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Life Portugal

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LIFE CAP PT II - Nº 101101821

Portugal Capacity Building for Better Use of LIFE II

GOOD PRACTICE GUIDEBOOK:

Policy uptake, replication, transfer and added economic value in LIFE projects

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apa agência portuguesa do ambiente

Direção-Geral de Energia e Geologia

IFCN Instituto das Florestas e Conservação da Natureza IP-RAM

GOVERNO DOS AÇORES | Secretaria Regional do Ambiente e Ação Climática

Executive Summary

This guide is intended to be a reference tool that highlights key components for any applicant wanting to increase the value of their proposal, as well as critical factors in the evaluation of LIFE applications.

The content encompasses: identification and summary of practices employed in LIFE projects with proficient examples of good practices for policy uptake (projects: LIFE MarPro, LIFE RELICT and LIFE RUPIS), replication (projects: FLAW4LIFE, LIFE RELICT, LIFE IMPETUS and LIFE LINES), transfer of results (project: LIFE IMPETUS), as well as projects with added economic value in Portugal (projects FLAW4LIFE and GreenShoes4All); recommendations from former project coordinators; and relevant contacts.

To create this guide, national cases of good practices were identified through a review of final reports, project surveys conducted, and a consultation with project monitors (ELMEN-EEIG). This was followed by interviews with the coordinators of the highlighted projects.

In essence, the purpose of this guide is to provide potential applicants with reliable and useful information with regard to how other LIFE projects have improved policy uptake, replication or transfer of results, and economic value, from the initial design phase to execution and post-LIFE activities.

Based on the experience of national LIFE projects, which serve as a model for adopting good practices, the major suggestions were compiled in terms of policy uptake, replication/transfer of outcomes, and additional economic value.

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Background

The aim of this guide, which includes instructions and good practice cases in LIFE projects, is to provide valuable recommendations and serve as a reference for the main question's candidates should consider while improving their proposal, as these criteria are important in the assessment of LIFE applications. Its contents include:

- identification and summary of good practices used in the Portuguese LIFE projects;
- examples of policy uptake, replication, and transfer of results and projects with additional economic value in Portugal;
- recommendations from the project coordinators;
- summary of each project and corresponding contacts.

This guide was developed through the identification of national cases of good practice, as detailed in final reports, inquiries to projects, and the consultation with project monitors (ELMEN-EEIG), followed by interviews with the coordinators of the identified projects.

In summary, the purpose of this document is to provide potential applicants with reliable and useful information about how previous LIFE projects improved policy uptake and replication or transfer of results, from the initial phases of project design to their execution and After-LIFE work, because while these factors are evaluated in any LIFE proposal, not all projects achieve these objectives.

POLICY UPTAKE

One of the LIFE Programme´s main objectives and added value is the legislative or regulatory impacts that may result from experience, good practices, and results obtained by financed projects leading to the change and/or adoption of new environmental policies - **'policy uptake'**. Some projects have had the ability to influence and make contributions at the legislative or regulatory level, resulting in the establishment of public policies.

Policy uptake cases

LIFE RELICT

LIFE RUPIS

LIFE MarPro

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Life-Relict

Prunus lusitanica – flower
LIFE RELICT

LIFE RELICT | Conservation of priority Laurissilva habitat

Rhododendron Route | LIFE RELICT

The Project

The **LIFE RELICT** project, coordinated by the **University of Évora (UÉvora),** aimed to **improve the conservation status of the Portuguese Laurel and the Pontic Rhododendron on mainland Portugal**. These are remnants of the Laurissilva, a priority habitat for conservation[1] in unfavourable conditions. Actions were carried out in Portuguese Laurel communities in **Serra da Estrela** (Cabeça and Casal do Rei) and **Serra do Açor** (Mata da Margaraça), as well as Pontic Rhododendron communities in **Serra de Monchique** (Foia), the most **representative** areas of this habitat in Portugal's **Natura 2000 Network**. The project, which had municipalities, a national association, and a Spanish research centre as partners, ran **between 2017 and 2023**.

As a result, the project promoted a set of actions, including conservation (collecting and propagating vegetative material, improving and increasing the Portuguese Laurel and Pontic Rhododendron), dissemination (promotion of nature tourism, awareness, education, and training), and monitoring (of vegetation structure, socioeconomic impacts, and ecosystem functions).

The LIFE RELICT project was considered an example of **good policy adoption practices, having contributed to the development of National Management Plans.**

The Case: Good Practices for Policy Uptake

This project exemplifies how the LIFE Programme promotes habitat conservation. Consequently, the project produced and planted specimens of Portuguese laurel (*Prunus lusitanica*) and Pontic Rhododendron (*Rhododendron ponticum*), as well as selectively

[1] 5230* - Arborescent Communities of *Laurus nobilis*. Annex I to the Habitat Directive (92/42/EEC)

controlled plant species that did not belong to the environment of the areas of the operation.

Following the fires that affected Serra da Estrela and Serra do Açor, an attempt was undertaken to create a project to **restore the plant communities** of the Portuguese Laurel and Pontic Rhododendron. It was also intended **to promote this plant heritage** so that the population would value it and contribute to its preservation.

The actions were preceded by a biophysical, socio-economic, and cartographic analysis of the territory. Based on this data, an Operational Plan was developed, defining the interventions to be implemented.

Despite not being anticipated in the application (as the project's objective was to have a more direct effect on the ground), LIFE RELICT had an impact on policy adoption. The Institute for Nature Conservation and Forests (ICNF) invited the project team to the participatory process to **contribute to the National Management Plans of 5 Special Areas of Conservation** (SAC). Catarina Meireles, project manager (UÉvora), pointed out the importance of this invitation, as well as the prior **knowledge of the entity involved** (ICNF) being aware of the project's existence, objectives, and the team's experience in this type of work, in this case a member of the scientific committee overseeing the project.

It was also important that the project intervened in 3 of the SACs (with the other 2 having the same type of habitat).

The inclusion of municipalities in the consortium allowed the results of the project to influence, albeit indirectly, local or regional management and conservation plans, including the training of municipal technicians responsible for their definition and implementation in workshops and technical sessions.

It should be mentioned that the Municipality of Monchique proposed incorporating some public properties into a local protected area to enable the continuous management of these areas.

Rhododendron | LIFE RELICT

It was also determined that a **guide of good practices** for the conservation of these Laurissilva remnants was required in order to objectively summarize the project's Operational Plan results. This document contained a proposal to assess the conservation status of this habitat for monitoring purposes within the Natura 2000 network.

This guide was distributed to property owners who, after learning about LIFE RELICT, contacted the team to see how they could assist with habitat conservation.

Additional Results

- This project was an example of useful replication practices. For more information, see the corresponding factsheet.

- The Project has managed to multiply rare and endangered species in Portugal (e.g., *Rhododendron ponticum* subsp. *baeticum*, *Quercus canariensis* and *Rosa rubiginosa*)

Regarding the **added value** of this project, Catarina Meireles states that no financial return was anticipated in its design, despite the fact that it featured measures aimed at **promoting nature tourism** to benefit the region (both economically and culturally). To accomplish this, 2 routes were constructed (integrated into the Via Algarviana) and audio guides were developed.

Rhododendron Route | LIFE RELICT

However, there were impacts at an economic level through **services provided indirectly**, and whose return is not immediate. For example, it mentions that the reconstruction of an old "*levada*" near one of the intervention areas also benefited the population (local heritage with cultural value was restored) and that some of the **native trees** planted are of **economic interest** (for example, strawberry trees), as well as highlighting the various **ecosystem services** (it is estimated, for example, that the reduction of the fuel load implied lower costs than those caused by the fires in the intervened areas, with a relevant increase in the resilience of the wooded areas and a reduction in future fire risks).

To learn more about the project results, we recommend contacting the team directly or checking the project page using the contact details in the factsheet below.

Reflections

When asked **what she would change in the design phase of the project** to improve policy adoption, Catarina Meireles mentioned incorporating an action plan into the project (to be approved by the ICNF), to allow conservation to be addressed at the national level, identifying priority areas and what can be done to improve them.

Tips to remember:

- Involve **municipalities**, to promote the adoption of policies at the **local level**;
- Involve **policymakers** at the national level to leverage policy adoption at the most strategic level.

The article was prepared by **Ana Santos, Ana Ferreira** and **Inês Bento (APA)** and **Isabel Lico (DDL),** based on an interview with **Catarina Meireles** (University of Évora), held on 10/07/2024, project page (liferelict.ect.uevora.pt), Layman's Report and Final Project Report

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LIFE RELICT (LIFE16 NAT/PT/000754) - ***Preserving Continental*** **Laurissilva** *Relics* Fact Sheet
Beginning: 01/10/2017 **Conclusion**: 30/04/2023

Approved Budget: 1 654 899 € **Executed Budget**: 1 459 210,21 € **LIFE Funding**: 1 219 078 € (73,66 %)
Project Coordinator: Professor Carlos Pinto Gomes (UÉvora)
Project Manager: Catarina Meireles (UÉvora)
Contacts: dpi@uevora.pt
Website: http://www.liferelict.ect.uevora.pt/
Coordinating Beneficiary: University of Évora
Associated Beneficiaries: ADRUSE - Associação de Desenvolvimento Rural da Serra da Estrela | Monchique City Council | Seia City Council | CICYTEX - Centro de Investigaciones Científicas y Tecnológicas de Extremadura (ES)
Layman's Report: http://www.liferelict.ect.uevora.pt/wp-content/uploads/2023/11/E1.3_Laymans_Report_web.pdf

Summary of Results

LIFE RELICT **aimed** to **improve the conservation status** of two plant communities that are **remnants of the vegetation of the subtropical climate** of mainland Portugal's past - **Portuguese Laurel and Pontic Rhododendron** - classified by the EU as priority *habitat* for conservation.

As for the propagation of vegetative material, aproximately 65 thousand plants were delivered to the nurseries of Monchique and Seia for use in actions to **improve and increase these habitats**. 2 **propagation manuals** were also produced (for native broadleaf species associated with these ecosystems and for species associated with Laurissilva forests).

To **improve the conservation status of the Portuguese Laurel in the Center-North**, selective control was carried out, removing species that were not part of the system: heliophilous vegetation, non-invasive alien species (pines) and species with great invasive power (*Acacia dealbata* and *Hakea sericea*); and **characteristic species were promoted** (by making directed plantations). To **reduce** the risk and speed of forest **fires**, measures were implemented to fragment the landscape and create buffer areas with native species. **1.2 km of "*levada*" were also restored** in the intervention area of Cabeça, in Seia, allowing **the recovery of feed flows**.

To **improve and increase the Pontic Rhododendron in the South**, namely in the intervention areas in Foia (Serra de Monchique), a **selective control** of heliophilous vegetation and **promotion of characteristic species** was also carried out in areas of improvement of the habitat structure and increment areas (where the target habitat can occur naturally). For **fire protection**, selective control of eucalyptus trees was carried out, and the creation of buffer zones, recovering existing areas or planting native species.

Regarding dissemination, it is worth mentioning the more than **180 activities to promote nature tourism**, including pamphlets, traveling exhibitions and 34 thematic events, having reached about 22 thousand people. The most impactful are the **interpretive walking routes**, with audio guides in 2 languages. **80 environmental awareness and education activities** were also carried out in schools in Monchique and Seia, reaching about 200 people, mostly students. There were also **3 technical conferences** to train agents for the management of Laurissilva remnant habitats.

For more information, we recommend consulting the Layman's Report.


Traditional pigeon loft
LIFE RUPIS

LIFE RUPIS | Expansion of the Douro Internacional SPAs

Egyptian vulture | LIFE RUPIS

The Project

LIFE RUPIS, which was coordinated by the **Portuguese Society for the Study of Birds** (Sociedade Portuguesa para o Estudo das Aves, **SPEA**) along with an extended network of partners in Portugal and Spain, took place between 2015 and 2020, with the primary goal of **increasing the Egyptian vulture and Bonelli's eagle populations in the region of Douro International Valley**.

For this reason, the project has promoted a series of conservation actions to **improve reproductive success**, **reduce adult mortality**, **reduce nest disturbance**, **increase prey availability** (particularly during breeding season), provide supplementary food, and overall **improve habitat quality for these birds** through the promotion of agro-silvo-pastoral management strategies and good practices.

Despite the excellent results achieved in other domains covered in this Guide–including, solid transnational work, which is essential for the conservation of species that use cross-border territory "without regard" for administrative borders– the RUPIS case is here presented as a **good practice for policy uptake, considering its results in defining the Natura 2000 Network in a national context**.

