GOVERNING THE ENVIRONMENT-RELATED DATA SPACE

Jörn Fritzenkötter, Laura Hohoff, Paola Pierri, Stefaan G. Verhulst, Andrew Young , and Anthony Zacharzewski

GOVLAB

democratic society

Photo by Sergey Lapunin on Unsplash

his publication was funded by the European Union, as part of an EU Partnership Instrument project “Environmental Diplomacy in G7 and G20” (PI/2018/397-610). Its contents are the sole responsibility of the Democratic Society and The Govlab and do not necessarily reflect the views of the European Union.

GOVERNING THE ENVIRONMENT-RELATED DATA SPACE

Jörn Fritzenkötter*, Laura Hohoff*, Paola Pierri*, Stefaan G. Verhulst**, Andrew Young** and Anthony Zacharzewski*

* With the Democratic Society
* * With The Govlab

I. EXECUTIVE SUMMARY

If we are to take action on climate change, support environmental justice and deliver a just transition for more resilient societies we urgently need to provide access, connect and (re)use environment related data (ERD). Several different projects are attempting to improve access, connection and use of data, but lack a clear common governance. The right governance system can simplify connections, open up processes to wider voices, and unlock barriers to accessing and re-using ERD.

THE OPPORTUNITY — ENVIRONMENT-RELATED DATA COLLABORATION

Society is in a time of datafication. A broad diversity of data points with environmental relevance are being generated globally. These datasets are being collected by governments, businesses, civil society, researchers, and citizen scientists alike. Potentially useful data is generated through IoT sensors, satellite imagery, administrative knowledge management systems, and people's mobile phones, to name a few.

If used (and reused) effectively, this wealth of data could help society to establish a sustainable economy, take action against climate change, and support environmental justice. Investors can use the data to create verifiable green bonds, and better reflect environmental risk in their portfolio. Citizens can find better, more trusted information in making product or service choices, and will better be able to hold governments to account. There is a clear opportunity and urgent need to make useful ERD generated and stored across sectors more accessible to actors that can use it to make better decisions in less time, design better targeted policies, unlock sustainable economic growth, and create societal value.

The scope of ERD can be best understood by the DPSIR Framework (Driving Forces - Pressures - States - Impact - Responses).[1] "Environmentally-related data" can be defined as data related to any element of DPSIR.

[1] https://www.eea.europa.eu/help/glossary/eea-glossary/dpsir

So, for example, data on what driving forces exist for particular actions; their resulting pressures on environmental and socio-economic states, the impact on the environment of these states and the subsequent societal and systemic responses.

As can be seen from this, the scope of ERD is very wide, and access to this data will depend upon the buy-in of a great variety of actors who will need to agree upon the right modalities for collaboration. That's why we need to focus on governance.

We define governance as the range of political, institutional and administrative principles, rules, practices; and formal and informal processes through which and how decisions are taken and implemented. Governance also covers the ways in which decision-makers are held accountable in the development and management of resources and the delivery of services. Finally, governance also covers stakeholder interactions, how they articulate their interests and have their concerns considered.[2]

In the context of ERD, we look at how to design governance that can incentivize collaboration between diverse actors in a way that fosters trust, both among and beyond its members. When initiatives are supported by legitimate decision-making processes, the decisions taken are more likely to achieve the defined goals for improved access to ERD. Today's enclosure of data can not just be solved by top-down decision-making. The diversity, fragmentation and scale of the data makes this impossible. Instead, initiatives to support collaboration will have to be built on mutual trust, win-win value propositions and other incentives that can operate through the whole production, supply and use chain, and in every country around the globe.

While several attempts at creating ERD dataspaces are underway, no overarching governance structure exists. We present some of the initial learnings on governance from these initiatives in this report, and suggest ways to strengthen collaboration. A key message is that if ERD remains ungoverned, we risk running into problems, and limiting opportunities for data collaboration.

---

[2] Akhmouch, Aziza, and Delphine Clavreul. 2017. 'Towards Inclusive Water Governance: OECD Evidence and Key Principles of Stakeholder Engagement in the Water Sector'. In *Freshwater Governance for the 21st Century*, Karar E. (eds). Global Issues. Springer.

CHALLENGES — DATA ASYMMETRIES AND ENCLOSURE

Despite the increased amount of data generated, at present, data are widely dispersed, distributed across different actors, ranging from large multinationals and governments to individual producers and citizens. Data are mostly not accessible, reusable or machine-readable. Local, national and global data are mostly available only at highly aggregated levels. Potentially valuable data on the environmental impact of products and processes, for example, are often closed off.[3] Due to this lack of data findability and accessibility, decision-makers often rely on estimates rather than exact and up-to-date insights. Better and more accessible data would enable more targeted action and a better understanding of the environmental impact of products from the very earliest stages of production.

The risks and costs of the current "data enclosure", and related "data asymmetries" are significant.[4] Data asymmetries, where access is only available to a few, exist in almost all single digital services or applications by default. Currently designed, anyone running an application automatically has access to more data than its users. Data asymmetry, and the resulting imbalances of power and value, are most often raised in the context of personal data. Smart meters, for instance, provide an individual with a personal view of their energy consumption, whilst providing energy companies with an aggregated view of consumption patterns across all consumers. Having access to this kind of information is of significant value to a lot of actors.

Without data access, investments will continue to be misallocated due to a lack of information. Accountability for environmental damage or inaction can not be allocated and designated. Innovation will be impeded, both in climate action and in the financial incentives that could be created.

---

[3] Poisot, T., Bruneau, A,. Gonzalez, A., Gravel, D., Peres-Neto, P. Ecological Data Should Not Be So Hard to Find and Reuse, Trends in Ecology & Evolution, Volume 34, Issue 6, Pg. 494-496 (2019), https://doi.org/10.1016/j.tree.2019.04.005

[4] Blair, Gordon S., Peter Henrys, Amber Leeson, John Watkins, Emma Eastoe, Susan Jarvis, and Paul J. Young. "Data Science of the Natural Environment: A Research Roadmap." Frontiers. Frontiers, January 1, 1AD. https://www.frontiersin.org/articles/10.3389/fenvs.2019.00121/full.

Data asymmetries are hampering environmental understanding and scientific progress.[5] Even access to raw data does not equate to full transparency and may be gamed (e.g. deprioritization of certain environmental data collection and access efforts under the Trump administration). We need to find a solution that can give space for more systematic, sustainable and responsible data collaboration — giving data users and data holders sufficient trust and value to provide access to their data and unlock the potential of re-using data for public good purposes.

A well designed governance process will help us reach the following objectives:

1. Establishing legitimacy and trust through diverse, global participation and engagement;
2. Global interoperability of standards and processes;
3. Incentivizing data collaboration - aligning both the societal and business case for data access.
4. Meeting needs for oversight, enforcement, and dispute resolution;
5. Dynamic and agile evolution to technical progress and user needs.

One of the most important considerations going forward is that the infrastructure needed to process data and the algorithms needed to extract insights are currently held by a handful of private sector actors. While public institutions are increasingly deploying these technologies, their capacities and access to financial resources often lag behind private sector actors. In the absence of governance design, the rules will be set by default by the well-resourced organizations who control the technical infrastructure and current data markets. That kind of scenario is very unlikely to be optimal for attending public goals.

As a result, public-private-people partnerships to define the rules for data access will be needed at various points across the ecosystem to tackle global environmental problems and contribute to positive public outcomes.[6]

---

[5] Blair, Gordon S., Peter Henrys, Amber Leeson, John Watkins, Emma Eastoe, Susan Jarvis, and Paul J. Young. “Data Science of the Natural Environment: A Research Roadmap.” Frontiers. Frontiers, January 1, 1AD. https://www.frontiersin.org/articles/10.3389/fenvs.2019.00121/full.

[6] UNEP, The case for a Digital Ecosystem for the Environment, Discussion paper 2019. The case for a Digital Ecosystem for the Environment – UN-SPBF

In sum, to capitalize on the societal opportunity presented by the (re)use of environment-related data (ERD) we urgently need to design a governance approaches and mechanisms for matching the supply of ERD held across sectors with the demand for it among those working to improve environmental outcomes, in a systematic, sustainable, and responsible way.

THE PATH FORWARD — GOVERNING ERD COLLABORATION

Yet, a key reason why data is not being made more accessible or why the demand for ERD fails to be matched with the supply involves the lack of a governance framework that can provide trust in how data is being re-used.

Further, environmental data can be considered as a good that is both private and collective — and more valuable societally when shared. We need to think about how to govern its use with that in mind, balancing the rights of data owners with the rights of society as a whole and trying to strike the right balance between the different private and public interests.

A successful governance approach will support the collaborations and new partnerships necessary to access and mobilize necessary data and expertise. It will incentivize networked open-source data infrastructure that can be used, modified, adapted, and supported by all users, for example, including local communities. It will embed FAIR principles.

New collaborations and partnerships aimed at unlocking the societal value of ERD held across sectors will not be established spontaneously or through market forces alone. Corporate interests, misaligned incentives, commercial confidentiality, concerns of privacy and simple inertia are significant barriers to collaborating, to name just a few. As the commercial and taxation policy value of the data increases,[7] so does the pressure for white-washing - to conceal or even falsify information.

---

[7] "Conflicts of Interest and Undue Influence in Climate Action." Transparency International , 2021. https://images.transparencycdn.org/images/2021_ConflictsOfInterestClimateAction_PolicyBrief_EN.pdf

The need for collective action is increasingly accepted among policymakers and international actors, yet a lack of coordination between stakeholders and uncertainty on how to establish legitimate decision-making procedures hamper collaboration.

Today's "enclosure" of data cannot be solved by government fiat. The global spread, fragmentation and scale of the data makes this impossible. Instead, initiatives to support collaboration will have to be built on mutual trust, win-win value propositions and other incentives that can operate through the whole production, supply and use chain, and in every country around the globe.

Stakeholders need a combination of operational, technical and governance solutions to spur progress. We do not consider the operational and technical responses needed here, but focus on what governance arrangements can be put in place to unlock the value of ERD in a trusted manner. At the same time, we realise that any governance approach needs to be "fit-for-purpose" and closely aligned with the model of operation and technology used. Our focus goes beyond "data governance" but examines how to govern the partnerships and collaborations needed to unlock data for decision making.

Some partnerships are already underway, but they are operating on the basis of small groups, who trust each other but whose trust model cannot scale to the level needed to fill the gaps in data on the global scale.[8]

A solution needs to be found that can give space for more systematic, sustainable and responsible data collaboration — giving data users and data holders sufficient trust and value to provide access to their data and unlock the potential of re-using data for public good purposes.

[8] Aceves-Bueno, E., et al. 2015. Citizen science as an approach for overcoming insufficient monitoring and inadequate stakeholder buy-in in adaptive management: criteria and evidence. Ecosystems 18(3):493-506. http://dx.doi.org/10.1007/s10021-015-9842-4

THREE COMPONENTS OF A GOVERNANCE FRAMEWORK

Governance frameworks are best positioned for success when they have a clear organising purpose that can inform the development of principles, processes, and practices, the "3 Ps" of governance. A purpose-driven approach to governance can ensure that all data-related activities are pursued with a consideration of the broader technical, social, political and economic contexts within which data is produced and consumed. The purpose will influence every subsequent element of the collaborative's design and of its governance. As data becomes more accessible and the different types of data grow, the purpose at the centre of a data collaborative is key in matching data supply with demand to use pooled resources efficiently and to create greater public value.

Clarity of focus is an important enabler of efficient and effective governance. Stakeholders will need to agree on a clear and bounded purpose for their activities and prioritise data types, objectives, and strategies that are "mission critical".

1. PRINCIPLES

Principles are critical because they offer a "North Star" for a governance framework and ensure that all activities are aligned with certain commonly agreed criteria. They act as a guide for the framework and empower it to move beyond the existing legal and institutional policy compliance structures to achieve higher levels of responsibility and sustainability than the contextual systems may offer. Mastercard, for example, has publicly shared their data responsibility principles[9] which govern their external data interactions and collaborations. Organizing governance principles such as these can be valuable for informing actions for which there are not already established processes or processes.

In the context of cross-sector data collaboration and governance, two types of principles come into play: decision making principles and data handling principles. Determining decision making principles is the first step, as these will later determine the data handling principles. Decision making principles are concerned with the challenge at hand and the strategy of approaching it and addressing it. They will, as

[9] https://www.mastercard.us/en-us/vision/corp-responsibility/data-responsibility.html

the name suggests, inform the decisions each actor in the collaboration takes, which brings us to the data handling principles. Data handling principles encompass notions of responsible data practices, privacy and efficiency for example. They operate in alignment with the decision making principles and later with the associated processes and practices.

2. PROCESSES

Governance processes build on the basis established through core principles to enshrine systematic mechanisms for making and implementing decisions. These processes include defining and communicating the roles and responsibilities of different actors and stakeholders; establishing oversight, transparency, and accountability policies and mechanisms; clarifying decision flows across stakeholders; and creating procedures for dispute resolution.

