ELLA
Evidence and lessons from Latin America

Through *Adapta Sertão*, small farmers in one of Brazil's semi-arid regions were helped to increase their yields, find markets to sell their crops and access micro-credit to buy productive technology – making them more resilient in the face of a fast-changing climate.

AN INTEGRATED APPROACH TO IMPROVING ADAPTIVE CAPACITY: THE ADAPTA SERTÃO EXPERIENCE

SUMMARY

Community-based adaptation (CBA) is a fairly new approach where communities are empowered to find their own adaptation solutions, without relying excessively on government interventions that may be too slow to address their quickly changing needs. However, successful CBA is difficult to accomplish; attempts frequently fail to integrate action across public, private and civil society sectors. Though still at an early stage, the Adapta Sertão programme seems to be succeeding in identifying and overcoming key barriers through partnership building and diversified interventions to address the multiple needs of farmers in Brazil's semi-arid region. Development professionals with similar dilemmas in South Asia and Sub-Saharan Africa could take advantage of this brief's reflection on a successful pilot project that is rapidly expanding, as they consider how to improve adaptive capacity in their own countries.

SMALL FARMERS AND CLIMATE CHANGE: THE CHALLENGE OF ADAPTING

Climate change studies point out that the likely medium- to long-term scenario for semi-arid regions is increased rain variability and longer droughts. This will aggravate a variety of existing problems such as food security, human health, economic underdevelopment and migration to urban areas. In Brazil, as in many countries in South Asia and Africa, farmers' vulnerability to climate change depends on a variety of factors, including the continuance of traditional, under-productive farming methods and inefficient use of scarce water resources. Top-down 'solutions' offered by national government do not reflect these wide-ranging vulnerabilities and are often fragmented, focusing on just one challenge while leaving the rest unaddressed. They also often fail to engage with actors from various sectors.

KEY LESSONS LEARNED

Adapta Sertão shows how adaptive capacity in the semi-arid region can be strengthened by changing farming methods and disseminating efficient and low-cost technologies starting from those which improve both water supply and use.

Public policies promoting access to technology and finance, commercialisation and technical assistance are fragmented. By using partnerships and establishing links between these policies through local actions, a systemic approach to climate change adaptation can be achieved.

Figure 1: Sertão Landscape
Source: Água Para o Sertão Blog

ADAPTA SERTÃO'S INTEGRATED APPROACH

Introduction to Adapta Sertão

The NGO REDEH, in partnership with the research institution Centro Clima, located at the Federal University of Rio de Janeiro, and the community-based organisation Rede Pintadas, created the Adapta Sertão coalition to identify possible adaptation strategies for the *Sertão,* Brazil's semi-arid region, and to go on to implement and disseminate them. These strategies aim to increase resilience and improve livelihoods of farmers who rely on rain-fed agriculture, obsolete knowledge, and rudimental technology, and lack funding and technical support. The objective of Adapta Sertão is to create a model that a community could implement and sustain after a period of external intervention, and be replicated in other communities.

The first step was to analyse the reasons for unutilised water resources and low productivity.

> **The main barriers identified in the Brazilian semi-arid region are: lack of technology retailer networks in the region, unsuitable technological and production systems, dependence upon single crops, poor diets for livestock, lack of access to credit for irrigation and production technologies, lack of market access for selling production.**

At the root of these problems, though, are disorganised, inconsistent policy frameworks and lack of systematised knowledge about which strategies, technologies and production systems would be appropriate for small-scale agriculture in the Brazilian semi-arid region. For example, Brazil does have a subsidised credit policy to provide finance for small farmers. However, this policy is not linked to any specific production system or technology that is appropriate to the local conditions; farmers usually receive little orientation, technical support or advice, and these loans have no environmental restrictions, giving farmers no incentive to protect the natural environment. The construction of new water infrastructure, such as dams and wells, is very seldom planned with local communities, and little training is given on how to use this water productively. The dissemination of appropriate technologies that could make farmers more resilient to climate change is not well integrated in federal policies.

Adapta Sertão therefore developed its design and implementation plan focusing on three key actions that make it unique:

1. Develop a small farmer production system that combines climatic resilience with improvement of local livelihood conditions
2. Establish 'Appropriate Technology Centres' to give farmers access to innovative technology and knowledge
3. Disseminate the system through a multi-stakeholder model that integrates current policies into a comprehensive adaptation progwramme at the local level

The following sections describe key elements of the Adapta Sertão approach, its development and some of the initial successes from the pilot phase.

