water & land

Beekeeping for the future

Colophon

This brochure is the result of the project Water & Land. Intangible heritage and sustainable development. This is a three-year, international pilot project of the Centre for Agrarian History and the Dutch Centre for Intangible Heritage.

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Vlaanderen verbeelding werkt

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Introduction

Biodiversity has been declining systematically for decades. Biodiversity includes the diversity of organisms that exist on this planet, from micro-organisms, plants, animals and humans. The disappearance of species and varieties throws nature out of balance, and that poses a real threat to our planet. And to us, simply because, for example, our food and drink depend on this precarious balance.

Bees are an important part of this ecosystem. Together with other insects, they ensure pollination and therefore our food. Pollinators are having a hard time today, due to declining biodiversity, climate change, diseases, and invasive species such as the Asian hornet. The honeybee also faces these challenges, though it is helped in this battle by the beekeeper. Beekeeping has always existed, and the honeybee has played a role in human life for centuries.

In this brochure we get to know the practice of beekeeping and we look for an answer to the question: **how can a practice such as beekeeping contribute to a climate-resilient future?**

With this brochure we want to inspire people to look at the honeybee and its beekeeper in a new perspective, and to value the knowledge of beekeepers. In addition, we are targeting a broader audience which includes policy makers, nature managers, heritage experts and enthusiasts, with the aim of informing them about beekeeping in a different way, as well as to develop ideas and to create collaboration, and to strive for a future-oriented heritage and nature management.

Intangible cultural heritage?

Intangible cultural heritage contains today's habits, knowledge and practices that people have inherited from the past and would like to pass on to future generations. And as times change, intangible heritage evolves along with it. This dynamic nature makes intangible heritage eminently suitable for teaching us more about how we deal with changes, for example in climate. However, intangible heritage is in the minds and hands of people. It is therefore not always self-evident to care for this heritage, let alone to assign it an active role in climate challenges. In the Netherlands and Belgium, knowledge and insights from heritage practices are still rarely included in decision-making. The policy and scientific separation between culture and nature remains strong, with the latter receiving by far the most attention. This is why the Centre for Agrarian History and the Dutch Centre for Intangible Heritage are looking at intangible heritage together from a new angle and investigating the link with ecological sustainability.

Curious about intangible heritage in your area? Be sure to take a look at www.immaterieelerfgoed.be or www.immaterieelerfgoed.nl.

This brochure is a result of the project 'Water and land. Intangible heritage and sustainable development.' It is a three-year, international pilot project set up by the Centre for Agrarian History and the Dutch Centre for Intangible Heritage. Through this project, we want to investigate intangible heritage practices that can contribute to a climate-robust future, support heritage communities in safeguarding and visibility, draw policymakers' attention to the opportunities of heritage, and stimulate international exchange between heritage communities, experts, researchers and managers.

The Dutch Centre for Intangible Heritage, partner in this Water & Land project, already investigated the practice of beekeeping in the Netherlands in 2022-2023, with the brochure 'Meer dan bijen houden. Bijen, mensen en een duurzame toekomst' as the end result. In the context of the Flemish-Dutch project Water & Land, we tested these results with Flemish beekeepers. In this brochure we provide an overview of that Flemish-Dutch story, in addition to the earlier brochure from KIEN.

Image 1: Bees fly back and forth from the hive – © Koninklijke Vlaamse Imkerbond

Beekeeping

Beekeeping is an age-old craft. The beekeeper keeps honeybees, which live in a colony in beehives or skeps. In exchange for caring for his or her bees and fighting diseases, parasites and other threats, the beekeeper can harvest honey and beeswax.

Beekeeping has undergone a great evolution over the centuries. In prehistoric times, honey was already harvested from tree hollows, caves and other places where wild bee colonies had settled. Egyptians, ancient Greeks and Romans were already beekeeping in ceramic tubes, before woven (straw) hives also made their entrance in Europe. Beekeeping then evolved alongside the available techniques, from bee skeps (woven baskets) to wooden (or even plastic) hives, with all kinds of technological gadgets and monitoring systems.

Skep beekeepers

Straw baskets have been used in the Low Countries since the early Middle Ages. They come in all shapes and sizes; every region had its own shape. The personal taste of the skep weaver could also bring about its own result. Today, the technique of skep weaving and beekeeping is only mastered by a few, after all, it requires years of knowledge and insight into the life of bee colonies. These bee skeps are often only accessible to the beekeeper from below, which makes supervision of the bee colony more difficult, and the honeycombs are stuck in the skep. Beekeepers who still work with skeps today do so with attention to natural comb construction and the swarming behaviour of the bees. Bee colonies in skeps live in synergy with all kinds of small organisms and fungi, which are kept out in modern beehives. Moreover, the climate in these modern hives is not always ideal. It turns out that – due to lower humidity in

the bee skep than in a modern beehive – there is less risk of contamination with varroa mites. Old techniques such as skep beekeeping can provide knowledge and inspiration for modern beekeeping in this way. For example, Vlaams Bijeninstituut is currently conducting tests with a combination hive: a bee house with the climate of the skep but with removable combs for the convenience of the beekeeper.