A key priority for multistakeholder, cross-sector ERD governance will be establishing decision-making processes that enshrine independence and clarify how decision-makers are shielded from influence by large, well-resourced actors in the public or private sectors. This independence could be achieved through several means, such as lobby registers, ban lobbyist fundraising, and closing the revolving door.

2. PRACTICES

While principles establish a North Star for governance and processes set the policy and strategic direction, practices are the most tactical component of the governance framework. Practices include the actions, tools and technologies that operationalize governance and ensure that principles are upheld and processes are undertaken in reality.

In the governance of large-scale cross-sector data collaboration, it may prove important to develop practices that streamline decision-making activities at each stage of the data lifecycle. Governing a multistakeholder ERD collaborative (ERD collaborative) effectively and legitimately will be a complex undertaking and necessitate investment of time and resources by contributors across sectors. Governance practices that seek to lower transaction costs and increase the agility of decision-making will benefit, and incentivize the continued engagement of, data suppliers, demand-side actors, and intermediaries alike.

Useful practices could include, for instance, developing templates and model language for data sharing contracts and agreements; clarifying and communicating "decision provenance" — or which stakeholder is responsible and accountable for different decisions across the data life cycle; or practices for attaching tags or "nutritional labels" to datasets with important information on their genesis, quality, and sensitivity.

FOUR GOVERNANCE PATHWAYS FOR ERD

There is no one-size-fits-all approach to data collaboration or its governance. Principles, Processes, and Practices can be designed and implemented in a near limitless range of combinations, as to be "fit for purpose". As global experimentation with new forms of data collaboration continues to expand and accelerate, several parties have developed taxonomies or mappings of the operational and governance models guiding such work.[10]

There is a critical window of opportunity over the next year to create a suitable governance framework for ERD that can be shaped to work for emerging regulatory and taxation frameworks. Outside this window, single-purpose or regional specific, inconsistent governance frameworks will emerge and lock-in incompatibilities. A governance arrangement that can win support in the G7 can create a positive synergy that brings others on board to an interoperable system.[11] The rapid growth of ERD means that some of these systems are being put in place now.[12] It is not too late to work towards a global regulatory approach, but concrete steps need to be taken in the next 12-18 months if one is to be in place early, rather than painfully created later on.

---

[10] https://sage-bionetworks.github.io/governanceGreenPaper/

[11] See https://www.swp-berlin.org/en/publication/advancing-european-internal-and-external-digital-sovereignty

[12] Blair GS, Henrys P, Leeson A, Watkins J, Eastoe E, Jarvis S and Young PJ (2019) Data Science of the Natural Environment: A Research Roadmap. Front. Environ. Sci. 7:121. doi: 10.3389/fenvs.2019.00121

Rallying actors around the goals of a greater ERD collaboration cannot be a tick-box exercise. We see four plausible options for a governance model that could be established in the short term:

Data Governance Components by Stefaan Verhulst and Andrew Young

1. LAISSEZ-FAIRE: NO ACTION. SELF-ORGANIZATION OF THE DATA SPACE.

The Status-Quo is one of Non-Governance, and in this scenario, nobody takes specific action to change this. Non-Governance is a provocative way of describing a shared data space without a centralized unit for oversight and coordination at operational level. The state and its public regulatory authorities have not disappeared in this scenario. Yet, they do not coordinate globally, and anyway leave data providers free hand to share data under pre-agreed terms that individual entities decide upon via bilateral agreements. Strategic decision making and lower-level governance rule-setting and procedures are done by individual data providers in negotiation with data users. States can still create incentives for data providers to share data, and they still define overarching principles and strategies as happened with the EU's Data

Governance Act[13], the OECD Recommendation on Enhancing Access to and Sharing of Data (EASD).[14]

The option holds the — potentially false — promise of an agility and efficiency advantage. A body charged with governance should avoid trying to act as a central clearing house for data, which would make innovation harder and reduce the willingness. It should not seek directly to control the transfer of data, but set and maintain standards that support common approaches but allow for rapid innovation. This role can be seen to be divergent from the driving interests of many of the stakeholders who would try to shape governance. Any governance organisation or network will also need to be flexible and agile enough to respond to the needs of a fast-changing environment.

The governance arrangements for ERD collaboration need a focused effort to design. They will not emerge on their own. Without a collective approach to the design and operation of ERD governance, trust in the data space will be low, leading to multiple negative consequences, including more limited use and reuse of ERD to advance a sustainable economy.

2. EMERGING LEAD: EXISTING ORGANIZATION WITH RELEVANT INTERESTS IN THE AREA EXPANDS ITS MANDATE, AND USES ITS CURRENT GOVERNANCE STRUCTURES

Currently, significant efforts by organizations are underway to create sectoral data spaces to share ERD. It is conceivable that a single entity with the right internal capacity, resources and outreach and convening power federates these organizations under the umbrella of its internal governance structure. Strategic decision making and lower-level governance rule-setting and process rules would then be undertaken by a governance committee or others in negotiation with data users.

Such an approach would be similar to efforts underway by the International Sustainability Standards Board (ISSB), created to develop sustainability disclosure standards and meet climate-related information needs of investors. This new body has the stated intention of expanding its work to cover information across Environment, Social, Governance criteria (ESG). While that does not cover the full

[13] See https://digital-strategy.ec.europa.eu/en/policies/data-governance-act
[14] See https://legalinstruments.oecd.org/en/instruments/OECD-LEGAL-0463

range of governance in the ER data space that we are considering here, it will be a significant body.

3. NEW TRADITIONAL ORGANIZATION: CREATION OF A GOVERNING INSTITUTION DE NOVO

This option differs from option two as partners create an entirely new structure and build governance principles and structures from scratch. Who does strategic decision making and lower-level governance rule-setting and sets process rules is agreed upon by its founding members with a narrow stakeholder involvement and possibly broader stakeholder consultation.

The creation of the United Nations' Green Climate Fund (GCF) provides some useful lessons as it is one of the latest creations of an entirely new Multi-Stakeholder Initiative that is comparable in the size that we ultimately need to reach for the ERD collaborative. The GCF holds three key lessons: First, its structure includes an influential Board with strong representation and an equal voice from recipients and contributors. An influential board meant that the GCF was able to be represented in various fora, gaining access to crucial information and gaining interest and support by a wide variety of actors. The GCF has developed, in a relatively short period since its creation, a set of more than 50 policies, frameworks and procedures based on global best practices. These policies were part of the operationalization process of the GCF during the creation phase. This suite of policies has the potential to contribute to a paradigm shift in the global context of climate change policies. This has mainly been achieved thanks to the early engagement of representatives from the Global South in the fund's creation, from the funding process to the beginnings of the technical working group that worked on its creation.

Second, an internal evaluation suggested that a devolved decision-making process may be more suitable for meeting the GCF's objectives while also enhancing its reputation. This is due to the GCF's expanded work volume and the urgency required for action.

Third, a decentralized model needs to streamline standardized processes through capacity-building. The GCF's overall structure includes a Board, a Secretariat and independent units. Its business model includes 84 Accredited Entities (AE) and National Designated Authorities (NDAs) in more than 140 countries. although the

current structure for implementing the priorities of the GCF relies heavily on AEs and NDAs, the structures and capacities of these AEs and NDAs vary significantly across countries. Therefore, imbalance in representation can stem from different sources, including a lack of financial means and a lack of capacity. A successful governance structure needs to find remedies for both.

We find further learnings on factors necessary from three other Multi-Stakeholder Initiatives (MSI) — the Extractive Industries Initiative (EITI), the African Peer Review Mechanism (APRM), and the Open Government Partnership (OGP) — which can be summarised as follows:

- Political commitment: sustained political engagement is necessary to open up institutional capacity to take on new tasks and responsibilities with the aim of filling the MSI with meaning;
- All members submit to peer review for monitoring and evaluation, possibly including a blend of sanctioning mechanisms and incentives for dealing with non-compliant actors;
- Institutionalized civil society and citizen participation, with openly available and accessible information for the public, incl. the Media, as well as targeted trainings to support these actors in their engagement with the MSI;
- Clarity on the use of stakeholder inputs in order to ensure that responsibilities and expectations are clear and to secure actors' support and buy-in in the long-term;
- Appropriate funding and resourcing sustain the process and cover logistical needs and dedicated staff;

4. NEW COLLABORATIVE: NEW STRUCTURE BASED ON PARTICIPATORY GOVERNANCE TAILORED TO CONTEXT AND DECISION-MAKING NEEDS.

We argue that the most promising model would see partners create an entirely new structure and build governance principles and structures from scratch. It differs from option three in its broader stakeholder engagement -participation in strategic decision making and lower-level governance rule-setting and process rules setting is agreed upon by founding members with a broad and significant stakeholder involvement. Significantly, this means that stakeholders collaborate closely and co-decide.

As demonstrated in the work of Nobel prize-winner Elinor Ostrom (among others), a non-excludable and non-rivalrous asset like data can be governed through models that go beyond private ownership and management. This understanding of data as a commons rather than an owned commodity can help to clarify more appropriate incentives for engagement and models for collaboration.

A governance strategy should seek to avoid the "Tragedy of the Commons" in the use of ERD. Commons resources can be subject to free-riding by certain parties who do not invest in maintenance, improvement, and innovation. In the face of wide use of assets they hold, data providers will need to be incentivized in order for the collaboration to achieve sustainability. A membership model that treats either the governance structures, or the data made accessible under them, as a "club good" could be a useful pathway forward.

Treating ERD as a club good need not limit the diversity and inclusion of stakeholders using or contributing data assets. A club good approach could see stakeholders enjoy equal rights and access, while also responsible for making contributions that support the functioning and viability of the commons resources in line with their capacity and manner of engagement. The levels and types of contribution can vary depending on the club member's size, financial resources, technical know-how, or other capacities.

Independent trustees could be empowered to oversee this governance framework, ensure equitable access to club goods, and respond to any disputes. Trustees could be diverse, with experts drawn from different regions and sectors relevant to ERD governance. Trustees could use innovative methods for engagement and deliberation to ensure they surface and act upon insight, perspectives, and evidence drawn from experts, impacted communities, and other stakeholders.

RECOMMENDED NEXT STEPS

In order to make progress in deriving societal value from ERD, there is an urgent need to begin prototyping a data collaborative governance structure for the space. To do so, we suggest the following approaches for crafting fit-for-purpose Principles, Processes, and Practices.

1. DEVELOPING PRINCIPLES THROUGH PARTICIPATORY PROCESSES

Based on lessons on what decision-making structures are needed to optimize outcomes for initiatives with wide shared interests for diverse stakeholders, as is the case for data sharing, it will be necessary to tap into both broad and targeted public input on guiding principles for ERD governance.

For this, we propose establishing a multi-pronged participatory engagement strategy with both open-calls for input as well as more targeted engagement with stakeholder communities. First, a broad call to participation can help to democratize the process of establishing guiding principles of ERD governance. This would be particularly important, as a global ERD structure would need to serve the specific needs of different stakeholder groups - including those who are currently involved in initiatives for specific defined sectoral or topic outcomes (e.g. carbon, building materials, batteries, plastics) some of whom are already in the process of developing tailored data governance principles. Participants would be brought on board through self selection or upon receiving a randomised invitation to provide their input. Second, decision-makers could establish a series of "mini-publics"[15] representing key stakeholder groups, interests, or perspectives. These mini-publics are tailored forums for specific stakeholder discussion and could include, for instance, certain marginalised communities, data science experts, environmental researchers, human rights campaigners, industry groups, and others.

This initial focus on participatory engagement for the development of guiding principles could be followed with a set of broader public deliberations at the heart of the ongoing governance framework to ensure sustained stakeholder and citizen engagement over time.

2. DESIGNING PROCESSES FOR COLLABORATIVE GOVERNANCE

As discussed in Icebreaker One's report on "Enabling secure scalable non-financial data flows to help deliver demonstrable Net Zero," decision support tools and clearly defined processes and procedures are needed to ensure that relevant information to inform collective decision-making across a range of issues is made accessible to the right parties — whether they be the general public accessing fully open datasets or specific stakeholders are provided functional access to data, insights, and expertise.

---

[15] See https://www.cogitatiopress.com/politicsandgovernance/article/view/4382

An initial priority along these lines is to establish a set of minimum viable governance processes that can be adopted, refined, iterated on, or abandoned over time as warranted.

A specific priority will involve defining roles and responsibilities for carrying out the governance framework. This could involve defining the decision making formats (e.g. committees) and roles and responsibilities embedded with participants on the supply and demand side. These structures, and the steps through which they will be established, can be codesigned by leaders working in the public interest and guided by the principles established through the multi-pronged citizen engagement campaign.

Next, it will be important to design and implement transparent decision-making processes for the collaborative, within the structures that have been codesigned. Governance will be more legitimate and trust more likely to take hold if lines of responsibility and accountability for decisions across the data lifecycle are clearly defined and publicly communicated. It will be especially important to define agile and independent processes for resolving disputes. These processes — which could include, for instance, the creation of a neutral ombudsperson — would be designed to guard against their capture by powerful interests.

