

Water



SHIFT

GUIDING PRINCIPLES
ON BUSINESS MODELS
FOR WATER USE
TRANSITION

 **VERTIGOLAB**
ECONOMIE & ENVIRONNEMENT



The Watershift project is
supported by



Water



SHIFT

This guide is part of the **Watershift Project**, which aims to support the transformation of the economic models of sectors that have an impact on biodiversity and water resources in the Mediterranean.

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CO-AUTHORS

Vertigo Lab :

Clémentine ANGLADA (clementineanglada@vertigolab.eu) ; Anna ANTRAYGUES (annanatrayment@vertigolab.eu) ; Thomas BINET (thomasbinet@vertigolab.eu) ; Amélie COLLE (ameliecolle@vertigolab.eu) ; Théo NORMAND (theonormand@vertigolab.eu), Marie-Anne PAULIN (mapaulin@vertigolab.eu) ; Clara REICHERT (clarareichert@vertigolab.eu).

Birdlife International:

Joana BORES (joana.Bores@birdlife.org), Shane SPARG (shane.sparg@birdlife.org), Sofia CAPELLAN (sofia.capellan@birdlife.org), Jesus PINILLA INFUESTA (consultant).

IUCN:

Maria FERNANDA REYES (consultant), Biljana ALJINOVIĆ (consultant), Carla DANELUTTI (Carla.Danelutti@iucn.org).

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The MAVA Foundation finances and supports partners and projects aiming to conserve biodiversity for the benefit of humans and nature.



Vertigo Lab is a research and consulting firm in environmental economics that supports companies and territories in transforming their economic models and strategies to accelerate the ecological transition.



BirdLife International is a non-governmental association that covers all continents, landscapes and seascapes to protect nature and birds in particular.



The International Union for Conservation of Nature is the world's leading authority on the state of the nature and conservation measures. This is a union of governments and civil society members.

THIS GUIDE IS INTENDED FOR



ECONOMIC STAKEHOLDERS

- ▶ **Farmers**
- ▶ **Hotel & golf managers**
- ▶ **Salinas managers**

Presentation of sustainable practices to be implemented (adapted to economic and environmental issues)

- ▶ Agriculture: **p. 12**
- ▶ Salt production: **p. 13**
- ▶ Tourism: **p. 14-15**



CONSERVATION STAKEHOLDERS

- ▶ **Investors in impact financing**
- ▶ **Companies, associations, NGO**

Presentation of sustainable practices to support and address sustainability issues in the Mediterranean



TERRITORIAL STAKEHOLDERS INTERESTED IN SUSTAINABLE WATER MANAGEMENT

- ▶ **Water management companies**
- ▶ **Public authorities**

Presentation of collective sustainable water management practices to be implemented on a territorial scale

A STEP-BY-STEP GUIDE

1

Why should you use this guide?

Objective of the Watershift project: improve water management in the Mediterranean **p.4-7**

2

What does this guide provide?

Objective of the guide: assist economic stakeholders by providing sustainable solutions **p.8**

3

What is the business model approach of this guide and how to use it?

Approach of the guide: provide sustainable solutions based on changes of companies' business mode **p.9-11**

4

How to find the right solution for you

Decision support tools to identify the most appropriate sustainable solution for each stakeholder **p.12-17**

5

How to implement the right solution

Good practice sheets to facilitate the implementation of solutions **p.18-19**

1

Why should you use this guide ?

THE CHALLENGES IN THE MEDITERRANEAN REGION BY 2050

What are the environmental risks involved?

The Mediterranean basin is currently one of the most threatened economic regions in the world because of its exposure to environmental consequences due to climate change. Both climate and non-climate risks are involved:

Climate-related drivers



- ▶ **Rising temperatures.** By 2040: mean temperature will be at least 2.2°C over pre-industrial levels.
- ▶ **Rainfall decreasing** by 4% per 1°C warming
- ▶ **Sea levels rising** around 90cm, causing loss of agricultural land

Non Climate-related drivers



- ▶ **Air and water pollution** illustrated by saltwater intrusion in aquifers, pesticides from agricultural runoff, and industrial waste
- ▶ **Urbanization and land degradation reduce agricultural land, raising food security issues**
- ▶ **Overfishing and invasive species threaten marine biodiversity:** 48% loss of natural wetlands since 1970



Want to know more about water management in the Mediterranean?

- ▶ Take a look at the "Framing study on business models for water use transition"

Current and future events threaten the water cycle disruption that raise food security and sanitary issues.

How is water management correlated with these environmental risks?

Water availability decline

The paradox: while only covering 2.6% of freshwater resources, Mediterranean countries represent 7.4% of the world's population. A decrease of up to 50% in freshwater resources available due to climate change is projected throughout the region by 2100.

The result: in the South and East of the basin, over 180 million people (i.e. 40% of Mediterranean population) have already suffered from water scarcity. This trend is increasing throughout the basin. Several countries are consuming more water than is available in their territories.



Water quality degradation

The paradox: Mediterranean economic development has been concentrated on coastal areas whereas the water quality is the poorest (both surface and groundwater sources).

The result: almost 50% of rivers do not reach the ecological status required by the Water Framework Directive mainly due to contamination in recharge areas, mismanagement during irrigation practices and over-exploitation of coastal aquifers.

Biodiversity loss

The paradox: the Mediterranean is world known for its biodiversity hotspots, even though they are currently overexploited for energy and agriculture production.

The results: it is predicted that by 2100, 50% of the biodiversity areas will have burnt and 40% of endemic fish species could be extinct.

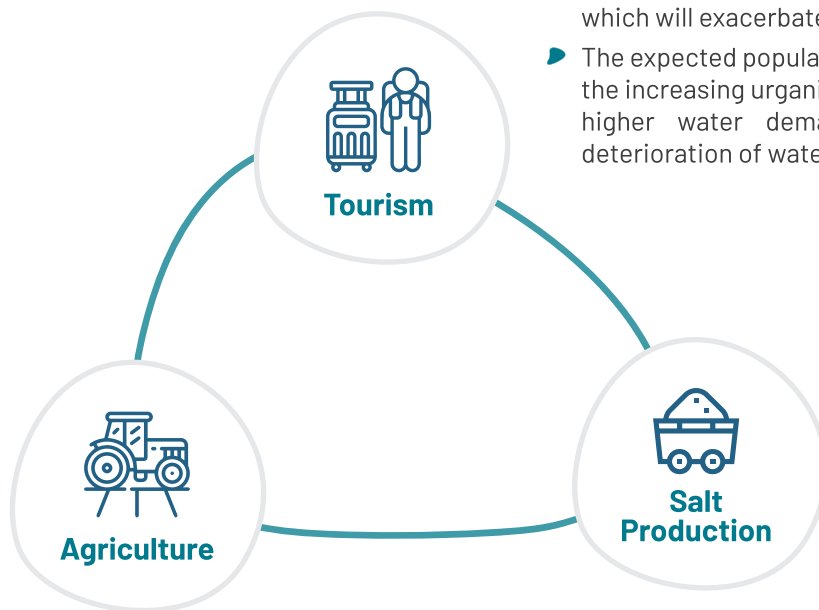


ARE YOU A STAKEHOLDER INVOLVED IN ONE OF THE THREE MOST HIGH-IMPACT ECONOMIC SECTORS IN THE MEDITERRANEAN?

