# Initial Stakeholder Meeting Report
# Agroforestry with Pigs, Galicia, Spain

**Work-package 5:** Agroforestry for livestock systems
**Specific group**: Agroforestry with pigs, Galicia, Spain
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**Location of meeting**: Centro Comarcal A Paradanta, A Cañiza, Pontevedra, Galicia, NW Spain

**Authors**: Rosa Mosquera-Losada, Nuria Ferreiro-Domínguez, Juan Luis Fernández Lorenzo, Pilar González-Hernández, Antonio Rigueiro Rodríguez
**Contact:** mrosa.mosquera.losada@usc.es

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## 1. Description of system

Celta pigs or "porco celta" are an autochthonous pig breed of Galicia (NW Spain) which has gained importance in recent years due to the high quality of its meat. The Celta pigs of the Iberian Peninsula are believed to derive from northern-central European pig breeds (Gama et al., 2013). Celta pigs are usually farmed in semi-extensive or extensive conditions in forest areas where chestnut (*Castanea sativa* Miller) and oak (*Quercus robur* L.) trees are dominant. Silvopastoralism with this pig breed could increase social and economic benefits and reduce fire risk, as Galicia is one of the most fire-prone areas of Europe.

Figure 1. Silvopastoral system established with Celta pigs in A Cañiza, Pontevedra, Galicia, NW Spain.

## 2. Participants

The meeting was attended by 24 stakeholders of which 16 answered the questionnaire. Of the 16 answering the questionnaire, seven managed small farms of Celta pigs, three were processors of meat products, two worked in the Technological Centre of the Meat (http://www.ceteca.net/), and two were presidents of forest communities. Of the remaining two: one was veterinarian from a Celta pig farm, and one was a mushroom mycelia supplier (www.hifasdaterra.com/). The team from the Univesrsity of Santiago de Compostela (USC) was represented by six people: two presenters and speakers, three assissants and one phorographer. Nine participants were aged 35-50, four were aged 50-65, while two were over 65, and one was between 20 and 35 years. There were 15 men and one woman. The stakeholders came from different parts of Galicia (NW Spain).

## 3. Introduction session

The meeting comprised an initial introduction session and a field visit. The meeting was held at the GDR (Rural Development Group) of Centro Comarcal A Paradanta, A Cañiza, Pontevedra, Galicia, NW Spain.

The meeting started at 11.00 am with a welcome from the Mayor of A Cañiza (Miguel Adolfo Domínguez Alfonso) and the Director of the Rural Development Group "Condado-Paradanta" (Bibiana Conde Álvarez). It was followed by a brief presentation of the AGFORWARD project and of agroforestry concept, given by the AGFORWARD lead participant of the USC (Maria Rosa Mosquera Losada) (Figure 2).


Figure 2. Photos of the presentations and the open discussion

A second presentation was given by the president of the Association of Celta Pig Breeders (ASOPORCEL) (Jose Antonio Carril) and then Pilar González Hernández from the USC spoke about the quality of some plants which could be potentially grown for production of animal feed, among which the speaker highlighted white mulberry (*Morus alba* L.), due to its high concentration of crude protein. She also detailed the importance of tannins of woody vegetation to produce healthier meat.

The program continued with the presentation of the 17 minute film: 'Agroflorestas: oportunidades e desafios' with Portuguese subtitles, directed by F. Liagre and N. Girardin. Before the coffee break, Maria Rosa Mosquera Losada explained to the participants how to complete the AGFORWARD questionnaire which sought to highlight the key positive and negative aspects of the agroforestry systems. After the coffee break, an open discussion session was carried out, focusing on establishment and improvement of the agroforestry systems (Figure 2). Most of the participants identified the advantages, problems and challenges in agroforestry systems established with Celta pigs which were collected in the questionnaires. The participants were then offered a lunch in a local restaurant, where the discussion on the main subjects continued until 4 p.m.

## 4. Field visit

After lunch, the participants visited a Celta pig farm in Deva in A Cañiza. This farm is managed by the Forest Community of Petán which has gained free cession from neighbours of 1100 plots to create an area of 90 ha. Currently, this area is divided into six plots, where the Celta Pigs are reared extensively with a diet based mainly on chestnuts and acorns. The farm has 180 animals and it is planned to double this amount to 360 animals in 2015. The production has the guarantee of the Association of Celta Pig Breeders (ASOPORCEL) and part of the production is purchased by the neighbours. During the field visit the discussion on the main subjects continued until 6 p.m. (Figure 3).

Figure 3. Photos of the field visit.