Leaders could also conduct scenarios or tabletop exercises to determine how they are currently positioned to respond to emergent situations or challenges. These exercises can further the goal of establishing minimum viable governance processes with an eye toward iteration. Stakeholders can first priorities scenarios with a greater likelihood of occurrence to ensure that no glaring gaps in process exist and then move toward testing edge cases, or scenarios that are unlikely to occur but still warrant due diligence and preparation.

3. CREATING PRACTICES AND TOOLS TO DE-RISK COLLABORATION

As part of a minimum viable governance approach, leaders in forging collaboration around ERD should centre the creation and dissemination of practices and tools that de-risk participants' engagement in the collaborative. Ineffective data governance poses risks to data subjects, data providers, and data users alike. While data subjects face risks to their privacy and security if data is not handled appropriately, data providers and data users could see their reputation or competitive advantage suffer

in the event of a data breach or other governance failure. Any public or stakeholder trust lost due to irresponsible data governance early in the initiative's life will be difficult to regain over time. Practices, such as regular assessments of access controls or other security provisions, and tools, including data protection impact assessments, can be embedded early in the process to mitigate the risks of collaboration.

TABLE OF CONTENTS

INTRODUCTION

To take action against climate change, support environmental justice and deliver a just transition for more resilient societies we urgently need to connect and (re)use environment related data (ERD).

The lack of access to more granular data means that the environmental impact of economic activity (investments, products or consumption) is estimated – for instance by creating an estimate of environmental impact of the production of different materials in a product or process and then multiplying by the number of items produced.[16]

THE OPPORTUNITY – ENVIRONMENT-RELATED DATA ABUNDANCE

Society is in a time of data abundance. A broad diversity of data points with environmental relevance are being generated globally. These datasets are being collected by governments, businesses, civil society, researchers, and citizen scientists alike. Potentially useful data is generated through IoT sensors, satellite imagery, administrative knowledge management systems, and people's mobile phones, to name a few.

If used (and reused) effectively, this preponderance of data streams could help society to establish a sustainable economy, take action against climate change, and support environmental justice. Investors can use the data to create verifiable green bonds, and better reflect environmental risk in their portfolio. Citizens can find better, more trusted information in making product or service choices, and will better be able to hold governments to account. There is a clear opportunity and urgent need to make useful ERD generated and stored across sectors more accessible to actors that can use it to make better decisions in less time, design better targeted policies, unlock sustainable economic growth, and create societal value.

[16] Poisot, T., Bruneau, A,. Gonzalez, A., Gravel, D., Peres-Neto, P. Ecological Data Should Not Be So Hard to Find and Reuse, Trends in Ecology & Evolution, Volume 34, Issue 6, Pg. 494-496 (2019), https://doi.org/10.1016/j.tree.2019.04.005

Product- and service-level environmental impact assessments, depending on data up and down the production, supply and use chain, will also be essential if carbon taxes — like the EU's Carbon Border Adjustment Mechanisms — are to be successful.

Not a single actor can tackle the above-mentioned challenges alone, as they surpass various sectors, types of actors, and conceptual frontiers, such as the one between humanities and natural sciences. This is where systems thinking should come into play. Systems thinking sets out to view systems in a holistic manner. A systems approach considers more than one issue and broadens the decision context.

Systematizing ERD will need to pull together data covering political, social and environmental factors. ERD covers economic production data, inputs and outputs of that production (including pollution, waste), data on the environment (and its reaction) into which the inputs and outputs interact, as well as societal responses (e.g. changes in people's behavior, political decisions).

The scope of ERD can be best understood by the DPSIR-Framework.[17] The DPSIR framework highlights the need for clear and specific information on a number of factors in an interlinked socio-economic and ecological system. It helps us define what we know about five key components. These are (1) driving forces and their resulting environmental (2) pressures on environmental and socio-economic (3) states, the (4) impact resulting from these, and the subsequent societal (5) responses. Driving forces could be any kind of human activity causing environmental degradation. The results are pressures such as emissions or waste. These in turn alter the environmental state (physical, chemical and biological) and 'impacts' on ecosystems, human health and functions, eventually leading to political 'responses' (prioritization, target setting, laws).

We can break this down into a highly simplified, single set of actors, in a given city: A pharmaceutical company shares emissions data on its production of a new treatment for cancer, including inputs and outputs of that said production, in real time and over time, in machine-readable formats. So do its suppliers, and those specialized firms picking up chemical waste caused by production. Cancer Treatment is a driving force, as it answers a human need for health. The production input and outputs are the

[17] https://www.eea.europa.eu/help/glossary/eea-glossary/dpsir

resulting environmental pressures. Local Government Authorities doing quality control can monitor the companies' production to feed into the analysis of the current environmental and socio-economic state. A local citizen scientist collective measures the changes in seasonal development stages (phenology) of plants in the same area, and feeds this data into the information cycle. The data thus generated gives a more exact account of the trade-offs surrounding the production of a treatment for cancer versus the subsequent environmental degradation. Environmental changes can rarely be attributed to a single cause, but the data can help identify and describe various cause-effect relationships. None of this is of course a linear process, as the fifth factor, the response, enters into play. The pharmaceutical company might make efficiency gains and reduce toxic waste generation, or a new law might make changes in production necessary. All actors above can identify changes on environmental pressures faster and respond in more certain ways if all data can be shared in real time. From this example we can also again highlight the diversity of actors (citizens, companies, governments, universities etc.) and data sources (Federal Law Gazette for a new law, impact analyses in reports from consultancy firms, data files from companies' scientific laboratories...). This is where it gets challenging.

THE CHALLENGES – DATA ASYMMETRIES AND ENCLOSURE

Corporate interests, misaligned incentives, commercial confidentiality, concerns of individual privacy and simple inertia are significant barriers to collaborating to give access to data, to name just a few.[18] As the commercial and possible value of data as a basis for taxation increases, so does the pressure for white-washing — to conceal or even falsify information.

The risks and costs of the current data enclosure, and related data and power asymmetries are significant.[19] Data asymmetries exist in almost all single digital services or applications by default. Anyone running an application automatically has access to more information than its users. In almost all cases there will be a database of users, content or transaction histories. Data asymmetry, and the resulting imbalances of power and value, are most often raised in the context of personal data. Social networks mining user information to target adverts, for example.

---

[18] "Conflicts of Interest and Undue Influence in Climate Action." *Transparency International*, 2021. https://images.transparencycdn.org/images/2021_ConflictsOfInterestClimateAction_PolicyBrief_EN.pdf.

[19] Blair, Gordon S. et al. "Data Science of the Natural Environment: A Research Roadmap." *Frontiers*. Frontiers, January 1, 1AD. https://www.frontiersin.org/articles/10.3389/fenvs.2019.00121/full.

Investments will continue to be misallocated due to a lack of information. Accountability for environmental degradation or simple inaction will not be possible. Innovation will be impeded, both in climate action and in the financial incentives that could be created. Product level environmental impact assessment will remain approximate, even as our need for knowledge increases.

One of the most important considerations going forward is that the infrastructure needed to process data and the algorithms needed to extract insights are currently held by a handful of technology companies. While public institutions are increasingly deploying these technologies, their capacities and access to financial resources often lags behind private sector actors. Public sector actors simply cannot keep up with the pace of innovation together with the engineering capacity and research and development funding that private sector companies can deploy. As a result, public-private partnerships will likely be needed at various points across the ecosystem to tackle global environmental problems and contribute to positive public outcomes.[20]

Therefore, we need to speak about governance.

THE PATH FORWARD – GOVERNING ERD COLLABORATION

Governance is about decision-making. By governance, we understand a mode of governing that takes into account the reality we describe above, where governments need to cooperate strongly with non-state actors. The term is useful for our purpose, as it emphasises networks of decision-making across multiple levels. Coordination, collaboration, and a strong degree of openness are keywords that cannot be missed when speaking about governance. This applies not only to cooperation among civil society, the private sector, and governments but also to breaking down silos within each set of actors — think for example about increased coherence between the actions of the Ministries or governmental departments responsible for Agriculture, Trade, and Development Cooperation.

[20] UNEP, The case for a Digital Ecosystem for the Environment, Discussion paper 2019. The case for a Digital Ecosystem for the Environment – UN-SPBF

We define Governance as the range of political, institutional and administrative rules, practices and formal and informal processes through which and how decisions are taken and implemented. Governance also covers the ways in which decision-makers are held accountable in the development and management of resources and the delivery of services. Finally, governance also covers stakeholder interactions, how they articulate their interests and have their concerns considered.[21]

In the context of ERD, we look at how to organise a diverse group of actors in a way that fosters trust in the system, both among and beyond its members, so that actors feel empowered to participate in initiatives that are supported by legitimate decision-making processes, so that the decisions taken are more likely to achieve the defined goals for improved access to ERD. Today's enclosure of data can not be solved by top-down decision-making. The spread, fragmentation and scale of the data makes this impossible. Instead, initiatives to support collaboration will have to be built on mutual trust, win-win value propositions and other incentives that can operate through the whole production, supply and use chain, and in every country around the globe.

Without trust and long term collaboration any effort toward making ERD accessible is doomed to fail. That's why well designed governance principles, processes and tools, will be essential to deliver the benefits of a connected data space.

Corporations, citizens, and public sector organisations need reassurances, incentives and a clear understanding that the cost of sharing data does not outweigh the benefits.[22] What kind of reassurances and incentives are the right one's naturally depends on context and each actor's perceptions, so the best governance design is done by co-design. The right incentives need to be coupled with a systematic, sustainable, and responsible structure for decision-making, coordination, collaboration, and oversight that generates trust in the dataspace.

---

[21] Akhmouch, Aziza, and Delphine Clavreul. 2017. 'Towards Inclusive Water Governance: OECD Evidence and Key Principles of Stakeholder Engagement in the Water Sector'. In *Freshwater Governance for the 21st Century*, Karar E. (eds). Global Issues. Springer.

[22] Maier, Claudia et al. "Influencing Factors on Consumers' Willingness to Share Energy Data on Online Energy Platforms", Business and Management Studies, 2021, vol. 7, issue 2, 13-22.

Some partnerships are already underway, but they are operating on the basis of small groups, who trust each other but whose trust model cannot scale to the level needed to fill the gaps in data on the global scale.[23]

Thus a governance model for an Environment-Related Data Collaborative is needed.

We use the term "data collaborative" instead of "data exchange" as improving access to data does not necessarily imply that data is exchanged and transferred directly between actors, still less the existence of a single data exchange or collated database. Data Collaboratives are a new form of collaboration, beyond the public-private partnership model, in which participants from different sectors — in particular companies — exchange their data to create public value. Hence data collaborative is an approach that disconnects data knowledge from the economic value for an actor. This can be sustained by Zero-Knowledge Proofs. Zero-knowledge techniques are mathematical methods used to verify things without sharing or revealing underlying Ωdata. They enable that data to stay private in their controlling organisation even as the proof of their existence or certain aggregate values are used elsewhere.

This paper proposes an outline governance model for an Environment-Related Data Collaborative, providing common governance for an Environment-Related Data Space that could fulfil the goals of existing initiatives, including the EU's Green Deal Data Space, and suggests steps towards testing and achieving it.

COMPONENTS OF A GOVERNANCE FRAMEWORK

Governance frameworks are best positioned for success when they have a clear organizing purpose that can inform the development of principles, processes, and practices, the "3 Ps" of governance.[24] A purpose-driven approach to governance can

---

[23] Aceves-Bueno, E., et al. 2015. Citizen science as an approach for overcoming insufficient monitoring and inadequate stakeholder buy-in in adaptive management: criteria and evidence. Ecosystems 18(3):493-506. http://dx.doi.org/10.1007/s10021-015-9842-4

[24] Provenza, F. et al. (2013). Complex creative systems: Principles, processes, and practices of transformation. Rangelands, 35(5), 6-13

ensure that all data-related activities are pursued with a consideration of the broader technical, social, political, environmental, and economic contexts within which data is produced and consumed. The purpose will influence every subsequent element of the collaborative's design and of its governance. As data becomes more open and the different types of data grow, the shared purpose at the centre of a data collaborative is key in matching data supply with demand to use pooled resources efficiently and to create greater public value.

Clarity of focus is an important enabler of efficient and effective governance. Stakeholders will need to agree on a clear and bounded purpose for their activities and priorities data types, objectives, and strategies that are "mission critical".