Image 2: Dozens of skeps were placed on the heath. In the background modern beehives can be seen © KIEN

Did you know that in the Netherlands the practice of skep beekeeping has already been included in the network of intangible heritage?

Beekeeping is characterised by a huge development towards professionalism. For example, beekeepers in Flanders are legally obliged to register with the Federal Agency for the Safety of the Food Chain, and European legislation also requires them to share information about bee colonies and hives. Another example is that beekeepers in Germany must share how many colonies they have, where their wintering place is, and which locations they travel to. In this way, excessive concentrations and excessive pressure on the available food sources in the landscape can be avoided. In Flanders, the registration obligation is more limited, and travel habits do not have to be reported. In the Netherlands, beekeepers are also obliged to register bee colonies, but in 2024, work is still in full swing on how to complete this requirement.

Image 3: Bees collect a lot of pollen with their hairy bodies © Willem Tel.

Beekeeping used to be an important source of extra income for farmers. Honeybees had (and still have) an important pollinating function, beeswax was used for candles and honey could be sold as an additional source of income. When cheap honey was increasingly imported from the mid-nineteenth century onwards, and electric lighting gradually began to make its appearance in the decades that followed, a number of important sources of income from honeybees were lost. Today, the honey harvest and the production of beeswax are often additional sources of income, and only the pollinating function remains. With the rise of intensive agriculture and horticulture, the role of honeybees as pollinators has become increasingly important. About 70% of our most important food crops require pollination. The

economic value of this pollination by insects is therefore estimated at 15 billion euros per year in the European Union alone!

Honeybees play an important role in this, but they are certainly not alone. Other pollinating insects such as wild bees, bumblebees, butterflies, etc. are also a necessary part of this. And these wild pollinators are under pressure. In a 2019 study, 403 wild bee species were counted in Belgium, of which 30% were threatened with extinction, and about 7% almost fell into that category of being threatened. Only less than half (42%) of these bee species were not considered to be in danger. Figures were also published in the Netherlands in 2018: of all 331 bee species counted, 181 are on the red list, and 30 of them are seriously threatened.

The honeybee also faces such threats. For years, beekeepers have had to watch out for mortality rates due to varroa mites, and recent challenges such as the Asian hornet, which has no natural enemies within our region, make life difficult for bees. The so-called 'disappearance syndrome' - possibly caused by disorientation caused by herbicides and neonicotinoids (a group of insecticides) - or other 'spray damage' also has had an impact on the health of bee colonies.

Fortunately, the honeybee can count on the beekeeper for good care. And wild bees can also benefit from this. Beekeeping associations are increasingly seeing a shift towards ecological beekeeping, with attention to the natural life of the bee, as well as a concern for the environment. It is this new (or is it a return to the old?) way of beekeeping that is central to this brochure.

We shouldn't joke about that old tradition of beekeeping that has existed for centuries and centuries. Every era has its own thing. We now live in a time where we must take that responsibility and know that we have that responsibility. The beekeepers of the early 1900s had a different vision and a very different knowledge of the environment. It's not about blaming them for what went wrong then. It's about doing the right thing based on the knowledge that we have now.

— Aat Rietveld, former vice-chairman of the Nederlandse Bijenhoudersvereniging

Want to know more about the threat to wild bees?

Then take a look at the Belgian Red List of Bees, a report that maps the threat of extinction for wild bees in Belgium, or at the Basisrapport voor de Rode Lijst Bijen for the situation in the Netherlands.

Reading list

- **Bakels, J.,** *'Meer dan bijen houden. Bijen, mensen en een duurzame toekomst'*, 2023.
- **Geurts, A. en Luyten, S.**, *Bij de imkerij*, 2016.
- **Goens, O. en Maes, J.**, *Geschiedenis van de Bijenteelt*, Bruges, 1985.

Image 4: Beekeeper Edwin at work © Willem Tel. 2024

Beekeepers in Flanders and the Netherlands

Not only beekeeping has evolved, but different types of beekeepers have also developed over time.

Jet Bakels from the Dutch Centre for Intangible Heritage conducted research into beekeepers in 2022-2023 and distinguished several groups of beekeepers.

- **The hobby beekeeper** who keeps one or more honeybee colonies
- **The ecological beekeeper**, who works as naturally as possible
- **The farmer** who keeps several colonies on his agricultural or horticultural business
- **The honey collector**, who keeps several colonies to be able to sell the honey
- **The professional pollination beekeeper,** who has hundreds of colonies and works with agricultural companies (very regionally linked to fruit and glass cultivation)

All these types of beekeepers are on a spectrum between anthropocentric beekeeping, with attention to the benefits for people, and apocentric beekeeping, where the bee is completely central. But what they all share is the care for their honeybees. After all, they all want a healthy bee population.