Mediterranean economic development relies directly on water. All the water-related risks detailed above are highly dependent on the water management of specific high-impact sectors.

Therefore, it is essential to support the transformation of the 3 sectors with the highest impact on water supplies towards more sustainable management.

What are the three most high-impact sectors on water supplies in the mediterranean?



- ▶ Summer coincides with irrigated crop season which will exacerbate water use conflicts.
- ▶ The expected population in the coastal areas, and the increasing urbanization would not only lead to higher water demand, but also to further deterioration of water quality.

- ▶ Highest water consuming sector in the Mediterranean with 66 billion m³/year (55% the total water demand), mainly to produce water-demanding cereals, vegetables and citrus.
- ▶ Irrigation demands are projected to increase up from 20% to 75% by 2100 (climate change only; added by demographic expansion and demand)

- ▶ Traditional salt pans are in continuous decline from the 1950s, because of environmental pressures and economic stress.
- ▶ To stay viable, salinas are struggling between closing, industrializing the production with the bigger impact on water resources, or changing the business orientation towards sustainable products.



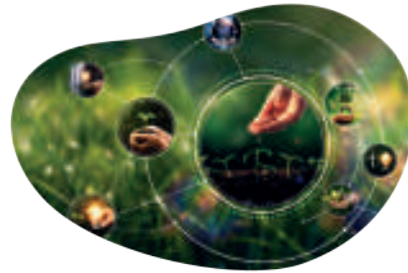
Want to know more about water management in the Mediterranean?

- ▶ Take a look at the Plan Bleu; Mediterranean Experts on Climate and Environmental Change (MedECC)

YOU WANT TO IMPROVE YOUR WATER MANAGEMENT AS A MEDITERRANEAN STAKEHOLDER?

From high-impact practices towards sustainable business models

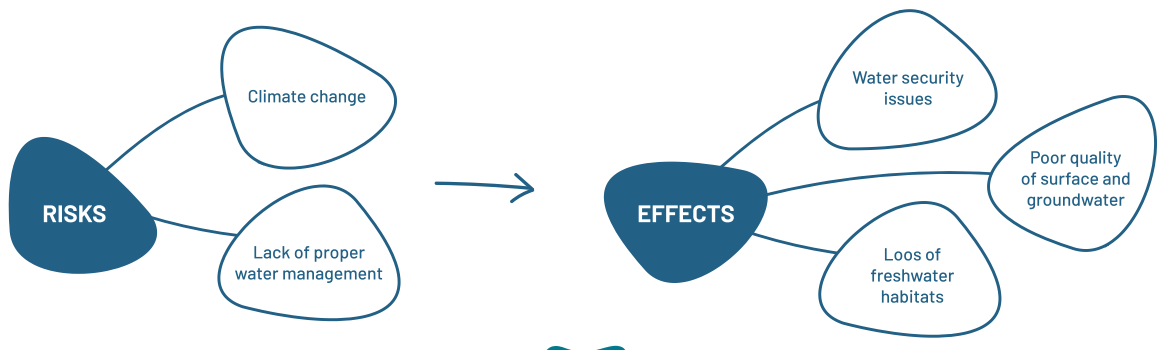
High-impact practices are strongly correlated with business models and the economic choices of companies. The impact of our targeted sectors on water resources and biodiversity is mainly due to their practices. A presentation of alternative practices alone is not enough to enable their implementation and effectively reduce the impact of sectors on water resources. Therefore, adapted economic suggestions are essential to trigger a change in practices.



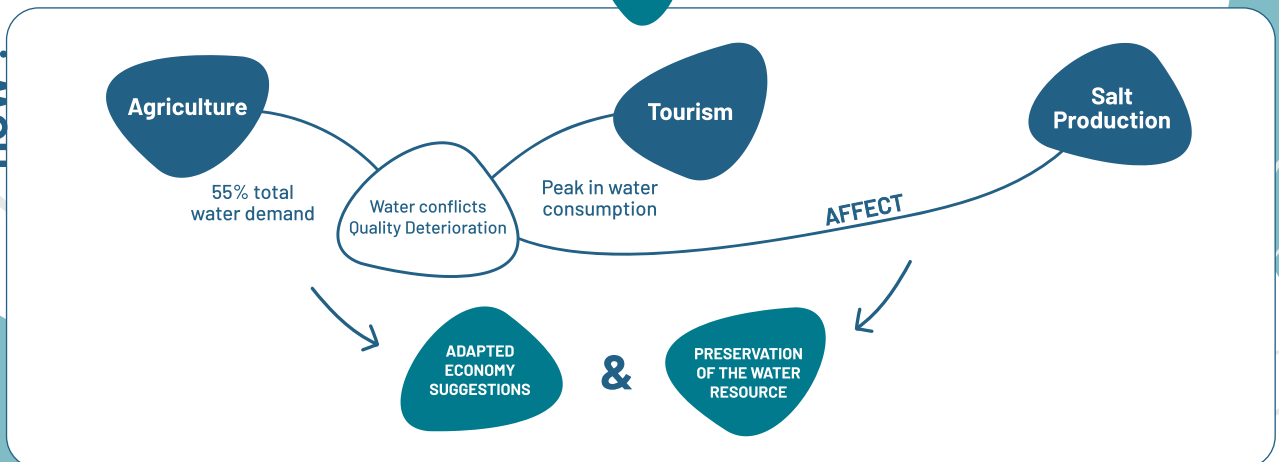
Major business models that have an important impact on water management remain based on productivity objectives. Despite an increasingly important shift to alternative models (organic farming, responsible tourism, preservation of traditional salt pans), major economic constraints faced by these sectors can limit their ability to invest in new solutions.

The Watershift project supports high-impact stakeholders towards more sustainable business models and practices

WHY?



HOW?



2

What does this guide provide?

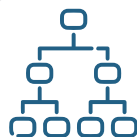
The main objective of this guidebook is to **directly assist the transition of economic actors**, by identifying **sustainable business models based on pioneering actions and inspiring water saving practices**.

TOOLS ADAPTED TO YOUR LEVEL OF INTEREST IN WATER CHALLENGES IN THE MEDITERRANEAN



An insight into the **business model approach**, to combine water challenges with economic realities.

The water project considers the business models of companies to assess their needs and economic issues related to water. This approach aims to target adapted solutions that allow companies to remain sustainable.



A decision tree to facilitate the identification of the most appropriate solution according to business model changes and priority needs of stakeholder. Different levels of commitment for business model transition are presented.



Good practice sheets

The agroenvironmental, social and economic advantages of each solution are then detailed in good practice sheets. They are stand-alone documents that are separated from this guide.

