# MANDACARU AWARDS

## INNOVATIVE PROJECTS AND PRACTICES ON ACCESS TO WATER AND LIVING IN HARMONY WITH THE SEMI-ARID


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BRAZIL-SPAIN COOPERATION SERIES,
Access to Water and Living in Harmony with the Semi-arid. Cisterns Program – BRA 007-B

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## IMPLEMENTATION

**Brazilian Institute of Development and Sustainability (IABS)**

The "Cisterns Program BRA 007-B" began on November 17, 2009, as part of an agreement between the Official Credit Institute, on behalf of the government of Spain and IABS, in the scope of the Water and Sanitation Cooperation Fund (FCAS), with support from the Spanish Agency for International Cooperation for Development (AECID) and co-financing from the Ministry of Social Development and the Fight Against Hunger (MDS).

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Access to Water and Living in Harmony with the SEMI-ARID. Cisterns Program – BRA 007-B

# Acknowledgements

The Mandacaru Awards organizers thank all those who participated in its development and who are part of this story in search of making a lasting contribution to construction of a fairer and more sustainable SEMI-ARID region. The experiences that were shared and the lessons learned made it possible to put together the diversity of this project that IABS holds in such high esteem.

We hope this spirit of simplicity, solidarity, innovation and efficiency present in social technologies and practices for living in harmony with the SEMI-ARID can be strengthened on a daily basis by the different stakeholders who have promoted true and profound transformations in the lives of families living in harmony with this region.

Lessons learned and examples of innovative practices are presented in this book with the highest degree of admiration and respect for the selected institutions and their teams, in search of appreciation and dissemination of their experiences and processes that may serve as examples for other communities and remain in the minds and hearts of all those who are part of this Award.

Long live the *sertanejo* people! Long live the *Caatinga* and the Mandacaru Awards!

# PRESENTATION

The *Brazil-Spain Cooperation – Cisterns Program BRA 007-B* series of publications is a result of activities and partnerships undertaken between 2010 and 2014 in the scope of this program, with the objective of consolidating and disseminating different types of actions and significant knowledge for living in harmony with the Brazilian Semi-arid.

The Cisterns Program BRA 007-B, in connection with the Fund for Cooperation in Water and Sanitation (*Fundo de Cooperação para* Água *e Saneamento* – FCAS) was created as a result of a partnership between the Official Credit Institution (*Instituto de Crédito Oficial* – ICO) on behalf of the Spanish Government and the Brazilian Institute of Development and Sustainability (*Instituto Brasileiro de Desenvolvimento e Sustentabilidade* – IABS). Financial support came from the Spanish Agency of International Cooperation for Development (*Agencia Española de Cooperación Internacional para el Desarrollo* – AECID), with the Brazilian Ministry of Social Development and the Fight Against Hunger (*Ministério do Desenvolvimento Social e Combate* à *Fome* – MDS).

The Program objectives included contributions to social transformation, promotion and appreciation of water as a right that is essential to life and citizenship. It also sought understanding and practical sustainable and solidary living with the Brazilian Semi-arid. These activities were boosted by diffusion of social technologies with participative processes as the fundamental bases for action, enabling viability of the region and protagonism of its people.

The process of technology diffusion and a new paradigm for living in harmony with the Semi-arid started with a civil society initiative, organized with the objective of guaranteeing access to potable water for families in locations where the problem of water scarcity for direct human consumption affects their very survival. Based on this movement, public policies for universal access to water incorporated these processes in order to contribute to local movements and networks.

Most of the Semi-arid lies within the *Caatinga*, considered by specialists as the Brazilian biome with the highest sensitivity to human interference and global climate change. Another characteristic of the Brazilian Semi-arid is its water deficit, although this does not mean a lack of water, on the contrary, it is the semi-arid region with the highest rainfall on the planet. However, rains are irregular over time and space and the amount of rain is lower than the rate of evaporation.

This means that families need to be prepared for coming rains. Knowing how to manage their resources and having reservoirs to capture and store water are fundamental to ensure water security during droughts. Examples of such reservoirs include household cisterns, boardwalk cisterns, school cisterns, underground dams and other social technologies.

Social technologies supported and disseminated like plaque cisterns for rainwater catchment are a solution for access to water resources for the rural population in the region. These cisterns are destined for low-income rural population, suffering from the effects of prolonged droughts that last up to eight months a year. During this period, access to water normally takes place by means of remote dammed water and wells with low or extremely low water quality, resulting in illnesses in families forced to drink water from these sources.

One of the greatest challenges in the struggle for living in harmony with the Semi-arid is guaranteeing universal access to water for all the *sertanejo* people. Therefore, plate cisterns are a milestone in this search for water and food sovereignty. The Misery-Free Brazil (*Brasil Sem Miséria*) plan, started by the federal government, by means of its Water for All (Água *para Todos*) project, planned to implement 750 thousand cisterns and six thousand simplified supply systems for human consumption by the end of 2014.

Thus, based on knowledge acquired by local partners, over 15 thousand plate cisterns (household, farming and school) were constructed by way of participative management, mobilization, capacity-building and building processes, in the scope of the Brazil-Spain Cooperation.

In addition to plate cisterns – social technology with the highest degree of consolidation and incorporation in public policies – other forms of support in this cooperation program were fundamental for this process. Important institutional strengthening activities were carried out, in addition to consolidation of knowledge networks, capacity development of leaders and managers related to the topic, exchanges of practices and experiences, identification and diffusion of social technologies with the Mandacaru Awards, evaluation and impact studies and research, consolidation of the Xingó Center for Living in Harmony with the Semi-arid, as well as several publications and videos that contributed to success of the program.

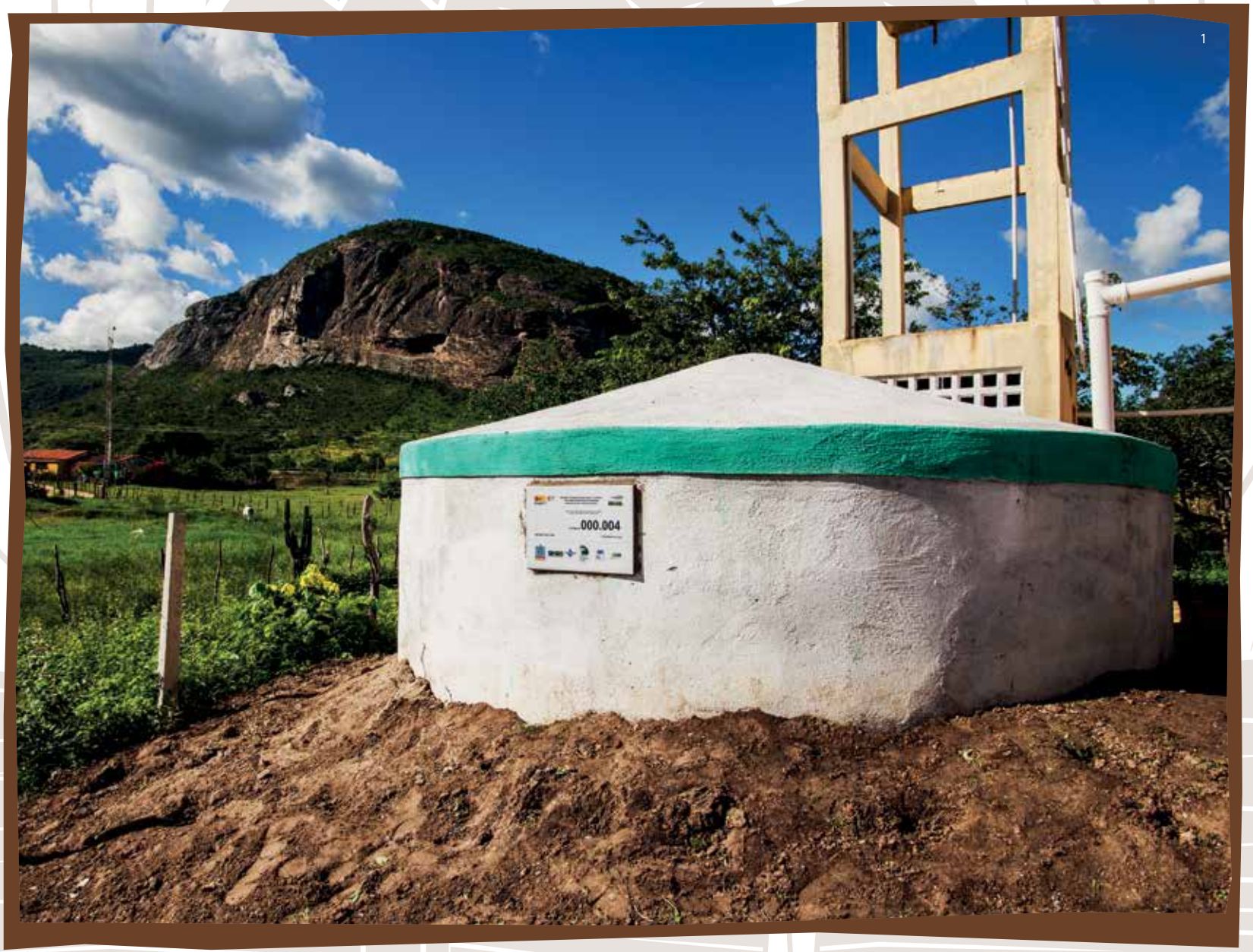
It is in this context that the Mandacaru Awards emerged in an effort to identify and support innovative practices and projects that transform the manner in which *sertanejo* people live in the *Caatinga* biome and its distinct climate. The Awards are open to all institutions working in or with the Brazilian Semi-arid, in a rich and diverse universe.

We thus hope to contribute to this new moment and outlook on the Semi-arid, supporting practices that are increasingly adapted to the biome, the local culture of *sertanejo* people and the significant advances Brazil has made in the past years.

**Ministry of Social Development and the Fight Against Hunger – MDS**

**Spanish Agency of International Cooperation for Development – AECID/DFCAS**

**Brazilian Institute of Development and Sustainability - IABS**

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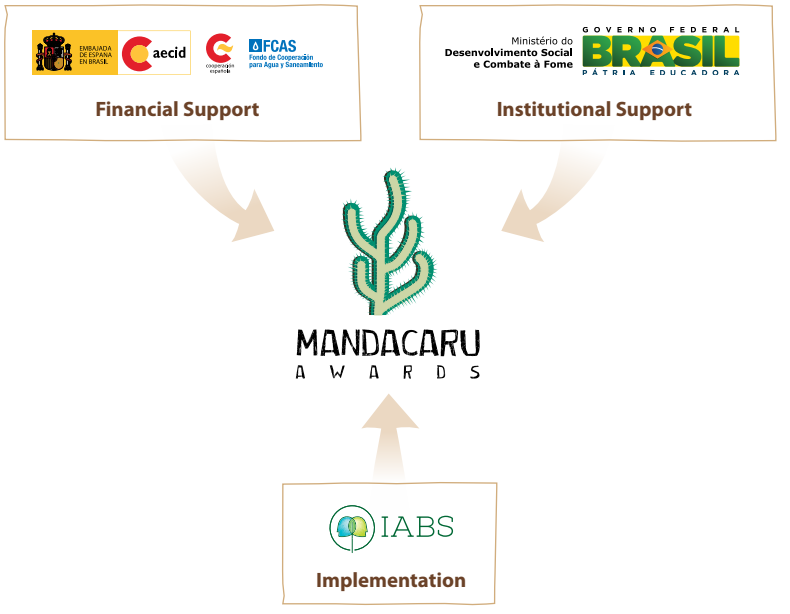
# INTRODUCTION

The Mandacaru Awards – Innovative Projects and Practices for Access to Water and Living in Harmony with the Semi-arid – was conceived to promote various expressions of innovation in knowledge and practices, that are often dispersed, with little or no formal support from government, seeking to contribute to solidary and sustainable living in the Brazilian Semi-arid. In order to achieve this, interactions between *sertanejo* people and their environment were identified and given recognition in the form of the award.

This knowledge has been constructed and replicated throughout decades of observation of natural dynamics, at times intensified by human processes, and developed in the most diverse regions of Brazil, revealing the creativity and possibilities for adaptation to very adverse conditions.

The Awards, in two cycles, have brought to the limelight several institutions and practices that have made contributions to living in harmony with the Semi-arid at different levels, be they social and political movements, academic departments, civil society organizations or even local governments composing the wealth of the Brazilian Semi-arid's mosaic.

The Mandacaru Awards are part of the "Cisterns Program – BRA 007-B", implemented by the Brazilian Institute of Development and Sustainability – IABS, by means of an agreement with the Water and Sanitation Cooperation Fund – FCAS, with financial support from the Spanish Agency of International Cooperation for Development – AECID and the Brazilian Ministry of Social Development and the Fight Against Hunger – MDS.



The Mandacaru Awards arose from a Cisterns Program BRA 007-B Steering Committee meeting in 2010, based on activities in its Operational Guidelines, Component 4, Specific Objective 2, which set forth development of new technologies, by means of projects, awards, seminars and exchange activities, in addition to support for new social technologies in favor of harmonious living in semi-arid regions.

The idea with the awards was to go beyond a financial reward, seeking further approximation to selected organizations with the use of communication tools and techniques that are appropriate to the reality of participants. The proposal involves systematic institutional strengthening for both awardees and awarders, generating lessons and adaptations that are important to meet established objectives.

The first cycle was held in 2012 and the second in 2013, involving 22 institutions in the nine states of the Semi-arid. This publication takes readers along the path followed in these two cycles with the purpose of promoting aprreciation, dissemination and publicity of the concept behind the Awards, as well as the selected proposals and institutions. Furthermore, the development process is described, with characterization and contextualization of areas, categories, and the steps involved. Next, the experiences of each cycle and their outcomes are presented. With the objective of fostering reflections about development of the Awards, with lessons learned, a brief analysis of opportunities and challenges is presented. Lastly, selected institutions and social technologies are described for each cycle.

# MANDACARU AWARDS:

## SUPPORTING AND PROMOTING INNOVATION AND TRANSFORMATION FOR LIVING IN HARMONY WITH THE SEMI-ARID

The Mandacaru Awards are based on principles of harmonious living with the Semi-arid and seek to contribute to expansion of this political and ideological movement undertaken in past decades with organization of civil society in activities that guarantee access to basic rights for improvements in quality of life for communities living in difficult situations in the region.

Steps taken in development of the Mandacaru Awards attempt to identify and reward proposals and social technologies with innovative processes; in addition to systematizing, disseminating and multiplying processes and lessons learned with a teaching-learning relationship involving the team behind the Awards and selected institutions. The idea is to contribute to strengthening of these institutions and to promotion of their knowledge and practices.

The Awards are aligned with the socio-political context of the Semi-arid, considering that the region has overcome the idea that it is impossible to farm and become more developed with better quality of life given the environmental conditions of the region. This idea dates back to the 1970s, when a project for regional development in the Northeast was started, based on the concept of a "fight against drought". This project gave priority to initiatives aimed at large-scale economies and international markets, such as irrigated perimeters and large dams.

**WHAT ARE PLATE CISTERNS?**

Plate cisterns are a technology for rainwater catchment and storage that is low in cost, adapted to the Brazilian Semi-arid.

The objective is to provide access to water for families living in rural areas of municipalities suffering from the effects of prolonged droughts and lack of water in sufficient quality for human consumption and farming.

Given the difficulties in this process, such as lack of water and food, with consequent rural exodus, people and organizations in civil society sought out alternatives to overcome this situation. Thus, with creativity from a *sertanejo* people who throughout their lives have looked for better living conditions with whatever

**WHAT DOES LIVING IN HARMONY WITH THE SEMI-ARID MEAN?**

An intelligent and efficient manner of living with difficulties imposed by the Semi-arid climate – stockpiling water and food by means of social technologies, such as cisterns for consumption and production, that appropriately capture and store rainwater. Other examples include seed banks, providing autonomous farming for longer periods of time, and seed and experience exchanges, among many other examples.

Living in harmony with semi-arid regions requires respect for nature, with rational use of each square inch of land, avoiding wastes of water, fires and pesticides, with crop diversification and native plants.

With this new concept, families have access to water and farming activities ensured year-round, even during long droughts. This manner of relationship with environment and people involves community organization and mobilization and contextualized education encouraging youth to stay in rural areas, as well as access to local markets.

Organizations in favor of harmonious living with the Semi-arid promote knowledge and experience held by family farmers, in addition to seeking to bring generations together in the struggle for a Semi-arid full of life and more worthy of pride.

*Source: ASA (2014).*

**WHAT IS A SOCIAL TECHNOLOGY?**

An innovative proposal for development, considering collective participation in organization, development and implementation processes. They are based on dissemination of solutions for problems aimed at food sovereignty, education, energy, housing, income, water resources, health care, environment and others.

Social Technologies may bring together popular knowledge, social organization and technical and scientific knowledge. Essentially, it is important that they be effective and replicable, providing social development at a larger scale.

*Source: FBB (2015).*

resources are available to them, social processes, tools and technologies emerged. People and activities in these organizations have been able to demonstrate the viability of access to water and food production and, based on this, to promote socially fair and environmentally responsible development, respecting existing socio-environmental limitations.

From an understanding these environmental characteristics (sparse rainfall, rocky soil and high temperatures and evaporation), alternatives were developed for access to water and its storage, for use both in consumption and farming. Little by little, by means of social coordination, collective actions and technologies were developed not with financial gain as the objective, but rather alternatives to meet needs with simple processes and empirical

knowledge, such as rainwater catchment in more concentrated periods for the region.

This process for improvement in living conditions for families contributes to convincing people in rural areas, specifically the youth, to remain where they are, instead of migrating to large urban areas, in an attempt to invert the traditional exodus to southern and southeastern Brazil.

In the document "Living in Harmony with the Brazilian Semi-arid: Autonomy and Social Protagonism", the authors discuss the transition between paradigms of "fight against drought" and "living in harmony with the Semi-arid". According to Josué de Castro, one of the most vocal critics to the older model of economic development used in the Semi-arid, human and social development is important as a means of overcoming structural inequalities, with a set of deep and continuous changes. According to this author, "there is only one true type of development: humankind's development. Humans are the protagonists and the beneficiaries of development" (CASTRO, 2003 *apud* CONTI; SCHROEDER, 2013, p. 25).

The same authors point out the need to face underdevelopment and the lack of food with a new model capable of overcoming inequalities and promoting emancipation of people and meeting their basic needs.

They thus suggest that transforming reality in semi-arid regions is viable by means of a new culture for overcoming inequalities with a matrix of ethical principles with ecological bases, i.e. conception based on sustainability of development models, in such a manner that behavior adjustments and development policies can be influenced and replicated throughout the world.

This paradigmatic transition based on rationality of harmonious living and development with quality of life in the Brazilian Semi-arid requires a combination of various social, economic, cultural and political activities, in coordination with dissemination and reaffirmation of values and practices aimed at equality and respect for dignity for every human being and for other living beings. Some such activities are as follows:

> *democratization and access to water in sufficient quality and quantity for human consumption and subsistence farming; access to land for those who need it for subsistence: promotion of contextual education that makes possible acquisition of knowledge adapted to living in harmony with this reality; incentives for appropriate farming techniques, with agricultural and non-agricultural practices that contribute to improvements in income and assurance of food and nutritional security; and access to basic services that make it possible to satisfy fundamental needs of* sertanejo *populations (SILVA, 2006* apud *CONTI; SCHROEDER, 2013, p. 29).*

This new vision seeks to find alternatives to a model that contributes to human development with solidary relations with nature. In this context, social technologies arise, with this new outlook on Living in Harmony with the Semi-arid, which has become consolidated based on collective actions by civil society organizations

and new public policies that acknowledge and promote this vision. According to Batista and Campos (2013, p.52-53):

> *living in harmony with the Semi-arid means living, farming and developing not in a mentality of pursuit and promotion of concentration of goods, but rather emphasizing sharing, justice and equitability, appreciative of nature and caring for its conservation. Living with the Semi-arid does not mean only employing different technologies, be they cheap or expensive. It means embracing a development proposal that affirms that the Semi-arid is viable, its people are intelligent and capable, its nature rich and possible, as long as humans can have a respectful relationship with it and appropriate public policies exist.*

These actions promote profound transformations in the manner in which *sertanejos* relate to the Semi-arid. Farmers are in the process of rescuing popular knowledge and learning innovative techniques that make better relations with the environment possible. These attitudes have positive results for access to and management of water and land, contributing to crops, herds and breeding, as well as protection of available natural resources.

Organizations and institutions developing and consolidating harmonious living with the Semi-arid reaffirm that quality of life is possible in the driest region of Brazil, with sufficient water, crops, herds, work, income, and, especially, pride of living in the *Sertão*.

The Brazilian Semi-arid Network (*Articulação no Semiárido Brasileiro* – ASA), is a reference in this context for the Cisterns Program of IABS and MDS, as it has, for 15 years, strengthened civil society for construction of participative processes for sustainable development and living in harmony with the Semi-arid, with cultural values and social justice as references.

The Mandacaru Awards thus seek to contribute to this process of transformation of reality in semi-arid regions based on innovative activities, such as social technologies that are generally simple and accessible alternatives. Their development processes are contained both in the various contemporary knowledge manifestations in society, and in old knowledge of traditional populations. Nonetheless, they are based on technical concepts, in addition to empirical practices.

Giving rise to a social technology involves the work of people who have managed to sidestep challenges imposed by nature in an innovative manner, inspired on the one hand by popular knowledge, and, on the other, by technical and scientific support from researchers. More than a concept, speaking of social technologies means establishing cooperation initiatives in networks. On this note, as Gushiken states, "the understanding that what is most important in technologies is the people using them becomes clear. The conceptual discussion, the accounts of experiences and mapping of initiatives are guided by yearnings and visions that are part of the challenge of transforming innovations into policies" (LASSANCE *et. al.*, 2014, p.14).

In this context, the Mandacaru Awards seek to contribute to appreciation of people and their knowledge, considering that the process involves both support for popular and empirical

knowledge held by farmers and technical knowledge from research institutions, non-governmental organizations and government agencies.

In both cycles of the Awards, several actions and social technologies were developed within this perspective for living in the Semi-arid. Fernandes and Maciel (2010) discuss the wealth of the universe that social technologies (ST) involve for people, institutions and organizations where they are developed, improved or replicated.

