



2009 SEED Winner Pintadas Solar

Brazil - Pintadas Solar (2008)

Overview

Pintadas Solar is the name of an initial series of pilot projects focused on testing irrigation technologies in the municipality of Pintadas, located in the semi-arid north-eastern region of Brazil called the “Sertão”, one of the poorest regions in the country (see box at right). The overarching aim of this initiative was to create a sustainable and replicable model geared towards improving livelihoods and climate resilience in areas where agriculture and pasture is the main economic activity. In 2008, Pintadas Solar was one of 5 projects selected to win the SEED Award. During 2008, the project in Pintadas was refined and began expansion to other municipalities in the Sertão, and partnership changed its name to Adapta Sertão.

Origins

Pintadas Solar first began in 2004, with an experiment using solar powered irrigation involving the Women’s Association of Pintadas, an NGO based in Rio de Janeiro called REDEH, technical companies and the state government. In 2006, the experiment captured the interest of the SouthSouthNorth (SSN) Collaborative and the Cariplo Foundation of Italy, which provided funding to expand the project to seven (7) pilots in the municipality in order to experiment with different irrigation technologies. The project’s aim was show that it was technically and economically feasible to improve agricultural yields in semi arid Brazil through access to irrigation technology and training and create a model replicable to other semi-arid regions in the world. From 2006-08, Pintadas Solar trained local farmers in the design and implementation of small-scale irrigations systems that allowed them to tap into existing water catchment systems. It also provided the farmers with a toolkit comprised of:

- Irrigation technologies (drip irrigation/organoponic),
- Water pumps (solar/diesel),
- Fertilisers,
- Technical assistance.

The initial results were promising, but showed that there was still a need to refine the technology, develop further capacity, provide technical assistance and create a solid platform to ensure replication and scale-up.

In 2008, the project won the SEED Award and continued to expand its strategic partnerships, strengthen its business model and better clarify its social, environmental and business goals.

The Brazilian Sertão and the Appropriate Technology Centers (ATCs)

The Sertão is a hinterlands region in northeastern Brazil characterized by distinctively low annual rainfall in comparison to other areas in the country. This rainfall is often extremely erratic, ranging from drought to torrential rains. The local population survives on subsistence farming using rudimentary and inappropriate methods (e.g. the use of watering cans for irrigation; dependence upon single crops; deforestation for creating pasture land that is quickly degraded). Further, there is no access to technology or markets. This, and other factors, has led to the Sertão being one of the most socially, economically and environmentally and vulnerable areas in Brazil. Due to climate change, the rainfall variation is expected to become even more extreme, which could certainly exacerbate the already low quality of life of the Sertão’s communities.

Adapta Sertão is improving the resilience of farmers to climate change impacts by providing them with very specific technologies through the creation of Appropriate Technology Centers (ATCs). The ATCs help farmers to manage the resources of their property to minimize climate change impacts. This involves reforesting a portion of the land with climate-resilient forage varieties, using saline water during specific periods of the year, storing large quantities of hay for the dry season, and providing specific technologies that have proved of help in adapting to climate change impacts (efficient irrigation, storage tanks, etc). The sale of technology is linked directly to a micro credit system to allow farmers access innovative and climate-resilient technology.

ATCs: tapping into existing infrastructure

Since 1960's, the Brazilian government and international institutions built a large number of artificial surface water reservoirs in the Sertão to improve water supply. Although many of these reservoirs could be used for small scale irrigation systems, only a negligible amount (3%) are currently being used for this purpose, because farmers do not have access to modern irrigation technologies. The Adapta Sertão partnership works with communities to implement Appropriate Technology Centres (ATCs) with the following aims:

- Act as local retailers for adequate technologies, including irrigation systems and drought –resistant seed varieties;
- Develop pilot and demonstration projects;
- Help farmers to access micro-finance programmes;
- Provide technical support;
- Will develop an “early warning” system for local communities.