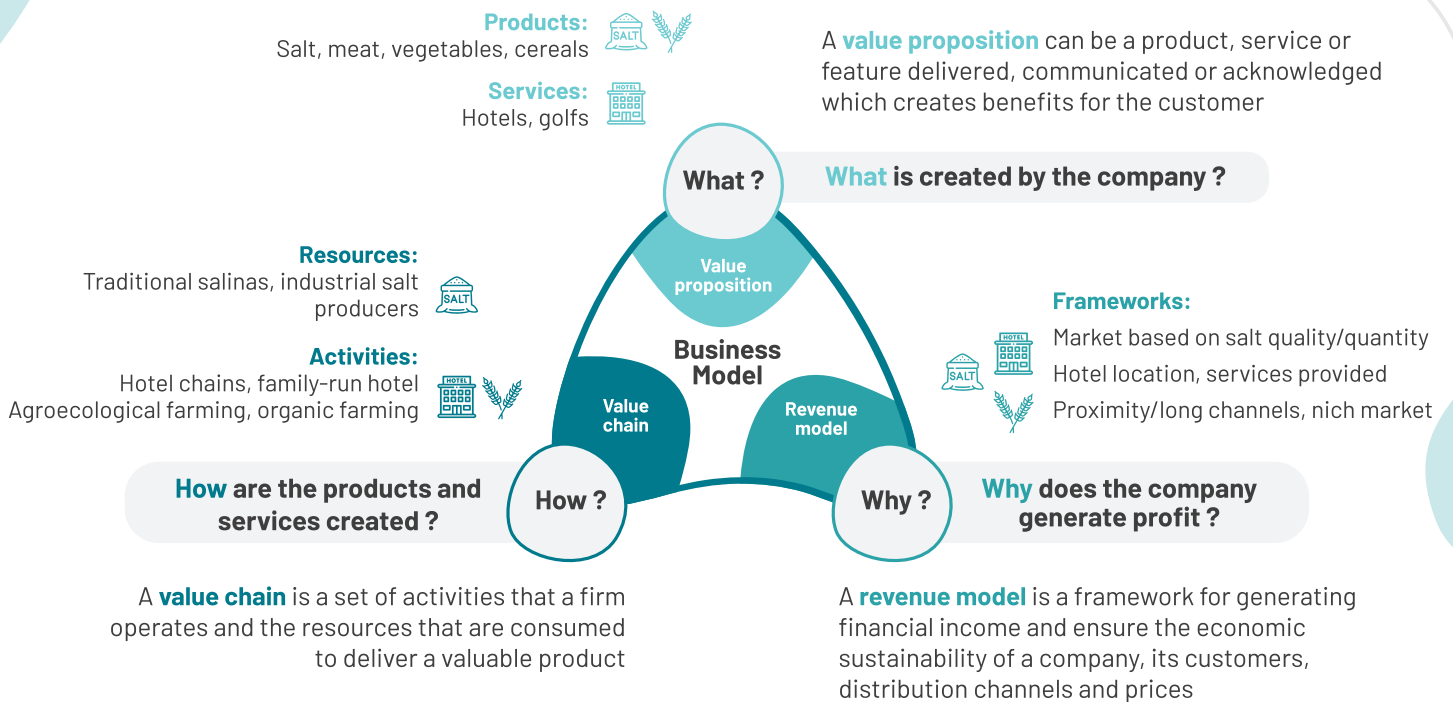
With an innovative approach, the Watershift project develops and deploys ready-to-use tools to support both strategic and operational transformation of companies willing to move towards more water-efficient practices.

3

What is the business model approach of this guide and how to use it?

A business model describes the principles by which a company **creates and captures economic value**. It identifies the value one organization can deliver, which kind of profit the business aims to make, and how the business concretely sustains itself. It also details the activities and needed resources to operate.

IN CONCRETE TERMS, A BUSINESS MODEL CAN REPRESENT A COMPANY IN A SYNTHETIC SCHEME



OBJECTIVES OF THE BUSINESS MODEL APPROACH ARE THREEFOLD



Enable a long-term transition of companies

by presenting systemic solutions that consider the whole companies' viability.



Ensure acceptability of solutions from companies:

start by the economic challenges they face and propose sustainable solutions adapted to their context.



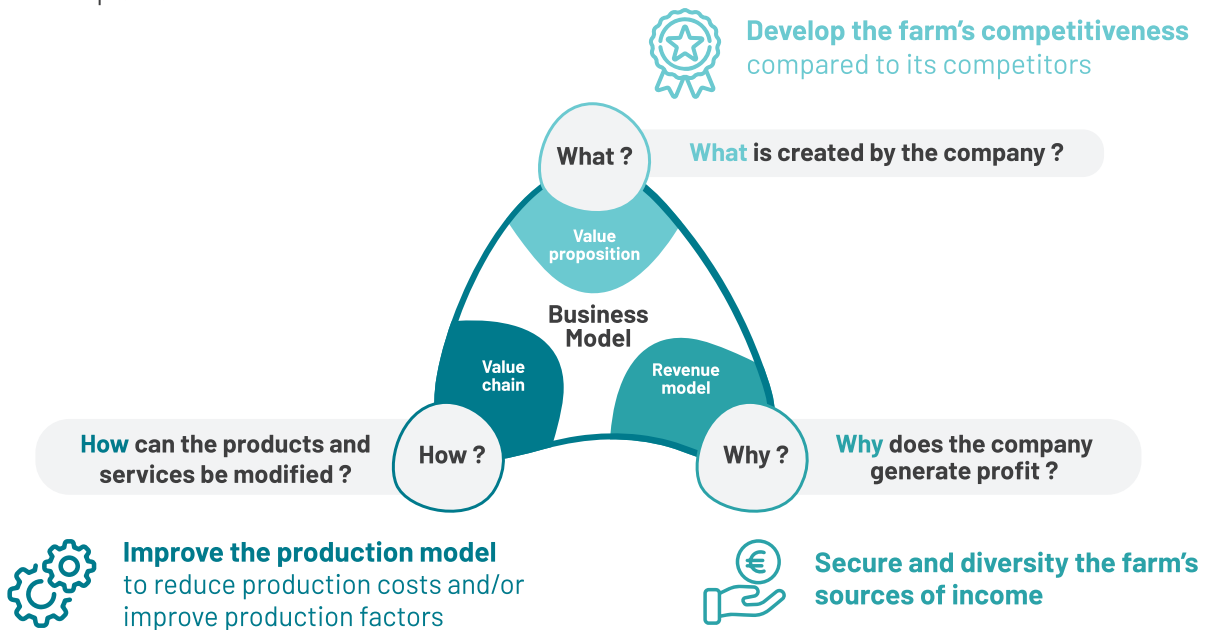
Allow a personalized choice of solution

adapted to the diversity of business models and needs for each company.

ILLUSTRATION: CATEGORIES OF BUSINESS MODEL CHANGES FOR THE AGRICULTURE SECTOR

The implementation of the eight good farming practices can lead to more or less significant changes in a farming company's business model, when implementing them. The chosen approach is to **support the company in leading to the most adaptable and relevant practices to limit the impact on water, while remaining viable.**

For agriculture, we identified 3 main business model's changes due to good practices implementation:



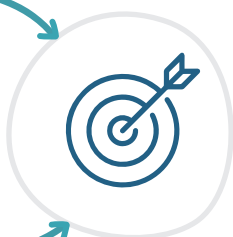
Even if they are all necessary for the economic development of companies, these three categories of economic challenges are sector-distinct and present very different levels of importance depending on the company.