The case: Good Practices for Policy Uptake

As a project aimed at implementing objectives established by the **Birds Directive**, the two-target species that are protected **exemplifies how LIFE assisted in the (re)designation of Special Protection Areas (SPAs), with a geographical configuration suitable for fulfilling the obligations imposed by this Directive on Member States.**

More specifically, the project led to the **revision of the initial limits of Douro Internacional and Vale do Águeda SPAs,** to include previously unprotected conservation areas. Overall, the

project proposal resulted in an increase in SPAs from the initial 50.845 ha to the current 104.575 ha, increasing the coherence area and allowing it to perform protection functions for a set of priority areas critical to the conservation of the target species.

To achieve these results, Joaquim Teodósio, SPEA's project manager, identifies a **key element of the project´s design is the integration of the Institute for Nature Conservation and Forests into the consortium. This Institute of Conservation of Nature and Forests (ICNF) ("Instituto de Conservação da Natureza e Florestas, ICNF") is the national authority responsible for proposing relevant measures.** Joaquim also emphasises that this type of measure cannot be presented and be successful unless it is properly substantiated from a technical standpoint, appropriately explained and coordinated with interested parties-particularly landowners and managers of the target territory-and has broad consensus and support from society and decision-makers.

In this context, the consortium's integration of various types of entities with diverse scales of action was critical to ensuring joint work, both at local and national levels, which continued beyond the duration of the project and proved to be an added value, assisting the administration in approving proposed legislative changes after the project was completed.

When the project was designed, the need to review the SPAs boundaries was already identified, albeit in a preliminary manner. Thus, in addition to actions targeted at gathering the necessary data for its preparation, the project´s structure included efforts to better substantiate a technically sound proposal for enlargement that was consistent with the ecological needs of the target species' conservation.

For such an effort to be viable, monitoring data from the project's early years was required. Based on these and the contributions of all partners, ICNF has prepared a proposal for SPAs revision/extension. It was completed at the project level, during its third year, following discussions, contributions, and approval from all partners. This was followed by a presentation and proposal to the relevant government ministry for subsequent approval.

Birdwatching | LIFE RUPIS

Contrary to expectations, the political-administrative procedure leading up to effective approval and publication encountered unforeseen obstacles, proving to be slower than initially anticipated. To overcome and mitigate the constraints, the cohesion and collaborative efforts of the consortium were critical, as was the regular support and determination of the monitoring and European Commission teams who monitored the project.

The diversity of the consortium partners' enabled collaborative and articulated work in governance and lobbying processes, which proved to be critical. This is intended to raise awareness among stakeholders, including landowners, territory managers, and local and national political decision-makers. Unexpectedly, these works resorted to various actions to gain consensus on the review of the SPAs limitations, allowing to encourage unusual participation that was later replicated in other geographic contexts linked with the approval of additional SPAs.

Activities in schools | LIFE RUPIS

In this context, it is worth noting the SPEA meetings with the government ministry, the ICNF meetings with local authorities, and the promotion and encouragement of society and stakeholder´s participation in the public consultation process, carried out, leveraged by prior contacts with other stakeholders in territory management and their awareness-raising, to increase and strengthen their participation. To support it, electronic forms were utilized for the first time in various processes, such as those currently associated with participation procedures and good governance standards.

These initiatives successfully resolved conflicting perspectives, resulting in significant stakeholder participation and, positive feedback on the SPAs' enlargement and amendment. In this context, Joaquim Teodósio emphasises that, at the end of the process, just one opinion was not positive, and even it was neutral in content, warning only of the need to consider particular provisions concerning energy transport infrastructure, which were dutifully considered.

Despite this effort, and following the publishing of the public consultation report, the administrative review procedure took three years to complete.

That goal was achieved in 2023, by a new government ministry team, in accordance with the emergence of new European and national policies' commitments to increase the percentage of classified areas in each Member State, a goal to which the SPAs growth also contributed.

Additional Results

As identified in the Final Report and emphasised by Joaquim Teodósio, the project produced additional advantages and objectives to support the implementation of public policies for nature conservation and biodiversity.

The following are highlighted:

- Effective international collaboration is crucial for preserving species that use transboundary territory;

Feeding area | LIFE RUPIS

- Collaboration with the DGAV- Food and Veterinary Directorate to increase the establishment of feeding areas for necrophagous birds, which leveraged the prior work that was then underway for definition and implementation of the "Action Plan for the Conservation of Necrophagous Birds";
- Collaboration between SEPNA- Nature and Environment Protection Service ("*Serviço de Proteção da Natureza e Ambiente")* and Spanish counterpart SEPRONA-The Nature Protection Service ("*Servicio de Protección de la Naturaleza"*) regarding environmental inspection training and field intervention, focusing on the poisoning of the necrophagous birds, which is a crime;
- With the support of POSEUR-Operational Program Sustainability and Efficiency in the Use of Resources ("*Programa Operacional Sustentabilidade e Eficiência no Uso de Recursos"*), in particular, the ICNF brigades received reinforcement of resources and improved firefighting procedures and restored important areas for birdlife affected by fires; These solutions were later replicated to other protected areas., with the support of POSEUR.
- An extensive and comprehensive environmental education and awareness program was created for both sides of the border and supported the founding of an Iberian nature festival, ObservArribas.

To learn more about the project results, we recommend contacting the team directly or checking the project page using the contact details shown in the factsheet below.

Tips to remember:

- **Involve the entities responsible** for relevant policies;
- Establish an **allowance** for anticipated **time** constraints.

Reflections

Despite the unexpected work, in which the project partners remained committed to achieving this goal after the project was completed, Joaquim Teodósio is unequivocal about the benefits achieved for conservation of protected target species and sustainable implementation of the provisions of the Birds and Habitats Directives.

When asked what he would change in the project design phase to facilitate its execution, Joaquim discusses possible areas of effort to mitigate risks associated with the slowness observed in political-administrative procedures in a national setting.

First, a longer duration for projects including this type of measure is identified and mentioned as an important factor to be considered. Albeit, it is just applied to the tasks and resources required for the approval processes, such as an extension would enable supporting work carried out by numerous partners that did not benefit from LIFE support.

In parallel, given the recent role of "partner" that the current LIFE foresees, and to allow more and better monitoring of the government ministry throughout the life of the project, the possibility of including it in the project's consortium is being considered.

This presence, complemented by ICNF as an "associated beneficiary"-that is, with LIFE budget and financing to assist in the process of preparing proposals for new political-administrative instruments–is identified as an opportunity to consider examining whenever there is availability and possible added value. As a formal "partner," the government ministry may thus monitor the development of proposals for new instruments from their inception, thereby contributing to increased commitment and priority in their respective approval.

Information panel | LIFE RUPIS

The article was prepared by **Luis Jordão** (Desafio das Letras), based on an interview with **Joaquim Teodósio** (SPEA) carried out on 28/03/2024, and the Project's Final Report.

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LIFE RUPIS (LIFE14 NAT/PT/000855)
Egyptian Vulture and Bonelli's Eagle Conservation in Douro/Duero Canyon Factsheet
Start: 16/07/2015 **End:** 31/10/2020

Approved budget: 3,578,924 € **Executed budget**: 3,698,529 € **LIFE financing**: 2,672,481 € (72.26 %)
Project manager: Domingos Leitão e Joaquim Teodósio (SPEA)
Contacts: spea@spea.pt
Website: https://www.rupis.pt/
Coordinating beneficiary: Sociedade Portuguesa para o Estudo das Aves
Associated beneficiaries: Instituto da Conservação da Natureza e das Florestas | Guarda Nacional Republicana | Transumância e Natureza - Associação | Palombar - Associação da Conservação da Natureza e do Património Rural | EDP Distribuição – Energia, S.A. | Junta de Castilla y Léon | Fundación Patrimonio Natural de Castila y León | Vulture Conservation Foundation
Layman's Report: https://webgate.ec.europa.eu/life/publicWebsite/project/LIFE14-NAT-PT-000855/egyptian-vulture-and-bonellis-eagle-conservation-in-douro-duero-canyon

Summary of Results

LIFE RUPIS carried out a wide range of actions to benefit the conservation of the populations of Egyptian vultures and Bonelli's eagles in Douro Internacional. One of the key actions was the **operation of two canine brigades for poison detection,** which led to an eight-fold increase in the number of offenses detected; the other was the **dismantling or adaptation of 54 km of electrical lines.** In both cases, these measures contributed to a very significant reduction in mortality within the project's intervention area.
With other measures, the project sought to increase the availability of prey for the target species. Thus, a strategy for feeding Egyptian vultures was developed involving the **reactivation and expansion of several feeding fields**, through which more than 32 tons of feed were made available. On the Spanish side, producers were also encouraged to increase food availability, especially during the breeding season, leading to approximately 145 tons of carcasses being made available through feeding fields of producers and municipalities. Habitat management work for the target species also involved the **promotion of extensive livestock farming**, including the **creation of nearly 65 ha of biodiverse pastures**, the **installation of fences** approximately 219 ha, and **pond recovery**.
Relating to the Bonelli's eagle, the project also improved food availability through **habitat management measures targeting prey such as wild rabbits, partridges, and pigeons** which included **deforestation** of approximately 222 ha, **cereal and legume sowing** in 166 ha, and the **installation of 20 drinking fountains**. Additionally, **36 traditional pigeon lofts** were **recovered and reactivated**, and a mobile pigeon loft prototype was developed and installed. Each loft was initially populated with 60 pigeons, and protocols to ensure their management and operation were improved. In the long term, habitat management will be improved through the acquisition of 228 ha of land, **maintaining cross-border cooperation to reduce disturbances to nests** leveraged with this project.
Altogether, this project's work led to an **increase of the Bonelli´s eagle breeding population from 13 to 15 couples**. As for the Egyptian vulture population, despite no demonstrable gains in reproductive success, it should be considered that the project duration was too short to detect and evaluate changes in long-term trends. Other results to highlight include **increasing awareness among the local population** regarding this problem, **collaboration established with owners and managers** to create an **Egyptian Vulture Friends Network**, as well as the promotion of local products that respect requirements associated with traditional landscape management and conservation. Awareness-raising activities included campaigns directed towards local schools and their students.
Lastly, and not least relevant, it is worthwhile to recognize the project's contributions to improved knowledge of the target species and revisions to the carcass management guidelines applied; these teachings and practices were extended to the entire national territory. For more information, we recommend consulting the Layman´s Report.

Stranded harbour porpoise
LIFE MARPRO

LIFE MARPRO | Conservation of marine protected species in mainland Portugal

Balearic shearwater | LIFE MARPRO

The Project

LIFE MARPRO, was coordinated by the **University of Aveiro (UA)** with several of Portugal´s marine-related entities with similar issues as partners. The project ran from 2011 to 2017, and its major aim was to **extend the Natura 2000 Network for cetaceans and seabirds in mainland Portugal**.

In this regard, the project carried out a series of actions, with particular emphasis on developing proposals for the **creation/extension of Special Protection Areas (SPAs)** dedicated to the conservation of the Balearic Shearwater (*Puffinus mauretanicus*), as well as proposals for the creation/extension of **Sites of Community Importance (SCIs)** for the conservation of the harbour porpoise (*Phocoena phocoena*) and the bottlenose dolphin (*Tursiops truncatus*).

Thus, the case of MARPRO is presented here as an example of **a good policy uptake practice, considering their success in defining the Natura 2000 Network for cetaceans and seabirds in mainland Portugal**.

The case: Good Practices for Policy Uptake

As a project whose specific aim was to designate Natura sites for cetaceans and seabirds on mainland Portugal, MARPRO also evaluated the issue of incidental catches, as well as defining the quantity of the species under consideration and the census methods utilized.

Through **LIFE financing,** Portugal was able to **provide information on cetacean and seabird populations in a structured way (in accordance with Article 17 of the Habitats Directive and Article 12 of the Birds Directive),** and allowing it to compare current information to baseline data. Portugal can now additionally publish statistics on **incidental catches**, as well

as species **abundance** of the species under consideration.

The project, as intended, resulted in the establishment of the **Cabo Raso and Aveiro/Nazaré SPAs** (Regulatory Decree no. 17/2015) and the approval of the **extension of the Cabo Espichel and Southwest Coast SPAs** (Legislative Decree no. 204/2015) to include the feeding and resting areas used by the Balearic shearwater (*Puffinus mauretanicus*) population during migration and wintering periods.

Given the project's aims, Catarina Eira, the project manager, stated that there was initial concern about including the **Institute for Nature Conservation and Forests (ICNF) in the consortium since it was the national authority to propose the recommended measures for extending the Natura Network to cetaceans and seabirds.** She also mentioned that the knowledge in Portugal at the time, particularly about cetacean species, was limited and that the designation of SCIs for the maritime environment presented numerous challenges. In this respect, it was crucial to have an entity that could provide technical clarity to the various interested parties, specifically decision-makers, a role that was ensured by the coordinator and the various project partners.

