

Introducing the Smart Villages Concept

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Many argue that the developing world is exposed to the impact of climate change in two ways. Geography, exacerbated by economic weakness, has left many countries vulnerable to climate extremes and natural disasters. Additionally, much of the developing world faces an opportunity cost for climate resilient low carbon growth and socio-economic development in comparison to established economies, which were able to utilize fossil fuels freely to support their development.

Nearly 1.3 billion people across the globe remain without access to electricity today and will find it challenging to achieve parity of development should they follow conventional models of development. Many such communities are often situated in remote areas, far away from urban centres and beyond the reach of national grid extensions.

However, an exciting tranche of recent innovations in finance, renewable energy, Information and Communication Technology (ICT), mobile healthcare and biotech offer a unique opportunity for those 1.3 billion individuals to bypass the highly centralized and gas-guzzling model used by the established economies. In short, sustainable rural development can offer considerable advantages over historical approaches, reaping benefits for a demographic comprising 70 per cent of the world's poor.

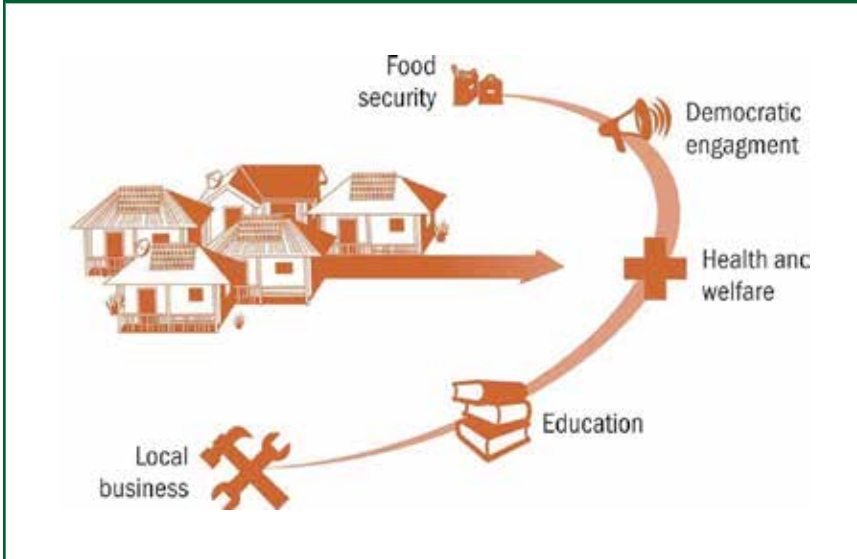
The 'smart village' is a model in which, energy access acts as a catalyst for a range of development outcomes. If managed correctly, technology 'leapfrogging' could lead to rapid improvements in healthcare, nutrition, education, and economic security. Villagers could thus have the opportunity to capture many of the benefits of urban life while retaining valued aspects of rural life, and ensuring balanced development at a national level.

Villagers can be empowered to realize their unique ambitions by picking and choosing the aspects of modernity they wish to incorporate into their communities. In doing so, they can take control over their own future, giving them a real choice between life in a city or a smart village. Residents would consequently be able to

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Figure 1: Access to energy can catalyse a range of development outcomes



lead healthy and fulfilling lives, achieve their development potential, earn a viable living, and stay connected to the wider world.

This model must consider not just the potential outcomes, but practical ways of sourcing, financing, and sustaining the requisite energy generation. Fortunately, in many off-grid locations, renewable energy is increasingly seen as the most practical and economic option. For example, the increasing cost-effectiveness of photovoltaic-based technology applications and further scope of small hydroelectric resources offer development models involving new forms of energy generation.

Sustainable energy access can enable the provision of good education and healthcare, access to clean water, sanitation and nutrition, the growth of productive enterprises to boost incomes, and enhanced security, gender equality, and democratic engagement. This vision is not without pitfalls. History is littered with expensive and ultimately flawed attempts by governments and development agencies to parachute infrastructure or technology into underdeveloped rural communities. Many of these actors have yet to realize the potential of energy access to transform lives and fail to take simple measures to promote progress. The Smart Villages Initiative aims to mitigate these difficulties.

Our three-year ‘smart villages’ project (www.e4sv.org) will collect, analyse, and apply good practices and expertise from around the world on how sustainable energy can catalyse development. This collected knowledge will be presented directly to policy-makers and funders, enabling them to support and promote sound interventions.

One early finding of our investigations is the importance of supporting local enterprise. Entrepreneurial ambition is both a driver and an outcome for the development of functioning smart villages. Small businesses generate not only wealth and employment but also demand for energy. Local entrepreneurs are also the best people to take ownership over power generation schemes and ensure that they are supported and maintained.

The ingenuity of the Maasai in Terrat in northern Tanzania is a notable success story. The village has built a 300 kW diesel-generating plant, fuelled by biofuel produced from locally grown *Jatropha*. The generator supports a mini-grid, which supplies electricity over 100 households, a radio station, a dairy, a village training and social centre, and several small shops and workshops. The social impact of the scheme has included improved health and new opportunities for income generation, giving to villagers reasons to stay within the community.

Exhibit A: A stable power supply in Terrat has allowed local business, such as this small workshop, to flourish



Exhibit B: The village micro-grid is powered by a 300 kW biofuel generator fuelled by locally grown *Jatropha*





Introducing regulatory frameworks and financial instruments that support innovation and enterprise will be instrumental in promoting similar examples of sustainable rural development. The smart village model offers a unifying framework that is also flexible enough to allow for different development pathways for a multitude of diverse rural communities. In turn, the smart village vision is potentially the key to achieving the post-2015 development agenda and the UN target of sustainable energy for all by 2030.

By maintaining an inclusive network of stakeholders, ranging from governments, international development agencies, local NGOs, and the villagers themselves, the Smart Villages Initiative can facilitate vertical information exchange. The benefits of integrating knowledge across this spectrum are potentially significant, merging practical insight with strategic vision, all the while keeping our feet on the ground. By working closely with networks of science academies in each region, we also ensure our briefs are held to academic standards of rigour and are influential at a high level.

The global scope of our engagement also provides a rare opportunity for information exchange between disparate regions. To date, Smart Villages has held workshops in East Africa and Southeast Asia. More workshops and other engagement activities are planned in South America, Central America, South Asia and West Africa.

Whilst our vision may be ambitious, we believe that with broad engagement, and support from key institutions, governments, and media outlets it is eminently achievable. Most importantly, this model of sustainable development has the potential to significantly improve the lives of village communities worldwide and help ensure a sustainable future for everyone.

Acknowledgements

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