FUTURE – the 100,000 trees project in Porto Metropolitan Area | Report 2011-2013

11.09.2013 | Marta Pinto, Conceição Almeida | Catholic University of Portugal
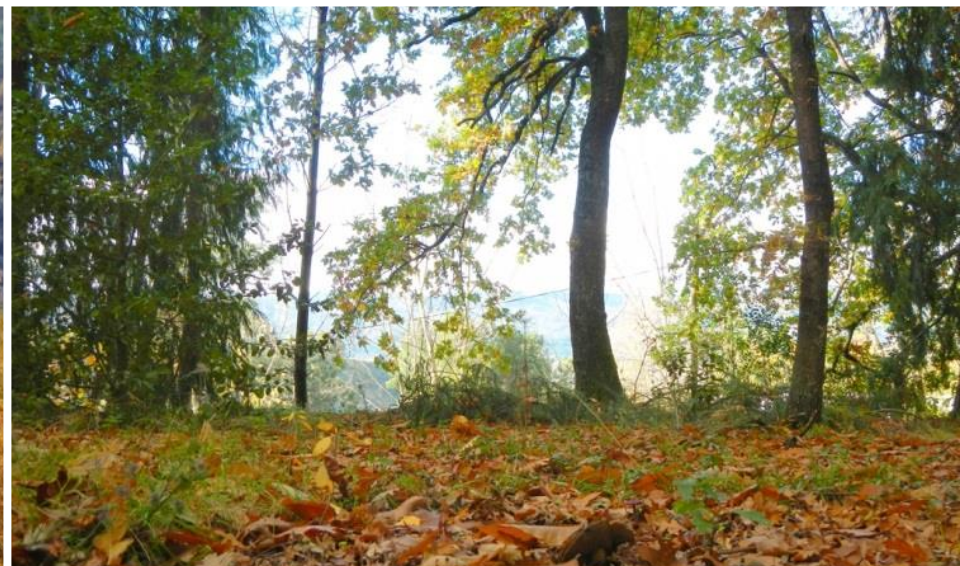
Project

Coordination

Co-financed

we want to plant and care for 100,000 native trees by 2016

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and we have in the metropolitan area territory in need of restoration

with native species of the Portuguese flora

Sweet Chestnut
(*Castanea sativa*)

English Oak
(*Quercus robur*)

Bay Laurel
(*Laurus nobilis*)

European Nettle
(*Celtis australis*)

Sycamore Maple
(*Acer pseudoplatanus*)

Birch
(*Betula celtiberica*)

Hawthorn
(*Crataegus monogyna*)

Montpellier Maple
(*Acer monspessulanum*)

Field Elm
(*Ulmus minor*)

Ash
(*Fraxinus sp.*)

Cork Oak
(*Quercus suber*)

Strawberry Tree
(*Arbutus unedo*)

Stone Pine
(*Pinus pinea*)

Holly
(*Ilex aquifolium*)

Alder
(*Alnus glutinosa*)

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we know that native trees are essential

Favour Biodiversity
(Manuel, Forest Engineer)

Reduce urban noise
(Francisco, Student)

Sequester carbon dioxide from the atmosphere
(Fedra, Designer)

Re-establish connections to our ancestors
(Rute, Civil Engineer)

Reduce the risk of fire spreading
(Iva, Engineer)

Contribute to the formation of soil and protect it from erosion
(Manuela, Biologist)

Stimulate our senses and decorate the "exteriors"
(Ana, Journalist)

Infiltrate and filter water by increasing its quality
(Artur, Environmental Engineer)

Promote psychological well-being and encourage physical activity
(Luísa, Psychiatrist)

Have positive impacts on the health and welfare of children
(Ana, Full-time mom)

Stimulate the senses, the minds and hearts of children
(Joana, Manager)

Retain pollutants from the atmosphere reducing respiratory diseases
(Fernando, Retiree)

Increase our well-being and personal productivity
(Pedro, Manager)

Facilitate adaptation to climate change
(Soraia, Environmental Engineer)

Reduce the effects of stress and anxiety
(José, Lawyer)

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◀ **Plant**

trees and shrubs native to the areas

Care ▶

for our trees and areas with natural regeneration
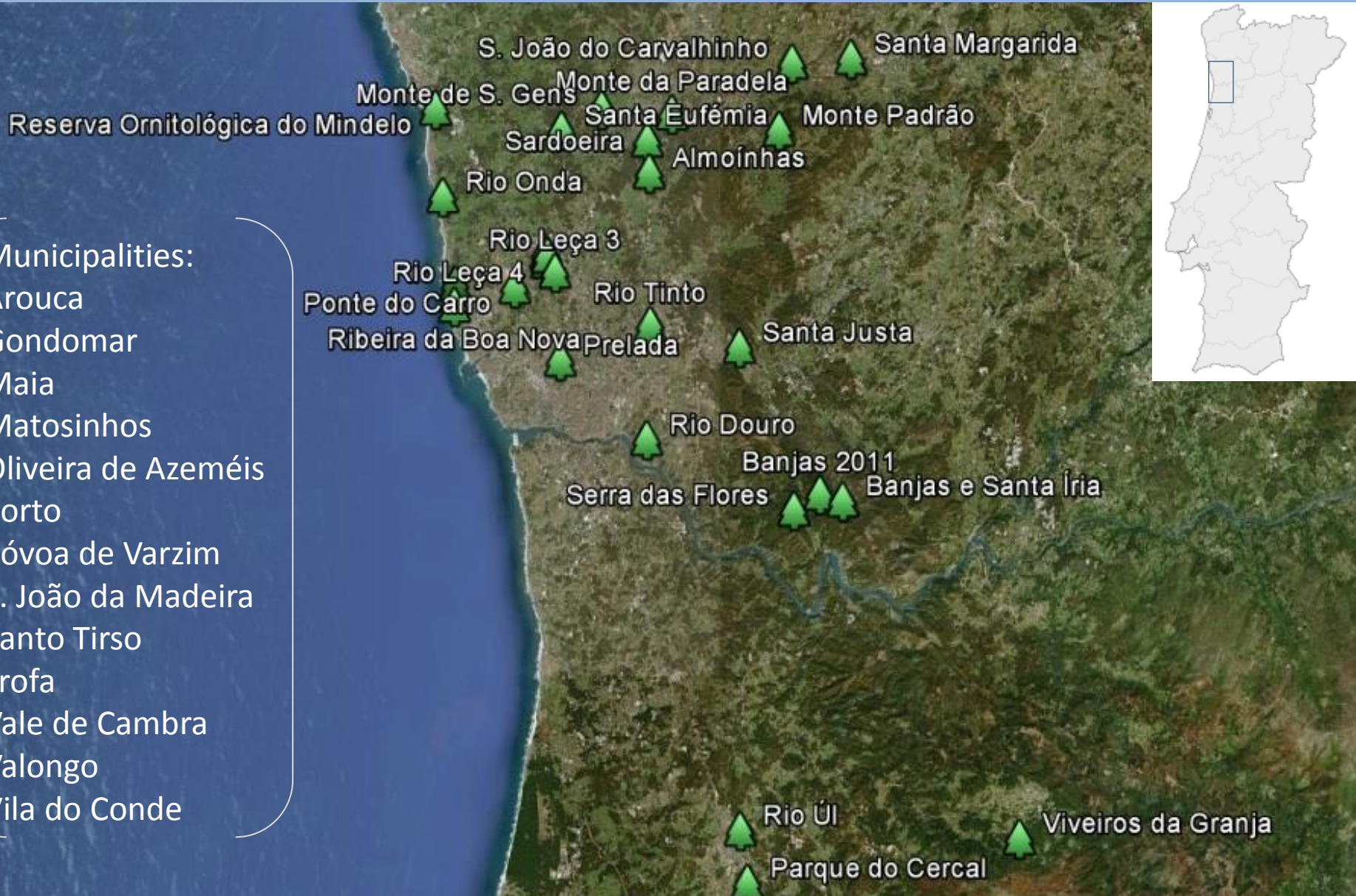
◀ **Monitor**

