continuum, and while it defines three major categories, it also allows for policy mixes (e.g. when we combine threat of regulation with a voluntary program).

Pollution control as a research topic became extremely popular in the literature between 1990 and 2005, with a growing interest in approaches that moved further away from more involved, allegedly more expensive and resource-consuming command-and-control approaches. Towards the end of the 1990s, work on "New Environmental Policy Instruments" (NEPI) led to a disinterest in regulatory mechanisms and an increase in attention to information-based and economic instruments. Environmental regulation faced a strong backlash around the mid 1995, as it was considered the one policy instrument that stifles innovation. A Journal of Environmental Literature pro/con debate helped situate the discussion as an argument of innovation stifling (Porter and van der Linde) vs pollution control and deterrence mechanisms (Palmer, Baum and Oates), but with more recent (and pressing) challenges such as climate change mitigation, the discussion around more traditional forms of pollution reduction (in water, land and rivers) took a backseat.

In this paper, I argue that, if there's something that experiments with various models of environmental policy instruments have shown us throughout the past 20 years is that policy instrument mixes work best under conditions of uncertainty and governance complexity. Shunning environmental regulation does not serve us well particularly when there are circumstances that make economic or suasive instruments less effective, useful or harder to implement. Regulation as a policy instrument has a place, particularly in contexts where its effectiveness can be improved by a strong rule of law.

I have structured the paper as follows. First, I examine the state of the art regarding regulation as an environmental policy instrument and situate current scholarship within the broader historical landscape of the literature. I then offer examples of policy instruments aimed at governing drinking water and solid waste. I chose these two areas and avoided the climate change literature not because it is not important, but because governing water and waste remain two of the most key environmental policy issue areas, even if their popularity in scholarly

literatures has been more limited than climate policy. Though, I hasten to add, my analysis could easily be extended to other areas of environmental policy such as conservation, forest governance and marine protected areas. In the third section of the paper I trace the literature on policy instruments for drinking water protection, wastewater treatment and solid waste management, using Mexico as a case study, with short vignette-type illustrations from other countries. I end the paper by taking stock of where we are in the environmental policy and planning research field and focus on the implications of a renewed interest in environmental policy instruments for pollution control and reduction.

The state of the art regarding regulation as an environmental policy instrument

The literature on policy instruments has exploded particularly because of the strong emphasis on climate mitigation strategies that has pervaded environmental politics' scholarship. However, as I have argued before, climate policy is not the only relevant policy area of interest with an impact on ecosystems. My argument is that we ought to maintain focus on problems that one would consider are already solved, like water pollution and solid waste management, even if abrupt climatic events, disasters and other manifestations of environmental change and accelerated global warming force us to consider climate a core policy area.

I conducted a systematic review of journal articles, books and book chapters tracing from the early 1990s through 2019. I did not specifically discount climate-related policy instruments, per se, but I did exclude them from the final tally and analysis because they were not specific to pollution control or reduction in water and land from solid and liquid sources. I also excluded air policy instruments because this specific area of research (smog policy, transboundary airsheds governance, etc.) focuses on rapidly diffusing contaminants in the air, something that the literature has already established is a wicked problem that requires a very sophisticated approach to regulation that goes beyond simpler command-and-control, or voluntary/suasive/informational instruments. Finally, given that there are already plenty systematic reviews on economic instruments for water policy, I chose to focus more on those articles where regulatory strategies were the core of the paper. My analysis shows a clear interest in economic instruments and a less visible emphasis on regulatory approaches.

Regulation, as a policy instrument, entails the establishment of behavioural guidelines that the target (the regulated agent) should comply with. If there is no compliance on the part of the target party, regulatory instruments establish that these agents ought to be sanctioned with some form of punishment. In the institutional theory literature, regulation is a traditional rule: there is an established target behaviour, a monitoring system and a sanction mechanism. Monitoring compliance obviously requires investment in resources, particularly human capital that can enforce said regulatory standard, on or off site. Systematic non-compliance with rules can lead to harsher punishments.

Regulation theory establishes that government creates rules to govern society member's behaviours (guiding or restraining). For regulation theory scholars, compliance is less of a moral

duty (Parker 2006) and more of an issue with establishing directives for behaviour change that can be followed, monitored and enforced.

Environmental regulation has been both lauded and criticized because of its achievements, particularly in contexts where there is a need for compliance of strict standards of pollutant emissions. Some of these standards are arbitrarily set by authorities with little to no technical expertise, but for the most part, regulations are usually designed and enforced within the limits of industrial responsiveness.

Regulations for water quality have been rightfully criticized for having requirements that may be unreasonably high and therefore quasi impossible to achieve (May 2005). Re These criticisms were some of the fundamental reasons why self-regulation and non-coercive approaches began a period of high popularity. Instead of letting regulators set specific, unreasonable standards, industrial firms began to suggest that they would be willing and able to self-regulate, and/or to engage in voluntary programmes for emissions' reduction.