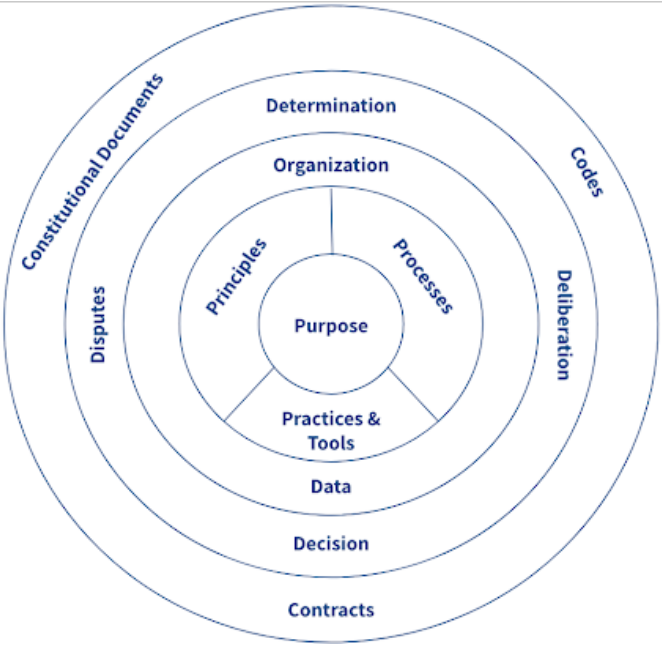


Figure: Data Governance Components by Stefaan Verhulst and Andrew Young

PRINCIPLES

Principles are critical because they offer a "North Star" for a governance framework and ensure that all activities are aligned with certain commonly agreed criteria. They act as a guide for the framework and empower it to move beyond the existing legal and institutional policy compliance structures to achieve higher levels of responsibility and sustainability than the contextual systems may offer. Mastercard, for example, has publicly shared their data responsibility principles which govern their external data

interactions and collaborations.[25] Organizing governance principles such as these can be valuable for informing actions for which there are not already established processes or processes.

In the context of cross-sector data collaboration and governance, two types of principles come into play: decision making principles and data handling principles. Determining decision making principles is the first step, as these will later determine the data handling principles. Decision making principles are concerned with the challenge at hand and the strategy of approaching it and addressing it. They will, as the name suggests, inform the decisions each actor in the collaboration takes, which brings us to the data handling principles. Data handling principles encompass notions of responsible data practices, privacy and efficiency for example. They operate in alignment with the decision making principles and later with the associated processes and practices.

PROCESSES

Governance processes build on the basis established through core principles to enshrine systematic mechanisms for making and implementing decisions. These processes include defining and communicating the roles and responsibilities of different actors and stakeholders; establishing oversight, transparency, and accountability policies and mechanisms; clarifying decision flows across stakeholders; and creating procedures for dispute resolution.

The Nationally Determined Contributions (NDC) Transparency Check is one example of a process from the ERD space.[26] Rooted in the principle of transparency, the NDC Transparency Check provides a robust reference to assess whether the mitigation efforts communicated by countries through NDCs are clear, transparent and understandable, in terms of the requirements set out in the Paris Agreement and its associated decisions.[27]

---

[25] Mastercard's Data Responsibility and Governance principles can be found at https://www.mastercard.us/en-us/vision/corp-responsibility/data-responsibility.html.

[26] Learn more about the NDC Transparency Check here: https://www.climate-transparency.org/ndc-transparency-check.

[27] The Paris Agreement is a legally binding international treaty on climate change. It was adopted by 196 Parties at the Conference of the Parties (COP) 21 in 2015 in Paris.

A key priority for multistakeholder, cross-sector ERD governance will be establishing decision-making processes that enshrine transparency and independence and clarify how decision-makers are shielded from influence by large, well-resourced actors in the public or private sectors. This independence could be achieved through defined data and decision provenance — or which stakeholder is responsible and accountable for different decisions across the data life cycle — systems. These systems play a key role in determining who takes ownership of and responsibility for the data and decisions involved in the initiative.

PRACTICES

While principles establish a North Star for governance and processes set the policy and strategic direction, practices are the most tactical component of the governance framework. Practices include the actions, tools and technologies that operationalize governance and ensure that principles are upheld and processes are undertaken in reality.

In the governance of large-scale cross-sector data collaboration, it may prove important to develop practices that streamline decision-making activities at each stage of the data lifecycle. Governing a multistakeholder ERD collaborative effectively and legitimately will be a complex undertaking and necessitate investment of time and resources by contributors across sectors. Governance practices that seek to lower transaction costs and increase the agility of decision-making will benefit, and incentivize the continued engagement of, data suppliers, demand-side actors, and intermediaries alike.

Useful practices could include, for instance, developing templates and model language for data sharing contracts and agreements; clarifying and communicating decision provenance; or attaching tags or “nutritional labels” to datasets with important information on their genesis, quality, and sensitivity.

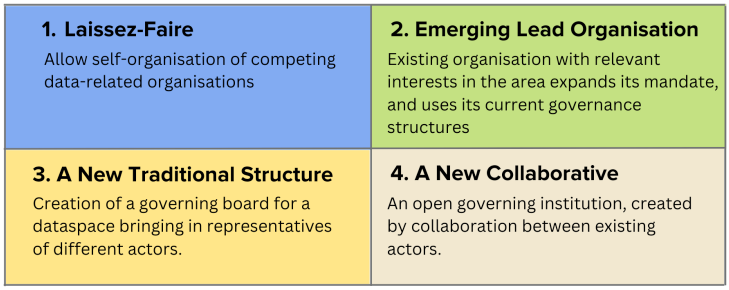
A number of institutions working with ERD and data stewardship more generally are engaged in drafting and sharing best practices from their experience. In 2020, for example, the European Commission published their staff working document on “Best Practices in Citizen Science for Environmental Monitoring”.[28] Not only does this

[28] See https://ec.europa.eu/environment/legal/reporting/pdf/best_practices_citizen_science_environmental_monitoring.pdf.

document summaries good practices and lessons learnt from the field, it also offers specific practices for the myriad stakeholders engaged in this work from public authorities and academics to community actors and citizen science networks.

PATHWAYS TO ERD GOVERNANCE

We see four plausible options for the emergence of a governance model. These do not cover every possibility but are different scenarios with analyzed benefits and their relation to implementing ERD governance.



LAISSEZ-FAIRE: NO ACTION. SELF-ORGANIZATION OF THE DATA SPACE.

The Status-Quo is one of Non-Governance, and in this scenario, nobody takes specific action to change this. The structure for sharing data will operate without a centralized unit for oversight and coordination at operational level. The state and its public regulatory authorities have not disappeared in this scenario. Yet, they leave data providers free hand to share data under pre-agreed terms that individual entities decide upon via bilateral agreements. Strategic decision making and lower-level governance rule-setting and process rules is done by individual data providers in negotiation with data users. States can still create incentives for data providers to share data, and they still define overarching principles and strategies as happened with the EU's Data Governance Act,[29] the OECD Recommendation on Enhancing Access to and Sharing of Data (EASD).[30]

The option holds the — potentially false — promise of an agility and efficiency advantage. A body charged with governance should avoid trying to act as a central clearing house for data, which would make innovation harder and reduce the willingness to participate. The body should not seek to directly control the transfer of

[29] See https://digital-strategy.ec.europa.eu/en/policies/data-governance-act.
[30] See https://legalinstruments.oecd.org/en/instruments/OECD-LEGAL-0463.

data, but set and maintain standards that support common approaches. It should be an enabler rather than a barrier for rapid innovation. Any governance organization or network will therefore need to be flexible and agile enough to respond to the needs of a fast-changing environment.

The governance arrangements for ERD collaboration need a focused effort to design. They will not emerge on their own. Without a collective approach to design and operation of ERD governance, trust in the data space will be low, leading to multiple negative consequences.

Constraint of the data marketplace. ERD is valuable in itself. In a low-trust environment, data holders will limit data accessibility to legally required minimums, and close off the opportunity for innovative data-driven products and innovations.

Worse policy. Climate change is likely to be the major policy issue of the next twenty to thirty years. Amidst rising contention on the issue, and increasing evidence of the impacts of climate change, policy makers will need to act quickly and effectively. For this, they need the best data, with the lowest lag times. Citizens and voters need access to the best information before voting or contributing to public debate.

Fragmentation entrenching division. Without a coherent transnational framework, state actors, industry bodies and international actors will come under pressure to create standards and governance for data interchange and use. Post-hoc co-ordination of existing governance will be far harder than creating a single system. It will also be less effective, operating at the trust level of its weakest member.[31]

Low quality data. Without a single trusted system across regulatory boundaries, data that are available will be of lower quality. Some data will be withheld or only made available inside regulatory boundaries. Verification will be made more difficult, and those with a financial incentive not to engage will

[31] Multi-level governance and power in climate change policy networks, Global Environmental Change, https://doi.org/10.1016/j.gloenvcha.2018.10.003.

be more likely to do so. This is likely to instigate less effective data use on a slower timescale.

Missing data on key environmental challenges. The lack of data accessibility can limit the capacity of stakeholders to measure and accelerate progress toward achieving environmental objectives. According to the UNEP report Measuring Progress Towards Achieving the Environmental Dimension of the SDGs, "there is too little data to formally assess the status of 63 of the 93 environment-related SDGs indicators", hampering global efforts to solve climate challenges.[32]

Power imbalance. A good governance system will balance the rights of those with market or state power and those without it, in the interests of the system as a whole. As has been seen in recent years with the rise of the "Splinternet",[33] state actors can create fragmentation for political reasons even when the interests of the network as a whole are for integration. Without being balanced by good governance, the voice and capacity of large corporations will always be louder than those of the small primary producers further up the production, retail, use and recycling chain, and of societal interests as a whole.[34]

We suggest that a successful governance approach will include regular and diverse multi-stakeholder participation to align interests, sensitivities, and requirements at all levels of decision making, which is not a given under Option 1. The governance arrangements will have higher legitimacy across the whole range of users to justify the use of data for public policy purposes if an inclusive, deliberative phase to discuss trade offs precedes decision-making. Governance will also need to promote rigour and accuracy, and take account of the possible inclusion of personally identifiable information (with appropriate standards of processing and release for that, including

---

[32] United Nations Environment Programme (2021). Measuring Progress: Environment and the SDGs. Nairobi.https://www.unep.org/resources/report/measuring-progress-towards-achieving-environmental-dimension-sdgs

[33] See https://www.theguardian.com/global-development/2021/jun/03/chinas-splinternet-blockchain-state-control-of-cyberspace

[34] "Conflicts of Interest and Undue Influence in Climate Action." *Transparency International*, 2021. https://images.transparencycdn.org/images/2021_ConflictsOfInterestClimateAction_PolicyBrief_EN.pdf.

proper duties of care and responsibility), which is more likely to occur in a more organized process.

EMERGING LEAD ORGANIZATION: AN EXISTING ORGANIZATION WITH RELEVANT INTERESTS IN THE AREA EXPANDS ITS MANDATE, AND USES ITS CURRENT GOVERNANCE STRUCTURES

Currently, significant efforts by organizations are underway to create sectoral data spaces to share ERD. It is conceivable that a single entity with the right internal capacity, resources and outreach and convening power federates these organizations under the umbrella of its internal governance structure. Strategic decision making and lower-level governance rule-setting and process rules would then be undertaken by a governance committee or other in negotiation with data users.

Such an approach would be similar to efforts underway by the International Sustainability Standards Board (ISSB), created to develop sustainability disclosure standards and meet climate-related information needs of investors. For climate-related information, ERD is a necessary basis. This new body has the stated intention of expanding its work to cover information across Environment, Social, Governance criteria (ESG). While that does not cover the full range of governance in the ERD space that we are considering here, it will be a significant body.

CASE STUDY: INTERNATIONAL SUSTAINABILITY STANDARDS BOARD (ISSB)

The ISSB has been created by the International Financial Reporting Standards Foundation (IFRS) and officially launched in early 2022. Before, a technical working group made up of six key players[35] prepared the groundwork for the creation of the ISSB, based on a clear set of tasks described in a work plan.[36]

The ISSB reports to the IFRS Board of Trustees of the International Financial Reporting Standards Foundation, and has a Chair and one or more Vice-Chairs.

[35] Members were Climate Disclosure Standards Board (CDSB), The International Accounting Standards Board (IASB), internal to IFRS, Task Force for Climated-related Financial Disclosures (TCFD), Value Reporting Foundation (VRF – bestehend aus dem Integrated Reporting Framework und den SAB Standards), World Economic Forum (WEF). Observers were IOSCO and the International Public Sector Accounting Standards Board (IPSASB)

[36] IFRS: Summary of the Technical Readiness Working Group's Programme of Work, 2021, IN: Summary of the Technical Readiness Working Group's Programme of Work (ifrs.org)

When fully established, it will comprise 14 members from across the world with a mix of professional perspectives, including investors and preparers. Diverse geographic and professional representation is a key principle in its governance design: the IFRS Foundation states that 'the mix of Trustees shall broadly reflect the world's capital markets and diversity of geographical and professional backgrounds'. To reflect this and ensure a broad international basis, six of the Trustees must be selected from the Asia/Oceania region, six from Europe, six from the Americas, one from Africa and three can be from any area, subject to maintaining overall geographical balance.

Another possible anchor organization could be the **World Business Council for Sustainable Development** (WBCSD).

CASE STUDY: THE WORLD BUSINESS COUNCIL FOR SUSTAINABLE DEVELOPMENT (WBCSD)

This is a CEO-led global community bringing together over 200 sustainable businesses. They say their goal is to cooperate to accelerate the system transformations needed for a net zero, nature positive, and more equitable future. Their Carbon Transparency Partnership brings together stakeholders from across industries and organizations to jointly tackle the challenge of businesses becoming under increasing pressure to decarbonize, and struggling to create transparency on the emissions created across their value chain.

