Building on Open Data and Information Technologies: The Future of Resources, Narratives and Collective Intelligence for Development

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ABSTRACT

The past decade has seen the emergence of two parallel data revolutions that affect development programming. First, the Open Data movement has pushed organizations - governments, non-profits and companies - to publicly share information and allow public scrutiny. Second, the increasing availability of free, open source and user-friendly information technologies is enabling a growing number of civic actors to collect, process and analyse their own data. The confluence of Open Data and community-driven data are changing the way development is done. This paper explores the processes that are being set in motion in the development project "marketplace" by these twin data revolutions. It describes three examples of the ways communities and organizations are building on these developments: by organizing and leveraging new resources, creating new narratives, and building collective intelligence. These changes present networked, decentralized alternatives to established ideas, and are beginning to exert some pressure on incumbent processes and stakeholders. We argue that the development sector has the opportunity to engage with and support the growth of these so-called alternative infrastructures into ones that complement incumbent infrastructures. To do so, development organizations must learn to allow communities to shape their priorities about where and how aid is deployed and focus programming on creating an enabling environment for this organic process to happen in a constructive, democratic manner. While this may seem like an uncertain, radical future, it is the natural corollary of giving millions of people open access to data, and the ability to generate and share it.

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Introduction: Building on Open Data and Information Technologies

The past decade has seen the emergence of two parallel data revolutions that affect development programming. First, the Open Data movement has pushed for public sharing of information by organizations - governments, non-profits and companies - to allow for public scrutiny and transparent accountability. Second, the increasing availability of free, open source and user-friendly information technologies is allowing a growing number of civic actors to collect, process and analyse their own data. The confluence of open data and community-driven data are changing the way development is done. This paper explores the processes that are being set in motion in the development project "marketplace" by these twin data revolutions, and how these processes should inform an understanding of how aid can be most valuable in a given country.

Open data and information technologies have given communities access to institutional processes that affect them. This has paved the way for initiatives that allow citizens to provide feedback on government services and development projects. Started in the UK, FixMyStreet[1] allows the public to provide feedback to the Government on local, urban problems. The platform has been replicated across the world, from Malaysia to Chile. In Kenya, a group of technologists and civic activists built Ushahidi[2] in 2008 in response to post-election violence. The platform allowed the public to tell and record the story of violence as they saw it from the ground. It has since been deployed in hundreds of different contexts to support community reporting.

Feedback mechanisms are not the focus of this paper; FixMyStreet and Ushahidi are just two illustrative examples of a broader trend that began about a decade ago. Opening up processes to feedback was an important first step, but feedback is just the first generation of projects that leverage open data and information technologies. In fact, lack of response to feedback has plagued this first generation of projects - with more open data and increased community-generated data, institutions often do not have the bandwidth to respond adequately. This paper is more interested in a second generation of projects that has emerged in part as a result of this failure. These projects build on top of open data and information technologies to impact and redefine existing processes. We explore examples of these in greater detail in the next section, but to illustrate the difference consider how FixMyStreet (feedback on urban problems) compares to SpaceHive (crowdfunded urban renewal) and how Ushahidi (feedback on violence) compares to PeaceTXT (crowdsourced peace messaging). The key difference is that citizens are increasingly organizing to take action directly on the data they now have access to.

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[1] https://www.fixmystreet.com/

[2] http://www.ushahidi.com/ Ushahidi means "testimony" in Swahili. It was the first tool of this kind, similar tools such as First Mile GEO (http://firstmilegeo.com) and Elva (http://elva.org/) have since been developed.

We believe this transformation of citizen-led projects is critical as we consider the future of development assistance. As alternative infrastructures emerge that promote citizen-to-citizen solutions, how will institutions remain relevant? Can this alternative method of getting something done not only get it done, but also exert influence on an existing (sometimes broken) method? We believe the future of development lies in citizen-led initiatives that leverage open data and information technologies and work with government and development organizations, not in spite of them. This transformation requires that development organizations work with these newly empowered communities, adapt to the new practices they are using, and learn together to be smart about where and how aid is deployed.

