# Evaluación de los Servicios de los Ecosistemas de Euskadi

## *6. Conocer la percepción de la sociedad sobre los SE*

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# .6. CONOCER LA PERCEPCIÓN SOBRE LOS SE

## PERCEPCIÓN DE LA POBLACIÓN SOBRE LOS SE

*1. ¿Perciben los usuarios de la IV urbana los SE que suministra más allá de sus funciones recreativas y paisajísticas?*

*2. Y si es así, ¿son valorados de forma equiparable a la función ecológica que realizan?*

***Encuesta:***

1. Indicar los beneficios que les suministra la IV urbana en la que se encontraban

2. Valorar los beneficios del 1-5 (0-10)

3. Mostrar los SE que ofrece dicha IV

4. Valorar el suministro de SE del 1-5 (0-10)

5. Análisis de los datos: comparación entre ambos valores y entre características de los encuestados


Naturaleza, base del bienestar

5. ¿Cuántas veces viene al año a esta zona?.....

6. ¿Cuál es el motivo principal por el que visita esta zona? (máx. 5)

- Investigación/gestión
- Agricultura/ganadería
- Actividad Forestal
- El interés por la naturaleza/conservación
- Picnic, pasar el día, etc.
- Disfrutar del paisaje.
- Descansar/relajarse/desconectar
- Dar un paseo
- Hacer ejercicio
- Tradiciones/Patrimonio cultural
- Religión/devoción
- Otros, ¿cuál? .....

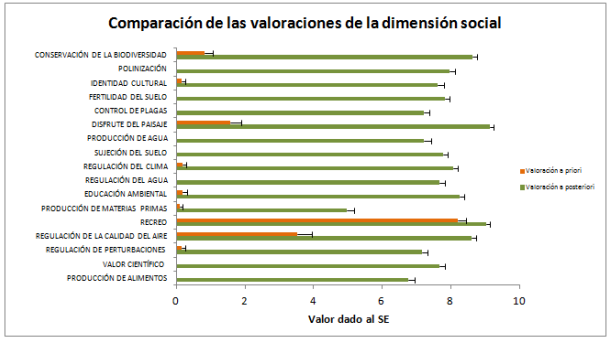
7. ¿Sabe qué son los servicios de los ecosistemas?

- Sí
- No

*La Naturaleza proporciona beneficios para el bienestar humano, de manera directa o indirecta, como, por ejemplo, la obtención de productos agrícolas o pesqueros para nuestra alimentación, la obtención de madera para mobiliario o papel, contribuyan a mantener el aire limpio, o beneficios relacionados con el ocio y el disfrute, entre otros.*

8. ¿Piensa que las infraestructuras verdes que forman la zona del Anillo Verde de Bilbao generan algún beneficio a la sociedad?

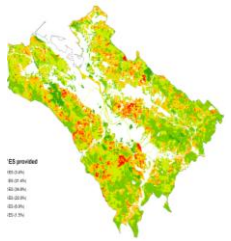
- No
- Poco
- Bastante
- Mucho

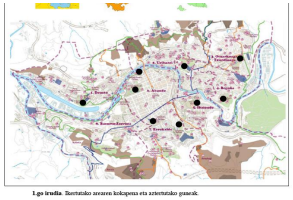
# .6. CONOCER LA PERCEPCIÓN SOBRE LOS SE

## ***Zonas de estudio***

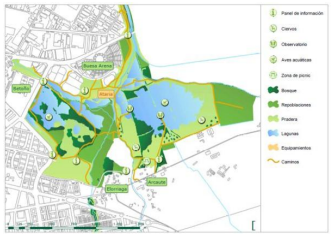
**Cinturón verde del Bilbao Metropolitano (2010):** 545 encuestas



**Parques urbanos de Bilbao (2014)**
126 encuestas

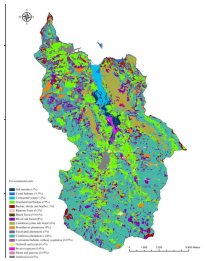


**Humedal de Salburua (Anillo verde de Vitoria/Gasteiz(2014)):**
219 encuestas

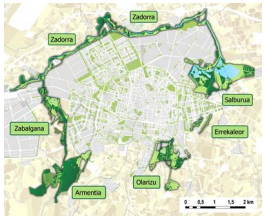


**Anillo verde de Bilbao (2015):** 111 encuestas

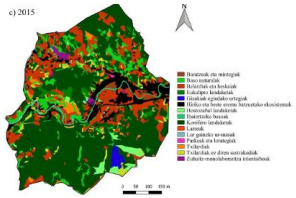
**Reserva de la Biosfera de Urdaibai (2015)**



**Anillo verde de Vitoria/Gasteiz (2015):** 110 encuestas

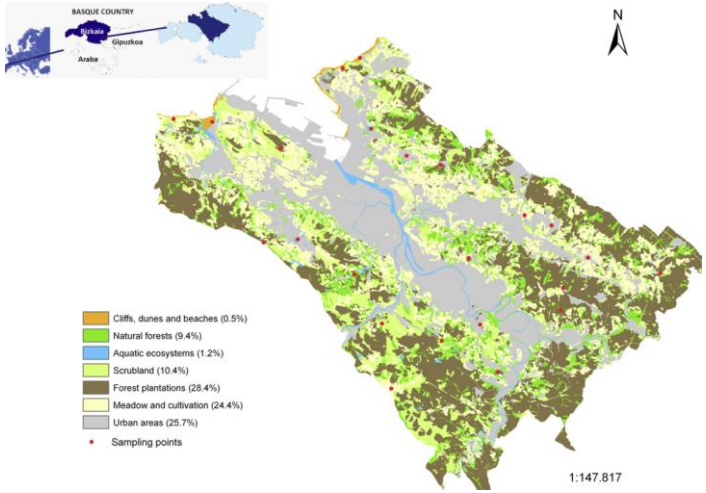



**Zalla (Bizkaia) (2018):** 100 encuestas



# .6. CONOCER LA PERCEPCIÓN SOBRE LOS SE

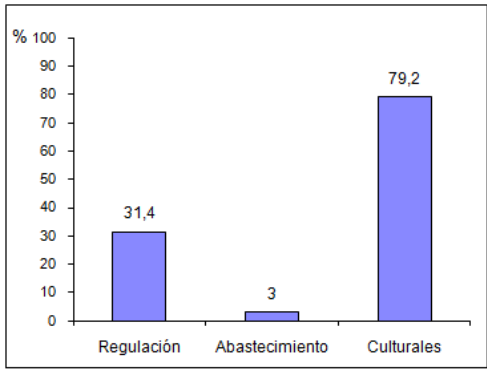
## Cinturón verde del Bilbao Metropolitano (2010): 545 encuestas




Superficie: 406 km$^2$

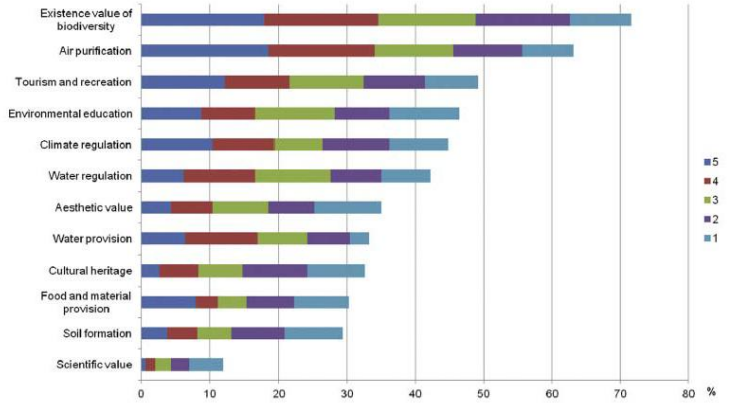
Habitantes: 893.298 (77 % de Bizkaia)

Habitantes por km$^2$ : 2.200




### Entrevistas a visitantes y agentes

- Percepción sobre los SE
- Comportamiento ambiental
- Disponibilidad a pagar



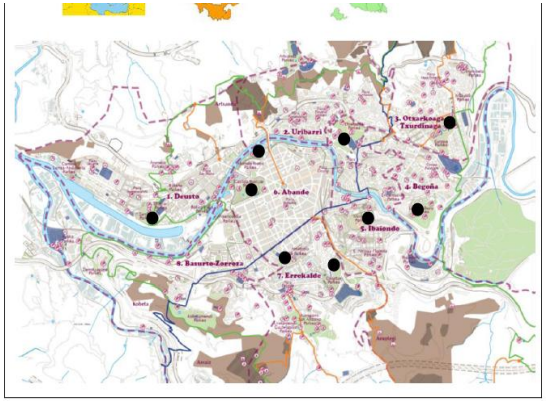

Purificación del aire

Conservación de la biodiversidad

Recreo

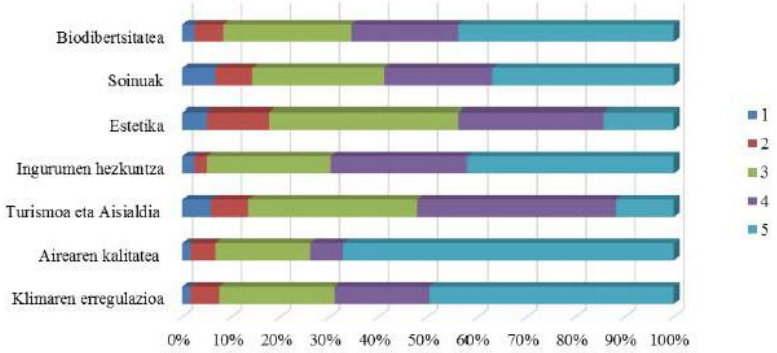
# .6. CONOCER LA PERCEPCIÓN SOBRE LOS SE

