Occupational foresight methodological guide

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methodological guide

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I. Introduction and background

The Youth Employment in the Mediterranean (YEM) project, an initiative led by UNESCO and funded by the European Union, targets countries in the South Mediterranean region with the aim of supporting youth employment through improved anticipation of skill needs and assessment systems, the promotion of quality and relevant Technical and Vocational Education and Training (TVET) and regional collaboration.

On January 16 and 17 2019, a planning and capacity-building meeting was convened within the context of the YEM project. At that meeting, theories and practices related to occupational foresight were presented to participants with two options for anticipation: a multisectoral foresight process to add qualitative options to employment forecast built through econometric models and a single-sector foresight process aiming to anticipate either skills needed in the future for that sector or how to obtain in the future skills already identified as important for this activity. The aim of this guide is to provide an overview of the detailed methodology of occupational foreign in a single activity sector.

The theories and practices must be performed by subject matter and educational experts. It can be organized through seminars involving 15 to 20 experts of both backgrounds (hereafter referred to as the Working Group). The last chapter of this guide details an organizational proposal for these seminars.

In March 2020, three-hour remote training sessions were provided to allow education experts to organize and perform the foresight study themselves. The purpose of these remote training sessions was to explain and go through a step-by-step practice of the tools and processes used to perform the study. It was hoped that the training would allow stakeholders to organize the study later with more flexibility (agenda, number of seminars) and lead the study in Arabic. To ensure dialogue and efficient remote workshops, the number of participants was limited to six or seven, half being subject matter experts and the other half educational experts.

A first training was performed in Lebanon for the water activity sector in November 2020. A second training was conducting in Jordan for the tourism sector in February and March 2021. Finally, training was provided for the handicraft sector in Morocco and the textile and clothing sector in Tunisia. Examples illustrated in this methodological guide come from the training session in Jordan. The results of the Lebanese training exercise are reproduced in Annex 2.

The main goal of this methodology is to build scenarios of the future of an activity aiming to determine the skills and competencies that will be needed in the medium term (5 to 10 years) to perform the activity as well as to provide policy recommendations.

Depending on country context and activity needs, the methodology can also be used to determine:

- How to obtain skills and competencies already identified as a need today

- Actions to foster employment within the concerned activity

The methodology is described in the following chapter, with three subchapters detailing each of the steps followed. However, it should be noted that the example used to detail the methodology is derived not from a real study but a remote training session on tourism in Jordan. This means that the process was performed without the documentation or in-depth discussion that a real study would require. The example in Annex 2 is also taken from a training session and therefore has the same limitations.

A third chapter describes methodological alternatives and advice for the practical organization of the study.

II. Methodology

The methodology consists in, first, identifying the activities required for occupational foresight into "drivers". The activities were described by the different steps. Then the methodology foresees the identification of all factors influencing each step of the value chain. These factors are then sorted to choose only the most important regarding employment and skills and the most uncertain in a five- to 10-year time frame. These factors are called "drivers" and ideally a maximum of 10 drivers should be selected.

The second step of the methodology consists in analyzing the drivers one by one and forecasting and documenting 10-year hypotheses for each. This documentation helps participants to discuss the future hypotheses to ensure they are possible within a 10-year time frame.

The third step is dedicated to building scenarios by combining future hypotheses. Each scenario should assemble a future hypothesis for each driver. Scenarios are then written out in full detail in a storyline. The impacts of each scenario in terms of employment and competencies needed are then deduced for each scenario or storyline. Obviously, competencies appearing in several scenarios are more important that competencies appearing in just a single one and support the drawing of conclusions and recommendations.

The three-step methodology is further detailed below.

1. Identify factors influencing steps of the activities required for occupational foresight (i.e. "drivers")

2. Develop hypotheses for "drivers"

3. Develop scenarios, impacts and recommendations for occupational foresight

This methodological process aims at helping people from different backgrounds to share a collective picture of how the activity runs (step 1), how each important factor or driver for employment and competency can evolve over time (step 2) and different paths of developing these activities and the competencies (step 3).

1. Identify the foresight system in drivers

This step aims to identify the factors, which once identified and sorted are called drivers, that will form the basis for the future of the related employment and competencies. The factors influencing the evolution of the value chain are usually uncertain. Drivers are almost never limited to a single factor or actor.

This step is divided into three stages that can be managed in three workshops with the Working Group. The first is to validate or identify the value chain of the activity. The second one is to identify factors influencing the development of this value chain through time with a proposal of two processes either a direct one for a simple value chain or through a SWOT (Strength, Weaknesses, Opportunities and Strengths) analysis for a complex and multiple issue value chain. The third stage consists in ranking and sorting the factors to keep only the most important ones for their influence on competencies and employment and the most uncertain (the ones for which change is expected). A maximum of 10 drivers (11 or 12 are often manageable but not more) should be found as a result of this stage to keep the methodology simple (if impossible, chapter III explains the more complex process through which to deal with a greater number of drivers).