Source Adapta Sertão factsheet/CDKN brief 15

Growth/current status/future prospects

During 2008, Pintadas Solar changed its name to Adapta Sertão, to better denote the partnership's regional scope to embrace the whole Sertão (semi arid region) and objectives.¹ It also began to work toward creating market linkages for the farmers and helping them to achieve microfinance; it more clearly defined the methodology to encompass not only efficient water usage, but also the reduction of deforestation, and planting of native species and the elimination of chemical fertilisers; and it sought to acquire more funding and expand the strategic partnerships of the Adapta Sertão network in order to increase the number of beneficiaries. Throughout this process, baseline research and monitoring was undertaken to help determine the most appropriate technologies, as well as to monitor the environment. It also created a community-based approach for undertaking these activities at the local level, called Appropriate Technology Centres (see box at right). Currently, Adapta Sertão has established 2 ATCs, which directly benefit approximately 100 farmers.

Recently, Adapta Sertão received the support of the Climate and Development Knowledge Network (CDKN) and funding from the Brazilian Ministry of Environment in order to extend the model to the whole county of Jacuipe formed by 14 municipalities of the Jacuípe river basin. This expansion phase (2010-2014) envisions the establishment of three additional ATCs serving the entire region. It is hoped that the success of these ATCs will fuel the creation of other centres by community members. The number of farmers served is expected to reach 400 by 2014. According to Adapta Sertão manager Thais Corral, (Corral, 2012), this current expansion phase will also include:

- Training 10 technicians in the management of the daily operation of the ATC (sale and technical assistance);
- Strengthening the cooperatives in the 14 municipalities of the Bacia do Jacuípe Municipality by training 60 technicians in the climate change resilient agricultural model and by strengthening current commercialization channels;
- Implementing 100 pilot projects and quantitative monitoring of all these pilots in order to generate key socio-economical, environmental and technical data;
- The installation of 4 automatic agro-meteorological stations to collect key data (humidity, temperature, etc.). Adapta Sertão is also currently negotiating the inclusion and management of these systems in the Brazilian Meteorological Organisation network (INMET). The idea is to develop an early warning system in partnership with EMBRAPA, a state-owned research agricultural research Company affiliated with the Ministry of Agriculture.

The expansion will also include the organisation of a seminar in each municipality on the outcome of the project.

Social, environmental and economic benefits and outcomes

The Adapta Sertão network addresses the problems of poverty and climate vulnerability by providing the following social, environmental and economic benefits to beneficiaries:

- a. **Social:** Adapta Sertão works to strengthen food security and improve the socio-economic prospects in the region through awareness raising on the issues in the Sertão and generating knowledge collaboratively on how to best deal with these problems. Specific actions have included:
 - i. Awareness raising and organisation of an action learning experience for 600 high school students (see box at right); creation of a manual for guiding teachers in how to foster learning that is geared toward embracing and creating opportunities in the Sertão.

¹ Furthermore, solar pumps, although the most environmentally friendly pumping technology, were abandoned as a tool in the toolkit during the pilot phase because the payback time made them unfeasible for small farmers.

- ii. Creation of 2 ACTs, which have provided technical assistance and training to 100 farmers in irrigation methodologies, food security, agricultural techniques.
 - iii. Technical partnership brokering: Adapta Sertão convenes technology partners in order to provide access to appropriate technologies (e.g. pumps, pipes, drought-resistant seeds).
 - iv. Generating knowledge together with farmers through monitoring, testing and exchange trips.
 - v. Policy alignment dialogues with government to work toward ensuring socio-economic policies are aligned with reality on the ground.
- b. Environmental:** In order to strengthen community resilience to climate change impacts, Adapta Sertão promotes the conservation and restoration of the local environment through sustainable agricultural practices. Specific elements of the Adapta Sertão model to this end include:
- i. Discouraging the traditional land use approach (deforestation to create pastures) by encouraging the use of semi-confined or confined pasture to decrease land degradation.
 - ii. Encouraging multi-cropping to avoid dependence on one crop and reduce plant-specific plagues, as well as endorsing the planting of native trees for productive use, (e.g. indigenous protein rich plants that may be used for cattle fodder that in turn increase milk yields) and indigenous fruits that can be used for to make products such as jellies and juice. The areas with increased vegetation cover will retain more water in the ground, which in turn will increase humidity, eventually creating a micro-climate more favourable to production.
 - iii. Reducing water wastage - Adapta Sertão's drip irrigation technologies use less water than traditional methods and avoid soil salination.
- c. Economic:** Adapta Sertão is making progress toward improving the livelihood of its beneficiaries through increasing income and diminishing staple food crop loss. Results include:
- i. More than twofold increase in income for approximately 30 of the farmers involved (from less than US\$250 per month to over US\$500 per month); for a further 40 farmers, 20-50% increase in income.
 - ii. Significant reduction in the loss of staple food crops (from 70% to 20%)
 - iii. Provision of jobs to Cooperative members - e.g. the Cooperative Ser do Sertão (Pintadas) began with 1 staff member in 2006 and now has 11.
 - iv. Creation of market links; establishment of rotating microcredit system.