the state of our trees

Educate ▶

about forest and trees

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S. João do Carvalhinho

Santa Margarida

Monte da Paradela

Monte de S. Gens

Reserva Ornitológica do Mindelo

Santa Eufémia

Monte Padrão

Sardoeira

Almoínhas

Rio Onda

Rio Leça 3

Rio Leça 4

Ponte do Carro

Rio Tinto

Ribeira da Boa Nova

Prelada

Santa Justa

Rio Douro

Banjas 2011

Serra das Flores

Banjas e Santa Íria

Rio Úl

Viveiros da Granja

Parque do Cercal

Municipalities:
Arouca
Gondomar
Maia
Matosinhos
Oliveira de Azeméis
Porto
Póvoa de Varzim
S. João da Madeira
Santo Tirso
Trofa
Vale de Cambra
Valongo
Vila do Conde

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Plant and care for 100,000 native trees by 2016

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and we have already achieved the following [2011-2013]

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Note 1: Potential for carbon retention: annual average for a 40 year expectancy for the number of trees planted to date

Note 2: Estimate based on the ability of the (adult) trees to capture CO_2, atmospheric pollutants and intercept rainwater.

Note 3: Total of 227,535 residents in the city of Porto and 1,663,277 residents in the Metropolitan Area of Porto (Census 2011)

25,228 trees planted on **88.6** hectares
= planting area equivalent to 90 soccer fields

75% survival rate
= 7.5 in every 10 trees planted survive

384 hours of activities held
= 4 hours of volunteer work per week

3,914 volunteer participation
= 38 citizens planting and caring for forests per week

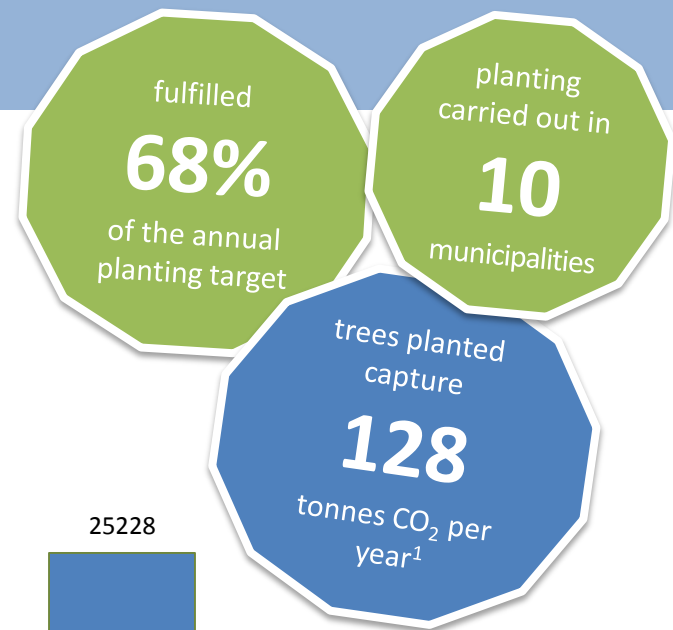**11,598** volunteer hours
= total of 16 volunteer hours per day

128 tons of CO_2 per year[1]
= annually our trees capture the equivalent of 600g of CO_2 per resident of the city of Porto[3]

€1,000,000 in ecological services per year[2]
= annually our trees 'give back' to each citizen[3] of the Porto Metropolitan Area €0.60 in ecological services

fulfilled
68%
of the annual
planting target

planting
carried out in
10
municipalities

trees planted
capture
128
tonnes CO_2 per
year[1]

trees planted (nº)