Three Examples: Resources, Narratives and Collective Intelligence

Organizing and leveraging resources

The opening of data can lead to a radical new awareness of the distribution of resources, and generate fresh insights about the demands and needs of potential beneficiaries. The emergence of civic crowdfunding demonstrates that open data can underpin the coordination of individuals and communities into groups that are able to better leverage existing resources and to advocate for more resources to meet their needs. Open data and new data-processing technologies create fresh knowledge that enables communities to understand their current resource position and to organize to improve it. This new potential agency may be particularly potent among underserved and marginal communities who have historically lacked access to resources, and had a limited understanding of both their current capacities and how to improve them.

Civic crowdfunding, the use of online fundraising platforms to build services for communities, such as parks, community centers and educational programs, is founded on open data related to planning processes and land use. Civic crowdfunding platforms provide the infrastructure for individuals and groups to take the insights gleaned from data, collect additional community-generated data and directly influence the shaping of their environment, by building campaigns around the change they would like to see. The UK-based platform Spacehive[3] was one of the first examples of this idea, and has built partnerships between its crowd of users and numerous municipal governments across the country, enabling them to work together on initiatives such as converting underused spaces into community gardens, installing public Wi-Fi networks and opening youth entrepreneurship education centers. These successful implementations of civic crowdfunding projects in turn create pressure for more transparency and openness around the planning process, by demonstrating public demand and appetite to engage with these processes.

Communities, energized by access to data and the ability to work on positive change, are motivated to seek a better understanding of how the processes and institutions that serve them are working – and to contribute to their improvement. ioby,[4] a New York-based civic crowdfunding platform, allows its users

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[3] https://spacehive.com/
[4] http://www.ioby.org/

to volunteer their time as well as make donations, and finds that almost two-thirds of donors do so. In this way, the platform is enabling communities to unearth and to gather a wide range of resources on which they can draw.

The potential to leverage new resources goes far beyond streetscape and neighborhood improvements, and is beginning to gain traction in middle- and low-income countries as an alternative way to tackle pervasive development problems. In Lima, Intercorp launched PeruChamps, a crowdfunding site that enables underprivileged school children to raise money to fund their education, while in Nepal, Possible Health has created Nyaya, a platform that is providing funding for healthcare to some of the country's neediest patients.[5] These platforms are in themselves generating highly localized, small-scale open data about the educational and health needs of their users, and by demonstrating the audience's desire to contribute to these projects, giving impetus to transparency efforts in those countries.

For development organizations, there is a compelling opportunity to partner with the communities and organizations that are advancing this type of work, to leverage the power of networked resource development, and to incorporate it into development assistance programs. There are a number of examples of these collaborations being piloted around the world. The U.S. State Department this year launched a pilot crowdfunding initiative to support 33 previous grantees of its entrepreneurship programs to use crowdfunding to seek second-round funding for their ideas, the first example of government-supported crowdfunding for development.[6] The projects in the initiative include an HIV prevention social marketing campaign in Sierra Leone, a seed fund for female entrepreneurs in Nicaragua, and a social impact crowdfunding platform in Macedonia. Development organizations can also learn from a model being piloted in Kansas City, MO that uses crowdfunding to support cooperation between social impact grantmakers and grassroots organizations.[7] The Kansas City Community Capital Fund, which supports social impact projects among underserved communities in the city, has for the past two years asked its grantees to crowdfund a portion of their total budget, to build fundraising capacity and expertise among those communities. In 2014 all its five grantees met their fundraising targets, with projects including the rehabilitation of a derelict street block, a youth education program and a community garden.

Making space for new narratives

In many developing countries, opening up data on issues of public concern is either not politically viable or, when viable, the available data is of very poor quality. New information technology tools allow civic actors to step into this gap, piecing together what open data is available with their own data. In this way, information technology tools provide new, creative ways for civic actors to foster alternative discourses and challenge prevailing narratives. These new visions can often compete with existing visions by being bolder and engaging more closely with their audience.