## 5. Questionnaire results: ranking of positive and negative aspects

As mentioned before, 16 participants completed a questionnaire which asked to rank from 1 to 10 the importance of the positive and negative aspects of agroforestry, being 1 the highest rank. Despite our efforts to explain the ranking procedure, most participants filled the questionnaire providing the same value to different aspects within the same category. To help interpret the data, an aggregate score for each aspect was determined using the scoring system described in Table 1 as used by Crous-Duran et al (2014). The key aspects are considered are headings of production, management, environment, and socio-economic effects.

Table 1. Scoring points for each the rank

| Rank | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| Points | 25 | 18 | 15 | 12 | 10 | 8 | 6 | 4 | 2 | 1 |

**Positive aspects**

The most highly ranked positive aspects of the agroforestry system (Table 2) were the benefits of pasture production and rural employment.

*Production effects:* the most positive aspect identified by the respondents was "crop or pasture production" followed by "animal health and welfare". During the open discussion most of the participants indicated the importance of these aspects in their farms.

*Management effects:* originality and interest was ranked 1 by seven participants; project faesibility and tree regeneration/survival also featured highly.

*Environmental effects:* biodiversity and wildlife habitat, change in fire risk, and soil conservation were the most positive aspects in this category.

*Socio-economic effects:* "rural employment" was selected as the most positive aspect perhaps because the system could help slow rural abandonment in the region.

**Negative aspects**

The most negative aspects of the agroforestry systems (Table 2), identified by 12 respondents (Table 3) as 4 respondents did not complete this part of the questionnaire.

*Production effects:* the most negative issue rated by the participants was "losses by predation", probably because the Celta pigs are usually bred in extensive conditions.

*Management effects:* the most negative aspect identified by the respondents was "complexity of work" probably because the management of agroforestry systems is more complex compared to exclusively agricultural or forestry systems. In the ranking, this aspect was followed by "inspection of animals".

*Environmental effects:* in this category the most negative aspects considered by the respondents were biodiversity and wildlife habitat, climate moderation, control of manure/noise/odour and soil conservation.

*Socio-economic effects:* administrative burden was the most negative aspect selected by the respondents. During the open discussion this aspect was widely discussed by participants.

Table 2. Positive aspects of agroforestry as ranked by 12 participants (1st to 10th) according to four categories