> *Dealing with conception of a ST means acknowledging the diversity of factors involved in its construction and development; among these are social transformation, direct participation by the population, the meaning of social inclusion, improvements in living conditions, meeting of social needs, socio-environmental and economic sustainability, innovation, the capacity to meet specific objectives, organization and systematization of the technology, communication among different forms of knowledge (academic and popular), accessibility and appropriation of technologies, diffusion and educational activities, construction of citizenship and democratic processes, the search for collective solutions, among others, all based on social justice, democracy and human rights as principles" (FERNANDES; MACIEL, 2010, p. 9).*

On this regard, the Awards seek to understand challenges and opportunities involved in processes and results of social technologies and to contribute to multiplying their benefits in *sertanejo* communities.

The Water for All Program, by the MDS, promotes universalization of cisterns for consumption and farming in the semi-arid region and actions of the Cisterns Program BRA 007-B, in addition to the Mandacaru Awards, are in line with this government program that aims at water and food sovereignty and full development of families in the Semi-arid, contributing indirectly to their objectives.

The Mandacaru Awards search for innovative ideas and social technologies for living in harmony with the Semi-arid that can be reapplied, like universalization of the cistern consolidated as a public policy by means of a grassroots process, i.e. originating from farmer communities and reaching federal government, based on many discussions and activities by civil society organizations.

**ASA?**

The Brazilian Semi-arid Network (*Articulação no Semiárido Brasileiro*) is a network of a thousand civil society organizations active in management and development of policies for harmonious living with the semi-arid region.

# MANDACARU:
## FAR MORE THAN AN AWARD

The mandacaru (*Cereus jamacaru*), also known as cardeiro, is a plant in the cactus family. Native of Brazil, it is ubiquitous in the Brazilian northeast. The size of a tree and with branches, it may reach over five meters in height with large flowers that blossom at nighttime, and is considered a symbol of the *Caatinga* (ANDRADE *et al*., 2006). Representative of droughts, the mandacaru is often confused of the struggle for survival of the *sertanejo* population. Euclides da Cunha said, in his book *Os Sertões*, "*sertanejos* are, first and foremost, a strong people".

3

Like the mandacaru, the *Caatinga* people establish a relationship with this plant based on complicity and reciprocity. In addition to being high in protein content compared to other cacti, it stores water in its interior, helping animals to satisfy their thirst at times of prolonged droughts that periodically strike this region. It thus provides food for wild animals and water for herds during more critical times and, consequently, survival of northeastern populations (MEDEIROS DA SILVA *et al*., 2007). In exchange, despite the fact that the mandacaru does not require much maintenance, its cultivation and management by small farmers are little by little replacing predatory collection of the species during droughts, with more sustainable use of the species.

In this biome, the mandacaru can feed cattle and typical *Caatinga* bird species, in addition to being an ornamental plant with therapeutic properties (DE LUCENA, *et al*., 2013; LIMA, 1996). Adapted to dry climates, with low amounts of water, its leaves change into thorns that serve as defense mechanisms against herbivores (MEDEIROS DA SILVA *et al*., 2007). Hence the saying that "mandacaru is good for neither shade nor leaning."

Durability, adaptability and beauty of this plant are also identified in popular folklore due to its resistance in areas of difficult

survival (DE ALBURQUERQUE *et al*., 2010). The mandacaru flower is the reward for such harsh times, and its blossom is associated with the start of the rainy season, such as illustrated in the popular song "*Xote das Meninas*" by Luiz Gonzaga and Zé Dantas:

> *"Mandacaru, when it blossoms in the drought*
> *is a sign that rain is coming to the Sertão*
> *Every girl who grows tired of her dolls*
> *is a sign that love is coming to her heart*
> *Long stockings, no more low heels*
> *dresses with belts, no more sertanejo clothing"*

Identification of the mandacaru with northeastern life and culture goes beyond drought periods. Nevertheless, this plant represents the strength of a population that resists long periods with no rain and struggles to live in harmony with the Brazilian Semi-arid. Throughout their history, in addition to mandacaru, *sertanejos* have cultivated the feeling of belonging to and pride about the region.

The Awards were inspired by this plant, supporting experiences and practices that seek better forms of access to water and harmonious living with the Brazilian semi-arid.


4

## *CAATINGA*

The *Caatinga* is the only biome that is entirely within Brazil, and is the home of a diversity of species as of yet little known

**HISTORY**
Created during activities and discussions in the Steering Committee of the Cisterns Program BRA 007-B, starting in 2010.

**WHAT IS MANDACARU?**
Mandacaru (*Cereus jamacaru*), or *cardeiro*, is a plant from the cactaceae family.

MANDACARU
AWARDS

**WHY THE MANDACARU?**
A symbol of resistance to droughts, it represents *sertanejo* people's ability to live in harmony with dry climates.
It stores water in its interior, helping animals satisfy their thirst during prolonged droughts.

and appreciated by large part of the population. It is also the most fragile biome in Brazil.

The name *Caatinga* comes from Tupi-Guarani indigenous languages, and means "white wood", according to the Etymological Dictionary by Antônio Geraldo da Cunha: "ka'a" means wood, while "tina" means white in Tupi, referring to the color of the trunks of plants that lose foliage in drier months.

According to data from the Ministry of Environment (2015), the *Caatinga* covers an area of approximately 844,453 square kilometers, equivalent to 11% of the national territory, including regions of semi-arid climates in the states of Alagoas, Bahia, Ceará, Maranhão, Pernambuco, Paraíba, Rio Grande do Norte, Piauí, Sergipe and northern Minas Gerais. Approximately 27 million people live in this region, as shown in Figure 1.

The *Caatinga* has peculiar characteristics in its flora, and, due to adaptation to dry climates and low amounts of water, they are called xerophytes and have structures that are resistant to arid conditions of the *Sertão*. Plants have tuberous roots for water storage, making re-sprouting possible even after long dry spells

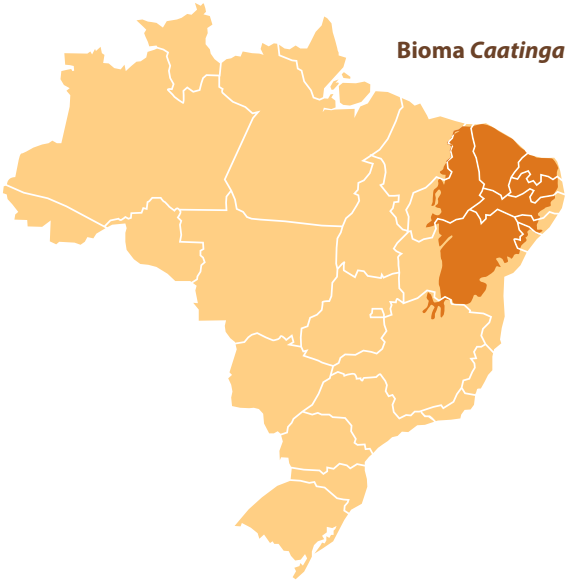



**Figure 1 -** *Caatinga.*
*Source: Cerratinga - ISPN, 2015.*

or even human interventions. Mandacaru, *xiquexique*, palm, *barriguda* and *umbuzeiro* are some of the species with large capacity for water storage. There is also a large list of medicinal plants such as the *catingueira*, *jericó* and *angico* (ISPN, 2015).

Approximately 932 plant species live on *Caatinga* soils, of which 318 are endemic, i.e. exist only in that region, with bromeliaceae and cactaceae as the main plant families in the region. The Semi-arid also houses rare species of high value such as purple *ipê*, *cumaru*, carnauba and *aroeira*, also threatened with extinction. Faced with fast-paced deforestation that has consumed 46% of the biome, according to Ministry of Environment data, a conservation agenda becomes necessary to promote sustainable use of local biodiversity.

*Caatinga* fauna has rich diversity. There are more than 178 species of mammals, 591 birds, 177 reptiles, 79 amphibians, 241 fish and 221 bees. In the *Caatinga* six feline species can also be found: the spotted jaguar, puma, ocelot, oncilla, margay and jaguarondi. However, uncontrolled human exploitation and inappropriate management of the land have increased pressure on local fauna. Countless species are threatened with extinction, such as pumas and armadillos (MMA, 2015).

Water availability in the region is directly influenced by the semi-arid *Caatinga* climate, marked by low humidity and irregular rainfall, with long periods with little or no rain – up to eight or nine months each year. Although rivers starting in the *Caatinga* are dry most of the year, one the most important rivers in Brazil, the São Francisco, has 80% of its water in that region. Another important perennial river in that area is the Parnaíba. In the past decades, the São Francisco has shown water levels far lower than normal. Due to intense human interference, this heritage is now under threat.

Rainfall, even when isolated, may guarantee universal distribution and access to water, as long as there are sustainable strategies for collection by means of social technologies such as tanks, dams and cisterns. In line with what has been discussed so far, sustainable management of natural resources and good practices for harmonious living with the region make it possible to ensure water for human and animal consumption, in addition to farming. It is worthy of note that throughout the *Caatinga* there are scattered oases, in the form of marshes, places that are suitable for farming and survival of many species.

The people living in the biome are also known as *Caatingueiros*: *sertanejos*, cowhands, farmers, indigenous populations and *quilombola* maroon communities. These human groups develop their own strategies for survival and living in harmony with *Caatinga* conditions, caretakers of knowledge about management of plants, in addition to their medicinal properties, millennial techniques for finding underground water with wands (known as radiestesy) and the signs of nature that long-lasting droughts are coming, as well as rain (ISPN, 2015).

The *Caatinga* is one of the most degraded biomes in the country, with over 60% of its area susceptible to desertification, according to data from the MMA. Throughout history,

the region has suffered from a lack of sustainable practices for management of natural resources, with monocultures and extensive cattle ranching, in addition to a large number of fires. The main causes for deforestation are currently associated with extraction of native trees for production of firewood and charcoal for gypsum factories and other large industries in the region. The lack of native plant cover has negative impacts on maintenance of water resources, soil fertility, extinction of fauna and flora species and, consequently, quality of life for the local population.

Only 7.5% of the *Caatinga* is protected by Conservation Units. Of its entire area, only approximately 1% is made up of strict conservation units. Despite the degradation scenario, experiences of traditional populations and family farmers living in that region have shown the possibility of living in harmony with the characteristics of the region, with diversity in crops and herds that are more adapted to regional characteristics (MMA, 2015).

## WHAT IS INTENDED

The Mandacaru Awards seek to contribute to development and consolidation of actions and practices that are innovative in access to basic natural resources which make possible better quality of life for *sertanejos* and sustainable management of the environment.

In order to find solutions for socio-environmental difficulties faced by populations in the semi-arid region, the strategy adopted is to identify and grant awards to innovative social actions and technologies developed in search of better environmental, social and economic quality for the region. The goal is to promote socially fair and environmentally sustainable development in the Brazilian Semi-arid.

The context of the Semi-arid, with its climate, political and social characteristics, has consolidated, throughout the years, the need of the populations living there, in addition to public policies and institutions working in this area to find solutions for farming and generating income at the local level. With its activities, the Awards seek to support and acknowledge the value of actions, social technologies and innovative practices involving access to water, food generation and improved quality of life. The Awards can also assist in convincing *sertanejo* families to stay on the land with consistent and efficient alternatives to ensure their water and food security.

In this regard, the Mandacaru Awards support development of activities and innovative social technologies that promote positive transformations for the semi-arid region in Brazil. With the Awards, institutions with activities in the Semi-arid have the opportunity of participating in the selection process by submitting their proposals and, if selected, to receive support for their implementation.

Award activities include monitoring, mediation of practices and systematization of results constructed, thus contributing to the use of lessons learned in for improvement of processes and persons involved.

**BANCO DO BRASIL FOUNDATION SOCIAL TECHNOLOGY AWARDS**

Awards that identify, certify, grant prizes and diffuse applied social technologies, implemented at the local, regional or national level, with proven effectiveness in solution of matters related with food, education, energy, housing, environment, water resources, income and health. The Foundation has a seat on the Mandacaru Awards Selection Committee.

*Source: FBB, (2015).*

## WHO IT IS MEANT FOR

The initiative is aimed at family farmer associations, research institutions, civil society organizations and government agencies in the Brazilian Semi-arid or with activities in that region. These institutional sectors were chosen due to their engagement with people and communities suffering direct consequences of prolonged droughts in the semi-arid region and who have, throughout the years, found alternatives to minimize difficulties such as lack of water, food and employment.

The Awards support both institutions with low levels of organization and resources, in search of a first opportunity, and well structured organizations with more experience. Organizations with smaller structures are generally made up of farmers using empirical knowledge and with few resources. More organized institutions, in turn, have more technical and financial support for carrying out their activities.

Proposals developed by selected institutions should contribute effectively to improvement in the quality of life of the people involved. The award granted to the "automatic deflection" social technology, for example, contributes directly to communities that use it by automatically sending the first rainwater collected on rooftops, containing dirt and animal droppings, to a separate reservoir for alternate uses, such as in gardens. Dissemination of knowledge about this social technology can contribute to other regions and communities to complement public policies for universalization of cistern implementation, with necessary proof of efficiency and viability for improvement in water resource management. Furthermore, research studies may be selected, generating scientific knowledge, papers and articles, on the one hand, while promoting simple and efficient alternatives for entire communities, on the other. The same occurs in the case of proposals selected for support by government agencies, assisting them, for instance, in their provision of education and health care.

Systematization of processes, results and lessons learned, in addition to contributing to those persons directly involved, serves as an example for other communities and regions, demonstrating that with simple yet innovative actions it is

often possible to contribute to effective and transformative improvements for an entire community.

## AREA OF ACTIVITY

The Mandacaru Awards cover all states in the Brazilian Semi-arid. This means a total area of 980 thousand square kilometers and 1133 municipalities in nine Brazilian states: Piauí, Ceará, Rio Grande do Norte, Paraíba, Pernambuco, Alagoas, Sergipe, Bahia and Minas Gerais.

It comprehends 18.3% of the Brazilian territory and has a population of 22.5 million people, 8 million of whom are in rural areas, according to the Brazilian Institute of Geography and Statistics (IBGE, 2010).

There are also municipalities suffering from effects of the drought that are not included in these boundaries. The Ministry of Environment, through its Secretariat of Water Resources (MMA/SRH), has developed a program in the Inter-ministerial Working Group for formation of the National Action Plan for the Fight against Desertification and Mitigation of Effects of the Droughts, called PAN-Brasil (2005), establishing the limits of Areas Susceptible to Desertification – ASDs, pointing out the need for attention in these regions as well.

The Brazilian Semi-arid is the world's most densely populated semi-arid region. It has high temperatures, with irregular rainfall patterns, involving long dry spells and rainfall concentrated in few months of the year. There is a large water deficit,


**Figure 2 -** *Semi-arid*

considering that rainfall is three times less than surface evaporation rates. The drought is part of the region's history.

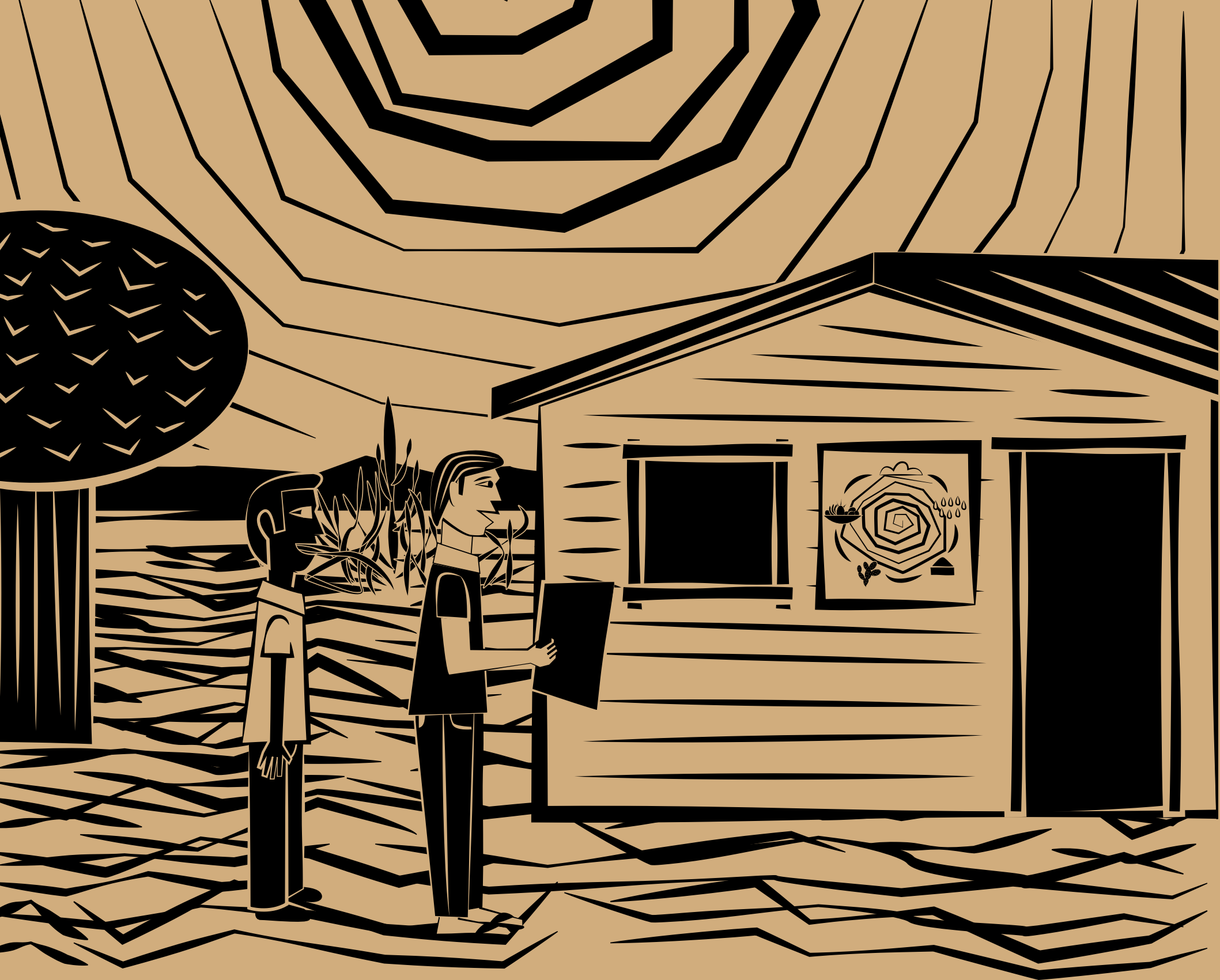
"The soil cannot store rainwater because it is too shallow, with rocks few meters beneath the surface. This rock formation is crystalline. Rainwater penetrates the soil, finds the crystalline layer, runs off and is rapidly drained into streams and rivers, that fill up and just as quickly dry up" (MDS, 2015).

The economy of the Semi-arid is based on family farming. Nevertheless, during droughts, families are unable to maintain

their livestock and crops. This scenario often leads *sertanejos* to abandon their land in search of better living conditions. However, throughout the years, many actions by civil society organizations and government have positively changed this situation and the reality in the Brazilian Semi-arid. With collective actions, social technologies and public policies, people who inhabit the region are learning to live in harmony with difficulties imposed by droughts, shallow soils incapable of storing water and high temperatures.

There are many examples of family sustainability in small properties. In these cases, families living in harmony with the Semi-arid have water, since they learn to store and make the most efficient use of rainwater. Cisterns are among such examples of technologies, making possible agro-ecological crops, management of renewable energy sources and reuse of organic residues, among other experiences.

Nevertheless, there is still much to be done, since these lessons about harmonious living with the Semi-arid require dedication from all sectors. The Mandacaru Awards thus seek to contribute to this new scenario in the region by means of appreciation and support for innovative activities and projects that promote positive transformations for the Semi-arid.



# ELIGIBLE CATEGORIES

With the goal of bringing to the limelight the various types of knowledge about harmonious living with the Semi-arid, the Mandacaru Awards include four categories, involving small farmer associations, non-governmental organizations, research institutions and government agencies. A wide range of innovative practices can thus participate and interact with the purpose of contributing to socio-environmental, technological, scientific and economic development of the region.

After these four groups were defined, the Awards made it possible for institutions with activities in the Semi-arid to have the opportunity of demonstrating their innovative projects and practices and of seeking support for development of their actions. Categories were idealized with debates held with the purpose of meeting the needs of the various stakeholders involved in the spaces in which they work, distributed as follows:

## I – FIELD EXPERIMENTATION

In this category, farmer associations with initiatives for support of rural communities are eligible. These institutions are closer to *sertanejo* communities seeking alternatives to remain in the Semi-arid with autonomy and food and water security. For this reason, these associations have more traditional and empirical knowledge about soil management and water resources in the region, with continuous activities.

**Eligible institutions**: Private farmer associations and organizations
**Award**: First Cycle: BRL 50,000– Second Cycle: BRL 60,000

## II – INNOVATIVE PRACTICES

This category is reserved for non-governmental organizations that maintain communication channels with *sertanejo* communities and other political stakeholders, in addition to holding technical and empirical knowledge about socio-environmental problems in the region.

**Eligible institutions**: Non-Governmental Organizations – private, non-profit NGOs
**Award**: First and Second Cycles: BRL 100,000

## III – APPLIED RESEARCH

This category is aimed at applied research, for production of scientific and technological solutions for challenges presented by the region's characteristics. Production of scientific knowledge that takes into consideration rescuing of traditional knowledge has priority in this category.