To start, the value chain of the activity must be identified. The value chain of an activity can be defined as the different tasks that should be managed, often by multiple stakeholders, to provide all products and services needed to perform the activity. An example of a value chain for tourism and hospitality in Jordan is reproduced below. Another value chain for water network maintenance in Lebanon can be found in Annex 2.

Figure 1: Tourism in Jordan: value chain from training exercise
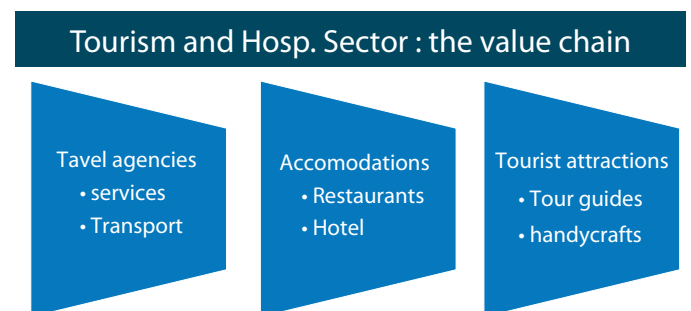
Tip: keep the value chain to a maximum of 5 to 6 steps. To save time during seminars, it is best to prepare a value chain proposal in advance for the Working Group to discuss. Once the Working Group has agreed on the value chain, there are two possible ways to identify the drivers with the most impact, as outlined below.

A. Direct driver process and sorting

A first direct way to find the drivers is to simply ask the Working Group what factors are influencing the future of the value chain. Below is an example for the drivers found for tourism activity in Jordan.
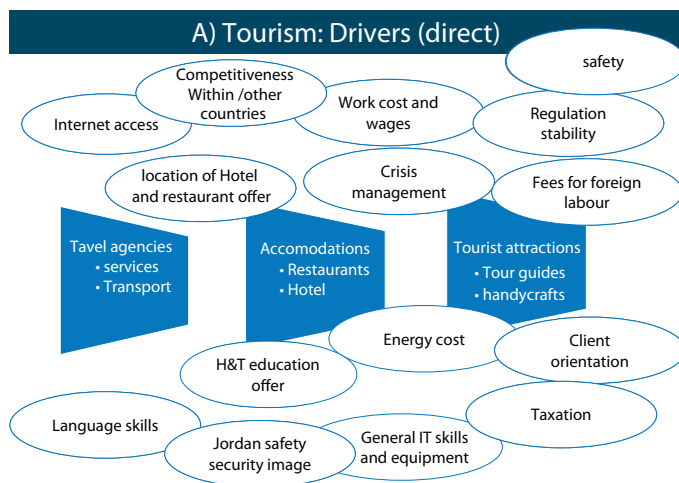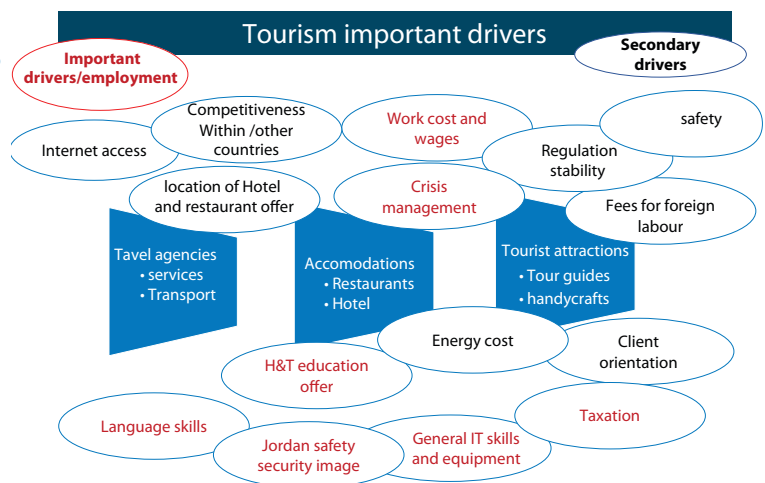
A) Tourism: Drivers (direct)
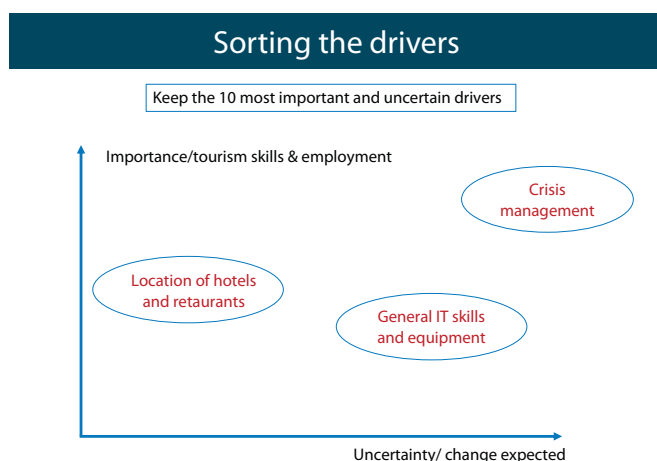