In this context, all consortium members were involved in **defining/extending new SCIs,** and the draft proposal was analysed in meetings between an ICNF technician and the Marine Biodiversity Working Group (a governmental group comprised of various entities that work on marine environmental issues). The Secretary of State for Spatial Planning and Nature Conservation **approved the final proposal, which was developed by ICNF** considering all the contributions submitted. In May 2016, the proposal was made available to the public.

Bottlenose dolphins | LIFE MARPRO

The project team also met with several ICNF technicians at the national level to define and discuss the **Management Plans** for the proposed locations (between April and July 2016). In October 2016, ICNF and the project team presented the proposals to consultants from the Secretary of State for the Ministry of the Sea, as well as the Secretary of State for Nature Conservation. Several meetings followed in April 2017 with various entities, including the DGRM, IPMA, APA, DGPM, DGEG, Turismo de Portugal and the Hydrographic Institute, among others. In September 2017, a final meeting was held to incorporate the comments received and approve the final proposal, which was then forwarded to the Ministers of the Environment, Spatial Planning, and the Ministers of the Sea for approval. Unexpectedly, the Management Plans did not receive the necessary approval to be made available for public consultation.

Furthermore, the project encountered an unexpected obstacle during its lifetime due to changes in the government's organizational structure, which included the establishment of the Ministry of the Sea and other new entities with expertise in the marine environment, potentially increasing the complexity of the entire administrative process of creating/extending SCIs, as well as the respective Management Plans.

Harbor porpoise rescue | LIFE MARPRO

To overcome these completely unexpected challenges, the project team, and particularly the ICNF, made every effort to clarify and emphasise the critical need to approve the consortium´s documents and proposals, while always considering the contributions received from other entities and the general public. As a result, it was necessary to request that the European Commission extend the duration of the project so that it might be completed in 2017 and so yield greater results.

Despite this effort, the **inclusion of the coastal strip between Maceda and Praia da Vieira on the National List of Natura 2000 Sites was only published by Council of Ministers Resolution 17/2019.** However, for reasons external to the project, it was not possible to approve the "Setúbal Coast" SCI and the extension of the "Sado Estuary" SCI.

Similarly, the draft of the **Management Plans for the Maceda-Praia da Vieira site and the extended marine area of the South West Coast SCI** were only submitted for public consultation between July and August 2018, and the Plans were published by **Ministerial Order 201/2019**, which recognizes that "*The draft Management Plan for the Maceda-Praia da Vieira site and the extended marine area of the South West Coast SCI was drawn up under the LIFE MARPRO project, involving different public entities (...)".*

According to Catarina Eira, the fact that the ICNF´s participation in the consortium meant that "post-project", this entity was the privileged interlocutor for all administrative and technical procedures linked to the creation of SCIs and the adoption of Management Plans.

Tips to remember:

- Include entities with the relevant **technical skills** in the consortium.
- Provide an adequate **allowance** for the anticipated time for the processing of **administrative procedures**.

These aims were only achieved in 2019, with a new government team, in accordance with the

European targets and each Member State´s pledges to expand the number of classified maritime areas, to which the creation/extension of the SPA and SCI contributed.

Additional Results

As identified in the Final Report and emphasised by Catarina Eira, the project produced additional advantages and objectives to the cetacean and seabird conservation policies. The following are highlighted:

- Provide **Training** to technicians, fishermen, authorities (GNR, Fire Brigade, Civil Protection, Maritime Police), and other marine users to **detect and alert to sightings**. Even today, these entities issue alerts as necessary;
- Supported the **stranding network** with acquired equipment, particularly veterinary equipment, that is still in use today;
- Implemented **Good Practice Manuals and Good Practice Tests** to reduce accidental catches, including pingers in the nets that emits low-intensity sounds (a type of Acoustic Deterrent Device (ADD) that emits low-intensity sounds to alert marine mammals of fishing gear) with no disruption, which obtained very good results. Fishermen authorized the boarding of observers to accompany in the implementation;
- Encourage legislative use of mitigation measures in *Arte-Xávega*, thus ensuring efforts to guarantee the reduction of dolphin mortality over time;
- **Improved Marine Animal Rehabilitation Centres**, increase the country´s ability to respond to the impact of human activities.
- Raises public awareness about the importance of protecting and conserving marine species.

To learn more about the project results, we recommend contacting the team directly or checking the project page using the contact details shown in the Factsheet below.

Reflections

Catarina Eira is unequivocal about the project´s importance in expanding the Natura 2000 Network for cetaceans and seabirds in mainland Portugal. She does, however, point out that if the project had been designed today, greater emphasis would have been placed on identifying risks and barriers associated with Portugal´s lengthy political-administrative procedures.

She concludes by stating that projects involving this type of measure should be designed from the start to have a longer duration, allowing the work carried out by the various partners to be considered within the scope of the project, even if it is only for the approval processes.

She also believed that they should have considered Fisheries Certification and the use of a Quality Seal, as has been done by other LIFE projects with similar concerns.

The article was prepared by **Isabel Lico** (Desafio das Letras), based on an interview with **Catarina Eira** (UA) on 29/04/2024 and the Final Project Report.

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LIFE MARPRO (LIFE09 NAT/PT/000038) - **Conservation of marine protected species in mainland Portugal** Factsheet
Início: 01/01/2011 **End**: 31/12/2017 (2-year extension)

Approved Budget: 2,773,032 € **Executed Budget**: 2,786,177 € **LIFE Funding**: 1,386,516 € (50.00 %)
Project Manager: Catarina Eira (UA)
Contacts: catarina.eira@ua.pt
Website: http://marprolife.org/; https://www.facebook.com/marprolife
Coordinating Beneficiary: University of Aveiro
Associated Beneficiaries: University of Minho | Portuguese Society for the Study of Birds | Portuguese Institute for the Sea and Atmosphere | Institute for Nature Conservation and Forests

Summary of Results

The Cabo Raso and Aveiro/Nazaré SPAs were created in 2015, and the extension of the Cabo Espichel and Southwest Coast SPAs was approved;

Definition of the abundance of the species considered and optimization of census methods and monitoring of population changes in the target species;

Quantification of incidental catch levels and optimization of assessment methods for the incidental catch of target species;

Measures to mitigate incidental catch, with the drafting of Good Practice Manuals and Good Practice Tests, for example, with pingers (equipment that emits low intensity sounds and is therefore not disturbing to the ocean) in the nets, which have achieved very good results- the fishermen have allowed observers on board to monitor the measure;

Improvement of the stranding networks and Rehabilitation Centres;

Proposal to create the SCIs of Maceda-Praia da Vieira and Costa de Setúbal and extend the SCIs of Estuário do Sado and Costa Sudoeste, which were submitted for public consultation in May 2016;

Management Plan proposals were drawn up for all the SCIs and SPAs considered in the project;

Greater public awareness of the need to protect and conserve marine species;

Portugal is now able to report information on cetacean and seabird populations in a structured way (Habitats and Birds Directives) and thus be able to compare current information with baseline information;

Portugal is now able to report structured data on incidental catches;

Training of technicians and fishermen, authorities (GNR, Fire Brigade, Civil Protection, Maritime Police) and other users of the marine environment. Even today, these entities issue warnings whenever necessary;

Acquisition of equipment, particularly veterinary equipment, which is still in use today;

After the end of the project, in 2019, only one of the proposed SCIs was created (Maceda-Praia da Vitória), as well as the extension of the Southwest Coast SCI;

Also, post-project, in 2019, pingers were purchased with funding from the Environmental Fund and delivered for use in Xávega fishing. However, it was not feasible to monitor their application due to lack of funding.

REPLICATION AND TRANSFER

In the context of LIFE, **replication** refers to the successful extension or repetition of a project or initiative across different locations, regions, or other geographic contexts. Replication presupposes the successful application of lessons learned in a project in other areas, to achieve similar results, while leveraging its geographic dispersion.

Transfer involves the dissemination and application of knowledge, technologies or good practices developed in a LIFE project to other sectors or stakeholders. It is the process that allows transferring and leveraging a project's innovations and solutions beyond its initial (non-geographical) context.

Replication and transfer cases

LIFE RELICT

Flaw4LIFE

LIFE LINES

LIFE IMPETUS

Casal do Rei intervention area in Serra da Estrela
LIFE RELICT

LIFE RELICT | Conservation of priority Laurissilva habitat

Team in Cabeça, Serra da Estrela
LIFE RELICT

The Project

The **LIFE RELICT** project, coordinated by the **University of Évora (UÉvora),** aimed to **improve the conservation status of the Portuguese Laurel and the Pontic Rhododendron in mainland Portugal**. These are remnants of the Laurissilva, a priority habitat for conservation[2] in an adverse environment. Actions were carried out in Portuguese Laurel communities in **Serra da Estrela** (Cabeça and Casal do Rei) and **Serra do Açor** (Mata da Margaraça), as well as Pontic Rhododendron communities in **Serra de Monchique** (Foia), the most **represented** areas of this habitat in Portugal's **Natura 2000 Network**. The project, which included municipalities, a national association, and a Spanish research centre as partners, ran **from 2017 to 2023**.

To accomplish this, the project promoted a series of actions, including conservation actions (collecting and propagating vegetative material, improving and increasing the Portuguese Laurel and Pontic Rhododendron), dissemination (promoting nature tourism, awareness, education, and training), and monitoring (of the structure of the vegetation and the socioeconomic impacts and ecosystem functions).

The LIFE RELICT project was approached as an example of **good practices in the replication of results, which were carried out in other municipalities and in Spain.**

The case: Good Practices for Replication

The project is an example of how the LIFE Programme supports the improvement of habitat conservation. To accomplish this, the project produced and planted specimens of Portuguese laurel (*Prunus lusitanica*) and Pontic Rhododendron (*Rhododendron ponticum*), as well as selectively controlled species that did not belong to the habitat in the areas of operation.

[2] 5230* - Arborescent Communities of *Laurus nobilis*. Annex I to the Habitat Directive (92/42/EEC)

Control of non-habitat plants | LIFE RELICT

Following the fires that ravaged Serra da Estrela and Serra do Açor, an effort was made to create a project to **restore the plant communities** of Portuguese Laurel and Pontic Rhododendron. It was also intended to **enhance this plant heritage** so that the population would appreciate it and contribute to its preservation.

Prior to the events, the land was characterized in terms of biophysics, socioeconomics, and cartography. Based on these findings, an Operational Plan was developed, defining the actions to be implemented.

Since its inception, the project has been designed **to promote replication of its results**. Some actions were designed specifically for this aim, such as dissemination, environmental education, and technical training of technicians (including the ICNF), as well as the **identification and contact of the entities** capable of replicating it in other territories. This action was managed in collaboration with the Spanish partner CICYTEX, with the aim of replicating it in Spain.

According to Catarina Meireles (UÉvora), project manager, **interaction, and collaboration with municipalities** were crucial factors in the national-level replication. The **Spanish partner´s commitment** from the start of the project was also critical to its success, both in terms of plant propagation in the first phase and replication on Spanish territory. After the initiative, this partner and the Monchique municipal nursery **continued to produce plants**. It should also be noted that an old nursery in Seia has been restored and will continue with the production of native species in the future.

The Municipality of Monchique proposed incorporating several public properties into a local protected area to ensure their continued management.

In terms of difficulties encountered, the **lack of resources should be highlighted**, particularly in the case of some municipalities that were interested in carrying out the replication, as well as some difficulties related to the **propagation of the Pontic Rhododendron**, because plantations could not be made without the plants.

The public's receptivity was generally positive. Although some of the species removed had economic value (pine) but were difficult to exploit given their location, the action was considered positive as it contributed to the prevention of fires.

Additional Results

- The project team was invited to contribute to the **National Management Plans of 5 Special Areas of Conservation** (SACs). To learn more, see the factsheet on policy adoption;
- A guide of good practices **for the conservation of Laurissilva remnants** was created;

Regarding the **added value** of this project, Catarina Meireles states that no financial return was anticipated in its design, despite the fact that it featured measures aimed at **promoting nature tourism** to benefit the region (both economically and culturally). To accomplish this, two routes were created (integrated into the Via Algarviana) and audio guides were developed.

Rhododendron Route | LIFE RELICT

However, there were economic consequences from the **provision of indirect services**, with delayed returns. As an example, it mentions that the reconstruction of an old "*levada*" near one of the intervention areas also benefited the population (as a local heritage with cultural value was restored) and that some of the **native trees** planted are **of economic interest** (for example, strawberry tree), as well as highlighting the various **ecosystem services** provided (it is estimated, for example, that the reduction in the fuel load implied lower costs than those caused by the last fires in the intervened areas, with a relevant increase in the resilience of the wooded areas and a reduction of future fire risks).