Year 1 = season 2011/12
Year 2 = season 2012/13

Note 1: Potential for carbon retention: annual average for a 40 year expectancy for the number of trees planted to date
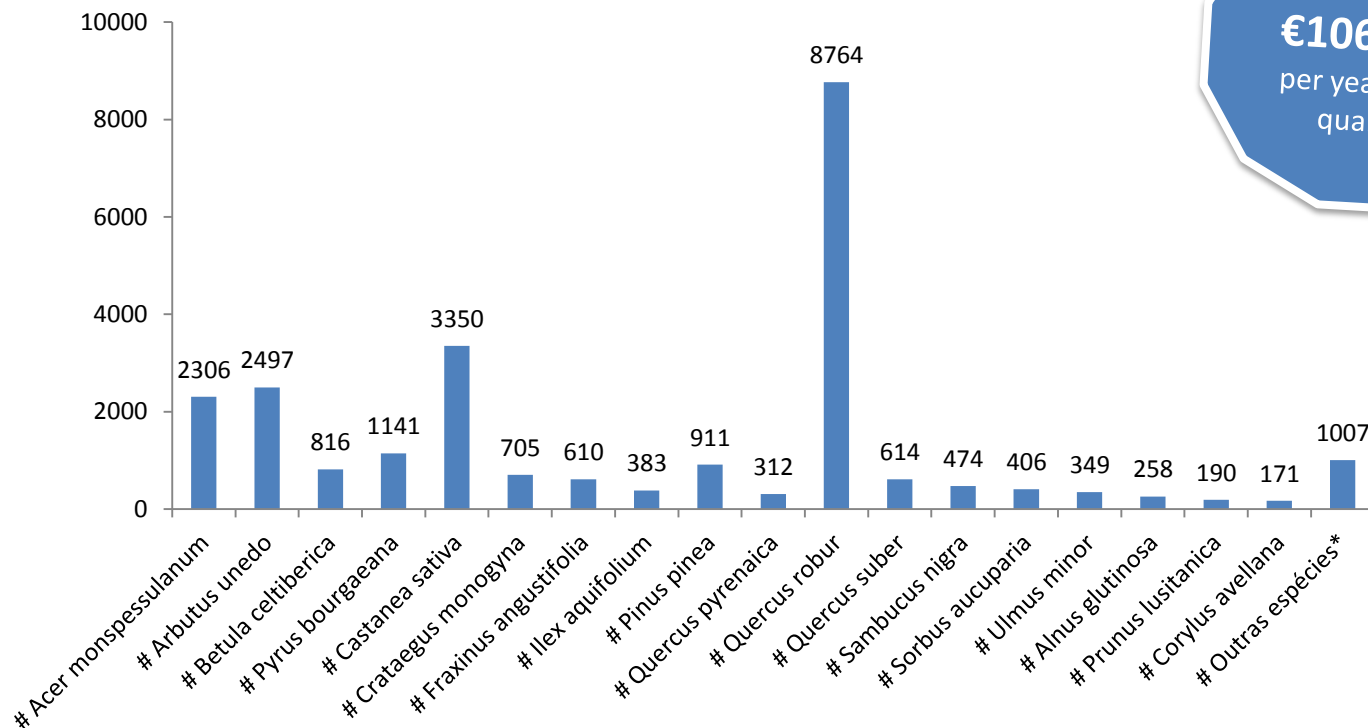
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CR**E**porto

overall results [2011 - 2013]

benefit of **€941 ,585** per year in water regulation[1]

24 native species planted

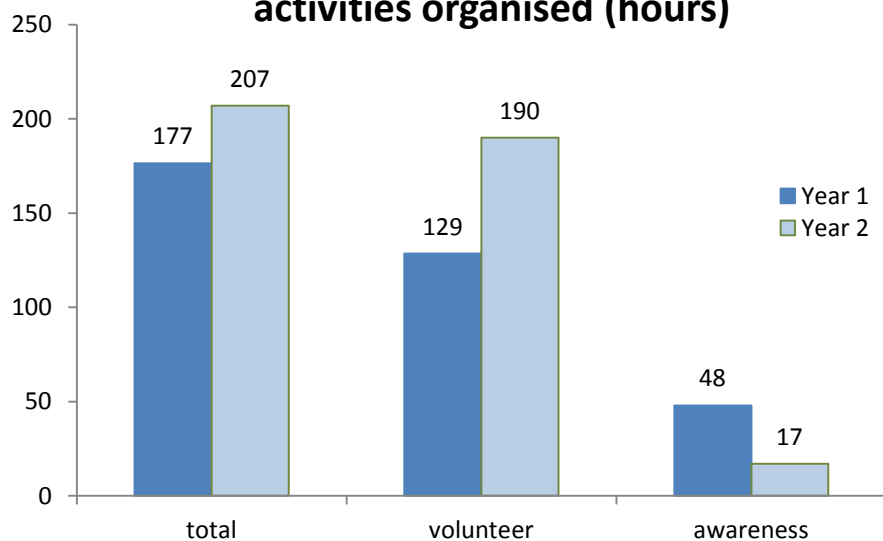benefit of **€106,260** per year in air quality[1]

tree species planted (nº)

* Laurus nobilis, Celtis australis, Salix sp., etc.

Note 1: Economic benefit of trees in improving air quality by retaining pollutants, capturing carbon dioxide and reducing water runoff after rain episodes resulting from the presence of 25,228 (adult) trees, calculation based on the study of valorisation of services rendered by trees in the urban context (Soares et al. 2011)
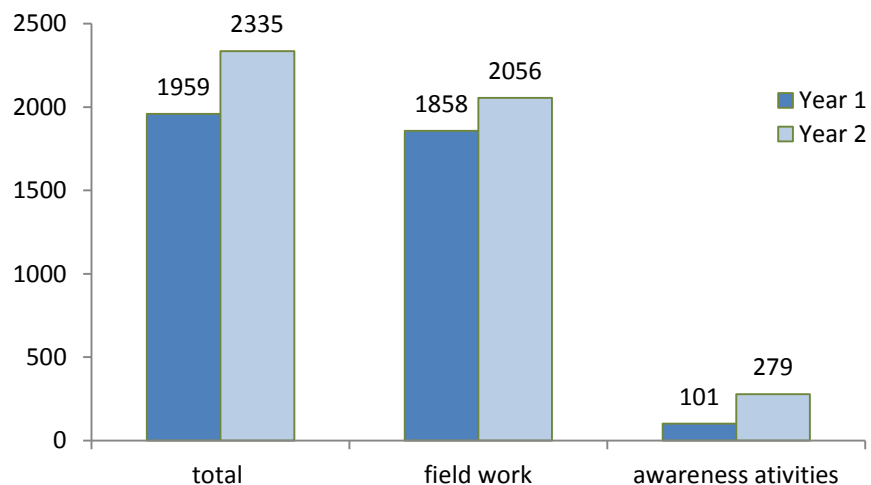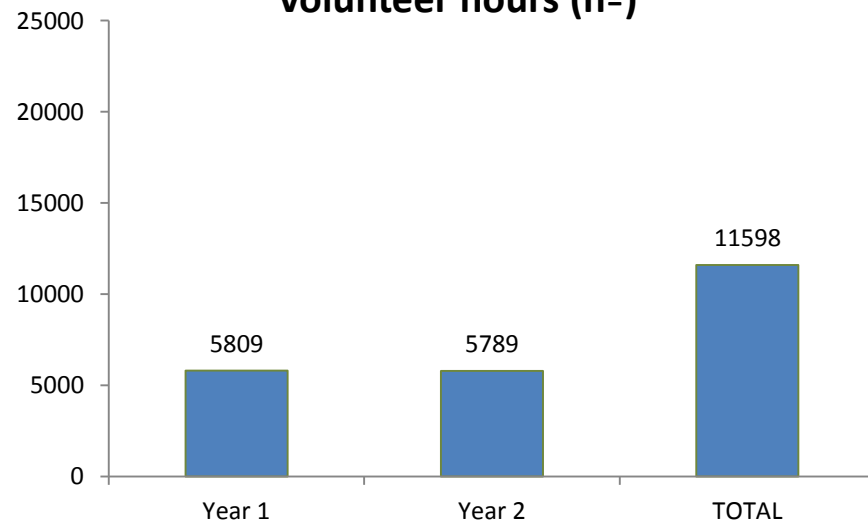
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overall results [2011 - 2013]

activities organised (hours)

