The Global Village Development Bank

financing infrastructure at the individual, household and village level worldwide

If the World Bank was being created at the dawn of the 21st century, how would its basic model and operations differ from the mid-20th century institution which supports projects worldwide today?

The Changing Technological Landscape

Since the foundation of the World Bank, two significant development have affected infrastructure financing. The first is the development of *distributed infrastructure* (DI) - a library of technologies and techniques which provide the same class of services that are provided by centralized systems like the water and power grids, but without the massive centralized investments in physical plant. For example, dry toilets and solar panels can provide high quality services household by household without a grid. The second development is *information and communications technology* (ICT) which enables organizations to span continents with ease, and makes the details of project progress accessible from the other side of the world, given a satphone and a camera.

There is a natural fit between distributed infrastructure and ICT. Keeping track of hundreds of thousands or tens of millions of small infrastructure projects would be impossible with conventional paper record keeping. Analyzing which systems will work best in a given climates is difficult for solar and wind, but is easily automated. Digital mapping technologies enable overviews of structural and society-wide progress in service provision. On the other hand, in a digital world, progress and change come faster than ever. The *stability* required to finance an infrastructure project with a 30 year payback period exists almost nowhere in the world today, as the political situation, energy policy and technology, global governance and other factors move the landscape. What constitutes a good investment in a fast world?

Small scale, low cost infrastructure projects have often been seen as less “efficient” than large scale megaprojects. However, as *Small is Profitable* (http://smallisprofitable.org) conclusively demonstrates, this is largely because different accounting practices must be used to fully reveal the value of small scale projects. Large scale project accounting practices work for comparing one large project with another, but small projects have very different dynamics. The *economies of agility* which go with small projects protect against all kinds of risks, but particularly against systemic risks. A large dam project must be completed to give service, and if something in the environment changes half way through the project, there is little hope of adapting the project to the new circumstances. The entire risk is assumed at the start of the project, based on long term projections about the future in many different domains, from energy demand through to geopolitical stability. On the other

hand, an array of micropower projects could provide equivalent electrical services, and as the projects are each built, continuous assessment of the "right next move" can be made to suit learning from previous projects, response to changing demand, adoption of improved technologies or shifting priorities. Fundamentally, half a dam is no dam at all, but 500 of 1000 small projects is half way to the goal. A modular approach to infrastructure in an uncertain world just makes sense.

Furthermore, in chaotic areas and areas of low population density, large scale infrastructure projects are simply not an option. Few recommend megaprojects for rural areas or (post-) war zones. But microprojects can efficiently reach into these areas, providing services one village or one home at a time without the unbounded risks required by projects which must be large, or not exist at all.

The Potential for Innovation in Infrastructure Financing

Imagining a financial institution - a *Global Village Development Bank* - which understands DI and ICT at a profound and instinctive level is not a simple undertaking. There are three profound shifts from conventional practices which must all be implemented simultaneously to even dream of creating an effective institution.

The first change is in the nature and scale of the projects to be financed, and how they are understood. *Triple bottom line* accounting practices must be applied at every level of this venture. A water project in Africa generates not only financial returns on investment, it saves lives, and both of these truths must show on the balance sheet. A million small stoves in Bangladesh impacts household economies, but also global climate. Triple bottom line (planet, people, profit) reveals these aspects of projects. The projects themselves are likely to be surprisingly simple in most cases: dig a well, train villages in integrated solar cooking, set up local manufacturing of efficient stoves. To account such small projects as *infrastructure investments* is the key to actually raising funds to pay for them. A million stoves is an energy investment just as important as a nuclear power station.

The second change is in risk management. Nobody can afford to hire expensive technical consultants to oversee each one of these hundreds of thousands of tiny projects. Rather, a combination of technical expertise and local knowledge about those undertaking the project must be combined to assess the technical risk and implementation risk of *entire classes of projects at once.* Each of a class of Namibian well projects is similar in some ways. The implementation team is known. Combined, these factors give rise to a degree of confidence in the project outcomes. Many small projects allow for statistical analysis of project performance, and for systematic investigation into factors which affect project success. Because each project is small, and they occur in generations, project methodologies or funding decisions can be adjusted depending on performance data from the field: in short, what does not work can be defunded before more money is wasted, and what works can be allocated those funds. In the limit, this kind of find tuning can be done day-by-day.