A THREE-STEP APPROACH TO GUIDE ECONOMIC ACTORS TOWARDS PRACTICES AND BUSINESS MODELS WITH LESS IMPACT FOR WATER MANAGEMENT

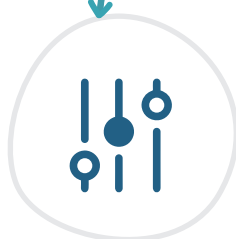
The general frame when engaging into the implementation of good practices will be divided into 3 main steps



1 Identify the business model changes by the company to know the major decision factors to consider



2 Target the priority needs of companies that lead to the implementation of sustainable solutions to define the exact expectations of companies.



3 Adapt suggested solutions to company's willingness to change by presenting different solutions corresponding to increasing levels of commitment



The implementation of sustainable practices depends on both the company's needs and willingness to change.



Two companies with similar economic needs may have different options according to their willingness to change. Once the company has identified its priority needs, different levels of commitment can be considered: from a slight adjustment of the company's operations to a total change of its production model.

4

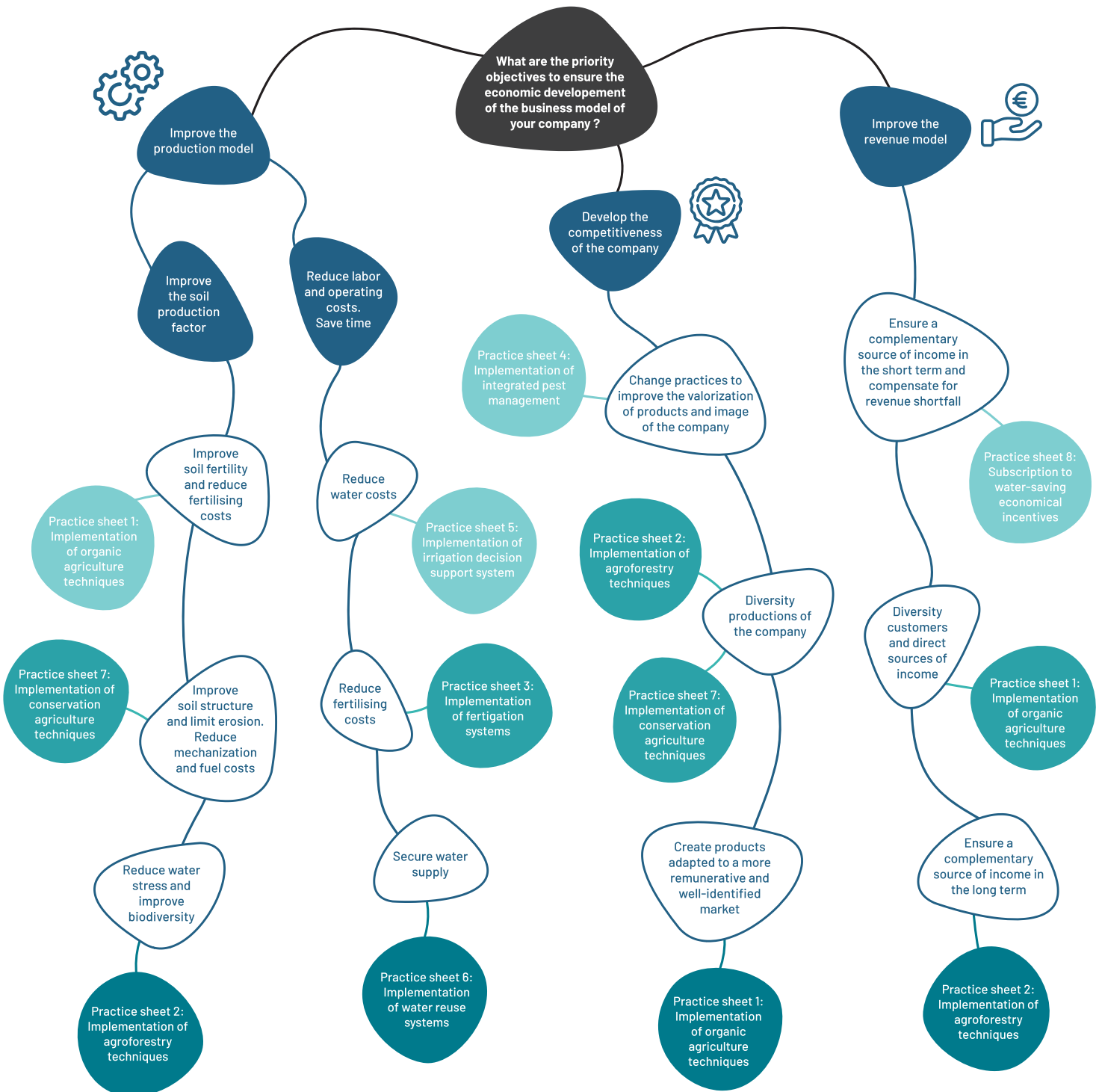
How to find the right solution for you

FOR AGRICULTURE STAKEHOLDERS

 Issue
 Low commitment practice

 Solution
 Medium commitment practice

 Priority needs of companies
 High commitment practice



FOR SALT PRODUCTION STAKEHOLDERS



Issue



Solution



Priority needs of companies



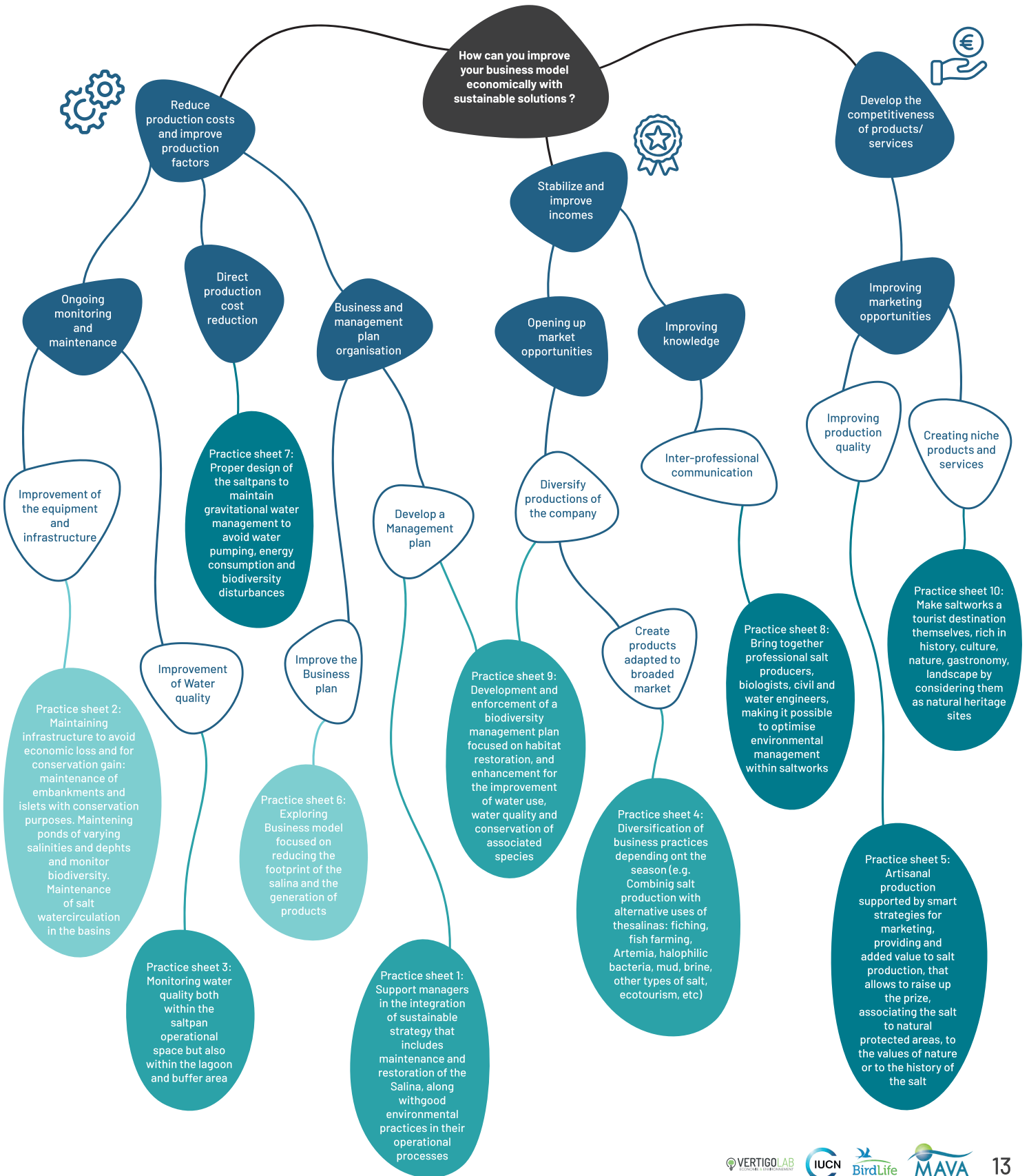
Low commitment practice



Medium commitment practice



High commitment practice