> *There are beekeepers who do not harvest, who simply have a hive within the surrounding landscape. They do not even check whether there is any honey, rather they keep it in the hive as winter food.*
>
> — Geert Meersdom, chairman of the Koninklijke Vlaamse Imkerbond

There are thousands of beekeepers in Flanders and the Netherlands, an estimated 10,000 in the Netherlands and 5,000 in Flanders. The number of professional beekeepers is very limited in both countries. The vast majority are beekeepers who keep bees in their spare time, or at most gain an additional income from pollination or honey production.

Those thousands of beekeepers are organized in associations. For example, in the Netherlands more than 8,500 beekeepers are affiliated with the Nederlandse Bijenhoudersvereniging. This is an umbrella organization, under which more than 200 local associations are active. In addition, there are several smaller beekeepers' associations, but also organizations such as Bijenlandschap West-Brabant that work with dozens of partners for a bee-friendly landscape.

In Flanders too, there are various associations. There are two large umbrella organisations. On the one hand, there is the Koninklijke Vlaamse Imkerbond, which represents approximately 4,000 members and has a national, provincial and regional operation. On the other hand, there is the Vlaams Bijeninstituut, a second umbrella organisation that brings together a thousand beekeepers and bee lovers, as well as cities and municipalities among their members. In addition, there are, as in the Netherlands, numerous local associations active.

These associations also organise courses, and beginners' courses are extremely popular in both Flanders and the Netherlands. The age-old knowledge of generations of beekeepers is thus passed on in abundance to the new generation of beekeepers. Moreover, in the Netherlands, beekeeping has already been recognised as an intangible cultural heritage and is listed on the Inventaris Immaterieel Erfgoed Nederland. In Flanders, the craft has already been given a place in the collection on the platform immaterieelerfgoed.be.

Image 5: Flower meadow at a farm © CAG

Sustainable beekeeping

Beekeepers can play a very important role in a climate-resilient future. By nurturing their honeybees, beekeepers also care for their environment and can provide sufficient food for both the honeybees and all other kinds of pollinators. Or at least that is how it should ideally go. Aat Rietveld, former vice-chairman of the Nederlandse Bijenhoudersvereniging, emphasises that the way of thinking of some beekeepers must still change: "Is it good for the honeybee? That is not the question. Is it good for biodiversity? And the honeybee has a place in that."

Beekeeping and the Sustainable Development Goals

The International Beekeepers Organisation Apimondia released a report in 2021 based on the idea that beekeeping has enormous value for sustainable development. For each of the 17 Sustainable Development Goals (SDGs), Apimondia employees identified how beekeeping contributes to that. As an example, we highlight two objectives in this brochure:

Goal 13: "Climate action. Take urgent action to combat climate change and its impacts"

Bees depend on a healthy living environment, with sufficient flowering plants in both agricultural and natural areas. Beekeepers are among the first to notice the consequences of the disappearance of such flowering areas due to climate change and human actions such as deforesta-tion or changing agricultural production. The vulnerable ecosystem is under pressure from pests, diseases, and loss of production, etc. The ecosystem services that bees can provide us are also threatened by climate change. The solution lies in a holistic view of the environment

with sufficient diversity for the pollinating insects.

Goal 15: "Life on land. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation, as well as halt biodiversity loss."

Beekeeping is a practice that is not harmful to the environment and – due to its role in pollination – provides an economic reason for the conservation of natural habitats. In addition, it can also help to involve local residents in the protection of biodiversity, by focusing on planting and by completing the flowering arc.

Taking the environment into account, the availability of food for the honeybee and other pollinators is therefore the basic condition for sustainable beekeeping. Beekeepers can focus on new plantings to provide varied food. In doing so, they speak of 'honey plants' or 'nectar sources': plants that provide food in the form of nectar and pollen to the honeybee and other insects. One plant provides a lot of nectar, another a lot of pollen, and the flowering periods differ from species to species. In order to have food all year round, bees need a supply of flowering plants from February to November. With this, they can provide themselves with honey and winter food. The beekeeper can help the bees to complete this period of flowering plants by growing specific - native - plants and (re)introducing the necessary diversity of species locally. In this way, the beekeeper can enrich his immediate environment with annual and perennial plants, taking into account what already grows in the area - from natural plants to agricultural crops. In doing so, they also strengthen the capacity of an area, where wild bees also go in search of food. And not only beekeepers can use this. A measure that is often used nowadays is the flower borders that farmers can create, whether or not compensated via a management agreement.

However, flower borders are only just one of the necessary measures to help bees, both honeybees and wild bees. After all, often they are short-term solutions. To help pollinators in the long term, steadfast flowering elements are needed in the form of small landscape elements. Hedges, high-stem orchards, small woods, wood edges... Such small landscape elements form the ecological connection between pieces of nature that are spread out in that landscape.

This allows wild bees to find food sources within flying distance of their nest. And what's more, such green ribbons in the landscape are also beneficial for other insects and small fauna.