To learn more about the project results, we recommend contacting the team directly or checking the project page using the contact details shown in the factsheet below.

Tips to remember:

- Utilize **existing resources,** including local initiatives.
- Don´t prepare overly ambitious measures.

Reflections

When asked what **she would do in the project´s design phase** to improve execution and promote replication, Catarina Meireles states that she would try to involve another Spanish partner who is more focused on enhancing these habitats. She also states that, while it is occasionally necessary to have additional funds to supplement its own financing and the LIFE Programme´s finances, it would have been prudent to include the potential of external contributions. She does, however, believe that we must do our best with the resources available. She also emphasises, as guidance to

other projects, that **the goodwill demonstrated by those who know the project**, even in the form of small actions without major costs and not anticipated in the application, can assist in achieving objectives.

Finally, she emphasises forming a **transnational consortium**, citing that the target habitat and species are widespread in the Mediterranean. Although managing a project with partners from multiple countries is more complex, the scope of the impact they enable is vastly different, both during and after the project.

The article was prepared by **Ana Santos, Ana Ferreira** and **Inês Bento (APA)** and **Isabel Lico (DDL),** based on an interview with **Catarina Meireles** (University of Évora), held on 10/07/2024, project page (liferelict.ect.uevora.pt), Layman's Report, and Final Project Report.

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LIFE RELICT (LIFE16 NAT/EN/000754) - ***Preserving Continental*** **Laurissilva** ***Relics*** Factsheet
Beginning: 01/10/2017 **Conclusion**: 30/04/2023

Approved Budget: 1 654 899 € **Executed Budget**: 1 459 210,21 € **LIFE Funding**: 1 219 078 € (73.66 %)
Project Coordinator: Professor Carlos Pinto Gomes (UÉvora)
Project Manager: Catarina Meireles (UÉvora)
Contacts: dpi@uevora.pt
Website: http://www.liferelict.ect.uevora.pt/
Coordinating Beneficiary: University of Évora
Associated Beneficiaries: ADRUSE - Associação de Desenvolvimento Rural da Serra da Estrela | Monchique City Council | Seia City Council | CICYTEX - CICYTEX - Centro de Investigaciones Científicas y Tecnológicas de Extremadura (ES)
Layman's Report: http://www.liferelict.ect.uevora.pt/wp-content/uploads/2023/11/E1.3_Laymans_Report_web.pdf

Summary of Results

LIFE RELICT **aimed** to **improve the conservation status** of two plant communities that are **remnants of the vegetation of the subtropical climate** of mainland Portugal's past - **Portuguese Laurel and Pontic Rhododendron** - classified by the EU as priority *habitat* for conservation.
As for the propagation of vegetative material, about 65 thousand plants were delivered to the nurseries of Monchique and Seia for use in actions to **improve and increase these habitats**. 2 **propagation manuals** were also produced (for native broadleaf species associated with these ecosystems and for species associated with Laurissilva forests).
To **improve the conservation status of the Portuguese Laurel in the Center-North**, selective control was carried out, removing species that were not part of the system: heliophilous vegetation, non-invasive alien species (pines) and species with great invasive power (*Acacia dealbata* and *Hakea sericea*); and **characteristic species were promoted** (by making directed plantations). To **reduce** the risk and speed of forest **fires**, measures were implemented to fragment the landscape and create buffer areas with native species. **1.2 km of "*levada*" were also restored** in the intervention area of Cabeça, in Seia, allowing for **the recovery of feed flows**.
To **improve and increase the Pontic Rhododendron in the South**, namely in the intervention areas in Foia (Serra de Monchique), a **selective control** of heliophilous vegetation and **promotion of characteristic species** was also carried out in areas of improvement of the habitat structure and increment areas (where the target habitat can occur naturally). For **fire protection**, selective control of eucalyptus trees was carried out, and the creation of buffer zones, recovering existing areas or planting native species.
Regarding dissemination, it is worth mentioning the more than **180 activities to promote nature tourism**, including pamphlets, traveling exhibitions and 34 thematic events, having reached about 22 thousand people. The most impactful are the **interpretive walking routes**, with audio guides in 2 languages. **80 environmental awareness and education activities** were also carried out in schools in Monchique and Seia, reaching about 200 people, mostly students. There were also **3 technical conferences** to train agents for the management of Laurissilva remnant habitats.
For more information, please refer to the Layman's Report.

Carrot with imperfections
FLAW4LIFE

FLAW4LIFE | Reducing food waste

Logistics | FLAW4LIFE

The Project

FLAW4LIFE, a project coordinated by **Fruta Feia CRL**, aimed to **reduce produce food waste that cannot be sold due to its appearance by developing an alternative market for rejected produce products and boosting public awareness about shifting consumption habits**. Due to the previous success of the pilot project, it duplicated the methodology and expanded locations, including **Lisbon** and **Porto**, as well as conducting a focused distribution effort among the various partners in the production and consumption chain. The "*Instituto Superior Técnico,"* an academic discipline at the University of Lisbon, and the Lisbon City Council collaborated on this initiative, which ran **from 2015 to 2018**.

The project promoted a series of actions, including replicating the consumption model (establishing new delivery points), monitoring environmental and socioeconomic performance, including the school community, and national and international dissemination.

This article discusses FLAW4LIFE project as an example of **good practices for replicating results.**

The Case: Good Practices for Replication

The project exemplifies how the LIFE Programme can assist with the **replication of an effective methodology to reduce food waste**. As a result, new box delivery points were established, an effective communication and dissemination campaign was launched, and the development of similar projects in other countries was actively promoted through mentoring actions.

In 2013, the Fruta Feia a non-profit consumers' co-op created a direct purchasing system from local producers for products rejected by large distribution chains due to their colour, size, or shape. This system also covers the assembly of boxes and subsequent sales to consumers at each delivery point.

As there was an interest from consumers and potential collaborators in joining this system, this project was created with the aim of establishing eight new delivery points in the national territory,

some of which are outside the Lisbon region, to reach more consumers and, in particular, reduce the number of products wasted annually.

These aims were not only achieved but also **exceeded**, with greater participation than expected, and consequently made it possible to avoid more waste than initially anticipated. The Fruta Feia network has been expanding, currently having sixteen delivery points.

Fruit and vegetables boxes | FLAW4LIFE

Thus, the project **was structured to encourage replication** of both the methods and their results. Isabel Soares (Fruta Feia), project manager, emphasises that replication at the national level was based on a **good idea** that had been demonstrated to be **effective** and **economically sustainable**. Having **extremely clear and defined objectives** in their application was also critical to their success.

Isabel also mentions that the LIFE Programme, due to its characteristics of supporting projects in the environmental area, provided an ideal foundation for the project concept.

The inclusion of the university and the municipality in the consortium gave strength to the project, allowing for better monitoring and dissemination.

A **good practice manual** was published, including guidelines and recommendations for a common consumption model, as well as indicating what institutions are required to conduct initiatives in similar circumstances in other countries.

At an international level, Imperfect Produce (USA), Fruta Imperfeita (Brazil), and Ugly'n'Good (Netherlands) collaborated to facilitate replication.

To acknowledge Fruta Feia's mentoring, a **logo** ("powered by Fruta Feia") was created and is used when a similar project is successfully implemented under the guidance of Fruta Feia.

In terms of challenges, only minor issues, such as the location of distribution points, proved to be impractical, although there was still potential for improvement.

Additional Results

- This project produced significant **added economic value** results. For more information, see the corresponding Factsheet);
- The project used **communication and environmental information campaigns** to raise awareness and promote conversation about food waste caused by product appearance;

Communication campaign | FLAW4LIFE

- The FLAW4LIFE project had no direct impact on policy uptake, as regulation does not prevent the consumption of fruits or vegetables based on their physical appearance, because this is a behavioural issue as well as a consumer 'aesthetic' preference. However, the discussion may have indirectly led to a reduction in the number of products regulated based on their appearance;

- Local authorities can use a **sustainable consumption guide** to support their local producers;

- Fruta Feia joined the National Commission to Combat Food Waste, which supported the development of the **National Strategy and Action Plan to Combat Food Waste**.

To learn more about the project results, we recommend contacting the team directly or checking the project page using the contact details shown in the factsheet below.

Tips to remember:

- Have **well-defined objectives**, based on clear ideas and mature starting points;
- Be **proactive** so that your ideas are heard in the design of policies;
- Publish and disseminate a **manual of good practices** to encourage replication of innovative models **globally**;
- Create a **logo/seal** to guarantee the **identity** of the project **concept**.

Reflections

The undeniable success of implementing this project was recognized in 2020 with the LIFE Award for Environment, which is awarded annually to the most innovative and effective projects in the environmental, economic, and social sectors. In the same year, it received the LIFE Citizen's Award, which is awarded to the public's favourite project.

When asked about potential improvements to the project´s design phase to improve its execution and promote its replication, Isabel Soares responded that no modifications would be required given the project´s success and previous experience in the 'pre-LIFE' phase.

Isabel advocates a proactive approach to policy formulation as a good practice for future projects.

The article was prepared by **Inês Cristóvão**, **Ana Ferreira** and **Inês Bento** (APA) and **Isabel Lico** (DDL), based on an interview with **Isabel Soares** (Fruta Feia CRL) carried out on 12/07/2024, cooperative page (frutafeia.pt) and Layman's Report.

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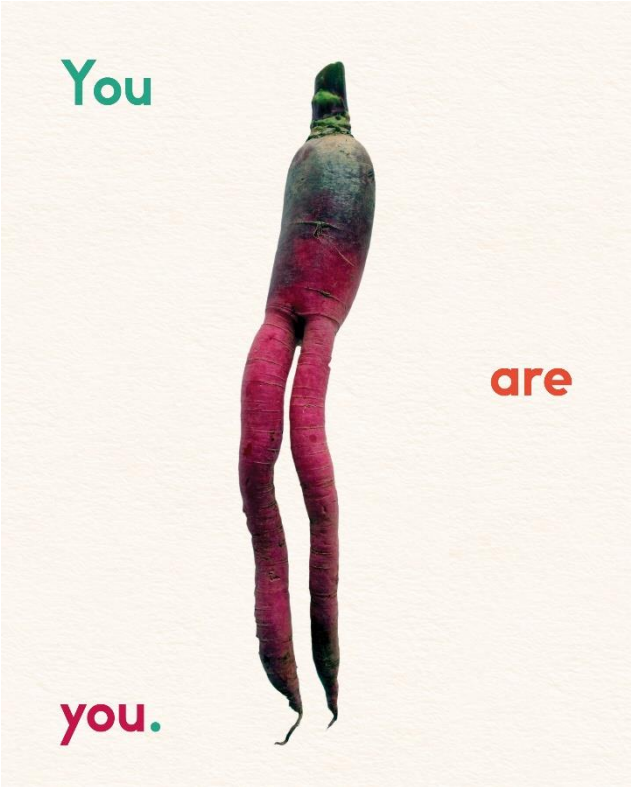

Fruta Feia Postcard | FLAW4LIFE

FLAW4LIFE (LIFE14 ENV/PT/000817) - **Spreading ugLy Fruit Against food Waste Factsheet**
Start: 14/09/2015 **End:** 13/09/2018
Approved Budget: 534 336 € **Executed Budget**: 472.892 € **LIFE financing**: 320 600 € (60 %)

Project Manager: Isabel Soares (Fruta Feia)
Contacts: https://frutafeia.pt/pt/contacto
Coordinator Website: https://frutafeia.pt/pt
Coordinating Beneficiary: Fruta Feia CRL
Associated Beneficiaries: Instituto Superior Técnico | Câmara Municipal de Lisboa
Layman's Report available in: https://webgate.ec.europa.eu/life/publicWebsite/project/LIFE14-ENV-PT-000817/spreading-ugly-fruit-against-food-waste

Summary of Results

FLAW4LIFE aimed to **replicate Fruta Feia's already applied methodology to combat food waste due to the appearance of products** throughout the national territory, as well as disseminate this model nationally and internationally.
Eight- new delivery points for fruit and vegetable boxes were opened in **Lisbon** and **Porto**. The results of the Fruta Feia pilot project were increased from 3 to 11 delivery points, from 750 to **3410 associated consumers**, from 49 to **157 farmers**, and from 3.3 to **14.6 tons of waste avoided per week**.
Several awareness-raising activities were organised within the school community, including the "**Ugly but Tasty**" competition, which resulted in the publication of a **book of stories** about food waste written by students.
The **dissemination** was made using press articles, television reports, scientific articles and conferences, and in a more targeted way through the presentation of the project on platforms and events related to food waste, circular economy, innovation and sustainability. To raise awareness among the general public, a promotional video was released.
To support the replication of the methodology, we highlight the development of a **guide for sustainable consumption**, aimed at local authorities, and the **support** provided to the implementation of **similar projects in other countries**.
For more information, we suggest consulting the Layman's Report.