	Year 1	Year 2
total	177	207
volunteer	129	190
awareness	48	17

3,914 field participations

11,598 volunteer hours

130 activities organised

volunteer participation (nº)

	Year 1	Year 2
total	1959	2335
field work	1858	2056
awareness atitivies	101	279

volunteer hours (nº)

Year 1	Year 2	TOTAL
5809	5789	11598

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overall results [2011 - 2013]

75%
survival rate[1]

English oak (*Quercus robur*) planted on the 28/01/2012. State on 14 /05/2013.

Hawthorn (*Crataegus monogyna*) planted on the 09/02/2012. State on 08 /06/2013.

English oak (*Quercus robur*) planted on the 23/11/2012. State on 04 /06/2013.

Common Hazel (*Corylus avellana*) planted on the 29/10/2011. State on 04 /06/2013.

Note 1: Estimated average based on:
1. monitoring survival rates studies; and
2. observation of the state of the plants during field visits for maintenance activities.

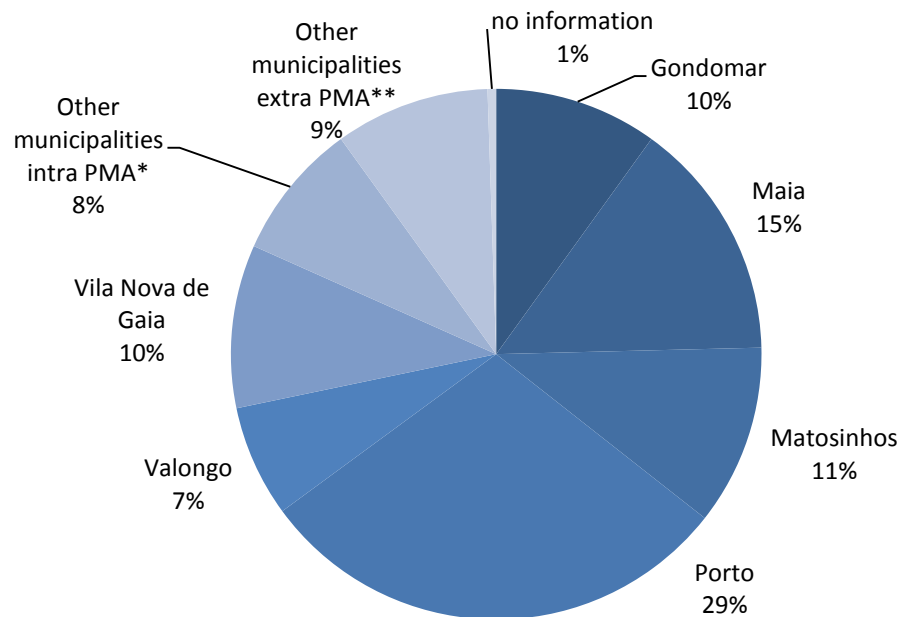www.embaixadadafloresta.blogspot.pt

90%
live in PMA***

15%
of the volunteers gave more than 10h[2]

32%
of the volunteers participated in more than one activity[2]

volunteer´s municipality of residence[1]

- no information 1%
- Gondomar 10%
- Maia 15%
- Matosinhos 11%
- Porto 29%
- Valongo 7%
- Vila Nova de Gaia 10%
- Other municipalities intra PMA* 8%
- Other municipalities extra PMA** 9%

volunteer´s occupation[3]