## Parques urbanos de Bilbao (2014): 126 encuestas



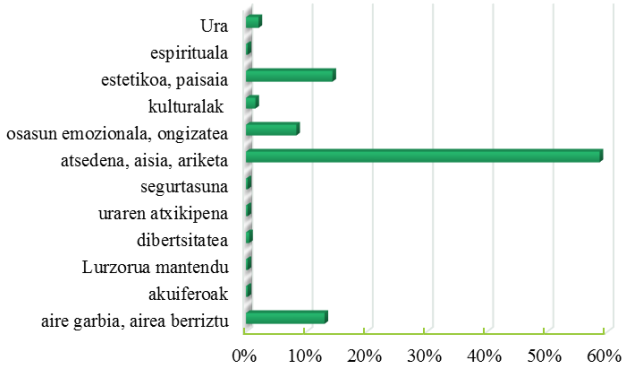
**1.go irudia**. Ikertutako arearen kokapena eta aztertutako guneak.

| Parkeak | Inkesta kopuruak |
|---|---|
| Doña Kasilda | 10 |
| Sarriko | 11 |
| Abando - Ibarra | 15 |
| Ametzola | 10 |
| Eskurtze | 15 |
| Larreagaburu | 14 |
| Miribilla | 14 |
| Etxebarria | 18 |
| Europa | 17 |
| **Guztira** | 126 |




Purificación del aire
Regulación climática

## Anillo verde de Bilbao (2015): 111 encuestas



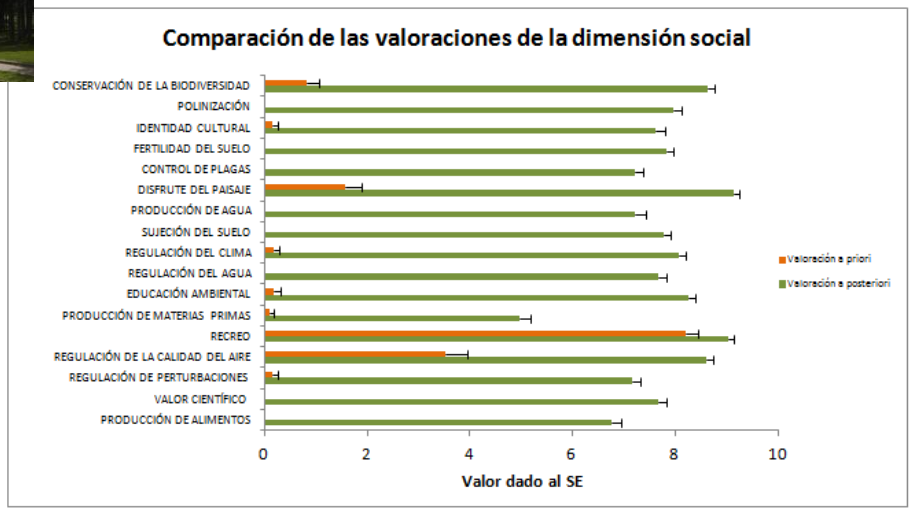

Recreo
Disfrute estético del paisaje
Purificación del aire

# .6. CONOCER LA PERCEPCIÓN SOBRE LOS SE

## Anillo verde de Vitoria/Gasteiz (2015): 110 encuestas

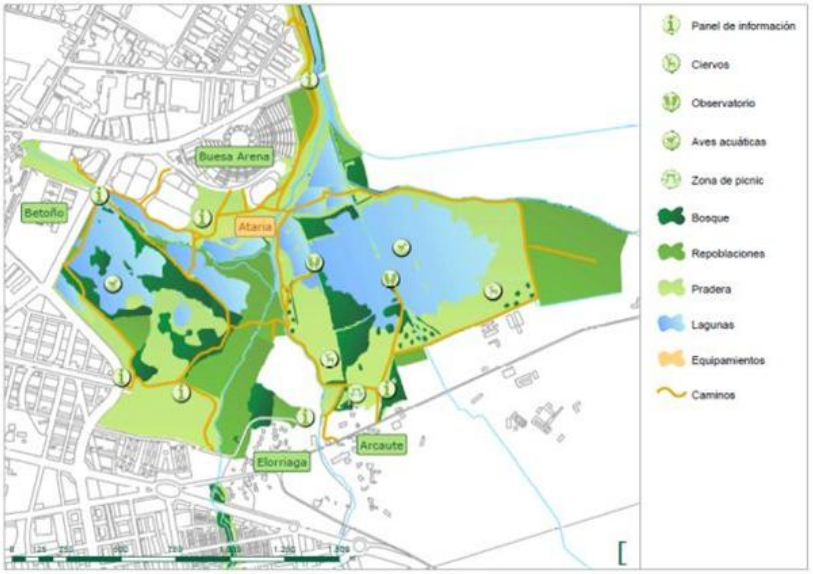

Recreo
Calidad del aire
Disfrute estético del paisaje
Conservación de la biodiversidad

**Importancia que adquiere luego la Educación Ambiental**



# .6. CONOCER LA PERCEPCIÓN SOBRE LOS SE

## Humedal de Salburua (2014): 219 encuestas




Superficie: 206 ha

Año creación: 1994

Humedal Ramsar de Importancia Internacional.

LIC, Red Europea Natura 2000.

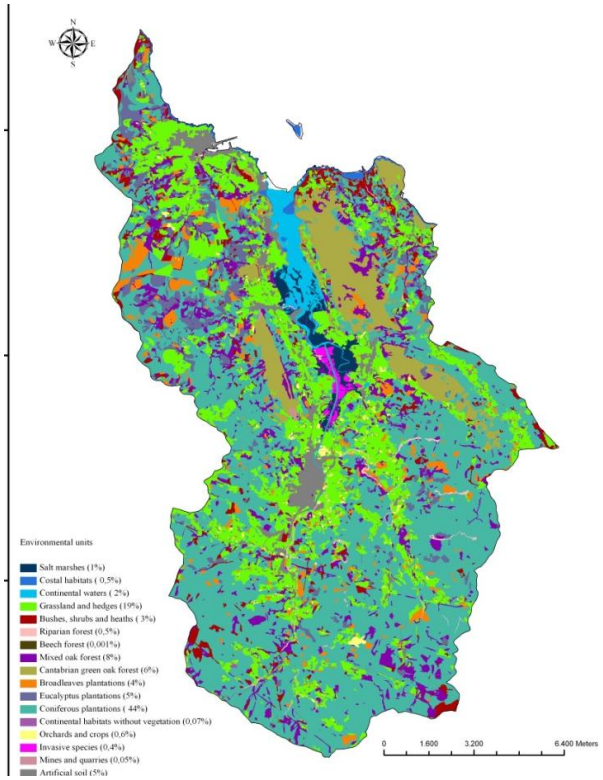
**Importancia ecológica del humedal:**
Control de inundaciones: casco urbano

