Science, technology and innovation for sustainable poverty reduction
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Pro-poor innovations
Science and technology are important components of a country’s economic growth, wealth creation, and poverty reduction strategy. This is valid in industrialized countries as well as in developing countries. Additionally, there is a growing recognition of the added value of private sector involvement in making knowledge and technology (provided by knowledge institutes) available to low income groups in developing countries. The access and availability of affordable innovative products and services to this so called Base of the Pyramid can help to improve their level playing field and may lead to sustainable poverty alleviation strategies.

Current challenges
In our opinion, currently there are four main obstacles in running successful pro-poor innovations:
1. Lack of a proper approach to tap the demands of the BoP with matching potential for a successful business case;
2. The necessary co-creation between knowledge institutes and private sector in North and South is insufficient;
3. There is a gap in investments for R&D. Current programs demand ‘proven technologies’; which hinders new, disruptive innovation;
4. The step towards scaling up fails often; because of a lack of a successful local business case, weak consortium, missing innovation management, etc.

TNO is convinced that enhanced inclusion of science and technology in pro-poor innovations will improve the success rate of these transition processes. Another success factor is open collaboration and transparency in the innovation process in order to learn and strengthen each other. That’s why TNO is an active player in consortia focusing pro-poor innovations.

Working to successful pro-poor innovations requires 4 types of innovation:
1. Technical innovation: development of sustainable and affordable new products and technologies;
2. Social innovations: partnerships with unusual suspects and new ways of interaction and organization of the collaboration;
3. Management innovation: new types of product development, marketing, purchasing and investment models ask for new types of management;
4. Innovation in the chain: new relationship and deals with suppliers and retailers with different financing schemes.

TNO is mostly active on the first 2 types of innovation.
TNO Innovation for Development
In Europe the independent knowledge institute TNO plays an important role in the innovation chain. As the second largest organization of its kind in Europe we develop and apply scientific knowledge with the aim of strengthening innovative power of industry, governments and civil society. We do this in close collaboration with our stakeholders. We have a staff of 4500 professionals and a turnover of approximately M€ 500, where 25% is coming from government and 75% from our turnover from external players out of the market.
Since 2007 TNO has been active in developing countries. We aim pro-poor innovations in order to utilize the huge social and economic potential of the Base of the Pyramid (BoP). Features of our approach are demand driven, local business driven, innovative, in co-creation with all stakeholders, sustainable and learning by doing. We closely collaborate with NGO’s, private sector, The Benelux BOP Learning Lab and the Global Research Alliance.

Our approach consists of 5 stages:

**Stage 0:** Identification of BoP context
Identification of needs and demands of low-income groups, detection of intervention area and potential partners for collaboration: the BoP team

**Stage 1:** Preparing the ground: Making the team and setting intentions for collaboration

**Stage 2.** Opening up: Deeper identification of market, context and possible solutions by field visits, workshops and participatory research;

**Stage 3.** Building the eco-system: Experimental stage of the innovation including making the first business case. Identification for value creation;

**Stage 4.** Enterprise creation: Development of the business model and preparing the launch of the innovation in the BoP market. Local entrepreneurs will be trained and local production and distribution will be arranged with matching finance model;

**Stage 5.** Scaling up: The private sector is working successful and independent. Scaling up of the innovation is fully market-driven. The local innovation infrastructure is build up.

Projects of TNO
For inspiration and request for participation, here a shortlist of TNO activities:

Rural electrification
1. Technology to generate electricity directly out of biogas. This enables rural families with lightning and loading of batteries (India);
2. Technology to generate electricity directly out of a parabolic solarcooker (Madagaskar);
3. Use of wireless sensor technologies in CDM for monitoring (India);
4. Development of the Sustainable Energy Potential Scan (global);
Food & Agriculture
5. Development of ergonomic farming handtools to increased productivity, health and income of farmers, black smiths and carpenters (with University of Development Studies and Kalabash Foundation in Ghana);
6. Using rock wool in mango horticulture reduces costs for irrigation and increases the survival rate of trees and yield of mangos (India and Ethiopia);
7. Processing of new pine apple products to reduce post–harvest losses of pineapples and to introduce affordable nutritious food on the local market (Ghana).

ICT
8. Mobiscopy: use of mobile phones to send samples of microscopes in rural health centers to academic hospitals for a proper diagnosis (Uganda);
9. Rural internet connections (Zambia)
10. Use of ICT in result based healthcare (Congo)
11. Improvement of the reliability of E–voting – (Namibia)

Monitoring
12. Monitoring of social effects in community development (India)
13. Methodology for system innovation in emerging markets (global)

Project in preparation
• Use of nanotechnology to use organic dyes in cotton (Inia, Pakistan)

Rural electrification with biogas or parabolic solar cooker. Preliminary key success factors: local demand with local business case and co-creation with all stakeholders (also unusual suspects)

A long handled hoe improves health, productivity and income of farmers, black smith and carpenters. Key success factors: local demand with local business case sharing knowledge on participatory ergonomics between North and South.