EN4 Road
LIFE LINES

Joaquim Pedro Ferreira

LIFE LINES | Reducing the impacts of linear infrastructures on biodiversity

Open Day Visit | LIFE LINES

The Project

LIFE LINES is a project coordinated by the **University of Évora (UÉvora)**, aimed to test, evaluate, and disseminate measures to **mitigate the negative effects of linear infrastructures (such as roads, railways, and power lines) on flora and fauna**. Additionally, it has promoted the creation of a Green Infrastructure to support the increase and conservation of biodiversity, alongside the aforementioned linear infrastructure, with its area of operation (Central Alentejo) being an important transport and energy corridor between Portugal and Spain. This took place between 2015 and 2021, and its range of partners included universities, municipalities, national companies, and non-governmental organizations at local and national levels.

The project promoted a set of measures, including **support actions** (the creation of a greenhouse to produce native species; remote sensing to discover and identify invasive plants; development of monitoring, and deterrence prototypes to keep animals away from high-risk regions); **conservation actions** (the implementation, development, and evaluation of solutions to minimize mortality due to road accidents and the barrier effect on roadways, as well as, to minimize mortality due to collision and electrocution on medium-voltage power lines; promotion of biodiversity in ecosystems connected with linear infrastructures), **monitoring actions** to assess the efficiency of the measures, and **actions to promote awareness and the dissemination** of the results to various target groups.

The LIFE LINES project´s methodology was utilized as an example of **good practices in replicating its results, and the solutions developed were implemented not only in other areas of Portugal but also abroad**.

The Case: Good Practices for Replication

The project demonstrated that **with the support of the LIFE Program, new effective practices can be developed and implemented to reduce the impact of infrastructure on biodiversity (mortality and barrier effect on the movement of species), improving its conservation**. It also helped to raise public awareness and support the control of the invasive flora.

More specifically, the project led to the **installation of novel types of bird roosting deterrent devices on medium-voltage power lines, structures to protect wildlife from being run over on roadways while increasing landscape connectivity, and micro biodiversity reserves**.

António Mira, project coordinator (UÉvora), **emphasised the necessity of stakeholder involvement, specifically those responsible for the infrastructures, given their active and vital role in the executing of the proposed measures.** By them becoming partners in the project, actions were incorporated into the application´s design, causing them to incorporate the project´s measures in their operations (for example, by adhering to the established good practices and implementing solutions developed when drafting contracts or building new infrastructures), ensuring future and sustainable replication of the results.

Thus, in the case of E-REDES, the **newly designed lines were installed even after the project was completed.** Portugal's infrastructure had already included conditions in its road maintenance contracts that were consistent with the project's aims, and the project **strengthened this practice by putting LIFE LINES specifications in the contracts**, which continued to be applied. The scale of these enterprises' operations will allow for more **widespread replication over the national territory**, beyond the initial area. New medium-voltage electricity lines are currently being built around the country, as well as **internationally** by other corporations.

Traffic sign: Hazard warning for amphibians
LIFE LINES

The identification of a set of problems (reduction in connectivity, mortality and infrastructure barrier effect; mortality by electrocution; lack of refuges and corridors; scarcity of information for management; dissemination, detection, and control of invasive flora) resulted in the design of this project, which brought together a group of entities related to the problem and with common goals to solve.

The work developed was based on the knowledge of the project area's fauna and flora gained through years of data collection on species distribution and mortality in the existing infrastructure, as well as connectivity maps for

some target species prepared based on their movement and/or habitat preference/use.

For replication purposes, António Mira stated that communication and dissemination of results were critical to success, which is why several workshops were held for a set of predefined target audiences, who were identified as being interested in the topics covered, promoting dissemination, and the use of the project results within the context of their professional activities. **Four good practice guides** were also created to aid replication: monitoring and recording data on wildlife mortality caused by roadkill; vegetation management for biodiversity promotion in linear infrastructures; solutions to reduce the impact of roads on wildlife; and the Horizontal Eco Conveyor, an innovative solution to reduce bird mortality on medium-voltage power lines.

The most difficult obstacle in establishing replication was **ensuring the timely involvement of all stakeholders**. In other situations, this precluded them from joining the coalition. However, this dilemma was resolved by inviting them to join the project as collaborators who supported the actions developed. This support was effective, and the entities not only played an active role even though they were not beneficiaries (notably contacts with owners made by REN and testing of a new type of horizontal conveyor belt designed by E-redes in collaboration with Quercus), but they also **continued to apply the solutions developed** after the project concluded.

Furthermore, it was difficult to determine the exact final **expenses** from the start of the project, which occasionally prevented the employment of more complex technologies that would have cost more.

There were also challenges in implementing a new traffic sign warning for amphibian crossings, which may be used in other areas. In reality, there was minimal initial public acceptance, necessitating a more intense and targeted communication campaign to explain the project's purpose and role in the LIFE Programme.

Additional Results

- Despite not being mentioned in the application, the initiative had an impact on **policy adoption**. With the publishing of Regulatory Decree No. 6/2019 on October 22, the **Hazard Warning Signal** "A19d – Anfíbios" was officially accepted into the national Traffic Code, with the objective of alerting drivers to the likelihood of amphibious creatures crossing the road.

- On a non-legal level, the project results were **included in the internal regulations** of "Infraestruturas de Portugal, I.P." In this regard, it is also worth noting that there were certain challenges in controlling plants on roadsides to enhance biodiversity. Although national legislation allows for the possibility of not cleaning the road berms for conservation purposes, the 2017 fires and the subsequent focus on prevention

made it harder to acquire authorization from official entities to not remove the vegetation from the road berms. To support the decision, the project created, in collaboration with the Intermunicipal Community of Central Alentejo, a **" Proposal for ecological solutions to promote biodiversity on roadside berms"** in the Alto Alentejo region, where fire and traffic intensity play a role in defining vegetation management along the road berms. The project provided **educational training** on this topic, and these actions were well received.

- Among other project results, we can highlight the public awareness campaign on the impact of linear infrastructures on biodiversity (including the environmental education program **'Adopt a Road'**) and citizen participation in the collection of the data (via the **LIFELINES app**, which contributes records to **the National Road Traffic Accident Database** created within the scope of the project) as well as conservation actions (i.e., volunteering).

Tips to remember:

- Choose partners with the capacity to implement the proposed measures and replicate their application;
- Contact the entities that started the project design.

To learn more about the project results, we recommend contacting the team directly or checking the project page using the contact details shown in the Factsheet below.

Reflections

When asked if he would change anything about the project design phase presently, so that it is easier to execute and replicate, António Mira replied he would include **invasive plant experts** on the team, as a lack of understanding on the subject hampered some of the activities taken. He also scrutinized the **duration of the contracts** with businesses that maintain the highways. Given that its effectiveness depends on the continuity of interventions over time, its effectiveness post-LIFE may have been compromised after the contract expired.

Overall, he emphasises the importance of contacting the entities well in advance, given that due to the time required to establish the partnership, ultimately, some of the entities simply became collaborators.

Despite the challenges, which were mostly overcome successfully, the LIFE LINES project resulted in undeniable benefits for the targeted species and habitats, including significant reductions in animal mortality and the promotion of ecological connectivity, which contributed to increased biodiversity.

Finally, in terms of action continuity, not only were they continued and replicated after the conclusion of the project, but it is also worth noting that one of the project's collaborator, REN, ended up encouraging biodiversity research following the work developed in order to ensure its continuation.

The article was prepared by **Vanda Pereira**, **Ana Ferreira** and **Inês Bento** (APA), based on an interview with **António Mira** (Universidade de Évora), and on the project's web page (lifelines.uevora.pt), Layman's Report and Final Project Report.

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LIFE LINES (LIFE14 NAT/PT/001081) - ***Linear Infrastructure Networks with Ecological Solutions*** Factsheet

Started: 01/08/2015 **Concluded:** 31/05/2021

Approved Budget: 5 540 485€ **Budget Executed**: 5 212 861€ **Financed by LIFE**: 3 127 716€ (60 %)
Project Coordinator: António Mira (UÉvora)
Contacts: amira@uevora.pt
Website: https://lifelines.uevora.pt/
Coordinating Beneficiary: Universidade de Évora
Associated Beneficiaries: Infraestruturas de Portugal S.A. | Câmara Municipal de Évora | Câmara Municipal de Montemor-o-Novo | MARCA - Associação de Desenvolvimento Local | Quercus - Associação Nacional de Conservação da Natureza | Universidade de Aveiro | Faculdade de Ciências da Universidade do Porto

Layman´s Report: https://lifelines.uevora.pt/wp-content/uploads/2022/03/LaymansReport_LLines_PT_vfinal.pdf

Summary of Results:

The **LIFE LINES** has implemented a large number of solutions **to mitigate mortality due to road accidents and reduce the barrier effect**, including the installation of permanent concrete barriers or removable canvas barriers associated with specific passages for amphibians; the adaptation of hydraulic passages with walkways; vertical signage warning of amphibian passage; light reflectors and net barriers for bird flight elevation; fences with complementary "L" shaped netting or progressive mesh netting; and rabbit deterrent nets. These measures have dramatically **reduced roadkill-related mortality rates in amphibians, birds, and bats**, while mortality rates in owls have also decreased, significantly. Globally, 14 out of 20 bird species and 2 mammal species have increased in abundance. The **ecological connectivity increased** significantly.

Regarding solutions to reduce mortality on power lines, **the support structure developed for medium-voltage power lines** (ECO-HAL A2S) was **extremely effective in reducing mortality due to electrocution**. Perching deterrent devices on power line supports for medium and big birds have shown promise but still require modification.

To improve biodiversity, the project contributed to **reducing the area occupied by invasive exotic plants in the intervention sites by 36%**. At the same time, it contributed to **increasing floristic diversity** using seed mixtures it developed and the **micro reserves** created by planting and sowing native plants that benefited animal communities.

The intervention area, which included these actions, is located in Central Alentejo and covers 210,000 ha.

The Youth Volunteer Program and the Environmental Education and Awareness Program 'Adopt a Road' stood out as ways to enhance public awareness, among other communication initiatives. Events and best practice guides were among the initiatives aimed at professionals in the area.

Finally, the project's tools are highlighted: the creation of a **National Database of Road Traffic Accidents** to record data; the development of the **LIFE LINES app**, which allows users to contribute records; and the prototype for automatic roadkill detection using **Mobile Mapping Systems** (MMS3).

For more information, see the Layman´s Report.

LIFE IMPETUS | Improving the current barriers to the control of pharmaceutical compounds in WWTP

WWTP of Faro Noroeste | LIFE IMPETUS

The Project

LIFE IMPETUS was coordinated by the **Laboratório Nacional de Engenharia Civil (LNEC),** which led a consortium of Portuguese partners. The project ran between January 2016 and December 2019.

The overall objective of the project was **to demonstrate realistic measures for improving the pharmaceutical compounds (PhCs) removal in urban wastewater treatment plants (WWTP) using traditional activated sludge treatment with low investment and energy consumption**.

To achieve its overall objective, easily implementable technical solutions **were tested in two Portuguese wastewater treatment plants located in water-scarce regions (Greater Lisbon and Algarve),** which included: i) strategies to optimize the operating conditions of the biological treatment using benchmarking tools and ii) the addition of powdered activated carbons to the biological reactor. In addition, the project enabled: the **comparison of new adsorbents, produced from local plant waste**, with commercial products; the creation of a **guide with recommendations for improving the removal of pharmaceutical compounds (PhCs) in conventional WWTPs** (minimizing operating costs and ensuring energy efficiency); the consortium´s (and stakeholders´) **capacity building** in drug monitoring; **as well as the production of knowledge** valuable for water resource protection and environmental policy related to developing pollutants of concern.

In this sense, the **IMPETUS project** configures a **good practice of replication, transferability, and uptake,** considering that the results obtained were widely achieved with regard to **new products, methods, and tools developed**, as well as **new knowledge and good practices on the occurrence and control of pharmaceutical compounds (PhCs)** in WWTP, on microbial resistance in raw and treated

wastewater, and drugs in the receiving media. **These results have a substantial demonstration value and tremendous potential for replication, as activated sludge is the most often utilized biological process in urban wastewater treatment plants in Portugal and around the world.**

The Case: Good Practices for Replication and Transfer

The increasing use of drugs by a growing and aging population ensures their presence in urban wastewater is inevitable.