Sufficient nesting opportunities for wild bees also keep some beekeepers busy. Bee hotels are now widespread, from small boxes in your own garden to larger constructions at industrial estates, farms or nature reserves. However, only 20% of wild bees nest in such

Image 5: Bee 'burrow' at Villa Heidetuin – Bergen-op-Zoom © CAG

above-ground shelters. The other 80% find their home underground. That is why building a so-called 'bee burrow' is an important tool for wild bees. Such a bee burrow is built in a ground-nesting habitat, an environment with sufficient pollen and nectar sources, which catches sufficient sunlight, and has some height differences. In recent years, more and more such bee 'castles' have appeared. For example, Bijenlandschap West-Brabant helped to build three new bee burrows. Annemieke Doomen tells us more about their work: "We have now helped to create three bee burrows in this region. Furthermore, the bee buffer strips are a project that we are very proud of. This was taken up and implemented for the first time this year. Flower seeds have now been sown over 144 kilometres. On the scale of the bee, that's a huge number of new connections for those pollinating insects."

Furthermore, honeybees are a very good indicator of the quality of the environment. The age-old craftsmanship of the beekeeper, and his insight into the vitality and functioning of a bee colony are therefore crucial. This can contribute,

Image 6: © CAG - bee burrow at Villa Heidetuin – Bergen-op-Zoom

hand in hand with research and technological innovations, to a more sustainable future. René De Backer, chairman of the Vlaams bijeninstituut, says: "The honeybee is the canary in the coal mine. If the honeybee is doing badly, nature is doing badly. That is not an understatement, that is reality." If a bee colony produces too little nectar and pollen, there is also a shortage for wild bees. Or when honeybees are exposed to pesticides or neonicotinoids, wild bees are also the victims. In this way, the beekeeper fulfils a crucial function.

> *The honeybee is the canary in the coal mine. When the honeybee is doing badly, nature is doing badly. That is not an understatement, that is reality.*
>
> — René De Backer, chairman of the Vlaams Bijeninstituut

Thus, the beekeeper is given a possible new role: from honey hunter to natural beekeeper. By focusing on caring for the environment and providing a flowering arch, the beekeeper promotes biodiversity. From his signal function, he monitors changes in the environment, whether caused by climate change or not. The beekeeper's insight into the environment and his practical knowledge can thus form an important link in strengthening wild bees and local biodiversity.

Meer weten?

Read the complete report Beekeeping contributes to achieve the Sustainable Development Goals.

In this brochure we mention two inspiring examples from Flanders. In the publication 'Meer dan bijen houden. Bijen, mensen en een duurzame toekomst' by the Dutch Centre for Intangible Heritage examples from the Netherlands can be found.

Image 7: Wild large-headed resin bee visits an insect hotel © Willem Tel.

Inspiring examples

Buzzwatch

The presence of sufficient honey plants is crucial for a healthy environment for both honeybees and wild bees. In the Buzzwatch project, honey plants and the bee population are mapped using a combination of artificial intelligence and citizen science. Researchers from PXL College (PXL BIO-Research and PXL Smart-ICT) and the Hogeschool PXL (PXL BIO-Research and PXL Smart-ICT) and the Vlaamse Bijeninstituut are joining forces with app developer Plantsoon to develop the Buzzwatch app, subsidized by Amai! (an organization that wants to inspire, advise and activate around Artificial Intelligence) .

The project was set up with the aim of preventing winter mortality of bees. Many beekeepers are confronted with this problem, partly due to a shortage of pollen. In the Buzzwatch project, an app is being developed to meet this need. Citizens can use this app to upload photos of the trees and plants in their garden or during a walk. A smart AI tool then analyses these images: which species are they, and are they already in bloom? Based on this, the nectar and pollen index of a location is determined. The more photos that are added to the app, the better it can be shown where and when sufficient nectar plants – and therefore nectar and pollen – can be found.

And that is valuable information for the beekeeper. This way, he knows where there is enough food available for the honeybees, and which locations are therefore interesting for placing the beehive. But it is not only the beekeeper who benefits. Municipal landscaping services can also use the app to estimate where the flowering period of public green spaces has ended, so that they can mow at the right time. In addition, the app helps to map the occurrence of plant species and possible gaps in the environment. This allows these gaps to be tackled by planting small landscape elements or sowing green verges. This also benefits the solitary, wild bee, which is often dependent on one specific plant species.

Buzzwatch is a new project, which is still in its trial period. In the summer of 2024, the app will be tested by a limited audience in the municipality of Nijlen. Although the project is still in its infancy phase, it was still nominated for the Innovation in Politics Award in the category Climate Protection, although the prize did go to another project.

Buzzwatch project?

Read more about it on the website of the Vlaams Bijeninstituut, the app developer Plantsoon, or subsidy provider Amai!.

Honeybee Valley

The Honeybee Valley collaborative platform was founded in 2014 on the initiative of Prof. Dirk de Graaf, head of the Laboratory for Molecular Entomology and Pathology of the Honeybee of Ghent University. The aim of the collaboration platform is to map and investigate issues surrounding the honeybee. Results and information are exchanged and disseminated (inter)nationally. This research is carried out using their own apiary, of 80 colonies spread over various locations, and with access to various analysis options and high-tech equipment and laboratories.