- retiree 1%
- unemployed 18%
- student 20%
- employed 61%
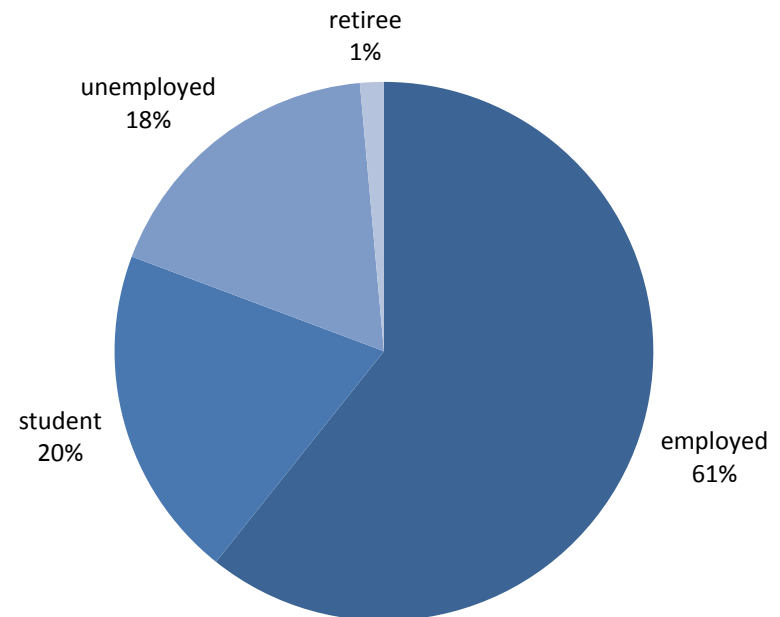
*Espinho, Oliveira de Azeméis, Vila do Conde, Trofa, Póvoa de Varzim, S. João da Madeira, Santa Maria da Feira, Santo Tirso
** Paredes, Esposende, Lousada, Paços de Ferreira, Braga, Aveiro, Vila Nova de Famalicão, Estarreja.
*** PMA – Porto Metropolitan Area
Note 1: N=191, volunteers registered as Trustees and Friends of the Forest
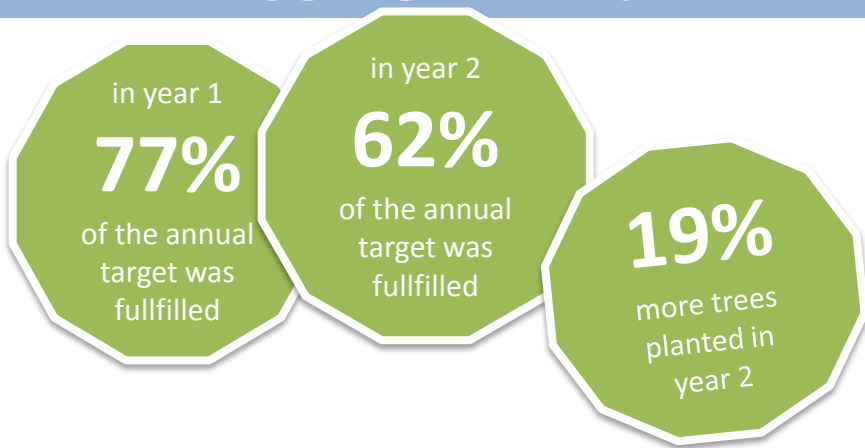Note 2: N= 350, volunteers registered in 47 activities
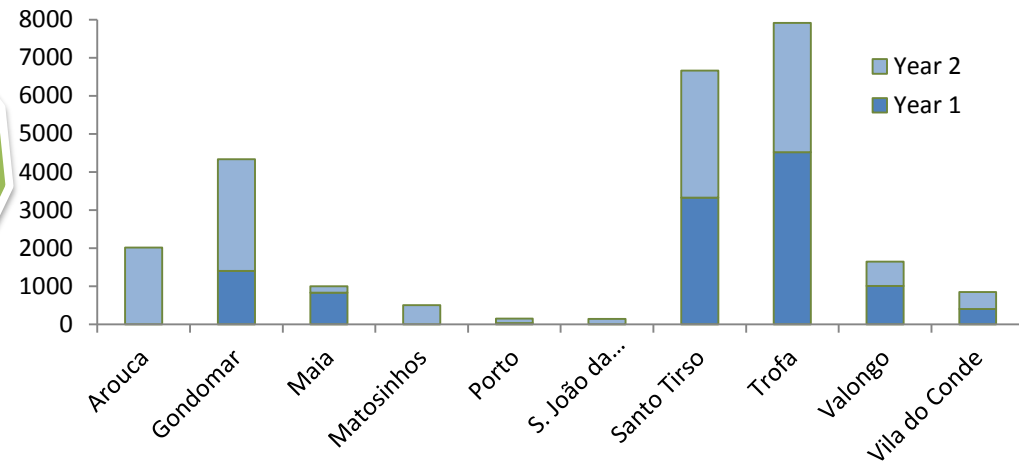Note 3: N=140, volunteers registered as Trustees of the Forest

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results aggregated by municipality [2011-2013]

in year 1
77%
of the annual target was fullfilled

in year 2
62%
of the annual target was fullfilled

19%
more trees planted in year 2

trees planted per municipality per season (nº)

Legend: Year 2, Year 1

Categories: Arouca, Gondomar, Maia, Matosinhos, Porto, S. João da..., Santo Tirso, Trofa, Valongo, Vila do Conde

trees planted per municipality (nº)

Vila do Conde 3%
Valongo 7%
Arouca 8%
Gondomar 17%
Maia 4%
Matosinhos 1%
Porto 1%
S. João da Madeira 0%
Santo Tirso 27%
Trofa 32%
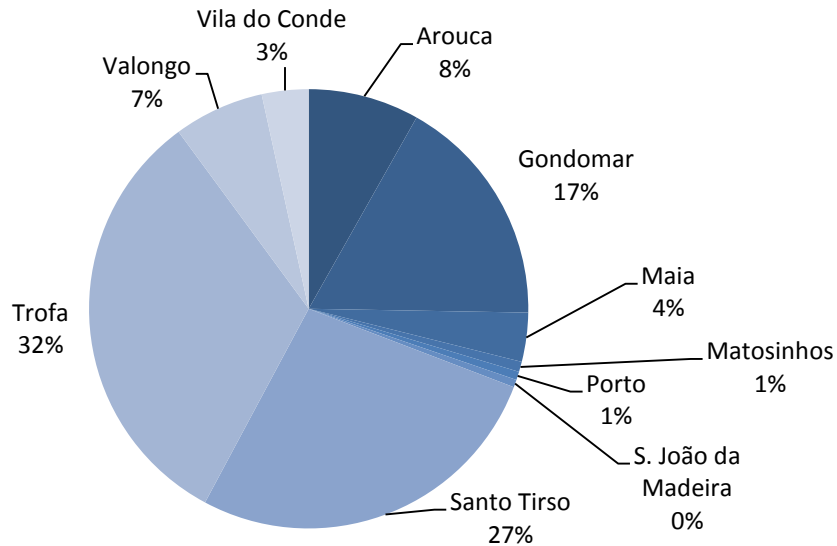
fullfillment of annual target (%)

Legend: Year 1, Year 2

Municipality	Year 1	Year 2
Arouca	0	72
Gondomar	140	117
Maia	83	20
Matosinhos		97
Oliveira de Azeméis		0
S. João da Madeira	0	53
Santo Tirso	238	51
Trofa	101	65
Valongo	50	42
Vila do Conde	100	60

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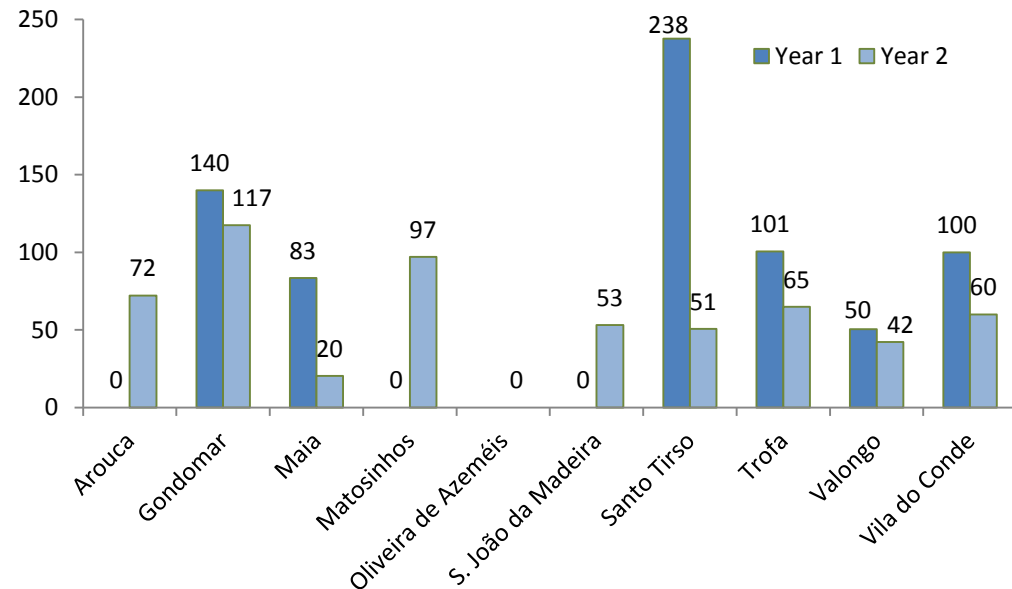
results aggregated by municipality [2011-2013]

hectares covered (nº)