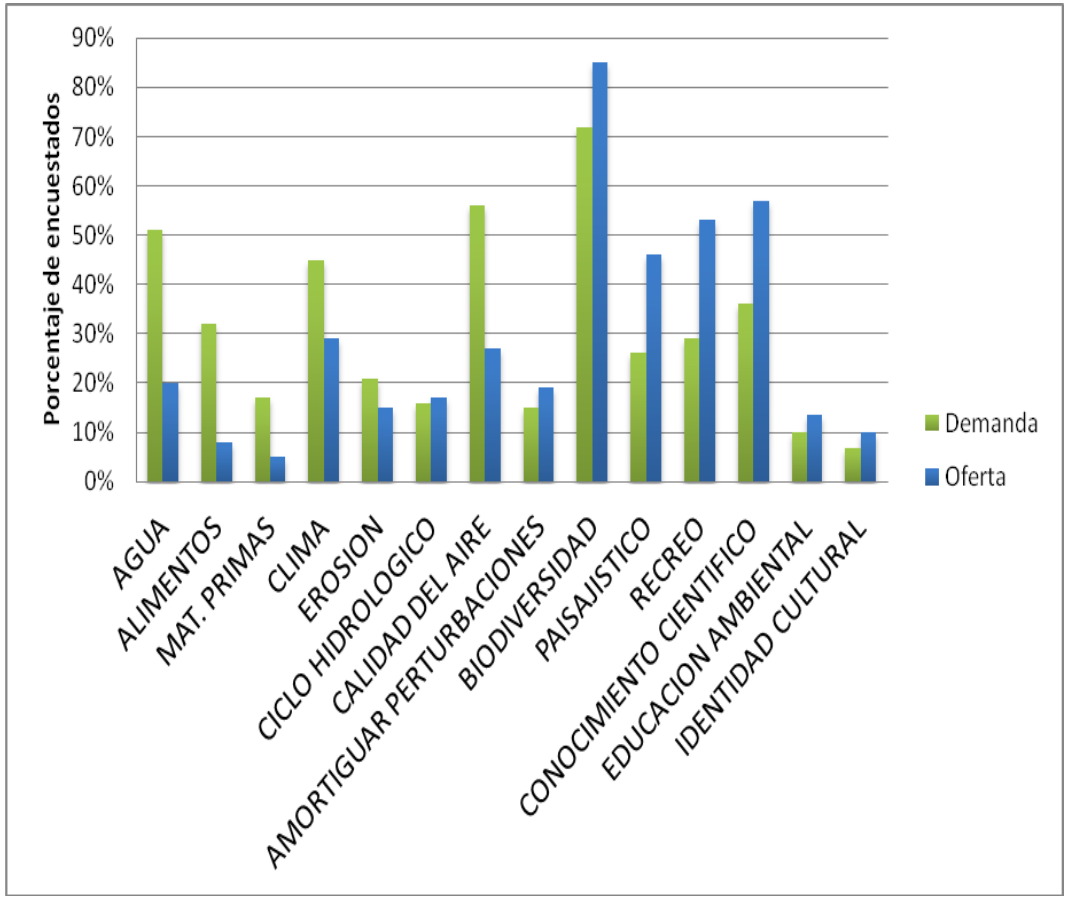
Las mujeres, los jóvenes y los que tienen estudios universitarios valoran de media más todos los SE

| Servicios de los ecosistemas | Antes de ser informados | | | | Después de ser informados | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Importancia* | | | % de encuestados | *Importancia* | | | Valoración media (1-100) | Valoración media (repartir 100 ptos) | % de encuestados |
| | Alta | Media | Baja | | Alta | Media | Baja | | | |
| *Regulación climática local* | | | | 0% | 90% | 9% | 1% | 77,8 ± 1,1 | 17,7 ± 4,3 | 14% |
| *Regulación climática global* | | | | 0% | 82% | 17% | 1% | 80,0 ± 1,0 | 26,2 ± 3,1 | 22% |
| *Regulación de la calidad del aire* | 75% | 24% | 1% | **30%** | 77% | 21% | 2% | 77,7 ± 1,1 | 23,1 ± 3,6 | 18% |
| *Regulación hídrica* | | | | 0% | 82% | 17% | 1% | 75,7 ± 1,1 | 24,2 ± 4,1 | 16% |
| *Control de la erosión* | | | | 0% | 77% | 22% | 1% | 76,6 ± 1,1 | 18,3 ± 4,2 | 14% |
| *Fertilidad del suelo* | | | | 0% | 81% | 19% | 0% | 76,4 ± 1,0 | 6,5 ± 0,2 | 8% |
| *Regulación de perturbaciones naturales* | 100% | 0% | 0% | 0,5% | 76% | 23% | 1% | 75,6 ± 1,1 | 14,1 ± 2,3 | 13% |
| *Control biológico* | | | | 0% | 91% | 8% | 1% | 75,4 ± 1,1 | 17,8 ± 3,0 | 15% |
| *Polinización* | | | | 0% | 81% | 18% | 1% | 78,3 ± 1,1 | 22,3 ± 4,5 | 13% |
| *Actividades recreativas y ecoturismo* | 74% | 25% | 1% | **53%** | 86% | 14% | 0% | **85,1 ± 1,0** | **46,2 ± 3,2** | **51%** |
| *Conocimiento científico* | | | | 0% | 91% | 9% | 0% | 77,8 ± 1,1 | 22,9 ± 2,9 | 20% |
| *Educación ambiental* | 73% | 20% | 7% | 7% | 79% | 20% | 1% | **83,0 ± 1,1** | **38,9 ± 3,2** | **40%** |
| *Disfrute estético del paisaje* | 61% | 39% | 0% | 16% | 76% | 23% | 1% | **84,6 ± 1,0** | **35,6 ± 3,6** | **29%** |
| *Conservación de la biodiversidad* | 74% | 25% | 1% | **39%** | 93% | 4% | 3% | **85,7 ± 1,0** | **42,1 ± 3,3** | **43%** |

