



# Evidence based knowledge: 5 policy recommendations for enhancing Science, Technology & Innovation for Sustainable Livelihoods initiatives

## POLICY BRIEF

In 2001, the Department of Science and Technology (DST) began supporting various community-based technology and skills transfer projects with the aim of contributing to poverty reduction and job creation. The DST is well positioned as a key promoter of poverty-alleviation applications of science and technology through demonstrating technology transfer and building models that other agencies could use in their poverty alleviation efforts. In the 2012/13 financial year, DST broadened its objectives from a narrow 'demonstration' focus to focusing on how it can best support a deeper appreciation and inclusion of technology opportunities and choices to contribute to national development objectives. The DST has thus changed its focus to policy learning, policy advice, scaling-up and diffusion of pro-poor and poverty-alleviating innovations, and pro-poor strategies in science and technology policy as an option for creating jobs and contributing to reducing inequalities and alleviating poverty in rural communities.

To this end, the DST has over the years invested in a number of agriculture, aquaculture and agri-processing projects implemented by knowledge partners like the Agricultural Research Council (ARC), the Council for Science and Industrial Research (CSIR), the University of Stellenbosch, the Vaal University of Technology and Sasol ChemCity. Located mainly in poor rural communities across South Africa, these projects seek to stimulate some economic activity through transferring existing technologies, generating new technical know-how as well as applying different types of innovations in order to create jobs as well as to stimulate commercial community enterprises. Some of these projects were funded through the European Union Budget Sector Support initiative.

Following from the policy dialogue held on 25 April 2013 involving policy makers, researchers, local and international practitioners and advisors to discuss the results and the implications of the DST sustainable livelihoods initiatives for policy development and implementation, this policy brief has been developed. Five policy recommendations emerged from the discussions and two models are shared.

## POLICY RECOMMENDATIONS

### 1. Identify critical success factors for achieving meaningful rural economic participation

- Innovation is not limited to scientific and technological research and development. Innovation also includes softer aspects such as organisational, social and institutional change and innovation policies should reflect the social aspect.
- The innovation itself may be an alternative process of resource allocation and application to create outputs and outcomes. The beneficiaries' ability

and capability to be self sustainable is critical and should include beneficiaries taking joint responsibility and share the risks of establishing and maintaining a successful enterprise. The sustainability of interventions must take into consideration climate change, **deforestation, soil degradation, shortage of natural resources, increasing demands and the growing population that will put pressure on natural systems.**

- **There has to be appropriate** and adequate knowledge and knowledge flows between different agents and among different actors – unblocking knowledge flow.
- The STI policy and programming ecosystem has to be appropriate and responsive, i.e. a system that is growing and reshaping itself over time.

## 2. Understand lessons for achieving scalability of projects

- **Projects require a business model that works: a model that is systematic** enough to be distilled to an easily understood methodology; **simple** enough for it to be copied; **and flexible** enough to be adapted for a new location with its own challenges.
- Projects should ideally be based on and aligned to comprehensive sector programmes and integrated into these programmes as sustainability may not be achieved in isolation and also without long-term commitments (7-10 years).
- **Project should be designed such that they allow active business participation and equity participation by communities**
- Projects should be designed and introduced such that they facilitate a positive and lasting change in the social economy, a deliberate **multi-level change plan** needs to be facilitated by the business developers.
- **Scalability requires a move away from development models that offer either profit or social upliftment - develop models which emphasises technologies for sustainable business development that combine Social Development and Business Development.**
- In order to keep up with technology advances over time, **technologies supporting scalability should be innovative and designed such that their functionality may be modified and enhanced over time.**
- **The history of worker co-operatives is one of unmitigated failure.** The **enthusiasm for co-operatives** coming from some government departments **appears to be policy driven and not evidence driven.**
- When evaluating sustainable livelihood interventions, it is essential to have effective **monitoring and evaluation to track reduced poverty or reduced inequality over time, particularly after the withdrawal of external funding.**

### KEY POLICY RECOMMENDATIONS

1. Identify critical success factors for achieving meaningful rural economic participation
2. Understand lessons for achieving scalability of projects
3. Consider if emerging models (using a systems approach) can be replicated effectively and efficiently
4. Understand the challenges and constraints for scalability and replication
5. Promote stakeholder relations to ensure successful sustainable livelihood interventions

## 3. Consider if emerging models can be replicated effectively and efficiently

- Several of the established projects have **potential to promote collaboration between DST and other government departments.**
- Some argue that entrepreneurship is a natural talent that cannot be taught but the 'franchise approach' can be given to someone who is not a born entrepreneur. **The system runs the business and the people run the system.** A lot of the risk can be reduced by systemising the processes.
- The lack of entrepreneurs seems to be a widespread problem but there is also need for more intermediaries, e.g. ARC, Sasol, CSIR, business development NGOs etc. **A system that identifies and encourages intermediaries who will help create social enterprises is needed.**
- There has to be recognition and adaptation of emerging models developed by intermediaries to ensure successful sustainable livelihoods interventions. Examples of these models are shown in Models 1-2 and Figures 1-2.