FOR TOURISM STAKEHOLDERS (HOTELS)



Issue



Solution



Priority needs of companies



Low commitment practice



Medium commitment practice



High commitment practice

What are the priority objectives to ensure the economic development of the business model of your company?



Reduce hotel costs and improve services for clients



Develop/improve the competitiveness of hotel services

Ensure high quality of services

reduce maintenance costs

Develop and comply with (internal) environmental plans

Reduce water costs

Reduce water consumption

Change (conventional) practices to improve the image of the hotel

Improve staff's environmental knowledge and awareness

Create customer's environmental awareness

Reduce energy costs

Ensure maximum flow with minimum water quality

Practice sheet 1: Installation of timed taps in general areas

Practice sheet 9: Use of seawater or own wells for pools

Practice sheet 4: Training staff to create awareness and save water

Practice sheet 7: Green messages for customers

Practice sheet 3: Pressure reduction on the main hotel's water supply

Adaptation of gardens for low water consumption

Practice sheet 2: Use of low-water consumption plants

Use of alternative (water) sources

Secure water supply

Practice sheet 8: Installation of aerators and consumption reduction devices

Practice sheet 6: Installation of rainwater collection system

Practice sheet 5: Reuse of greywater for toilet flushing and gardening

Practice sheet 10: Reuse water from pools

FOR TOURISM STAKEHOLDERS (GOLF COURSES)