Municipality	Value
Arouca	12,4
Gondomar	7,2
Maia	2,7
Matosinhos	0,4
Porto	0,2
S. João da Madeira	0,3
Santo Tirso	16
Trofa	33,2
Valongo	3,6
Vila do Conde	1,2

total of 88,6 hectares in intervention

454 trees planted per hectare (average)

128 tons of CO_2 per year[1]
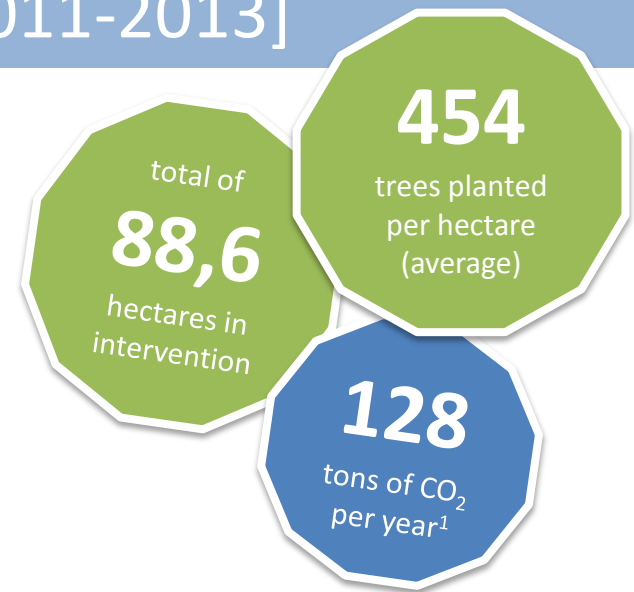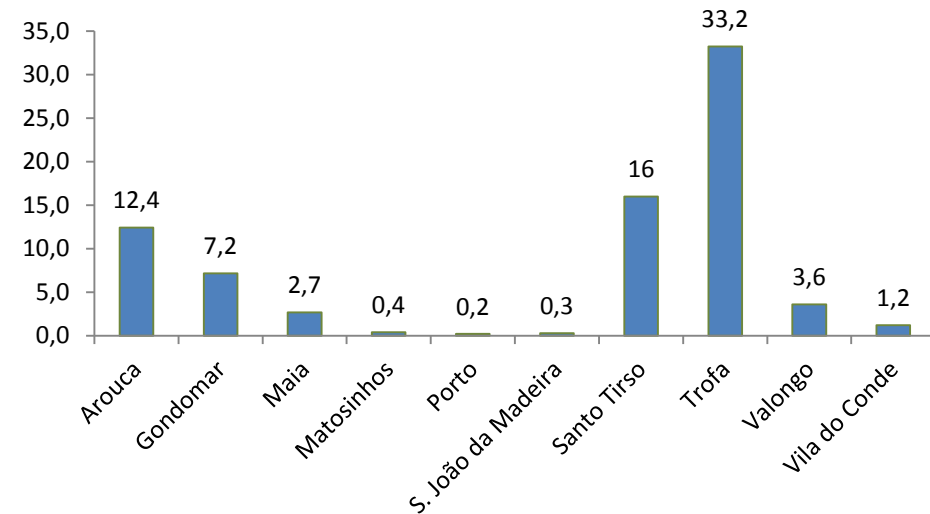
average density of native trees in planted areas (nº)

Municipality	Value
Arouca	162
Gondomar	590
Maia	334
Matosinhos	463
Porto	760
S. João da Madeira	460
Santo Tirso	417
Trofa	238
Valongo	456
Vila do Conde	696
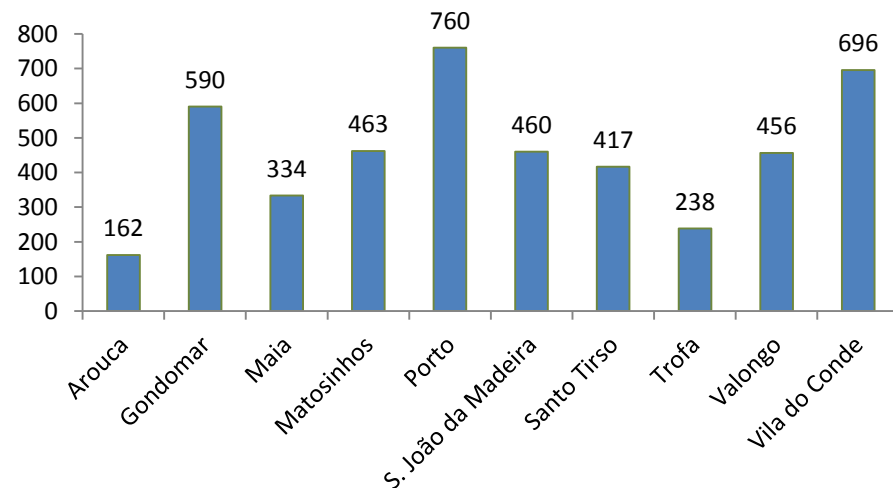
potential of CO_2 retention (ton/year)
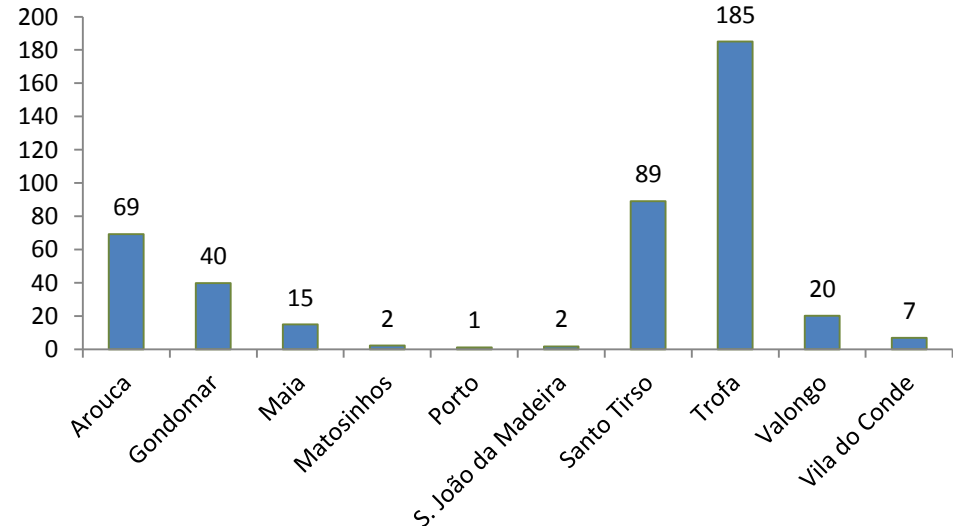
Municipality	Value
Arouca	69
Gondomar	40
Maia	15
Matosinhos	2
Porto	1
S. João da Madeira	2
Santo Tirso	89
Trofa	185
Valongo	20
Vila do Conde	7