**Target institutions**: Public or private, non-profit research institutions
**Award**: First and Second Cycles: BRL 150,000

## IV – INNOVATIVE MANAGEMENT

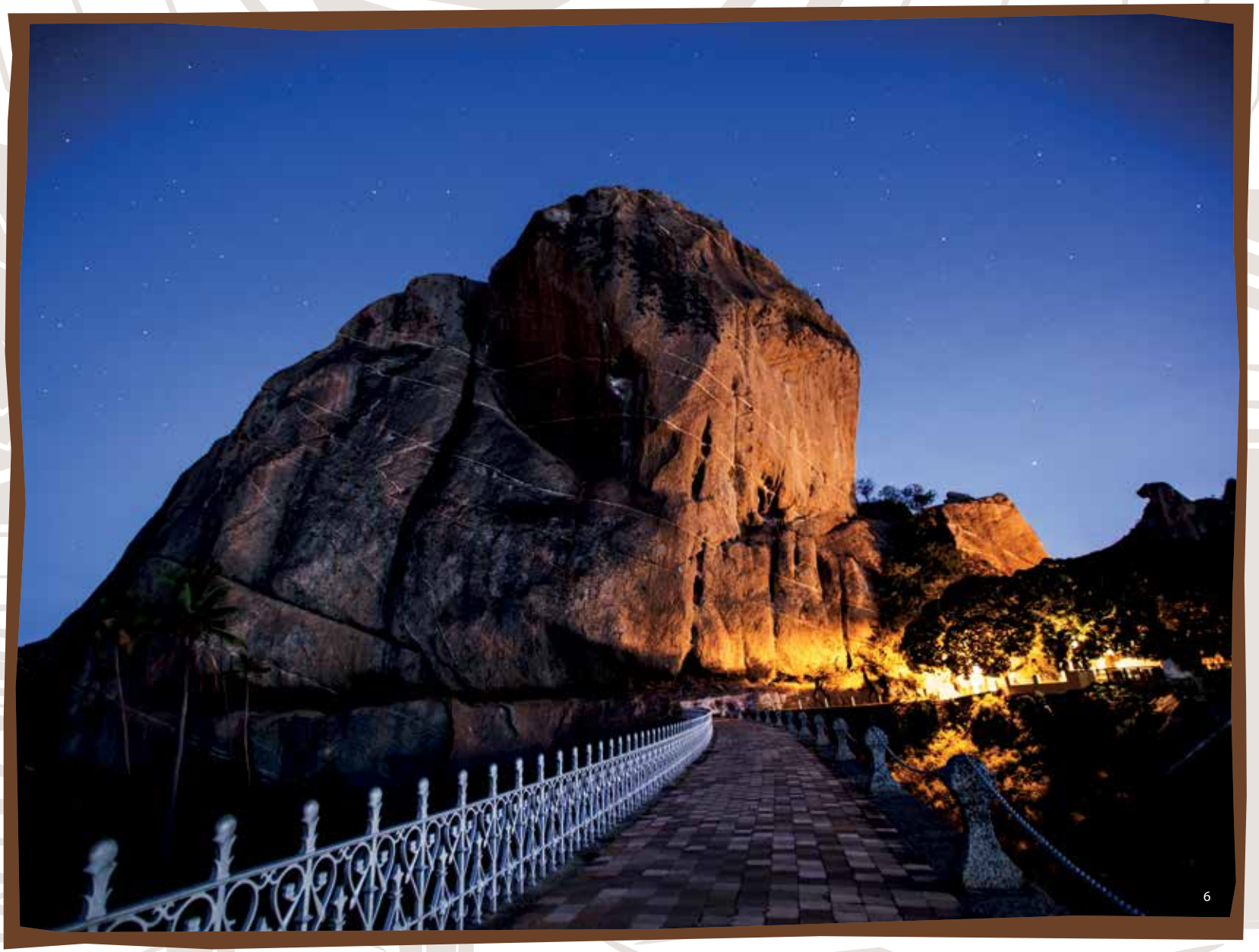
This category has as its main characteristic innovation in public management based on government actions aimed at Semi-arid problems. Well structured institutions with the potential to promote actions at a larger scale are the main participants.

**Target institutions**: Federal, state and local government agencies located in the Brazilian Semi-arid or with activities in the region.
**Award**: First Cycle: certificate – Second Cycle: BRL 30,000

**AWARD AMOUNTS**

The total amount awarded in the First Cycle of the Mandacaru Awards was BRL 960,000, and this was expanded to BRL1,000,000for the Second Cycle.

Category I "Field Experimentation" saw an increase from BRL 50,000 to BRL 60,000 per prize, making it possible to increase support for experiments developed by farmer associations and organizations. Category IV, "Innovative Management", had BRL 30,000 to be awarded in the form of prizes, in addition to the certificate issued to all selected proposals in both cycles.



# THE AWARDS STEP BY STEP

The Mandacaru Awards is developed by an organizing team made up of technical experts from IABS who have the objective of construction, improvement and consolidation of methodological processes and development of a teaching-learning relationship with selected institutions, guaranteeing communications among all stakeholders, be they institutional, supporting or financial partners. This organizing team assembled the methodology for the Awards, following the steps described below:

## A. REGULATIONS

Once financial resources for the Awards have been secured, the organizing team holds consults all interested parties to define the theme, timetable and regulations for each cycle. The theme is chosen based on the political context of the region and seeks to contribute to the activities of government and other institutions working with the Semi-arid. Regulations are posted on the IABS website and a summary is published in the official federal gazette.

## B. DISSEMINATION

Dissemination takes place in the form of printed information material, mailed to potential candidates or partners for reiterated communication; announcements in events with Semi-arid-related topics; mobilization meetings in all states of the region; direct contact with institutions; articles and other media instruments, as well as the Awards and IABS websites and those of partner institutions, in an attempt to reach interested organizations in all four Awards categories.

## C. SUBMISSION

The process for submission of proposals must be in accordance with regulations, and all required documents must be included in the proposal submitted with all its attachments. Submissions by e-mail and regular mail are accepted at the addresses specified in regulations.

Innovative projects and practices that have already been implemented and can be reapplied are eligible, in addition to proposals currently in development stages for continuity and/or expansion purposes and those in search of a first opportunity to become a reality.

## D. SCREENING

During this stage, submissions are screened by means of verification of required documentation, proposal objectives and location, according to regulations. Eligible proposals are grouped into categories and systematized in tables and summary sheets containing the main information included and attachments submitted with the proposals.

## E. SELECTION

A Selection Committee made up of representatives from institutions with recognized activities in the Brazilian Semi-arid selects proposals. Evaluation and selection processes are carried out during a work meeting at IABS headquarters, and the meeting facilitator, with the help of the organizing team, presents selection criteria and makes all submitted material available. The following are evaluation criteria:

- Effectiveness;
- Socio-environmental impact;
- Diffusion/replication potential;
- Social participation;
- Originality and
- Integration with other policies and programs.

In order to evaluate proposals, representatives are divided into groups for each Awards category, according to their characteristics. Each evaluator analyzes proposals in her or his group and scores them between 0 and 10 for each criterion, on evaluation sheets.

In order to do this, committee members receive systematized materials, and have all original documents submitted by candidate institutions available, in addition to copies of regulations, criteria and evaluation methodology.

As evaluation sheets are filled out, they are handed in to the support team, which goes on to systematize data, calculating average scores for proposals evaluated by each group ad rank proposals according to their average score.

With the results of these evaluations, each group validates the highest scores, considering a calculation matrix with scores given by each group representative. Next, committee members gather in a General Assembly to define the final results by confirming the set of selected institutions for that cycle of the Mandacaru Awards, which are then confirmed by the IABS President. Results are made available on the Awards website and sent to all participating institutions.

## F. PREPARATION OF PARTNERSHIP AGREEMENTS AND TERMS OF REFERENCE AND CONTRACT SIGNATURES

After results are confirmed, representatives from selected institutions gather with the organizing team for participative construction of Partnership Agreements and Terms of Reference for each initiative, consolidating activities to be carried out in each proposal, terms of contracts between IABS and selected institutions and financial plans for implementation.

Partnership Agreements are documents that take into consideration institutional and juridical matters involved in contract terms between IABS and selected institutions. Terms of Reference provide guidance for implementation, including work plans, calendars, deliverables, disbursement timetables and reporting requirements among others. Products and indicators agreed upon in a participative manner with representatives are set forth in this document, guaranteeing disbursement of each installment for timely submission of deliverables. Both documents aim to make possible and provide guidance for procedures necessary for development of selected proposals

At this moment, selected proposals are adapted to the period and amount available for each category and any remaining technical or administrative doubts are addressed prior to signature of the contracts.

## G. ORIENTATION WORKSHOP

In order for the development process of proposals planned by the Awards to be better assimilated by representatives from selected institutions, the organizing team holds an orientation workshop providing information, discussing means and procedures for implementation of proposals. The technical and accounting staff provides information about methodological and contractual aspects, as well as templates for technical reports (products and deliverables) and respective disbursement. Doubts about monitoring of proposal implementation, financial reporting and other doubts institutional representatives may have are also addressed.

## H. AWARD CEREMONY

The award ceremony is the moment in which the Mandacaru Award is given to representatives from selected proposals and institutions and results are announced. At this time, selected projects and social technologies are presented with a summary of the story behind each institution. This moment involves celebration and exchanges of experiences among representatives, partner institutions and IABS team.

## I. IMPLEMENTATION AND MONITORING

As set forth in the regulations, Award money must be invested in reapplication, multiplication and/or consolidation of the supported idea or initiative. Therefore, all implementation is monitored by Awards/IABS technical experts, who follow closely development of activities and financial resource application, with each disbursement conditioned to meeting of established milestones. Monitoring takes place in the form of product evaluation (work plan and progress reports), as well as work meetings and visits in each supported initiative.

Throughout monitoring activities with involved teams and communities, the organizing team makes use of a form to gather basic information about development stages of projects and practices, with the objective of getting to know each process and stakeholder and their potentialities and challenges.

## J. SEMINAR FOR INTEGRATION AND EXPERIENCE EXCHANGES

This activity involves a final meeting with representatives from selected institutions and the Awards team for exchanging of experiences and lessons learned during the process of proposal development. The meeting also facilitates evaluation, dissemination and multiplication of proposals and social technologies by means of results and testimonials presented, serving as inspiration for new reapplications and partnerships involving these institutions.

## K. SYSTEMATIZATION AND RECORD KEEPING (PUBLICATION AND DOCUMENTARY)

The organizing team systematizes the process in each cycle of the Awards in technical reports, involving all steps from conception to development of selected proposals. Furthermore, institutions are instructed to keep records of all activities, submitting these records for systematization by the Awards team. These records are inputs for construction of teaching-learning tools such as folders, booklets, videos and this publication. These materials are important for improvement of the Awards methodology.


MANDACARU
AWARDS

# MANDACARU AWARDS I

## "ACCESS TO, MANAGEMENT AND QUALITY OF WATER"

### THE FIRST CYCLE

The Mandacaru Awards I was launched at the end of 2012 with the theme: "Access, Management and Quality of Water", under the framework of access to and sustainable management of water and the *Caatinga*, in the scope of social technologies of innovative nature, including constructive aspects both for rainwater catchment and storage areas and for processes of dissemination of techniques and knowledge related with management of water and other natural resources in the Semi-arid.

This award was the result of an in-depth debate with partners of the Cisterns Program BRA 007-B, with the objective of becoming acquainted with other initiatives and social technologies that could contribute to overcoming the challenge of living in harmony with the Semi-arid.

After an intense process of publicity and mobilization of institutions with activities in the region, interested candidates submitted their projects, which were then evaluated according to terms set forth in the posted regulations.

Proposals were analyzed by a judging committee, made up of representatives from institutions active in the Semi-arid and the topic of social technologies, as shown in the table that follows:

**Table 1**

| INSTITUTION |
|---|
| Spanish Agency for International Cooperation for Development (*Agência Espanhola de Cooperação Internacional para o Desenvolvimento* – AECID) |
| National Secretariat of Food and Nutritional Security – Ministry of Social Development and the Fight against Hunger (*Secretaria Nacional de Segurança Alimentar e Nutricional do Ministério do Desenvolvimento Social e Combate à Fome* – MDS) |
| Secretariat of Water Resources and Urban Environment – Ministry of Environment (*Secretaria de Recursos Hídricos e Ambiente Urbano do Ministério do Meio Ambiente* – MMA) |
| Secretariat of Research – Ministry of Science, Technology and Innovation (*Secretaria de Pesquisa do Ministério da Ciência, Tecnologia e Inovação* – MCTI) |
| Bank of Brazil Foundation (*Fundação Banco do Brasil* – FBB) |
| Brazilian Semi-arid Network (*Articulação no Semiárido Brasileiro* – ASA) |
| Consortium for Development of the Ipanema Region (*Consórcio para o Desenvolvimento da Região do Ipanema* – Condri) |
| Food and Nutritional Security Network (*Rede de Segurança Alimentar e Nutricional* – RedeGenteSan) |

Center for Sustainable Development (*Centro de Desenvolvimento Sustentável* – CDS/UnB)

Brazilian Institute of Development and Sustainability (*Instituto Brasileiro de Desenvolvimento e Sustentabilidade* – IABS)

Selected institutions were granted, in addition to recognition and a certificate, financial support for reapplication of their proposals. Prizes varied between BRL 50,000 and BRL 150,000, depending on the category of each project/proposal. The total amount awarded was BRL960 thousand for implementation of proposals selected over the period of one year, with a six-month extension in specific cases.

During the first cycle, ten initiatives were selected, in seven states of the Semi-arid, divided among the categories as follows: four projects in the category "Field Experimentation", three in the category "Innovative Practices" and three in the "Applied Research" category. No proposals were selected for the category "Innovative Management".


8

Selection Committee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Meeting with representatives from selected institutions

Representatives from selected institutions participated in meetings with the Mandacaru Awards team for information sharing, participative construction of Partnership Agreements and Terms of Reference and signature of contracts between IABS and selected institutions.

The ceremony to give awards to representatives from selected institutions in the Mandacaru Awards I took place on May 3, 2013, at IABS headquarters in Brasilia, and was attended by partners, institutions and guests. During this ceremony, each representative had the opportunity to share the trajectory of the proposal in their institution and to explain expected contributions the award should have for consolidation and expansion of the initiatives. In this scenario, institutional representatives celebrated their awards with the IABS team and guests in attendance.

All practices were monitored by the Awards technical team with regards to resource application, generation of income and employment, consolidation of the social technology and socio-environmental responsibility. This monitoring also contributes to strengthening of selected institutions and improvements for proposals, since organization, operating capacity for development of proposed activities and financial reporting are required.

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Award recipients

During the first cycle, two monitoring visits were held in each organization – the first at the start of activities and the second at the end. This in loco monitoring was essential for better understanding of each proposal, processes involved and challenges and potentialities of each project and category. With this experience, the entire process of initiative development was shown to be rich and involved stakeholders were able to see how their activities contributed to development of their proposals.

Furthermore, this procedure was fundamental for the Awards organizing team, who learned, improved and adapted methodologies in accordance with the reality of the public involved, making it possible to consolidate activities and assimilate lessons for coming cycles.

Monitoring activities also set the groundwork for discussions about some of the potentialities in each selected proposal and the role of identification, consolidation and publicity practices, experiments and social technologies represented by the Mandacaru Awards have in the scenario of construction of more solidary living in the Semi-arid.

# SELECTED PROPOSALS MANDACARU I

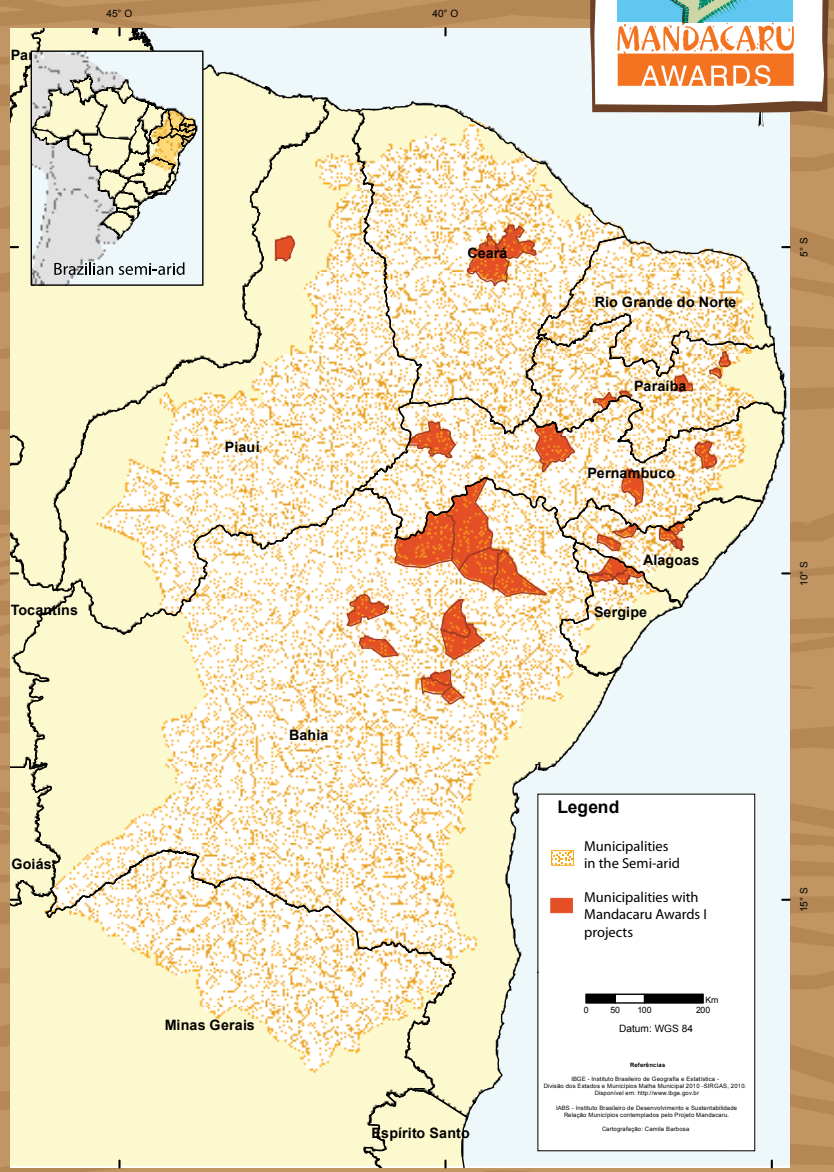


**Figure 3** – *Mandacaru Awards I*


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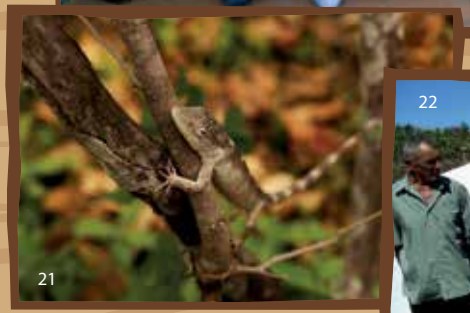
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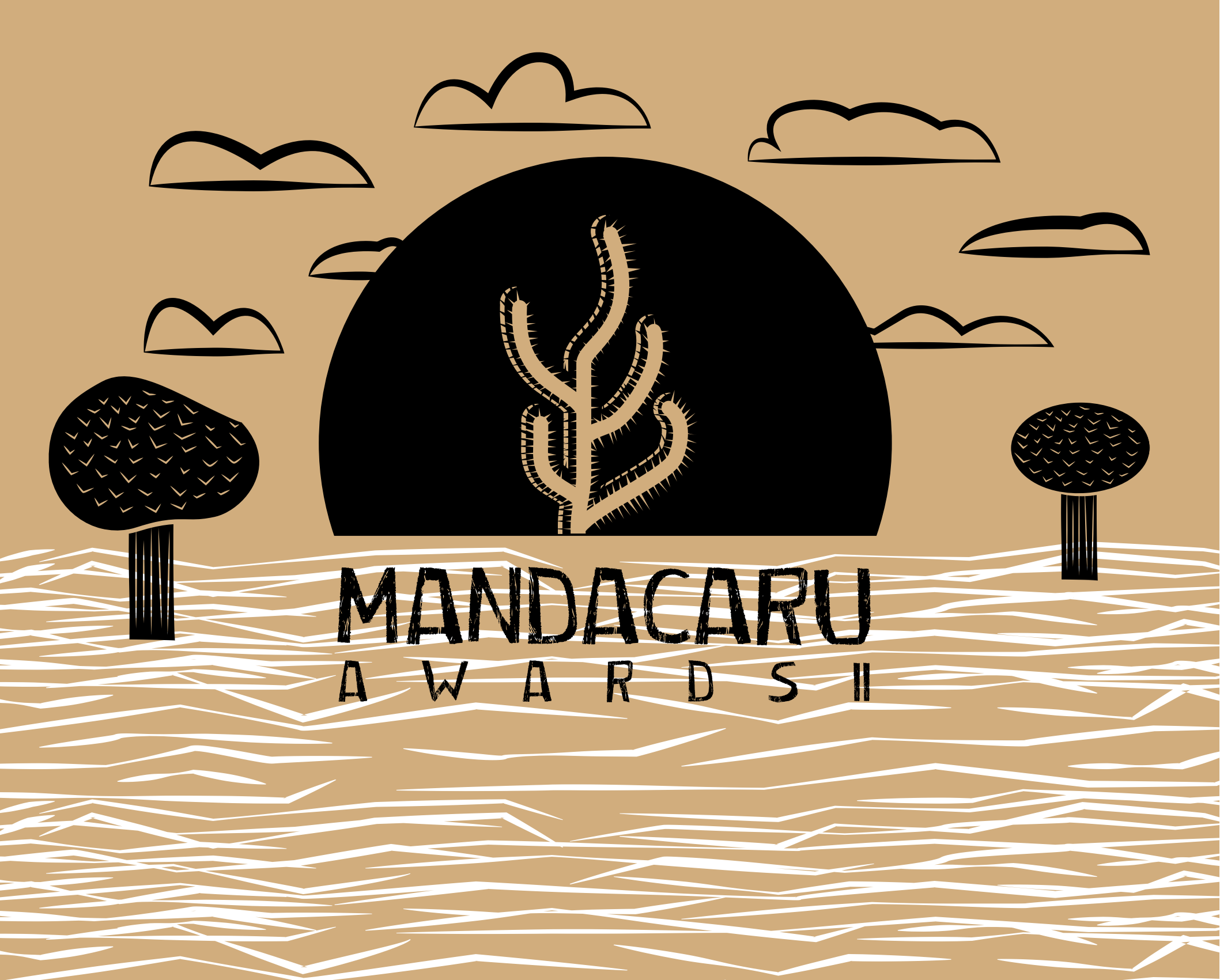
MANDACARU
AWARDS II

# MANDACARU AWARDS II

## "WATER, PARTICIPATION AND FOOD SOVEREIGNTY"

### NEW LESSONS LEARNED

The positive results of the first cycle of the Awards made it possible to launch a second cycle, in an attempt to multiply and consolidate more positive actions in favor of solidary and sustainable living with the Semi-arid, expanding the ongoing support for innovative projects and practices.

In this context, considering the main pillars in the search for harmonious and solidary living in the Semi-arid, the Mandacaru Awards II had the theme of "Water, Participation and Food Sovereignty." This second cycle maintained the same categories, with changes only in the amounts in each category, according to the demand of the previous cycle.

Based on the experience of the first cycle, the organizing team identified the importance of having close contact with those involved in each category, throughout the process of divulging the Mandacaru Awards II. Therefore, the team participated in a series of related events and visited a number of institutions with activities in the Semi-arid. In addition to giving continuity to the process of dissemination employed in the first cycle, sending printed materials such as flyers, banners, portfolios, press notes and giving interviews in general media, all information and dissemination material was made available on the Mandacaru Awards hotsite.