Collaborative Development of Appropriate CBA Responses

The community-based adaptation process in the project region has been in operation for five years, and consists of a trial-and-error testing process involving local farmer communities, research institutions, local municipalities and NGOs. The partners began working together to understand which technologies, crops, cultures and production methods would be most appropriate for the local socio-economic and environmental conditions. The consultation process went hand-in-hand with a period of testing of selected technologies in partnership with local farmers. Results were evaluated by the stakeholders to identify and select the most promising and adequate ones based on their potential to be scaled-up. This process continues today - any new technologies or approaches discovered by farmers or research institutions are validated through the same process.

Pillars of the Adapta Sertão Production System

1. **Product diversification** (multi-cropping) to reduce dependence on one crop and the propagation of plant specific plagues
2. Employ **drought-resistant seeds** supplied by EMBRAPA (Brazilian Agricultural Research Institute)
3. Improve **water supply and management** and reduce water wastage to prolong supply
4. Disseminate **drip-irrigation** technology with specific technical recommendations to prevent soil salinisation
5. **Minimise land-use** by concentrating production in small areas
6. **Restore the local ecosystem** by planting trees that may be put to productive use, especially indigenous protein-rich plants that may be used for animal fodder
7. Create protein-rich diets for livestock in order to **increase milk yields**
8. Use **semi-confined or confined pasture** to decrease land degradation

Appropriate Technology Centres (ATC)

Within two years, Adapta Sertão created two Appropriate Technology Centres (ATC) to address the structural deficits that prevent farmers from accessing the basic equipment necessary to implement even minimum technological change. The ATCs were created in partnership with national technology providers of drip irrigation, water pumps, piping systems, drought resistant seeds and other technologies approved by farmers and research institutions. A local cooperative, Coopsertão, was formed to create one of the technology centres, while the other capitalised on existing cooperatives.

Figure 2: Drip Irrigation Field in Pintadas, Brazil
Source: Adapta Sertão

The ATCs sell equipment and technology to local farmers through the micro-credit line supported by local rural banks. An initial evaluation by Adapta Sertão of participating farmers, based on average income per month relative to total system cost of production systems, shows the loan payback time to be between two to five years.

To change ingrained practises of generations, much time and effort was invested in building relationships of trust with the farmers and showing the tangible benefits of the Adapta Sertao production system in the light of climate change and variability. Capacity building courses were organised for local technicians with the aid of professionals and consultants to provide toolkits on organic farming and the production systems and technologies that were identified as adequate for and by local farmers. Based on this knowledge, the local technicians then engaged farming families through regular meetings and helped them conduct tests to show how yields were increasing as a direct result of the new methods employed. The positive results were seen throughout the community, and as such engaging interest was relatively easy.

Multi-stakeholder Cooperation Model

The Adapta Sertão model centres on partnerships. Stakeholders from the private sector, mainly technology providers, enter into commercial agreements with local farmer cooperatives that distribute the equipment, technology and production models at a premium price to farmers. Farmers can increase their yields because of these innovations and manage to sell more products back to the cooperative that then sell the products to local, regional and institutional markets. Local credit cooperatives and rural banks support the dissemination of these innovations through specific lines of credit for farmers. The public agricultural research cooperation EMBRAPA Semi Árido helps develop and systematise the integrated production system. Local NGOs and policy makers help create the framework for disseminating innovations and facilitate farmers' access to institutional markets.