| Aspect | Ranking by 16 participants | | | | | | | | | | | | | | | | ∑ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Production effects** | | | | | | | | | | | | | | | | | |
| Crop or pasture production | 1 | 1 | 1 | 6 | 3 | 5 | 1 | 5 | | 5 | 1 | 1 | 1 | 6 | 2 | 1 | 279 |
| Crop or pasture quality/food safety | 1 | 1 | 1 | 7 | 1 | 4 | 1 | 4 | | 3 | 1 | 2 | | 7 | 3 | 2 | 252 |
| Animal health and welfare | 1 | 1 | 1 | 10 | 2 | 7 | 1 | 10 | | 1 | 1 | 6 | 2 | 10 | 1 | 8 | 232 |
| Diversity of products | 1 | 1 | 2 | 8 | 8 | 3 | 1 | 3 | 2 | 4 | 1 | 4 | 5 | 8 | 5 | 5 | 232 |
| Timber/wood/fruit/nut quality | 1 | 1 | 2 | 7 | 10 | 1 | 3 | 1 | 1 | | 1 | | | 7 | | 6 | 204 |
| Animal production | 1 | 1 | 2 | 8 | 2 | 8 | 5 | 9 | | 2 | 1 | 5 | 3 | 8 | | 3 | 193 |
| Disease and weed control | 1 | 1 | 1 | 10 | 8 | 6 | 1 | 7 | | | 1 | 3 | 4 | 10 | | 4 | 184 |
| Timber/wood/fruit/nut production | 1 | 1 | 2 | 7 | 10 | 2 | 3 | 2 | | | 1 | | 6 | 7 | 4 | 7 | 183 |
| Losses by predation | 3 | 1 | 2 | 6 | 5 | 9 | 3 | 6 | | | 1 | | | | | 9 | 128 |
| **Management effects** | | | | | | | | | | | | | | | | | |
| Project feasibility | 1 | 1 | 1 | 10 | 3 | 2 | 1 | 5 | | 1 | 1 | 3 | 2 | 6 | 3 | 3 | 265 |
| Tree regeneration/survival | 1 | 1 | 1 | 10 | | 1 | 2 | 2 | | 5 | 1 | 1 | 3 | 10 | 4 | 2 | 243 |
| Originality and interest | 1 | 1 | 1 | 10 | | 3 | 1 | 6 | 1 | | 1 | 2 | 1 | 10 | | 8 | 222 |
| Management costs | 1 | 1 | 2 | 10 | 1 | 4 | 2 | 7 | | 2 | 1 | | 4 | 10 | 5 | 4 | 208 |
| Inspection of animals | 1 | 1 | 2 | 7 | 5 | 7 | 1 | 8 | | 4 | 1 | 5 | 5 | 7 | | 1 | 207 |
| Labour | 1 | 1 | 2 | 10 | 4 | 5 | 2 | 3 | | | 1 | 4 | | 10 | 1 | 6 | 195 |
| Mechanisation | 1 | 1 | 2 | 6 | 2 | 6 | 3 | 4 | | | 1 | | | 6 | 2 | 7 | 186 |
| Complexity of work | 1 | 1 | 2 | 8 | | 8 | 1 | 9 | | 3 | 1 | | | 8 | | 5 | 157 |
| **Environmental effects** | | | | | | | | | | | | | | | | | |
| Biodiversity and wildlife habitat | 1 | 1 | 2 | 10 | | 2 | 1 | 5 | 2 | 1 | 1 | | 1 | 10 | 2 | 2 | 252 |
| Change in fire risk | 1 | 1 | 1 | 10 | 3 | 1 | 1 | 7 | 3 | 3 | 1 | 2 | 6 | 10 | | 6 | 237 |
| General environment | 1 | 1 | 2 | 10 | | 4 | 1 | 6 | 1 | 2 | 1 | 3 | 4 | 10 | 5 | 7 | 226 |
| Soil conservation | 1 | 1 | 1 | 5 | 2 | | 1 | 7 | | 4 | 1 | 1 | 5 | 7 | | 4 | 224 |
| Control of manure/noise/odour | 1 | 1 | 2 | 10 | 4 | | 1 | 4 | | | 1 | | | 10 | 1 | 10 | 170 |
| Runoff and flood control | 1 | 1 | 2 | 7 | 5 | | 1 | 5 | | | 1 | | | 6 | | 3 | 167 |
| Water quality | 1 | 1 | 1 | 5 | 1 | | 2 | 4 | | | 1 | | | | | | 165 |
| Carbon sequestration | 1 | 2 | 2 | 10 | | | | 3 | | | 1 | 4 | 2 | 10 | 3 | 5 | 158 |
| Climate moderation | 1 | 3 | 1 | 10 | | | | 8 | | 5 | 1 | | 3 | 10 | | 1 | 146 |
| Landscape aesthetics | 1 | 1 | 3 | 10 | | 3 | 1 | 4 | | | 1 | | | 10 | | 9 | 146 |
| Reduced groundwater recharge | 1 | 2 | 2 | 6 | | | | 9 | | | 1 | | | 10 | 4 | 8 | 113 |
| **Socio-economic effects** | | | | | | | | | | | | | | | | | |
| Rural employment | 1 | 2 | 1 | 5 | | 1 | 1 | 5 | | 2 | 1 | 1 | 4 | 5 | 2 | 1 | 271 |
| Business opportunities | 3 | 2 | 2 | 10 | 3 | 2 | 2 | 3 | | 1 | 5 | 2 | 1 | 5 | 1 | 2 | 249 |
| Profit | 1 | 7 | 2 | 10 | 1 | 4 | | 2 | | 3 | 1 | 5 | 3 | 5 | | 6 | 188 |
| Farmer image | 1 | 5 | 3 | 7 | | 3 | 1 | 5 | 1 | | 1 | | 5 | 10 | | | 167 |
| Income diversity | 1 | 3 | 2 | | 5 | | 3 | 4 | | | 1 | 3 | 2 | 7 | | 9 | 161 |
| Tourism | 1 | | 1 | 10 | | 7 | 2 | 7 | 2 | 5 | 1 | | 6 | 10 | 4 | | 155 |
| Local food supply | 1 | 2 | 2 | 7 | | 6 | 2 | 5 | | | 1 | | | 7 | | 4 | 146 |
| Regulation | 1 | 1 | 2 | 6 | 2 | | | 6 | | | 2 | | | 6 | 5 | 10 | 139 |
| Farmer/owner | 3 | 1 | 3 | 10 | | 5 | 1 | 3 | | | 1 | | | 10 | | 8 | 136 |
| Marketing Premium | 1 | 4 | 3 | 5 | | | 3 | 2 | | | 2 | 4 | | 5 | | | 135 |
| Subsidy and grant eligibility | 1 | 1 | 2 | 5 | | | 5 | 2 | | | 9 | | | 5 | 3 | | 133 |
| Inheritance and tax | 1 | 1 | 2 | 6 | | | | 2 | | | 2 | | | 6 | | | 120 |
| Market risk | 1 | 2 | 2 | 5 | | | 3 | 6 | | 4 | 8 | | | 5 | | | 120 |
| Farmer/hunter | 3 | 3 | 3 | 10 | | | 1 | 4 | | | 1 | | | 10 | | 7 | 115 |
| Cash flow | 1 | 6 | 3 | | 4 | | | 2 | | | 5 | | | 6 | | 3 | 111 |
| Opportunity for hunting | 1 | 2 | 3 | | | | | 6 | | | 1 | | | 10 | | 5 | 102 |
| Administrative burden | 3 | 4 | 2 | 6 | | | 5 | 1 | | | 9 | | | 5 | | | 100 |