In concrete terms, Honeybee Valley is committed to translating relevant research to beekeepers, journalists and policy makers and to guiding beekeepers in practice with techniques and disease control. They share business methods for beekeepers and offer a list of honey plants to facilitate the search for bee-friendly species. In addition, they also offer a list of measures that help the bees develop. This list is searchable by impact (high, moderate or average), by target group (citizen, farmer, municipality, beekeeper, school, etc.) and by category (e.g. more food, less pesticides, good business methods, raising awareness, etc.).

Honeybee Valley reaches a diverse audience, from researchers to beekeepers and municipalities. In addition, joint research projects are regularly set up, in which beekeepers can make an important contribution, but companies, organisations and individuals can also play their role. Honeybee Valley is therefore a striking example of cooperation, of a holistic approach and of co-production, which is necessary in the use of traditional ecological knowledge and intangible heritage for the future.

Want to know more about Honeybee Valley?

Then definitely take a look at their extensive website! More interested in Dutch research? Wageningen University and Research also has an expertise cell Bijen@WUR.

honeybee valley

Image 8: Pollen grains collected by beekeepers are examined in the lab © Willem Tel.

Opportunities and challenges

Today we face major challenges in the areas of climate, biodiversity, sustainability, spatial planning and society. Intangible heritage practices can serve as a source of inspiration, as they have continuously adapted to the ecosystems and environments in which they are practiced. Natural or organic beekeeping, with its focus on caring for the environment and signalling significant changes, can play an important role in the current climate and biodiversity challenges.

Much intangible heritage and knowledge still exists today only in the minds and hands of a few. But in today's fast, technological and urbanized society, old techniques such as hedge weaving are often too time-consuming and labour-intensive. Nevertheless, they remain interesting practices to safeguard and maintain, because on a small scale they do have important contributions to make, and because they retain knowledge that can potentially be deployed on a larger scale.

This is in line with UNESCO's call: think global, act local. Local practical knowledge can be combined with scientific research. It can enrich landscape management and connect old techniques with the present. And above all: it strengthens the appreciation for and the emotional connection with the landscape and nature. Intangible heritage can thus be an important and engaging means to make the environment greener and promote biodiversity.

The opportunities are therefore great, but the challenges are just as great. In order to be able to use intangible heritage as a lever in climate issues, there are four major focal points on which we can fully collaborate.

- Need for a change of mentality
- Co-production as a key word
- Need for policy and good examples
- Substantiate with further research

Working on a change of mentality

People and landscape have influenced each other for centuries. The current cultural landscape is the result of thousands of years of interaction between natural processes and all kinds of human developments. Over the past century, we have increasingly and radically

shaped the landscape to our liking, based on the possibility of creating nature. However, we are now reaching the limits of that idea, with all its consequences. The landscape has become a lot emptier in just a few decades. Small fields with various crops, field edges and ditches were transformed into large, intensively cultivated plots with monocultures. As a result, much of the diversity also disappeared. This has made the living conditions for pollinating insects a lot more difficult, and in the meantime, various species are threatened with extinction. But we do not always fully realize this.

> *The advantage of growing old is that you can remember how it used to be. When I was young, it was a buzzing of insects, of bees and of everything that lived. But someone of 30 years old doesn't know how it used to be.*
>
> — René De Backer, chairman of the Vlaams Bijeninstituut

The shifting baseline syndrome ensures that we have all forgotten what nature, and the landscape used to look like, and which species live and lived in it. Because people often use the landscape from their childhood as a frame of reference, the basis, the reference point – the baseline – shifts per generation. Or as Aat Rietveld succinctly summarizes it: "The frame of reference of children today is three birds. My frame of reference is three hundred birds." This applies equally to insects and bees. The biomass of insects in nature reserves is declining rapidly. This disappearance of species and varieties is throwing nature out of balance. Restoring that balance is not an easy task and requires a fundamental change in our thinking about nature and landscape. We need to move away from a controllable, human-oriented approach and switch to a landscape vision with attention to the ecosystem. The intangible heritage practice of beekeeping can contribute to this. In a landscape that has been stripped down to such an extent that it offers insufficient food sources for both honeybees and wild bees, beekeepers can help to bring it back to life.

Ecosystem services by beekeepers

Ecosysteemdiensten (ESD) zijn voordelen (diensten) die wij als mens van Ecosystem services are benefits (services) that we as humans receive from nature and the environment (ecosystems). Think for example of pollination by insects, food production, natural flood protection, or green environments for recreation.
There are three major groups of ecosystem services:

- Producing services: Ecosystems provide products such as food, drinking water and raw materials.
- Regulatory services: These services are more supportive, less visible and work in the background. Ecosystems regulate certain processes such as climate and water quality, CO2 storage, etc. Often there are still opportunities within these services to strengthen them.
- Cultural services: These are life-enhancing natural benefits that make our lives healthier, more pleasant and more interesting. For example, a green living environment, nature-related recreation, and landscape heritage have a positive influence on our quality of life.

