

# FORESTS 4WATER

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2015 - 2020

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# INTRODUCTION

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Amigos de Iracambi (Iracambi) is a non-profit registered in the US (501(c)(3)) and Brazil, situated in the Serra do Brigadeiro region of Minas Gerais, in the Atlantic Rainforest. It's one of the most important biodiversity hotspots on the planet, but for years the combination of continued deforestation and unsustainable farming practices together with accelerating climate change have resulted in increasingly severe droughts, significantly affecting the regional economy.

Iracambi has been working on forest restoration for the past twenty-one years, and our flagship program Forests4Water focuses on restoring forests and providing a measure of environmental education to local farmers. The program demonstrates that forest conservation is completely compatible with productivity, and our decades of work have resulted in many technical improvements. To date we have planted 160,000 trees, involving dozens of farm families and more than two thousand students and researchers from across the world.

This report outlines the data and results of our reforestry program between 2015-2020, showing how the program has evolved and what is its future potential.

Enjoy the read!



# ABOUT

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Forests4Water started in 2015 as a result of farmer-led requests for help with planting trees on their properties. It was a period of severe drought in the region which led to several springs drying up, but also caused increasing numbers of local farmers to prioritize environmental restoration, so that they would never again suffer from lack of water.

This is how the program began, and, differently from previous restoration efforts, Forests4Water focused on protecting and restoring water, with the active participation of the farmers themselves. Over the years, the program was adapted and improved, as we shall see below.

In the first two years (2015 and 2016,) we distributed 7,035 native tree seedlings to 28 local farms. Following this early acceptance both from farmers and donors, the program was expanded in 2017 to increase capacity in the forest nursery and provide a better level of follow up, and a total of 4,131 seedlings were donated to 23 farms.

But, in spite of the increased number of seedlings donated, we quickly understood that many of them were not surviving. So from 2018, instead of simply donating seedlings we started to work alongside the farmers, planting the seedlings together. This proved to be essential to their survival, and was made possible through an increase on funds. We also took control of the whole process before planting, from collecting data on the forestry plots to undertaking soil analyses, correcting the PH of the soil and using organic fertilizer.

That same year we partnered with the local water company in analyzing the water quality on each of the 31 farms involved in the program, and to our surprise, only two farms were producing water that was considered to be up to standard for human consumption. In 2018 we also started to monitor and maintain the seedlings, working with our forestry staff and also providing small financial incentives to the farmers to help with the costs. Our team began to visit the farms every three months, to photograph and record tree growth, and cut the weeds and fertilize the seedlings. This resulted in a significantly higher survival rate – 70% of the 6000 seedlings planted.

In 2019 we continued planting, but sadly were unable to take water samples or carry out monitoring and maintenance – due to a lower level of financial support. As a result of this, the survival rate of the 4000 seedlings planted dropped to around 50%. Things improved considerably in 2020 allowing us to continue planting, and carrying out maintenance activities five times a year for two years, raising the survival rate to nearly 90% – by far the best to date.

This report reinforces the importance of understanding the whole process of restoration, if we are to give the seedlings the best possible chance of survival. In the following pages we'll go into further detail and present data for the period 2015–2020.

# THE REFORESTRY PROCESS

The process begins with visits to those farms whose owners are interested in reforestry. During these visits we explain how the program works, and we evaluate the context of the property, collect data and measure the area to be reforested.

After the initial visit, we select the properties that will participate in the program and draw up detailed plans. Participating farms are selected in order of priority, depending on the urgency of the situation. We then define the areas of water catchment to be reforested, collect data, and discuss species selection depending on topography, soil type and vegetation cover (pasture, scrub woodland, swamps, etc.)

During the rainy season – October through February, we start preparations for planting, clearing ground cover, digging holes, correcting soil acidity and adding organic fertilizer. This is followed by planting and maintenance – weeding and clearing the competing vegetation. We continue carrying out maintenance for two years until the seedlings are well established, and we insist that reforestry areas are fenced to protect the young trees.

