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Accelerating Climate Resilient Entrepreneurship and Innovation

Jacob Park
Professor of Strategy, Innovation,
and Entrepreneurship (as of Fall 2016)
Green Mountain College
One Brennan Circle
Poultney, Vermont 05764 USA
E-mail: parkj@greenmtn.edu

Many clean energy (including solar, biomass, wind, etc.) and climate smart agriculture enterprises (including drip irrigation, precision agriculture, etc.), particularly those operating in the developing world, never get off the ground or do not effectively scale because traditional sources of capital like banks tend to shy away from sectors that seem unfamiliar or too risky. This is unfortunate because with the growing threats posed by climate change and food & natural scarcity dilemmas intensifying around the world, it is imperative that the international community meets the basic human needs, particularly at the base of the pyramid marketplace, without exhausting our finite resource base.

In response to this integrated social, environmental, and market challenge, there is a critical need for the business sector, in consultation with governmental and nonprofit/philanthropic sectors, to respond strategically by capitalizing on entrepreneurial, innovation, financial, and mobile technology trends to design, develop, and scale clean energy and climate smart agricultural enterprise development (or what I refer to collectively as "climate resilient entrepreneurship and innovation") in emerging market economies.

Based on a multi-year research project exploring clean energy and climate smart agriculture entrepreneurship, finance, and innovation in sub-Saharan Africa, Asian, and Caribbean countries/regions, a key objective of this paper/presentation seeks to better connect the theory and practice of climate resilient entrepreneurship and innovation in emerging market economies.

Understanding the emerging market context for climate resilient entrepreneurship and innovation

According to Henderson and Newell (2011), an innovation ecosystem needs to have the following three elements: (1) the substantial, differentiated, end-user demand that enables private firms commercializing the technology to anticipate healthy returns; (2) the sustained funding and effective management of fundamental research; and (3) the development of an institutional environment that includes robust mechanisms to promote the widespread diffusion of both knowledge and technology and that favors vigorous private-sector competition.

While these three elements may be common in OECD industrialized economies, what are their implications for emerging market economies (EME) in sub-Saharan Africa, Asia, Latin America, and other EME regions?

Franz et al (2015) argue that entrepreneurs and small-scale startups associated with climate resilient entrepreneurship and innovation and encounter more complex and multifaceted challenges as compared to OECD developed markets. Climate resilient entrepreneurs and innovators are faced with a set of difficult questions when trying to scale agricultural innovation for climate insecure farmers and energy access for energy poverty stricken population. To address this dilemma, a new analytical framework (see **figure 1**), which can highlight the right entry points and enabling environment that make implementation through both private and public sector delivery models, is needed.

This new analytical framework consists of three different levels. Level 1 is composed of the market value chain, which includes manufacturing, power generation, establishment of distribution networks, retail sales of energy services and energy consumption. Operation, management and maintenance are often weak links in climate resilient market development in emerging market economies. Level 2 is composed of inputs, services and finance provided by the local labor market, and finance from domestic and international sources (Franz et al 2015).

Level 3 is composed of what may be best described as the "enabling environment" including energy tariffs, development plans, quality-control regulations, energy-related economic regulations, fiscal regulations related to fuels and appliances that are often beyond the scope of control by the clean energy entrepreneurs themselves. Local social and cultural factors, including energy literacy and cooking habits, can also shape the overall clean energy markets in many important ways (Franz et al 2015). Using the analytical framework proposed by Franz et al (2015), the following three key insights and lessons can be highlighted in terms of designing and scaling a climate resilient entrepreneurial and innovation ecosystem in emerging market economies.

To design and develop a viable climate resilient business model, strategic market interventions need to be made in the entire spectrum of the climate resilient entrepreneurial and innovation value chain

For a climate resilient business model to be viable in emerging market economies (EMEs), effective market interventions need to be made in the entire spectrum of the business value chain, including fuel, design/R&D, production, marketing, sales & distribution, billing/ payment methods, consumer finance, and after sales support service.

Even if a well-tested climate resilient business model can be found, many EME-based entrepreneurs and innovators lack the knowledge, financial resources, and organizational capacity to recruit, hire, and retain the necessary team to implement the business model. Entrepreneurs and innovators who operate in the climate resilient market space in EME countries find themselves struggling to balance the many and varied responsibilities of finance, marketing, billing, and research & development.

While the problem of management undercapacity is not unique to EME entrepreneurs and innovators, the challenge of recruiting, retenting, and managing the necessary talent pool represents a critical yet underexamined management issue in the social and environmental entrepreneurship research literature.

Although the access to finance has improved in recent years, it is unclear whether and from whom climate resilient entrepreneurs and innovators will be able to find the necessary investment capital to start and/or to expand their business ventures.

Most notably, certain types of climate resilient market investments have been increasing and getting more attention. For instance, in collaboration with the African Development Bank, African Union announced a $20 billion plan to build 10 gigawatt in renewable energy capacity in Africa by 2020 (Hirtenstein 2015). Overall, $25 billion investments have been made in the renewable energy market development (excluding large hydro) by the second half of 2015, while the regional clean energy capacity almost doubled in 2014 as compared to investment levels in 2013. These investments have allowed countries such as South Africa, Kenya, Mozambique, and sub-Saharan countries to build a new renewable energy infrastructure and to address their low electrification rates (Climatescope 2015).