Note 1: Potential for carbon retention: annual average for a 40 year expectancy for the number of trees planted to date

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results aggregated by municipality [2011-2013]

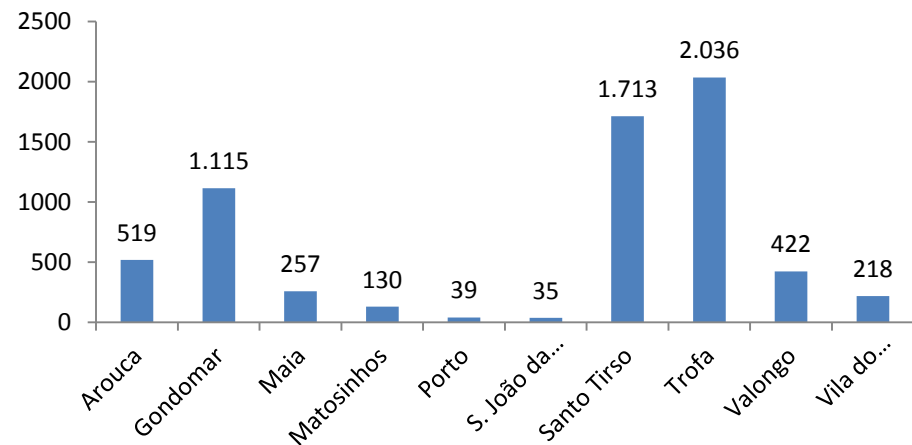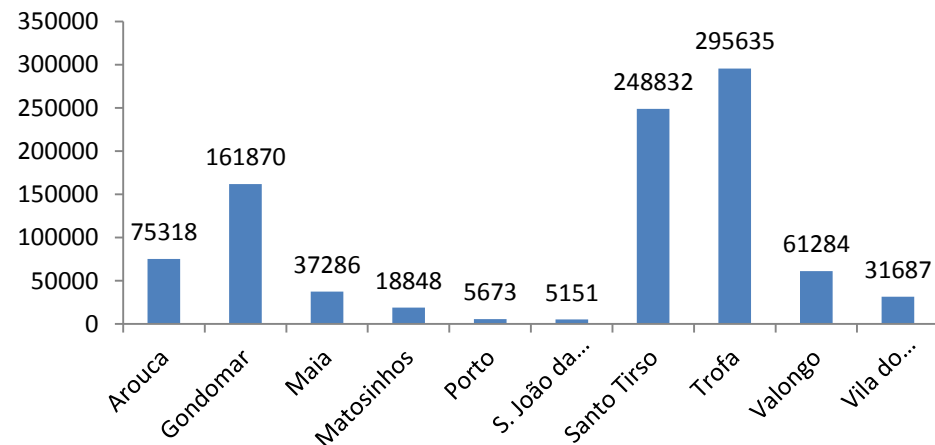## economic benefit - annual value of the trees due to CO_2 capture[1] (€)

Arouca 519; Gondomar 1.115; Maia 257; Matosinhos 130; Porto 39; S. João da... 35; Santo Tirso 1.713; Trofa 2.036; Valongo 422; Vila do... 218

economic benefit - annual value of the trees due to reducing water runoff[1] (€)

Arouca 75318; Gondomar 161870; Maia 37286; Matosinhos 18848; Porto 5673; S. João da... 5151; Santo Tirso 248832; Trofa 295635; Valongo 61284; Vila do... 31687

economic benefit - annual value of the trees due to retention of atmospheric pollutants[1] (€)

