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The Rise of Data-Driven Governance

DAVID CHANDLER

The world appears to be overflowing with data, thanks to rapid developments in technology over the past ten to fifteen years. It is increasingly argued that data-driven knowledge is capable of changing the ways in which we understand the world as well as the ways in which the world can be governed. This essay is not about the governance of data—concerns over privacy, data protection and management, and so forth—but about how new forms of data collection and analysis are being touted as a means of doing governance differently.

Ways of Governing

Fourth in a series

Advocates of data-driven governance assert that we are in the midst of a knowledge revolution, promising to displace traditional or "top-down" focuses on causal analysis and theory. Data-driven governance is not so much about knowing more, they say; it is a way of responding to problems more efficiently and effectively. The availability of vast amounts of digitally generated data, also known as big data, and the development of computational algorithms to analyze it, enables new ways of empowering communities to address problems at the source.

In international governance, data-led approaches are said to have the potential to build self-governing societal capacities for resilience and adaptation. Through real-time reflexive awareness, advocates claim, risks and problems can be managed as soon as they arise. In the international arena, this can be seen particularly in ambitions for the prevention of—and speedy responses to—disaster, conflict, and health and environmental problems.

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In 2009, the United Nations renamed Natural Disaster Day (October 12) as Disaster Day—to make the point that disasters do not just happen naturally but are the result of how communities and individuals respond to the early signs of external crises. Rapid responses can mitigate the impact of disasters or even prevent them entirely. Data-driven governance, supporters say, has the ability to see problems or crises as they emerge, rather than merely reacting after an event is over and the damage is done. It is closely linked to new approaches to resilience, adaptation, and vulnerability. For example, the UN Sustainable Development Goals report for 2019 highlights the importance of data collection and dissemination.

The prospect of data-intensive knowledge production informing decision-making in such areas has been welcomed in the world of international policymaking. High-level collaborative initiatives include Global Pulse, established by the UN secretary-general to research and coordinate the use of big data for development; the World Bank's Open Data for Resilience program, which seeks to monitor the emergence of natural hazards and the impacts of climate change in real time; and initiatives on big data and community resilience funded by the Rockefeller Foundation. These are just a few examples of the growing importance and rapid development of data-driven governance, especially in the fields of disaster risk reduction, peacebuilding, and resilience.

As data-driven governance has become increasingly central to policy thinking, critics have raised concerns regarding privacy and data ownership. They also argue that focusing on the effects of problems like climate change rather than tackling long-term causes tends to lower political horizons. And the burden of adaptation is often placed on

marginal or vulnerable communities and individuals who are already coping on the edge of crisis.

SELF-GOVERNING COMMUNITIES

Failures of centralized and bureaucratized forms of international intervention to address questions of peace, conflict, rights, and development have led to the promotion of data-driven approaches as an effective and ethical substitute for traditional forms of global governance, which are seen as too slow, too unwieldy, and too reductionist to adequately engage with the complex reality of the world. Data-driven governance has emerged as a tool for problem-solving through community empowerment and capacity-building. The idea is that harnessing data can allow local communities and civil societies to generate their own knowledge of themselves and to act on it accordingly.

The context-specific nature of self-generated data can enable local communities to be proactive in their own governance—for example, in the ability to measure energy consumption down to the level of individuals and households, or in local tracking of environmental data such as pollution, river levels, and land use changes. This kind of data is seen as the key to empowering people in new ways and at the most local levels.

In fields such as disaster risk reduction and disaster management, the shift is already clear. Data potentially can empower precisely those who are most marginal and vulnerable at their moments of highest risk. Open information flows contribute to the building of resilience by making communities aware of the risks and hazards they may encounter so that they can mobilize to protect themselves. Disasters, conflicts, and other problems are being reinterpreted as problems of data access and of knowledge or communication breakdowns within communities. Policymakers argue that at-risk communities need data just as much as they need water, food and medicine, or shelter.