Enforcement, compliance and sanctions are the three key components of a rule-based regulatory framework. While the standard to be set for compliance is important, it is irrelevant if it is not enforced, if there are no sanctions for non-compliance or if the punishment is so minimal that there is no incentive to comply. Traditional environmental regulation seeks to set standards for a broad range of industries and activities (Holley 2017). These may range from specific targets not to be surpassed when emitting pollutants on both land and water bodies to drinking water standards that establish specific quality controls and components that may or may not be present in water. For solid waste, standards may also establish maximum amounts of waste to be disposed in a location, or the types of materials that may or may not be dumped on site.

Compliance can be achieved through direct means (e.g. the regulator establishes a standard and sets out to enforce compliance through sanctions, usually economic but also operational such as shutting down a plant) or indirect strategies (i.e. where a non-governmental organization is empowered to shame and blame an industrial facility to push them to comply with regulations). Direct compliance is enforced through systematic, periodic inspections, whose success depends on having enough of a workforce to allow for these to occur. As with other types of environmental issue areas, water and waste offer specific and unique challenges for regulators to ensure compliance with norms and standards. Ensuring that there are enough inspectors to monitor industrial activity across different sectors requires strong investments in human capital and infrastructure to support their work. There is a wide variance in enforcement capabilities across the board and countries with lax enforcement capabilities usually achieve poor compliance results (Knill, Tosun And, and Heichel 2008).

One important theoretical, pragmatical and empirical innovation in how we view regulation is the emergence of alternative approaches to strict command-and-control, such as "smart regulation" and "meta-regulation". Self-regulation is still considered within the spectrum of suasive (voluntary) programmes, though I would include it as part of the toolkit of "smart regulation" (Gunningham and Sinclair 2017).

In the mid 1990s, non-regulatory approaches began to appear as a popular solution to traditional command-and-control strategies. The argument underlying these less regulatory approaches was more focused on using market forces or altruistic behaviour on the part of the regulated actors. More emphasis was given to economic, market-based instruments because their implementation lightened the load of compliance monitoring and enforcement from already-overburdened regulatory agencies.

Kathryn Harrison, following up on Evert Vedung's typology, wrote what has become perhaps one of the most influential and popular articles on voluntary programs for pollution reduction in the past 25 years. Harrison analyzed two emerging programmes, one in Canada (the Accelerated Reduction of Emissions in Canada, ARET) and the 33/50 program in the United States of America (Harrison 1998). The "talking with the donkey" metaphor is particularly apt not only because it allows researchers to align degrees of coerciveness with how easy it would be to converse with difficult targets, but also because it facilitates the compartmentalization of specific targeting strategies depending on how hard it is to implement. Harrison's skepticism of voluntary programs is not unwarranted. Further work with Werner Antweiler using econometric techniques uncovered an unpleasant truth for those who uncritically praised voluntary programmes for environmental protection: these programmes work best when there is a threat of regulation (Antweiler and Harrison 2003, 2007).

Why do we keep calling them "New Environmental Policy Instruments"? This is an interesting question that also drives my research. In the 1990s, voluntary programs were extraordinarily popular and therefore, they were considered "new". Regulatory approaches (command-and-control) were considered no longer efficient in terms of goal-achievement and investment. They were also criticized for being too narrow, non-flexible. The goal with suasive instruments was to ensure that flexibility was given to polluters so that they could better design their own strategies for pollution abatement. Given more information, the assumption was that industries would choose to self-regulate and go beyond traditional standards as they were set up. This reliance on non-regulatory approaches made them popular at the time. Even in 2003, they were still considered "NEPIs".

Policy instruments aimed at governing drinking water, wastewater and solid waste.

Water and waste are two of the most important environmental policy areas where the theory of policy instruments have made great strides. Drinking water protection and the regulation of pollutant emissions in effluents are two components of the same equation and in this paper, I discuss both. Although most scholarship focuses on instruments to regulate point-source pollution because of the diffuse nature of non-point sources, regulating drinking water brings along different and interesting challenges for environmental policy theories. In this paper I provide a very brief overview, given how extensive the field of water economics and governance

is[1]. I focus primarily on pollution reduction policy instruments, though a vast majority of the literature I reviewed has examined water allocation strategies, particularly in agricultural contexts.

Payments for watershed services are another type of water policy instrument that, while reliant on appropriators' interests, are still part of the toolkit of governments to protect specific watersheds.

Water markets are considered economic instruments that can be implemented to achieve various policy goals, including robust and equitable water allocation, reduction in emissions, but also can be used to regulate and control access to water bodies and distributional issues.

Environmental policy instruments for drinking water governance

On the issues that water governance presents, one could use a broad range of environmental policy instruments, or combinations thereof. First, we could regulate pollution emitted by industries into rivers, lakes, aquifers, and other types of water bodies. We could establish emission standards which are traditionally regulatory in nature because once emission levels reach a certain point, regulators can impose fines and sanctions, from monetary to temporary or definite plant closure.