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[5] http://peruchamps.org/en; http://possiblehealth.org
[6] http://rockethub.com/projects/partner/socialimpact
[7] https://www.indiegogo.com/partners/ccap

When governments refuse to share data on sensitive topics, citizen journalism and community data collection often fills the gap. In Sri Lanka, Groundviews[8] is a website for citizen-journalists to offer alternative perspectives on governance, human rights, peace building and other issues. The site is credited with being the only source for controversial topics linked to the conflict and the only media outlet regularly challenging attitudes towards peace and conflict. By introducing new narratives, citizen journalism and data collection platforms are contributing to break the deadlock in sensitive situations, challenging public perceptions and shifting attitudes. In the Somali Region, the Puntland Development Research Centre works to engage hard-to-reach communities in Puntland on dialogue about key issues related to peace, civic participation and reconciliation. These dialogues leverage data and technology in two ways: by deploying tech-enabled participatory polling to collect data on public perceptions and by using mobile film screenings to inform people and begin transformative conversations.[9]

At times, the creation of new narratives is a catalyst for community advocacy. In India, the I Paid a Bribe[10] movement encourages individuals to publicly report when they have paid a bribe or refused to pay a bribe. The campaign has received nearly 30,000 reports since its inception. The campaign website has become a reference point on information about the correct administrative procedures, slowly building an anti-corruption movement from the ground up. The campaign has also used data collected to lobby the Government on corruption issues. In Kenya, Muslims for Human Rights (MUHURI)[11] organizes social audits to monitor projects funded through Kenya's Constituency Development Fund (CDF).[12] MUHURI used open data available from the government to identify key implementation problems (inflated costs, irregularities in bills, preferential selection of contractors), and then collected information during project site visits through both physical verification and interviews with local people. The results of this social audit were shared in public hearings that brought together thousands of local community members and local Members of Parliament, allowing a dialogue to begin on local corruption issues.[13]

Development organizations are often supportive of initiatives that use data and technology to make space for new narratives. Groundviews has been supported by the Ford Foundation.[14] The Puntland Development Research Centre receives funding and technical support from Interpeace.[15] MUHURI receive similar support for their social audit work from the Open Society Foundations.[16] The growth in

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[8] http://groundviews.org/

[9] Nordstrom, "Tailored Technology for Peace", *Building Peace*, 07/2014.

[10] http://www.ipaidabribe.com/

[11] http://muhuri.org/

[12] The CDF provides every Member of Parliament with $1 million dollars per year to spend on poverty reduction projects. On paper, the CDF is structured to involve communities in the selection of development projects and management of project funds. In practice, MUHURI found the fund's management was shrouded in secrecy and inaccessible to community members.

[13] "Community Monitoring and Participatory Auditing", Open Society Foundations, 2009.

[14] http://www.fordfoundation.org/

[15] http://www.interpeace.org/

[16] http://www.opensocietyfoundations.org/

new civic narratives based on open data and information technology tools provides an opportunity for development organizations to increasingly seek out and support these initiatives as the foundation of grassroots social change, which provide a better understanding of how aid can be most valuable in a given country.

Working from a place of collective intelligence

Collective intelligence posits that shared or group intelligence emerges from collaborative data sharing, and results in a shift of power from the individual to the collective. Critically for our discussion, collective intelligence is enabled by group processing of information, which is only possible when data is open and networked information technologies are available. It is this networked processing of information that both enhances social knowledge and expands group interactions. By empowering groups to take collective action and engage in consensus community planning, collective intelligence has the potential to change development processes.

The ability to share information with more people can help achieve more effective and creative solutions for collective action on the toughest development problems. The Sudanese Development Initiative (SUDIA)[17] works with conflict-prone communities along migratory routes in Darfur, and has identified that enhancing information flows along the routes can help prevent conflict by allowing for collective early responses to emerging tensions. The NGO has been running a community communications system that combines SMS and radio to share information along migratory routes in Darfur, and has recorded the overwhelmingly positive experiences of collective action that emerge from this shared information source.