Issue



Solution



Priority needs of companies



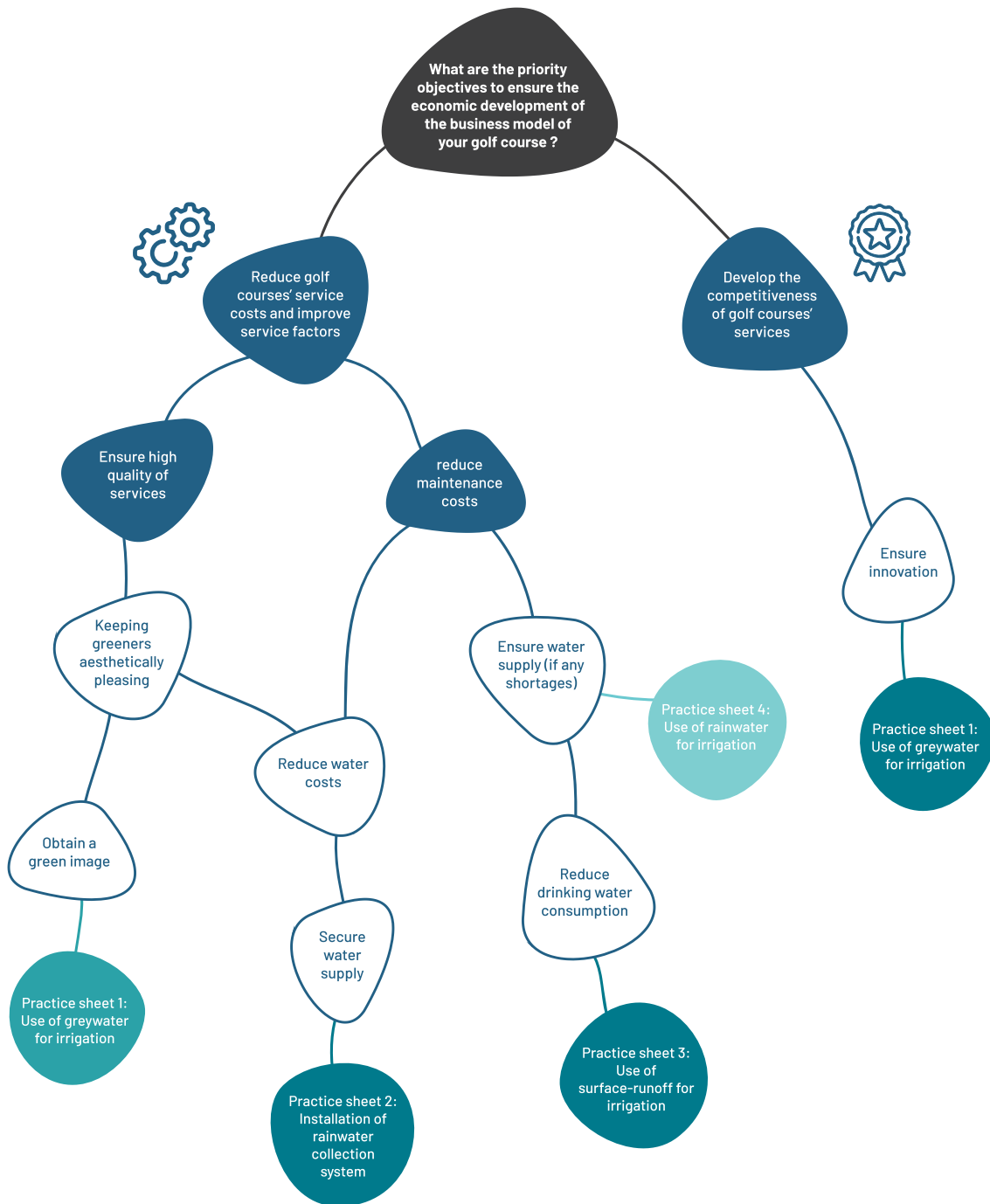
Low commitment practice



Medium commitment practice



High commitment practice



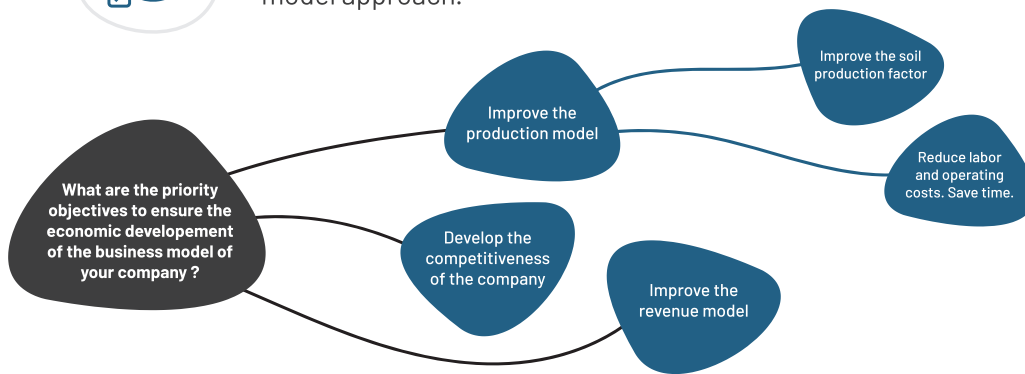
HOW TO READ THE DECISION TREE

Decision trees are designed to make the connection between the economic challenges faced by companies and the sustainable solutions that we propose. They facilitate the identification of the most relevant practice for each company regarding the three-step approach presented below:

1 Identify the business model changes wished by the company to know the major decision factors to consider



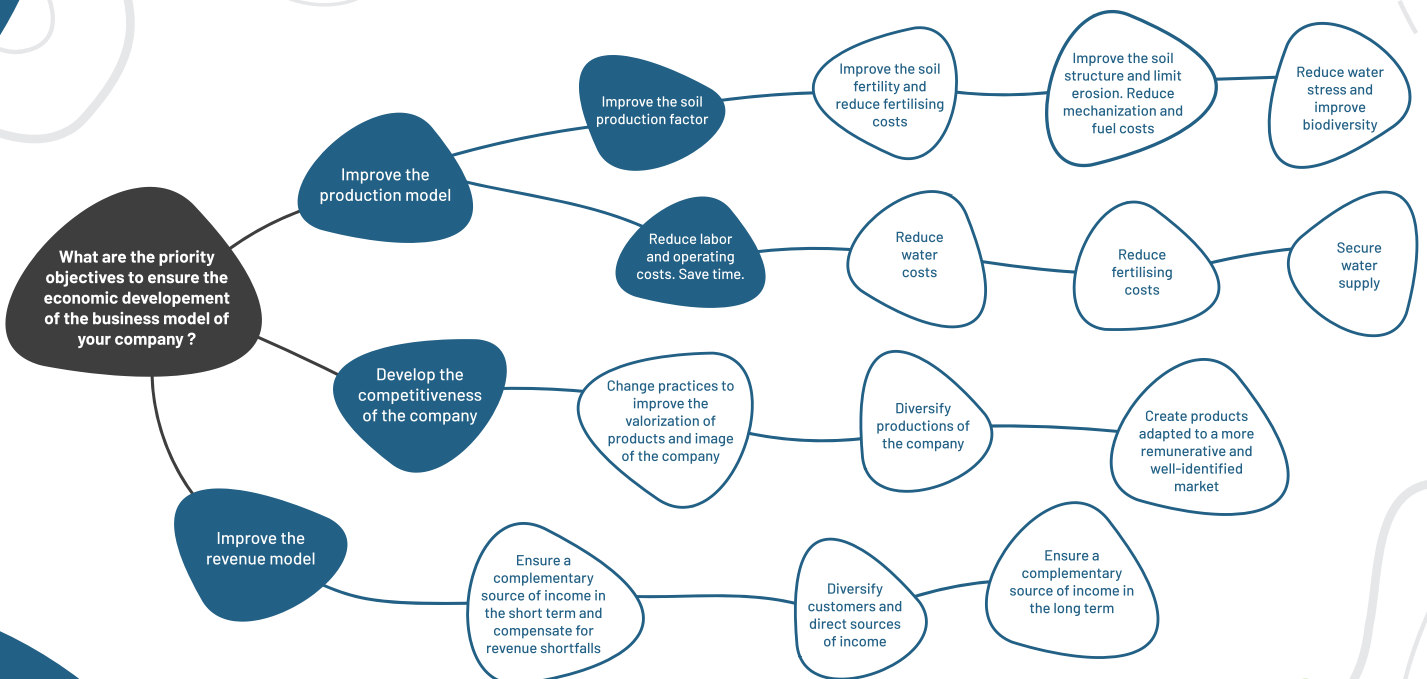
The first node of decision trees represents **the main categories of business model changes per sector**, based on our business model approach.



2 Target the priority needs of companies that lead to the implementation of sustainable solutions to define the exact expectations of companies



For each of the 3 business model changes, priority needs of companies related to these changes are then detailed. **Each sustainable solution is placed in the decision tree according to the set of priority needs it addresses.**