## 4. Understand the challenges and constraints for scalability and replication

- Scientifically-validated results allow replication of successful cultivation and processing sites, and with the right data, it becomes possible to predict where certain species can grow.
- Science, Technology and Innovation (STI) infrastructure, including institutional infrastructure are often inadequate.
- The participatory technology development approach (PTD) as a stand-alone effort seems insufficient. Beneficiaries might be knowledgeable, skilled and empowered, and have participated in the development of technologies, but **without an improved business environment, technology will only produce marginal improvement.**
- There is a case for changing the 'laws and permit-based approach' to environmental management to one of self-regulation. Current **bureaucracy may act as an impediment to development** whereas the market has the potential to regulate itself through social and environmental responsibility.
- South African **agricultural markets are highly deregulated**, which makes it hard for new entrants and it also creates a situation where **there are limited points of policy leverage.** Therefore the state struggles to find places to intervene in the retail side of food, for example, because agricultural food chains are privately regulated.
- **Innovation and growth may support further inequality, meaning that certain groups get ahead and others get left behind; this is often difficult for policymakers to accept and calls for potentially difficult political decisions.**

- After the demonstration projects the next step needs partners with **financial instruments** that are **not yet in place**. **Developing these instruments must be part of the action plan going forward.**

**5. Promote stakeholder relations to ensure successful sustainable livelihood interventions**

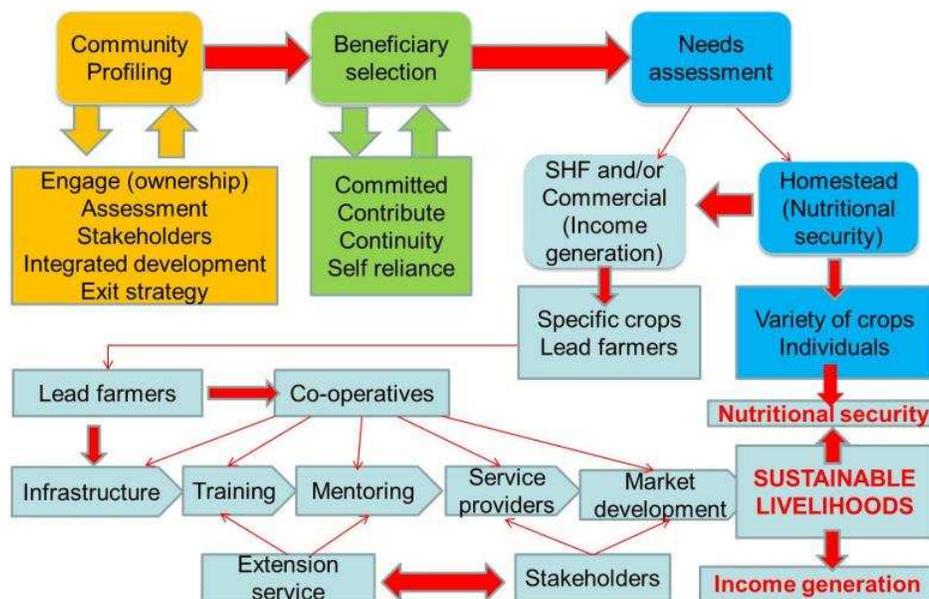
- **Beneficiaries must be involved** in planning and implementation **from the outset** to ensure ownership and that social issues are addressed.
- There is a **need to link beneficiaries** with service providers and businesses in and beyond community boundaries. On this basis, the supply and demand chain must be wholly understood.
- **Training** on all aspects is critical – on site, on-going, and adapted to specific requirements.

Training interventions must include ALL aspects of the business model.