After planting we upload to our Geographical Information System (GIS) the data previously collected through using the Collector. Our maps can be consulted here. <https://iracambi.maps.arcgis.com/home/webmap/viewer.html?webmap=baca060291d24b75a21810f3c5926dda>

Our restoration process involves planting different varieties of tree together, recreating as closely as possible conditions in naturally occurring forests. We also use the successional model, using species from differing ecological niches, Pioneer species, (quick growing and tolerant to sunshine,) provide shade to successional and climax species. Mixing species in this way usually produces good results in terms of seedling survival and growth and consequently in successful protection of water resources.



# 2015

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**2.000**

## SEEDLINGS PLANTED

from our forest nursery, raised from seeds collected from healthy forest trees.

**5**

## FARMS

# 2016

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**5.035**

## SEEDLINGS PLANTED

from our forest nursery, raised from seeds collected from healthy forest trees.

**23**

## FARMS



# 2017

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**67**

## **SPECIES**

species of native trees including pioneer, successional and climax species, as well as some fruit trees.

**4.131**

## **TREES PLANTED**

from our forest nursery, raised from seeds collected from healthy forest trees. Seedling height at planting varied from 20-70 cm.

**3**

## **COUNTIES**

Muriaé, Rosário da Limeira and Ervália.

**23**

## **FARMS**

between 30 - 990 seedlings planted on 23 farms.



# PARTICIPATING FARMERS

## **Muriaé/Belisário, Minas Gerais**

Luis Montino, Pedra Alta, 100 seedlings  
José Paulo, Santa Lúcia, 100 seedlings  
Sebastião, Santa Lúcia, 30 seedlings  
José Domingos, São Thomé, 200 seedlings  
Silvano/Margarida, São Thomé, 100 seedlings  
Edivaldo, São Thomé, 250 seedlings  
Silvério, São Thomé, 50 seedlings  
José Milton, Graminha, 300 seedlings  
Leandro Santana Moreira, Graminha, 250 seedlings  
Toninho/Maria José, São Geraldo, 520 seedlings  
Fabiano, Santa Catarina, 100 seedlings  
Vivaldo, Estrada Graminha-Belisário, 100 seedlings  
Lourdes Calais, Fazenda Ribada, 200 seedlings  
Iracambi Ltda, São Geraldo, 990 seedlings



## **Ervália, Minas Gerais**

Ramon Franco, zona rural, 111 seedlings



## **Rosário da Limeira, Minas Gerais**

Maria das Graças, Santo Antônio, 200 seedlings  
Joanes, São Pedro, 200 seedlings  
João Paulo, São Pedro, 200 seedlings  
Medeiros, Godinhos, 40 seedlings  
Lúcia, São Pedro, 30 seedlings  
Silvano, Godinhos, 20 seedlings  
Nelson, Fazenda Palmeiras e Caetano, 20 seedlings  
Hilda, Estiva, 20 seedlings

## **Testimonial from Lourdes Calais:**

“When we started to run short of water on the farm we realized that we needed to restore the spring if we were going to survive. So we started the hard work of protecting and recuperating the spring. Our partnership with Iracambi helped a lot and today we're proud to say that it is possible to recuperate a spring. Congratulations, Iracambi, on your brilliant work.”



# TREE SPECIES PLANTED

Abacate, *Persea americana*  
Açoita Cavallo, *Luehea divaricata*  
Adrago, *Croton urucurana*  
Ameixa, *Prunus domestica*  
Angelim coco, *Andira anthelmia*  
Angico Branco, *Anadenanthera colubrina*  
Angico Vermelho, *Anadenanthera macrocarpa*  
Araçá Roxo, *Psidium myrtoides*  
Araucária, *Araucaria angustifolia*  
Barbatimão, *Stryphnodendron adstringens*  
Biriba, *Annona mucosa*  
Boleira, *Joannesia princeps* Vell  
Camboatá, *Cupania vernalis*  
Canafistula, *Peltophorum dubium*  
Canjerana Miúda, *Cabralea canjerana*  
Canjiquinha, *Rhamnus sphaerosperma*  
Capoeira Branca, *Solanum mauritianum*  
Carambola, *Averrhoa carambola*  
Caroba da flor verde, *Cybistax antisiphilitica*  
Castanha do Maranhão, *Bombacopsis glabra*  
Chuva de Ouro, *Cassia ferruginea*  
Coco Jeriva, *Syagrus romanzoffiana*  
Embaúba, *Cecropia pachystachya* Trécul  
Fedegoso, *Senna macranthera* (Collad.)  
Fedegoso do Mato, *Senna silvestris*  
Garapa, *Apuleia leiocarpa*  
Goiaba, *Psidium guajava*  
Graviola, *Annona muricata*  
Guabiroba, *Campomanesia xanthocarpa*  
Guapuruvu, *Schizolobium parahyba*  
Imbiruçu, *Pseudobombax simplicifolium*  
Inga Quatro Quina, *Inga vera* Willd  
Ingá Banana, *Inga laurina* (sw Willd)  
Ingá Cipó, *Inga edulis*  
Ipê preto, *Handroanthus arianæ*  
Ipê Roxo, *Handroanthus impetiginosus*  
Jabuticaba, *Plinia cauliflora*  
Jaca, *Artocarpus heterophyllus*