Following an intense dissemination process with mobilization of the entire Awards team, many institutions submitted proposals, which were in turn systematized in accordance with the respective categories and pre-screened by the organizing team for verification of requirements.

As in the first cycle, proposals submitted to Mandacaru Awards II were analyzed by the Selection Committee made up of representatives from institutions with activities in the Semi-arid, social technologies and food sovereignty, to verify meeting of criteria set forth in the terms and conditions, as shown in the table 2.

Selected institutions were awarded financial support and a certificate of honor. Awards varied between BRL 60,000 and BRL150,000, depending on the category of the proposal, and were invested in reapplication of projects and practices. The total amount was increased to BRL 1,000,000, but implementation time was shortened due to the end of the Cisterns BRA 007-B Program, which the Awards are part of, as explained

**Table 2** – *Mandacaru Awards II*

| INSTITUIÇÃO |
|---|
| National Secretariat of Food and Nutritional Security – Ministry of Social Development and the Fight against Hunger (*Secretaria Nacional de Segurança Alimentar e Nutricional – Ministério do Desenvolvimento Social e Combate à Fome* – MDS) |
| Secretariat of Water Resources and Urban Environment – Ministry of Environment (*Secretaria de Recursos Hídricos e Ambiente Urbano – Ministério do Meio Ambiente* – MMA) |
| Secretariat of Research – Ministry of Science, Technology and Innovation (*Secretaria de Pesquisa – Ministério da Ciência, Tecnologia e Inovação* – MCTI) |
| Bank of Brazil Foundation (*Fundação Banco do Brasil* – FBB) |
| Brazilian Semi-arid (*Articulação Semiárido Brasileiro* – ASA) |
| Consortium for Development of the Ipanema Region (*Consórcio para o Desenvolvimento da Região do Ipanema* – Condri) |
| Food and Nutritional Security Network (*Rede de Segurança Alimentar e Nutricional* – RedeGenteSAN) |
| Sustainable Development Center – University of Brasília (*Centro de Desenvolvimento Sustentável* – CDS/UnB) |
| Interamerican Institute of Cooperation for Agriculture (*Instituto Interamericano de Cooperação para a Agricultura* – IICA) |
| Federal University of Cariri (*Universidade Federal do Cariri* – UFCA) |
| Ministry of National Integration (*Ministério da Integração Nacional* – MI) |
| Social Technology Institute (*Instituto de Tecnologia Social* – ITS) |
| Alagoas State Secretariat of Agriculture and Agrarian Development (*Secretaria do Estado de Agricultura e do Desenvolvimento Agrário* – SEAGRI/AL) |

Selection Committee

earlier. Implementation was thus planned for six months, with some extensions in specific cases.

12 practices and projects were selected in the second cycle, located in six states of the Semi-arid, as follows: four projects in the category "Field Experimentation", four in the category "Innovative Practices", two in the category "Applied Research" and two in the category "Innovative Management".

The Awards organizing team also held individual meetings with representatives from selected institutions for participative construction of Partnership Agreements and Terms of Reference, in addition to signature of contracts.

Based on the need identified during the first cycle of providing further explanation about proposal implementation, in accordance with established procedures, the organizing team held a workshop for orientations for representatives of selected institutions. During this occasion, means and tools for better project development were discussed.

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Award recipients

The award ceremony, held on March 28, 2014, at the IABS headquarters in Brasilia, had participation of partners, representatives from selected institutions and guests. As in the first cycle, each representative made a brief presentation of his or her institution and the selected proposal, creating a moment for integration, dissemination and exchange of experiences.

Both cycles of the Awards were running simultaneously during some months, with stricter deadlines for development of proposals in the second cycle, in comparison with the first. Therefore, only one round of monitoring visits was undertaken for verification of results, and meetings and reports were used in lieu of visits throughout the entire period.

All practices were also monitored with regards to application of resources, participation, income and employment generation, consolidation of social technologies and socio-environmental responsibility. With the second cycle, the importance of monitoring to consolidate the teaching-learning relationship proposed by the Awards was confirmed. This contributed both with selected proposals and institutions and the methodological and ideological process of the Mandacaru Awards.

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Maiti Fontana, Technical Expert Mandacaru Awards and
Carla Gualdani, Coordinator Cisterns Program BRA 007-B

# SELECTED PROPOSALS
# MANDACARU II

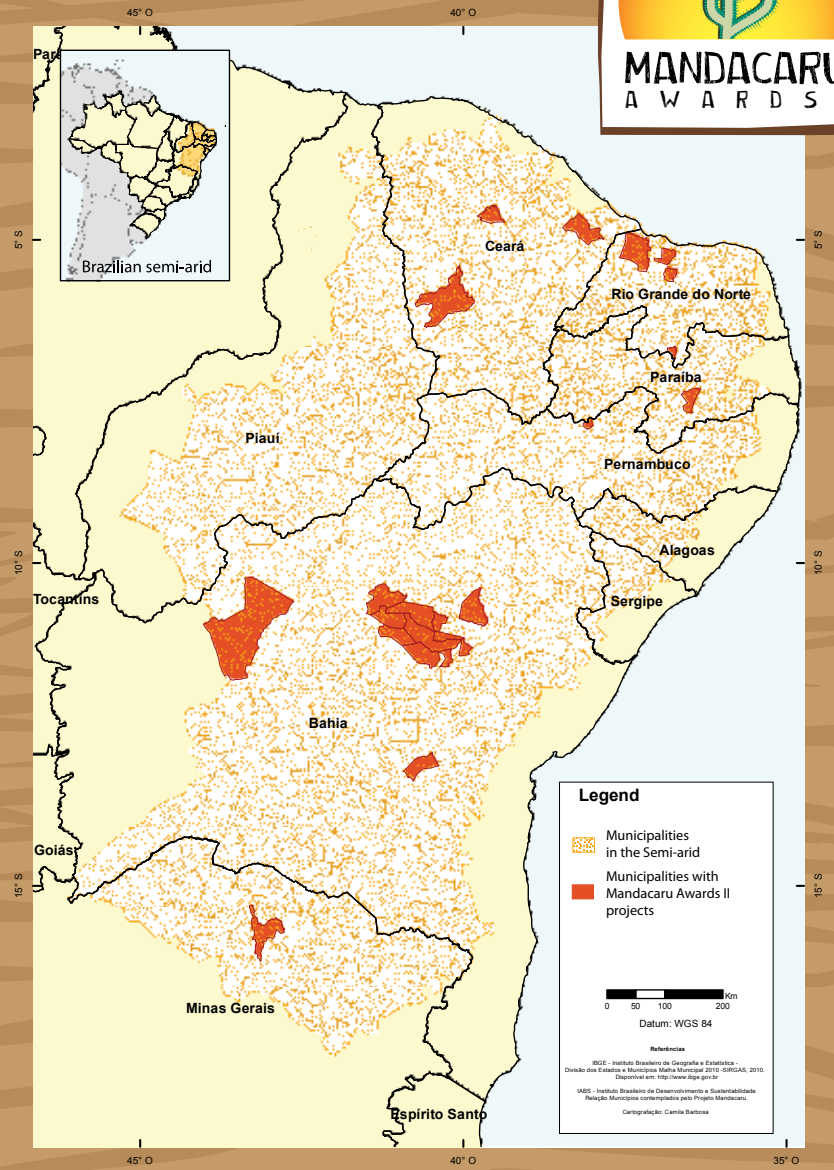


**Figure 4** – *Mandacaru Awards area of influence*


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# LEARNING WITH THE MANDACARU AWARDS

## RESULTS

The Awards sought to involve different institutions with activities in the Semi-arid, with its four categories, which led to different results regarding development and implementation of selected practices. Each institution and its respective experience have singularities reflected in their history, ideological and political position, and other factors that make them unique, each in their own manner.

Participation in development of proposals is a common aspect when social technologies are involved. Nevertheless, community involvement was stronger in the first categories, involving farmer associations and non-governmental organizations.

In general, selected institutions have a certain degree of experience and organization. The Awards have contributed to organization and strengthening of some institutions, especially in the first categories, since it promotes management capabilities and systematization of practices and processes. However, most institutions in this group have a history of formation and organization, be it by ASA or other networks that contribute to strengthening, mobilization and socio-environmental transformation in the region.

This demonstrates how the process of continuous formation and technical assistance, allied with development of social projects and practices, is fundamental to meeting of objectives, creativity, self-esteem, sustainability and cultural appreciation of each region.

Some information, data and analyses for both cycles of the Mandacaru Awards, starting with the number of proposals submitted according to category and cycle, are presented in the table below:

**Table 3**

| Categories | Cycle | |
|---|---|---|
| | Mandacaru I | Mandacaru II |
| I – Field Experimentation | 4 | 4 |
| II – Innovative Practices | 3 | 4 |
| III – Applied Research | 3 | 2 |
| IV – Innovative Management | 0 | 2 |
| **Total:** | **10 (29)** | **12 (67)** |

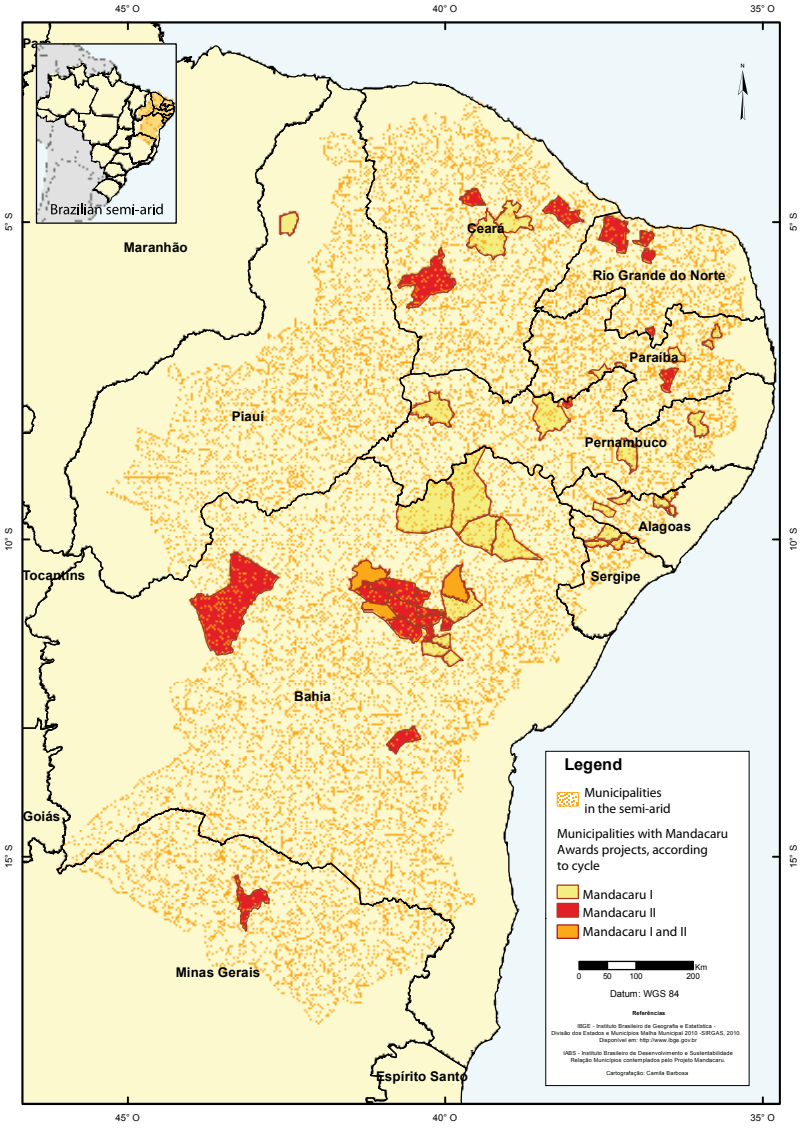
29 proposals were submitted in the first cycle and 67 in the second. This increase in proposals is due, mainly, to a strategy for publicity of the Awards in a manner closer to those involved, as explained in the chapter "Mandacaru Awards II – New Lessons".

For the first cycle, none of the proposals submitted under the fourth category met requirements set forth in the Call for Proposals, but two were selected in the second cycle. It is believed that one of the factors that contributed to lower participation is associated with the lack of proposals selected for the category in the first cycle and the scope that is limited to municipalities, which in the second cycle was expanded to include institutions at the state and federal levels.

Figure 5 contains the territorial distribution of proposals selected in both cycles of the Mandacaru Awards.

The Mandacaru Awards receives proposals developed in the nine states of the Brazilian Semi-arid. According to Figures X, 32 municipalities were selected in the first cycle and 23 in the second. Among these, three municipalities in the state of Bahia had their projects selected in both cycles, and are identified in orange on the map. In all, 52 municipalities were selected and supported in Mandacaru Awards I and II.

The graph shows the distribution of municipalities selected according to state and region. Bahia is the state with most selected proposals, followed by Paraíba, Pernambuco and Alagoas. However, the greater number of municipalities selected in Bahia does not mean there is territorial imbalance, since this this the state with the largest number of municipalities in the Semi-arid, and this does not reduce the institutional engagement of representatives from that state.




**Mandacaru I: 32 municipalities**
**Mandacaru II: 23 municipalities**
**52 municipalities (3 with projects in both cycles)**

**Figure 5** – *Territorial Distribution*

Approximately 38,000 people, including direct and indirect beneficiaries, leaders and researchers, benefitted from both cycles of the Mandacaru Awards.

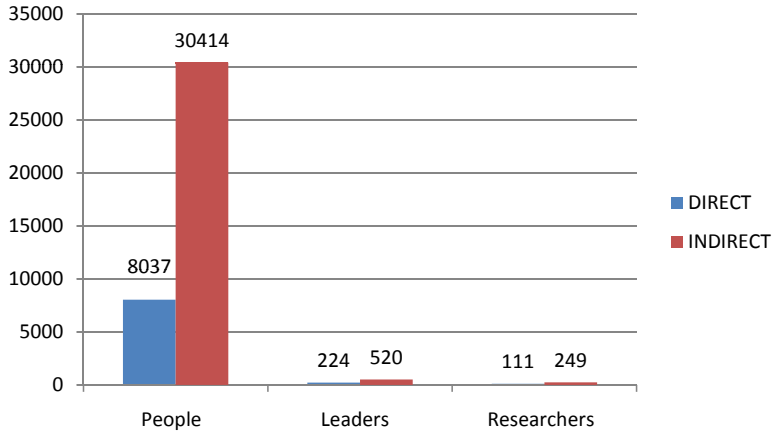



**Figure 6** - *Total number of beneficiaries in both cycles of the Mandacaru Awards*

During monitoring visits in both cycles of the Awards, a questionnaire was filled out by each selected institution. The information presented next consolidates data systematized from these forms for both cycles of the Mandacaru Awards. Among the main findings, the following stand out:

- 22 institutions with activities related with harmonious living in the Semi-arid supported;
- 109 technologies developed in the first cycle of the Awards;
- 88 technologies developed in the second cycle of the Awards;
- Approximately 6,000 direct and 18,000 indirect beneficiaries in the first cycle;
- Approximately 2,000 direct and 12,000 indirect beneficiaries in the second cycle.

Some data generated from consolidation of questionnaires filled out during monitoring visits are presented next.

## Problems approached

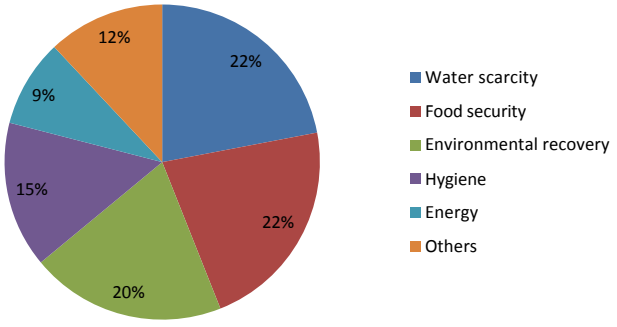



**Figure 7** - *Problems approached*

During the Awards, the main problems to be overcome were water scarcity for drinking purposes and food production for food security purposes, demonstrating that these basic human rights are not fully guaranteed and need to be supported by different institutions and activities. Environmental recovery came next as one of the main problems to be solved, as shown in Figure 7.

## Social Technologies implemented

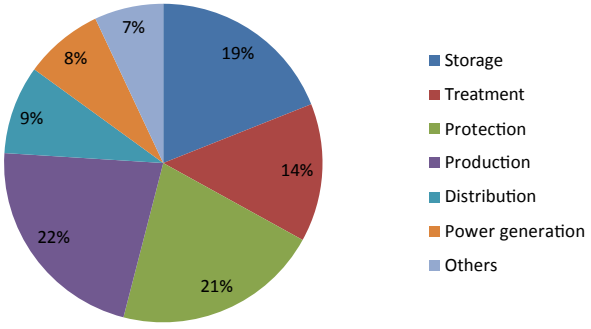



**Figure 8 -** *Type of technolgy implemented*

Most social technologies implemented were of the production type (production of food and other goods); followed by technologies for protection of natural resources; water storage; water treatment and, to a lesser degree, water and distribution, power generation and others, as shown in Figure 8.

Data show that social technologies for access to water for production are preferred over those for consumption, since the latter are part of a public policy for universalization. Once this need is met, families search for technologies for food production, both for subsistence and for consumption by their livestock.

In the two cycles of the Awards, 197 social technologies were supported and developed by 22 institutions.

Data also show that a significant number of institutions sought protection of natural resources, and that storage technologies were important with innovations for more appropriate water management.

## Origin of practices and projects

The origin of most of the solutions proposed for the problems identified in each context arose during collective discussions among stakeholders, followed by community strengthening activities, among others, as shown in Figure 9. This analysis indicates that there is strengthened participation in processes for local development of populations in the Semi-arid and likewise for institutions with activities in the area that have been creating coordinated networks for resolution of problems and adaptation to conditions found in each region.

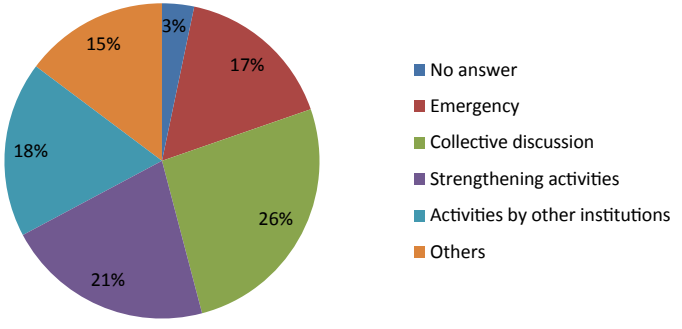



**Figure 9** - *Origin of proposed solutions*

## Efficiency of social technologies

Implemented social technologies made it possible to meet objectives proposed by each selected institution, and over 90% of those involved consider actions undertaken as efficient in solving problems identified by each of them. Data confirm results and improvements monitored by the Awards team during monitoring visits.

Each selected proposal can be an example for this analysis, demonstrating lessons learned, challenges overcome, in addition to those that are yet to be overcome. Thus, readers may become acquainted with these innovative practices and technologies supported by the Awards in the final chapter of this book, with a brief description of the proposals.

## Improved technologies

With the support provided by the Awards, technologies were improved in 86.5% of the cases. These improvements were also made possible by bringing together popular and technical knowledge in different contexts of the Semi-arid. Deflection of the first waters sent to consumption cisterns, for example, was presented in different forms in all four categories, using different social technologies.

## Cofinancing

Of all 22 institutions selected in both cycles of the Mandacaru Awards, most (62%) of the cases had financial and non-financial counterpart contributions, and fewer (32%) non-financial only. Non-financial contributions were primarily in the form of labor by families involved and also logistic support by awarded institutions. Thus, there was collaboration among executing institution, award recipients and others, considering there were partnerships established among public, private and government institutions.

## Publicity material

Throughout both cycles of the Awards, many tools for publicity were used, including printed materials such as flyers, banners, manuals, newsletters, posters, booklets, brochures, identification plaques and workbooks. Personal use materials such as caps, shirts and T-shirts, aprons, backpacks and mugs, in addition to videos, a blog, newsletters, website and radio shows were also used. Furthermore, awarded universities produced articles and dissertations.

Development of this material and tools for teaching-learning was important for institutional strengthening of awarded institutions, in addition to systematization of their proposals, social technologies and associated processes, making possible greater capillarity for actions and knowledge held by communities in the Semi-arid.

## Partnerships

Selected institutions established partnerships with different organizations, both public and private. This made it possible to construct collaboration networks involving several institutions,

with interactions that enabled effectiveness of the practices and projects.

### Difficulties in implementation of proposals and technologies

Most difficulties identified during development of both cycles of the Awards were caused by **institutional aspects of selected organizations**, such as mobilization and transportation. Social problems were also identified, such as a lack of interest in some communities for participation in learning about new social technologies and low levels of education of settler farmers. Additionally, **technical and environmental** difficulties such as a lack of systematization of costs for implementation of cisterns and other social technologies by organizations, as well as high temperatures at the time of project implementation, which affected development of proposals and monitoring activities.

Considering systematized results for the first cycles of the Mandacaru Awards, it is clear that, in spite of advances promoted by actions of civil society organizations and public policies for access to water in the Brazilian Semi-arid, most selected proposals also sought to find solutions for problems of this nature.

Data show that the main causes of problems to be solved with selected proposals are meant to achieve water security and food sovereignty. This shows that initiatives such as the Mandacaru Awards contribute to strengthening of these policies for the basic challenges at hand.

Furthermore, a considerable number of innovative proposals and technologies that received support sought to find solutions for problems of natural resource recovery, with activities involving socio-environmental sustainability, by means of a system of improvements in management of water collected in cisterns, agroforestry systems, generation of alternative energy, desalinization systems and use of residues for production, biophysical water storage, bioconstruction and many other experiences for more harmonious living in *Caatinga* climates and the Brazilian Semi-arid, as shown later in this publication.

In this regard, the scenario of the first cycles of the Awards shows that *sertanejo* people seek, with their activities and social technologies, alternatives to deal with challenges, in addition to quality of life and socio-environmental sustainability.

Thus, continuity in implementation of public policies for living in harmony with the Semi-arid, awards and actions such as this pave the way for overcoming of other challenges. This perspective makes it possible, in the future, to provide better conditions for socio-environmental citizenship by means of an understanding of difficulties found in each region, as well as the creativity for development of the most appropriate technologies to face each difficulty.

## OPPORTUNITIES AND CHALLENGES

The Mandacaru Awards provided numerous insights, both for participants in development of proposals submitted and

selected and for organizers in the technical team in charge of the process.