# .6. CONOCER LA PERCEPCIÓN SOBRE LOS SE

## Reserva de la Biosfera de Urdaibai (2015)

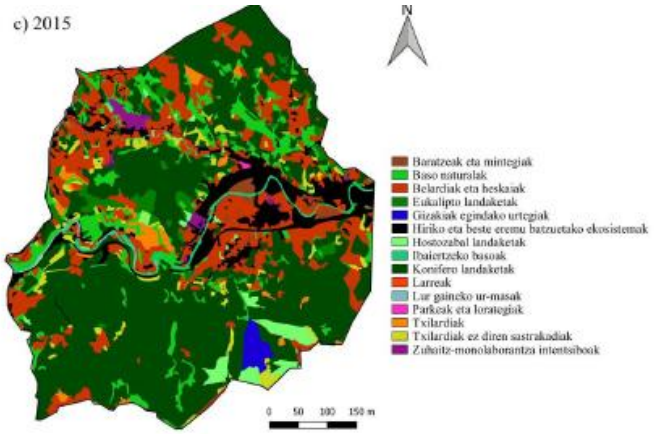


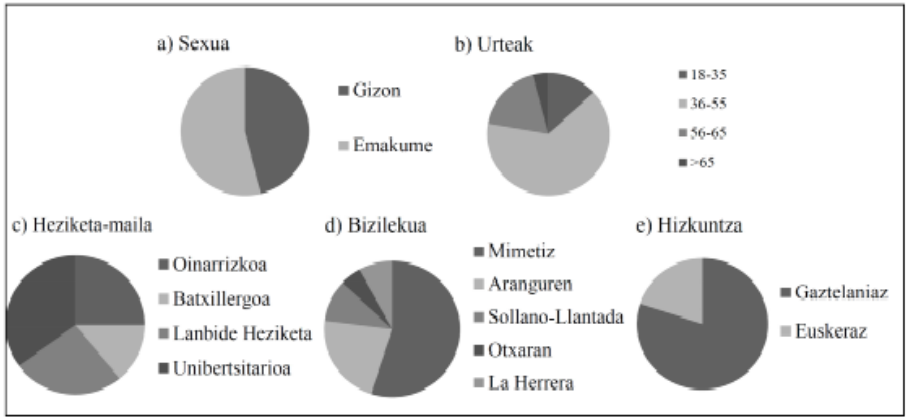



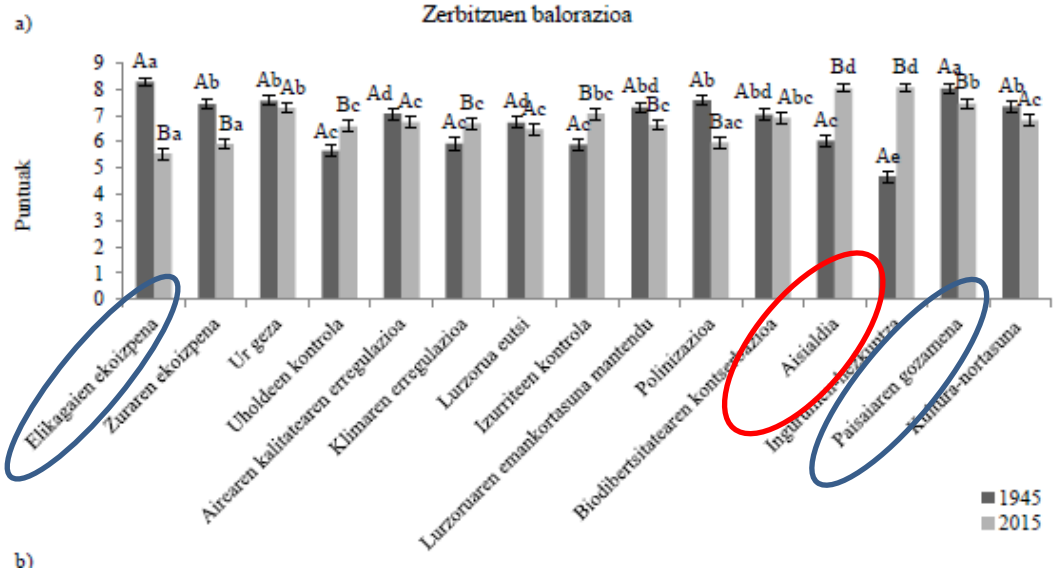

Biodiversidad
Conocimiento científico

# .6. CONOCER LA PERCEPCIÓN SOBRE LOS SE

**<u>Zalla (Bizkaia)</u>:** 100 encuestas



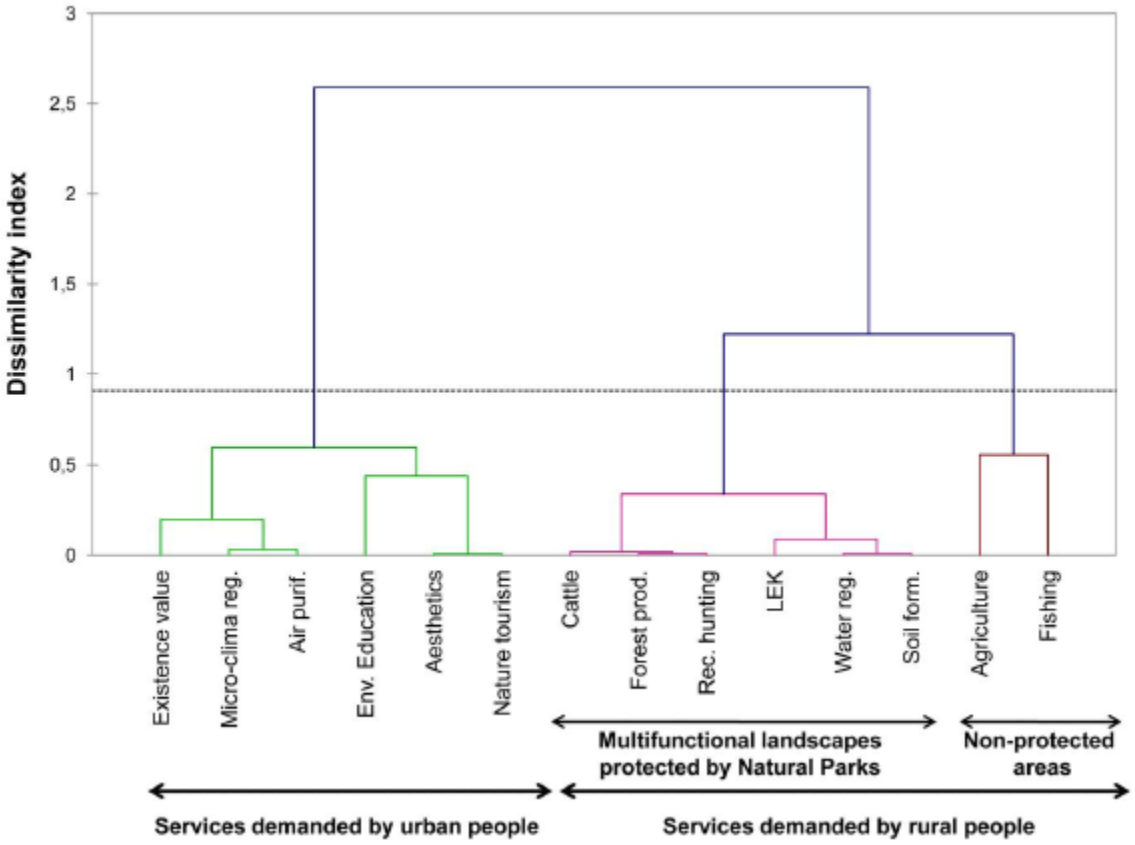

**Se valoran mejor los SE que se ofrecían antes (1945) en Zalla que los de ahora (2015)**

**Las mujeres valoran mejor los SE que los hombres**

# .6. CONOCER LA PERCEPCIÓN SOBRE LOS SE

*Martín-López, B., Iniesta-Arandia, I., García-Llorente, M., Palomo, I., Casado-Arzuaga, I., García del Amo, D., Gómez-Baggethun, E., Oteros-Rozas, E., Palacios-Agundez, I., Willaarts, B., González, J.A., Santos-Martín, F., Onaindia, M., López-Santiago, C.A., Montes, C. 2012.* ***Uncovering Ecosystem Service Bundles through Social Preferences****. PLoS ONE 7(6): e3897*

Se compararon 8 casos de estudio en toda España, sobre que SE elegía la gente y que características tenían esas personas

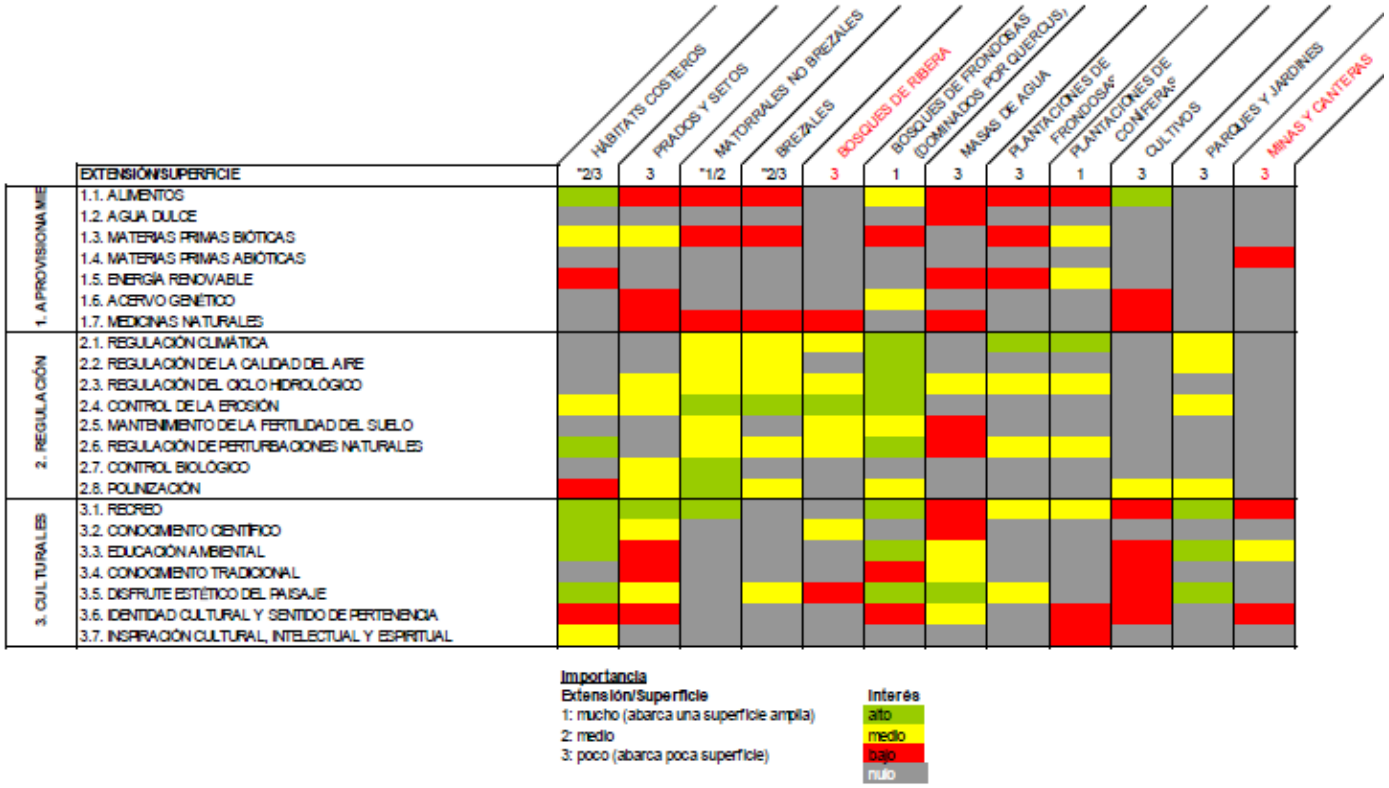


# .6. CONOCER LA PERCEPCIÓN SOBRE LOS SE

## PERCEPCIÓN DE LOS TÉCNICOS DE LA ADMINISTRACIÓN SOBRE LOS SE

### Técnicos del Parque rural "Monte Ulia" (Donostia) (2017)

1) Valoración de la importancia de los SE por 4 agentes con un profundo conocimiento del área derivado de sus actividades profesionales y personales y comparación con la cartografía de SE



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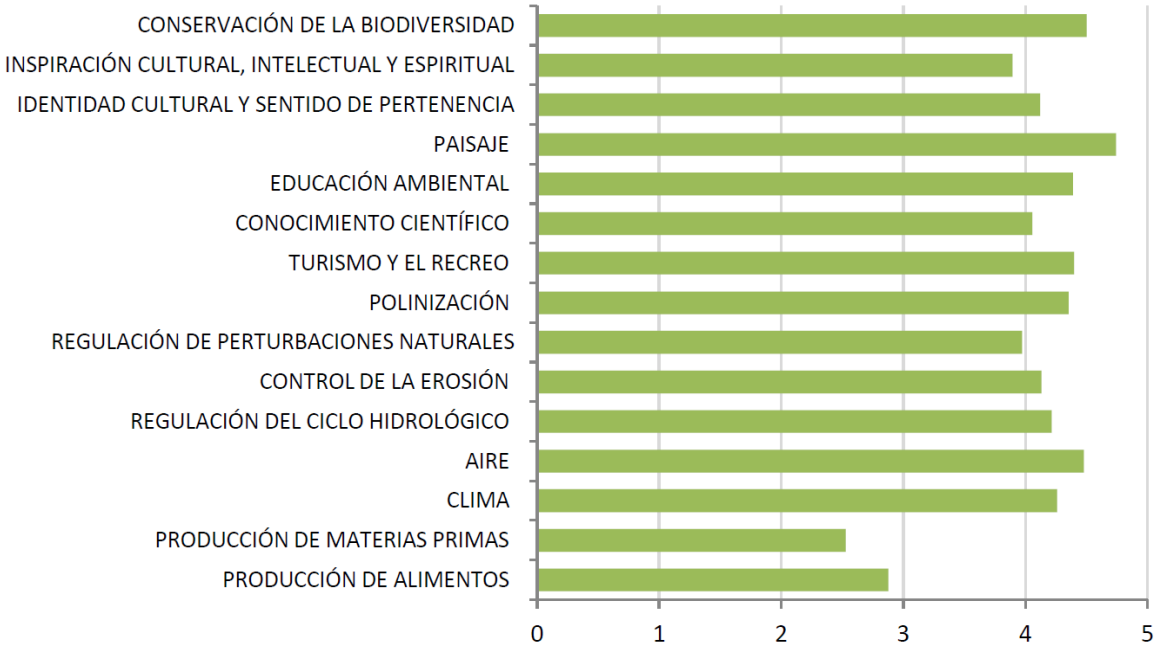
## 2) Encuesta: valoración de los SE