Proponents of this approach increasingly argue that data should not be used by communities merely in response to disasters but could play a more preventive or mitigating role. In their view, data-driven governance enables adaptive capacity. Data can now be context-dependent, reflecting local knowledge and generated in real time; it can be used "in the now" rather than just for analyzing a disaster after the event. Thus the generation and use of data are increasingly combined. International agencies are promoting the use of crowdsourced data for preventing disasters.

In these visions, data collection becomes a technique of governing through the inculcation of self-knowledge. Data-driven governance aspires to remove the need for governing on the basis of abstract or "top-down" rules and laws; it seeks to displace them with real-time feedback mechanisms based on new forms of data-rich awareness. Advocates believe data-driven governance holds the potential to transform reality by providing communities with self-knowledge.

JAKARTA EXPERIMENTS

Indonesia offers one example of how data-driven governance seeks to redistribute governing responsibility down to the community level. The Indonesian state has prioritized disaster risk reduction since the 2004 Indian Ocean tsunami, which killed more than 100,000 people in the city of Banda Aceh on the northern tip of Sumatra.

The capital, Jakarta, has been at the center of climate change and disaster risk concerns. The ever-expanding megacity is rapidly approaching ecological catastrophe. The problem of securing the city against rising water levels (the combined threat from rainfall, river turbulence, and rising sea levels) has exposed the limits of structural engineering projects, creating an opening for new ideas that no longer rely on traditional approaches to flood prevention. Instead, advocates of data-driven governance seek to rethink ways of living with security threats and use new technologies to engage with and transform citizen awareness.

The Jakarta Open Street Map project organizes volunteers to create a free and open map for community development and disaster response. Its leaders see mapping as an ongoing process shared by citizens. In this way, rather than being the province of "armchair" mappers from outside the community who rely on drone cameras, mapping becomes a local project. The information mapped has special value in the specific context in which it is generated. Local people can identify objects, sites, and related facts that could be important in disaster situations (such as opening times or access points) in a fine-grained perspective that would be impossible for outsiders to match. The categories used to describe or to classify sites and objects are not always readily transferable—for example, the use of street classifications in Western Europe would be of little use to a street mapper in many parts of Africa or Asia. Mapping is no longer a one-off project but an ongoing process; maps have to be continually updated to include changes in site use and availability.

One emerging strand of data-driven governance seeks to magnify or intensify this participatory mapping approach. A leading example of this new methodology, also in Indonesia, is PetaJakarta, an international research project that aims to use social media for real-time mapping of flooding in Jakarta. This collaboration among the University of Wollongong in Australia, the Jakarta Emergency Management Agency, and Twitter aims to facilitate what it calls "geo-social forms of collective intelligence."

From the data governance perspective, the population of a major city is a resource in need of mobilization. Residents are already extensively networked through social media—they could generate more useful data themselves. Geospatial tagging of the precise time and location of their posts enables others to check and compare information from multiple sources and makes verification much easier. Social media can be reconfigured with humanitarian apps to activate these elements.

Different problems can be used to construct engaged and active communities able to play a role in addressing those issues as a form of "civic co-management," as the PetaJakarta coordinator said in an interview. The development of civic communication technologies could amplify the collective networked social intelligence of the city. Such technologies are being bankrolled and tested for responding to disasters and emergencies, but some hope that this could be the beginning of new forms of geo-social networked systems that would make possible much more participatory and democratic forms of real-time governance.

These are seen as citizen-led data initiatives, in which local knowledge and ownership is vital for the development of civic apps that help people deal with problems from flooding to crime hotspots. Such data-driven governance approaches are hailed as self-transformative initiatives, generating not just information to be used by others but a different form of politics—"to enable people to think differently and thus to feel differently," in the words of the PetaJakarta coordinator.