Just as collective intelligence can help positive collective action, so it can aid violent collective actions: calls to violent action spread fastest over mobile phones and the internet. In Kenya, local peacebuilders are using the same tools as violent groups to counter negative campaigns by mobilizing collective expression of positive messaging. NGO Sisi Ni Amani[18] runs the PeaceTXT program, which aims to contact people in at-risk areas in order to propose a moment of reflection at critical times when calls to violence are spreading. Community informers identify such critical times and report to the Sisi Ni Amani team, who then send out a targeted SMS to interrupt escalation. The use of collective intelligence to alter attitudes in critical times is not limited to peace messaging. Games for Peace[19] works with with teenagers in Israel and Palestine to collaboratively build peace villages on Minecraft. Like other collaborative online games, Minecraft depends on collective intelligence to expand. Even though the outputs are produced in the confines of a fantasy game environment, Games for Peace nevertheless demonstrates the power of bringing together the collective knowledge of Israeli and Palestinian players together through a game to imagine a joint future.

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[17] http://sudia.org/
[18] http://www.sisiniamani.org/
[19] http://gamesforpeace.org/

Collective intelligence does not just support response to conflict crises, it can also be the foundation for community planning. In Sudan, UNDP's Crisis and Recovery Mapping and Analysis (CRMA) project opened up the data held by all UN agencies operating in Sudan. This was the first time that all UN data was turned into open data in a country. The project then ran participatory mapping processes in communities across Sudan to compare local perceptions of development challenges against this open data. The overlays and comparisons were shared with local communities and State Governments, leading to the first participatory process for development of State Strategic Plans.[20]

For development organizations, there is an opportunity to build more robust interfaces between collective awareness projects like the ones described above and existing development assistance processes. Work is already underway in this direction. For example, PeaceTXT shares its data on community tensions with Kenya's national Conflict Early Warning and Early Response Unit in the Ministry of Interior. Information sharing as a good first step, but does not integrate grassroots collective action with institutional interventions. The experience of CRMA points the way for participatory processes where communities both inform development planning and collaborate with institutions to find and implement development assistance solutions.

The Emergence of Alternative Infrastructures

The examples described above highlight an emerging trend: open data and information technologies encourage decentralization and distribution of knowledge. This trend is important for three reasons, which extend far beyond data and technology alone. First, distribution of knowledge creates the space for openness and transparency. As citizens organised around social audits in MUHURI's campaign, it became impossible to hide corrupt practices in the closed processes and budgetary tricks of an implementing agency. As citizens make use of crowdfunding platforms to understand local problems and propose solutions, it becomes impossible for central planning agencies to ignore the needs of marginalised communities. If we know that corruption and neglect of marginalised groups are most likely to occur in systems where information is tightly controlled, projects to promote governance should seek to be closely connected to its stakeholders, highly flexible and transparent.

Second, it enables knowledge and ideas to reach and circulate among populations in ways that are meaningful and durable. The power of decentralised data sharing is evident for example in how quickly hate speech and calls to violence can spread over online media. PeaceTXT was set up in direct response to this insight, using the same technique (viral text messages that are shared) as they had observed radical groups use to incite violence. If the most effective forms of hate speech are those are easy to replicate and share, so are the most effective forms of messaging for positive behavior change.

Third, it allows us to build organizations that function like networks - that use open data and information technologies to remain responsive to circumstances and to empower many individuals to

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[20] Indreboe Alshaikh and Puig Larrauri, *Building Resilience Through Crisis Mapping, Community Engagement and Recovery Planning in Sudan*.

take independent, creative action towards a shared goal. There is great power in organizing in this way, as is demonstrated for instance by the use of decentralised, network-based data technologies by violent non-state actors. The Islamic State of Iraq and Syria (ISIS) actively recruits on social networks, using a plethora of Twitter accounts to get out its message. When Twitter recently moved to ban accounts associated with ISIS, its activists quickly moved to the open-source, decentralised social network Diaspora.[21] The Syrian Electronic Army or Syria Hackers Army is a collection of computer hackers who support President Bashir Al-Assad (and are allegedly supported and organized by his Government). These hackers use a number of techniques, mostly defacement of websites and denial of service attacks, to target news websites, human rights websites and online applications that can help anti-government activists. If some of the most dangerous groups in the world are using decentralisation powered by information technologies to leverage a multiplicity of parallel actions in their favor, then peacebuilding should not seek to impose singular ideas or processes either.