Another factor to consider is who makes the decision: pooling funds into a single bucket which is managed by experts is efficient on paper, but in practice this approach has not proven able to meet the challenges of funding DI. Processes like Kiva (http://kiva.org) allow each investor to manage their own portfolio of

humanitarian investments and, with expert advise and good tools for visualization of project outcomes, this approach is likely a much better fit for massive funding of distributed infrastructure projects. Precisely how to facilitate expert input into these processes without overwhelming investors is an open question, and a critical one as we attempt to pair investor empowerment with systematic performance analysis.

The third change relates to ICT. Ronald Coase and Yochai Benkler have examined, from slightly different angles, how increased access to information at lower and lower costs changes the relative efficiency of different kinds of enterprises. The general trend is that in cheap-information environments, networks of small enterprises form efficient markets and provide services in aggregate. In expensive-information environments, larger organizations form to amortize the cost of understanding the environment and making decisions. The modern world is an almost quintessentially information-cheap environment, and service provision networks are ubiquitous in many areas, from franchising through to software ecologies like Linux. Enterprises like the Grameen Bank, Kiva and Akvo (http://akvo.org) all examine, from different perspectives, how financial architectures which make full use of ICT and provide services in the developing world at a scale and cost which makes sense. Global Village Development Bank might be a series of legal agreements and software protocols which create a similar business process to the World Bank, but as an interaction between tens or hundreds of millions of people, providing capital, maintaining software systems, implementing infrastructure and development projects, objectively reporting on performance, monitoring risk and ensuring efficient allocation of capital in triple bottom line terms. Streamlining transaction costs has three parts: reducing the cost of making an offer, reducing the cost of making a decision, and reducing the cost of acting on an offer. Each one of these costs can be reduced by ICT.

Furthermore, the governance and policy problems associated with centralization of capital resources may turn out to be soluble in transparency and decentralized decision making. Far more numerous decision-makers are much harder to corrupt, for example.

A global financial architecture like the one described here might not be immediately recognizable as a development bank. However, the essential function of capital management clearly does not require a single monolithic command-and-control structure in a networked world. A networked approach to capital management - a distributed bank which understands and financed distributed infrastructure - is a plausible equilibrium state for infrastructure financing in a cheap-information environment.

Current Examples

Akvo is a charitable foundation which produces software to help small-scale water and sanitation infrastructure projects find funding. They epitomize several aspects of decentralization in their business process, including allowing investors to manage their own portfolio of projects to suit their risk and other preferences. They collaborate closely with a variety of partners to raise awareness, funds, to implement projects on the ground, and to report on the fundamental success or failure of individual projects within their whole portfolio of projects. The network-centric

approach to infrastructure financing allows for buildups of local knowledge and expertise in financing specific technologies. However, Akvo only coordinates grant funding, not loans, and is focussed heavily on water and sanitation technology rather than operating as a more generalized capital market.

However, Akvo's success is strong support for the notion that a decentralized infrastructure can be funded by decentralized finance. The network-centric nature of day-to-day operations (Akvo's founders work from four countries, and the organization has partners in dozens more) is a further testament to the effects cheap-information environment on financial institution design.

Conclusion

Re-imaging how to provide capital to those who need it to improve their lives is a critical issue for the 21st century. The first real breakout methodology was microfinance, which essentially lends against social rather than financial capital and works because of the astonishingly large number of poor people who pay back their loans. But microfinance is hard to apply to infrastructure because the municipal bureaucracies which take out loans on behalf of people in developed world municipalities simply do not exist in the developing world, and if they did, they would usually not be regarded as credit-worthy. Decentralizing infrastructure to the household level might reduce barriers to infrastructure investments for some kinds of services. ICT can help in other areas.

The challenge is to imagine full end-to-end decentralization in infrastructure, including financing. Every step can be decentralized, from raising the capital, allocating it to loans or triple-bottom-line investments, deploying the infrastructure systems, repaying the loans and measuring the impacts. The largest benefits of re-imagining how we do development financing may be what we currently call intangibles: better responsiveness, building of relationships between people all along the supply chain, understanding where our money is at work and what it achieves. There may be unexpected payoffs in resilience, in international relationship building, and in reductions in corruption through increased transparency.

The beginnings are all around us. The question is how to scale these seedling efforts, learn from them, and deploy them globally.