Tourism important drivers

The goal is to keep the **10 drivers that most influence employment and skills in the value chain.** Therefore, the Working Group participants are asked which of the drivers they think **are the most influential.**

If the first sorting results in more than 10 drivers, participants can proceed to prioritize them on an importance/ uncertainty graph.

Uncertainty is bound to the speed of change for each driver. For example, in a time frame of 5 to 10 years, drivers involving urbanism, construction or demography have generally more inertia and thus a slower speed of change than economical drivers.

Figure 4: Tourism in Jordan — driver sorting, by ranking

Sorting the drivers

In this example, there are three drivers:
(1) Location of hotels and restaurants;
(2) General IT skills and equipment and
(3) Crisis management.

It is important to ensure that all key stakeholders have the same understanding of how the different drivers influence skills and whose skills are targeted (youth in education, employees within the activity, customers, etc.). In this example, "location of hotel and restaurant" is important for employment and skills because most accommodations today, such as hotel and restaurants, are in Amman. If a higher number of accommodations were opened in other cities and near tourist sites, employment in the activity could be enhanced and tourists may be motivated to stay longer. However, construction and permits are needed to open accommodations, thus changes in this area require time. "IT skills and equipment" are likely to change faster than the "location of hotels and restaurants" because less monetary investment is needed. However, the importance of the "IT skills and equipment" driver is not as high for employment and skills in the tourism activity because Jordanians are already equipped with smartphones and tablets; the skills to use this equipment are important for tourism workers and students but as labelled this driver is not quite as critical. The Working Group participants in this example have deemed crisis management the most important and the most uncertain, because the training coincided with the COVID-19 crisis, which led to a shutdown of international flights.

Note, through this example, that the factor or driver selection is highly influenced by the context: if the training had been conducted in 2018, "crisis management" would probably not have been considered as a driver.

Drivers that are almost certain (low uncertainty) can be considered as heavy trends, which can lead to a single future hypothesis. For this reason, these can be eliminated from the list of drivers with uncertainties. The same hypothesis will be considered in all scenarios at the end. Similarly, drivers with low importance, whatever the uncertainty, can be considered as secondary drivers and thus disregarded. Only drivers with high importance and uncertainty are kept as key

drivers. No more than 10 (or 11 to 12) drivers should be kept for this exercise. Chapter III of this report explains how the methodology adapts to consider a larger number of drivers.

The discussion about drivers' uncertainties and relative importance towards skills and employment should be used as an opportunity to better define the drivers.

B. Defining drivers with a SWOT analysis

The second way to identify drivers will lead to more drivers/factors to sort, and consists of conducting a Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis.

This method is preferred when

- One of the steps of the value chain is targeted for the occupational foresight study

- The value chain is complex with a large variety of processes and product issues

The SWOT analysis is performed on each step of the value chain during a seminar. It is possible to split the Working Group into smaller groups, each working on one step of the value chain.

A SWOT analysis generally lists facts or trends than can easily be translated into drivers, factors on which hypotheses can be built. An example of a SWOT for the "tourist attractions" step of the tourism and hospitality value chain is illustrated in the below.

Figure 5: Tourism in Jordan - factors influencing the system

The driver or factor translation from facts and trends can be as follows:

- From opportunities: either "cultural tourism service offer", "experiential tourism service offer", "ecotourism service offer" or a single driver including these three dimensions that can be named "specific or new trend tourism service offer (cultural, experiential and ecotourism)".

- From threats, the regional safety for foreigners can be translated into "safety perception of Jordan", since safety for foreigners is not an issue in Jordan, but the perception of Middle East safety is a threat.

- From strengths, since there is no uncertainty about historical sites or the existence of natural beauty, only services bound to these sites can be drivers. Thus, drivers can be "tour services for historical sites, natural beauties, and religious sites" and "services offer using therapeutic resources".