Image 9: Beekeepers can provide many ecosystem services, including production (blue), regulatory (purple), and cultural (green) services.

In addition to their role in strengthening biodiversity, beekeepers can also make other contributions in the form of ecosystem services, with pollination as the most obvious one. But also, pest control; beekeepers quickly noticed the invasive Asian hornet five years ago and sounded the alarm. In addition to these regulating ecosystem services, there are production services that beekeepers can provide. The production of honey is an example, although this is mainly done on a small scale by the vast majority of hobby beekeepers. The same applies to the production of natural materials such as beeswax and propolis. Finally, there are several cultural ecosystem services that can be provided by the beekeeper, starting with anchoring and spreading the wealth of knowledge that they possess. In addition, beekeeping is in itself a fascinating outdoor activity, and the beekeeper can share it with others in the form of workshops and visits. And the beekeeper can ensure a green living and working environment by planting and completing the flowering arc in the vicinity of his beehives.

Want to know more about the ecosystem services of the bee-keeper and the honeybee?

Aryal, S. et al, *'Ecosystem Services of Honey Bees; Regulating, Provisioning, and Cultural Functions'*, Journal of Apiculture 35(2), 2020.

Seward, B., *'Honey Bees as an Ecosystem Service?'*, 2019.

DIntangible heritage, such as beekeeping, can play a role in the necessary change of mentality towards a new approach to nature and the landscape. The beekeeper's insight into the fascinating habitat of the honeybee can also inspire others to take bee-friendly measures. In the popular starter training courses, organisations also note that this care for nature is an important motivation for novice beekeepers, as Geert Meersdom, chairman of the Royal Flemish Beekeepers' Association says: "Nowadays, we have more interest from people who used to have nothing to do with beekeeping, who do not learn it from father to son, but out of interest. These are people who love nature, who also want to ensure biodiversity."
Heritage can create a powerful connection, not only between beekeepers and bees, but more generally between humans and nature. This deep connection, often referred to as eco-citizenship, refers to the ecological awareness of belonging to an environment. This awareness is rightly seen as an important motivation for so-called 'pro- environmental behaviour ' and sustainable lifestyle changes, even more effectively than policy instruments do.

A change in mentality, both with regard to heritage and our approach to the landscape, is a long-term project. How can we stimulate a new perspective on heritage and landscape?

Within the Water & Land project, we highlight several intangible heritage practices that offer solutions for climate and biodiversity challenges. Heritage communities, heritage organisations, regional landscapes, etc. can also bring intangible heritage to the attention from this sustainability perspective, through activities, documentation processes, etc. This can contribute to the development of eco-citizenship among local residents, in which the connection between people and nature promotes a new respectful approach to the landscape.

Co-production as a key word

Intangible heritage practices such as beekeeping and the traditional ecological knowledge associated with it can be extremely valuable. For centuries, beekeepers have been attuned to specific local characteristics and microclimates, and how these are relevant to the health and productivity of their bees.

The technical knowledge of beekeeping is of a high level in Flanders and the Netherlands. As a result, honeybees often thrive under the supervision of their beekeeper. Nevertheless, bee colonies face challenges in terms of disease, pests, climate change and declining biodiversity.

> *The most important thing is that we strengthen the carrying capacity of the landscape. That is the basis of everything. You have to work on that with all parties involved.*
>
> — Arjen De Groot, researcher Animal Ecology Wageningen University & Research

These kinds of challenges transcend the individual level of the beekeeper. Working on a landscape scale is necessary for creating sufficient surface area for measures, as well as a sufficient distribution within the landscape. However, a multidisciplinary approach for a bee-friendly landscape is not always self-evident and the knowledge of the beekeeper can be an important added value. Collaboration between municipalities, provinces, associations, nature organisations, scientists, farmers... and beekeepers are crucial.

This cooperation can take various forms. For example, the Vlaams Bijeninstituut provides training to landscaping services on how and when to prune, in order to make as many flowers bloom as possible for the bees. Or many beekeepers get to work on passing on observations of exotic species, so as to better arm the ecosystem against them. Or the campaign of 'Bijenvriendelijke gemeente' for example, encourages municipalities in Flanders to design public green spaces in a bee-friendly way.

Want to know more?

In the brochure *'Meer dan bijen houden. Bijen, mensen en een duurzame toekomst'* author Jet Bakels explains several Dutch examples of collaboration.

Such examples show that steps are already being taken towards the co-production of public spaces. Geert Meersdom of the Koninklijke Vlaamse Imkerbond also agrees: "I think that there is a general evolution towards more participation. That is a big change compared to fifteen years ago. Back then, the city decided what was planted, now we can make suggestions in some places about which trees are interesting." He also notes that there is a conscious effort to achieve more biodiversity. "People no longer plant only single species, only one or two types. People are going to plant multiple species so that you have a better impact on the world of insects."