For the first cycle, the methodology for development of the Awards had to be constructed. During this stage, development of selected proposals, in addition to their monitoring, had positive results, although opportunities and challenges were identified and served as the basis for improvements in the second cycle, which began as the first cycle came to an end.

Supporting a wide variety of institutions in four different categories, with heterogeneous stakeholders, actions and activities, makes the experience richer, more demanding and more challenging.

One of the main strengths identified is the opportunity to become familiarized with and support actions that consolidate the idea of living in harmony with the Semi-arid, both with proposals submitted to the call for proposals and monitoring of

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selected initiatives. Likewise, the awards were important for selected institutions, especially those seeking to develop, perfect or replicate activities with few financial resources. Therefore, the Awards create the opportunity for solidary exchanges, toward a common goal, by means of construction of public policies that are appropriate for sustainable development in the Semi-arid.

The potential for multiplication is another important factor of the Awards, since it becomes possible to get to know and support different proposals, knowledge and processes that can be disseminated in other communities. Another important aspect the Awards bring to selected institutions with little experience in technical and financial reports is institutional strengthening, promoted by support and monitoring of management of awards granted, from the time of planning to implementation, reporting and construction of communication materials.

Representatives from each institution were responsible, in both cycles, for developing some type of communication material, which they were free to choose, to record the entire process of development of their projects. This made it possible to create a database of selected initiatives. This is based on the teaching-learning relationship, with which the IABS technical team provided guidance, in addition to observing and mediating activities carried out in each of the 22 proposals selected in both cycles of the Mandacaru Awards.

Social technologies go beyond constructions and involve all processes for capacity-building and social participation


related with their development. During monitoring visits, testimonials revealed unanimous opinions of communities regarding these capacity-building processes for greater efficiency and continuity of social actions and technologies.

During all stages of the process, continuous systematization and reflection take place, in search of improvements for methodology and the Awards in general. Among lessons learned, for example, is the identification of a need to require administrative and legal documents only for those institutions

that are selected, minimizing time wasted in gathering papers, on the part of participating institutions, and in reviewing these papers, on the part of the selection committee.

Considering the wealth of proposals received, a Steering Committee became necessary for the Mandacaru Awards, with representatives from institutions in the Semi-arid that could contribute to the process of development of the Awards. Furthermore, the organizing team has been working on construction of a database of selected social technologies. Both the Steering Committee and the database are tools to be consolidated in the following cycles of the Awards.

Based on lessons learned, identified and suggested by institutional representatives, improvements and transformations should be incorporated into the process in order for support granted to selected institutions, with each cycle, to realize the potential for contribution to living in harmony with the Semi-arid, overcoming challenges and consolidating results.

An important factor worthy of repeating for sustainability of the Awards lies in the fact that it does not offer only resources for awards, but also for preparation of the call for proposals and construction of communication materials, for dissemination, monitoring, systematization and an Integration Seminar. This makes it a support tool for teaching learning that is rich and diverse, while increasing the challenge to consolidate and find sustainability.

In this regard, IABS, driven by the Mandacaru Awards and its objectives, places this dream of promoting innovative practices in favor of harmonious living with the Semi-arid on the pathway to sustainable and long-lasting outcomes. Lessons learned and incorporated are expected to promote improvements in methodology to make the Mandacaru Awards a reference for appreciation and acknowledgement of innovative proposals that have brought about positive transformations in the Brazilian Semi-arid.

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# CLOSING COMMENTS

The road traveled during these two years of construction and development of the Mandacaru Awards has shown how actions in favor of living in harmony with the Semi-arid are capable of overcoming the old idea of "fighting" droughts, which considered the region unproductive and unsustainable. Contrary to that idea, the Awards have made it evident that the *Caatinga* holds great wealth, with its diversity of species of fauna and flora. Most importantly, the importance of *sertanejo* people was acknowledged as agents for transformation of concepts that have been deep-rooted for decades in Brazilian public policies and culture.

During one of the monitoring visits, this ability of changing a reality of suffering with the drought was portrayed in a simple and playful manner in the words of a *sertanejo* woman, an example of the strength these people have to overcome a harsh reality on a day-to-day basis, with good practices.

*"The Sertão is a good land,*
*You can bet on it.*
*Everything you sow you will reap*
*Just plant it and water it!"*
*Carla Costa – Community leader, Umburanas, Bahia*

During the Awards it was possible to assess the importance and transformative power of social technologies in a broader sense, starting with development of innovative projects, all the way to their reapplication in other communities. By means of the participative processes involved, communities are able to become empowered, develop autonomy and create means of sustainability for activities undertaken.

The Mandacaru Awards are aligned with the institutional mission at IABS, of contributing to local and sustainable development of regions in risk situations, such as the Semi-arid. During the period of development of the Awards, important transformations in communities involved were achieved. Monitoring of activities and testimonials during the trajectory encouraged collaborators to continue their search for construction of socio-environmental sustainability and overcoming of inequalities in Brazil.

Thus, it is expected that the Awards can be continuous and expand its contribution to support and acknowledgement of actions in favor of living in harmony with the Semi-arid. It is also believed that accounts and records in this publication can serve as inspiration for appreciation of the work carried out by selected

institutions, in order to give them strength to carry on developing activities and practices that foster socio-environmental citizenship and countless positive transformations in the Semi-arid.

IABS is honored to promote the Mandacaru Awards and finds it rewarding to be able to see closely how these innovative projects and practices are developed, with traits that are environmental, economic, social and cultural in the *Caatinga*. These experiences have, little by little, won over the Brazilian population with examples of overcoming adverse situations with strength, by means of intelligence and creativity to develop means and social technologies to live in harmony with the difficulties found in the Semi-arid.


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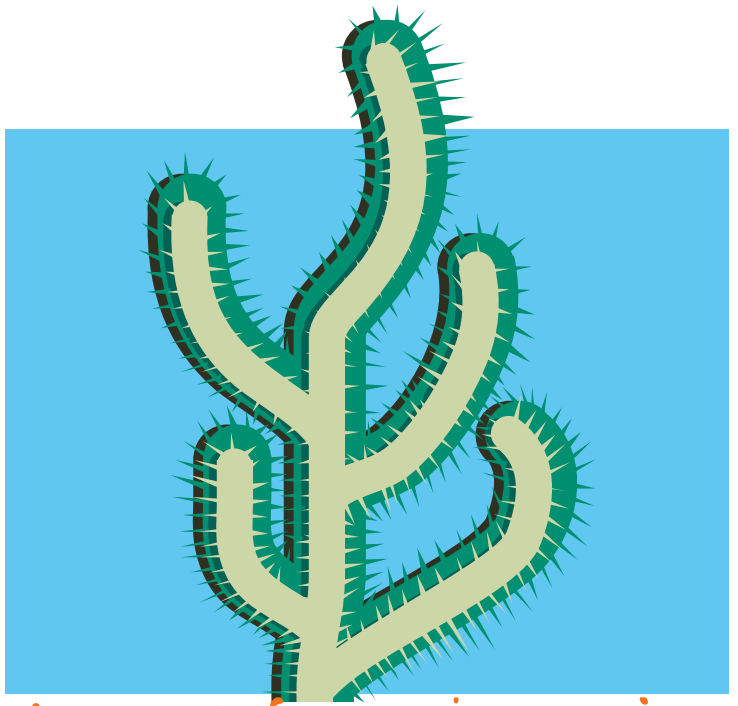
MANDACARU AWARDS:
AND THE WINNERS ARE...
"The Sertão is the whole world."
Guimarães Rosa – Grande Sertão: Veredas



MANDACARU

AWARDS

# Mandacaru Awards I

## Water Quality, Management and Access

# Category I
## Field Experimentation

*"The sertanejo people are, first and foremost, strong.""*

*Euclides da Cunha – "Os Sertões"*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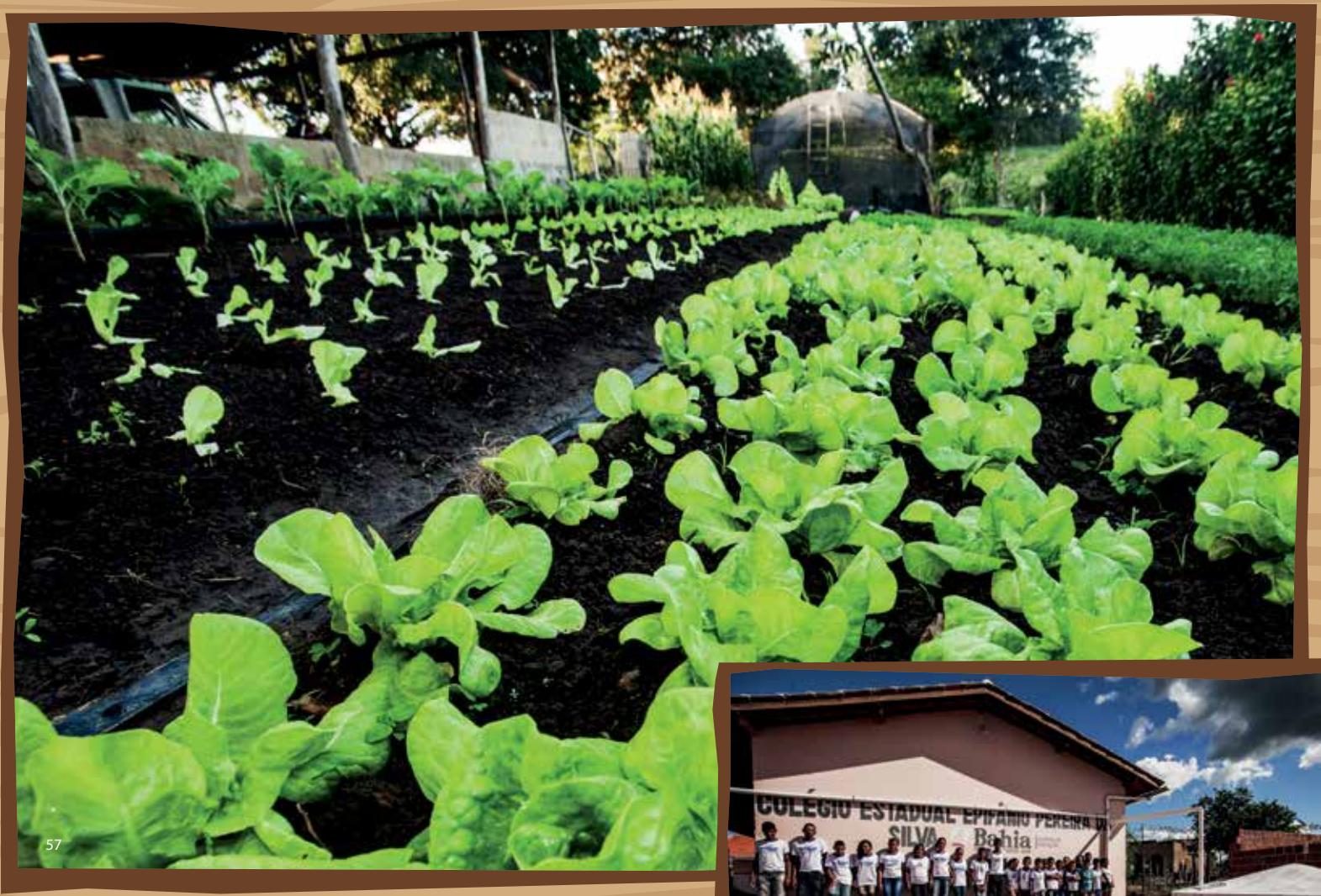

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# 1 WATER FOR LIFE

**Instituto Diamante Verde – IDV**

Manoel dos Reis Primo

**DESCRIPTION**

Socio-environmental activity with the goal of promoting diffusion of theoretical and practical knowledge about successful and sustainable practices in water resource management and climate change, especially concerning rainwater catchment and storage. Meetings and lectures were held in schools and associations, with the purpose of creating dialog and building conscience about the topics involved, in addition to promotion of activities for adaptation and exchanges of experiences. Its activities bring together the actions of schools and rural workers unions.

**LOCATION**

Municipalities of Queimadas and Itiúba (Sisal Region), Bahia.

**WHO IS INVOLVED**

Rural communities in the Sisal region, state of Bahia.

**SOCIAL TECHNOLOGIES**

Plate Cisterns, Small Dams, Underground Dams, Stone Tanks with community laundering spaces and Seedling Nursery.

**TESTIMONIAL**

*"Mr. Reginaldo met us here at a critical time of suffering and drought, and, by means of a video showing a truck with women around it fighting over a liter of water, he landed at Gregório and I don't even know how! We came to this dam with me telling the story of how I grew up here, watched it as it was built by my father, who is one of the founders, and he came with this project that did nothing but improve all our lives in the community. There is no more shortage of water and the community is more united because of community work."*

***Manoel dos Reis Primo "Teca"*** *– Farmer – Gregório Village – Municipality of Queimadas, Bahia.*

**CONTACT INFORMATION**

http://www.diamanteverde.org.br e idv.socioambiental@gmail.com

## Stone tank

**WHAT IS IT?**

With different formats, stone tanks are a social technology for water storage that make use of local characteristics, such as large rocks in rural properties, and construction of "walls" that keep water from draining.

**WHAT IS ITS USE?**

Providing animals with drinking water; irrigate small gardens; supply houses with water for general uses: doing laundry, bathing and cleaning the house; fish breeding.


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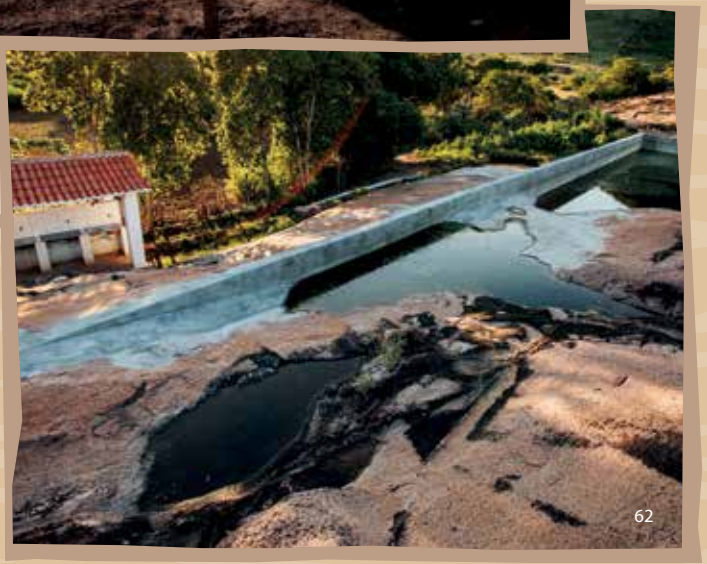
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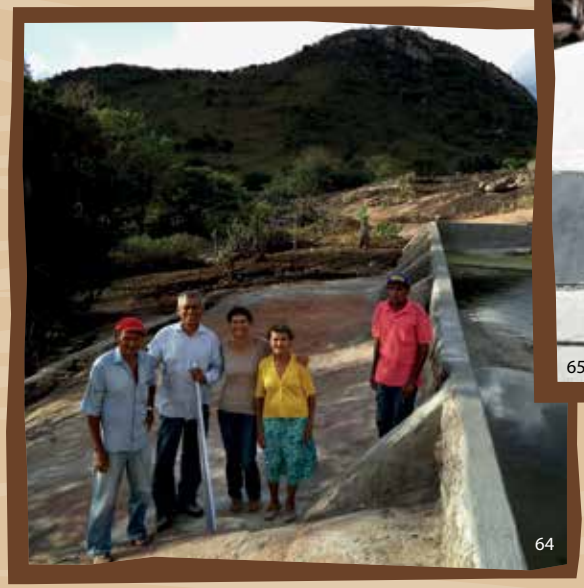

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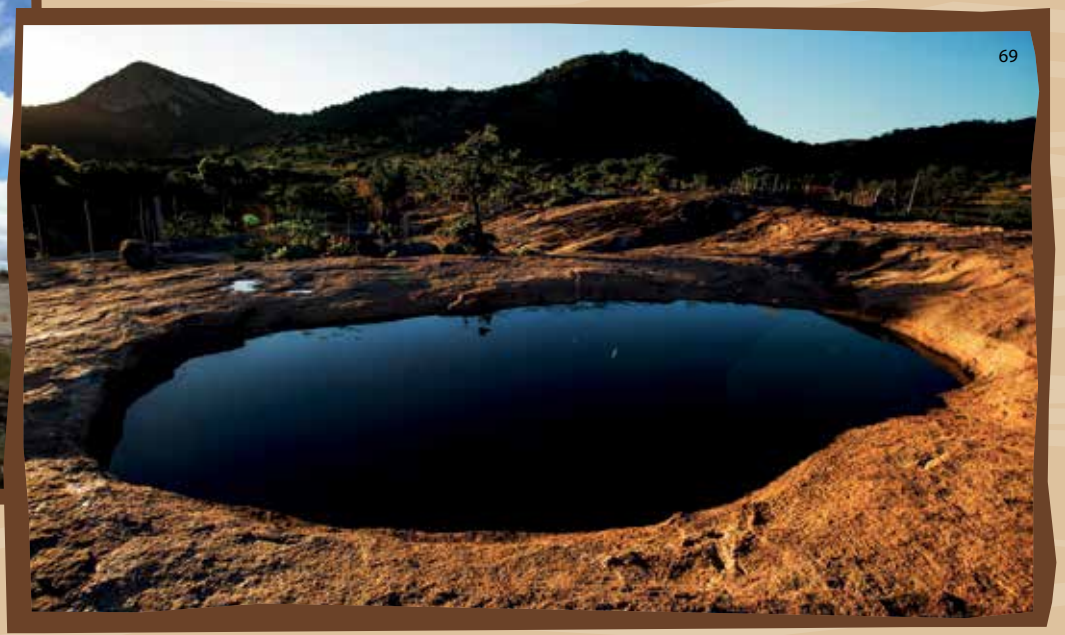

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# 2 BIODIGESTOR. WE DO IT, YES WE CAN.

**Center of Assistance and Service for Land Workers Dom José Brandão de Castro**

*(Centro de Assessoria e Serviço aos(às) Trabalhadores(as) da Terra Dom José Brandão de Castro – CDJBC)*

## DESCRIPTION

This project has as its objective reapplication of the experience of Mrs. Maria Aparecida da Silva in implementation of a biodigestor for use of cattle feces for energy production. The family biodigestor was reapplied in the municipality after an interstate exchange, during which Maria Aparecida saw this technology on Mr. Abel Manto´s farm. Later, in partnership with the assistance provided by the Dom José Brandão de Castro institution, the social technology was constructed, and is currently a reference for the community. With the biodigestor it was possible to considerably reduce firewood consumption and overall cooking costs.

## LOCATION

Municipalities of Monte Alegre de Sergipe, Porto da Folha and Gararu, Sergipe.

## WHO IS INVOLVED

Family farmers

## TECNOLOGIA SOCIAL

Biodigestor

## TESTIMONIAL

*"This biodigestor brought me wealth – it´s going on two years now sine I last had to buy cooking gas. Not to mention the biofertilizer, as you can see all my crops look wonderful, with such a good yield that I can give some away to folks, in addition to selling dry manure and adding it to my worm bed. This means a lot financially for me, especially considering all my work is on the garden. This exchange I participated in created the expectation of doing this for myself, because I just knew it could work. I was so excited when I heard the Mandacaru Awards had selected six more families to share my experience! And the happy look on these families' faces when we were testing the biodigestor, it was priceless. I have only thanks to give!"*

Maria Aparecida da Silva

***Maria Aparecida da Silva "Cida Silva"*** *– Observer, experimenter and mulitplier farmer – Sítio Verde, municipality of Porto da Folha, Sergipe.*

## CONTACT INFORMATION

www.cdjbc.org.br e cdjbc@cdjbc.org.br

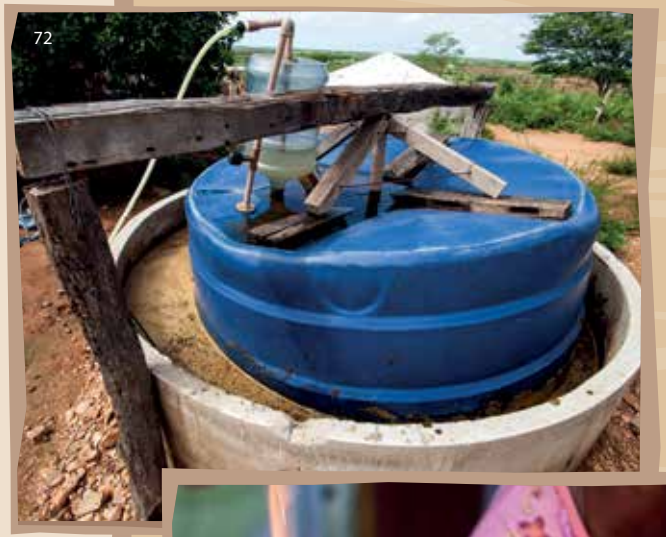
# Biodigestor

**WHAT IS IT?**

Equipment for production of biogas. With the use of fresh cattle feces, along with water and bacteria and a lack of oxygen, at the appropriate temperature, it is possible to generate both biogas and biofertilizer.

**WHAT IS ITS USE?**

Producing biogas and biofertilizer with bovine droppings, reducing household costs with cooking gas and helping to improve sustainable production.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# 3 SHADE AND LIVING WATER

**Palmeira dos Índios Regional Farmers' Cooperative**
*(Cooperativa Agropecuária Regional de Palmeira dos Índios – CARPIL)*

## DESCRIPTION

The objective of this project was recovery of springs located at the heads of the Coruripe River (Palmeira dos Índios) with the Shade and Living Water spring recovery methodology developed by the Palmeira dos Índios Regional Farmers' Cooperative. Activities also included sensibility building and mobilization of involved communities, in addition to a simplified mapping of recovered springs, with the goal of promoting awareness about the importance of recovery and protection of springs in the Coruripe Basin. As a result, 42 springs were recovered, providing a flow of potable water for the population in all the participating communities.

## LOCATION

Municipalities of Palmeira dos Índios, Belém, Quebrangulo and Tanque d'Arca, Alagoas.

## WHO IS INVOLVED

Family farmers, indigenous groups, elemantary and high school teachers and students.

## SOCIAL TECHNOLOGIES

Spring recovery and family gardens.