- From weaknesses: The availability of leisure activities can itself be a driver, but it should be clearly differentiated from the other drivers already listed. It can be more clearly defined as "leisure offer (excluding cultural tours and services using therapeutic resources)".

This translation into drivers is an opportunity to obtain a clear definition of the drivers, which will be needed for the hypotheses phase. Drivers must be sorted to keep only the ones that are able to change within a 5-to-10-year time frame and drivers with significant impacts on skills and employment.

C. Checking the driver system

It may be useful to check the impact relationship within the driver system, once sorted. This will allow to produce another view of the driver list and to possibly identify missing topics. Additionally, the relationships among drivers will be used later to build the scenarios. Thus, the graph will show in advance the logical links between drivers that will help building storylines of scenarios.

The exercise about tourism in Jordan led to the production of the graph system below (Figure 6). In a study, the driver relationship system can be sketched with the working group after listing drivers, sorting them by discussing the precise meaning, uncertainty through time and relative importance towards skills and employment for the activity.

In this example, H&R stands for hotel and restaurants, H&T stands for hospitality and tourism, Education major includes IT and language skills, taxation means VAT and other taxes (excluding social taxes). The arrows show the influence of drivers on each other.

Figure 6: Tourism in Jordan - factors influencing the system

THE SYSTEM
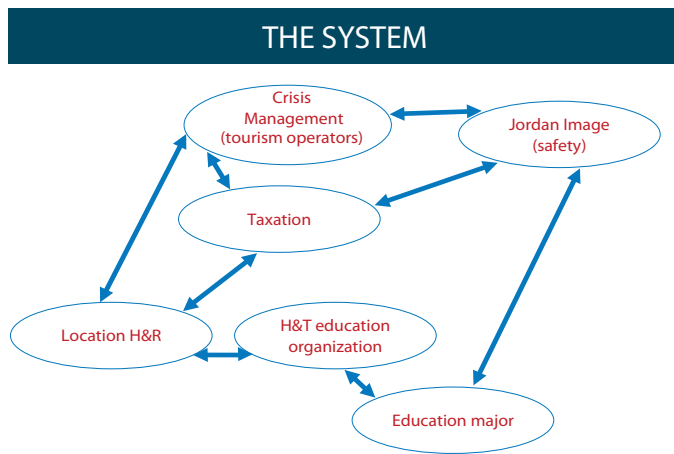
Note that driver identification is bound to the goal and question the foresight study aims to answer

If the question is **"how to find identified skills we need?"** then the driver system should include educational drivers (Curricula by level, TVET organization…)

If the question is **"what will be needed skills in the future (not yet identified)?"** then the driver system should include technological and organizational drivers related to the activity.

If the question is **"what to do to foster employment in the activity?"** then the driver system should include drivers about companies' strategies, needs, organization as well as context (country) drivers.

2. From drivers to hypotheses

The aim of this step is to imagine possible hypotheses about each of the drivers across a 10-year time frame. A hypothesis is a state of the driver in this time frame. Hypotheses can be found directly by the Working Group; the group should discuss plausibility about each hypothesis and try to find the most contrasted ones. For each driver, between two and five hypotheses can be found. Another way to find hypotheses is to document drivers: documentation helps creative thinking and knowledge-sharing within and outside of the working group.

It is highly recommended to document each driver to deduce possible hypotheses for each one. A complete and precise foresight report can be achieved with the simple knowledge and statement of experts. However, having the driver files explaining the hypotheses that were previously argued helps sharing this scientific groundwork outside the Working Group.

Documentation for each driver is managed in a **driver file**. The template is as follows:

1. Definition

2. Indicators (numbers or facts)

3. Past evolution: what, how and by whose influence (actors)

4. Hypothesis: a name and definition for each

First, a clear definition of the driver is needed. Secondly, indicators showing the evolution of that driver through time are listed. The following table shows examples of possible indicators for drivers used in the tourism in Jordan exercise.

DRIVER DEFINITION	POSSIBLE INDICATORS (examples of data to gather and document in a driver file)
Crisis management for tourism companies in Jordan	• Past crisis management (organization/change) • Tools used to manage a crisis
Location of Hotel and Restaurant Most being in Amman, issue of location in other cities	• Number of hotels and restaurants in Amman, other cities and in the rural areas (near touristic tourist sites) • Hotel standards by location
Perception of Jordan Image of the country from the point of view of foreigners, including on issues of safety and security	• Jordan image for foreigners (surveys through time) • Communication/advertising channels and messages

In the third part of the driver file, past evolution is described: how, why and under whose influence the driver evolved. This part can provide the conclusion of the analysis contained within the previous sections. It may contain signals of change, i.e., facts that may be local, or involving only second tier actors, or that may announce larger changes for that driver. This third part can be concluded by a description of the main uncertainties about that driver's evolution.