Encouraging youth to stay in the Sertão

For most residents, life in the Sertão is difficult with little prospect for improvement. This leads many youth to leave the region to search for a better lifestyle in bigger cities (where they often end up in large, crime-ridden shanty towns). An important component of Adapta Sertão is working with teenagers through an action learning process, in order to help them value their heritage and perceive opportunities for improving income and wellbeing in Sertão. The youth conduct research over 3 months, visiting local markets to study types of produce and fields to see production practices. They experiment with production of high value products such as juice and jelly from native plants and bring their research results (and products) to a regional Knowledge fair.

Source: Nereide Segalo, director president of Ser do Sertão Cooperative and local manager of Adapta Sertão

Mapping BCP's stakeholders

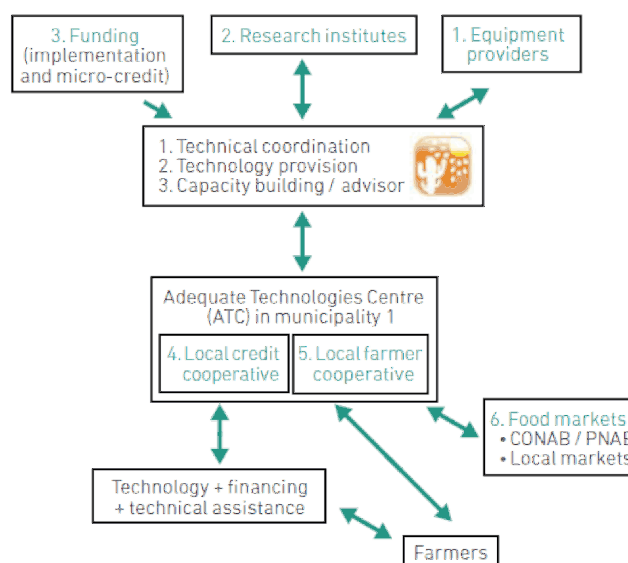
The Adapta Sertão coalition currently comprised of community based organisations, research centres, NGOs, public and private institutions. From its origins in 2004, The Pintadas Solar core project management team continues, but the project has changed its core funders, has been expanded to include more equipment providers, has accrued financing organisations, accrued two more community organisations and secured government support in agricultural markets.

Adapta Sertão management

Thais Corral - Thais Corral, Director of REDEH, Network for human Development and NGO based in Rio de Janeiro and Daniel Cesano Adapta Sertão Technical Coordinator-, were central to technology provision, capacity building and advising, as well as proposal writing to achieve core funding and strategic support.

Pintadas Solar project manager Nereide Segala has helped to establish the community based model and engage farmers, community organisation.

Stakeholder map: source (Ella, 2012)



Type of Stakeholders	Organisation's Name
1. Equipment providers	Netafim ,Naan Jan, Tigre, Amanco
2. Research Institutes	Centro Clima/UFRJ; Embrapa Semi Arido; INMET/National Geographic Center
3. Funding	UBA/German Environmental Agency; Fundo Clima/Brazilian Ministry of the Environment
4. Local credit cooperative	SICCOB
5. Local farmer cooperative	Coopsertão, Pintadas. Three additional ATC by 2014
6. Food markets	CPE Stock/Government CONAB/PNAE; Local Markets
7. Farmers	Small farmers in the region Bacia do Jacuiapé

Success factors

Adapta Sertão is a network as well as a methodology. Factors that have contributed to its success include:

- Unique, integrated development model:** Three key elements have been identified that make the Adapta Sertão's development model unique: 1. A small farmer production system combining climatic resilience with improvement of local livelihoods; 2. "Appropriate Technology Centres" that provide farmers with access to technology, microfinance and knowledge; 3. A multi-stakeholder approach that seeks to integrate existing policies into a comprehensive adaptation programme at the local level (Ella, 2012).
- Base data, testing, ongoing monitoring and evaluation:** Scientific/technical expertise has been applied in order to refine the Adapta Sertão suite of solutions. At the outset, a thorough assessment was undertaken to identify the key barriers for disseminating innovation and preventing development in the region. Besides this, the approach is hinged upon testing the methodology and technologies together with farmers, through trial and error. Further, throughout the development of Adapta Sertão, monitoring and evaluation has been ongoing, and will be applied to the implementation of an early warning system for the region.

- **Working hand in hand with leaders in a town with strong community leadership:** Pintadas is a community with a long history of pursuing and achieving benefits (see box at right). For example, in 2004, the community had already acquired cisterns for nearly all of its 1,600 rural residents. This fact, together with the strong community organisation, attracted the interest of external partners in order to begin the Pintadas Solar project (REDEH, 2008). Harnessing community leadership is a central success factor for scaling up this project in other municipalities of the Sertão - and part of the project design involves showcasing successful examples of the Adapta Sertão methodology through ACTs as a means to encourage other communities. By giving prominence to community leaders or champions who are already respected in the community, a small number of projects could be sufficient to raise interest in a community.
- **Building upon existing policy:** Adapta Sertão has capitalized on the existence of national government policies such as the PNAE law - which stipulates that 30% of the food provisions given by the local schools must be produced in the communities.
- **Research and partnership with universities:** One key factor in the success of the project has been the partnership with two universities: Centro Clima/Federal University of Rio de Janeiro and Institute for International Relations and Pacific Studies at the University of California San Diego. This has helped to refine the model, identify the technologies that proved to be climate resilient, and develop a means for identifying the key factors and areas that lead to enhanced resilience to climate change.

Challenges and how they have been met

- **Rural area – high cost of technology:** It is not cost-effective for technology retailers to have a presence in small, rural communities. Adapta Sertão is addressing this challenge through working with private technology providers and engaging them to expand distribution networks by building local capacity through local cooperatives. This has resulted in the creation of local retailers in rural areas who can give instruction, guidance, technical support and long-term maintenance.
- **Financing for farmers:** Achieving financing to help farmers pay for the technological inputs is fundamental, however it has not yet been consolidated. Good headway has been made by establishing a partnership with a federal government financing programme (ProNAF), however some of the incentives under ProNAF need to be changed (see below).
- **Aligning government programmes with ecological objectives:** The ProNAF programme to help agricultural families is not aligned with the overall objectives of the project and at a larger scale goes against the principals of climate change adaptation and carbon offsetting. For example, it promotes the purchasing of cows and inputs needed for pasture land. According to Thais Corral, REDEH, “We have started discussions with the government in order to bring changes to this programme and ensure that it is aligned with the principles of the Adapta Sertão project. We are also trying to identify other government programmes that need to have their policies realigned to this end”.
- **Disorganised and inconsistent policy frameworks:** There is little degree of integration between different policies, availability of financial and human resources and a unifying framework at different levels of government (Adapta Sertão 2011a). Adapta Sertão is currently in dialogue with policy makers in order to improve this situation.

Harnessing community leadership

Pintadas contains a strong network of 11 community organizations, including women's associations, young peoples' groups, bee-keepers, and credit and agriculture cooperatives. The Catholic Church was a key force in the birth of the local community organisation process three decades ago. Other interesting influences making this town stand out in the region is the early election of a woman mayor. These influences have led a number of social projects to be carried out in the area. Practically all of the more than 1,600 rural households in the district, for example, now have rainwater storage tanks. The solidarity built in the process, in which “the beneficiaries and designers of the projects are one and the same,” is the engine of local development, according to Nereide Segala, a 49-year-old former nun - turned social activist and small farmer; manager of the Pintadas project since its inception, and founding president of the city's agricultural cooperative.