## TESTIMONIAL

*"I´ve been here with this community for 40 years, it is a good and proper place for our crops and development, and our culture is all for preservation of nature and gardening. This project for water was really important for us, because we were not motivated, but we are now excited since we have water, thank God and this project that we participated in with CARPIL. Now we have to work hard so our children and grandchildren we be able to move this along!"*

***José Roberto Pereira de Lima*** *– Family farmer – Acatatau indigenous group – Cafurna de Baixo Village, Municipality of Palmeira dos Índios, Alagoas.*

José Roberto Pereira de Lima

## CONTACT INFORMATION

gerencia@carpil.com

## Spring recovery

**WHAT IS IT?**

Agroecological technique for recovery of native woods to strengthen soil around springs, in addition to directing water from springs.

**WHAT IS ITS USE?**

Recovery of springs in a state of degradation and improvement in use of water in a more rational and sustainable manner for continuity of rivers and streams for use in vegetable gardens.

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# 4 RAINWATER IS LIFE AND JOY OF LIVING

**Altos Municipality Community Association for Family Farmer Production and Services**
*(Associação Comunitária de Produção e Serviços dos Agricultores e Agricultoras Familiares do Município de Altos – ASAF)*

## DESCRIPTION

This project seeks to provide access to potable water by means of rainwater catchment and management for rural communities in the municipality of Altos, by means of recovery and construction of water holes and organic gardens. Other objectives include promoting rational use of water and guidance for farmer families for use of rainwater stored in wells, popularly known as water holes.

## LOCATION

Altos municipality, Piauí.

## WHO IS INVOLVED

Families from Força Jovem, São Benedito, Tesoura and Santa Rita/ Paraíso settlements, rural areas of Altos, Piauí.

## SOCIAL TECHNOLOGIES

Water holes and Community Family Gardens.

## TESTIMONIAL

*"Things have gotten much better, we didn't use to have a place to get parsley from and now we have it close to home. Income has improved, we are eating better and we have permanent jobs!"*

***Valdeci Pereira da Silva** – Family Farmer – Força Jovem settlement, Altos, Piauí.*

Valdeci Pereira da Silva

## CONTACT INFORMATION

asafaltos@yahoo.com

# Water hole

**WHAT IS IT?**

Cylindrical well. Water holes are constructed on river and stream beds (underground waters) with soft sand that makes digging easier. Due to the depths of some holes, drawing water can become difficult, making water pumps necessary.

**WHAT IS ITS USE?**

Water holes provide water for different family tasks and, mainly for animal consumption and small-scale irrigation.


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# Category II

## Innovative Practices

*"I have two weapons to fight against despair, sadness and even death: laughter mounted on a horse and galloping dreams. With these I face this arduous and fascinating task that is living."*

***Ariano Suassuna***

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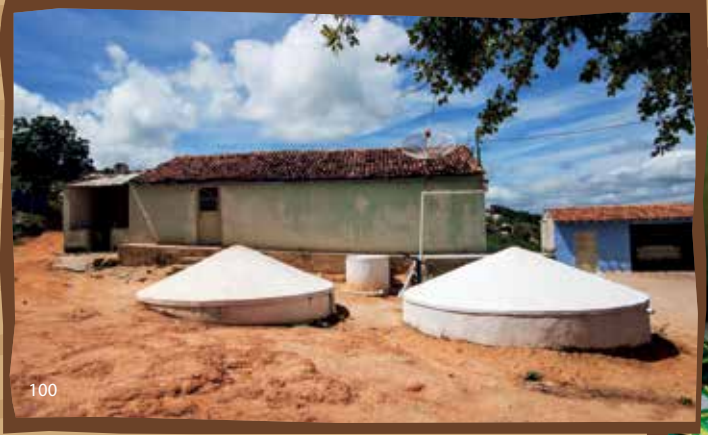

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# 1 ADAPTING *SERTÃO* – SOCIAL TECHNOLOGIES FOR ADAPTATION TO CLIMATE CHANGE

**Human Development Network**
*(Rede de Desenvolvimento Humano – REDEH)*


Nereide Segala Coelho 104

**DESCRIPTION**

This is a coalition of organizations that seeks to understand how climate change is affecting municipalities in the Jacuípe Basin in the state of Bahia, and what solutions can be implemented to help family farmers adapt to these changes. This research aims at making a detailed analysis of economic, social and water resource costs and benefits in innovative production and storage systems for drought-resistant foragers, as an alternative strategy for climate change adaptation, comparing physical and biophysical water storage systems for farming, with researchers from the University of California.

**LOCATION**

Municipalities of Várzea da Roça, Mairi and Pintadas, Bahia.

**WHO IS INVOLVED**

Small farmers and farmer cooperatives. Decision makers and representatives of local, state and federal government.

**TECNOLOGIA SOCIAL**

Forager produciton.

**TESTIMONIAL**

*""This award made it possible for us to carry out research with three important aspects. The first is that water can be stored in two ways – physical and biophysical – the first with cisterns and the latter with palms and other crops. The second aspect is that this study was carried out with farmers, who are the stakeholders, oriented by technical experts from the Ser do Sertão Cooperative and systematization of the partnership with the University of California. Thirdly, it is interesting that we have to work with two technologies: production cisterns and dams on long basins for palm plantation. It is of extreme importance for farmers to have two storage technologies! It drew our attention in this study that biophysical storage policies are not implemented. The study also pointed out that some locations known as semi-arid have already become arid areas."*

***Nereide Segala Coelho*** *– Local Coordinator and farmer – Roça Velha farm, Municipality of Pintadas, Bahia.*

**CONTACT INFORMATION**

www.adaptasertao.net / www.redeh.org.br
redeh@redeh.org.br

# PALM PLANTATION

**WHAT IS IT?**

Biophysical water storage.

**WHAT IS ITS USE?**

Animal feeding, contributions to recovery of *Caatinga* areas, avoiding transformation of the semi-arid region into arid regions and reducing impacts of climate changes. Palm production as a source of animal feed can increase milk production, reduce costs with feed and impacts of the drought on animals.

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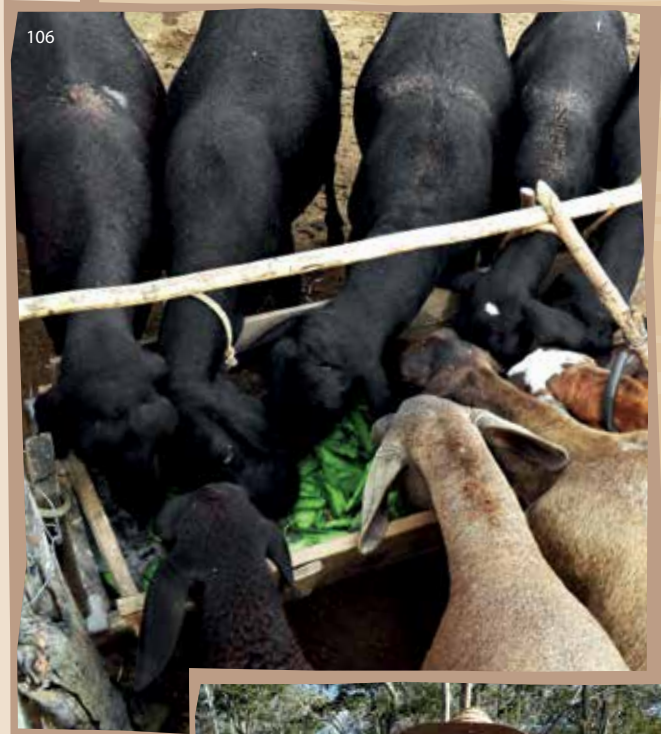

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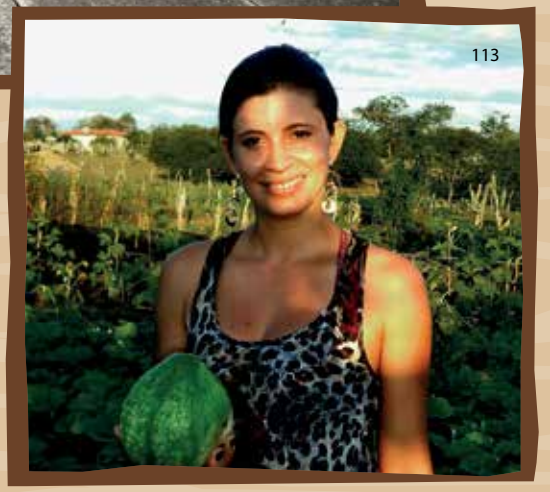

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# 2 GARDENS FOR LIFE

**Worker Center of Studies for Work and Assistance**
*(Centro de Estudos do Trabalho e de Assessoria ao Trabalhador – CETRA)*

Maria de Lourdes Oliveira da Silva

## DESCRIPTION

The project aims to implement and disseminate social technologies, in particular productive and agroecological gardens, with food security and income generation for small farmer families in the Semi-arid as goals. Productive gardens are spaces for agroecological farming in the surroundings of houses, with simplified irrigation systems and adapted technologies for diversified food production. The project draws attention to the experience of Fábio Araújo Baia, who uses alternative irrigation techniques with recycled materials and involves technical monitoring visits, water management workshops, implementation of tank cisterns and economic garden beds with simplified irrigation systems, in addition to a meeting for evaluation of the implementation process with a map of garden installations.

## LOCATION

Municipalities of Quixadá and Quixeramobim, Ceará.

## WHO IS INVOLVED

Agricultores(as) familiares nos Territórios da Cidadania – Vales do Curu e Aracatiaçu e Sertão Central.

## SOCIAL TECHNOLOGIES

Agroecological gardens with downpour cisterns.

## TESTIMONIAL

*""I have lived in the settlement for 14 years and started participating in the CETRA team in 2008, with an agroecology course. This was a very important step in my life. First because it changed my way of life, I am a different person now and my husband works in the garden with me. My garden became a demonstrative unit and currently nearly every family in the community has their own garden and this is very important for food security. It is going on two years now since we started the Agroecological Fair in Quixadá and we currently hold two fairs every week. The Mandacaru Awards came to add to this and helped with food security, in addition to helping us depend less on social benefits, with the certainty that each week you will have healthy food to eat and sell at the fairs."*

***Maria de Lourdes Oliveira da Silva*** *– Farmer, Family Experimentator – Boa Vista Settlement, Municipality of Quixadá, Ceará.*

## CONTACT INFORMATION

www.cetra.org.br
cetra1981@cetra.org.br

## DOWNPOUR CISTERN

**WHAT IS IT?**

Social technology for rainwater catchment and storage, with capacity of 52 thousand liters. The cistern receives water from downpours with the added strength of gravity and landscape inclination.

**WHAT IS ITS USE?**

Mainly for food production, with the possibility of being used for animals and domestic services, but never for family consumption. Downpour cisterns store a large amount of water for use during droughts or little rainfall.

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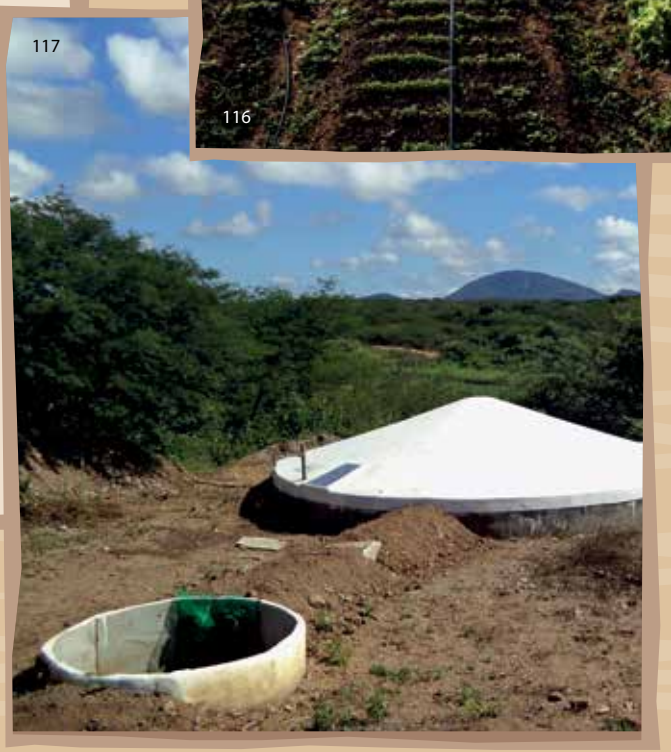

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Quintais para a vida
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Margarida Pinheiro
Edite Silva
Cumaru
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# 3 BUOY SYSTEM FOR ROOFTOP WASHING DURING PROCESS OF RAINWATER CATCHMENT AND MANAGEMENT

**Center for Popular Education and Social Formation**
*(Centro de Educação Popular e Formação Social – CEPFS)*

João Paulo Santos da Silva

## DESCRIPTION

This project seeks to guarantee the quality of rainwater stored in cisterns and collected via rooftops. Basic orientation for management of rainwater usually says to turn off pipes during the first rain showers to allow for rooftops and gutters to be cleaned, which is efficient during the first rainfall. However, as time goes by, rooftops become polluted again, making a new cleaning process necessary in order to ensure the quality of the water. Based on research by the Regional Institute of Appropriate Small Farming and with the use of participative methodologies, CEPFS developed a new, low cost technology that enables storage of water for rooftop cleaning, using a buoy system. Likewise, the project has encouraged creation of Solidary Rotating Funds and capacity building for community leaders and families involved to disseminate the experience.

## LOCATION

Municipalities of Teixeira and Imaculada, Paraíba.

## WHO IS INVOLVED

Family farmers.

## SOCIAL TECHNOLOGIES

Plate Cisterns and Buoy Systems

## TESTIMONIAL

*""This cistern came to benefit us, since we had cisterns, but with some problems. Then this buoy system came along to help bring cleaner, healthier water and to fight diseases. There were many diseases caused by poor water quality, because management was not done correctly. Based on this technology management became more effective and improved our quality of life."*

***João Paulo Santos da Silva*** *– Farmer – Tavá Farm, Municipality of Matureia, Paraíba.*

## CONTACT INFORMATION

www.cepfs.org e cepfs@uol.com.br

## BUOY SYSTEM FOR ROOFTOP CLEANING

**WHAT IS IT?**

Social Technology for rainwater catchment and management with automatic deflection of first waters from rooftop drainage and buoy system to remove water from cistern.

**WHAT IS ITS USE?**

Avoiding contamination of cisterns with first waters collected from rainfall on rooftops and removal of polluted water from cisterns. The buoy system for rooftop cleaning is useful to deflect the first waters from rooftop drainage to a separate container. The trampoline water pump, in turn, is used to remove water stored in cisterns, avoiding contact with containers that could contaminate it.

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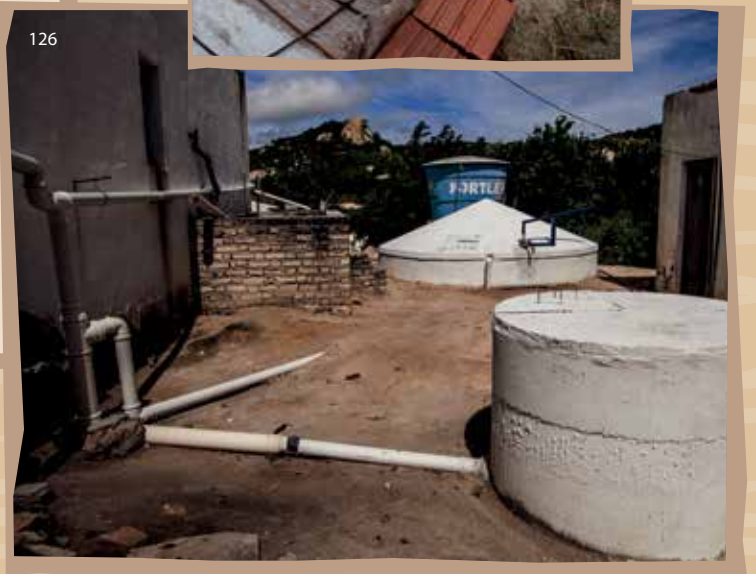

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# Category III
## Pesquisa Aplicada

*"A single rooster can't weave a morning;*
*it will always need other roosters."*

*João Cabral de Melo Neto –*
*in "Tecendo a manhã" – A Educação pela Pedra*


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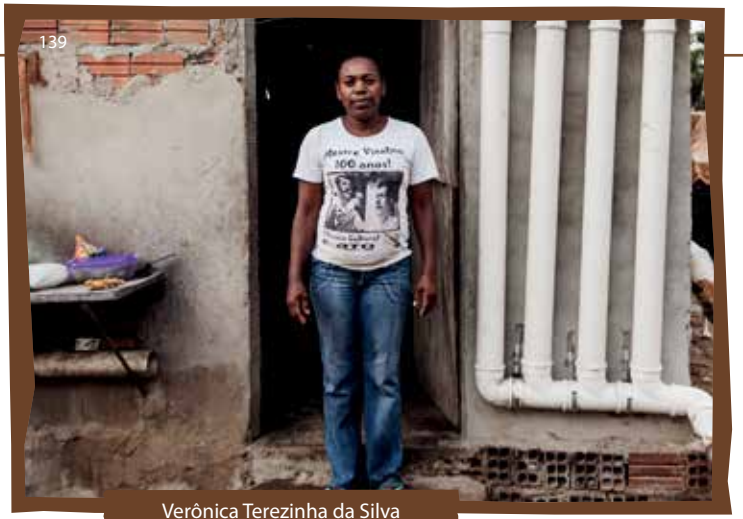
# 1 AUTOMATIC DEVICE FOR PROTECTION OF QUALITY OF RAINWATER STORED IN CISTERNS

**Federal University of Pernambuco**
*(Universidade Federal de Pernambuco – UFPE)*



Verônica Terezinha da Silva

## DESCRIPTION

A device for automatic deflection of first waters was developed in this project, making it possible to send away impurities introduced in rainwater during cleaning of atmosphere and collection surfaces (rooftops and gutters). As an innovation, and opposed to manual disposal systems for first rainwaters commonly found in the region, the device developed with this study is simple and cheap, enabling automatic disposal, which frees inhabitants from the need to wake up, often in the middle of the night, to deflect the waters. Evaluation of this device indicated that it was responsible for removal of 94.2% and 44.8% of total coliform and heterotrophic bacteria, respectively, which is reflected in improvements for the health of families using rainwater for human consumption.

## LOCATION

Municipality of Caruaru, Pernambuco.

## WHO IS INVOLVED

Communities and persons using rainwater for consumption.

## TECNOLOGIA SOCIAL

Cistern with automatic device.

## TESTIMONIAL

*""Before the cistern came, we used to get water from pits, with great difficulty, and two or three months later there would be no more water. Thank God the cistern project came and then these pipes, this was a blessing! Truly wonderful! People's and farmers' lives are 100% better, since water is already clean when we need it. At first, when it rained, people had trouble getting up in the middle of the night to remove pipes, and with these the dirty water just goes away by itself and the clean water reaches the cistern, it is 100% better now, a perfect 10!"*

***Verônica Terezinha da Silva*** *(Housekeeper) – Lajedo do Cedro Farm, Municipality of Caruaru, Pernambuco.*

## CONTACT INFORMATION

www.ufpe.br/caa
caa@ufpe.br

## AUTOMATIC DEFLECT

**WHAT IS IT?**

Social technology for improvement of plate cisterns. Made of PVC pipes and installed on rooftop gutters prior to access to cistern.

**WHAT IS ITS USE?**

Deflect first rainwater automatically to prevent impurities accumulated on rooftops from reaching cisterns. In addition to keeping water in cisterns clean, first waters do not go to waste and can be stored for use in gardens, animals, etc

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# 2 DESALINATOR USING SEEDS FROM TYPICAL SEMI-ARID PLANTS

**Federal University of Bahia – Chemistry Institute**
*(Universidade Federal da Bahia/Instituto de Química – UFBA)*

## DESCRIPTION

The objective of this project is to assess the capacity for salt absorption by materials prepared with seeds of typical Semi-arid plants, both in their natural state and in the form of active charcoal, aiming at continuity for studies started in the past and expanding possibilities for application of typical Semi-arid seeds in water desalination for human consumption, making the process more efficient. This study indicated that charcoal from *umbu*, a typical *Caatinga* fruit, is efficient in desalination of salt water by means of a domestic, low-cost process. The project was developed on the Salitre River basin, in the Bahia semi-arid.

## LOCATION

Municipalities of Juazeiro, Várzea Nova and Umburanas, Bahia.

## WHO IS INVOLVED

Communities in need of water fit for human consumption.

## TECNOLOGIA SOCIAL

Desalinator using *umbu* seeds.

## TESTIMONIAL

*""This brings some light to us, for us living in the Semi-arid, because water in this region contains salt. So we first tried to find an alternative for us, and I participated in a workshop about how to purify water and now the folks at UFBA, particularly researcher Vânia, came to us with this alternative to remove the salt in a natural, simple, cheap method that only takes our time and no other resources, it entirely up to us to do it!"*

Cícero Gomes da Silva

***Cícero Gomes da Silva*** *– Director-President of the Mixed Farming Cooperative of the State of Bahia (Cooperbahia), Municipality of Umburanas, Bahia.*

## CONTACT INFORMATION

www.ufba.br e vaniaroc@ufba.br

# Desalinator

**WHAT IS IT?**

The homemade water desalinator is a social technology using *umbu* seeds turned into charcoal and ground up to remove salt from water. *Umbu* charcoal is placed in a filter.

**WHAT IS ITS USE?**

Removing salt from water and making it fit for human consumption. When in contact with salt water, umbu charcoal has the capacity to remove the salt, making it safe to drink.


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# 3 UNDERGROUND DAM: PROMOTING INCREASED ACCESS AND USES TO WATER IN FAMILY-BASED AGROECOSYSTEMS

**Brazilian Agricultural Research Company**
*(Empresa Brasileira de Pesquisa Agropecuária – EMBRAPA Solos UEP)*

Sebastião Rodrigues Damasceno

## DESCRIPTION

The project is based on research aiming at evaluation of local conditions favorable for implementation of underground dam units and socioeconomic and environmental impacts, in addition to analyzing soil from underground dams to identify sustainability conditions, in addition to identifying main bottlenecks and proposing solutions. In this regard, the project is developed with a participative and systemic approach, with six action plans: project management; construction and appropriation of knowledge about underground dams in rural Semi-arid agroecosystems; reapplication of underground dams in northeastern Semi-arid territories; soil and water management and crop options; underground dam information system; and assessment of underground dam sustainability in their agroecosystems.

## LOCATION

Bahia (Canudos, Uauá and Curaçá); Pernambuco (Serra Talhada, Ouricuri and Buíque); Paraíba (Solânea, Soledade and Remígio); Alagoas (São José da Tapera, Santana do Ipanema and Palmeira dos Índios).

## WHO IS INVOLVED

Families of farmers in the semi-arid region of the Brazilian Northeast.