Seeing differently is also the objective of the UN-sponsored Pulse Lab Jakarta, which emphasizes the importance of "thick data"—that is, using fine-grained ethnographic research and crowdsourcing to supplement digitally generated data.

One of the Pulse Lab's many projects is a collaboration with the World Food Program to study the impact of climate change on food poverty. This project relies on recruited (paid) volunteers who use an app to record a range of market data, taking photos of various items and noting their quality and prices. Their observations are geo-located and time-stamped to build up a detailed and real-time picture of market fluctuations.

This actively generated market price data is then matched against other data streams, such as household resilience surveys and local weather patterns, to map the effects of climate change on community sustainability. The project is focused on locating outlier communities: those that seem to do either better or worse than the average. The main purpose is not so much to provide a complete picture as to find communities that are in trouble and require intervention by the World Food Program.

A second goal is to initiate research projects to learn from the resilience capacities of communities that do better than average. These communities are often described as demonstrating "positive deviance," and perhaps hold the keys to locally generated solutions or workarounds that can enable others to survive in crisis situations.

The UN Global Pulse (which runs similar projects around the world) and the World Food Program seek to use new data technologies not to generate universal forms of knowledge or develop large-scale interventions, but rather to build up local capacities and solutions. Long gone is the idea that international development organizations already possess exclusive know-how or technological solutions that can be generalized and exported through training or project grants. If solutions to problems of climate change adaptation and poverty do emerge, they will be context-specific and generated by communities themselves. This is how data-driven governance seeks to mobilize the power of the geo-socially networked citizen: by harnessing the immanent capacities of social networks to enhance awareness of pressing problems in new ways.

Yet many social, economic, and ecological questions still are ignored or are not posed at all. A good example in Jakarta is the city's relationship to its river system, which often floods in the mon-

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soon season. The city is currently undertaking a massive project of "normalization," tearing down informal settlements on the riverbanks and concreting the walls of the rivers; in some areas, the rivers are being completely covered with concrete. Many well-off citizens view this "beautification" as a good thing and are in favor of pushing the rivers underground and out of sight.

As one data governance activist said to me, "They are turning their backs on the reality of the city. The river is an ugly monster that no one wants around." From this perspective, the preference for covering up the problem prevents rethinking the city's handling of its rivers. It is also seen as counterproductive: increasing the rigidity of a river system that is constantly in flux only stores up more problems for the future.

As one member of the PetaJakarta team told me: "Understanding the river as a line is the first problem. It doesn't move in one constant direction or with a constant thickness." The application of traditional technical approaches to solve the problem of the river system makes the problem worse: sporadic concretization renders rivers even more turbulent, since "the river cannot be forced into a box." Twitter feedback from project participants who geo-locate sporadic flooding helps in the process of remapping the city, making it more dynamic: "This enables thinking differently. The river is not a line but a body ever-present across the city."

The PetaJakarta project assumes that the conditions for radical change are already in place. There is a networked citizenship on social media, and the technology for geospatial mapping is available (the project sends out automated responses with a video telling people how to record their location using the Global Positioning System). The project seeks to reconfigure this already existing geo-social technological infrastructure, and to activate civic elements.

What could perhaps be understood as the extension of emergency aid or disaster risk reduction to the politics of everyday life can also be seen as creating an empowering network capable of amplifying the power of self-organizing community intelligence. The vision involves transforming existing capacities to remap problems and issues. This could include reconfiguring apps developed as open source software to make them capable of serving as tools for mobilizing and re-envisioning community relations in experimental directions.

MAPPING RISK IN RWANDA

Another example of the shift toward data-driven governance is the Rwandan government's launch of its National Risk Atlas in 2015. This was widely billed as the first-ever comprehensive risk tool created in Africa. In collaboration with the UN Development Program (UNDP), the World Bank, and the European Union, the atlas was developed to provide guidance on disaster risk for national planning and policymaking. Again the "mapping" motif recurs, with the emphasis on seeing and responding to problems as they emerge.

