

Coming to grips with adaptation technologies

Relevance of adaption technologies

The volume of international climate finance for adaptation is increasing. At the same time, adaptation planning is preparing the ground for implementation in many countries. The demand for adaptation technologies is likewise growing, while improving access to adaptation technologies has become a priority for political actors. To meet these needs, a new institutional set up was created following the UNFCCC Cancun Agreements of 2010 called the 'Technology Mechanism', which is designed to promote the transfer of such technologies to developing countries. The mechanism is comprised of the Technology Executive Committee (TEC) and the Climate Technology Centre and Network (CTCN).

However, despite the recent institutional progress, it is not always clear what exactly adaptation technologies are and how they differ from conventional techniques. Drawing on our longstanding experience in the field of sustainable development, the *Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH* has supported the implementation of adaptation technologies in a wide range of sectors (Table 1). This factsheet lays out what these solutions have in common.

What are adaptation technologies?

Stakeholders from different sectors occasionally argue that adaptation technologies are nothing new, but are simply sustainable solutions for conventional technical problems. We agree that they are not necessarily new inventions, but we argue that they differ from business as usual solutions as they address an explicit adap-

tation hypothesis. The adaptation hypothesis is the underlying assumption of how an adaptation action will contribute to reducing the negative impacts from climate change. In other words: any technology may qualify as an 'adaptation technology', if it demonstrably serves a clear adaptation-related purpose and contributes successfully to either reducing vulnerability or enhancing resilience. Therefore, the identification of adaptation technologies should be based on an assessment of this potential ability, clarifying the adaptation hypothesis in the specific context of the application.

GIZ's experience with adaptation technologies

There are different types of adaptation technologies, including 'hard' technologies such as capital goods or hardware; 'soft' technologies such as knowledge of methods and techniques; and 'orgware' relating to the ownership and institutional arrangements of the community or organisation where the technology will be used. From GIZ's perspective, technology transfer must operate on a broad front covering these different technology types: A 'hard' technology, like a sole dyke, is not of great use if the knowledge and appropriate institutional arrangements for maintenance are missing. Therefore, all three technology types are usually applied in combination by GIZ according to the partner's needs. In order to reduce vulnerability, it is important for partner countries to not only gain access to a particular technology, but also to attain the expertise and other resources to make the technology usable and sustainable.



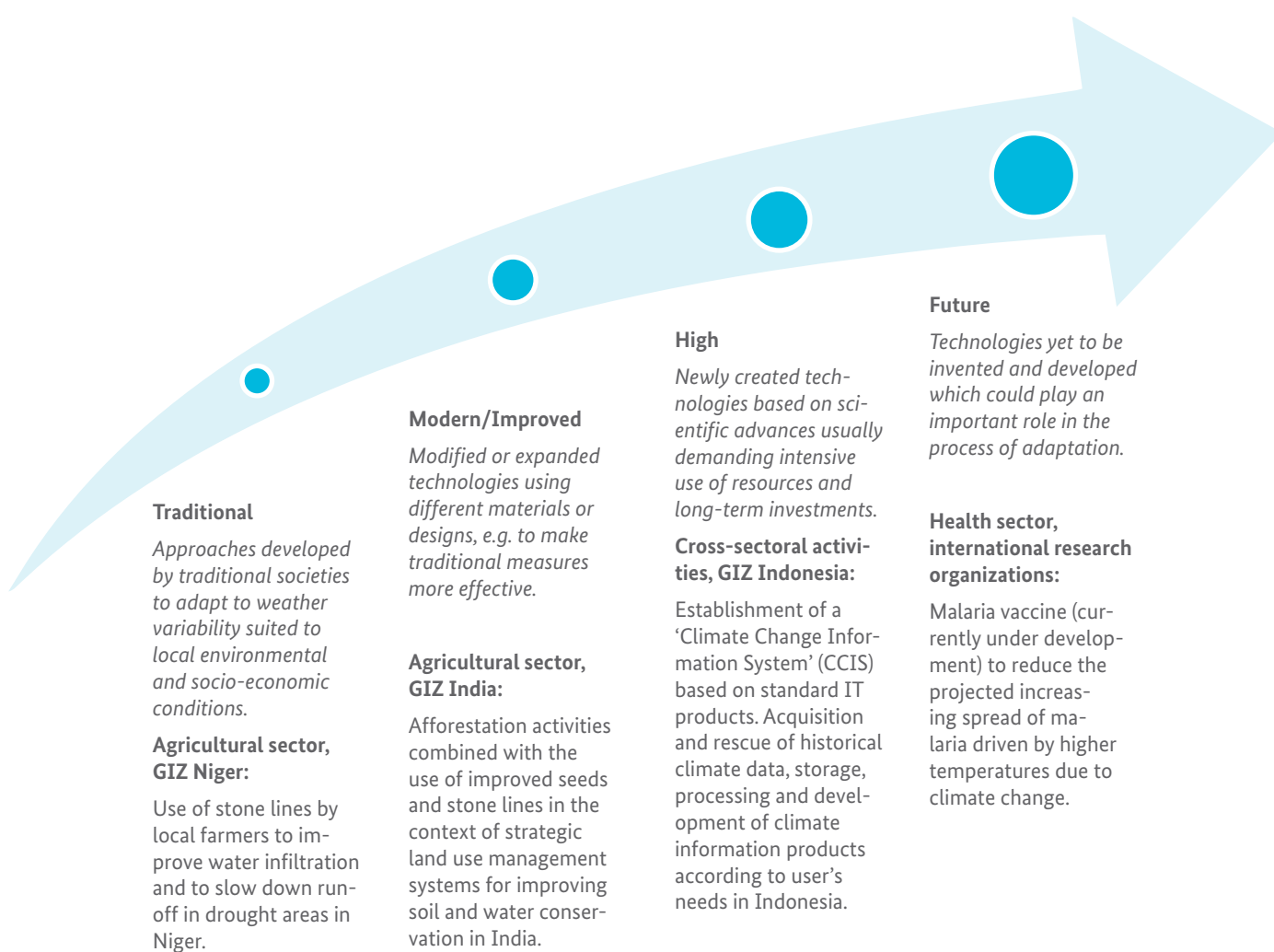
Web directories:

The UNFCCC Technology Portal provides a database of technology briefs and roadmaps on adaptation and mitigation-related technologies. UNEP has established the 'Climate Tech Wiki', a similar platform with information about feasibility, status, development benefits and costs of different adaptation and mitigation technologies (links are provided below under 'further reading')

Information on GIZ's experience in applying adaptation technologies in different countries is documented in the 'Knowledge' section of AdaptationCommunity.net.

Evidence from adaptation actions taken all over the world clearly shows that adaptation is primarily an evolutionary process of learning, allowing adaptation technologies to also be grouped on a temporal scale. Accordingly, UNFCCC provides four main categories of adaptation technologies: traditional, modern/improved, modern/high and future technologies (see Figure 1).

Figure 1: Adaptation technologies on a temporal scale – Examples from GIZ's different working areas



Many traditional technologies are already available in developing countries, so they often just require modified designs or an enabling environment to make them more effective. Accordingly, GIZ's activities on the ground often combine existing traditional technologies and modern/improved ones to allow for low

resource input, e.g. afforestation activities combined with the use of improved seeds (see Table 1). High technologies are also explored and disseminated by GIZ (e.g. usage of leak detection equipment and pressure reduction valves for water loss reduction management (see Table 1).

GIZ's role is usually to support the partner in identifying the appropriate technical solution for the problem at hand. This selection is greatly determined by the intended results, the institutional context, the efficiency and the overall sustainability of the technical options. In order to better inform these decisions, GIZ has developed various methods, ranging from a Vulnerabil-

ity Sourcebook that helps identify climate change hotspots and adaptation needs (most vulnerable regions, populations, ecosystems and economic activities) to methods of improved cost-benefit analyses using the parameters of 'saved health' and 'saved wealth' of adaptation activities. Both publications are available in the 'Knowledge' section of AdaptationCommunity.net.

Table 1: Documented Examples for applied adaptation technologies from different sectors