Table 3. Negative aspects of agroforestry as ranked by 12 participants (1st to 10th) according to four categories

| Aspect | Ranking by 12 participants | | | | | | | | | | | | ∑ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Production effects** | | | | | | | | | | | | | |
| Losses by predation | 7 | 9 | 3 | 4 | 5 | 10 | | 9 | 1 | 1 | 2 | 1 | 141 |
| Animal production | 10 | 5 | 2 | 1 | 5 | 4 | 2 | 9 | | 3 | 4 | | 123 |
| Disease and weed control | 10 | 8 | 2 | | 7 | 6 | | 9 | 2 | 2 | 1 | 2 | 118 |
| Animal health and welfare | 10 | 8 | 2 | | 10 | 2 | 1 | 9 | | 4 | 5 | 5 | 101 |
| Crop or pasture quality/food safety | 10 | 9 | 3 | 3 | 10 | 5 | 4 | 9 | | 5 | | 4 | 80 |
| Diversity of products | 10 | 8 | 3 | | 7 | 7 | 5 | 9 | | | 3 | | 59 |
| Crop or pasture production | 10 | 8 | 3 | | 7 | 5 | 3 | 9 | | | | | 53 |
| Timber/wood/fruit/nut production | 10 | 7 | 3 | 5 | | 8 | | 9 | | | | 3 | 53 |
| Timber/wood/fruit/nut quality | 10 | 7 | 3 | 2 | | 8 | | 9 | | | | | 46 |
| **Management effects** | | | | | | | | | | | | | |
| Complexity of work | 10 | 10 | 4 | 4 | 7 | 3 | | 9 | 1 | 1 | 2 | 2 | 135 |
| Inspection of animals | 10 | 6 | 3 | 1 | 7 | 4 | 4 | 9 | | 5 | 1 | | 116 |
| Management costs | 10 | 10 | 3 | 2 | 7 | 6 | 1 | 9 | | 5 | 4 | 3 | 113 |
| Originality and interest | 10 | 6 | 3 | 3 | 10 | 4 | 3 | 9 | 2 | | | 1 | 112 |
| Labour | 10 | 5 | 3 | | 10 | 2 | | 9 | | 2 | 3 | 5 | 90 |
| Mechanisation | 10 | 8 | 3 | | 5 | 7 | 5 | 9 | | 3 | 5 | 4 | 85 |
| Project feasibility | 10 | 6 | 3 | | 10 | 7 | 2 | 9 | 3 | 4 | | | 78 |
| Tree regeneration/survival | 10 | 6 | 2 | 5 | 7 | 5 | | 9 | | | | | 55 |
| **Environmental effects** | | | | | | | | | | | | | |
| Climate moderation | 10 | 6 | 3 | 2 | | 4 | 2 | 9 | 1 | | 4 | | 111 |
| Soil conservation | 10 | 7 | 1 | 5 | 10 | 6 | 4 | 9 | | 5 | 1 | | 100 |
| Control of manure/noise/odour | 10 | 7 | 2 | | 10 | 6 | | 9 | | 1 | 5 | 1 | 96 |
| Biodiversity and wildlife habitat | 10 | 8 | 1 | 3 | 7 | 6 | 1 | 9 | | | | | 86 |
| Water quality | 10 | 6 | 1 | | 7 | 8 | 5 | 9 | | 4 | 2 | | 86 |
| Runoff and flood control | 10 | 8 | 1 | | 10 | 4 | | 9 | | 3 | 3 | | 75 |
| Landscape aesthetics | 10 | 6 | 2 | 4 | 10 | 8 | | 9 | | | | 2 | 64 |
| Carbon sequestration | 10 | 6 | 2 | 1 | | 6 | | 9 | | | | | 62 |
| Reduced groundwater recharge | 10 | 7 | 1 | | | 6 | | 9 | | 2 | | | 60 |
| General environment | 10 | 8 | 2 | | 10 | 5 | 3 | 9 | | | | | 51 |
| Change in fire risk | 10 | 5 | 2 | | 10 | 5 | | 9 | | | | | 42 |
| **Socio-economic effects** | | | | | | | | | | | | | |
| Administrative burden | 7 | 5 | 3 | 1 | 5 | 7 | | 9 | 1 | 1 | | 4 | 136 |
| Inheritance and tax | 10 | 5 | 3 | 2 | | 8 | | | 5 | 2 | 1 | 5 | 111 |
| Market risk | 10 | 10 | 2 | | 5 | 7 | 3 | 2 | | 6 | 2 | | 95 |
| Business opportunities | 7 | 4 | 2 | | 10 | 6 | 2 | 9 | | | | 1 | 90 |
| Marketing premium | 10 | 4 | 2 | | 7 | 5 | | | 2 | 5 | 4 | | 87 |
| Profit | 10 | 6 | 2 | | | 6 | 1 | 6 | 3 | | | | 83 |
| Subsidy and grant eligibility | 10 | 7 | 3 | | 1 | 7 | 5 | 9 | 4 | 7 | | | 83 |
| Regulation | 10 | 6 | 2 | 3 | | 5 | | | 6 | 3 | | | 75 |
| Cash flow | 10 | 3 | 1 | | 5 | 9 | | 9 | | | 5 | | 65 |
| Tourism | 10 | 6 | 2 | 5 | 7 | 9 | | 9 | | | | 3 | 62 |
| Farmer/hunter relationship | 7 | 5 | 3 | | 10 | 4 | | 9 | | | 3 | | 61 |
| Income diversity | 10 | 7 | 3 | | 7 | 4 | | 9 | | | | 2 | 60 |
| Local food supply | 10 | 5 | 2 | 4 | 7 | 5 | | 9 | | | | | 59 |
| Farmer image | 10 | 8 | 3 | | 10 | 4 | | 9 | | 4 | | | 47 |
| Rural employment | 10 | 9 | 2 | | 7 | 7 | 4 | 9 | | | | | 47 |
| Farmer/owner relationship | 7 | 8 | 3 | | 10 | 4 | | 9 | | | | | 40 |
| Opportunity for hunting | 10 | 7 | 3 | | | 4 | | 9 | | | | | 36 |