## TECNOLOGIA SOCIAL

Underground Dams

## TESTIMONIAL

*"I have received here, from P1+2, an underground dam for my own consumption and water for agroecological farming. Then comes along this gist from the Mandacaru Awards, bringing Embrapa Solos here to analyze our soil and see how my farm is doing, the quality of my land. Because it is about more than just planting, it is about knowing how to take care that water and food for humans and animals is sustainable."*

***Sebastião Rodrigues Damasceno*** *– Family Farmer – "Caretaker of Creole seeds in Alagoas" – Cabeceiras farm, Municipality of Santana do Ipanema, Alagoas.*

## CONTACT INFORMATION

www.uep.cnps.embrapa.br e sonia.lopes@embrapa.br

## Underground dams

**WHAT IS IT?**

Social technology for water catchment for farming activities.

**WHAT IS ITS USE?**

Storing water brought by rains and streams, stopping flow and creating and maintaining a humid soil area appropriate for plantation. The humid area can be used for crops destined to human and animal consumption.


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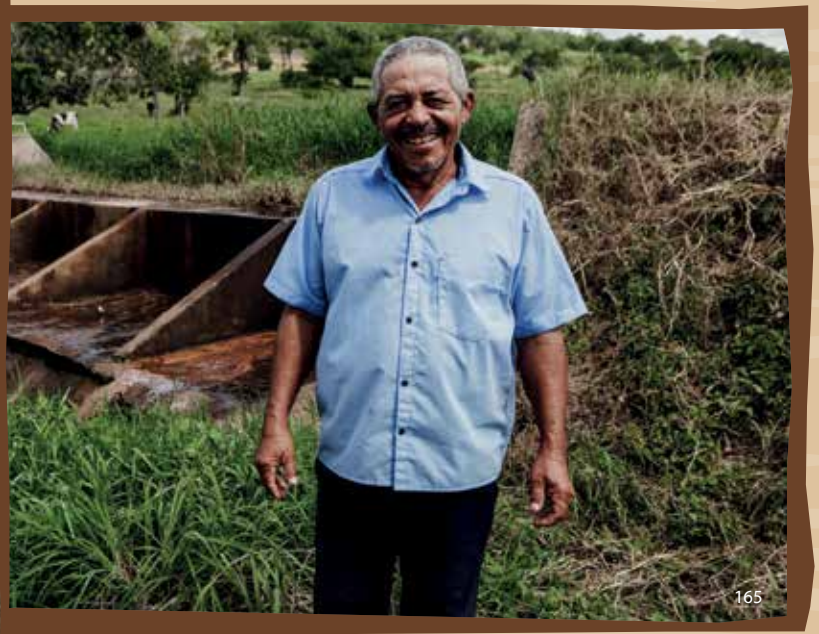

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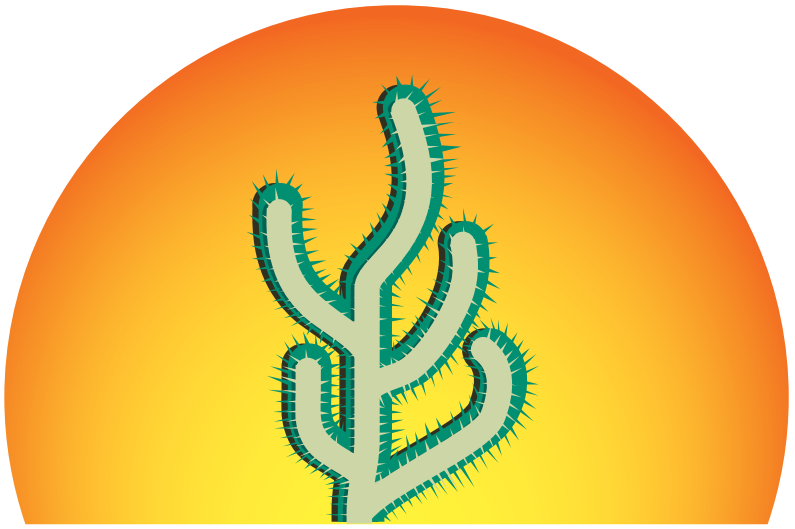


# MANDACARU AWARDS II

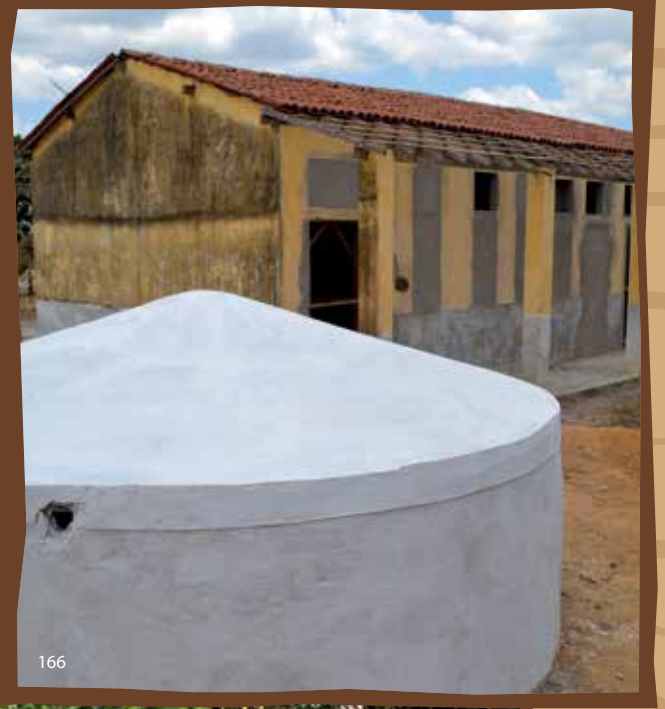
# Mandacaru Awards II

## Water, Participation and Food Sovereignty

# Category I
## Field Experimentation

*"The Sertão is everywhere."*

*Guimarães Rosa – Grande Sertão: Veredas*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# 1 SUSTAINABILITY WITH WATER USE: FROM GARBAGE TO LUXURY

**Garrote Community Association**
*(Associação Comunitária de Garrote)*


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Jurinedi


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Anita

## DESCRIPTION

The project involves activities with the objective of increasing family income and food sovereignty for farmers in the Garrote farm. Among these activities, the following stand out: implementation of a dripping system; construction of production cisterns; reorganization of physical space for assembly of a fruit processing micro unit; and a capacity-building course for planned activities. These activities seek to contribute to promotion of food autonomy and keeping families in rural areas, in addition to social organization, assisting in promotion of family sustainability and improvements in quality of life for men and women in the *Caatinga* with rural entrepreneurship experiments.

## LOCATION

Municipality of Caém, Bahia.

## WHO IS INVOLVED

Farmers from Garrote Farm.

## SOCIAL TECHNOLOGIES

Downpour cisterns, community orchard, household cisterns and adaptation of a small agroindustry.

## TESTIMONIALS

*"It was something we really needed, we had a lot of difficulty finding water each day."*

***Sra. Jurinedi*** *–Family farmer – Garrote Community, Municipality of Caém, Bahia.*

*"The cistern is a blessing from God, a gift from God."*

***Dona Anita*** *– Family farmer and housekeeper – Garrote Community, Municipality of Caém, Bahia.*

## CONTACT INFORMATION

marlucia01_ribeiro@hotmail.com

## Human use and farming cisterns

**WHAT IS IT?**

Social technology for rainwater catchment for human use and farming

**WHAT IS ITS USE?**

Store rainwater in 16,000 Liter cisterns (consumption) and 50,000 Liters (farming), thus stopping part of this water from going to waste and using it for drinking, fruit and sweet production, in addition to orchard irrigation.

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ASSOCIAÇÃO COMUNITÁRIA RURAL DE GARROTE
ACRG
FUNDAÇÃO
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# 2 RURAL WOMEN IN SUSTAINABLE FAMILY FARMING

**Association of Rural Farmers of Santa Rita de Cássia**
*(Associação das Produtoras Rurais de Santa Rita de Cássia)*

Valdeti

## DESCRIPTION

This initiative aims at perfecting and equipping the existing structure in the Association, which has been developing a project for unity, solidary production and marketing, in addition to environmental, social and associative education. The proposal includes activities such as: drilling of an artesian well; installation of necessary equipment for water extraction and storage; construction of a fence around the property with appropriate screens; construction of greenhouses; construction of a henhouse; expansion of the dam to increase production of garden varieties and vegetables; and construction of a community cistern. The project is aimed at food production, promoting access and availability, in a solidary, sustainable and associative manner.

## LOCATION

Municipality of Itiúba, Bahia.

## WHO IS INVOLVED

Women from the Rural Workers Association of Santa Rita de Cássia and other inhabitants of the Ponta Baixa Village and microregion.

## SOCIAL TECHNOLOGIES

Community cistern, community garden, henhouse and dam expansion.

## TESTIMONIAL

*""We used to make bricks, but it took forever to see gains. We had no money to buy vegetables. Thank God we started our gardens, all working together and now we have vegetables to eat. My life has changed."*

***Sra. Valdeti*** *– Family farmer – Ponta Baixa, Muinicipality of Itiúba, Bahia.*

## CONTACT INFORMATION

mira_itiuba@hotmail.com

# Pavement cisterns and family gardens

**WHAT IS IT?**

Pavement cisterns are a social technology that captures and stores rainwater with more quality, cleanliness and protection. It can hold up to 52,000 liters of water, connected to a 200 square meter pavement that serves as a rainwater catchment area, which then feeds the cistern.

Family gardens, when properly watered, sown and cared for, can yield garden varieties, legumes, etc. As suggested by its name, their location is usually near households, but always near a source of water such as a spring, lake or swamp.

**WHAT IS ITS USE?**

Pavement cisterns can potentialize garden variety production in backyards and farms of family farmers of the Brazilian Semi-arid and for livestock. The paved area is also used to dry beans, corn, manioc and others. Family gardens ensure food security for families and animals such as chickens and pigs, with leftovers and foliage from gardens. This system promotes fair trade and income generation for farmer families.

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# 3 MULTIPLYING WATER AND LIFE AT THE PAJEÚ: RECOVERY OF DEGRADED SPRINGS AT THE PAJWÚ RIVER WATER BASIN

**Association for Sustainable Rural Development of Baixa Verde**
*(Associação de Desenvolvimento Rural Sustentável da Serra da Baixa Verde – ADESSU)*

## DESCRIPTION

This project involves an integrated set of activities planned and executed in a participative manner for recovery and revitalization of ten springs composing the Pajeú River water basin. Direct interventions for recovery of areas with Agroforestry Systems, involving preparation of seedlings, nurseries and planting, in addition to installation of fences around springs were carried out. Furthermore, indirect activities included sensitivity building, participation and involvement of communities in planning meetings, as well as project monitoring and evaluation, an Agroforestry System course, recovery of waterways, creation of seedling nurseries, care with garbage and sewage and thematic mobilizations for environmental education.

## LOCATION

Municipalities of Triunfo and Santa Cruz da Baixa Verde, Pernambuco.

## WHO IS INVOLVED

Families from the Arado and Mulungu Farm Inhabitants Association and ADESSU Baixa Verde.

## SOCIAL TECHNOLOGIES

Recovery of Springs and Agroforestry Systems.

Maria do Carmo Vieira Ferreira 191

## TESTIMONIAL

*""The spring was filled with dirt, it was not cared for and this project really improved people's understanding and care required. It was really, really good, first thanks to God, and to you who brought this project here, because on our own we would have been able to achieve any of this…"*

***Maria do Carmo Vieira Ferreira*** *– Family Farmer – Arado Community, Municipality of Santa Cruz da Baixa Verde, Pernambuco.*

## CONTACT INFORMATION

adessu@oxente.net

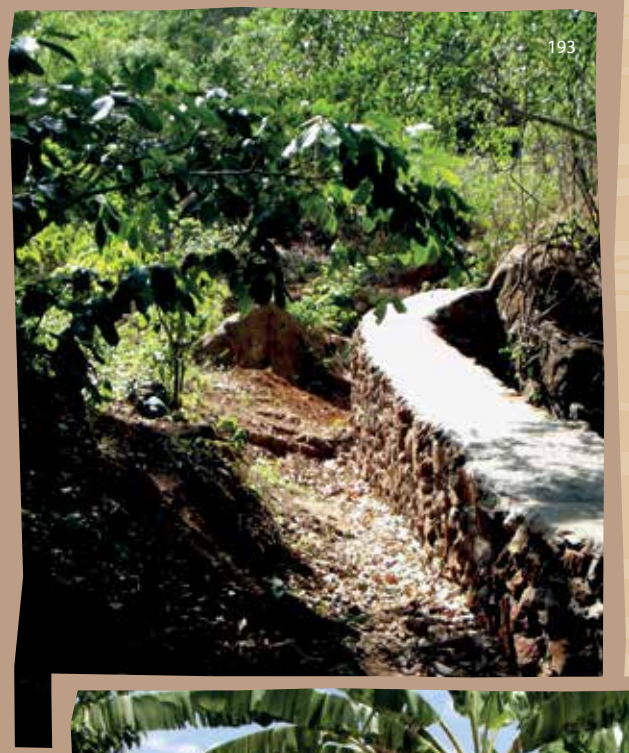
# Agroforestry Systems

**WHAT IS IT?**

An Agroforestry System is a food production technique that conserves or recovers nature and biodiversity in planted areas.

**WHAT IS ITS USE?**

Agroforests are good for food production and environmental conservation, since no agrotoxins or chemical products are used, avoiding pollution of water, soil and food.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# 4 FAMILY GARDEN PRODUCTION IN THE SEMI-ARID, ASSOCIATED WITH BIRD AND FISH BREEDING IN TARP TANKS

**Porteirinha Rural Workers Union**

*(Sindicato dos Trabalhadores e Trabalhadoras Rurais de Porteirinha - STR PORTEIRINHA)*

## DESCRIPTION

The main objective of this project is to ensure food and nutritional security for farmer families in the Semi-arid, who have difficult access to water and food, by means of construction of excavated tanks lined with tarps for water storage to serve as fish and bird breeding tanks and use of water for family garden irrigation, producing meat and vegetables. Thus, the project seeks to contribute to social inclusion, promoting practices and capacity building in herb, fish and bird farming.

## LOCATION

Municipality of Porteirinha, Minas Gerais.

## WHO IS INVOLVED

Low income farmer families registered in the Federal Government's CadÚnico.

## SOCIAL TECHNOLOGIES

Tarp tanks associated with fish and bird breeding.

## TESTIMONIALS

*"The land wouldn't hold water, but with the tarps we managed, and things got much better."*

***Sr. Raul** – Family Farmer – Curral Velho, Porteirinha, Minas Gerais.*

201 Raul

202 Pedro Ramos

*"The tank acts as a reservoir too, so when needed it is there, guaranteed."*

***Sr. Pedro Ramos** – Family farmer, Porteirinha, Minas Gerais.*

## CONTACT INFORMATION

www.strporteirinha.blogspot.com.br

# Tarp tanks associated with fish and bird breeding

**WHAT IS IT?**

Production system composed of gardens, henhouses, and an excavated tank lined with a dirt-covered tarp to hold on average 300,000 liters of water.

**WHAT IS ITS USE?**

The tank is used to breed fish and irrigate gardens, in addition to supporting small livestock activities, with the objective of guaranteeing food security for farmer families, with better health and quality of life, by means of a healthy, agrotoxin-free diet.


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# Category II

## Innovative Practices

*"I am from a land where people are in need*
*But don't give in and try to win.*
*From a dear land, where the beautiful* cabocla
*With a smile on her lips,*
*makes fun of her suffering..."*

***Patativa do Assaré***


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# 1 SUPPORTING INNOVATIVE PRACTICES OF STRENGTHENING AGROECOLOGICAL FAIRS IN PIEMONTE DA DIAMANTINA AS A STRATEGY FOR LIVING IN HARMONY WITH THE SEMI-ARID

**Piemonte Sustainable Family Agriculture Work and Assistance Cooperative**
*(Cooperativa de Trabalho e Assistência à Agricultura Familiar Sustentável do Piemonte – COFASPI)*

## DESCRIPTION

The objective of this project is to connect several links in production chains, thus fostering interconnection among cooperatives and associations to function as a network in municipalities that hold Agroecology Fairs (Jacobina, Várzea Nova, Miguel Calmon and Serrolândia), extending to other municipalities in the Piemonte da Diamantina Territory. In order to achieve this, proposed activities include: holding capacity-building workshops in municipalities with the purpose of constructing knowledge about topics related with the proposal; technical visits with the objective of monitoring initiatives and family production units; monitoring meetings for the fairs network aimed at assessment of project activities; and meetings for construction and formalization of the Piemonte Network of Agroecological Fairs (*Rede de Feiras Agroecológicas do Piemonte* – REFAS Piemonte).

## LOCATION

Piemonte da Diamantina Identity Territory, made up of ten municipalities: Caém, Saúde, Miguel Calmon, Jacobina, Mirangaba, Capim Grosso, Ourolândia, Várzea Nova, Serrolândia and Umburanas, Bahia.

## WHO IS INVOLVED

Farmers with agroecological production in the Piemonte da Diamantina Identity Territory.

## SOCIAL TECHNOLOGIES

Network of Agroecological Fairs, Production Cisterns and Biofertilizers.

Edileuza dos Santos Santana de Jesus

## TESTIMONIAL

*"Organics are like this, you have to care for them in order to move forward, visit your garden every single day. And you've got to love what you do! People think large vegetables are filled with pesticides, but organics can be large too."*

***Edileuza dos Santos Santana de Jesus*** *– Agroecological Farmer, Jacobina Agroecological Fair, Bahia.*

## CONTACT INFORMATION

www.cofaspi.org.br

# Farming cistern, weir and organic gardens

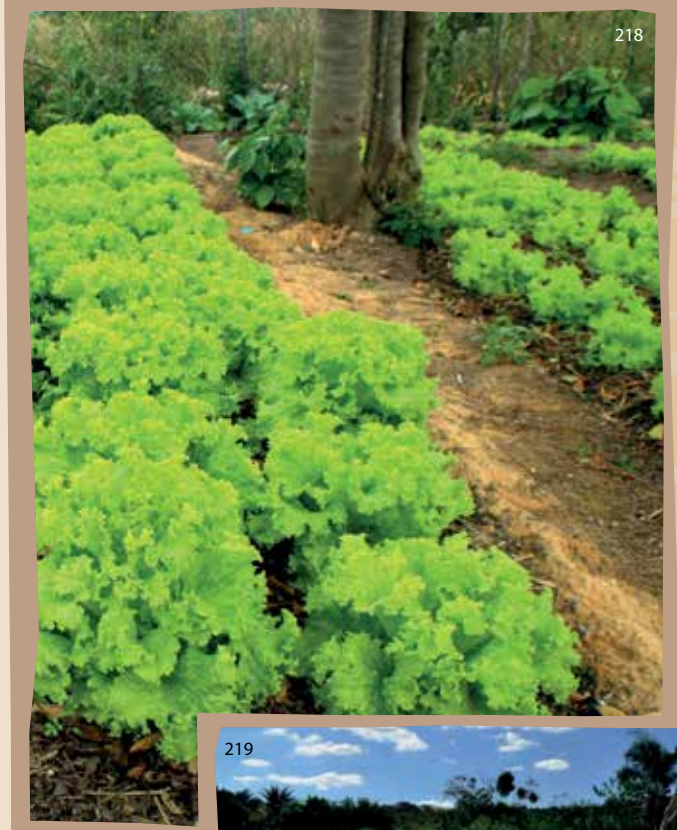
**WHAT IS IT?**

Farming cisterns and weirs are social technologies for rainwater catchment and organic gardens have crops that are agrotoxin-free.

The Network of Agroecological Fairs is a coordination among farmers who manage their lands sustainably, not damaging the environment with their activities. These technologies and their processes integrate this cooperation network with common objectives.

**WHAT IS ITS USE?**

Rainwater catchment and storage technologies are useful for water security of farmers, both for consumption and farming activities in organic gardens. The Network of fairs seeks to improve knowledge, planting and marketing techniques by means of capacity building, exchanges of information, structures for events, in addition to production of materials, such as aprons, hair nets, brochures and banners. This helps farmers establish a visual identity for the network to market organic agroecological products. Network activities are based on principles of fair trade, agroecology and solidary economy.



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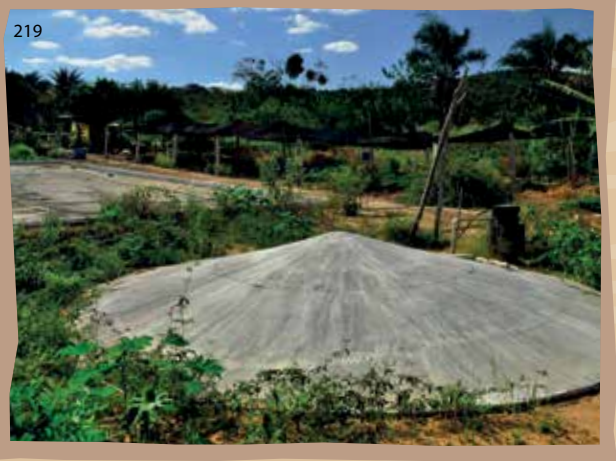

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# 2 LIVE *CAATINGA* PROJECT

**Rio Grande do Norte Organization of Arts, Culture, Sports and Environment**

*(Organização Potiguar de Arte, Cultura, Desporto e Meio Ambiente – CARNAÚBA VIVA)*

## DESCRIPTION

This project aims at empowering people involved in the Carnauba value chain, providing them with occupation, income and food autonomy by means of sustainable activities supported by expansion of a nursery for production of native plants to increase carnauba plantation areas and recover riparian woods in settlement areas covered by the project; signing contracts for rights to extract carnauba to ensure sufficient biomass for production of brickets (ecological firewood) and capacity building for agents to produce them.

## LOCATION

Municipality of Assú, Rio Grande do Norte.

## WHO IS INVOLVED

Settlers and carnauba extractors from the municipality of Assú.

## SOCIAL TECHNOLOGIES

Carnauba Biomass and Seedling Nursery.

## TESTIMONIAL

*""It is interesting to see the reality of settlers, who have the environment on one hand and the large agribusiness we all know to be unsustainable on the other. We are working to deconstruct this conscience of fires and agrochemicals and have taken on the challenge of creating a unit with sustainable management of carnauba trees and a seedling nursery, which has contributed to building awareness in the group."*

***Francisco Antônio Alexandre*** *– Technical Expert and Settler – Rosa Luxemburgo Settlement, Municipality of Assú, Rio Grande do Norte.*

Francisco Antônio Alexandre

## CONTACT INFORMATION

www.carnaubaviva.org.br
contato@carnaubaviva.org.br

# Carnauba Biomass

**WHAT IS IT?**

Use of biomass from carnauba straw substract as a source of renewable energy for the ceramics industry in Vale do Açu. The nursery, in turn, is a structure covered by screens for production of native *Caatinga* plant seedlings.