The partnership's experience holds important lessons for governance with private sector participation.

A functioning governance model makes sure that anyone coming in a network has a clear vision of what they get and why they should stay. The WBCSD was able to mobilise corporate actors through distinct incentives and advocate against putting up high barriers to leave in their governance model. Such incentives can include information, peer pressure, investment and consumer demand.[37] Storytelling around use cases with regards to participation in governance have been an impactful leverage, too.

The WBCSD Governance model also thrives on trust among actors, transparency, and a balance of all represented voices. The convenor, the WBCSD, acts as and is perceived as a neutral facilitator to ensure implementation of these principles.

[37] See Reaching Net Zero: Incentives for supply chain decarbonization - World Business Council for Sustainable Development (WBCSD)

Finally, the Value Commission could act as an anchor organization. The commission's initiative aims to make available converted measurements (no. of trees, water, carbon, work force, wages, trust etc.) into a value of impact or dependency, providing context and making the information useful and relevant for decision making.

The Value Commission is an interesting case as it sets out from the onset a three-year-plan to move the hosting of the Value Commission and the Database over to an internationally recognized third party, such as a UN body, Multilateral Bank etc., to hold on behalf of the entire world. This holds the promise of creating new governance structures that avoids potential past mistakes such as weak inclusion and trust of some non-founding members, or an organizational culture that slows down progress.

CASE STUDY: THE VALUE COMMISSION BY THE CAPITALS COALITION

It's an independent collaboration created to set the international rules for the development of value factors. As such, it could play a highly complementary role to the ERD collaborative that creates the data ecosystem of environmental data and to which valuation factors could be applied.

The Commission is working with major value factor producers (S&P, PwC, Ecosystem Services Valuation Database and Social Value International) to create a consistent, open-source Value Database for business, finance, and government to use and a robust reliable method to track the world's progress on value.

The Coalition puts emphasis on the principles of trust, reliability, and inclusivity to kickstart the process of defining its governance structure.[38]

NEW TRADITIONAL STRUCTURE: CREATION OF A GOVERNING INSTITUTION DE NOVO

This option differs from option two as partners create an entirely new structure and build governance principles and structures from scratch. Who does strategic decision making and lower-level governance rule-setting and sets process rules is agreed upon by its founding members with a narrow stakeholder involvement and possibly broader stakeholder consultation.

[38] Value Accounting Network - Capitals Coalition

IN SHORT: KEYS TO SUCCESS FOR GLOBAL GOVERNANCE INITIATIVES

- Political will and institutional capacity to take on new tasks emerging from joining Multi-Stakeholder Initiatives.
- All members submit to peer review for monitoring and evaluation, possibly including a blend of sanctioning mechanisms and incentives for dealing with non-compliant actors
- Institutionalized civil society and citizen participation, with openly available and accessible information for the public, incl. the Media, as well as targeted trainings to support these actors in their engagement with the MSI
- Clarity on the use of stakeholder inputs in order to ensure that responsibilities and expectations are clear and to secure actors' support and buy-in in the long-term
- Appropriate funding and resourcing sustain the process and cover logistical needs and dedicated staff

The creation of the United Nations' Green Climate Fund (GCF) provides some useful lessons as it is one of the latest creations of an entirely new Multi-Stakeholder Initiative that is comparable in the size that we ultimately need to reach for the ERD

CASE STUDY: THE UNITED NATIONS' GREEN CLIMATE FUND (GFC)

The GCF plays a global key role in channeling new, additional, adequate and predictable financial resources to countries and catalyses climate finance, both public and private, and at the international and national levels.

The Fund's Board is charged with the governance and oversight of the Fund's management. It was established by 194 sovereign governments party to the UN Framework Convention on Climate Change (UNFCCC). The Board is independent and guided by the Conference of the Parties (COP) to the Convention. The GCF's overall structure includes a Board, a Secretariat and independent units. Its business model includes 84 Accredited Entities (AE) and National Designated Authorities (NDAs) in more than 140 countries. The GI also mandated the Transitional Committee (TC) to establish a private sector facility that "enables it to directly and indirectly finance private sector mitigation and adaptation activities at the national, regional and international levels."

Access to GCF resources is provided through national, regional and international implementing entities - the AEs - that are accredited through a process developed by the Board. There is no prescribed limit on the total number of entities. Recipient countries determine the access modality through which they will request access to the Fund. Recipient countries can designate an agency to apply for accreditation.

collaborative. Through which they will request access to the Fund. Recipient countries can designate an agency to apply for accreditation.

The GCF holds three key lessons: First, its structure includes an influential Board with strong representation and an equal voice from recipients and contributors. This has mainly been achieved thanks to the early engagement of representatives from the Global South. They were a leading voice in the fund's creation, from the fundraising process to the beginnings of the technical working group that was set up to coordinate its creation.

Second, an internal evaluation suggested that a devolved decision-making process may be more suitable for meeting the GCF's objectives while also enhancing its reputation. This is due to the GCF's expanded work volume and the urgency required for action.

Third, a successful governance structure needs to find remedies for the imbalance in representation due to a lack of financial means and lack of capacity. Although the current structure for implementing the priorities of the GCF relies heavily on AEs and NDAs, the structures and capacities of these AEs and NDAs vary significantly across countries. Therefore, imbalance in representation can stem from different sources.

We find further learnings from three other Multi-Stakeholder Initiatives (MSI) which we briefly introduce and draw lessons from, the Extractive Industries Initiative (EITI), the African Peer Review Mechanism (APRM), and the Open Government Partnership (OGP).

CASE STUDIES: MULTI STAKEHOLDER INITIATIVES WITH GOVERNMENTAL LEADERSHIP

The Extractive Industries Initiative (EITI): EITI was established in 2003 with the purpose of addressing many resource-rich countries' inability to transform their natural resource wealth into developmental benefits for their citizens. The initiative began by establishing a set of principles and rules to promote minimum transparency requirements in the oil, gas, and mining sectors. Later these rules were developed into an EITI Standard, which requires countries to publish timely, accurate information on natural resource management, including the way licenses are allocated, corporate tax rates, and government spending. Adherence to the Standard is required, but the process is flexible enough to take into account a member state's specific needs and circumstances. Currently, 51 countries implement the EITI worldwide. Six are suspended, for reasons varying from failing to meet reporting deadlines to political instability.

The African Peer Review Mechanism (APRM): The APRM is a mutually agreed self-monitoring mechanism. It aims at allowing countries at different levels of democratic and socio-economic development to cooperate toward common goals through non-adversarial peer reviews. These encourage learning from each other, capacity building, and sharing of best practices. The initiative provides for an interesting case study as partners are naturally highly reluctant to assess each other's levels of such a sensitive topic as democracy.

The Open Government Partnership (OGP): It was established in 2011 by eight founding members (Brazil, Indonesia, Mexico, Norway, the Philippines, South Africa, the United Kingdom, and the United States). Thematically similar to the APRM, the OGP's narrower focus includes fiscal transparency, access to information, income and asset disclosure, and citizen engagement. Countries that achieve ratings of 75% against these criteria are given the green light to join. The OGP creates partnerships between government and civil society to improve governance and accountability by promoting transparency, empowering citizens, and fighting corruption by harnessing new technologies. The OGP currently has 70 member states, and 15 sub-national governments have recently joined.

These MSIs hold important lessons for the future setup of such initiatives.

Sustaining engagement through rules and incentives. As voluntary partnerships, MSIs have limited power to oblige countries to comply with their international commitments. Rules at the African Peer Review Mechanism

(APRM) for instance do not foresee any mechanism to delist or suspend countries that fail to comply with their commitments, including subscription payments and reporting. The Open Government Partnership (OGP), as well as the Extractive Industries Initiative (EITI) have such mechanisms in place and made use of them in the past to exclude countries. The Green Climate Fund (GCF) has an Independent Redress Mechanism and Independent Integrity Unit to deal with similar issues. This Unit performs the essential function of safeguarding the lawful and accountable utilization of the funding and to ensure its staff, in addition to external stakeholders, implementing agencies and intermediaries relating to the GCF adhere to the highest standards of integrity. It involves addressing and responding to complaints from project-affected people.

Peer pressure has had mixed results. While the EITI and OGP have upheld their foundational principles by delisting or suspending non-compliant countries, the costs of withdrawal and/or suspension from these initiatives is mostly repetitional, and has failed to either promote greater governance reforms in member countries or to induce suspended countries to make greater efforts to comply with commitments and be readmitted.

Incentives on the other hand can be more successful and have been used in different format: from monetary incentives (GCF, EITI), to reputational incentives (OGP, APRM, EITI) - through public engagement and pressure - and importantly, educational incentives (most MSIs display this component). Appropriate and stable funding to sustain the engagement process, logistical expenses related and other support material and competent and dedicated staff (see *MSI Secretariat below*) should be ensured.

The long-term effects of these incentives on sustained engagement still needs to be studied.

Monitoring and Evaluation. An overall weakness of MSIs is that actors remain reluctant to criticise or being criticised by one another. Power dynamics in MSIs need to be acknowledged: sovereignty is highly prized, preserving “face” is often important (for politicians and others) and relationships are unequal among different actors, as well as among different levels of

governance. Instruments that seek to address these dynamics – such as the APRM *Panel of Eminent Persons* composed of highly respected African figures or the EITI *Multi-Stakeholder Groups* that include representatives from government, the private sector and civil society – create avenues for a more balanced, non-threatening engagement.

Thematic scope. More focused MSIs have greater potential to be more effective. The GCF's Forward-looking Performance Review is a useful example for a large-scale initiative that has managed to produce various documents in digestible formats targeted towards specific audiences.[39]

Other over-ambitious initiatives that did provide the same scope, such as the APRM, have produced content and action plans that only contain vague and many *unfunded* commitments which are, in turn, poorly executed and remain impactless. The narrower scope of both the EITI and the OGP has helped both initiatives become in some cases more effective in translating into transformative, tangible governance policies.

Openness and public engagement. Without broader public support, MSIs struggle to remain relevant. To that end, greater media coverage of MSIs performance and relevance in members' countries is critical. MSIs have remained mainly "elite" initiatives, interesting mostly to those governments, companies and established think tanks and CSOs which are involved. More work needs to be done to promote and popularise them, for instance by reaching out and cultivating relationships with journalists to ensure more informed and consistent reporting on MSI progress.

Institutionalised representation provides results, as seen with the OGP that has given CSOs an institutional platform to demand greater access to public information. Thousands of civil society organisations – large and small – use the OGP platform to advance their key issues and concerns. OGP helps these organisations directly reach government representatives and provides a platform and process for ongoing engagement with each other.

---

[39] [39] See https://ieu.greenclimate.fund/evaluation/fpr2019.

Reporting mechanisms and Communication. MSIs have contributed to the production of a large volume of comprehensive, insightful, and honest reports. However, most of these reports tend to be lengthy, overly technical, and their conclusions are not well publicised or understood by the general public.

Shorter reports, firm standards, and faster reporting cycles could generate greater public interest, media coverage, and civil society engagement. The reports need to be readable and accessible to the media and non-experts, and produced in a timeframe that sustains the reform momentum. The Independent Reporting Mechanism (IRM) of OGP is another useful example of a functioning governance structure. The IRM is an independent body guided by but not directly accountable to, the Steering Committee of the Open Government Partnership. An International Experts Panel (IEP) directly oversees the IRM. The IRM produces reports that assess the design and implementation of the commitments adopted by OGP participating governments in their country action plans.

A good balance between *informal and formal channels* for communication and for actors to exert influence should be also allowed, to ensure informal networks of communication are used but in transparent ways.

MSI Secretariats. The secretariats are primarily administrative bodies, but they play a major role in the daily operations of these initiatives. Centralised decision-making has harmed their operational procedures in the past, calling for a devolved decision-making process. They provide technical assistance to actors involved, improve capacity of in-country stakeholders engagement, produce cross-learning, can navigate the often-difficult political undercurrents, and act as information hubs that track adherence and commitments from different actors to the MSIs. However, they need the necessary resources to function effectively.

A NEW COLLABORATIVE: NEW STRUCTURE BASED ON PARTICIPATORY GOVERNANCE TAILORED TO CONTEXT AND DECISION-MAKING NEEDS

We argue that the most promising model would see partners create an entirely new structure and build governance principles and structures from scratch. It differs from option three in its broader stakeholder engagement. Who does strategic decision making and lower-level governance rule-setting and sets process rules is agreed upon by its founding members with a broad and significant stakeholder involvement. Significant here means that stakeholders collaborate closely and co-create.

As demonstrated in the work of Elinor Ostrom (among others), a non-excludable and non-rivalrous asset like data can be governed through models that go beyond private ownership and management. This understanding of data as a commons rather than an owned commodity can help to clarify more appropriate incentives for engagement and models for collaboration.