In the fourth and last part of the driver file, future hypotheses are described. Hypotheses are assumptions about the driver's state in 10 years. Two to five hypotheses can be built. Each hypothesis should have a title, but a clear definition should also be written. Additionally, hypotheses should be exclusive to ensure that they are different assumptions about the same topic. This means that when hypothesis 2 is true, hypothesis 1 is false.

At the hypotheses stage, it might be useful to decide that hypothesis 1 is always the main past trend hypothesis without change, i.e., what will happen if nothing changes.

Driver files should be written between seminars (either shared among the Working Group experts or subcontracted to the activity observatory for example). But their content, and especially the future hypothesis, should be discussed by the Working Group.

Driver files examples are shown in Annex 1. When hypotheses are found directly then the Working Group is asked to picture future, possible and exclusive hypotheses for each driver. They are asked to find H1 (the main trend hypothesis) and other contrasted hypotheses of change.

The Working Group can be split into smaller groups of four to five people, each one dealing with two or three drivers.

The goal of this hypotheses step is to achieve a driver/hypothesis table that will allow scenario building. Note that in this training example table the hypotheses were found directly. Thus, no lengthy definition was written for each hypothesis.

When hypotheses are gradual, meaning that a hypothesis adds something else to another one, they are written "Hx + something", for them to be mutually exclusive. For example, the first driver, H4 means: tourism companies do risk assessment and planning for emergency (H2 +) and do have employee training for risk management as well as communicating about their practices about risk management.

Table of hypotheses per driver for the Tourism training exercise in Jordan

Drivers	H1	H2	H3	H4
Crisis Management (tourism companies)	Risk awareness. Saving	Risk assessment and planning for emergency	Resilience: Local exchange Mutualization	H2 + Employee training + communication
Perception of Jordan	Communication safety procedure in social networks	Digital marketing strategy for tourism in Jordan	H2 + central tourism platform for booking	H2 + employees' engagement
Location of H&R	Most in Amman	More investments and other cities than Amman	H2 + more home stay everywhere	H1 + home stay elsewhere
Taxation (VAT)	Decrease 8 per cent VAT and service charge (5 per cent) but not lasting.	H1 permanent + decrease alcohol and raw materials taxes	H2 + no taxation on investments in Jordan outside Amman	Increase in taxes
H&T org.	Not much practice No lifelong training for trainers	More practice School for trainers	H2 + Tourism Council rules are applied	H3 + platform for education
Education Major	Traditional and hybrid. H&T option	IT and language skills improved. H&T option	H2 but H&T mandatory	
SCENARIO				

3. Scenarios, impacts and recommendations

During this step, scenarios are built by combining a driver with a hypothesis. The goal is to build the most contrasted scenarios, not to build as many as possible. Scenarios are storylines. They should be detailed in order to help depict possible futures of the activity and skills access (if educational drivers are in the driver system). For each scenario, a different set of skills is generally needed. Scenarios do not aim at depicting exactly what the future will be but at sketching the array of possible futures to help decide what tomorrow's strategy should be. It is the reason why skills and employment impacts can be derived from each storyline. And, at the last stage, recommendations can be deduced from the comparison of scenarios, by listing actions that should be performed to promote the best scenarios and avoid the worst ones.

Once the driver/hypotheses table is available, the rules to build scenarios are quite simple.

By combining hypothesis and driver, we should be able to tell what the storyline is. No driver should be omitted. The storyline should be logical and consistent.

An easy way to start with a Working Group, might be to first build primary trend scenarios by assembling main trend hypotheses. This assembly must make sense and remain consistent in a 10-year time frame. This scenario is a useful reference to show where we are heading without change.

Then the experts in the Working Group are asked to build alternative scenarios either individually or in small groups. They can start by any alternative hypothesis on any driver. Main trend hypotheses (Hypothesis 1 or H1 in the following example) can be reused in an alternative scenario.

Generally, the working group leader indicates alternative scenarios in the driver/hypotheses table by using a specific cell colour for each scenario and/or specific letters (coloured, bold, or underlined), and/or a specific outline of the chosen cell or box. Below is the scenario table for "tourism and hospitality in Jordan" training workshop.