Disfrute estético del paisaje

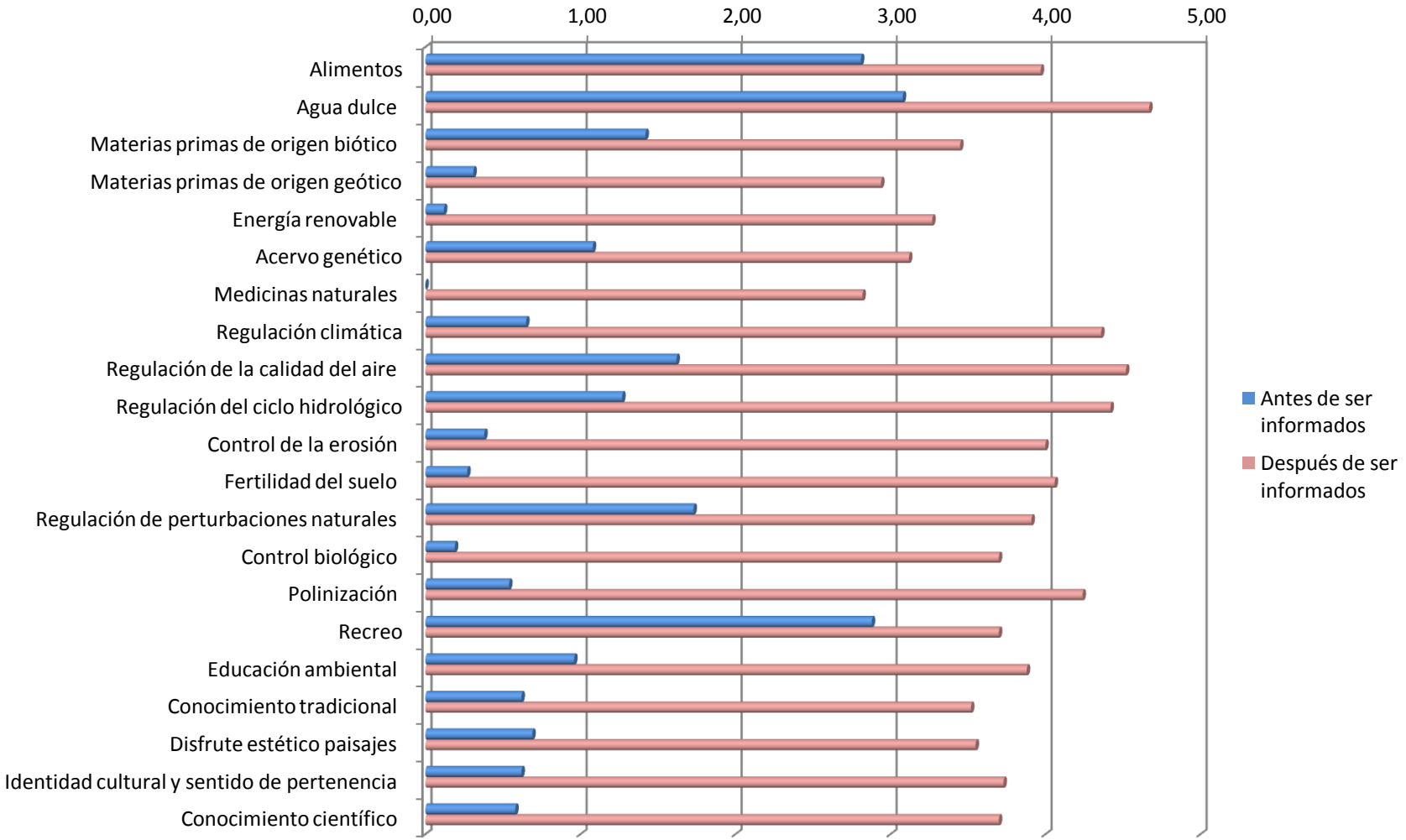
Lo valoran mejor las mujeres y los que visitan más a menudo el área

| | BIODIVERSIDAD | APROVISIONAMIENTO | REGULACION | CULTURAL |
|---|---|---|---|---|
| **Sexo** | 0,036* | 0,000*** | 0,002** | 0,004** |
| **Edad** | 0,029 | 0,023 | 0,311 | 0,757 |
| **Municipio de residencia** | 0,219 | 0,205 | 0,482 | 0,645 |
| **Pertenencia a una asociación** | 0,977 | 0,015* | 0,323 | 0,071 |
| **Beneficio para la sociedad** | 0,290 | 0,098 | 0,804 | 0,726 |
| **Conocimiento de los SE** | 0,474 | 0,277 | 0,409 | 0,113 |
| **Visitado alguna vez Ulia** | 0,740 | 0,089 | 0,592 | 0,622 |
| **Frecuencia de visita a Ulia** | 0,127 | 0,018* | 0,005** | 0,001*** |
| **Lugar donde se ha rellenado la encuesta** | 0,028* | 0,001*** | 0,263 | 0,004** |

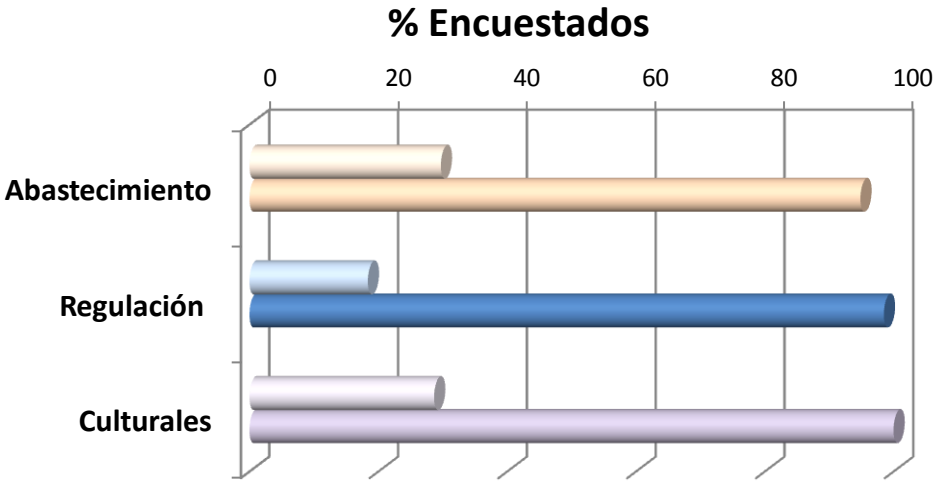
# .6. CONOCER LA PERCEPCIÓN SOBRE LOS SE

## Técnicos asistentes a un curso del IVAP sobre Servicios de los ecosistemas

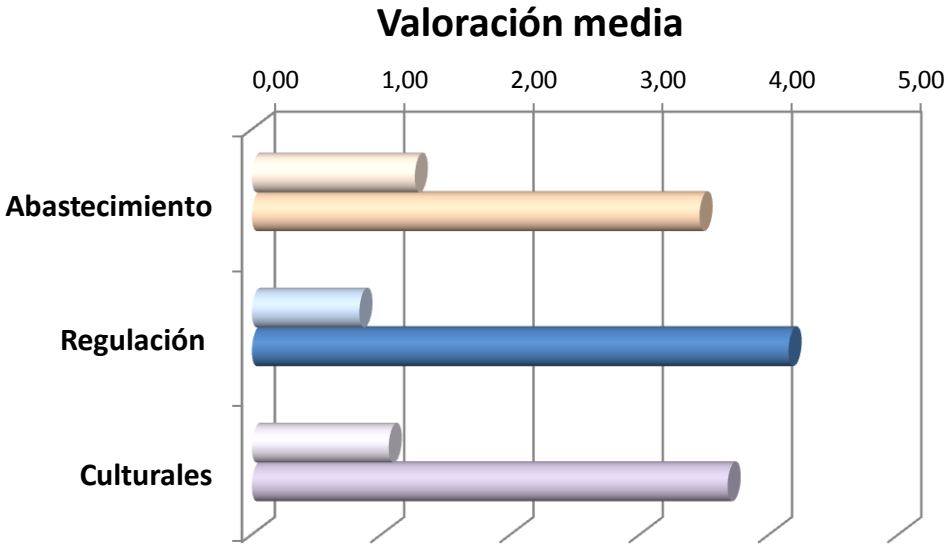
1. Identificación y valoración de SE antes de recibir información sobre SE
2. Identificación y valoración de SE después de recibir información sobre SE