Source: Osava, 2007

Current needs/types of support the enterprise requires now

According to Thais Corral, “Adapta Sertão needs to be put in contact with projects employing similar methods, we also need help with communication and scaling up. We need someone to join the organisation who is an expert in communications with a lot of experience, who can document the elements of our growth process and effectively transmit the project results.” (Corral, 2012). This need for documenting the process is mirrored by Nereide Segala,

director-president of the initiative's first co-op: "This project holds a wealth of history. We need to bring this to memory. It will help us to analyse the bigger question: are we on the right track?" (Segala, 2012).

Lessons Learned from the Pintadas Solar Case Study

The Adapta Sertão approach has successfully implemented drip irrigation technologies in combination with access to reservoirs and cisterns in order to reduce crop dependence on rainfall. The success of this project to date has shown that resilience to climate change and food security can be strengthened in semi-arid areas through appropriate irrigation technologies and small-scale, environmentally beneficial farming methods. Important in this scale up and replication of this project has been the support of local NGOs to: help low-income beneficiaries gain capacity and access to the technologies, provide access to micro-credit, and create market linkages.

Key to the continued scale up of this project in the Sertão will be ensuring that farmers embrace the Adapta Sertão methodology, technology and approach. Harnessing the influencing power of local leaders is a current strategy applied to this end, as is working toward further strengthening community-based organisations and enabling them to access existing government programmes as a means of attaining self-sustainability.

References

CEMINA (2011) Adapta Sertão Vai à Escola. Guia par reflexão com educacordes(as): Uma experiência coletiva em educação contextualizada - 1ª edição. Comunicação Educação Informação Adaptação - CEMINA. Available: http://www.adaptasertao.net/uploads/noticias/13_Guia.pdf

Adapta Sertão (2011a) The Adapta Sertão Experience Summary. Prepared for the Climate and Development Knowledge Network (CDKN). Available: http://www.adaptasertao.net/uploads/noticias/15_Brief1.pdf

Adapta Sertão (2011b). Technical Brief. Example of a production system of Adapta Sertao Prepared for the Climate and Development Knowledge Network (CDKN). Available: http://www.adaptasertao.net/uploads/noticias/16_Brief2.pdf

ELLA Brief (2011). An Integrated Approach to Improving Adaptive Capacity: The Adapta Sertão Experience. Ella Brief. Experiences and Lessons from Latin America. Practical Action. (<http://goo.gl/MSB1p>) Available: <http://ella.practicalaction.org/node/787>

Osava, M. (2007) AGRICULTURE-BRAZIL: Using Alternative Methods to Adapt to Drought. Inter Press Service News Agency. IPSNews.net Available: <http://ipsnews.net/news.asp?id-news=39357>

REDEH (2008) Projeto Pintadas Solar Vencedor do Prêmio SEED 2008. Rede de Desenvolvimento Humano - REDEH http://www.redeh.org.br/antigo/a_pintadas.asp

Zoninsein, L. (2012). Resilience to climate change in the semi-arid region of Brazil Climate and Development Knowledge Network. Available: http://cdkn.org/2012/01/resilience-to-climate-change-in-the-semi-arid-region-of-brazil/?loclang=en_gb

2.2.12 Websites consulted

- Adapta Sertão coalition - <http://www.adaptasertao.net>
- Governo de Pintadas- <http://www.pintadas.ba.gov.br>
- REDEH <http://www.redeh.org.br/>
- Climate and Development Knowledge Network – <http://www.cdkn.org>

- SEED website Pintadas Solar project page - <http://www.seedinit.org/2008-awards/35-pintadas-solar/view-details.html>
- SISCOOB - Credit Cooperative of the Sertão - <http://www.sicoobsertao.coop.br/>
- CODES Territorio Bacia do Jacuípe - <http://territoriobaciadojacuipe.blogspot.com.br/p/o-territorio.html>
- Videos: Adapta Sertão: V Feira do Conhecimento 2009 - Pintadas/BA <http://www.youtube.com/watch?v=U8KHs4OQVOQ>

Interviews

- Thais Corral, NGO Human Development Network (REDEH)
- Nereide Segala, Rede Pintadas, Director-president of the Cooperative “Ser do Sertão”
- Matheus Martins, Secretaria Executive Secretary of CODES, regional council on territorial planning.