Testing | LIFE IMPETUS

If WWTPs are unable to manage the discharge of these compounds, their presence in water bodies will be unavoidable, affecting the biota and/or leading to build-up in the food chain. If these sources of water are used to produce water for human consumption, pharmaceuticals may be present in drinking water. As previously stated, drugs have been detected in urban wastewater, both before and after treatment in WWTPs, as well as in surface and groundwater in recent years. WWTPs are therefore critical barriers against the introduction of pharmaceuticals into the aquatic environment. The removal of pharmaceuticals in WWTPs varies greatly, depending primarily on the type of compounds, their physicochemical properties, and the treatment technology. This diversity allowed us to conclude that there was opportunity for improvement in treatment barriers and drug control in conventional WWTPs. LIFE IMPETUS focuses on enhancing the major processes of PhCs removal in urban wastewater treatment plants, which are biodegradation/biotransformation and adsorption to particles and sludge, LIFE IMPETUS focused on improving these mechanisms through the following actions:

- Operational strategies to improve the performance of the most often utilized biological treatment (activated sludge);
- Addition of powdered activated carbon to improve the removal of recalcitrant (non-biodegradable) compounds;

Maria João Rosa, project coordinator, emphasised the significance of this project in both the national and European context. **LIFE financing has enabled the development of new products, methods, and tools,** including:

- **Procedures for quantifying pharmaceutical compounds (PhCs) in wastewater, sludge and clams**;
- A **performance evaluation system** for identifying, evaluating, and monitoring WWTP improvement strategies based on

resource effectiveness, reliability, and efficiency (sludge and energy).

Good practices were also **proposed, and new knowledge was gained**, including on:

- Pharmaceuticals found in WWTPs vary by capacity and climatic conditions (temperature and precipitation);
- Bacterial resistance to antibiotics, with nearly 7,000 resistant colonies isolated in raw and treated wastewater;
- The bioaccumulation of PhCs in clams, an important product in the local economy of the Algarve, Ria Formosa region, and other regions of Europe;
- Operational improvement and treatment strategies with activated carbon were tested on a pilot and/or real scale in two WWTPs with varying capacity, representing different realities (Beirolas, 45000 m^3/day and Faro Noroeste, 4500 m^3/d);
- Conducted cost-benefit analysis (CBA) of the solutions studied such as direct and indirect costs as well as benefits.

To improve replication and transfer, a technical guide was written: ***Technical Guidelines for Improved Control of Pharmaceutical Compounds in Urban Activated Sludge WWTPs***, which compiled the essential state of the art, objectives, and results of the project, converting them into recommendations of good practice for the sector-managing and regulatory entities of wastewater systems and services in Portugal, in Europe, and around the world.

Powdered Activated Charcoal
LIFE IMPETUS

Additional Results

Obtaining a **new high-performance powdered activated carbon (PAC) produced from pine nut shell waste was a result that exceeded initial expectations**. This new product outperformed the best commercial products tested for adsorption of recalcitrant drugs and is "more environmentally friendly": its precursor (raw material) is a renewable plant waste (not a bituminous precursor), physically activated (rather than chemically activated bituminous coals), and thus has a lower environmental impact.

Given these characteristics, it piqued the interest of the scientific community and the activated carbon industry, and a collaboration was established with the company Sigma-Aldrich of Merck (Germany) through its hub in Pennsylvania, USA. This PAC, as well as the mathematical adsorption model developed to support the design and operation of its industrial application, received the 2019 WEX Global Award for "Innovation in Technology."

Pine nut bark | LIFE IMPETUS

The success of these results and the LNEC-FCUL-Sigma/Aldrich partnership gave rise to the **FCT-funded project EMPOWER+ (2020-2024), which has contributed to the replication and transfer of LIFE IMPETUS results, expanding the range of coals, applications and target contaminants**, namely, (i) finer powdered coals, with better kinetics and, therefore, even better performance, (ii) magnetic PACs, which can be recovered and regenerated (minimizing the less favourable aspects of conventional CAP application), (iii) granulated carbons, for use in filters–more advantageous for regular application (compared to PACs for sporadic/seasonal application)–in full-scale WTPs or in domestic filters, (iv) advanced treatment of water for human consumption to control (v) drugs, but also organic matter in the water (precursor of chlorine disinfection by-products), pesticides, cyanotoxins (microcystins), compounds that give colour and flavour to water, and residual chlorine (organoleptic correction – flavour).

Another hurdle overcome in the LIFE IMPETUS project was the proposal of **a drug classification matrix, based on four classes** (from A-easily removed to D-recalcitrant), to expeditiously interpret and predict the potential level of drug removal in urban wastewater treatment plants using activated sludge. This matrix serves as the foundation for the ***CEC ForecasTool***, which is presently being developed as part of the **LIFE FITTING (https://lifefitting.lnec.pt/) project**, coordinated by LNEC and in collaboration with TRATAVE and the Universidade Católica do Porto.

It should be emphasised, as results of the LIFE IMPETUS project:

- The proposal of a **bioindicator for the bioavailability for PhCs in actual water environments** (species *Ruditapes decussatus*);
- Exceeded **stakeholders'** expectations in terms of awareness and involvement, as well as significant website traffic as well as visits to the project's website (which continues to this day);
- Four new permanent green jobs were created.

Tips to remember:

- Promote stakeholder activities from the start of the project;
- Develop good communication;
- Promote training actions.

To learn more about the project results, we recommend contacting the team directly or

checking the project page using the contact details shown in the Factsheet below.

Replication and Transferability Support

There was no obligation for a specific action/WP for "replication and transfer" when the LIFE IMPETUS application was submitted in 2015, as there is in the current version of the LIFE program. Thus, these aspects were considered:

- Stakeholder activities include collaborative workshops with a panel of **stakeholders**, seminars including the project's advisory board (relevant entities in the water sector) and participation in **networking activities**;
- Communication and dissemination activities include **project website** (including its maintenance and updating during and after the project), brochures and leaflets, organization of technical visits to pilots, news in technical publications of the sector, realization of training actions, participation and presentation of communications in over fifty national and international congresses, production of scientific articles (more than fourteen) and book chapters (two); development of technical guide as well as organization of international final conference;
- After-LIFE **Plan**;
- Developed a Replication and Transfer Plan (*LIFE IMPETUS Replicability and Transferability Plan*), outlining dissemination, replication, and transfer strategies to maximize project results. To maximize the project´s impact, the plan was created early in (2016); to enhance its impact, it was modified twice (2018 and 2019).

Reflections

Maria João Rosa, Catarina Silva, and Margarida Campinas reported challenges in attaining replication and transfer objectives, mostly due to the lack of stimulation for controlling micropollutants in WWTPs. In particular, they highlight aspects such as the lack of legislation at the time of the project, the limitation of the CAP production in Europe (production has been relocated to other continents), the sector´s reduced proactivity to innovate in treatment (some resistance to change), and the reduced commercial supply for the analysis of drugs and other micropollutants.

They believe that the LIFE programme should support more (and at a higher rate of financing) developments/capacity building in the management and operation of treatment systems rather than just product development (technologies and computer applications), particularly for projects that aim to support the implementation of water policies, such as is the case of the new Urban Wastewater Directive.

Maria João Rosa suggests that if the project had been designed today, they would have expanded the consortium and “test geography” to include other countries. However, this option is not feasible within the budget of the LIFE projects due to the experimental effort, including

but not limited to the transportation of samples and the cost of analyses. They would have also expanded the application range, collaborating with WWTP on other variants of activated sludge, other advanced treatment technologies (e.g., ozonation), other raw wastewater matrices (including those from industrial inflows), and other pharmaceutical compounds and other micropollutants (e.g., those of the new UWWD).In fact, these features, as well as an increase in capacity-building activities, have already been included in the **LIFE FITTING project, which runs from 2023 to 2025**.Finally, given the success achieved in expanding the network of partnerships and attracting subsequent R&D projects aimed at advancing knowledge and good practices (EMPOWER+ and LIFE FITTING directly, H2020 B-WaterSmart indirectly), which also allow co-financing part of the **LIFE IMPETUS after-LIFE** actions, the team emphasises and suggests the usefulness of providing a way for LIFE itself to finance **post-LIFE activities**. As a good practice for additional projects, it is recommended to use a proactive approach to getting ideas heard in policy design.

To accomplish this, it may be imagined that a sum of money for a period of one to three years post-project would be paid as a reward, attributed to initiatives that exhibited, as was the case here, extraordinary results.

This article was prepared by **Isabel Lico** (Desafio das Letras), based on an interview with **Maria João Rosa, Catarina Silva, Margarida Campinas (LNEC)** held on 24/05/2024, Final Report and Layman's Report.

life.capacitacao@apambiente.pt | apambiente.pt/programa-life

LIFE IMPETUS (LIFE14 ENV/PT/000739) - ***Improving current barriers for controlling pharmaceutical compounds in urban wastewater treatment plants*** Factsheet
Start Date: 01/01/2016 **End date:** 31/12/2019 (2-year extension)

Approved Budget: 1,425,987 € **Executed Budget**: 1,492,452 € **LIFE Funding**: 855,589 € (60 %)
Project Manager: Maria João Rosa (LNEC)
Contacts: mjrosa@lnec.pt
Website: http://life-impetus.eu/
Coordinating Beneficiary: LNEC – Laboratório Nacional de Engenharia Civil
Associated Beneficiaries: UALG – Universidade do Algarve | FFUL – Faculdade de Farmácia da Universidade de Lisboa | EHS – Environment and Regional Development Consulting, Lda., Portugal. | AdTA – Águas do Tejo Atlântico, S.A.| AdA – Águas do Algarve, S.A. | EPAL – Empresa Portuguesa das Águas Livres, S.A. | FCUL – Faculdade de Ciências da Universidade de Lisboa

Summary of Results

Technical solutions to improve the removal of pharmaceutical compounds (drugs) in urban wastewater treatment plants (WWTPs) with conventional activated sludge (AS) treatment. The solutions proved to be easily implemented in the current WWTP-AS and adjustable to wastewater quality variations, with low investment, low energy consumption and using renewable ecomaterials. The project team implemented two innovative technical solutions: i) operating strategies to enhance biological treatment for PhC removal, and ii) addition of powdered activated carbon (PAC) to the biological reactor, using eco-friendly adsorbents, to control recalcitrant PhCs. Extensive monitoring and field testing was conducted in two Portuguese CAS-WWTPs of different sizes and CAS reactor types: Beirolas WWTP, near Lisbon, discharging into the Tagus River, ca. 50 000 m3/d (anaerobicanoxicoxic process); and Faro NW WWTP, in Faro (Algarve), discharging into Ria Formosa lagoon, 5 000 m3/d (oxidation ditch type). Up to 908 wastewater (and 72 sludge) samples were analysed for twenty-four PhCs/hormones found in wastewater. 150 clam samples were also analysed in the Algarve to assess PhC bioaccumulation. The clam species Ruditapes decussatus was found to be a suitable bio-indicator of PhC bioavailability in water environments.

Several compounds were shown to be below their quantification limit at the WWTPs inlets, others presented intermediate and variable removals, but two compounds (carbamazepine and diclofenac) were found to be recalcitrant with almost unchanged concentrations. To assess the impact of adding PAC to the biological reactor, two doses (10 and 25 mg/L) were applied to Faro NW WWTP. With 10 mg/L, a decrease in most compounds was obtained, most noteworthy high reductions of the antibiotics erythromycin, sulfamethoxazole and sulfapyridine, of atenolol and other beta-blockers, and of carbamazepine and diclofenac (the latter two hardly eliminated without PAC addition). With 25 mg/L, the results generally pointed to greater PhC reduction and higher reliability.

These results, including a cost-benefit analysis, demonstrated improved control of PhCs in conventional wastewater treatment, with little additional cost investment, energy consumption or indirect greenhouse gas (GHG) emissions. In fact, costs of PAC addition to bioreactor are lower than those of technology-intensive solutions (e.g. PAC, GAC, ozone, and membrane post-treatments) particularly for low plant capacity. In turn, by maximising energy efficiency and improving treated water quality, cost savings potential from CAS-operation improvement (related with WWTP discharge fee) amounted to 5 854 /year in Beirolas and 2 069 /year in Faro NW WWTPs.

Environmental and health benefits derive from the improved removal of PhCs, and the production of improved treated water quality, including water colour, turbidity, transmittance and organic matter. In terms of social benefits, the project trained technicians and helped create jobs, contributing to better informed professionals involved in water and PhCs decision-making and education. During the project, six qualified workers were hired, four of which resulted in permanent positions.