Jacaré, *Piptadenia gonoacantha*  
Jambo Rosa, *Syzygium jambos*  
Jussara, *Euterpe edulis*  
Laranja, *Citrus X sinensis*  
Lichia, *Litchi chinensis*  
Manga Espada, *Mangifera indica* L.  
Manga Ouro, *Mangifera indica* L.  
Mulungu, *Erythrina verna*  
Oiti, *Licania tomentosa*  
Olho de Cabra, *Ormosia arborea*  
Orelha de Macaco, *Enterolobium contortisiliquum*  
Papagaio, *Aegiphila sellowiana* Cham.  
Pata de vaca com espinho, *Bauhinia forficata*  
Pau Viola, *Cytharexylum myrianthum*  
Pêssego, *Prunus persica*  
Pitanga, *Eugenia uniflora* L.  
Quaresmeira, *Tibouchina granulosa*  
Quebra Foice, *Mimosa laticifera*  
Sapucaia, *Lecythis pisonis*  
Sete Casca, *Samanea tubulosa*  
Sibipiruna, *Caesalpinia pluviosa*  
Sobrasil, *Colubrina glandulosa* Perkins  
Sucurujuva  
Sombreiro, *Clitoria fairchildiana*  
Urucum, *Bixa orellana* L.  
Uva do Japão, *Hovenia dulcis*  
Uvaia, *Eugenia pyriformis*  
Veludo Branco, *Guettarda viburnoides*  
Vermelhão, *Hirtella glandulosa*



# 2018

37

## SPECIES

species of native trees, pioneers, succession and climax species as well as fruit trees.

6.000

## TREES PLANTED

trees planted from our forest nursery, raised from seeds collected from healthy forest trees.

3

## COUNTIES

Muriae, Rosário da Limeira and Ervália.

31

## FARMS

between 31 - 705 seedlings planted on 31 farms.

70%

## SURVIVAL RATE

seedlings planted by the Iracambi team after preparing the land, collecting soil samples, correcting the soil and using organic fertilizer. Maintenance carried out three times a year.



# PARTICIPATING FARMERS

## **Muriaé/Belisário, Minas Gerais**

Lourdes Calais Laia, 200 seedlings  
Frei Gilberto Teixeira, 60 seedlings  
Toni, 80 seedlings  
Hideraldo Sebastião e de Mendonça, 210 seedlings  
Regina Gomes de Paula Silva, 350 seedlings  
Vivaldo, 69 seedlings  
José Antunes, 410 seedlings

## **Ervália, Minas Gerais**

Rogéria Castro, Godinhos, 200 seedlings  
Antonio Teixeira, 480 seedlings  
Kamilo Fonseca e Castro, 105 seedlings  
Luiz Antonio, 55 seedlings

## **Rosário da Limeira, Minas Gerais**

Robin Le Breton, Graminha, 600 seedlings  
João Paulo, São Pedro, 215 seedlings

José Milton da Rocha, Graminha, 40 seedlings  
Leandro Santana, Graminha, 170 seedlings  
Claudinéia, 70 seedlings  
Dagmar, 60 seedlings  
Edinho, 31 seedlings  
Eloy Clemente, 205 seedlings  
Felipe, 48 seedlings  
Flávio, 705 seedlings  
Jair Paula, 180 seedlings  
Maria Gomes, 150 seedlings  
Markin, 106 seedlings  
Nelson Cabral Pereira Junior, 49 seedlings  
Olyvier, 155 seedlings  
Rodrigo Ramalho, 100 seedlings  
Rosilene, 170 seedlings  
Sebastião da Laura, 200 seedlings  
Felipe, 178 seedlings  
Nelio, 349 seedlings