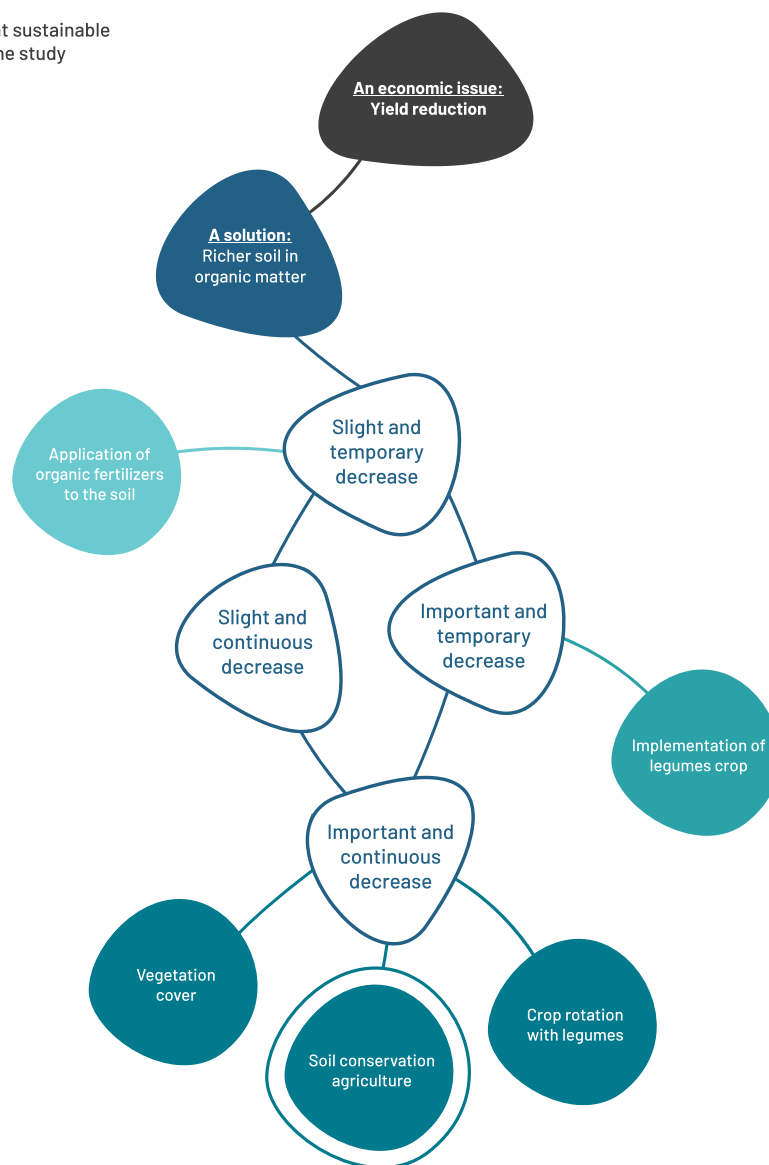
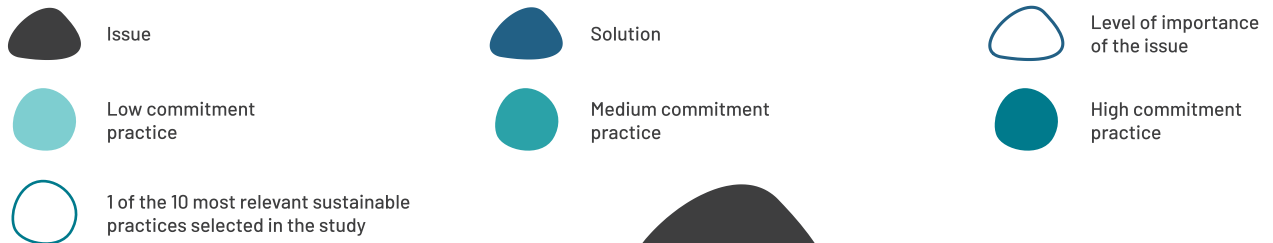


3

Adapt suggested solutions to the company's willingness to change by presenting different solutions corresponding to increasing levels of commitment



The business model approach allows both the needs of the company that can facilitate the implementation of new practices as well as different levels of willingness to change to be considered. **The expected level of commitment of the company corresponds to the level of advancement of the solution in the decision tree.** It leads to successive "commitment steps", the lower levels being at the left of the tree and the higher at the right.



Finally, once the right solution has been identified from the decision tree, **each solution is detailed in good practice sheets** to assist companies in its implementation: benefits, points of attention, feedbacks in Mediterranean, etc.

5

How to implement the right solution

A good practice sheet is proposed for sustainable solutions or case studies depending on the sector. Each good practice sheet gathers:

- ▶ The main advantages of the solution, as well as the priority needs it addresses at an environmental, social and economic level.
- ▶ The key figures and indicators related to the impacts to bring quantitative data and scientific research.

GOOD PRACTICE SHEET N° 2
AGROFORESTRY

What is agroforestry?
Agroforestry is the intentional integration of trees and shrubs into crop and/or animal farming systems to create environmental, economic, and social benefits.

Why should you implement agroforestry?
Agroforestry enables positive impacts on production farmers (and so water and climate, biodiversity...). For farmers, it makes it possible to diversify products and income with fruits, fuel and the many uses of wood. The services provided by trees (nitrogenous fixation, habitat and fuel for crop, medicinal, landscape, soil fertility and organic matter, insect resistance, mulch, wood energy...) are particularly useful & long-term. There are also environmental, sustainable capital, which adds value to the farm.

What are the environmental and agronomic needs addressed by agroforestry?

- Improve soil fertility and biodiversity
- Improve soil structure and water retention
- Reduce water stress

What are the economic needs addressed by agroforestry?

- Diversify production on the farm
- Secure a complementary source of income in the long term

Decision tree reminder for the good practice

Main advantages of the solution

Priors needs addressed by the good practice

GOOD PRACTICE SHEET N° 2
AGROFORESTRY

What are the key figures for agroforestry? *

AGRO-ENVIRONMENTAL IMPACTS

- The overall productivity of agroforestry plots is higher than that of croplands, up to 30% more biomass, and 40% more products to sell.
- An average increase in organic matter of about 50%.
- A potential carbon storage between 0.1 and 1.0 tC/ha/year.
- More agroforestry models have been developed in the Mediterranean basin with a wide range of biomass products: vineyards, livestock, market gardening.

SOCIAL IMPACTS

The high social value of agroforestry was recognized at EU level in 2005. With the Council Regulation on support for rural development by the European Agricultural Fund for Rural Development (EAFRD) the first grant support was made available for the creation of agroforestry systems due to their high ecological and social value.

ECONOMIC IMPACTS

- A total investment estimated between 400 and 1000€/ha according to the species that can be covered (from 0 to 200€/ha by support measures).
- An average annual return of: 330€/ha/year for hybrid walnut 90€/ha for collected paper 60€/ha for cherry tree.
- The internal rate of return (IRR) varies from 10, to more than 70%, for a real-time perspective. In agroforestry depending on the tree species. One of the main profitability parameters of these long-term investments is the number of years to obtain the desired yield.

POTENTIAL DEVELOPMENT

At office, between 2010 and 2014, 1000 ha of agroforestry systems were created in the Mediterranean basin.

Quantitative impacts of the good practice for sustainable development

Main figure to illustrate the potential development of the good practice

- ▶ The triggers that lead to the implementation of the solution as well as the benefits that economic stakeholders can obtain from it. Recommendations and major points of attention in the implementation of each solution are also detailed and based on feedback.
- ▶ Some suggestions of documents, projects, networks, and funding sources to deepen good practice knowledge on a Mediterranean level are detailed in each good practice sheet.

Main farm issues addressed by the good practice

Up to 5 key steps to implement the good practice from scratch

GOOD PRACTICE SHEET N° 2
How to implement an agroforestry system?