A completely different track of co-production can be found among farmers. In the international project Beespoke (Benefiting Ecosystems through Evaluation of food Supplies for Pollination to Open up Knowledge for End users) the focus is on strengthening and diversifying the population of wild pollinators . By means of management agreements for flower strips, farmers were stimulated to commit themselves to this. These were re-examined for the project and optimised for wild pollinators. New seed mixtures were also developed for this. And although beekeepers were absent from the project, the Beespoke project is inspiring. The bottom-up approach ensured that relevant stakeholders such as farmers were included in the project as equal partners. Expertise was brought together and knowledge and experiences from the local demonstration areas were shared on a European scale.

Setting up such networks is an important recommendation to realise co-production. By involving local heritage communities in the process of landscape management plans or spatial development, the possibilities of heritage (both intangible and immovable) can be included from the beginning. Through local projects, which fortunately are becoming more common, work can be done on global sustainability goals.

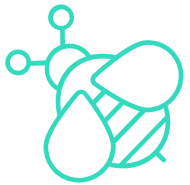

Image 10: A blooming flower border around a grain field © Willem Tel.

Policy and best practices

The connection between sustainable development and intangible heritage is still in its infancy. Making this link known to policymakers and professionals, as well as the general public, is urgently needed. There are already various policy instruments and strategies for beekeeping that provide frameworks for the heritage story.

Both Flanders and the Netherlands have a bee strategy. In the Netherlands, the Ministry of Agriculture, Nature and Food Quality took the initiative in 2018 to draw up a Nationale Bijenstrategie in collaboration with provinces, municipalities, water boards, nature organisations, knowledge institutions (such as the Dutch Centre for Intangible Heritage), and also beekeeping associations. In Flanders, several different policy instruments have appeared in recent years. There is a Vlaams Actieplan Wilde Bestuivers, a Belgische nationale strategie inzake bestuivers 2021-2030, a Federaal Bijenplan (2017-2019), and finally a Strategisch Plan Bijenteelt. In the context of the latter plan, the Agency for Agriculture issues an annual call for beekeeping projects, which can be submitted by beekeeping associations or research institutions. In the Strategisch Plan Bijenteelt, honeybees are central to various projects, while the focus in other strategies is more on wild bees.

Want to know more?

In the Netherlands a report was published on '5 years of National Bee Strategy" and what has been achieved in the meantime!

Bees in policy

In recent years, policy attention for bees, and more specifically wild pollinators, has grown enormously. This has translated into national strategies and plans, both specifically for these important insects, and more broadly in the area of biodiversity.

The different strategies in Belgium and Flanders make it clear that the powers regarding beekeeping are divided. Food safety is viewed from the national/federal level. Beekeeping with honeybees as farm animals is housed under the Department of Agriculture, while the impact on biodiversity is often viewed from the Department of the Environment. At each of these levels, various plans with associated budgets have been drawn up in recent years. In the Netherlands it is simpler, because both the pollination function and the production of honey, as well as the impact of beekeepers on biodiversity, all fall under the Ministry of Agriculture, Nature and Food Quality.

In addition, there are also all kinds of European measures and other international measures, such as the UN Environment Programme, which deals with the problem of the decline of honey and wild bees.

Want to read more about this? The article 'Protecting bees, a policy challenge' provides an overview of Belgian and international measures.

So, there is much legislation on bees, but the focus is (almost) entirely on wild pollinators. Tools such as the Biocultural Heritage Framework are designed to include the opportunities offered by intangible heritage, in this case beekeeping, in such strategies, laws and plans. It is a tool intended to change the mindset, to stimulate policy makers to implement participatory management, and to facilitate a different view of landscape and heritage and projects. This Biocultural Heritage Framework consists of five elements, which are interconnected and together create the conditions for resilient societies: biodiversity, landscape, local knowledge, participatory management and finally cultural, social and economic values. The framework can be used as an instrument:

- To see how the different elements that lead to resilience are present in Flemish or Dutch policy
- To open the conversation about gaps in that policy, or the total absence of heritage as an actor

During the Water & Land project, we will continue to examine vision and policy texts, looking for frameworks to hang heritage on and helping to create opportunities for such a holistic vision of the future.

Substantiate with research

The knowledge of beekeepers, about their bee colonies, the nectar plants, the care of a flowering arch and the local effects thereof is primarily in the hands and heads of these heritage bearers. This rather practical and intangible knowledge is therefore sometimes difficult to grasp for managers and policy makers. With the help of platforms such as Honeybee Valley or citizen science projects, it is gradually becoming possible to anchor this knowledge.

"Een imker moet goed observeren, abnormaliteiten vaststellen en daarover informatie vragen of conclusies trekken."

— Geert Meersdom, voorzitter Koninklijke Vlaamse Imkersbond

There is already a lot of research into the honeybee, and for this there is already a lot of collaboration with beekeepers to gather knowledge. In order to gain insight into the complex interactions that influence the health and productivity of the honeybee, long-term observations are necessary. Scientific researchers therefore see an excellent opportunity in collaboration with beekeepers for this. But not only the honeybee itself is being researched extensively. The carrying capacity of the landscape remains an issue that has not yet been given a conclusive answer, and the climate robustness of different beekeeping methods would also be a fascinating research topic. Once again, beekeepers, who are in the landscape and are networked with farmers and nature managers, are important stakeholders in such research.