In the risk analysts' language, bringing data governance into the mainstream of development planning would ensure that "evidence-based" and "risk-informed" policymaking shapes governing strategy. A UNDP official argued that responsiveness to data had to be kept at the forefront: "We will never successfully eradicate poverty or achieve sustainable development so long as we continue to marginalize disaster risk reduction."

Data is seen as the key to empowerment in new ways and at the most local levels.

Here, the goals that would have been instrumentalized and used to shape governance in the past—ending poverty and furthering development—become secondary by-products of a focus on gathering real-time data. The top priority is enabling adaptation to problems and crises that cannot be fully predicted. Data-driven governance assumes the need for constant adaptation to change. Risk profiling and mapping measures, often using new technologies, have thus become crucial to agendas shaped by data-driven governance.

Rwanda's National Risk Atlas makes for interesting reading, particularly the methodologies and assumptions deployed for this project by leading international institutions. The project maps five main hazards that Rwanda faces: droughts, floods, landslides, earthquakes, and windstorms. This approach follows the recommendations of the 2005 Hyogo Framework for Action, adopted at a UN conference in Japan, to bring disaster risk assessment into the mainstream of governments' policy-making practices. The Risk Atlas seeks to "identify and prioritize hazard-prone areas during planning and programming for development activities in various sectors, such as transport, health, and

education . . . as well as in urban and rural land-use planning and in the development of building codes."

The policy encourages government planners to work with constant data streams, taking into account the nature and risk of numerous emergent hazards as well as the exposure and vulnerabilities of the population and national infrastructure, facilities, and resources. The aim is to build awareness of changing risks, not through a static set of measures, but via an ongoing process of adaptation.

Increasingly, data-driven governance seems to be displacing other frameworks for managing or legitimizing urban planning and governance. Data is what drives innovation and new accounting technologies; governments themselves are no longer seen as initiators of projects of change and transformation. The integration of data is central to a new discourse of internationally managed programs of good governance focused on resilience: efficient and non-disruptive adaptation to changing relationships, flows, and interactions.

Yet bringing data into discourses of governance seems only to intensify the levels of international regulative intervention and control. If data-driven governance does in fact open up possibilities for new ways of thinking, it would appear that they tend to be oriented toward international concerns about maintaining and strengthening the system that currently exists. This is a potentially conservative aspect of data-driven governance.

THE LIMITS OF EMPOWERMENT

Data-driven governance is not intended just to understand and predict disasters or prevent them from occurring. It is also meant to help communities cope with and mitigate the effects of disasters by gaining a better understanding of themselves. The process of turning self-generated data into knowledge that replaces externally orientated or expert knowledge is supposed to enable communities to better measure their own resilience.

For advocates of data-driven governance, this approach to community self-empowerment is a bit like that of the Quantified Self movement, which encourages people to improve their health by using fitness-tracking devices and apps—but applied on the larger scale of cities and societies. If, through data collection and sharing, we can detect and manage our own biorhythms and know the effects of poor diet or lack of exercise, we can monitor our own health and perhaps avoid the need for costly medical interventions. Equally, if vulner-

able and marginal communities could "datafy" their relationships with their environments, they would be able to augment their coping capacities and resilience, mitigating the impact of potential disasters or crises. Just as with Quantified Self, the hope is that data-driven programs can enable better self-help by providing more instantaneous and detailed feedback than ever before. This feedback will become the basis for governance, understood in terms of managing social, community, and individual adaptation and change.

Data-driven governance aims not so much for instrumental or causal knowledge but for revealing feedback effects (for example, the effects of changing land use or working practices), which enable systems to be better and more reflexively managed. Disaster risk reduction thus becomes a way of making communities more self-aware, so that the unintended consequences of social interaction do not undermine coping capacities.