## 6. Questionnaire results: qualitative written responses

Thirteen respondents gave a written answer to the question "What key constraints or challenges could be addressed by changes carried out in an existing agroforestry system". In general, the comments matched those given orally during the open discussion in which most of the participants gave their opinion. The topics involved the following:

- Lack of raw materials for animal feed
- Low profitability in the farms established with Celta pigs
- Fire risk and soil erosion
- Difficulty in establishing farms due to the lack of available land
- Abandonment of rural areas by young people
- Lack of financial support

Thirteen respondents also gave written responses to "What kind of solutions or research themes would you propose". The suggestions included the following:

- Introduction of new crops on farms
- Land consolidation
- Return of young people to rural areas
- Dissemination of research through practical trials
- Control by the Government of products from Celta pigs

## 7. Next steps

Most of the participants expressed their interest in participating in future meetings and in being informed about the progress/results of the project. According to the results obtained in the open discussion session and in the questionnaires, the principal innovation identified by the group was the introduction of new crops such as *Morus alba* or *Morus nigra*, as new sources of livestock feed, which could represent an economically interesting alternative -or supplementary- source of feed. It was proposed that studies would be undertaken to select clones adapted to different climate and soil conditions in the region, and which show a high value as a source of feed in terms of aspects such as digestibility and protein content. This could build on an existing experiment designed to test Cuban and Galician-sourced *Morus alba* trees. There was also a high interest in knowing the potential of native shrubby, herbaceous and tree species nutritive value, which could be investigated across different Galician environments.

## 8. References

Crous-Duran, J., Amaral Paulo, J., Palma, J. (2014). Initial Stakeholder Meeting Report Montado in Portugal. Instituto Superior de Agronomia (ISA), Universidade de Lisboa, Portugal

Gama, L.T., Martínez, A.M., Carolino, I., Landi, V., Delgado, J.V., Vicente, A.A., Vega-Pla, J.L., Cortés, O., Sousa, C.O., BIOPIG Consortium (2013). Genetic structure, relationships and admixture with wild relatives in native pig breeds from Iberia and its islands. *Genetics Selection Evolution* 45:18.

## 9. Acknowledgements

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