# TREE SPECIES PLANTED

Abacate, *Persea americana*  
Adrago, *Croton urucurana*  
Algodão, *Gossypium*  
Amora, *Morus alba*  
Angico Vermelho, *Anadenanthera macrocarpa*  
Araçá Roxo, *Psidium myrtilodes*  
Araticum-Cagão, *Annona montana*  
Bico-de-pato, *Machaerium nyctitans*  
Biriba, *Annona mucosa*  
Camboatá, *Cupania vernalis*  
Candeia, *Eremanthus erythropappus*  
Canela, *Cinnamomum verum*  
Canjerana Miúda, *Cabralea canjerana*  
Caquizeiro, *Diospyros kaki*  
Cassia Rosa, *Cassia grandis*  
Castanha do Maranhão, *Bombacopsis glabra*  
Coco Jeriva, *Syagrus romanzoffiana*  
Cutieira, *Joannesia princeps*  
Fedegoso, *Senna macranthera* (Collad.)

Fruta do Lobo, *Solanum lycocarpum*  
Goiaba, *Psidium guajava*  
Guapuruvu, *Schizolobium parahyba*  
Ingá Peba, *Inga macrophylla*  
Ipê Rosa, *Handroanthus heptaphyllus*  
Jatobá, *Hymenaea courbaril*  
Jenipapo, *Genipa americana*  
Jussara, *Euterpe edulis*  
Mamão, *Carica papaya*  
Manga Espada, *Mangifera indica* L.  
Mulungu, *Erythrina verna*  
Pata de vaca, *Bauhinia unguolata* L.  
Pata de vaca com espinho, *Bauhinia forficata*  
Pitanga, *Eugenia uniflora* L.  
Sapucaia, *Lecythis pisonis*  
Sibipiruna, *Caesalpinia pluviosa*  
Tamboril, *Enterolobium contorsiliquum*  
Urucum, *Bixa orellana* L.



# 2019

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**39**

## SPECIES

species of native trees, pioneers, succession and climax species as well as fruit trees.

**4.000**

## TREES PLANTED

trees planted from our forest nursery, raised from seeds collected from healthy forest trees.

**2**

## COUNTIES

Muriae and Rosário da Limeira

**14**

## FARMS

between 71 - 810 seedlings planted on 14 farms.

**50%**

## SURVIVAL RATE

seedlings planted by the Iracambi team after preparing the land, collecting soil samples correcting the soil and using organic fertilizer.



# PARTICIPATING FARMERS

## Muriaé/Belisário, Minas Gerais

José Antunes, 321 seedlings

Regina, 775 seedlings

Lourdinha, 287 seedlings

## Rosário da Limeira, Minas Gerais

João Paulo, 210 seedlings

Sebastião, 29 seedlings

Olyver, 150 seedlings

Eloy, 300 seedlings

Markin, 74 seedlings

Jair Paulo, 260 seedlings

Maria G., 303 seedlings

Rosilene, 221 seedlings

Claudineia, 71 seedlings

Wilson, 189 seedlings

Robinho, 810 seedlings

# TREE SPECIES PLANTED

Abacate, *Persea americana*

Adrago, *Croton urucurana*

Amora, *Morus alba*

Angico Branco, *Anadenanthera colubrina*

Angico Vermelho, *Anadenanthera macrocarpa*

Araçá Roxo, *Psidium myrtilloides*

Araticum-cagão, *Annona montana*

Cinco Folhas, *Potentilla nepalensis*

Copaíba, *Copaifera langsdorffii*

Coco Jeriva, *Syagrus romanzoffiana*

Embaúba, *Cecropia pachystachya* Trécul

Fedegoso, *Senna macranthera* (Collad.)