Water policy instruments can be divided by type of medium where they act and the type of water that is being processed (drinking water, wastewater). We can distinguish different types of water by geographical location as well (rural/urban/periurban). Finally, we may distinguish a broad range of instruments by dividing them into the traditional "conversation with a donkey" typology (Harrison 1998; Vedung 1998) from very regulatory (emission standards, drinking water standards) to very voluntary/suasive (information campaigns on water bills), to economic (market incentives to reduce consumption, water markets, tradable pollution permits)

Environmental policy instruments for garbage governance

Governing waste entails a broad range of policy strategies, from incentives to reduce generation of municipal refuse, regulating who can engage in the collection, transportation and final delivery of discards, and establishing strict emission control standards and quotas for final treatment and disposal. These instruments could be considered traditional, though more modern versions include Extended Producer Responsibility (EPR) and other forms of corporate social responsibility (CSR) approaches.

[1] An extensive overview of cases in economic instruments was developed by the OECD https://www.un.org/waterforlifedecade/pdf/cases_table_by_tool.pdf

Policy instruments for drinking water protection, wastewater treatment and solid waste management: Vignettes from the Mexican case

Have we changed much in our thinking about how to govern water and waste? I chose the Mexican case because in the early 2000s, Mexican environmental policy was touted as being extremely progressive and aggressive towards the implementation of innovative policy strategies for pollution reduction and control. One of the first countries to innovate with the concept of environmental audits, Mexico developed their own country standards well beyond what the International Standards Organization (ISO) 14000 standard for environmental systems auditing established. One would have expected that, despite an incipient rule of law and emerging democratic regime, a progressive environmental policy would continue to grow and continue to implement innovative approaches. This hasn't been the case, and while in the case of Mexico it has been more the result of systematic dismantling on the part of the Federal government, it is important to remember that the shift in focus towards climate policy instruments has left other important areas of environmental policy unattended.

What can be gleaned from a systematic review of the environmental regulation/policy instruments literature of the past 25 years? My main concerns are three. First, poor compliance with environmental regulation may be triggered by a systematic (and very recent) trend of policy dismantling (Jordan, Bauer, and Green-Pedersen 2013; O'Neill, Kapoor, and McLaren 2019). The US Environmental Protection Agency's enforcement capabilities and standard-setting role have been systematically eroded by the Trump administration (Pulido et al. 2019). The allegedly-leftist Mexican President, Andres Manuel Lopez Obrador, has imparted draconian cuts on environmental agencies across the board, leaving the country to defend for itself on issues such as deforestation and water quality monitoring. This dismantling of policy capacity is concerning and from what I can perceive, growing in several countries, or at the very least in the US and Mexico.

My second concern is that in 25 years, we seem to have developed variants of environmental policy instruments that remain to this day more-or-less the same that we designed ages ago. We seem to have evolved very little in the realm of environmental regulation, and self-regulation/meta-regulation/smart regulation approaches don't appear to have yielded much in the sense of

Conclusion: taking stock of where we are in the environmental policy instruments for pollution control and reduction field.

One of the conceptual challenges that the field of environmental policy and more importantly, the policy instruments sub-field, brings along is the increasing interest in networked forms of governing. The emergence of "governance" as a mainstream concept, as first pushed by R.A.W. Rhodes, but popularized by many other scholars, has meant that we have needed to

become much more flexible and adaptive in the way in which we define policy instruments, their inner workings, their parameters and scope of operation, and their implementation strategies. These networked strategies have given rise to mixed modes of regulation where the regulating entity is often involved to a lesser extent than other actors. This approach also has brought along an increasing interest in "governance" and much less on the "governing" component of creating and operating policy (Andrew Jordan et al. 2005).

Are environmental policy instruments, particularly those touted as "new", good or bad for innovation? We should exercise caution when we argue that environmental regulation has a potentially deleterious effect on innovation. A meta-review of studies in four areas (theoretical models on incentives for innovation, econometric studies based on observed data, survey analyses based on stated information and technology case studies) finds that over-generalizing about the innovativeness or lack thereof of environmental policy instruments is risky because some of these instruments may be appropriate for specific types of technological innovation depending on the type (incremental vs rapid), the industry under study and the conditions under which these instruments are applied (Kemp and Pontoglio 2011).

Why do we still use regulation, up to this day? Why didn't voluntary and suasive policy instruments take off as we expected to do in the mid-1990s? In this paper I have outlined several hypotheses that I believe could give us more insight into this issue. First, non-regulatory approaches became popular because of a widespread belief that stiff regulation would hinder innovation and foster disinvestment in environmental technologies. This has not been conclusively proven so far, as Kemp and Pontoglio indicate. I argue then that the alternative (using less regulatory approaches) is attractive to policy makers because their ability to cope with the burden of compliance and regulatory enforcement is less than the cost of implementing innovative tools that still would require involvement on the part of the agency. Second, there is a systematic attack on environmental policy capacity. Because of this, developing innovative environmental policy instruments has been slow. Third, climate politics and policy instruments to govern mitigation (and in an emergent manner, adaptation) has taken over other areas of research and policy development. There is less interest in experimenting with policy instruments for water and waste than there is for climate adaptation and mitigation.

My general (and emerging) conclusion is aligned with Antweiler and Harrison's earlier work and with Michael Howlett's and other scholars' recent work on policy mixes. I believe that the best approach to reducing pollution in water and waste policies is to adopt policy mixes that can be adapted to take advantage of the threat of regulatory action but encouraging polluters to be more innovative.

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