ON-FARM ISSUES

- 1 Decline in yields
- 2 Soil erosion problems
- 3 Commercial dependence
- 4 Polluted soils and water, pollution of catchment areas
- 5 Water management problems

KEY STEPS TO A SUCCESSFUL IMPLEMENTATION

1. Assessment of the farm and its resources
2. Selection of the agroforestry system
3. Design of the agroforestry system
4. Implementation of the agroforestry system
5. Monitoring and evaluation of the agroforestry system

IMPACTS AND BENEFITS

- 1 Soil fertility and plant growth
- 2 Land restoration, reducing soil erosion and requiring water
- 3 Diversification of agricultural produce
- 4 Reduction of water and soil pollution, biodiversity preservation
- 5 Resilience to weather events

FIELD ADVICE

*Thinking about your agroforestry project is not only a matter of anticipating the price of wood in 30 or 40 years. The agroforester must also think about the **phase of crisis in the farm** leading to their idea and how it may help to respond globally to the needs of their current system, in particular, **agrobots in set up in three stages**: a stage of production adaptation (the choice of species adapted to a given climate and agroecological conditions), a stage of adaptation to the specific of the farm and its resources, and a stage of diversification of the farm's products. The agroforester must also think about the **phase of crisis in the farm** leading to their idea and how it may help to respond globally to the needs of their current system, in particular, **agrobots in set up in three stages**: a stage of production adaptation (the choice of species adapted to a given climate and agroecological conditions), a stage of adaptation to the specific of the farm and its resources, and a stage of diversification of the farm's products.

KEY CHALLENGES

- Economic profitability in long term**: The economic transition towards an agroforestry system must be accompanied by financial support to ensure the quality of the farm during the transition.
- Technical improvements to be made**: The success of agroforestry must consider the requirements of its associated agricultural sector, and to improve efficiency and adaptability.
- Ecological competitiveness in short term**: There may be competition between certain types of trees and the crops planned for crops and livestock for high, water and soil services.

VERTIGO Water, **GLAD** 3/4

Key benefits of implementing the good practice

Identified limits of the good practice

Feedbacks from pioneer's actor

On-going projects that focus on the good practice. To be joined at any-moment

Existing funding sources that can bring financial support to your ready-to-implement project

GOOD PRACTICE SHEET N° 2
How to go further?

MORE INFORMATION DOCUMENTS AND DATA

- ADRIE, 2016**, Recognizing trees: how agricultural systems to diversity production and strengthen ecosystems.
- Buatoir C., Lignier E., 2018**, Agroforestry - 2000 ans de l'arbre en France. Paris, Editions France Agricole, 416p.
- TW3, 2021**, Agroforestry for landscape restoration: Exploring the potential of agroforestry to enhance the sustainability and resilience of degraded landscapes. <https://doi.org/10.1007/978-94-007-7114-4>
- Jean, E., 2008**, Agroforestry for ecosystem services and environmental benefits: an overview. Agroforestry - Systems, 18(3): 1-16. <https://doi.org/10.1007/978-94-007-7114-4>
- Prunier-Lucas, M. et al., 2018**, Agroforestry in Europe? A land management advice book to correct climate change.
- Berthelin E., Anton K., De Foresto G., 2020**, The contribution of agroforestry within the European enhanced agroforestry in France. CarbonDioxide Capture, Storage and Agroforestry for Sustainable Landscapes. Management, 1(2): 1-12. <https://doi.org/10.1007/978-94-007-7114-4>

DISCUSS AND TEST PROJECTS, TOOLS AND NETWORKS

- LEONARDO** is a cross-border project that addresses the challenge of knowledge and technological transfer in Mediterranean agriculture and forestry systems through six agroforestry pilot projects: **Spain, Greece, Lebanon and Jordan**. It aims to achieve and share good practices for agroforestry production, increasing biodiversity, enhancing farmer's resilience and increasing profitability for farmers, and more active in social and institutional practices.
- ARISE** is a European transnational project that aims to support innovation in agroforestry by increasing the transfer of knowledge between the different stakeholders in the development of agroforestry development.
- AGROFOR** is a European initiative project to promote agroforestry practices to practitioners. It is based on the identification of good practices, dissemination of knowledge, and training that will provide farmers with the skills and knowledge they need to implement agroforestry on their farms.
- AGROFOR** is a project led by the French Association of Agroforestry in the Mediterranean basin to promote agroforestry practices, covering the diversity of agricultural soils, the planting of trees and water management.

TAKE ACTION FUNDING SOURCES

The Project: Thanks to the financing of European entities in order to meet their needs in their territories and to strengthen impact. For France, the project is financed by the French Republic and the French Republic and the French Republic. The project is financed by the French Republic and the French Republic. The project is financed by the French Republic and the French Republic.

GLAD: Agroforestry pilot sites have received an agricultural grant, four beneficiaries, but applying for CAP and under the tree and second culture, after a total of 2021 trees per hectare. European measures to support agroforestry in agriculture (measure 312) or the 2021 financial support to the practice of agroforestry pilot sites. The amount of aid can reach 30% of the investment (2021) however, it only concerns new plantations with objectives of wood production.

Agroforestry in French farming program is a program supported by the French Republic through existing financial aid for the planting of agroforestry trees in France.

VERTIGO Water, **GLAD** 4/4

Complementary documentation if you want to deepen the theory of the good practice

Good practice sheets will be presented in separate, sector-specific workbooks to develop documents adapted to the sectors' needs.



Bibliography

EEA (2006) Priority issues in the Mediterranean environment.

EEA (2018) Ecological Status of Surface Water Bodies.

Fader, M. et al. (2016) 'Mediterranean irrigation under climate change: more efficient irrigation needed to compensate for increases in irrigation water requirements', *Hydrology and Earth System Sciences*, 20(2), pp. 953-973. doi:10.5194/hess-20-953-2016.

Guiot, J. and Cramer, W. (2021) 'Is the Mediterranean Basin really a hotspot of environmental change?', *The Conversation*.

Ludwig, W. et al. (2010) 'Water and nutrient fluxes from major Mediterranean and Black Sea rivers: Past and future trends and their implications for the basin-scale budgets.', *Global Biogeochemical Cycles*, 24.

Margat, J. and Treyer, S. (2004) 'L'eau des méditerranéens : situations et perspectives.', *MAP Technical Report Series*, 158.

MedECC (2020) *Climate and Environmental Change in the Mediterranean Basin – Current Situation and Risks for the Future*.

MED-EUWI (2007) *Mediterranean Groundwater Report*.

Milano, M. et al. (2012) 'Facing climatic and anthropogenic changes in the Mediterranean basin: what will be the medium-term impact on water stress?', *Comptes Rendus Geoscience*, 344, pp. 432-440.

Nikolaidis, N.P. et al. (2014) *Water Quality of the Mediterranean*.

Oréade-Brèche (2018) *Économiser l'eau pour l'irrigation par les changements de pratiques agricoles : analyse comparée de politiques publiques et pistes d'amélioration en France*.

PNUE/PAM and Plan Bleu (2020) *État de l'Environnement et du Développement en Méditerranée*.

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VERTIGOLAB
ECONOMIE & ENVIRONNEMENT

06 46 18 65 06
contact@vertigolab.eu



Darwin Eco-système
87 Quai des Queyries
33100 Bordeaux



www.vertigolab.eu
www.watershift.org