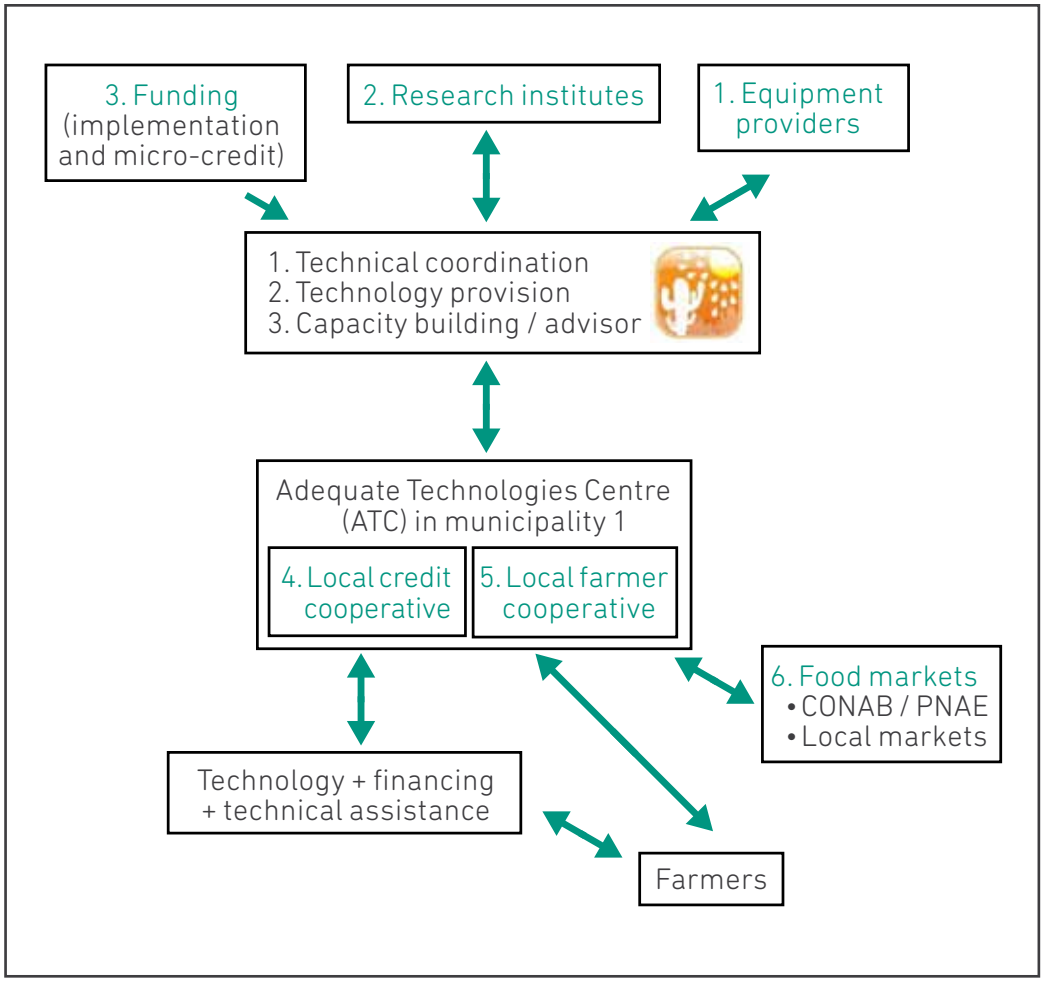

Figure 3: Adapta Sertão Multi-stakeholder Relations
Source: REDEH

The flow-diagram above shows the links between the different stakeholders involved in Adapta Sertão. In practical terms, the project worked by creating a cycle of transferring money, technology and knowledge. The project functions through a rotating fund: participants are offered repayable loans to buy the equipment necessary; this credit is then repaid and subsequently made available for other participants.

As part of its multi-stakeholder model, a participatory planning approach was used. Communities participated in consultation sessions with the initiative's stakeholders – including NGOs, technology providers, local farmers' cooperatives, research institutions, trade unions, credit providers, strategic support experts, radio stations, schools and local and regional policy makers. In these meetings, partners discussed barriers limiting productivity and proposed opportunities, synergies and solutions. Forums were also held to engage policy makers from state legislative bodies to try to develop joint policies based on the Adapta Sertão experience.

Integrating Fragmented National Policies at the Local Level

One of the key features of Adapta Sertão is that it has capitalised on the existence of national government policies by creating a structure for integrating those policies at the local level.

This includes policies like the federal micro-credit programme PRONAF that provides finance to local farmers in partnership with local rural banks. To facilitate market access for farmers' products, Adapta Sertão also takes advantage of the institutional markets created by the government (CONAB) to buy a substantial portion of the products to build national food stock and supply the local school meals programme for children (PNAE).

Results

Preliminary results from the pilot phase's data collection do point to the model's success.