Sector	Field of intervention	Project example	Technology Type			Contact	Link
			Hardware	Software	Orgware		
Water	Flood risk management	Flood proofing in medium-sized coastal cities of Vietnam	<ul style="list-style-type: none"> • Early warning systems (high technology) 	<ul style="list-style-type: none"> • Capacity development (modern/improved technology) • Adjustment to national legislation (modern/improved technology) • Flood-proofed urban planning (modern/improved technology) 	<ul style="list-style-type: none"> • Provincial People's Committees • Governmental entities (Ministry of Construction, four provincial governments) 	daniel.nordmann@giz.de	
Water	Water loss reduction management	Strategic Alliance for Water Loss Reduction (GIZ, VAG, Sewerin, Hamburg Wasser)	<ul style="list-style-type: none"> • Leak detection equipment (high technology) • Pressure reduction valves (high technology) 	<ul style="list-style-type: none"> • Asset management systems (modern/improved technology) • Financing mechanisms (modern/improved technology) • Capacity development (training and training of trainers) (modern/improved technology) • Water loss reduction strategies/ national programs (modern/improved technology) 	<ul style="list-style-type: none"> • Water utility companies • Water utility associations • Regional/national training centres 	katja.schmitt@giz.de	www.waterloss-reduction.com
Agriculture	Soil and water conservation/water harvesting	Rural development and productive agriculture, Niger	<ul style="list-style-type: none"> • Stone lines (traditional technology) • Drought resistant seeds (traditional; modern/improved technology) • Afforestation (traditional technology) 	<ul style="list-style-type: none"> • Land use planning (modern/improved technology) • Land use conventions (modern/improved technology) 	<ul style="list-style-type: none"> • Village development committees • Farmer groups • Local cadastre offices 	luis.waldmüller@giz.de dieter.nill@giz.de	
Agriculture	Support climate adaptive use of natural resources at local level	Climate Change Adaptation in Rural Areas, India	<ul style="list-style-type: none"> • Horticulture plants and trees (traditional technology) • Afforestation (traditional technology) • Farm ponds (traditional technology) 	<ul style="list-style-type: none"> • Climate proofing of planning(modern/improved technology) • Business plans (modern/improved technology) • Trainings (modern/improved technology) • Vulnerability assessments (modern/improved technology) 	<ul style="list-style-type: none"> • Farmer group • Trainer group 	luis.waldmüller@giz.de martina.wegner@giz.de dieter.nill@giz.de	
Cross-sectoral	Climate data and information management	DATACLIM: Data and Information Management on Adaptation to Climate Change, Indonesia	<ul style="list-style-type: none"> • Climate Change Information System (CCIS) based on standard IT products such as the Open Climability Suite (www.climability.org) (high technology) 	<ul style="list-style-type: none"> • Adaptation Planning/ mainstreaming of adaptation (National Plan for Adaptation to Climate Change) (modern/improved technology) 	<ul style="list-style-type: none"> • BMKG (Indonesian institute for meteorology, climatology and geophysics) • Scientific community • User of climate information products (public sector, public, etc.) 	gerhard.rappold@giz.de	www.dataclim.org



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Lessons learned

- Adaptation technologies are not necessarily new inventions. However, they are different from business as usual solutions because they address an explicit underlying adaptation hypothesis.
- Adaptation technologies include not only 'hard' technologies, but also the mechanisms and expertise ('soft') and relevant actors ('orgware') to make this technology sustainable.
- GIZ offers a number of methods for selecting appropriate technological adaptation options in a participatory manner based on criteria like effectiveness, efficiency, and social and ecological impact.

Links

- Adaptation Community Platform
AdaptationCommunity.net
- UNFCCC Technology Portal
http://unfccc.int/ttclear/pages/roadmap_search.html
- UNEP Climate Tech Wiki
<http://www.climatetechwiki.org>

Where to find resources

Publications

- L. Christiansen, A. Olhoff and S. Trærup (eds.) (2011): Technologies for Adaptation: Perspectives and Practical Experiences, UNEP Risø Centre, Roskilde. Available online at: http://tech-action.org/Perspectives/TechnologiesAdaptation_PerspectivesExperiences.pdf (24.10.13).
- UNFCCC (2006): Technologies for Adaptation to Climate Change, Adaptation, Technology and Science Programme of the UNFCCC secretariat, Bonn. Available online at: http://unfccc.int/resource/docs/publications/tech_for_adaptation_06.pdf (24.10.13).
- UNFCCC seminar on technologies on adaptation in Trinidad and Tobago (2005): All materials and reports available online at: http://unfccc.int/ttclear/pages/ttclear/templates/render cms_page?s=events_workshops_WshpTobago (24.10.13).

Published by

Deutsche Gesellschaft für
 Internationale Zusammenarbeit (GIZ) GmbH

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As at

July 2014

GIZ is responsible for the content of this publication.

On behalf of

Federal Ministry Federal for Economic
 Cooperation and Development (BMZ)

Division

Special unit 'Climate'

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