International research projects

There are numerous international research projects that focus on the health of honeybees and wild bees. We would like to highlight one example here.

The INSIGNIA-EU project is investigating environmental pollution with the help of beekeepers and their tens of thousands of honeybees. Detection of pesticides, microplastics, heavy metals and air pollutants is done using citizen science: beekeepers from all 27 EU countries provided samples to research laboratories. In the summer of 2024, the project will still be working hard on analysing and modelling the results. Such a large-scale study teaches us a lot about environmental pollution and shows the added value of citizen research.

Conducting research is one side of the story. The research results (which are often region- or time-bound) are ideally reported to both policymakers and beekeepers. Umbrella organisations of beekeeping associations focus on this via their member magazines, the Honeybee Valley collaboration platform provides theme publications. And in the meantime, in basic beekeeping training courses in Flanders and the Netherlands, final terms have been established in which the most recent insights are preferably passed on to a new generation of beekeepers. For example, the Flemish terms include objectives in connection with nectar plants for honeybees and wild bees, from recognising them to promoting them. In this way, both beekeepers with years of experience and young beekeepers can play their part in promoting biodiversity.

In the Water & Land project, we will continue to collect research questions and themes during the course of the project to encourage universities to conduct more research into the leverage function of intangible heritage.

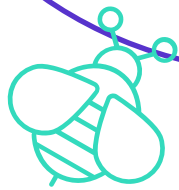

Image 11: Checking the hive frames © Honeybee Valley

Get started

The incorporation of intangible heritage in development, management, policy, and research requires a new perspective. It challenges conventional thinking patterns and established values. Beekeepers are today already regularly involved in research, management, and policy. With the help of their honeybees, they can fulfil an important signalling function or collect data for scientific research. In addition, beekeeping with attention to nature not only helps the honeybees, but also other pollinating insects. Smart plantings with native species can locally complete the flowering arc and provide both the wild bee and the honeybee with pollen and nectar. More and more beekeepers are committed to this way of beekeeping. Moreover, everyone can contribute to this. Attention to a bee-friendly environment helps beekeepers, honeybees, and wild pollinators to progress. Planting native species, placing insect hotels or leaving pieces of land uncultivated for nesting opportunities are all possible measures for a biodiverse future. This can be done in your own garden, or in collaboration with cities and municipalities, companies or organisations... Together with the beekeepers, and the bees, for the future!

Do you know of any other intangible heritage practices that are connected to water and land? Please let us know!

Are you excited to get started on intangible heritage, climate and sustainability? We have a few recommendations for you.

- **Map sustainable intangible heritage practices and focus on safeguarding.** Take a look at which practices are practiced in your (work) environment and how they could contribute to climate challenges? Do these practices tie in with (local) climate or environmental objectives? Or do you yourself perhaps practice heritage that can contribute to climate issues? Make the practice visible, for example by registering on immateriee-lerfgoed.be or immaterieelerfgoed.nl.
- **Begin the conversation with potential partners**. Collaboration and co-production are crucial, as we have learnt in the Water & Land project. Find out who could be interesting partners and think about the benefits of involving heritage for each of those partners. What common interests do you share?

- **Document and research practices** further from a historical, ecological, biological, hydrological... point of view. The more we learn about these practices, the better. Search local archives, literature and maps for landscape history, or as a biologist, ecologist, geographer... put on a historical lens.

- **Make policymakers, nature managers, local communities, young people enthusiastic** about this climate-robust heritage. Heritage works as a link between people, nature, culture, and landscape. By making people enthusiastic about (local) intangible heritage, the safeguarding of intangible heritage practices can be helped.

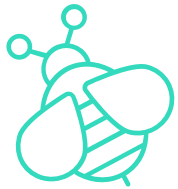

Image 12: Honeybee on a forget-me-not flower © Willem Tel.

Read more

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Nationale Bijenstrategie Nederland

Naturalis Biodiversity Center, *Bloeibogen*

Project *Beespoke*

Wageningen University & Research en partners, *Hulp voor Bestuivers*

Werkplaats immaterieel erfgoed, *Imkeren*

Website *Leve de bijen!*

Organisations associated with beekeeping in Flanders and the Netherlands

- *Nederlandse Bijenhoudersvereniging*
- *Koninklijke Vlaamse Imkerbond*
- *Vlaams Bijeninstituut*
- Tal van *Nederlandse* en *Vlaamse* lokale verenigingen
- *Bijenlandschap West-Brabant*
- *Honeybee Valley*

Project Water & Land

On the *website* you will find more information, concrete tips and project results. What do heritage bearers themselves say? And what do experts think? Listen to the podcast series Water & Land or watch the videos on the *Knowledge page* of our website.

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