# .6. CONOCER LA PERCEPCIÓN SOBRE LOS SE




**Los encuestados antes de ser informados identifican y valoran por igual los SE culturales y de abastecimiento. Sin embargo, cuando reciben la información los SE de regulación adquieren mayor importancia.**



## .6. CONOCER LA PERCEPCIÓN SOBRE LOS SE

**Técnicos del Departamento de Sostenibilidad y Medio Natural de la DFB**

10 técnicos

- Matriz DAFO sobre la integración de SE en la ordenación territorial
- Se les pidió que valorarán del 1-5 los SE que proporcionan algunos ecosistemas

| **Debilidades** | **Amenazas** |
|---|---|
| Poca priorización | Recortes presupuestarios |
| Lenguaje poco accesible | Falta de confianza en su funcionamiento |
| Falta de instrumentos prácticos | No tener en cuenta el valor intrínseco de los SE |
| Poca utilización de las TICs | Impulsores de cambio: contaminación |
| **Fortalezas** | **Oportunidades** |
| Respaldo de organismos internacionales | Universalidad |
| Sinergias con otras administraci. y actores sociales | Concepto accesible para la sociedad |
| Visión integral del territorio | Normativa europea |
| Plataformas ciudadanas | Sostenibilidad de recursos |

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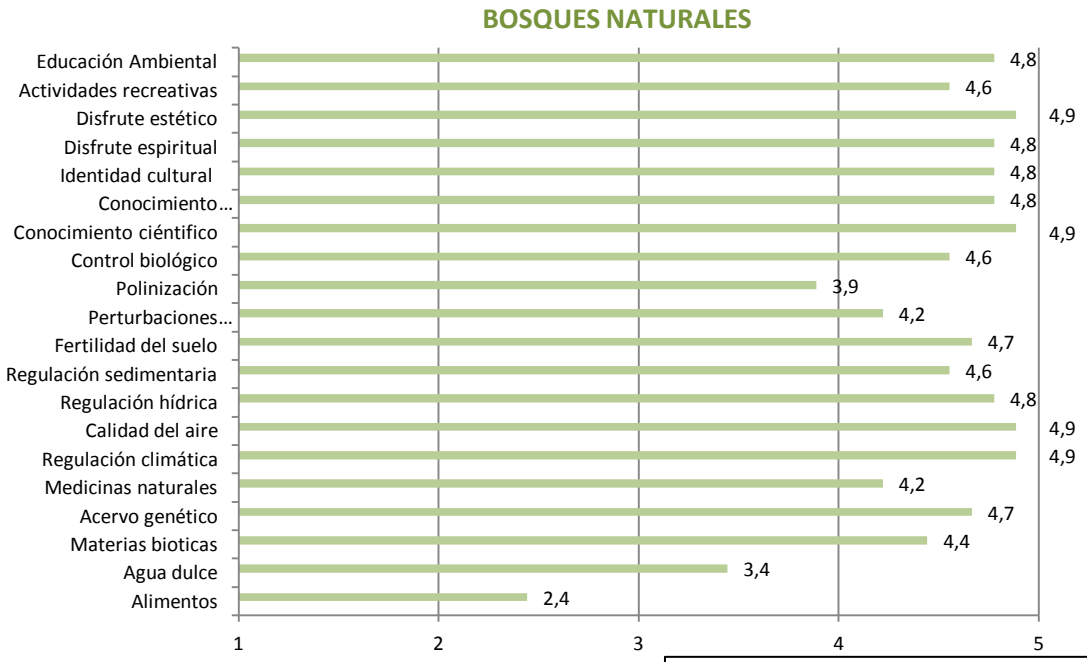
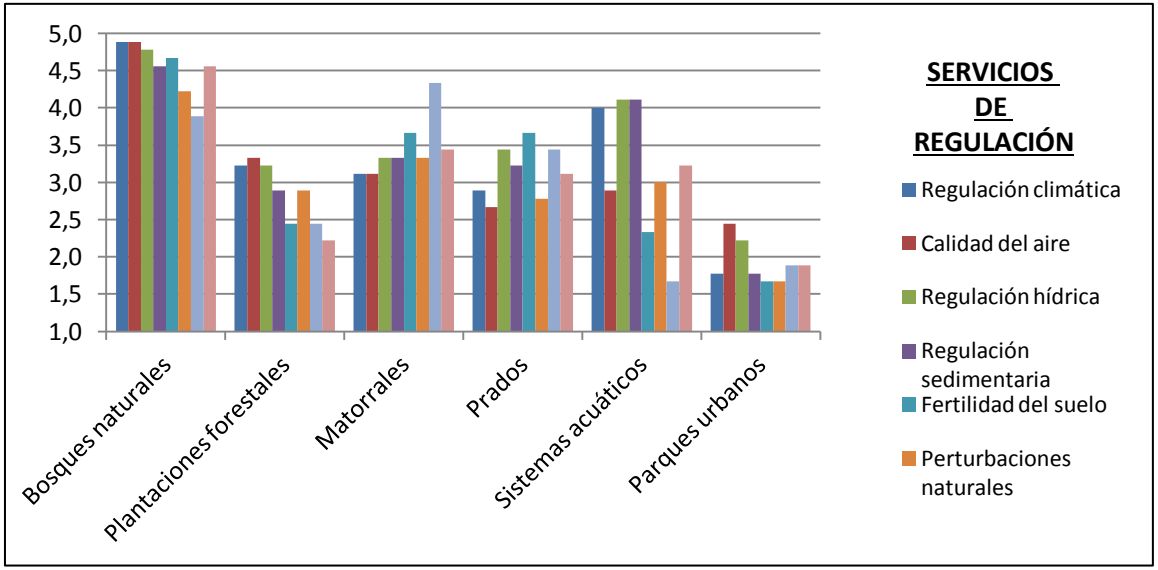



## Análisis de las valoraciones

- Por ecosistema
- Por tipo de SE

***Bosques naturales y ecosistemas acuáticos ofrecen mayor cantidad de SE***



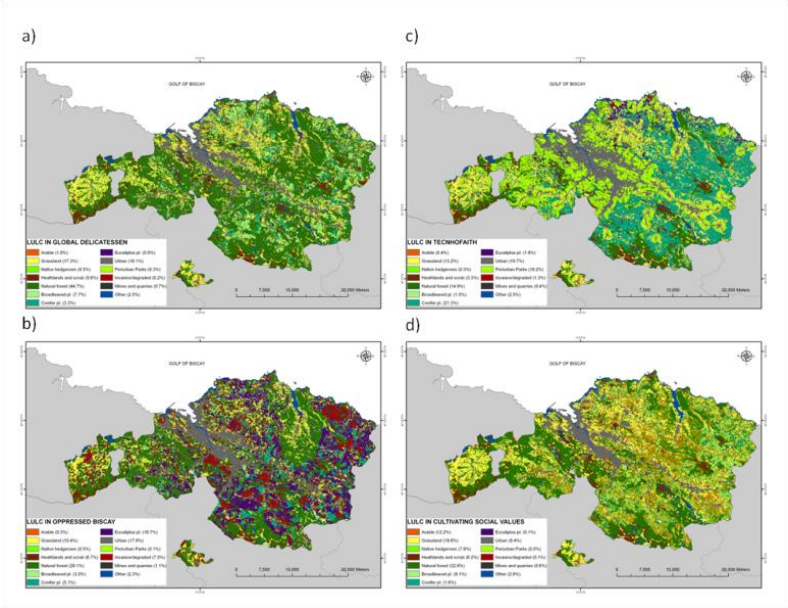
# .6. CONOCER LA PERCEPCIÓN SOBRE LOS SE

**Técnicos invitados a un proceso participativo dentro del proyecto para generar escenarios para evaluar las consecuencias de las decisiones**

Encuestas estructuradas: 285 stakeholders

2 Workshops: 66 stakeholders.

Discutir los impulsores claves de cambio y definir estrategias de gestión



# .6. CONOCER LA PERCEPCIÓN SOBRE LOS SE

*Spyra, M., Kleemann, J., Ipek Cetin, N., Vázquez Navarrete, C.J., Albert, C, Palacios-Agundez, I., Ametzaga-Arregi, I., La Rosa, D., Rozas-Vásquez, D., Adem Esmail, B., Picchi, P., Geneletti, D., König, H.J., Koo, H., Kopperoinen, L., Fürst, C. 2018.* ***The ecosystem services concept: a new Esperanto to facilitate participatory planning processes?*** *Landscape Ecology, 1-21. DOI 10.1007/s10980-018-0745-6*