A governance strategy should seek to avoid the “Tragedy of the Commons” in the use of ERD. Commons resources can be subject to free-riding by certain parties who do not invest in maintenance, improvement, and innovation. In the face of wide use of assets they hold, data providers will need to be incentivized in order for the collaboration to achieve sustainability. A membership model that treats data made accessible as a “club good” could be a useful pathway forward.

Treating ERD as a club good need not limit the diversity and inclusion of stakeholders using or contributing data assets. A club good approach would see stakeholders enjoy equal rights and access, while also responsible for making contributions that support the functioning and viability of the commons resources in line with their capacity and manner of engagement. The levels and types of contribution can vary depending on the club members’ size, financial resources, technical know-how, or other capacities.

Independent trustees could be empowered to carry out this governance framework, ensure equitable access to club goods, and respond to any disputes. Trustees would

be diverse, with experts drawn from different regions and sectors relevant to ERD governance. Trustees could use innovative methods for engagement and deliberation to ensure they surface and act upon insight, perspectives, and evidence drawn from experts, impacted communities, and other stakeholders.

We have already identified the need for the governance arrangements to build trust through transparency, accessibility and participation. What does this mean in practice for the way in which decisions can be taken?

To secure transparency and accessibility, the potential circle of participation needs to be drawn widely.

One argument to support this view is the growing individualization in liberal societies. More and more sub-groups and movements emerge, identities are more varied and fluid. One visible outcome of this phenomenon is the relative decline of memberships in traditional conservative and social democratic parties, or the church.[40] As people voice more diverse views, they need more representation. Another argument is the growing diversification in media consumption — the traditional filters, the editors of large scale news outlets — have diminished in importance and given room to more specialized outlets and social media to inform ever-more targeted profiles of readers, listeners, and viewers. Another central argument is the impact of globalization and global governance itself — as ever more levels of decision-making emerge, and information flows more rapidly thanks to technological progress — understanding policy choices at different levels of decision-making and their impact on local communities has become harder. Strong representation could be an effective remedy, but is not a given in current legislative bodies across the world.[41]

As a consequence, establishing broad citizen participation is gaining interest by international public institutions as a means to fight the disconnect between citizens, governments, and large corporations in a context of rapid technological progress.

---

[40] Biezen, Poguntke: The decline of membership-based politics. IN: Party Politics 2014, Vol. 20(2) 205–216 PPQ519969 205..216 (sciencesconf.org).

[41] Zürn, Michael and Schäfer, Armin: Die Demokratische Regression ("The Democratic Regression"). Suhrkamp. 2021. P.13-32.

The World Health Organization's (WHO) Expert Advisory Committee on Developing Global Standards for Governance and Oversight of Human Genome Editing recommends to include growing numbers of people in more direct ways to foster accessibility, trust and transparency. The Committee was established in 2018, with the purpose of providing advice and recommendations on appropriate institutional, national, regional and global governance mechanisms for human genome editing.

Two recommendations are particularly pertinent. Recommendation Number Two calls for the establishment of a global genome editing clinical trials registry. The Recommendations Report states that making information on clinical trials involving human genome editing publicly accessible reflects the values and principles of openness, transparency, honesty and accountability.[42] Adoption of this recommendation would thus be an important step in embedding transparency and accountability into the governance of genome editing. Recommendation Seven recognises the critical importance of education, engagement and empowerment. However, this recommendation does not provide the same concrete guidance in how to embed public participation in the governance of genome editing as Recommendation Two did for transparency and accountability. Rather, the Recommendations Report states that "it would be counter-productive to be too prescriptive on how to pursue education, engagement and empowerment activities".[43]

Beyond these exhortations for greater public involvement, little or no guidance has been provided on how to actually engage with members of the public, at what stage and to what end. This is the case whether we are talking about involvement in policy development or more direct participation in the approval processes.

While we advocate for broad citizen participation, we suggest that unwieldy structures that only reach decisions after much coordination and conciliation will not reach decisions quickly enough for a fast-developing field.

---

[42] Expert Advisory Committee on Developing Global Standards for Governance and Oversight of Human Genome Editing (2021c). Human Genome Editing: Recommendations. Available at: https://www.who.int/publications/i/item/9789240030381 (Accessed April, 2022).

[43] Ibid

Broad participation should therefore be used for the most important strategic issues, accompanied by a narrower governance approach, led by independent trustees, and built around quick decisions, accountability and transparency. A broad governance structure is needed to bring in voices from those who are affected by ERD (at a rough approximation, every global citizen), and narrower governance structures are needed for operational and technical standards-setting. In between those levels, an oversight approach is needed to deliver transparency and accountability, founded in the broadly-agreed strategy and demonstrating to all that the governance of the space is being realised fairly, and bad actors are not able to warp the results. This model could ensure a good governance system that is open throughout but establishes a good synergy between broad engagement in strategy and values setting, and technical and operational expertise delivered through smaller-group processes.

Going back to our example of human genome editing, we can learn from the experience of an international citizen assembly on genome editing in Australia. The Global Citizens' Assembly will bring together at least twenty-four participants representing different countries across all continents most affected by genome editing. Participants will take part in five days of deliberations about the global principles of governance of genome editing. They will have access to eminent scientists at the forefront of genomic research, ethicists, and other stakeholders. The recommendations of the global citizens assembly will be turned over to the Secretary General of the United Nations, the Director-Generals of the World Health Organization and Food and Agriculture Organization, to relevant ministers and government departments throughout the world as well as to major relevant stakeholders from the Industry, Civil Society and Science and research. Many more such examples exist, with the European Union's Conference on the Future of Europe involving 800 randomly selected citizens, being one of the largest such processes so far, as well as institutionalized processes in regions such as in Eastern Belgium or cities like Paris, or Aachen.

A strong governance approach will also have an ongoing dialogue with state and financial actors, aligning and shaping incentive structures for contributing to club goods. There are several ways this could be achieved. An investment labelling scheme could require good open data as one of its criteria. In taxation, through the proposed CBAM for instance, a requirement to provide ERD through the production, retail and use chain could be incentives by using an unfavorable default - assuming

SEVERAL ENVIRONMENT-FOCUSED, CROSS-SECTOR DATA COLLABORATIVES ARE COMPILED IN THE GOVLAB'S DATA COLLABORATIVES EXPLORER[44], SUCH AS:

- The California Data Collaborative[44]: "The CaDC was founded by water managers to facilitate data-centric policy and operational decisions that enable a sustainable water future for all."
- The Water Data Collaborative[45]: "The Collaborative's mission is to grow and maintain an inclusive community of trained and qualified community water scientists who employ best available practices and technologies to provide data that enable the protection and restoration of our nation's waterways."
- Subak[47]: "Subak is building a data cooperative: a source of truth on climate data, to make data connected, searchable and trusted to help accelerate the impact of climate nonprofits."
- Global Partnership for Sustainable Development Data — Environment Data Collaborative[48]: "The Environment Data Collaborative focuses on using data innovation to protect the environment and improve climate resilience. It provides a space for organisations to collaborate and share knowledge around how to access and use data drawn from earth observation technologies, such as satellites, and remote sensing technologies that detect air quality, soil composition, humidity, and more."

that those who do not provide good data are likely to be the poorest performers and levying their products accordingly.

---

44 To access The GovLab's Data Collaboratives Explorer, go to https://datacollaboratives.org/explorer.html.

45 See https://www.californiadatacollaborative.org/ for more information on the California Data Collaborative.

46 For more information on the Water Data Collaborative, see the https://waterdatacollaborative.org/.

47 Visit https://climatesubak.org/ to learn more about Subak's work.

48 To learn more about the Environment Data Collaborative, go to https://datacollaboratives.org/explorer.html.

ANALYSIS OF THE FOUR GOVERNANCE MODELS

Each of these governance models has benefits and barriers to success. In this section we map how each approach could be responsive to a set of persistent challenges in the effective use and governance of ERD and briefly reflect on the affordances of each model.

Challenge	Laissez-faire	Emerging Leader	New traditional structure	New collaborative
Diversity of Sources, Actors, Purposes, and Products	Low	Low to Mid	Mid to High	High
Avoiding competing concerns, power imbalance and lack of common principles	Low	Low	Mid to High	High
Preventing data asymmetries from being reinforced	Low	Low to Mid	Mid to High	Mid to High
Proportionality, Ownership and Collective rights	Low	Low to Mid	Mid to High	High
Securing quality, provenance, and standards	High (yet limited to sectors)	High (yet limited to sectors)	High	High
Ensuring continuity and sustainability	Low to Mid	Mid	Mid to High	Mid (possible disenfranchisement of wider community)
Avoiding a risk of Bias, interest-capture and Whitewashing	Low	Low to Mid	Mid	Mid
Reflecting local and cultural difference	Mid	Low to Mid	High	High
Managing disputes in a multi-stakeholder environment	High	Mid	Mid to High	Mid to High

The **“Laissez-Faire”** Option falls short because it risks creating significant silos and barriers to data exchanges across sectors. As rule-setting will be done by a single

entity without external and independent oversight, trust will remain low. The potential for being effective is higher due to a lack of coordination needs.

We see a higher potential for effectiveness in the **"Emerging Leader"** Option due to its restraint decision-making circle. Yet, its greatest strength will also be its weakness, as the search for one actor that could convene all stakeholders in a trustworthy environment is unlikely, even though trust levels among those participating could be exceeding those of other options for the same reason of limited participation.

A **"Traditional New Organisation"** prevents the risk of lack of trust, and we believe gives the opportunity to create a system that works on a collective basis. If designed well, this should lead to strong outcomes in terms of both effectiveness and trust. However, trust may be compromised if a small number of powerful organisations are seen as having a monopoly of voice.

A **"New Collaborative"** with strong co-decision opportunities for a broad range of stakeholders would promise high trust levels. Effectiveness however could be challenged, especially at the outset, by the need to ensure agreement and inclusion of all relevant stakeholders.

KEY PERFORMANCE OUTCOMES FOR ERD COLLABORATIVE GOVERNANCE

A likely overarching objective of a governance model for an ERD Collaborative is to maximize access to valuable ERD in production and consumption value chains in a systematic, sustainable, and responsible manner. To achieve this, it should work toward a range of more specific key performance outcomes, including:

1. Diverse, Global Participation and Engagement

A successful governance approach will require multiple stakeholders to align interests, sensitivities, and requirements at all levels of decision making. These stakeholders include a large set of people with completely different capacities, interests, and perspectives, such as investment firms, local authorities, companies, citizen scientists, tax officials to name just a few. The governance approach will seek to enable inclusive participation from around the world, and everybody's continued engagement. These actors can roughly be divided into data users (either in the

production retail, use and recycling chain, as investors, or as financial regulators), data providers (including the production, retail, use and recycling chain, but also governments and others, and data intermediaries (those specialized in matching the demand or users with the supply or providers, e.g. via packaging and interpreting of data).

They can also be divided into those who use or provide systemic data (such as civil society, citizens and governments), and those who use or provide specific data (such as those in the production, use and recycling chain).

ERD can be considered as a good that is both private and collective — and more valuable societally when shared. We need to think about how to govern its use with that in mind, balancing the rights of data owners with the rights of society as a whole and trying to strike the right balance between the different private and public interests. Doing so will likely require efforts for these and other relevant actors to co-design the governance framework in which trusted data collaboration can take place.

2. Global Interoperability of Standards and Processes

ERD are often important for individual actors listed above, but with the rise of sustainable finance, and carbon-based taxation and tariffs, such as the proposed European Carbon Border Adjustment Mechanism, they are to become systemically and financially important. A global focus on ensuring interoperability of governance standards and processes can mitigate risks of fragmentation and provide for more systematic, consistent, and de-risked data provision and collaboration.

Without the early achievement of a process for a coherent transnational framework, state actors, industry bodies and international actors will come under pressure to create standards and governance for data collaboration and (re)use. Post-hoc coordination of existing governance will be far harder than creating a single system. It will also be less effective, operating at the trust level of its weakest member.[49] Moreover, absent a trusted set of standards across regulatory boundaries, data that are available are likely to be of lower quality. Some data will be withheld or only made available inside regulatory boundaries. Verification will be made more difficult, and

[49] Multi-level governance and power in climate change policy networks, Global Environmental Change, https://doi.org/10.1016/j.gloenvcha.2018.10.003.

those with a financial incentive not to engage will be more likely to do so. This is likely to instigate less effective data use on a slower timescale.

Clear, publicly-set standards related to interoperability and reusability can provide assurance to users that data will be of requisite quality and integrity for their intended purposes, as well as assurance that decisions involving environmental technology are supported by appropriate quality-assured engineering standards and processes.

Standards need to be set for the medium term, and need consistent implementation and oversight. At present, concerns with the financial and environmental sustainability of environmental data efforts are largely unaddressed and the continuity of environmental data infrastructure is not secured and remains open to political forces.

Stakeholders can drive the adoption of standards through a variety of means, such as carbon accounting through the system, which can be reinforced by carbon taxes ("carbon as a currency").