However, progress has not been evenly spread across the 19 African countries that make up the sub-Saharan African region. Most notably, South Africa accounts for over $16 billion of the region's clean energy investments, while Kenya has received $4 billion. After Ethiopia ($1.8 billion), no other country has attracted more than $500m cumulatively. In addition, South Africa and Kenya have also had more success in attracting larger clean energy projects than building a broader pipeline of smaller, entrepreneurial clean energy projects (Climatescope 2015).

Moreover, the recent increase in clean energy investments obscures the policy and market challenge of providing access to electricity and other energy services. Even for those that do have electricity access in sub-Saharan Africa, average residential electricity consumption per capita is still equivalent to around half the average level of China or one-fifth of Europe. Most critically, very little of the clean energy investments SSA region has received in recent years targets the 730 million rural and urban poor population in the region who rely on the traditional use of solid biomass for cooking. Each year nearly 600 000 premature deaths in Africa can be attributed to household air pollution resulting from the traditional use of solid fuels, such as fuelwood and charcoal (IEA 2014 and IRENA 2013).

Developing a robust institutional environment that fosters climate resilient entrepreneurship and innovation is going to require greater as well as more effective public, private, and civil society collaboration.

One of the most intractable debates in the international development field centers on the scope and boundary of the role local public sector and civil society actors should and need to play in fostering community development. Specifically, how can a more participatory approach to community development produce a more sustainable and positive socio-economic and institutional change as well as more effectively harness civic capacity in respond to systematic failures in governmental and civil society failures (Mansuri and Rao 2013)?

Institutional capacity that is necessary support market innovation and new venture development is weak in EME countries and regions. This is a key reason why only a multi-sectoral, collaborative approach to climate resilient entrepreneurship and innovation, as well as the more traditional public-private partnership, has any chance of market success in EME countries and regions. To put this in the form of a more direct question, what "blend" of policy framework, community engagement, and market strategy can most effectively scale climate

resilient entrepreneurship and innovation, and at the same time, “solve” the deep socio-economic poverty issues in EME countries and regions?

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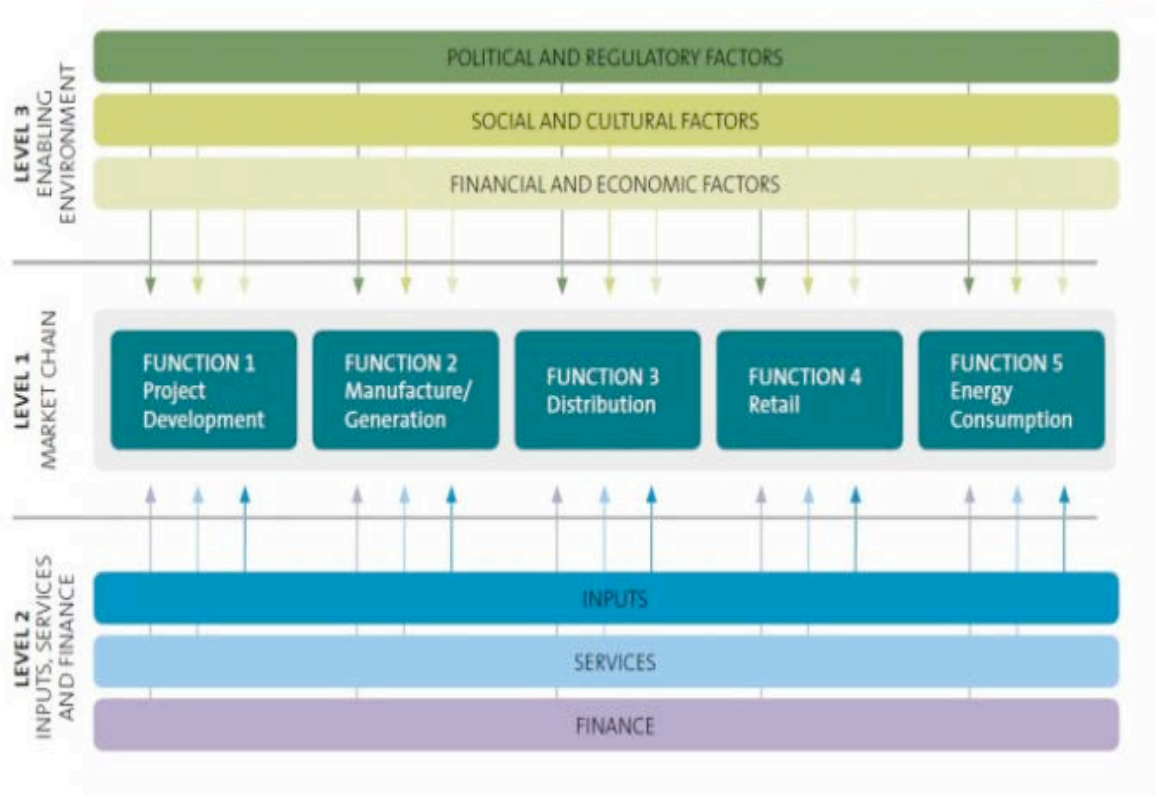
Figure 1

Building Energy Access Markets in Emerging and Developing Countries Markets Analytical Framework



Source: EU Energy Initiative Partnership Dialogue Facility and Practical Action (2015) Building Energy Access Markets A Value Chain Analysis of Key Energy Market System