Se analizaron 11 casos para ver cómo se había utilizado el concepto de servicio de los ecosistemas en los procesos de participación realizados, y para identificar en los casos de éxito las lecciones aprendidas. Finalmente se dan una serie de recomendaciones para su futura aplicación en procesos participativos.

| | | Järvenpää City | Tabasco Region | Northern Ghana I | Omerli Watershed | Basque County | Czech-Polish borderland | Schouwen-Duiveland Island | Northern Ghana II | Fuhrberg Watershed | La Araucanía Region | Schaalsee Reserves |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Actors involved in the planning process | Stakeholder(s) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Researcher(s)/ Expert(s) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Citizens | ✓ | ✓ | | ✓ | | ✓ | ✓ | | ✓ | | ✓ |
| | Total number of actors [1] | 333 | 210 | 31 | 562 | 37 | 78 | 33 | 95 | 30 | 14 | 12 |
| Governance system | Top-down | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | |
| | Bottom-up | ✓ | | ✓ | | | ✓ | ✓ | ✓ | ✓ | | ✓ |
| Obstacles in the planning process | Economic related issues | ✓ | ✓ | ✓ | | | | ✓ | ✓ | | ✓ | ✓ |
| | Data | | ✓ | ✓ | ✓ | | | | ✓ | | | |
| | Organizational inconsistencies | | | ✓ | ✓ | ✓ | ✓ | | ✓ | | | |
| | Motivation of actors | | | | | | ✓ | | ✓ | | ✓ | |
| | Understanding of scientific concept | | | ✓ | ✓ | | | | ✓ | ✓ | | |
| | Others | | | | | | | | ✓ | | ✓ | |
| Planning scale of the analyzed case studies | ***Type of planning scales*** | | | | | | | | | | | |
| | Policy planning | | ✓ | | ✓ | ✓ | ✓ | | ✓ | | | ✓ |
| | Spatial planning | ✓ | | ✓ | ✓ | ✓ | | ✓ | | | ✓ | |
| | Management planning | | | ✓ | | | | | ✓ | ✓ | | ✓ |
| | ***Spatial scales*** | | | | | | | | | | | |
| | Macro scale | | | | | | | | | | | ✓ |
| | Meso scale | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| | Micro scale | ✓ | | | | | | | | | | |
| | ***Temporal scales*** | | | | | | | | | | | |
| | Strategic (long-term ~50-100 years) | | | | | | ✓ | | | | | ✓ |
| | Tactical (mid-term ~10-30 years) | ✓ | | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Operational (short-term ~1-5 years) | ✓ | ✓ | ✓ | ✓ | | | ✓ | ✓ | ✓ | | |
| Methodology applied to put the ES concept into practice | ***Assessment methods*** | | | | | | | | | | | |
| | Qualitative | ✓ | ✓ | ✓ | ✓ | | | | ✓ | | ✓ | ✓ |
| | Quantitative | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | ***Participatory methods used*** | | | | | | | | | | | |
| | Focus group discussions, workshops | | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Surveys | | | ✓ | ✓ | | | | ✓ | | | |
| | Participatory mapping | ✓ | | | | | | ✓ | | | | |
| | Training | | ✓ | | | ✓ | | | | | | |
| | Others | ✓ | ✓ | | | | | | ✓ | | | |
| Case study deliverables | ***Documents and/or acts prepared as process outcomes*** | | | | | | | | | | | |
| | Report | ✓ | ✓ | ✓ | ✓ | | | ✓ | ✓ | | ✓ | ✓ |
| | Data oriented outcomes [2] | | ✓ | | | | | | | | | |
| | Capacity building acts [3] | | ✓ | | | | | | | | | |
| | Inputs for spatial plans [4] | | | | ✓ | ✓ | ✓ | ✓ | | | | |
| | ES models [5] | | | | | | | | | ✓ | | |
| | ***Financial mechanisms proposed to implement*** | | | | | | | | | | | |
| | International funds / EU funds | | | | | | ✓ | | ✓ | | | |
| | National funds | | | | | | | | ✓ | | | |
| | Local public funds | ✓ | ✓ | ✓ | | ✓ | ✓ | | | ✓ | ✓ | ✓ |

[1] This number shows the total amount of actors that were involved in implementation of particular case study [2] Data oriented outcomes contains metadata, databases etc. [3] Capacity building acts contains training courses, academic exchange etc. [4] Inputs for spatial plans contains scenario workshop, maps of protection zones, regional planning guidelines, development strategies, landscape design strategies. [5] ES models contains assessment models as standalone tools.

# .6. CONOCER LA PERCEPCIÓN SOBRE LOS SE

*Peña, L., Casado-Arzuaga, I, Onaindia, M. 2015.* ***Mapping recreation supply and demand using an ecological and a social evaluation approach.*** *Ecosystem Services 13: 108-118.*

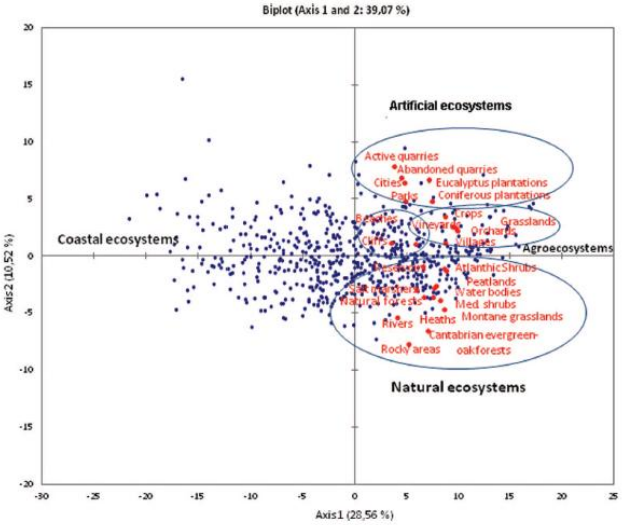



Fig. 4. Distribution of social perceived mean value of the environmental units.


Fig. 3. Example of photos used in the photo-questionnaire.

**Table 2**
Mean perceived value of the environmental units (mean ± standard error) and results of Turkey's test: means with the same letter are not significantly different at $P < 0.05$. ANOVA was significant at $P \leq 0,0001$.

| Environmental units | Perceived value | Environmental units | Perceived value |
|---|---|---|---|
| Rivers | 5.68 ± 0.03 a | Villages | 4.37 ± 0.05 gi |
| Rocky areas | 5.49 ± 0.03 ab | Orchards | 4.36 ± 0.05 gi |
| Montane grasslands | 5.42 ± 0.03 b | Vineyards | 4.31 ± 0.05 hi |
| Natural forests | 5.39 ± 0.04 b | Mediterranean shrubs | 4.18 ± 0.05 ij |
| Reservoirs | 5.34 ± 0.04 bc | Peatlands | 4.07 ± 0.05 j |
| Beaches | 5.14 ± 0.04 cd | Crops | 3.93 ± 0.05 jk |
| Cliff | 5.11 ± 0.04 cde | Parks | 3.72 ± 0.05 kl |
| Water bodies | 4.98 ± 0.04 df | Coniferous plantations | 3.70 ± 0.06 l |
| Cantabrian evergreen-oak forests | 4.97 ± 0.04 df | Eucalyptus plantations | 2.79 ± 0.06 m |
| Heaths | 4. 90 ± 0.04 ef | Cities | 2.29 ± 0.04 n |
| Salt marshes | 4.76 ± 0.04 fg | Abandoned quarries | 2.04 ± 0.05 o |
| Atlantic shrubs (no heaths) | 4.43 ± 0.05 g | Active quarries | 1.51 ± 0.04 p |
| Grasslands | 4.42 ± 0.05 gh | | |

**ENCUESTAS**

# .6. CONOCER LA PERCEPCIÓN SOBRE LOS SE

Palacios-Agundez, I., Onaindia, M., Potschin, M., Tratalos, J.A., Madariaga, I., Haines-Young, R. 2015. **Relevance for decision making of spatially explicit, participatory scenarios for ecosystem services in an area of a high current demand.** Environmental Science & Policy 54: 199-209.