Figure 7: Example of scenarios built as exercise about tourism in Jordan

	H1	H2	H3	H4
Crisis Management (tourism comp)	Risk awareness. Saving	Risk asst and planning for emergency	Local exchange Mutualization	H2 + Employee training + communication
Jordan Image	Communication safety procedure in social networks	Digital marketing strategy (all aspect tourism) Jordan and Jordanians	H2 + Central tourism platform for booking	H2 + employees engagement
Location of H&R	Most in Amman	More investments in other cities than Amman	H2 + more homestays everywhere	H1 + home stay elsewhere
Taxation (VAT)	Decrease 8% VAT and service charge (5%) but how long ?	H1 permanent + decrease alcool and raw materials taxes	H2 + reduced taxation on investments outside Amman	Increase in taxes
H&T org.	Not much practiceNo lifelong training for trainers	More practiceSchool for trainers	H2 + Tourism Council rules are applied	H3 + platform for education
Education Major	Traditional and hybrid. H&T option	IT and language skills improved . H&T option	H2 but H&T mandatory	
SCENARIO 2030	Business as usual with better IT skills	More employment reduces taxation + tourism deployment	Digital transformation to come out of the crisis	Gov invests in education and private investment for tourism

The yellow cells are main trend scenario, while the alternative scenarios are red cells, underlined, bold and blue letters. Note that a hypothesis can be chosen for several scenarios thus, a cell colour cannot always be used to "read" a scenario in the table, other codes must be used to select a hypothesis used in different scenarios (like Taxation H1 or H&T organization H2).

Scenarios should not just be an assembly of hypotheses. It is also important to note that the purpose of the scenario exercise is not to build several scenarios or storylines, but only the most contrasted ones. The aim is not to guess what the future will look like, but to show the array of possible futures. Three to six scenarios are generally enough.

When gathering alternative scenarios in the driver/hypotheses table, the letter or cell colour code helps to immediately see if two scenarios are close: they use the same hypotheses, except for one or two. In that case, the Working Group must discuss which one to keep (the one best targeting a logic for example).

After gathering alternative scenarios, the assembly of hypothesis and the logic of the storyline, scenarios should be written in detail after the meeting or workshop. Such detail should lead each hypothesis chosen to be translated into at least a sentence.

The impact of scenarios on skills and competencies, or strategies to obtain required skills can be drafted when building the scenario logic in the scenario workshop, and later The yellow cells are main trend scenario, while the alternative scenarios are red cells, underlined, bold and blue letters. Note that a hypothesis can be chosen for several scenarios thus, a cell colour cannot always be used to "read" a scenario in the table, other codes must be used to select a hypothesis used in different scenarios (like Taxation H1 or H&T organization H2).

Below are examples of three scenario writings (out of four scenarios)

SC1 Business as usual with better IT skills

As a result of COVID-19 crisis impact, tourism operators in Jordan benefited from reduced Value Added Tax and service charges but their turnover has been very low until 2024. Taxes may increase anytime, thus, tourism operators do not invest outside Amman in Hotel and Restaurants. Being aware of risks, they would rather be cautious. For this reason, they do not increase wages and, consequently, tourism is not a very attractive employment for H&T graduates. Tourism operators still meet difficulties in finding skilled employees. H&T training did not change, but students and trainers have improved their IT skills, thanks in part to the COVID-19 lockdowns. In 2020–21, trainers as well as students in high schools were forced to manage relationships through digital tools.

Impact of SC1: IT skills have improved but, in order to recruit workers skilled in terms of languages, hygiene procedures or maintenance (of kitchen equipment for example), they have no other choice than to train the workers themselves or organize private trainings, with operators from the Union of Tourism for example.

SC2 More employment reduces taxation+ tourism deployment.

In 2021, the Board of Jordan Tourism launches a digital marketing strategy involving most tourism companies and operators as well as a central booking platform to facilitate

a rebound of the activity after the health crisis. Due to the pandemic, additionally, tourism companies now use risk assessing tools and planning in order to prepare for any new upcoming crisis. To support the tourism actors' initiatives, the Government increases IT and language teaching in elementary and high schools and reorganize Hospitality &Tourism (H&T) specific studies to integrate more internships, lifelong training for trainers (about new forms of tourism) and regular review of the H&T graduation programme with the activity representatives (Tourism Council rules are applied).

The centralized booking platform is an opportunity for many people to offer homestay, wished by people wanting cultural tourism. But regular hotels and accommodations are also needed in cities other than Amman. As soon as tourists are back, the government is tempted to stop the decrease in VAT and service charges decided during the COVID-19 crisis. However, the Tourism Board/Union enters a negotiation with the government: by keeping VAT, services charges, alcohol, and raw material taxes low until 2030, an ambitious employment target can be reached. The high employment in the tourism sector would lead to more workers paying taxes, enabling the government to balance lower taxation income (VAT) with more social taxes income. Also, to develop tourism infrastructures outside Amman, private investments of tourist accommodation outside the Capital City are promoted by lower taxing of investments.