As citizens realise the creative power of decentralised structures that leverage open data and community-driven data, supported by technology, they are taking action in ways that seem to challenge existing organizational models. In other words, we are seeing the emergence of alternative infrastructures: new methods and practices being created by groups for whom existing methods are not working satisfactorily. What do we mean by infrastructure in this context? Daniel Kreiss describes infrastructure as "the technical artifacts, organizational forms, and social practices that provide background contexts for action."[22] In other words, it is a mix of technical, organizational and social factors that come together to provide a basis for action, and a framework for getting things done. Some of the features of these alternative infrastructures that help us to identify them are the fact that they grow organically, tend to be ad-hoc and temporary in nature, have distributed decision-making processes, and are transferrable across cultural contexts. The three types of examples described above, which produce resources, narratives and collective intelligence, share these features, and are mostly occurring outside established processes. They are providing networked and decentralized alternatives. At the same time, they are beginning to exert some pressure on those established processes and influencing stakeholders, but they remain fundamentally outside the sphere of established ideas.

From Alternative Infrastructures to Complementary Infrastructures

Thus, the examples described in this paper highlight an emerging and fundamental tension between these alternative infrastructures and existing institutions: while open data and information technologies are encouraging us to decentralize and distribute knowledge, many of our most important civic and development organizations remain highly centralized. How can a decentralized model of citizen action for local development interface with a centralized model of citizen engagement for development assistance? Is it possible to take these alternative ways of doing things, and enable them to grow into complementary infrastructures, that supplement and inform incumbent ones?

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[21] Cook, "ISIS Takes to Crowdfunded Social Network After Twitter Bans Graphic Images", *Business Insider*, 08/21/2014.

[22] Kreiss, *Taking Our Country Back*.

We would argue yes, given the right level and type of engagement from the owners of incumbent processes and infrastructures within the field of development assistance. Organizations are beginning to value and incubate community-led development efforts, to bring the narratives that are emerging from within communities into program development conversations, and to allow the collective intelligence that is being created at the grassroots level to inform decision making. But these efforts are in their infancy, and need to be built up dramatically. Indeed, if thinkers such as Clay Shirky are correct, it may be very much in the interest of incumbent institutions to begin this conversation, since the emergence of networked society points, in the long term, to the decline of large institutions.[23] This does not suggest that large development organizations will disappear, but it may mean that the future of development assistance will not consist of constructing large, monolithic bodies to meet the world's needs. Instead we may look to a future that is built on an open ecosystem of practices and ideas that supports a diverse range of initiatives, and emphasizes transparency, collaboration and responsiveness among all stakeholders. This may seem like a uncertain, radical future for some, but it is the natural corollary of giving millions of people open access to data, and the ability to generate and share it. The development sector should embrace these changes and seek to grow in tandem with them.

To be sure, the future that open data and community-driven data action promises also presents three important challenges that the development sector will need to address. First, the spreading of resource opportunities creates the potential for great inequalities in the use of those opportunities. Large online open markets are often highly 'skewed' and organized in Pareto distributions – in other words, the majority of the resources are concentrated among a small percentage of participants.[24] We might assume that, for instance, in the case of civic crowdfunding, well-resourced communities may be better placed to take advantage of the opportunity to develop further resources and to advocate for their interests. There is therefore an important role for development organizations to play in incentivizing the use of these opportunities by the communities that could most benefit from them. One example of this is match-funding of crowdfunding campaigns by mission-driven organizations, such as the Kapor Foundation's contribution to a campaign by Black Girls Code, which trains young African-American women to be software developers.[25]

Second, the proliferation of opportunities for individuals to create new narratives and highlight fresh stories may lead to the fragmentation of narratives in a given situation. Participants and stakeholders alike may feel confused by the array of voices that they are hearing, and have difficulty judging the veracity and strength of different arguments. This is a challenging issue, but it is also not a new one, since every community and context has a plethora of competing and conflicting narratives. While in the past these narratives may have been parsed and simplified by particular actors (often with the best of intentions), their true complexity is no longer hidden by these processes.

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[23] Shirky, *Here Comes Everybody: The Power of Organizing Without Organizations*.
[24] See Davies, *Civic Crowdfunding: Participatory Communities, Entrepreneurs and the Political Economy of Place*, and Agrawal et al., *Some Simple Economics of Crowdfunding*.
[25] James, The Ultimate Matching Grant, *Philanthrogeek*, 08/22/2013.