3. Sustaining a Critical Mass of Participation and Engagement

Creation of shared standards for data sharing are essential, but wide, lasting acceptance and widespread, common usage of a particular set of standards will need to be delivered and sustained by broad societal and stakeholder buy-in and ongoing support, in the face of likely alternative, competing data access models (e.g. promoted by private interests).

This is particularly important in an ERD collaborative, whose success relies on the width of voluntary participation and whose operations and governance will be iterative and evolve over time. (There is no one-time, eternal solution to the challenge of providing functional access to valuable ERD in a systematic, sustainable, and responsible manner, as data needs, participants and opportunities evolve). Data providers, users, intermediaries, funders and policy makers will need to be incentivized to sustain their participation and engagement over time in order to unlock the societal value of ERD at scale.

Organizational leaders will need to define fit-for-purpose incentives for stakeholders to invest in and institutionalize their participation in ERD collaborative and alignment with its governance framework. Governance will need to be designed to allow unorganized sectors (such as small primary producers proper and the general public) representation. Incentives to participate will vary across types of stakeholder and their function in the ERD collaborative, with a focus on how participation will generate business or institutional value, including but not limited to regulatory compliance.

Sustaining participation of relevant actors will require targeted, fit-for-purpose incentives built around the gravitational force of a critical mass of participants, that speak to different values, priorities, and key performance indicators of wider stakeholders. It will also involve the investment of funding, resources, infrastructure, and capacity in order to ensure that stakeholders of different size and influence have a seat at the table for decision-making.

To ensure broad participation, an approach for incentivizing and sustaining participation should involve efforts to reach all actors in all geographies, even if they are not brought into the system from the start. The Open Data Charter, for example, sets a low threshold for entry — essentially a commitment "to make data open and freely available, while protecting the rights of people and communities".[50] In this way it seeks to exert consistent positive pressure both to bring on new adopters, but to improve the performance of all players, no matter what level they are at. In the same way, governance of ERD will need to work to bring in and bring on participating actors, with a clear goal for openness and availability of data.

4. Meeting needs for Oversight, Enforcement, and Dispute Resolution

While incentive "carrots" can spur engagement through the creation of business or institutional value, "sticks" can also play a role in driving effective participation and data exchange in the interest of avoiding fines, reduced access to assets and resources, and negative public scrutiny. There have to be remedies for breaches of the standards and rules decided upon.

Participation in the ERD collaborative should be subject to oversight by empowered leaders within the collaborative as well as continuous public oversight through

[50] See https://opendatacharter.net/.

experts, media, international organizations, NGOs, and citizens. Evidence-based policy evaluations both by citizens and experts, e.g. the Global Forest Watch, have become crucial in developing indicators to monitor climate actions.

Contravention of ERD collaborative policies and codes of conduct will need to lead to some form of enforcement mechanisms, which provide disincentives for breach, so create trust in the data sharing. These will need to be clearly defined and agreed from the outset and communicated publicly. As is the case with incentives for participation, these enforcement mechanisms should be fit-for-purpose and targeted to the unique interests and capacity of offending parties. For example, monetary fines or expulsion from the collaborative, will have different levels of impact on different types of offending parties. Enforcement, like expectations on asset and resource contribution, should be customized for the party in question according to a well-publicized set of criteria.

While oversight and enforcement are essential, the governance framework will need to avoid becoming too prescriptive and top-heavy, which risks reducing innovation and increasing the risk of walk-away by powerful actors in the ERD collaborative.

To secure trust and accountability, all stakeholders should have access to mechanisms to address disputes responsibly and effectively. International agreements such as the SDGs, The Data Governance Act[51], the OECD Recommendation on Enhancing Access to and Sharing of Data (EASD)[52], provide for a guideline for principled action that all actors should subscribe to.

Disputes about environmental data require agile and independent processes (and can often not be disconnected from more overarching environmental disputes). While environmental data may provide environmental accountability; there must also be clear lines of responsibility and accountability for its use as data. The absence of a single ‘fount of justice’ means that decisions must be made by a collective. National and international law can support but not compel.

---

[51] The Data Governance Act - https://digital-strategy.ec.europa.eu/en/policies/data-governance-act.

[52] The OECD Recommendation on Enhancing Access to and Sharing of Data (EASD) - https://legalinstruments.oecd.org/en/instruments/OECD-LEGAL-0463.

A successful governance approach will establish decision provenance, such as transparency about who is responsible and accountable for actions involving ERD, and have independent, agile dispute resolution processes that are unaffected by natural power or wealth imbalances. It will create a connection with environmental dispute resolution practices and principles.

5. Dynamic evolution to technical progress and user needs

The ERD field is complex and growing. Advances in sensing and monitoring technology, such as the Internet of Things and new types of satellites, have expanded the data universe and ecosystem. New data collection methods, such as citizen science, have led to the generation of massive amounts of both personal and non-personal data. Advances in machine learning have accelerated and transformed analytical processes. Despite these advances, according to the UNEP report Measuring Progress Towards Achieving the Environmental Dimension of the SDGs, "there is too little data to formally assess the status of 63 of the 93 environment-related SDGs indicators", hampering global efforts to solve climate challenges.[53]

New innovations in data collection, analysis, and use will continue to emerge in the coming years, as will shifts in user needs and opportunities. An ERD collaborative governance framework will need to be agile and iterative to enable dynamic evolution in line with technical advancements and shifting needs and opportunities. Regularly scheduled reviews, assessments, evaluations, and participatory co-design processes of ERD collaborative governance can help to navigate changing circumstances and refresh guiding principles, processes, and practices to bolster stakeholders' ability to use state-of-the-art tools to address contemporary environmental objectives.

DESIGN PRINCIPLES FOR ERD COLLABORATIVE GOVERNANCE

1. Smallest necessary intervention

What is the core purpose of a governance architecture for ERD? It is to create the lightest and smallest intervention approach that de-risks collaboration around ERDwhile ensuring the mutual benefits of:

---

[53] United Nations Environment Programme (2021). Measuring Progress: Environment and the SDGs. Nairobi. https://www.unep.org/resources/report/measuring-progress-towards-achieving-environmental-dimension-sdgs

- Access to trustworthy ERD for core social and economic purposes such as the creation of financial instruments;
- Commercial privacy and security for business-critical data;
- Space for innovative data interchange and data use approaches to grow;
- Broad and continuing acceptance from data users, holders and society as a whole.

2. Maximise Societal Value Creation

Functional access to ERD presents a range of value propositions to the diversity of stakeholders in the ERD ecosystem. These value propositions could include the creation of new commercial value through product design, innovation, or improved operational efficiency. In order to maximize the public interest value creation of ERD collaborative, stakeholders — including especially investors and policy makers — will need to orient their decision-making and overarching governance framework toward the realization of value from ERD, which, in practice given the width of users for whom the data is valuable, means the societal value from ERD. An ERD collaborative is likely to create benefits across regions, sectors, and industries, but advancing collective good and resisting private capture of insights, outputs, and impacts should act as a "North Star" and organizing priority for actors instrumental in the design and ongoing implementation of the ERD collaborative governance framework.

At present, access to data is sporadic, not systematic. To realise the benefits of data collaboration, firms and decision-makers within those firms need to know that by opening up they are creating both business value and societal benefit. To do this, the right incentives need to be in place to clarify the value proposition and spur action. Incentives alone are unlikely to establish an effective and legitimate data space - the environment in which data is shared and used. In order for a data collaborative to be trusted, incentives for engagement by data holders will need to be matched with appropriate governance principles, practices, and policies.

3. Deliver Trust

Trust is the basis for consensual data access and functional provision of insights. ERD is valuable in itself. In a low-trust environment, data holders will limit data accessibility to legally required minimums, and close off the opportunity for innovative data-driven products and innovations. An absence of trust will also instigate concerns and scepticism on the value and accuracy of data, and rejection of ERD access amongst the public, data subjects, potential data providers and intended beneficiaries of ERD collaborative activities.

There is no simple formula for inspiring trust amongst collaborating stakeholders nor amongst the public or intended beneficiaries of the ERD collaborative and its governance framework. Transparent processes and decision-making, however, can be important enablers of trust. Trusted approaches can demonstrate accountability, transparency of operations and the ability of actors to participate fairly in decision making about the system. Transparency can increase trust by providing access to information and context. The ENTSO E-Transparency platform[54], for example, gives free continuous access to pan-European electricity market data. In the climate field, the NDC Transparency Check[55] assesses the transparency of mitigation efforts undertaken through states' Nationally Determined Contributions.

Trust can also be a contributor to credibility and confidence among stakeholders and the general public that ERD assets will continue to be made accessible over time and used to advance the public interest. This involves both trust and belief that stakeholders will sustain their focus on the public good — and avoid capture by special interests or exclusively commercial concerns — as well as confidence in the capacity of involved parties to successfully implement the ERD collaborative both operationally and from a governance perspective. A successful governance approach will incentivise solutions that set the right balance between ownership and collective rights, and do so in a transparent, reliable and public way. The balance should be set in such a way that it can develop over time.

[54] https://transparency.entsoe.eu/

[55] https://www.climate-transparency.org/ndc-transparency-check

A public understanding of proportionality (see Principle 5) and a discussion of digital self-determination, where groups who are marginalized, are empowered to co-design the governance framework, must be at the heart of this work.[56]

4. Inclusive Decision-making

There exists a wide array of stakeholders, affected parties, and segments of the public with expertise, experience, or perspectives that should be taken into account in the governance of ERD collaborative. Establishing participatory decision-making processes can improve outcomes by tapping into important novel insights. It can also bolster trust in these processes amongst participants and those whose interests they represent. Participatory decision-making that is aligned with public perspectives can also ensure that ERD collaborative operates with a clear social license.

Without being balanced by good governance, the voice and capacity of large corporations will always be louder than those of the small primary producers further up the production, retail, use and recycling chain, and of societal interests as a whole.

The participation of diverse stakeholders across the ERD ecosystem — including interested individuals — can also be a powerful tool for improving the coverage and quality of ERD. Citizen Science can complement existing data and facilitate national monitoring of environmental data[57]. The European Commission, for example, argues that such participatory initiatives "offer an under-used, cost-efficient additional source of knowledge and feedback in the monitoring of the environment and the implementation of environment policies." The European Commission has also published a best practice document on the use of citizen science in environmental monitoring.[58]

Where participation in decision-making is not balanced, design outcomes and operations will almost inevitably, and without malintention, reflect the interests of the

---

[56] Longdon, Joycelyn. "Environmental Data Justice." The Lancet, November 2020. https://www.thelancet.com/journals/lanplh/article/PIIS2542-5196(20)30254-0/fulltext.

[57] Aceves-Bueno, E., et al. 2015. Citizen science as an approach for overcoming insufficient monitoring and inadequate stakeholder buy-in in adaptive management: criteria and evidence. Ecosystems 18(3):493-506. http://dx.doi.org/10.1007/s10021-015-9842-4

[58] https://ec.europa.eu/environment/legal/reporting/pdf/best_practices_citizen_science_environmental_monitoring.pdf

more powerful voices. If this results in design choices not adequately reflecting the needs of less-powerful users (e.g. upstream small primary producers) the core purpose of the ERD collaborative - access to data - will be marginalized.

Participation should be structured so as to rebalance the inherent power advantages that state actors and large corporates enjoy. In the words of the Inclusive Data Charter,[59] the Sustainable Development Goals' 'leave no one behind' promise will only be achieved "by empowering the furthest behind. This means ensuring their voices are heard and their experiences are represented through data and analytics." In the same vein, the European just transition agenda[60], focusing on delivering social and economic inclusion alongside carbon neutrality, makes the inclusion of the voices of marginalized and vulnerable groups more important than ever.

Participatory efforts should also prioritize the engagement of members and representatives of marginalized communities who are simultaneously among the most-impacted by the impacts of climate change and invisible in official data streams, for example including indigenous communities who are beneficiaries and data users. WHO's report *Environmental health inequalities in Europe*,[61] for example, highlights "data and evidence gaps that currently restrict the assessment of environmental health inequalities in the WHO European Region", and said that "much work needed to be undertaken".

As a consequence, establishing broad citizen participation is gaining interest by international public institutions as a means to fight the disconnect between citizens, governments, and large corporations in a context of rapid technological progress.

For example, the World Health Organization's (WHO) Expert Advisory Committee on Developing Global Standards for Governance and Oversight of Human Genome Editing recommends to include growing numbers of people in more direct ways to foster accessibility, trust and transparency. The Committee was established in 2018, with the purpose of providing advice and recommendations on appropriate institutional, national, regional and global governance mechanisms for human genome editing.

---

59 https://www.data4sdgs.org/sites/default/files/2018-08/IDC_onepager_Final.pdf

60 https://ens-newswire.com/europe-defines-fair-inclusive-shift-to-climate-neutrality/

61 https://www.euro.who.int/__data/assets/pdf_file/0010/157969/e96194.pdf

Two of their recommendations are particularly pertinent to the accessing of ERD. Recommendation 2 calls for the establishment of a global genome editing clinical trials registry. The Recommendations Report states that making information on clinical trials involving human genome editing publicly accessible reflects the values and principles of openness, transparency, honesty and accountability.[62] Adoption of this recommendation would thus be an important step in embedding transparency and accountability into the governance of genome editing. Recommendation 7 recognises the critical importance of education, engagement and empowerment. (However, this recommendation does not provide the same concrete guidance in how to embed public participation in the governance of genome editing as Recommendation 2 did for transparency and accountability.)