**WHAT IS ITS USE?**

Replace use of native trees as firewood with carnauba straw substract in ceramics industries, avoiding deforestation of the biome and strengthening sustainable carnauba management and generation of income for those involved in a sustainable manner.

The nursery provides plants for degraded aras, making use of popular knowledge about native species, such as seed collection, germination and seedling transplant, thus contributing to acknowledging the value of the carnauba production chain and *Caatinga* biome conservation.

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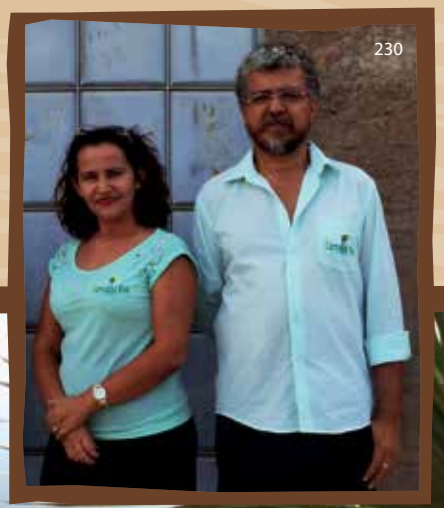

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# 3 PROJECT WATER: SOURCE OF FOOD AND INCOME – A SUSTAINABLE ALTERNATIVE FOR THE SEMI-ARID

**Foundation of Innovative Technology Reference Centers**
*(Fundação Centros de Referência em Tecnologias Inovadoras – CERTI)*

Ana Jussara Oliveira

## DESCRIPTION

This project aims at disseminating the System for Production in the Semi-arid, including water catchment and management and food sovereignty for incorporation in public policies and integrated operation with the private sector, resulting in Productive Territories in the Semi-arid. This system has already been developed and consists in using desalination byproducts, with social, environmental and economic activities that provide development of a sustainable and replicable model for Semi-arid regions. The intention is to make conservation of water resources possible with use of byproducts in microalgae (Spirulina) breeding, with derivatives, and implementation of hydroponic crops integrated with tilapia breeding, connected with the desalination station. The project makes possible development and application of a sustainable and replicable model for the region, with economic results that retro feed into the system, enabling communities to have better quality of life.

## LOCATION

Municipality of São João do Cariri, Paraíba.

## WHO IS INVOLVED

Family farmers.

## SOCIAL TECHNOLOGIES

System for use of desalination byproducts in microalgae (*Spirulina*) breeding for production of hydroponic crops and tilapia.

## TESTIMONIAL

*"The Mandacaru Awards brought an opportunity for Project Water with the perspective of promoting integration and interaction of the Uruçi productive system with other communities in the Paraíba state Semi-arid that already have desalinators. This new perspective will further benefit the community, increasing income in a sustainable manner."*

***Ana Jussara Oliveira*** *– President of the Hidroú Cooperative – Hidroçu Farm, Municipality of São João do Cariri, Paraíba.*

## CONTACT INFORMATION

www.certi.org.br

# Food production in desalination processes

**WHAT IS IT?**

Hydroponics and aquaponics production system using refuse from desalination processes, the so-called "concentrate", as an input for gardens, fish and fruit cultures.

**WHAT IS ITS USE?**

Generation of potable water for human consumption, food for subsistence and alternative income generation, by means of sales.


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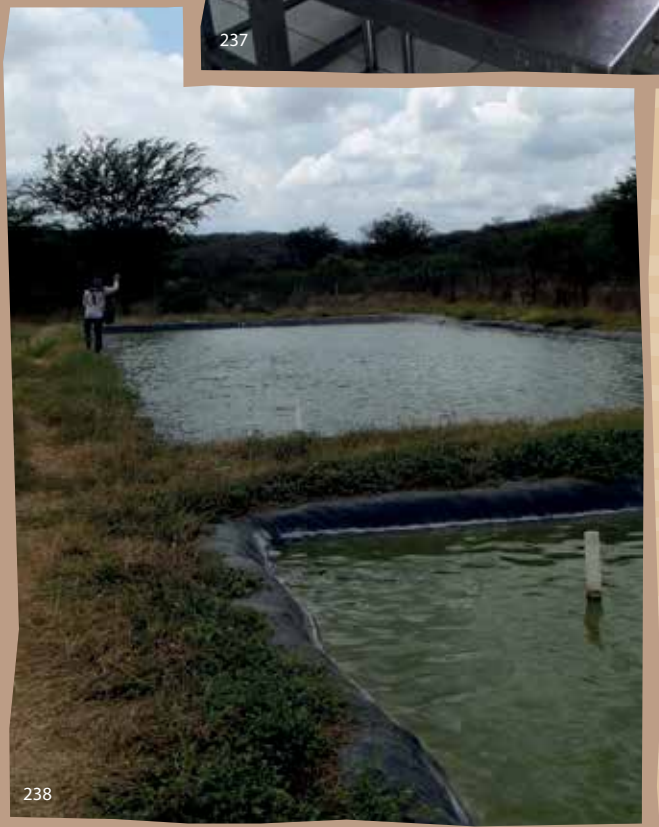
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# 4 PROGRAM FOR COMMUNITY DEVELOPMENT AND INTEGRATION

**Northeast and Citizenship Institute**
*(Instituto Nordeste e Cidadania – INEC)*


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Adriano Oliveira Silva


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Paula Paz

## DESCRIPTION

This Program seeks to acknowledge the value of individual and community identity by means of encouragement for community organization, transformation of locations, caring for people and nature, based on implementation and development of sustainable, low-cost technologies, based on concepts of permaculture. This is a form of contribution to improved quality of life for families in communities, with activities in social, cultural, environmental, economic and health areas, considering local specificities and potentialities, as well as sustainable living with the environment.

## LOCATION

Municipality of Russas, Ceará.

## WHO IS INVOLVED

Rural communities.

## SOCIAL TECHNOLOGIES

Technologies for water catchment, storage or reuse, productive gardens with banana cycles and herb spirals, seedling nurseries, bio-construction of reading spaces and houses and furniture with recyclable material.

## TESTIMONIALS

*"This project means everything to me. My dream was to have my own kitchen, and I have it and it´s gorgeous! I learned how to make comfortersand jars with recycled materials. It was all great and they still built this reading space where children can play and we can gather to strengthen our community ties. It was a blessing!"*

***Paula Paz**, Representante Comunitária*

*"Our house became more colorful, life got better with everything that happened! I found the herb spiral really great, because we had no parsley and now we don't have to buy any. And the banana cycle was also great, since it removed bad smells and plants can use water that is left in the garden."*

***Adriano Oliveira Silva**, Student*

## CONTACT INFORMATION

www.inec.org.br e comunicacao@inec.org.br

# Banana tree circle, edible gardens and bio-construction

**WHAT IS IT?**

Banana tree circles are a permaculture technology employed for gray water (from sinks, washing tanks and showers) treatment and use.

The herb spiral is a spiral-shaped garden with many natural functions gathered in a single element, making it more productive. With herb spirals it is possible to create micro-climates and plant different species in the same space, adapting to the need of each. Suspended gardens are small, vertically hanging gardens using plastic bottles attached to a wall or in small spaces of backyard gardens. With the use of common waste such as tires, plastic bottles, pallets and pieces of wood, both technologies are often called edible gardens.

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Restoration of houses and furniture with bio-construction involves techniques that use materials found in the environment, such as mud, rocks and roots, in addition to recycled materials. This technique promotes arts and citizenship.

**WHAT IS ITS USE?**

The banana tree circle is used to clean water from households (sinks, washing tanks and showers), providing small scale banana and papaya production.

Edible gardens provide flowers, aromatic and medicinal herbs, in addition to encouraging access to healthy diets, providing organic products and using recyclable materials, in favor of environmental education.

Restoration of houses, furniture and community spaces creates more harmonious environments, strengthening the feeling of belonging and appropriation of spaces, for stronger bonds within groups. Self-esteem is promoted, in addition to caring notions. Capacity building is offered for leaders and others in communities to become multipliers capable of maintaining these structures.


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# Category III

## Applied Research

*"Sertão is a place that spreads: it is a where pastures have no boundaries; where one can stride over ten, fifteen leagues, without running across a single inhabited house."*

***Guimarães Rosa – Grande Sertão: Veredas***


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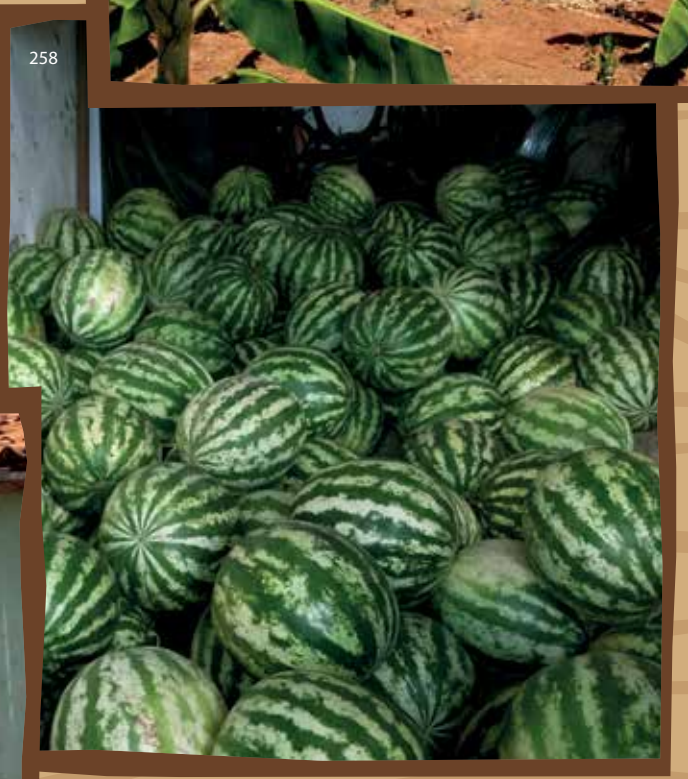
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# 1 INTEGRATED MANAGEMENT OF DESALINATION BYPRODUCTS: A SUSTAINABLE ALTERNATIVE FOR THE RIO GRANDE DO NORTE SEMI-ARID

**Federal Rural University of the Semi-arid**
*(Universidade Federal Rural do Semiárido – UFRSA)*

## DESCRIPTION

This project seeks to minimize negative environmental impacts caused by disposal of byproducts in reverse osmosis treatment plants, with the goal of obtaining potable water for families by means of desalination of water with salt found in wells. This desalination process generates, in addition to potable water, a byproduct that is high in salt concentration, with high potential for pollution. Thus, the project undertook activities for research to both assess environmental impacts of saline byproduct disposal and analyze viability of use of this residue in agriculture. Research activities found technical possibilities for "noble" uses of saline waste and point to viability of this process for family farming production, with generation of income as the goal. The project cooperates with participative residual water management and creating potential for income and food generation by means of innovation and diversity of activities developed by families, in addition to contributing to environmental conservation of two important natural resources: soil and water.

## LOCATION

Municipalities of Mossoró and Campo Grande – Rio Grande do Norte.

## WHO IS INVOLVED

Family farmers.

## SOCIAL TECHNOLOGIES

Innovative systems using saline byproducts for farming activities.

Dona Ângela

## TESTIMONIAL

*"We used to throw out water refuse on the ground, with no proper destination for it, and it was too close to the waterways, which made us scared of polluting the water. This project came at a good time, since, from my point of view, we now have a proper place to put refuse from the desalination unit with no harm to soils, benefitting us with fish farming, which was very positive for me."*

***Mrs. Ângela** – Family farmer, Santa Elza Settlement Project, Municipality of Mossoró, Rio Grande do Norte.*

## CONTACT INFORMATION

www.ufersa.edu.br/portal/

# Innovative Systems Using Saline Refuse for Farming

**WHAT IS IT?**

A technology for harmonious living with the Semi-arid that uses residual water from desalination processes in wells for animal and plant production.

**WHAT IS ITS USE?**

Use of saline refuse from reverse osmosis desalination* for fish farming purposes in rough and use of rejects in for crops (gardens, foragers and fruit and forest seedlings).

* Reverse osmosis is a natural phenomenon that occurs when two solutions with different concentrations (fresh water and salt water, for example) are separated by a semi-permeable membrane, i.e. the membrane allows only the solvent to pass through (water), retaining dissolved salt and contaminants.


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# 2 PRODUCTION SYSTEMS WITH LOW COST IRRIGATION AND EFFICIENT USE OF WATER FOR FAMILY FARMERS IN SETTLEMENTS OF THE SEMI-ARID

**Brazilian Agricultural Research Company – EMBRAPA Manioc and Fruit Farming**
*(Empresa Brasileira de Pesquisa e Agropecuária – EMBRAPA Mandioca e Fruticultura)*

## DESCRIPTION

This project has two main purposes: water catchment for human and animal consumption, as well as irrigation of small mandalas and productive systems of sustainable nature with low-cost irrigation. Project activities include a Rapid Participative Diagnosis; Participative Strategic Planning; qualification and monitoring of irrigation systems for family farmers; assessment of low cost irrigation systems adapted to family farmer conditions; establishment of demonstrative units for organic, conventional and agroforestry production systems; assessment of techniques for conservation of water in soils in irrigated production systems; and transfer of irrigation technologies and production systems for short- and long-cycle crops adapted to Semi-arid conditions.

## LOCATION

Territories of Chapada Diamantina (Caxá Settlement in Paraguassu River Valley), Territories of Velho Chico and Vale do São Francisco (Santo Expedito, Conselheiro, Fundo de Pasto Ribeirão and Angicos Settlements), Bahia.

## WHO IS INVOLVED

Family farmers with irrigated perimeters and from riverside settlements in the Semi-arid.

## SOCIAL TECHNOLOGIES

Production Cisterns with low cost irrigation production systems.

Carlos Gomes Oliveira

## TESTIMONIAL

*"I put into practice organic production for pest control as learned in capacity-building activities. I found it really important to find outthat not all insects are pests. This project is helping a great deal. Water and intelligence can do it all!"*

***Carlos Gomes Oliveira** – Organic farmer – Caxá Settlement, Municipality of Marcionílio Souza, Bahia.*

## CONTACT INFORMATION

www.cnpmf.embrapa.br e ildos.parizotto@embrapa.br

# Low-cost irrigation system

**WHAT IS IT?**

Low-cost irrigation system for small farming.

**WHAT IS ITS USE?**

Irrigate fruit and some garden varieties with lower costs of materials and higher water conservation efficiency in cases in which water is located under a dam, weir or reservoir. Water to supply the irrigation system should be at least 1 meter above crops.


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# Category IV
## Innovative Management

*"The reward for hard work is the joy of having done it. When I am done working, I feel remunerated."*

*Luís da Câmara Cascudo*


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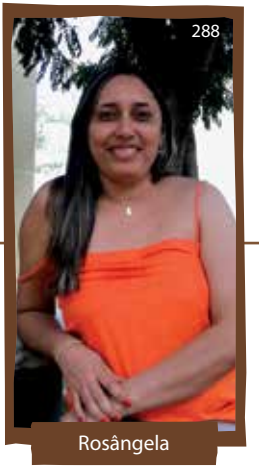
# 1 CONSERVATION AND SUSTAINABLE MANAGEMENT OF THE *CAATINGA* BIOME – *MATA BRANCA*: SEEDS OF LABOR

**Environmental Policies and Management Council**
*(Conselho de Políticas e Gestão do Meio Ambiente – CONPAM)*

Tamires



Rosângela

Antônio

## DESCRIPTION

This project has as its goal improving social, environmental and economic indicators for the region, with the objective of preserving, conserving and managing biodiversity in the *Caatinga* biome in a sustainable manner, in addition to providing quality of life for local inhabitants by means of sustainable development practices. To this end, the project has the following structure: institutional and political support for integrated ecosystem management; demonstration subprojects; promotion of integrated ecosystem management practices; and project monitoring and evaluation, dissemination and management. Furthermore, strategies for shared management of a seedling nursery with seed germplasm banks in public schools are promoted, making it possible to guarantee genetic heritage of native floristic species in the *Caatinga*.

## LOCATION

Municipalities of Tauá, Quixadá, Jaguaribe and Alto Santo, Ceará.

## WHO IS INVOLVED

School teachers and managers, technical experts from seedling nursery and small farmers.

## SOCIAL TECHNOLOGIES

Seedling nursery with native seed germplasm bank.

## TESTIMONIALS

*"The Mandacaru Awards came to strengthen topics already included in the Circular Plan – Com Vidas – to work with reforestation and native seeds."*

***Rosângela Costa*** *– Pedagogical Coordinator*

*"This work is really nice, because we are already dealing with soils and ecology and this native seed study came to complement that, as well as the mandala gardens."*

***Tamires Rolim Gonçalves*** *– Teacher at Cantinho do Saber School*

*"It is good to preserve our biodiversity because in addition to providing shade, there are fruits and we end up with a beautiful landscape."*

***Antônio Alves****, 11 – Student.*

## CONTACT INFORMATION

www.conpam.ce.gov.br e sexec@conpam.ce.gov.br

## Seed Germplasm Bank and Seedling Nursery

**WHAT IS IT?**

Social technologies to insure genetic heritage of native *Caatinga* species.

**WHAT IS ITS USE?**

Conserve orthodox seeds (tolerant to dessication) in controlled temperature and humidity conditions and production of native forest and fruit seedlings within quality standards.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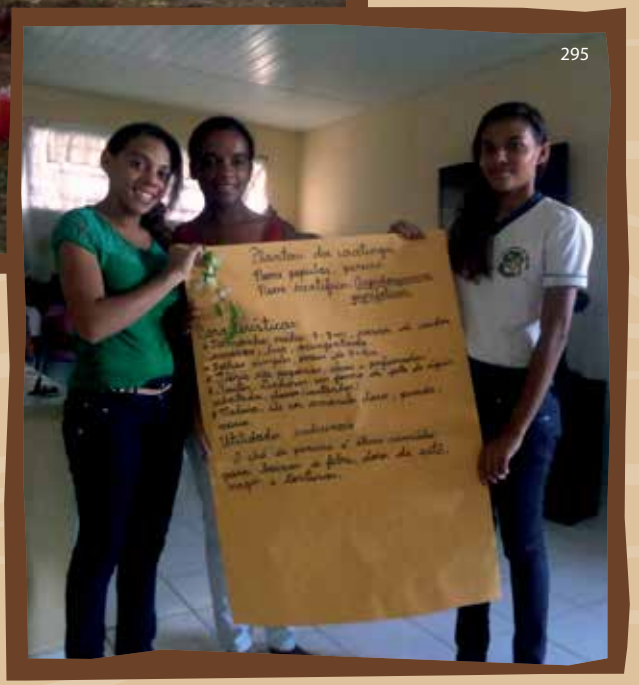

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mata branca

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BANCO DE GERMOPLASMA
SUPERMATA
Superintendência Municipal de Meio Ambiente de Taua
mata branca
FUNDAÇÃO

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# 2 REUSING RESIDUAL WATER FOR PRODUCTION OF ANIMAL FORAGER IN SANTANA DO SERIDÓ

**Santana do Seridó Town Hall**
*(Prefeitura Municipal de Santana do Seridó)*

## DESCRIPTION

This project has the objective of using residual water for production of forage for animals in the form of palms of the Elephant-Ear variety (*Opuntia tuna L. Mill*), in sufficient quantity to provide food security for the local herd during drought periods and end drying up of waters on river beds, addressing an important environmental issue.

## LOCATION

Municipality of Santana do Seridó, Rio Grande do Norte.

## WHO IS INVOLVED

Farmers.

## TECNOLOGIA SOCIAL

System for use of residual water for forager production.

## TESTIMONIAL

*""Palm plantation, irrigated with sewage water, can guarantee both maintenance of livestock and my family. Additionally, we stop polluting the river."*

***José Reinaldo dos Santos*** *– Farmer – Municipality of Santana do Seridó, Rio Grande do Norte.*

José Reinaldo dos Santos

## CONTACT INFORMATION

www.santanadoserido.rn.gov.br

# Residual water reuse for palm cultures

**WHAT IS IT?**

Reusing residual water consists in household sewage treatment at a certain location.

**WHAT IS ITS USE?**

Using residual water from household sewage for irrigation of foragers (palm) to feed animals.


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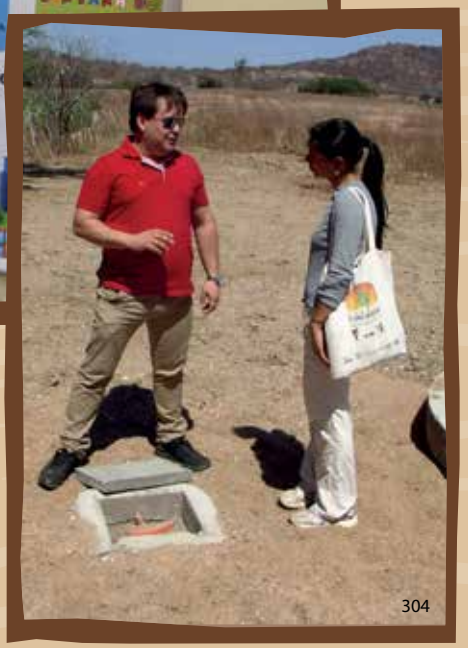

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# Nature we care for

*Agriculture is a need*
*Modern man has in order to survive*
*Since it is from it that food comes from*
*for everyone to eat*
*If it were just for eating*
*Nature would survive*
*However crops*
*Are sold*
*The more money one makes*
*More one wants to produce*
*Regardless of dying forests*
*Rivers and birds*
*With machinery, agrotoxins and fires*
*Humans destroy fauna and forests*
*Not realizing they are destroying*
*What little is left*
*Come now, it is time to change*
*Sow, reap and care*
*Use organic fertilizer, with no fires*
*And take care of our planet*

***Paulo Rocha – Organic farmer, ASAF, Altos, Piauí.***

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**Eugênio Carlos da Silva Oliveira Júnior**: 33, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226 e 308.

**Flávio Souza Cajado**: 166, 172, 173, 174, 175, 176, 177, 178, 179, 180 e 181.

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**Jeferson Danilo Maciel**: 201, 202, 203, 204, 205, 206, 207, 208, 209, 210 e 211.

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