Figure 4: Community Engagement in Agricultural Production
Source: Adapta Sertão

Before installing the production systems, a baseline was undertaken of the farmers' production. Farmers in the poorest and smallest communities did not know about how to utilise water sources or implement irrigation systems, and they were relying mostly on rainfed agriculture for staple crops like corn and beans. Crop loss from rainfed irrigation was on average 70%. Hand irrigation with buckets was used, and usually women spent 1 to 3 hours per day for water harvesting and hand irrigation.

Monitoring and analysis of 14 farmers from one community over two years showed the following:

- Strong results for about 30% of the farmers, with their salary rising from less than US$250 per month to over US$500 per month. This increase just considers the sale of vegetables and fruits, not the increase in milk production due to forage growing. With data from current earnings, the payback time of the technology is projected to be between two and three years.
- Satisfactory results for about 40%, with their staple crop loss decreasing from about 70% to 20% and their income increasing by about 20% to 50%. With data from current earnings, the payback time of the technology is projected to be between three and five years.
- The model did not seem to have any impact on family income for about 30% of these farmers. Some migrated to urban areas while others stopped using the system or started other jobs. In these cases, the negative results can be attributed to social problems like alcoholism, illiteracy and extreme poverty, as well as the lack of personal drive and motivation. Inappropriate engagement and mobilisation of these farmers from Adapta Sertão should also be considered as a cause of this failure.

Perhaps the strongest sign of Adapta Sertao's potential is its current scaling-up: with funding from the Ministry of Environment, the intervention will be implemented in the 14 municipalities of the Jacuípe river basin, with a population of approximately 250,000 people. The expansion phase initially envisions outreach to 100 farmers and three cooperatives that within two years are to establish three additional ATCs serving the entire region. The expansion phase represents an opportunity to identify possibilities for scaling-up the drive to improve adaptive capacity in the semi-arid region.

CONTEXTUAL FACTORS

ENABLING ADAPTA SERTÃO'S SUCCESS

Some specific contextual and enabling factors underpinned the success of the approach.

For example, the engagement of both farmers, the project team (REDEH, Centro Clima) and research institutions (Embrapa, other NGOs) in the identification and validation of technologies before considering them as 'appropriate' increased their acceptance by farmers.

The participation of organisations with strong leadership skills, knowledge of the semi-arid region and a genuine desire for development in the region were of key importance. The partnership of an NGO with a history of effective project implementation and a climate change research centre provided excellent synergies.

The particular policies in place in Brazil gave policy options upon which the Adapta Sertão coalition could capitalise and build. Furthermore, the actors implementing these policies were willing to engage with the Adapta Sertão model and recognised it as being in their interest.

LESSONS LEARNED

1 The practices of the Adapta Sertão project can be considered successful because of the integrated approach to addressing vulnerabilities that are increasingly accentuated by climate change. By engaging with farmers, technology providers, knowledge and implementation experts, and micro-credit organisations, the community enjoyed the benefits of long-term comprehensive partnerships, creating a space where all stakeholders involved could build on each other's knowledge and experience.

2 Drip irrigation, drought resistant seeds, crop diversification and the use of protein rich vegetation for animal feed seem to strengthen adaptive capacity. However, in the case of heavy drought, a disaster management approach will be indispensable.

3 The creation of ATCs helps the dissemination of appropriate technologies that became a commercial activity for local farmers' cooperatives while increasing the yields and adaptive capacity of small farmers. Integrating access to micro-credit increased the impact of these ATCs.

4 The importance of civil society in instigating change is apparent: policy makers are often unable to disseminate successful practices in other municipalities. The presence of strong entrepreneurs and well-established organisations could enable this gap to be filled.

5 Adaptive capacity can be improved even without policy support: success seems dependent upon a web of local actors pulling together to make positive change. What may be intimated from this is that national policy and funding would allow such projects a far greater reach. Indeed, policy integration is key for dissemination of CBA over a larger scale. Relying only on donor funding is too risky. Instead, NGOs can make good contacts with policy makers, engaging them in the process and showing positive results to get their attention.

CONTACT SSN

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FIND OUT MORE FROM ELLA

To learn more about Brazilian CBA, read the ELLA Guide, which has a full list of the ELLA knowledge materials on this topic. To learn more about other ELLA development issues, browse other ELLA Themes.

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