Specific contributions have already been provided to be included in EU policy on water protection and water reuse. The project knowledge on emerging contaminants and safe control barriers is influencing the Portuguese position with respect to the ISO wastewater reuse standards. Besides, in the LIFE Waste-Water Treatment Platform Meeting, the project team shared their findings and outcomes with industry and key players in EU water policy, responsible for the ongoing revision of the EU Urban Wastewater Treatment Directive (UWWTD).

The project outcomes have good demonstration value and huge replicability potential, as activated sludge (CAS) treatment is the most common biological process in urban WWTPs in Portugal and worldwide. The project beneficiaries produced technical guidelines, comprising best practices and lessons learned. An important unexpected project result was the production of a new pine nut shell-derived, physically activated PAC, which outperforms the best commercial PAC tested and is already under pre-industrial production. This new pine nut shell-derived PAC provides an opportunity for companies, including Millipore/Sigma, to develop green activated carbons from local vegetable wastes.

ECONOMIC VALUE

The economic value associated to LIFE projects:

Direct

Associated with the introduction of a new product or service in the market, the development of new patents and other forms of intellectual property, and the improvement of manufacturing process effectiveness and cost reduction.

Indirect

The value chain recognizes differentiating characteristics, such as talented teams, innovation, disruption, proactivity, etc.

Added Economic value cases

Flaw4LIFE

LIFE GreenShoes4All

Fruit and vegetable boxes
FLAW4LIFE

FLAW4LIFE | Reducing food waste

"Ugly" potato | FLAW4LIFE

The Project

FLAW4LIFE, a project coordinated by **Fruta Feia CRL**, aimed to **reduce produce food waste that cannot be sold due to its appearance by developing an alternative market for rejected produce products and boosting public awareness about shifting consumption habits**. Due to the previous success of the pilot project, it duplicated the methodology and expanded locations, including **Lisbon** and **Porto**, as well as conducting a focused distribution effort among the various partners in the production and consumption chain. The *Instituto Superior Técnico,* an academic discipline at the University of Lisbon, and the Lisbon City Council collaborated on this initiative, which ran **from 2015 to 2018**. The project promoted a series of actions, including replicating the consumption model (establishing new delivery points), monitoring environmental and socioeconomic performance, including the school community, and national and international dissemination.

The case study discussed FLAW4LIFE project as an example of a **case of added economic value.**

The Case: Added Economic Value

The project exemplifies how the LIFE Programme supports **implementation of an effective and economically viable methodology to reduce food waste**. As a result, new box delivery points were established, an effective communication and dissemination campaign was launched, and the development of similar projects in other countries was actively promoted through mentoring actions.

In 2013, the Fruta Feia a non-profit consumers' co-op created a direct purchasing system from local producers for products rejected by large distribution chains due to their colour, size, or shape. This system also covers the assembly of boxes and subsequent sales to consumers at each delivery point.

Because there was interest from consumers and potential collaborators in joining this system, this project was developed with the aim of opening eight new delivery points throughout the

national territory, some of which are located outside the Lisbon region, in order to reach more consumers and to reduce the number of products wasted annually.

Fruit and vegetable boxes | FLAW4LIFE

These goals were not only met but also **exceeded**, thanks to higher engagement, allowing us to eliminate more waste than initially anticipated. The Fruta Feia network is expanding, with 16 delivery points now in operation.

FLAW4LIFE was designed with added economic value in mind, as it was a **close-to-market** project that assisted in the commercialization of Fruta Feia, a circular economy solution. Isabel Soares (Fruta Feia), project manager, states that, to this aim, the **economic sustainability** of the model devised was critical, noting that the assembled network no longer required additional financing.

The created consumption model is based on a rationalized supply chain that does not waste natural or energy resources: products are exclusively seasonal and produced close to the point of sale; the transportation system is optimized; transport boxes and bags are reused; there is no product storage; and surpluses are donated.

Thus, the productivity of the One hundred and eighty-seven producers who participated increased in 2018, preventing the waste of 14.6 tons of fruit and vegetables per week, with an economic worth of €5,486 per week or €2,633,280 per year for farmers.

The FLAW4LIFE project enabled the creation of eight new full-time jobs and eight new local coordinators, all with permanent employment contracts.

Additional Results

- This project was effective in **replicating results** (see corresponding case study);
- The project used **communication and environmental information campaigns** to raise awareness and promote conversation about food waste caused by product appearance;
- The FLAW4LIFE project had no direct impact on policy uptake, as regulation does not prevent the consumption of fruits/vegetables based on their physical appearance, because this is a behavioural issue as well as a consumer 'aesthetic' preference. However, the discussion may have indirectly led to a reduction in the number of products regulated based on their appearance;

- Local authorities can use a sustainable **consumption guide** to support their local producers;

Distribution | FLAW4LIFE

- A **good practice manual** was published, including guidelines and recommendations for a common consumption model, as well as indicating what institutions are required to conduct initiatives in similar circumstances in other countries;

- Fruta Feia joined the National Commission to Combat Food Waste.

To learn more about the project results, we recommend contacting the team directly or checking the project page using the contact details shown in the Factsheet below.

Reflections

The undeniable success of implementing this project was recognized in 2020 with the LIFE Award for Environment, which is awarded annually to the most innovative and effective projects in the environmental, economic, and social sectors. In the same year, he received the LIFE Citizen's Award, which is awarded to the public's favourite project.

Tips to remember:

- Have **well-defined goals**, based on clear ideas and mature starting points for entrepreneurship;
- Ensure the **economic sustainability of the business model**, through the application of circular economy principles, following a logic of efficiency and process optimization.

When asked about potential improvements to the project design phase to improve its execution and promote its replication, Isabel Soares responded no modifications would be required given the project success and previous in the 'pre-LIFE' phase.

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The article was prepared by **Inês Cristóvão**, **Ana Ferreira** and **Inês Bento** (APA) and **Isabel Lico** (DDL), based on an interview with **Isabel Soares** (Fruta Feia CRL) carried out on 12/07/2024, cooperative page (frutafeia.pt) and FLAW4LIFE project Layman's Report.

life.capacitacao@apambiente.pt | apambiente.pt/programa-life

FLAW4LIFE (LIFE14 ENV/PT/000817) - ***Spreading ugLy Fruit Against food Waste*** Factsheet
Start: 14/09/2015 **End:** 13/09/2018

Approved Budget: 534 336 € **Executed Budget**: 472.892 € **LIFE financing**: 320 600 € (60 %)
Project Manager: Isabel Soares (Fruta Feia)
Contacts: https://frutafeia.pt/pt/contacto
Coordinator Website: https://frutafeia.pt/pt
Coordinating Beneficiary: Fruta Feia CRL
Associated Beneficiaries: Instituto Superior Técnico | Câmara Municipal de Lisboa
Layman's Report available in: https://webgate.ec.europa.eu/life/publicWebsite/project/LIFE14-ENV-PT-000817/spreading-ugly-fruit-against-food-waste

Summary of Results

FLAW4LIFE aimed to **replicate Fruta Feia's already applied methodology to combat food waste due to the appearance of products** throughout the national territory, as well as disseminate this model nationally and internationally.
8 new delivery points for fruit and vegetable boxes were opened in **Lisbon** and **Porto**. The results of the Fruta Feia pilot project were increased from 3 to 11 delivery points, from 750 to **3410 associated consumers**, from 49 to **157 farmers**, and from 3.3 to **14.6 tons of waste avoided per week**.
Several awareness-raising activities were organised within the school community, including the "**Ugly but Tasty**" competition, which resulted in the publication of a **book of stories** about food waste written by students.
The **dissemination** was made using press articles, television reports, scientific articles and conferences, and in a more targeted way through the presentation of the project on platforms and events related to food waste, circular economy, innovation and sustainability. To raise awareness among the general public, a promotional video was released.
To support the replication of the methodology, we highlight the development of a **guide for sustainable consumption**, aimed at local authorities, and the **support** provided to the implementation of **similar projects in other countries**.
For more information, we suggest consulting the Layman's Report.

Shoe

LIFE GreenShoes4All

LIFE GreenShoes4All | Reduction of footwear environmental footprint

Recycled sole | LIFE GreenShoes4All

The Project

LIFE GreenShoes4All was coordinated by the **Centro Tecnológico do Calçado de Portugal (CTCP)** and included partners from Portugal, Spain, Belgium, and Romania. The project ran between October 2018 and September 2022.

The project's actions focused on 4 Member States (Portugal, Spain, Italy, and Romania), who collectively account for the highest percentage of footwear manufacturers in the European Union.

The primary aim of the project was to implement, demonstrate, and disseminate a **Product Environmental Footprint (PEF)** methodology for footwear, as well as to develop **efficient eco-design, recycling, and manufacturing solutions to produce footwear with a lower PEF**.

The project also aimed to test and demonstrate new recycling pathways throughout the EU´s footwear value chain, as well as to establish and compare innovative eco-design concepts and green manufacturing methods through demonstration experiments.

In this sense, the **GreenShoes4All project** is a **good practice for economic uptake**, given that the results obtained showed **the technical and economic feasibility, as well as the environmental benefits, of incorporating lightweight materials and manufacturing waste into footwear, which allows for reduced resource consumption (raw materials and energy).**

The Case: Added Economic Value

As a project with a specific objective of applying an innovative Product Environmental Footprint Category Rules (PEFCR) methodology to the footwear sector, it was initially expected that at the European level, the Final Report with the category requirements of the footwear environmental footprint would be published. As

Page

a result, the project team was forced to design the methodology without access to the European reference not being available.

Thus, LIFE financing enabled the implementation of **this pioneering project**, which resulted in the development of new products and methodologies, as well as new services, which contributed to the **Recommendations** for the rules on the environmental footprint of footwear products (PEFCR). Going above and beyond the predicted outputs, these standards could assist manufacturers in reducing emissions related to footwear production and recyclable waste by 15%.

To do this, 66 representative footwear styles from the EU, including eco-design versions and models, were examined across three categories: open-toed shoes, closed-toe shoes, and boots. Footwear models included children's, fashion, casual, sports, and safety footwear.

Considering that the European footwear industry generates a significant amount of waste and that approximately 50% of the raw materials rejected by footwear manufacturers are polymers such as rubber, textiles, or polymer composites, the project aimed to establish innovative eco-design criteria and eco-friendly processes for the manufacture of footwear with high potential for transfer to other sectors (e.g., leather goods, etc.).

Waste generated from the footwear industry with recycling potential (e.g., EVA/ethylene-vinyl acetate, TPU/thermoplastic polyurethane, TR/thermoplastic rubber, and SBR/vulcanised

Recycled rubber | LIFE GreenShoes4All

rubber) was utilized to produce the soles, EVA plates, and shoes.

Waste from other sectors was also used, such as rubber powder from the production of tires and cork processing waste.

The optimized formulations, which incorporated up to 100% rejected material, enabled the fabrication of high-quality materials with favourable physical-mechanical properties for application in footwear products.

Prototypes of footwear models were tested and evaluated in a real-world industrial setting with 15 footwear companies. For 12 of the models, the project team thoroughly examined the PEF as well as factors of eco-design, lightweight and recycled materials, and eco-manufacturing.

Maria José Ferreira, project manager, emphasised the significance of this project in the European context and the industry, as it was the first time that this integrated approach was used not only in footwear (composition, weight, structure, and so on), but also in other materials, such as insoles and laces.

She also mentioned that the project contributed to strengthening the resilience and sustainability of the footwear industry, making it more competitive and environmentally friendly.

However, she stated that the project encountered significant challenges due to the COVID-19 pandemic, which forced the consortium to adapt some of the actions, such as partner travel, event management, and some acts being carried out online.

On the other hand, despite having expected a different label (similar to the one used in electrical equipment) to be produced at the European level and surprisingly communicating this expectation to companies, this situation did not emerge at the European level. In this regard, additional work was required to explain the challenges to the companies, for whom the label was clearly an important factor to positively differentiating their products.

To overcome these challenges, the project team created a PEF Guide for Footwear and another for ECO-DESIGN, which support companies in their environmental transformation. They believe, however, that the implementation of the **Digital Passport** of products can contribute to compensating for the non-existence of the label and allowing companies to **benchmark**.

Maria José Ferreira is confident that the project has demonstrated the technical-economic feasibility as well as the environmental and socioeconomic benefits of incorporating lightweight materials and manufacturing waste, resulting in a reduction in the resource consumption (raw materials and energy), waste deposited in landfills, greenhouse gas emissions, and the raw materials, manufacturing, and waste management costs.

Footwear | GreenShoes4All

The results indicated that **using less impactful materials, associated with weight reduction, has a significant impact on reducing the environmental impact of footwear (by 10% and 30%).** In this context, **the earnings generated by the project's sustainable solutions far exceeded the 200,000 euros initially anticipated**.