- Empowered, capable officials are needed, particularly those with ability and Capabilities to generate, search for, select and implement solutions.
- Recently, there has to be a focus in DST to **work with the implementing agencies to find better ways of including the community voice**
- Projects which combine socio-entrepreneurship with classical financial outlooks need farsighted investors. **It is important for the planning to consider the exit strategy, mobilise finances and involve the right kind of investors.**

**MODEL 1: ARC'S MODEL FOR SUSTAINABLE RURAL DEVELOPMENT**

This model starts with a proper community profile, then selection of beneficiaries, then a proper needs assessment for the specific community and the model is divided between smallholder farmers and homestead production. Lead farmers are identified and by identifying infrastructure, training, mentoring, service providers and market development, sustainable livelihoods can be achieved. For the homestead farmer, the main purpose is nutritional security, while for smallholder or commercial farmer this will be achieved through income generation, and both will contribute to sustainable livelihoods



**ARC model for Sustainable Rural Development**

COMMENT: This model is proposed for agricultural research and technology transfer interventions in rural communities.

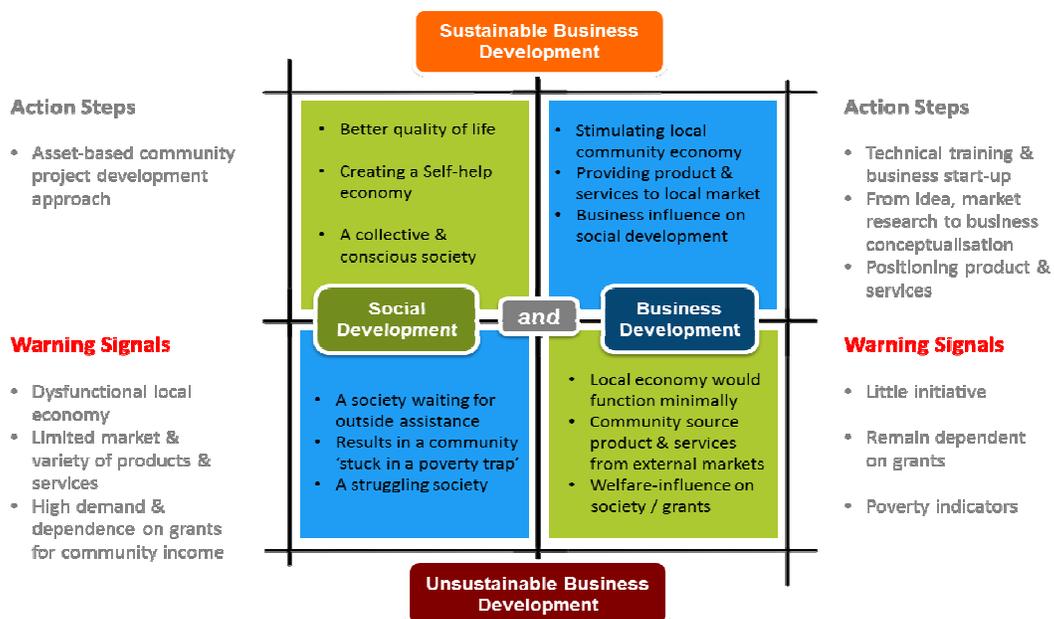
## Points to ponder on

There [were] three overarching topics arising from the various presentations. The first concerns sustainability and inequality. Can we talk about sustainable livelihoods in a context of endemic inequality? South Africa has economic growth but this is accompanied by growing inequality. A question we must ask ourselves is whether science, technology and innovation are good for everybody, or can innovation actually exacerbate these barriers? Is it always good for everybody? Can it actually make inequality worse?

Dr Erika Kraemer-Mbula, Institute of Economic Research Innovation

## Model 2: ChemCity's Systems Approach to Building a Business Prototype

The model adopted avoids the conventional approach of *either* a purely for profit venture *or* a purely social upliftment, non-profit approach, but has developed a model using technologies for sustainable business development which comprises Social Development *and* Business Development. This is therefore a social purpose business that makes profit *and* contributes to social upliftment. The figure below describes the elements of this model and highlights the warning signals which are evidence of the unsatisfactory either/or approach.



COMMENT: This model is proposed for a systems approach to building a business prototype

## CONCLUSIONS AND PERSPECTIVES

The questions this dialogue sought to answer were:

- Have these DST projects increased learning that can help society spread economic opportunities?
- Are the projects designed in a manner that lends them to scalability and replication?

The short answer is that the projects presented during this policy dialogue comprise an impressive collection of innovative ideas with the potential for spreading economic opportunities, particularly in some of the more remote and impoverished parts of South Africa. Scalability is addressed in most of the models but is not without challenges which will require further support from DST, other government departments the private sector and the participating beneficiary communities.

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