First Impacts of SC2: The most ambitious scenario for tourism. It requires a strong cooperation of –tourism actors and the government's will to have tourism as the main employment activity in 2030. Possible issue in this scenario: the time and means to reorganize education (elementary and secondary), as well as H&T studies, to have enough skilled people to work for tourism in 2030. Another issue to check is the balance between increased social taxes with higher tourism employment and reduced VAT on many products.

SC3 Digital transformation as a result of the crisis

To allow a rebound of the tourism activity as soon as possible (2022–23), the Board of Jordan Tourism starts a digital marketing strategy to advertise not only sites of natural beauty and cultural attractions but also to promote the Jordanian hospitality, traditions, and culture. Locally, in response to the COVID-19 pandemic, tourism operators have started to self-organize they mutualize buying, for example, to obtain reduced prices and can share employees according to workload/reservations to avoid unemployment. The government knows that IT skills as well as foreign languages are a necessity to develop services activity (including tourism, but also service activities). Thus, the Ministry of Education reforms elementary as well as secondary school studies to increase language and IT skills for all. With the support of the Tourism Board or Union, H&T studies will be reformed in 2022 to include more practical internships and to ensure lifelong learning of trainers through a "tourism trends" platforms developed by the Tourism Council. Through this platform, H&T

Figure 8: Recommendations workshop

	Hypotheses	H1	H2	H3	H4	H5
Key sectoral uncerainties						
1)	Country Image	H11	H12	H13	H14	H15
2)	safety	H21	H22	H23	H24	
3)	wages and work cost	H31	H32	H33	H34	H35
4)	Leisure offer	H41	H42	H43		
5)	Room capacity	H51	H52	H53 …	…	
6)	Language skills	H61	H62	H63	H64	H65
7)	Hotellry skills	H71	H72	H73	…	…
….		…	…	…	…	…
SCENARIOS		Référence	Scénario 1	Scenario 2	Scenario 3	Scenario 4

The recommendations: Immediate view of favourable/unfavourable scenarios

➢ Actions to promote for the most favourable scenario

➢ Actions to promote to avoid/alleviate the most unfavourable scenario

trainers can learn with tourism experts about the new trends (adventure tourism, ecotourism, slow tourism, etc.) and share the knowledge with their students.

The decrease of VAT and service charges, which was implemented in 2020 to mitigate the effects of the pandemic crisis, is planned to be cancelled as soon as the tourism activity returns to pre-crisis level. This, however, will take a few years. Many Jordanians, especially the young ones with better IT and foreign language skills after 2023, take the opportunity to offer homestay outside Amman since the accommodation offer is very low outside the capital.

The first impacts of SC3: entrepreneurship is boosted, with digital and language skills improvement for all. But, without investment, it is mainly through homestay that tourism accommodation offers increase. People engaging in homestay start their own small business relying on digital marketing, their language and IT skills, and reduced VAT. Regular hotel and restaurant find better skilled employees in this scenario, but only if employees want to live in Amman.

Note: these scenarios are exercise training. In a real study, the scenarios should be discussed in detail by the Working Group.

Impacts on skills

Additional work should be done to target better the skills needed in each storyline. For example, skills and knowledge to run a homestay can be quite different from the ones required for a five-star hotel and/or restaurant. Additionally, in that example, we had no driver about what types of tourism will develop in Jordan (example, adventure tourism, medical tourism, slow tourism, etc.). This type of driver would have

a strong influence on specific skills needed, apart from IT and languages. Skills can also be ranked according to their occurrence in the different scenarios. A skill needed in just one scenario might be less important than a skill needed in most scenarios.

Recommendations

Scenarios are thinking tools. Once they are drafted, individuals can decide which ones are favourable and which are not. In order to go from foresight (scenarios) to strategy, the working group can list actions to promote the favourable scenario(s) or to alleviate the unfavourable scenarios. Another way to list these strategic actions is to list actions to go from unfavourable scenarios to more favourable ones.

Remark: among our scenarios, scenario 2 seems the most ambitious for tourism development and scenario 3 might be an intermediate between scenario 1 and 2.

In practice: list actions from scenario 1 to scenario 2, for examples:

- Tourism operators work together (instead of competing) for the digital marketing and the central booking platform

- Ask the Ministry of Education will or agreement to change educational programme

Taking more time, the list of actions will be longer. Actions can then be ranked according to their usefulness to serve the "good" scenario(s), their cost, the difficulty to engage the action or any other criteria valuable to decision maker.