5. Proportionality and Functional Access

Any default rules on access to data must be designed to be proportionate to its use and limited to agreed functions. While there is an understanding that some data ought to be publicly available on policy grounds, the proportionality of using data that is the property of individuals or firms is a question of balance.

Current consent provisions are flawed, but there are concerns about broadly permissions access compelled by state action. The use of ERD should not replicate the negative behavior of surveillance capitalism[63], which is driving a general suspicion of public sector and corporate actions around data that will in itself be a barrier.

6. Efficient Decision-making Processes

Efficiency in decision-making stems from functional knowledge management, that facilitates internal communication and creates living archives where information is stored, accessible, and used. This knowledge management function will need a degree of central co-ordination, and so there will be a need for governing bodies

---

[62] Expert Advisory Committee on Developing Global Standards for Governance and Oversight of Human Genome Editing (2021c). Human Genome Editing: Recommendations. Available at: https://www.who.int/publications/i/item/9789240030381 (Accessed April, 2022).

[63] Zuboff, Shoshana, Gavan Jacob, and Michael Public. "Surveillance Capitalism by Shoshana Zuboff." Project Syndicate, January 3, 2020. https://www.project-syndicate.org/onpoint/surveillance-capitalism-exploiting-behavioral-data-by-shoshana-zuboff-2020-01 .

(either hosted by an existing neutral actor, or independently constituted) to support this.

Clarity of focus is an important enabler of efficient and effective governance. Stakeholders will need to agree on a clear and bounded purpose for their activities and priorities data types,[64] objectives, and strategies that are "mission critical".

As discussed in Icebreaker One's report on "enabling secure scalable non-financial data flows to help deliver demonstrable Net Zero," decision support tools and clearly defined processes and procedures are needed to ensure that relevant information to inform collective decision-making across a range of issues is made accessible to the right parties — whether they be the general public accessing fully open datasets or specific stakeholders are provided functional access to data, insights, and expertise. Such an approach can not only mitigate risks and ensure that sensitive data is handled safely and appropriately, it can also ensure that contributors' data, infrastructure, and capacity are used in the most effective and efficient manner possible.

There is a trade-off between the efficiency of processes and the width of participation, and decisions must be made (and revised) to find the correct operation balance between these two.

Different factors come into play. For example, to secure transparency and accessibility, the potential circle of participation needs to be drawn widely. The degree to which this is needed depends on the variance in viewpoints relevant to specific ERD issues. In liberal societies, growing individualization lead to more and more sub-groups and movements emerging with identities that are more varied and fluid. As people voice more diverse views, they need more representation. The growing diversification in media consumption with growth of more specialized outlets and social media to ever-more targeted profiles of readers, listeners, and viewers enhances this diversity. Strong representation could be an effective remedy, but is not a given in current legislative bodies across the world.[65]

---

[64] Open Up Climate Data: Using Open Data to Advance Climate Action and Priority Data Types

[65] Zürn, Michael and Schäfer, Armin: Die Demokratische Regression ("The Democratic Regression"). Suhrkamp. 2021. P.13-32.

While we advocate for broad citizen participation, we suggest that unwieldy structures that only reach decisions after much coordination and conciliation will not reach decisions quickly enough for a fast-developing field.

7. Matching participation to decisions_

One solution is to match the degree of participation to the nature of the decision involved in the ERD collaborative. Different levels of governance are going to be needed in the data space. A ***broad governance*** structure is needed to bring in a wide range of those who are affected by environmental data (at a rough approximation, every global citizen), and ***narrower governance*** structures are needed for technical standards-setting. In between those levels, an oversight approach is needed that draws on the technical standards that are drawn up in the narrow governance group, but which demonstrates to all that the governance of the space is being realised fairly, and bad actors are not able to warp the results. This model could ensure a good governance system that is open throughout but establishes a good ***synergy between broad engagement*** in strategy and values setting, ***and technical expertise*** delivered through smaller-group processes.

Suited for broad governance	Suited for narrow governance
Agreeing on core values and principles Deliberating options for strategic development, in particular to determine fundamental approaches to data rights and ownership Fundamental approaches to data rights and ownership	Decisions on technical and quality standards Resource management and executive functions of a holding body/agency Decisions on guidance on appropriate forms of data management (e.g. collective management of data rights/ data trusts)
Suited for mixed governance	
Review of processes Oversight of executive or agency functions Quality and process assurance Enforcement decisions	

We can characterize these as ***broad***, ***narrow*** and ***mixed*** governance systems, designed within an overall set of principles around equity, equality and openness. The different governance roles can be attributed within the system as a whole.

Differentiating governance arrangements in this way also allows different approaches to be used with appropriate audiences and provides clarity on the use of different stakeholder inputs. This is crucial since if stakeholders do not understand how their input will be used and will contribute to the governance process, they may feel misplaced or manipulated by and will therefore lose interest to participate (Akhmouch and Clavreul, 2017).

These forms of environmental data governance could be designed on a voluntary basis - proactive rather than reactive and in response to an obligation. This will require a complex exercise of mapping and recognizing all different stakeholders (over time) who have a similar understanding of the environmental data governance problem, realize their interdependence for solving it, and come together to achieve better outcomes that none of them could be achieving individually.

Defining broad and narrow governance alone does not answer all the questions of governance (as illustrated in the next section below). In particular, all three aspects of governance have their specific challenges.

Broad governance involves a very wide range of stakeholders. For many, their awareness of the environmental data space will be next to zero. They may not see the personal benefit in prioritizing contributions to this governance area, even if there is societal benefit to finding a wide range of voices. That could result in skewed samples, where even those groups that are meant to be broadly representative are made up of people with an abnormal level of interest in the field. Other processes have managed these risks with stratified selection models that deliberately select on the basis of level of knowledge to ensure a representative sample. For instance forms of **deliberative governance**[66] can be included in regard with the broad governance approach, where a solution or consensus is sought from citizens and the wider society for a global and usually complex or controversial issue. Experiences of deliberative governance in practice have shown that random selection from broad

[66] Deliberative approaches provide space and time for learning in both horizontal and vertical formats that link chosen or elected representatives to the broader citizenry.

groups of citizens is well suited to setting broad ethical parameters and strategies, rather than making detailed technical recommendations.

Honorariums and other forms of payment are also common to ensure that barriers to participation are lower.

Narrow governance involves a range of technically qualified stakeholders, who are close to the issues at hand. For this reason it is impossible to avoid involving stakeholders who have personal or professional interest in the area. Particular effort needs to go into the design of processes to avoid bias and self-interested decision making. A critical element of this is developing a good synergy between strategy- and principle-setting through broad governance of a mostly disinterested group, with checks and balances on the narrower governance groups to ensure that their decisions are in line with an overall set of principles and values.

Finally, the creation of **hybrid approaches** has to create systems that do not allow those with expertise to dominate in hybrid forums, and provide the information architecture through which non-specialist participants can gain enough knowledge about an issue to contribute effectively to an informed collective judgement on it.

RECOMMENDED NEXT STEPS

This is a fast-moving area, and action is needed soon. Even given a goal of creation of an optimal decision-making structure, there is a challenge in the creation of consensus from potential participants in the creation of the principles and processes by which a data space is created. Furthermore, we identify information asymmetry as a critical barrier to meaningful citizen participation. By information asymmetry, we mean that a critical mass of citizens is currently not feeling concerned by the issue of environmentally-related data governance. The fact that ERD is dispersed throughout the system, held by various actors in various formats, constitutes a significant barrier in that sense. To learn from similar and former initiatives, a bottom up and broad governance approach thus needs to start with democratizing environmental data governance through broad citizen participation.

A. DEVELOPING PRINCIPLES THROUGH PARTICIPATORY PROCESSES

Broad participation can be achieved via various means. We suggest the establishment of a standing committee of the full-range of stakeholders in ERD whose voices are unlikely to be otherwise heard, and place that at the heart of the proposed governance structure to ensure sustained citizen engagement. As the ERD collaborative needs to be global, and brings benefits for the public good, globally, that means the inclusion of potential users and beneficiaries of the ERD collaborative, from all around the world (we'll call them 'global citizens').

How do we get there?

1. The initial design phase of the ERD Governance Framework will be led by highly engaged stakeholders from the corporate world, public authorities, researchers and civil society. To reconcile the need for swift action from these actors with the parallel need for strong legitimacy through broad stakeholder representation, we recommend the nomination of highly respected figures such as former prominent decision-makers from the public sector, and/or civil society. These people will be tasked with overseeing and steering the activities outlined below and remain advocates and advisors for global citizen participation in the proposed governance structure throughout.

2. To understand global citizens' current concerns and interests with regards to environmental-related data, we suggest facilitated, face-to-face small-group discussions to delve more deeply into people's views and perspectives, as well as the values, needs, and concerns that lie behind people's needs and beliefs around ERD. At this early stage, these stakeholders should receive privileged access to information resources to strengthen their knowledge and interest. Their participation should be incentivized financially, to make it possible, and attractive, considering that the direct interests of small, African farmers, or Indian dairy farmers do not lie in participation. This effort should be complemented by outreach efforts to engage user groups and beneficiaries who otherwise will never hear of it.

3. At a next stage, we propose to mobilize a representative set of global citizens with the aim of setting consensus principles for the creation of the ERD collaborative. They could be drawn by lot, mobilized based on a state-backed process motivated by the idea of data as public good and further incentivized

based on financial remuneration. Global citizens could convene in citizen-only sessions first, followed up by interactions with all other stakeholders identified in this paper, to ensure they have confidence to voice their specific concerns. The first outcome of this process is a standing citizen committee – made up of a small number of elected global citizen ambassadors who chair permanently on the ERD governing board.

4. In parallel, we suggest the development of digital means to broaden global citizen participation in the design of the ERD Dataspace. One way to do so is the creation of an online platform, paired with face-to-face exercises, that allow people to suggest ideas – and then rank, refine, and comment on all the ideas generated by the crowd. Over time, smartphone-based tools that allow people to enter data to complement existing data, but also to share particular problems and conditions, such as missing or unclear product information, should be set up. The global citizen committee could steer this work and bring its results to the attention of the wider governing board.

The global citizen committee will not function without its endorsement by all stakeholders, in particular the most powerful. Therefore, the development of collaborative governance would need to be progressive, in line with the progressive development and expansion of use of the data collaborative, steered by a technical working group, including an adequate collective of the currently powerful players who can speak for the common goal.

B. DESIGNING PROCESSES FOR COLLABORATIVE GOVERNANCE

In order to promote the collaborative governance of ERD, we suggest the following actions going forward:

1. Seeding the network

An initial group of participants should be brought together to work with the design team in the piloting and growth phase. Many of the people we interviewed during our research expressed willingness to be part of this network, and these could be the future core of the governance group. A simple website with the ability to sign up for later involvement would also be needed at this point.

2. A small but comprehensive group of partners

The core network needs to bring together corporations (or associations of corporations), regulatory agencies, civil society, data experts and governance experts, to ensure that the design and piloting considers the full range of potential uses and users for the system. At the same time, the network in its early stages needs to be compact enough to work effectively so membership should be kept small, with members relaying information into wider networks as development continues.

3. Establishing data stewards.

Private, public and civil society entities with access to ERD should create and promote the role of a Chief Data Steward within their organizations. Data stewards would work towards unlocking the value of data and sharing insights with stakeholders to ensure that governance systems are designed and remain in place to allow the maximum future value of ERD to be realized, for collective societal good.[67]

C. CREATING PRACTICES AND TOOLS TO DE-RISK COLLABORATION

What are the next steps that should be taken to create practices and tools to begin to mitigate risk in this collaboration? We suggest:

1. Dedicated time.

Although the work needs to be coordinated across a network as described above, that network needs to be supported by dedicated time for a small implementation team, drawn either from participating organizations or from outside them, to ensure that work moves forward quickly. The funding for this is the bridge from this research to the broader funding certainty needed to start piloting.

[67] For more information on the roles and responsibility of a data steward, see https://thegovlab.org/static/files/publications/wanted-data-stewards.pdf.

2. Further development.

The proposals in this paper should be shared more widely and reviewed with a range of users, one-on-one and in groups to test and develop the idea, with a particular focus on the governance arrangements. This should lead to a piloting plan, with more detailed costs and success indicators being ready in [June].

3. Engagement across the broader picture.

There are numerous other initiatives underway in this area, focusing not just on the governance aspects, but on more technical matters. Engagement and alignment with these approaches is an important early step, to prevent the fragmentation of initiatives, which we identify as a risk.

4. Startup action plan.

Once the next round of development and design has been completed, piloting and practical action should start, based around the initial network and seeking to grow rapidly from there. Given the nature of the governance structure we suggest, this step would ideally not be undertaken until a clear future funding path is established, to avoid the risk of stop-start development.