Third, in repressive societies, it can be difficult for citizen-led initiatives to complement and work with existing institutions. In these contexts, alternative infrastructures that push for democratic change can be highly destabilizing, yet encouraging them to become more stabilizing, complementary infrastructures may be meaningless to social change if rights and freedoms are not being respected by institutions. This may at times require civic actors to continue working through alternative infrastructures and accept temporary instability in the pursuit of positive social change.[26]

Understanding the mechanisms by which open data and information technologies affect development processes at the community level is not an academic endeavour. It is critically important to development programming and to the future of development assistance. As communities build on open data, generate their own data, and build on both to create new means of development, civic engagement and social impact, the picture for the field of development becomes inexorably more complex. It also demands greater responsibility and engagement from development professionals to understand the changing landscape, to incorporate new practices, and to help co-create the new future of development with a broader-than-ever set of stakeholders. The future of resources, narratives and collective intelligence described above points to the emergence of a new type of citizenship, more concerned about fostering relations and taking action with other citizens than building relations with organizations and participating in institutional processes.

Recommendations for the Future of Development Assistance

The challenge for development organizations to remain relevant is to transform the development project "marketplace" to value alternative, citizen-led networks of action. This is challenging because in order to engage with them development organizations can no longer be in the driving seat - they need to learn to allow citizens to shape priorities for development assistance to a greater extent than they already do and focus programming efforts on creating an enabling environment for this to happen in a constructive and democratic manner. Based on our analysis of the transformations underway, we recommend five approaches for the future of development assistance.

1. Commit to participation in funding decisions
An important way for development organizations to allow the collective intelligence that is being created at the grassroots level to inform programs is to open up funding decisions. Too often, development organizations set funding priorities at a central level, dictating what programs local organizations should design through detailed calls for proposals. Moving from calls for proposals to open calls for ideas or responses to broad challenges will allow development organizations to introduce flexibility to funding, with priorities defined or changed by collective processes. Development organizations can leverage emerging crowdfunding platforms and civic challenge competitions to this aim.

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[26] Thanks to Amy Noreuil for first pointing out this distinction between alternative and complementary infrastructures.

2. Invest in scale

When development organizations identify innovative practices at the grassroots, they often provide seed-funding for pilot activities. Very rarely do they go on to fund scale-up. Scaling-up a community-led effort entails risks (some will surely fail as they scale) and requires giving up control of programming to a greater extent than most organizations are used to. Yet in order to truly value and incubate community-led development efforts, investing in scale-up is critical. Development organizations can learn from the practices of private markets to assess risk and accept failures as part of an organic process.

3. Engage with existing dialogue

Many development organizations are leveraging open data and information technologies to organize dialogue on critical development issues. However, most of these efforts aim to bring communities to a dialogue managed by an institution. This approach foregoes the richness of dialogue already happening organically. Development organizations should aim to bring the narratives that are emerging from within communities into program development conversations, leveraging existing community platforms rather than creating their own.

4. Work with iterative processes

Alternative infrastructures that tackle development issues grow organically, tend to be ad-hoc and temporary in nature, and have distributed decision-making processes. These three characteristics make it challenging for development organizations to engage with them. Many calls for proposals require that an organization exist as a legal entity, often with requirements on the organization's length of existence (e.g. minimum 3 years). Successful community movements are very different, often iterating through different organizational forms quickly to suit the needs of a specific objective. Development organizations should find ways of working with less formally established groups, working to reformulate grant-giving procedures.

5. Build an open ecosystem

Although all development projects are highly context-dependent, many alternative infrastructures are transferrable across cultural contexts. There is an important opportunity for development organizations to help build an open ecosystem of practices and ideas that supports a diverse range of initiatives. Development organizations are uniquely placed to connect citizen-led initiatives across the globe, thus supporting transparency, collaboration and responsiveness among all stakeholders. Development organizations should refocus their approach to act as the connective tissue of a network, rather than set priorities through a funding hierarchy. Ultimately, the future of development assistance will be defined by highly localized initiatives networked globally by this connective tissue.

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