Industry Results

According to Maria José Ferreira, the LIFE GreenShoes4All project assisted the participating companies in achieving particularly relevant results.

AMF Safety Shoes, PORTUGAL

The LIFE GreenShoes4All project was effective in identifying better ways to produce new models of footwear with a lower environmental impact. By creating and analysing several versions of the models, it was possible to conclude that implementing eco-design strategies may maximize available resources while generating

less waste. Water, power, and transportation usage have all been reduced as a result of improved design and production efficiency. Planning also played an essential role in avoiding difficulties such as manufacturing line interruptions, which waste resources.

IL PASSO – Pestos Production, ROMÉNIA

Three organic article prototypes were developed and presented at the international fair MICAM in Milan. They have also established a footwear line for customers to test and review. They manufactured 200 pairs of sports boots called "LENNIE ECO" from alternative, recyclable, and sustainable materials. The public´s reaction was positive; however, just 44% of LENNIE ECO consumers were willing to pay a higher price for eco-friendly products.

Atlanta, PORTUGAL

A TR (thermoplastic elastomer based on styrene-butadiene-styrene) was developed, reformulated, and recycled in the plant's extrusion lines. A dark-coloured thermoplastic polymer was developed for use internally in the injection process, utilising 80% of TR´s internal waste. The product has excellent physical-mechanical properties and is ideal for very demanding sole models. A TR was also produced with 5% micronized rubber from the sole´s vulcanisation process residue.

The TPU was reformulated and recycled through the plant's extrusion lines. A thermoplastic polymer material with a dark tint was developed for use internally in the injection process, utilising 98% of the internal TPU waste. This product also has excellent physical and mechanical properties, making it ideal for high-performance sole models.

Finally, using the rubber vulcanisation process, they created SBR (styrene-butadiene-rubber) with varying percentages of recycled or alternative components.

EVATHINK, ESPANHA

EVATHINK, a company with over 25 years of experience, manufactures enlarged EVA plates for a variety of applications, including footwear.

The company believes that the project´s advance have enabled the commercialisation of new sustainable and high-quality products while minimising waste. More precisely, new lines have been created, including sheets manufactured from 100% devulcanized EVA, sheets with up to 20% vulcanised EVA, bio-based EVA sheets, and sheets made from waste from other industries. All new products developed meet the highest quality standards; the optimal relationship between environmental commitment and performance has been proven in laboratories.

Tips to remember:

- It is feasible to use **waste** to produce footwear with a lower environmental footprint;
- Develop **PEF and ECODESIGN Guides** for the footwear industry;
- Bet on a **differentiating label** of the products.

Because of this commitment, the Spanish government has recognised EVATHINK with a seal that symbolises the organization's carbon footprint decrease since the project´s inception.

To learn more about the project results, we recommend contacting the team directly or checking the project page using the contact details shown in the factsheet bellow.

Reflections

Maria José Ferreira indicated that they expected a tool at the European level for companies to conduct PEF/life cycle assessment studies, as well as a free platform, but this did not occur for reasons outside of the project. The existence of these tools would have further increased the project´s results.

She also emphasises that the termination of the LIFE project does not mean that the consortium will stop assisting companies in their transition to greener production.

Companies can still examine and measure their environmental footprint using the project´s eco-design principles, which are still available on the website.

CTCP and other entities are leveraging project results for national companies through "BioShoes4All: Innovation and training of the footwear sector for the sustainable bioeconomy," project nº11. This investment is supported by the PRR-*Plano de Recuperação e Resiliência*, component 12-Sustainable Bioeconomy, and the European Next Generation EU Funds.

The article was prepared by **Isabel Lico** (Desafio das Letras), based on an interview with Maria José Ferreira (CTCP) held on 23/05/2024 and Project web page (www.greenshoes4all.eu/#project).

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apambiente.pt/programa-life

LIFE GreenShoes4All (LIFE17 ENV/PT/000337) - ***Footwear environmental footprint category rules implementation and innovative green shoes ecodesign and recycling*** Factsheet
Start date: 01/10/2018 **End date:** 30/09/2022

Approved Budget: 1,120,129 € **Executed budget**: 1,120,129 € **LIFE funding**: 659,640 € (58.8 %)
Project manager: Maria José Ferreira (CTCP)
Contacts: MJose.Ferreira@ctcp.pt
Website: https://www.greenshoes4all.eu/#project
Coordinating Beneficiary: Centro Tecnológico do Calçado de Portugal
Associated Beneficiaries: Confédération Européenne de l'Industrie de la Chaussure (Bélgica) | AMF, Lda. (Portugal) | Associação Portuguesa dos Industriais de Calçado, componentes e artigos de pele e seus sucedâneos | ATLANTA-Componentes para calçado, Lda. (Portugal) | EVATHINK S. L. (Espanha) | The National Reasearch and development Institute for Textiles and Leather – INCDTP- Division: Leather and Footwear Research Institute (ICPI – INCDTP-ICPI) (Roménia) | Associación de Investigación para la Industria del Calzado Y Conexas (Espanha) | FICE – Federación de Industrias del Calzado Español | SC PESTOS Production SRL (Roménia)

Summary of Results

Demonstration, implementation, and dissemination of the Product Environmental Footprint (PEF) methodology for footwear, as well as developed innovative eco-design, recycling and manufacturing solutions to obtain footwear with a lower PEF;
Implementation of the PEF methodology, analysing 66 representative EU footwear styles, including eco-design variants and models, from three categories: open-toed shoes, closed-toe shoes and boots. Footwear models included children's, fashion, casual, sports and safety footwear.
Development of innovative recycled materials and components in accordance with relevant industry standards. Waste generated by the footwear industry with recycling potential was used (e.g., EVA/ethylene-vinyl acetate, TPU/thermoplastic polyurethane, TR/thermoplastic rubber and SBR/vulcanised rubber) to produce soles, EVA plates and shoes. Waste from other sectors was also used, such as rubber powder from the production of tires, or waste from the processing of cork, sugar cane and coconut. The optimized formulations, which incorporated between 60-100% of rejected material, allowed the production of high-quality materials with good physical-mechanical properties for use in footwear products.
Prototype footwear models were tested and evaluated in a real-industrial context, involving 15 footwear companies. For 12 models, the project team conducted a comprehensive analysis of PEF, and aspects related to ecodesign, lightweight and recycled materials, and eco-manufacturing.
The project team demonstrated the technical feasibility and the environmental and socio-economic benefits of incorporating lightweight and manufacturing waste materials, which reduced the consumption of resources (raw materials and energy), the amount of waste deposited in landfills, greenhouse gas emissions, as well as the costs of raw materials, manufacturing processes and waste management. The results indicated that the selection of materials with lower impact and the reduction of weight have an important impact on the reduction of footwear environmental impact (between 10% and 30%). The revenues associated with the project's sustainable solutions largely exceeded the anticipated revenue of €200 000.
Furthermore, the project beneficiaries produced PEF & Ecodesign recommendations and guides for the footwear sector to support the development of products, outsoles and footwear with a lower PEF. These will help footwear companies to incorporate the environmental factor in their production processes, while responding to consumers' responsible consumption and environmental demands.
Some of the resulting footwear products have already been certified and are, or will be soon, placed on the market.

Key recommendations

The following recommendations are based on the experience of the national LIFE projects, which serve as benchmarks for the adoption of good practices:

Policy uptake

- Identify and involve entities responsible for relevant policies and/or with technical skills in the project subjects.
- Include training and awareness raising actions in your application, targeting both the above-mentioned entities and other stakeholders.
- Identify clearly the feasibility of the proposed regulatory changes.
- Analyse problems on a regional, national, or European scale and adapt the implementation of measures to the proper scale.
- Elaborate good practice guides whose contents may support or serve as a basis for the intended legislative changes.
- Review planned objectives and actions and their calendar to predict and/or overcome temporal constraints that may arise.

Replication and transfer

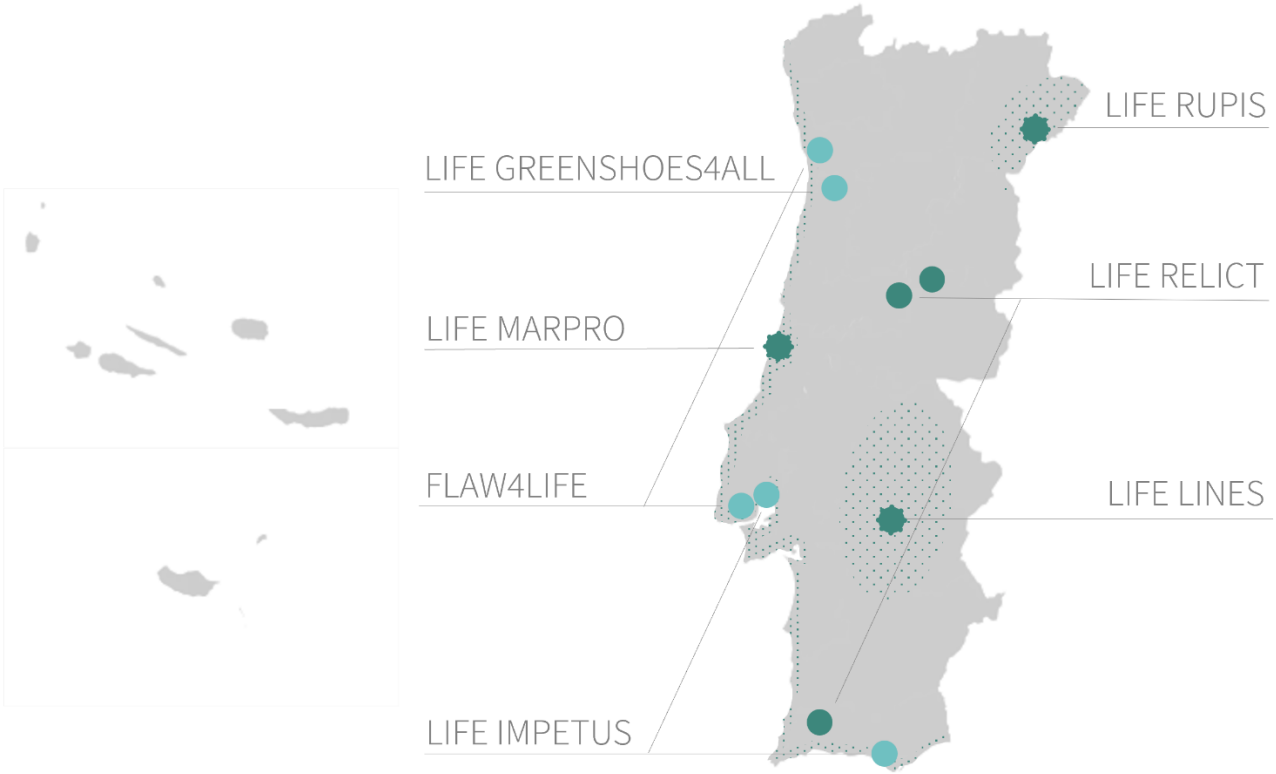
- Announce the project's actions and results and raise awareness:
  - covering key and varied audiences;
  - in (bio)geographical regions similar to those of the project;
  - using the LIFE communication channels;
  - using videos, podcasts, or other engaging materials and tools.
- Train and prepare to the implement identified solutions.

- Evaluate during project design its potential for replication or transfer and define its objectives well.
- Identify and involve stakeholders, from the application phase (meetings, workshops, …) and, if possible, choose partners with the capacity to replicate actions.
- Make good use of existing resources and optimise processes, promoting replication on a reasonable scale.
- Publish good practice guides to support replication and publicise them widely.
- Include initiatives in the project budget to promote replication or transfer.

Added Economic value

- Define clearly the intended objectives in terms of investment, economic return, and market reach.
- Ensure the business model´s viability and economic sustainability through efficient and optimised processes.
- Develop guides and manuals to promote more efficient or sustainable practices and solutions based on circular economy
- Use differentiating labels and logos for the products, to distinguish them as a brand image

Location of intervention areas



Projects´LIFE sub-programmes:

- Nature and biodiversity (NAT)
- Circular economy and quality of life (ENV)

Territorial scope:

- Indicative area

Project list

	Project	Contact
1	LIFE RELICT	dpi@uevora.pt
2	LIFE RUPIS	spea@spea.pt
3	LIFE MarPro	catarina.eira@ua.pt
4	FLAW4LIFE	https://frutafeia.pt/pt/contacto
5	LIFE LINES	amira@uevora.pt
6	LIFE IMPETUS	mjrosa@lnec.pt
7	LIFE GreenShoes4All	MJose.Ferreira@ctcp.pt