**Table 1**
Plausibility and coherency of the mayor land cover changes in each scenario.

| | Major land cover changes | % of the total change | Plausibility | Coherency |
|---|---|---|---|---|
| Oppressed Biscay scenario | | | | |
| 1. | From coniferous plantation, grassland, heathlands and scrub and eucalyptus plantation to natural forest | 35.64 | It is a plausible change because natural forests are the potential natural vegetation of these land cover types (Basque Government, 2006) and natural succession usually proceeds towards woodland (Prach et al., 2014). In addition, plantations in the study area provide optimal conditions for regenerating native forests although some management actions must be undertaken to bring about regeneration (Onaindia et al., 2013a). | Following a productivity crisis and land abandonment, the primary sector declines in favour of growth in tourism dependent on protected and relatively wild natural areas. Therefore, in protected public areas native forest regeneration is expected. |
| 2. | From Coniferous plantation to Eucalyptus plantation | 28.29 | This results from a forestry management decision that many land owners have already taken in order to maximize profit. | In this scenario differing tendencies are shown with regard to landscape planning and forest management. While in publicly protected areas natural forests regeneration is encouraged, the private sector prioritizes more intensive high rate growth plantations for energy production. |
| 3. | From various cover types to urban | 16.44 | This is a plausible anthropogenic conversion that has historically occurred in the region, having had a significant impact over the last 50 years. | In this authoritarian scenario, where rich people live in heavily protected houses with gardens outside the cities, an increase in urban areas, especially around the development of new large-scale transport infrastructure, is expected. |
| 4. | From grassland, heathlands and scrub, arable land and other cover types to invasive species or degraded land | 13.84 | With land abandonment, widespread use of invasive species and transgenic organisms, and various unsustainable activities having severe environmental impacts, many land cover types are likely to became degraded. | The heterogeneous landscape of this scenario includes heavily damaged areas and abandoned rural areas. In addition, expansion of areas dominated by invasive species and genetically-modified plants present a challenge to an already impoverished native biodiversity. All of this results in the conversion of many cover types to invasive species or degraded land. |
| 5. | From grassland to heathlands and scrub | 4.78 | Due to land abandonment, many grasslands became scrubland and heathlands by natural succession. After land abandonment, natural succession has been seen to follow a broadly predictable pathway (Prevosto et al., 2011). | It is coherent with this scenario where land abandonment is expected. |
| 6. | From a variety of cover types to mines and quarries | 1.02 | The territory is rich in limestone, much of which has not been yet exploited due to high negative trade-offs with other uses. | Linked to unsustainable consumption of resources and the development of large-scale infrastructure projects in this scenario, a dramatic increase in the number of quarries is expected in this authoritarian scenario, which is not influenced much by social or environmental issues. |
| Global delicatessen scenario | | | | |
| 1. | From coniferous plantations (56% of changes in cover), exotic forest plantations, heathlands and scrubland, grassland and other cover types, to natural forests | 69.49 | This is a plausible change because all of these cover types may convert to natural forest, which is the potential natural vegetation of these areas (Basque Government, 2006). 40 years will allow time for at least the early stages of native forest regeneration, especially with active management (Onaindia et al., 2013a). | It is coherent with the scenario because growth of natural forests is promoted in order to encourage ecotourism, which is as an important economic activity in the scenario. |
| 2. | From rapid growth and fast turnover plantations, to slow turnover broadleaved deciduous plantations | 12.71 | This conversion in forestry from rapidly growing to slower growing but higher quality species is a plausible change, although it currently occurs only occasionally, as it is not widely promoted. | In this scenario, in order to increase landscape quality, forestry is reoriented towards higher quality, mainly native, species and more sustainable management. |
| 3. | From coniferous plantations to heathlands and scrub | 1.74 | After clear-cutting a coniferous plantation, heathlands and scrublands predominate in the early stages of succession, unless interventions are put in place to prevent this. | Not all forest plantations are expected to be clear-cut at the same time and interventions to prevent the development of heathland or scrub is not expected at all locations. |
| 4. | From various cover types to urban | 14.41 | This is a plausible anthropogenic change that historically has often occurred in the region, having had a dramatic impact over the last 50 years. | In this scenario, where the global market is a key driver of change and consumption patterns are not sustainable, an increase in urban areas due to infrastructure development is expected. |
| Technofaith scenario | | | | |
| 1. | From forest plantations, grasslands, heathlands and scrub, natural forests and other cover types to Periurban parks | 53.87 | When urban population increases, there is likely to be a greater demand for periurban parks with more and more man-made features and infrastructure to service them. | Population density in urban areas increases in this scenario and outlying areas are converted to large periurban parks. Many rural areas are therefore converted into locations for leisure activities for city dwellers. |
| 2. | From various cover types to urban | 29.79 | With an increase in urban population and higher levels of demand, for housing land, service industries etc., the urban area is likely to increase. | This scenario is the most urban and most disconnected from the natural world. In this consumption-driven and highly technological society urban areas are expected to increase. |
| 3. | From coniferous plantations to natural forest | 12.06 | Pine plantations in the study area provide optimal conditions for regenerating native forests (Onaindia et al., 2013a). | Even though this scenario is the most urban and most disconnected from the natural world, and its ecosystems are highly modified, some natural forest recovery occurs, such as in riverine woodland. |
| 4. | Form heathlands and scrub to invasive or degraded land | 3.48 | The generalized use of genetically modified organisms in the region would bring about a change from heathlands and scrub to land dominated by invasive species or degraded land. | In this scenario the use of genetically modified organisms is common, and there are high levels of biological pollution. |
| Cultivating social values scenario | | | | |
| 1. | From exotic forest plantations (mainly pine) to natural forest | 41.96 | Plantations in the study area provide optimal conditions for regenerating native forests because within approximately 20 years they are able to foster the regeneration of most species of native trees and ferns as well as some herb species typical of native woodland (Onaindia et al., 2013a), although some management initiatives must be undertaken to encourage this regeneration. | In this scenario management is undertaken to preserve, improve and regenerate natural ecosystems and recovery of natural forests is actively promoted |
| 2. | From rapid growth and fast turnover plantations (e.g. *Pinus radiata*), as well as from heathlands and scrubland, to arable land with native hedgerows surrounding it | 41.91 | In the 1950s, industrialization in the region initiated a crisis in the agricultural areas that resulted in farm abandonment and the spread of rapid growth and fast turnover plantations in many places suitable for agriculture. | Under this scenario there is an aim to reduce dependency of ES from outside the region, and increase self sufficiency and sustainability. It promotes mosaic landscapes and diversified, organic and sustainable arable land. Furthermore, the ecological and economic value of some ES can be maintained and enhanced on arable farm land by adopting sustainable practices such as organic farming (Sandhu et al., 2010). In addition, hedgerows of native species are an important element of multi-functional landscapes that contribute to the maintenance of biodiversity and ES, providing resources of economic and social interest (Otero and Onaindia, 2009, Morandin and Kremen, 2013). |
| 3. | From fast growing exotic tree species to broadleaved native plantations | 13.52 | This conversion in forestry from rapidly growing to slower growing but higher quality species is a plausible change, although it currently occurs only occasionally, as it is not widely promoted. | In this scenario, a more diversified and sustainable forestry sector is encouraged, with a tendency towards slower growing, mainly native, species, where timber quality is higher. |
| 4. | From other land cover types such as grassland, arable land, heathland and scrub to natural forests (especially riparian) | 2.24 | Natural succession usually proceeds towards woodland (Prach et al., 2014), which in this scenario is expected to be encouraged by active management to encourage regeneration of native forest. | In this scenarios key ecosystems such as riverine woodland are regenerated, because conservation of healthy riparian habitats is crucial for maintaining many important ecological functions (Naiman et al., 2005), including many services provided to society (Hruby, 2009). |

# .6. CONOCER LA PERCEPCIÓN SOBRE LOS SE

*Palacios-Agundez, I., Fernández de Manuel, B., Rodríguez-Loinaz, G., Peña, L., Ametzaga-Arregi, I., G. Alday, J., Casado-Arzuaga, I., Madariaga, I., Arana, X., Onaindia, M. 2014.* ***Integrating stakeholders' demands and scientific knowledge on ecosystem services in landscape planning****. Landscape Ecology 29: 1423-1433.*

**Table 1** Summary of the main results obtained in the participatory process

| Questionnaire results (% of respondents) | Participants' perception on forest systems and their services | Most relevant drivers of change | Sustainable target scenario description | Management proposals |
|---|---|---|---|---|
| 34.29 % explicitly mentioned forest aspects on their open answers | Natural forests have a higher potential to provide ES to society than exotic plantations | Governance and institutional coherence | Proactive work is performed from the local to the global scale and vice versa | Coherence between policy and actions is needed: governments at different scales have an important role to play |
| Highest potential for successful intervention among drivers of change | Currently some important ecosystem services, such as the aesthetic value of landscape diversification, are not sufficiently reinforced | Land and urban planning | Landscape multi-functionality is key in this scenario: biodiversity and carbon storage are enhanced | Strategic landscape planning and management is needed |
| Indirect driver: primary sector development (88.57 % assigned the highest value) | The applied forest management type is relevant for the quality and quantity of ES | Primary sector development | Local sustainable productivity is promoted | New financial mechanism and incentives should be created |
| Direct driver: forest management (85.71 % assigned the highest value) | Current lack of profitability: new business options (e.g., diversification of species) | Forest management | Sustainable forest management is reinforced, and the quality and variety of forest are improved | Changes in forest management and landscape planning should be promoted in an integrative and proactive way |
| | | Ecosystems degradation | Autochthonous ecosystems and their functionality are conserved and recovered | Public lands are used to recover natural forest ecosystems |
| | | Innovation and science | Society uses scientific knowledge to protect ecosystem functionality | Research and traditional knowledge recovery are essential |
| | | Participatory policy making model | Education, local participation and knowledge society | Public awareness on the importance of Landscape multi-functionality should be reinforced |
| | | | | Promotion of environmental education from early stages |
| | | | | Scientific and local knowledge should be spread to society through educational campaigns |

Number of participants: questionnaire on drivers of change = 35, workshop = 55, total (counting each individual just ones) = 66