Arouca 8.500; Gondomar 18.267; Maia 4.208; Matosinhos 2.127; Porto 640; S. João da Madeira 581; Santo Tirso 28.081; Trofa 33.363; Valongo 6.916; Vila do Conde 3.576
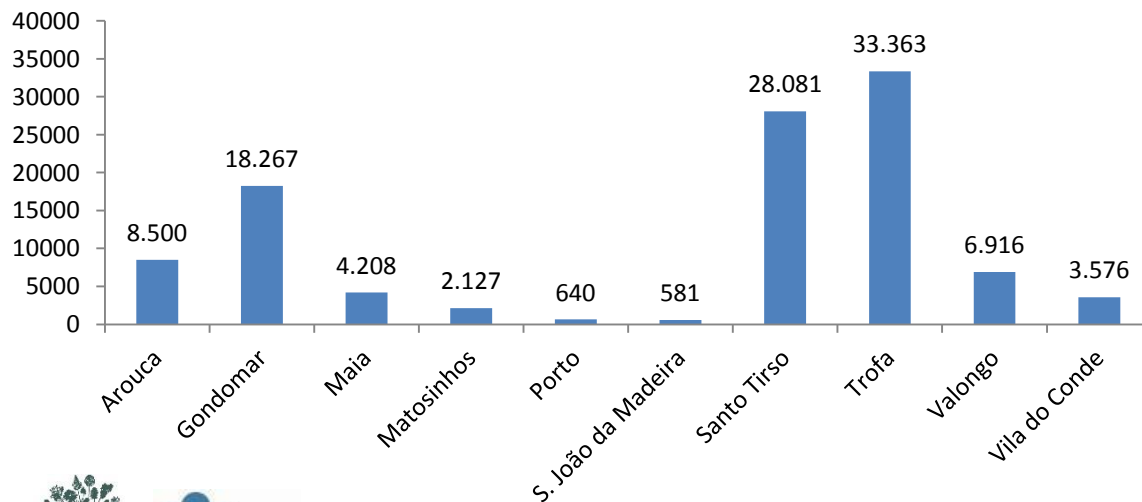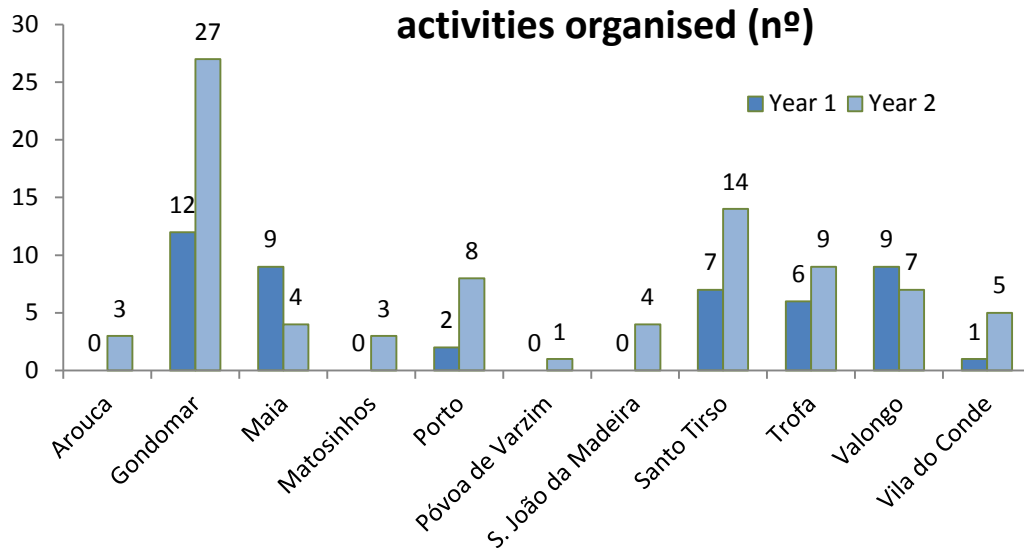
Note 1: Economic benefit of trees in improving air quality by retaining atmospheric pollutants, capturing carbon dioxide and reducing water runoff after rain episodes resulting from the presence of the (adult) trees, calculation based on the study of valorisation of services rendered by trees in the urban context (Soares *et al*. 2011).

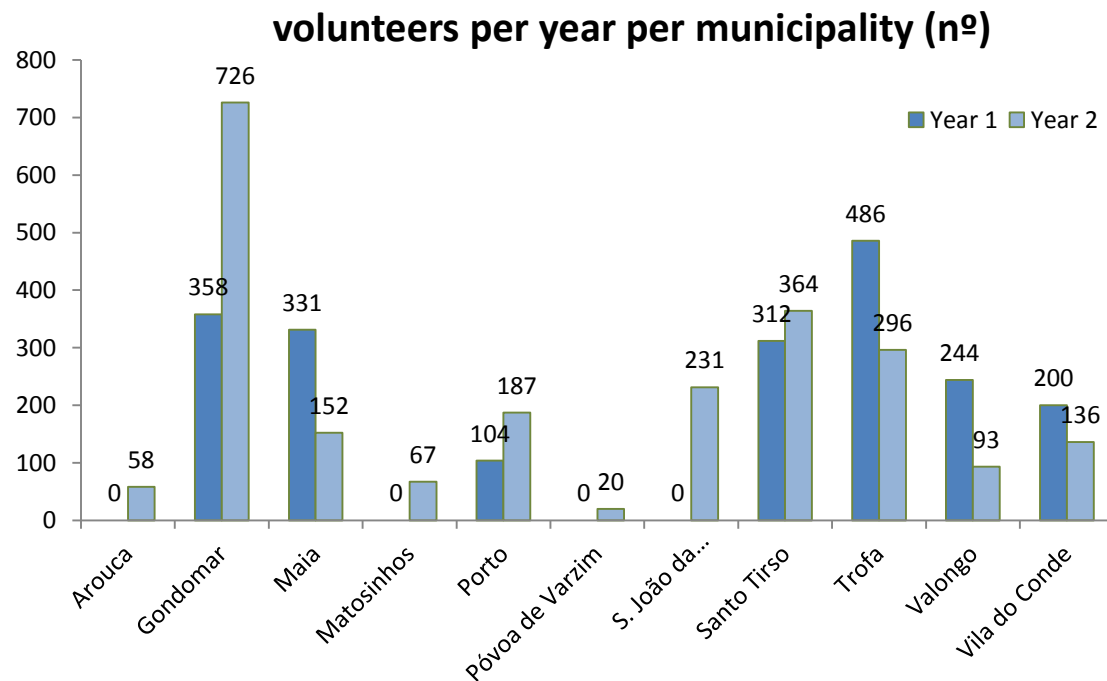An economic value was assumed for an average tree when adult.

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results aggregated by municipality [2011-2013]

activities organised (nº)

Legend: Year 1, Year 2

Municipality	Year 1	Year 2
Arouca	0	3
Gondomar	12	27
Maia	9	4
Matosinhos	0	3
Porto	2	8
Póvoa de Varzim	0	1
S. João da Madeira	0	4
Santo Tirso	7	14
Trofa	6	9
Valongo	9	7
Vila do Conde	1	5

85% more activities than in year 1

15% more participation in year 2

volunteers per year per municipality (nº)

Legend: Year 1, Year 2

Municipality	Year 1	Year 2
Arouca	0	58
Gondomar	358	726
Maia	331	152
Matosinhos	0	67
Porto	104	187
Póvoa de Varzim	0	20
S. João da...	0	231
Santo Tirso	312	364
Trofa	486	296
Valongo	244	93
Vila do Conde	200	136

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these results were achieved thanks to the following partners

The case study of the FUTURE – the 100,000 trees project in Porto Metropolitan Area is included in the book "Traditional Knowledge and Biodiversity" published by the United Nations University (2013).

FUTURE – the 100,000 trees project in Porto Metropolitan Area received the Award *'Terre de Femmes*' Yves Rocher Foundation (2013) for first place (Portugal).