This process of self-monitoring to improve self-awareness is the essence of some of the UN's data governance projects, such as the previously mentioned famine prevention program that gathers data to provide real-time awareness of food price changes. Data-driven governance typically operates on the basis of this kind of "everyday" data, analyzing it to reveal fine-grained differences and distinctions, rather than engaging in large-scale, national-level statistical analysis. Such approaches often make use of social media to analyze real-time social interaction, as with the use of Twitter feeds in response to flooding in Jakarta.

Thus, data-driven governance is more about responding to problems than solving them in top-down ways. The data generated by communities on social media does not necessarily help explain global warming, but it can enable individuals and households to measure their own energy consumption through the datafication of household objects and complex production and supply chains. Data-driven governance thereby works on the basis of "datafying"—recording or illuminating through data—individuals' or communities' relations to their environments. This also provides them with better knowledge of themselves, by revealing feedback effects that might otherwise go unseen.

The hope is that the producers and consumers of knowledge and governance will become indistinguishable—that both knowing and governing will happen without external mediation, constituting a harmonious and self-adapting system,

often called "community resilience." In this framing, increasingly articulated by governments and policymakers, knowledge of causal connections is no longer so important; communities will adapt to the real-time appearances of the world without necessarily understanding them. Being connected is what counts, as new digital technologies, such as mobile phones, allow individuals to organize themselves in order to adapt to or recover from disasters or other threats. The idea is that awareness of data will lead to behavioral change.

Now that the use of technology to reveal feedback effects, and enable responses to them, has become central to ideas of resilience in data-driven governance, approaches drawing on big data and the Internet of Things promise local communities a previously unimaginable level of responsiveness and sensitivity to environmental changes. Boosters in international development agencies and corporations say these approaches will provide the necessary information to transform crisis-prone areas and occupations, especially those dependent on climate variations.

A prevalent example involves small-scale agricultural production. Start-up companies supported by international development agencies argue that rather than being forced into environmentally destructive industrial mono-cropping, farmers can make small-plot alternatives economically viable if they sign up for "cloud-based" management systems and large-scale data collection via sensor-based monitoring tools. This will allow them to track and minimize the use of chemicals and other costly resources, as well as rapidly respond to drought, pests, and disease—detecting problems even down to the level of specific trees and plots. Just as with Google and Amazon, sensitivity to feedback increases the more data is shared and used.

Countless agritech start-ups have adopted the new governance mantras of using data to cope with adversity and crisis. A typical sales pitch calls for the use of cloud storage (to store raw and processed imagery), cloud computation (to process huge amounts of data and extract insights), and personally tailored applications. These businesses promise that their technological fixes will help farmers grow healthier crops and enjoy a better livelihood despite a harsh environment.

WHOSE PROBLEMS?

Data-driven governance is a method or approach that increasingly emphasizes concepts of adaptation, resilience, and vulnerability. For some advocates, a focus on community resilience is a logical response to the failures of previous large-scale programs of development and disaster prevention, which are now considered too unwieldy, unsuitable for different contexts and communities, or lacking in local engagement. For other supporters, data-driven governance makes sense on its own terms—they see it as a spin-off benefit of new technologies, particularly sensors and the digital traces left by mobile phones.

Critics often view data-driven governance as a step backward from more ambitious programs of development. The focus on community self-government and self-empowerment can also be seen as a way of making already marginal or vulnerable communities responsible for their own problems.

Data may enable new forms of governing at the edge of crisis, as with flood awareness in Jakarta and disaster risk in Rwanda. But it could be argued that this approach merely maintains local communities in situations of stress, while alternative forms of development or more transformative (and expensive) ways of addressing problems are delayed or evaded.

There is little doubt that data-driven governance provides important insights into differences among communities and the importance of local context. However, issues such as development and disaster risk are increasingly linked to climate change and instability. Although problems may appear to be localized in their effects, attention to causes should not be neglected. There is a need for adaptation and change in the world's better-off and least-affected communities, not only in those prone to constant crisis.   ■