Fruta do Lobo, *Solanum lycocarpum*

Goiaba, *Psidium guajava*

Guapuruvu, *Schizolobium parahyba*

Ingá Peba, *Inga macrophylla*

Ipê Amarelo, *Handroanthus albus*

Ipê Roxo, *Handroanthus heptaphyllus*

Jabuticaba, *Plinia cauliflora*

Jaca, *Artocarpus heterophyllus*

Jacarandá, *Jacaranda mimosifolia*

Jacaré, *Piptadenia gonoacantha*

Jussara, *Euterpe edulis*

Limão-rosa, *Citrus × limonia*

Mamão, *Carica papaya*

Manga Espada, *Mangifera indica* L.

Pata de vaca, *Bauhinia unguolata*

Pata de vaca com espinho, *Bauhinia forficata*

Quaresmeira, *Tibouchina granulosa*

Sapucaia, *Lecythis pisonis*

Sete Cascas, *Samanea tubulosa*

Sibipiruna, *Caesalpinia pluviosa*

Sucupira, *Pterodon emarginatus*

Suinã, *Erythrina velutina*

Tamboril, *Enterolobium contorsiliquum*

Urucum, *Bixa orellana* L.

Uvaia, *Eugenia pyriformis*

Vinhático, *Plathymenia foliolosa*



# 2020

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41

## SPECIES

species of native trees, pioneers, succession and climax species as well as fruit trees.

5166

## TREES PLANTED

trees planted from our forest nursery, raised from seeds collected from healthy forest trees.

1

## COUNTY

Rosário da Limeira.

7

## FARMS

between 350 – 1300 seedlings planted on 7 farms.

89%

## SURVIVAL RATE

seedlings planted by the Iracambi team after preparing the land, collecting soil samples, correcting the soil and using organic fertilizer. Maintenance carried out five times a year for two years.

# PARTICIPATING FARMERS

## Rosário da Limeira, Minas Gerais

Bruno Nery, Graminha, 430 seedlings  
Carla Faccina, Buracada, 1000 seedlings  
Eduardo Senra, Graminha, 486 seedlings  
Luiz Gusmão, Graminha, 1300 seedlings  
Luiz Sodré, Graminha, 350 seedlings  
Robin Le Breton, Graminha, 600 seedlings  
Leandro Santana, 1000 seedlings

# TREE SPECIES PLANTED

Abacate, *Persea americana*  
Açoita Cavalo, *Luehea divaricata*  
Adrago, *Croton urucurana*  
Ameixa, *Prunus domestica*  
Angelim Coco, *Andira anthelmia*  
Angico Branco, *Anadenanthera colubrina*  
Biriba, *Annona mucosa*  
Cafe, *Coffea arabica*  
Canjerana Miúda, *Cabralea canjerana*  
Canjiquinha, *Rhamnus sphaerosperma*  
Cassia Rosa, *Cassia grandis*  
Castanha do Maranhão, *Bombacopsis glabra*  
Chuva de Ouro, *Cassia ferruginea*  
Cinco Folhas, *Potentilla nepalensis*  
Copaíba, *Copaifera langsdorffii*  
Coco Jeriva, *Syagrus romanzoffiana*  
Embaúba, *Cecropia pachystachya* Trécul  
Embiriçu, *Pseudobombax grandiflorum*  
Fedegoso, *Senna macranthera* (Collad.)  
Fruta do Lobo, *Solanum lycocarpum*

Goiaba, *Psidium guajava*  
Ingá Peba, *Inga macrophylla*  
Ipê Roxo, *Handroanthus heptaphyllus*  
Jabuticaba, *Plinia cauliflora*  
Jaca, *Artocarpus heterophyllus*  
Jacaré, *Piptadenia gonoacantha*  
Jenipapo, *Genipa americana*  
Jussara, *Euterpe edulis*  
Limão-rosa, *Citrus × limonia*  
Mamão, *Carica papaya*  
Manga Espada, *Mangifera indica* L.  
Mulungu, *Erythrina verna*  
Papagaio, *Aegiphila sellowiana* Cham.  
Pata de vaca, *Bauhinia unguolata* L.  
Pau Viola, *Cytharexylum myrianthum*  
Sapucaia, *Lecythis pisonis*  
Sibipiruna, *Caesalpinia pluviosa*  
Urucum, *Bixa orellana* L.  
Uvaia, *Eugenia pyriformis*  
Vinhático, *Plathymenia foliolosa*



# PARTNERS

This work would not have been possible without support from our partners, to whom we are most grateful!