III. Alternative, practical organization

1. Alternative when more than 10 drivers are required

If the value chain is too complex, 10 drivers might not be enough to describe factors influencing skills, competencies, employment and/or how to obtain these competencies. In that case, partial scenarios concerning each step of the value chain can be built. In the case of tourism in Jordan, the value chain has three steps: travel agencies, accommodations (hotel and restaurant) and tourist attractions. Ten drivers influencing skills and employment by step of the value chain can be identified to build a set of scenarios on each step of the value chain.

Figure 9 below illustrates drivers and hypotheses that can be built, for example, on the "tourist attraction" step.

Figure 9: Scenarios on just one step of the activity value chain

IF MORE THAN 10 DRIVERS (longer process)
Tourims FORESIGHT, micro-scenarios « Tourist attraction (tour guides, handicrafts) »

Key drivers	Hypotheses			
1. Craft innovation	H1	H2	**H3**	
2. Tour offer	H1	**H2**	H3	
3. Touring logistic	H1	H2	H3	**H4**
4. Handicraft distribution channels	H1	**H2**	H3	
5. Handicraft training.	H1	**H2**	H3	H4
6. ….	H1	H2	**H3**	H4

Sub-system A «tourist attraction»

Micro -scenarios

A 1	A 2	A 3
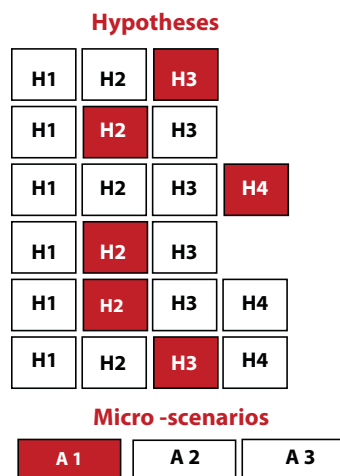
Scenarios on a single step of the value chain are called micro scenarios. Once micro scenarios are built on the different parts of the value chain, then these micro scenarios become hypotheses for the global system as shown in the next picture.

Figure 10: Assembling partial scenarios (by step of the value chain) into global scenarios

PHASE 4 : FROM MICRO-SCENARIOS TO GLOBAL SCENARIOS

Key components	Micro-scenarios			
A. TRAVEL AGENCIES	**A1**	A2	A3	
B. ACCOMODATION	B1	**B2**	B3	B4
C. TOURIST ATTRACTION	C1	**C2**	C3	
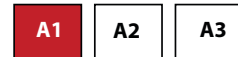
Global system	Scenarios		
	Tourism 1	Tourism 2	Tourism 3

When assembling the global system, the table contains only the names of the micro scenarios. Thus, people should have at hand the full text of all micro scenarios and the table to do the final assembly. The process will be facilitated by ensuring that the same group of people built the micro and the global scenarios.

Figure 11: Possible process over four seminars

Possible process (4 seminars)	
Stages	**Meetings**
Stage 1: Preparation: activity sector documentation, list of experts	Preparatory work
Stage 2: **Qualitative** analysis of **employment demand/ skill offer. Value chain – drivers (foresight system)**	Seminar 1 System/Drivers (uncertainties)1 to 2 days
Optional work to document hypotheses	Intersessional work
Stage 3: Construct **hypotheses** of **change** on uncertainties impacting the activity and its employment	Seminar 2Hypotheses about Drivers1 day
Stage 4: Construct employment demand scenarios	Seminar 3 Scenarios 1 day
Stage 5: Draw recommendations from scenarios	Seminar 4 Scenarios/recommendations: 1 day

2. Practical organization

A foresight study is always a collective work. Occupational foresight allows activity and educational experts to work together. A first stage consists in preparing the study by

- Deciding the activity of focus and the related question (how to get identified skills we need / what future skills we will need / how to foster employment in that activity)

- Identifying the activity and educational experts

- Gathering the available documentation about the activity in trends

- Preparing a calendar of the study

The second stage consists of identifying the driver system and can be performed in a seminar of one or two days. In particular, the first day can be used to agree collectively on the value chain, to list drivers influencing it or to perform the SWOT analysis by step of the value chain in small groups and sort the drivers by uncertainty and importance. The second day, on the other hand, can be dedicated to reviewing the key drivers, agreeing on their precise meaning and definition, and doing the influence mapping to secure and finalize the system. This second day can also be used to share the driver documentation among participants, if the group decided to document each driver.

Documentation of the drivers, if decided, is done outside any meeting, but the driver files should be discussed during another seminar within the third stage. This stage can be performed in a single-day seminar where participants either build future hypotheses or discuss each driver file to ensure no important hypothesis per driver is forgotten.

The fourth stage is dedicated to scenario building. Each scenario must be written in detail before the last stage.

Once the scenarios are written, they are discussed in a final seminar, during the fifth and final stage, regarding impacts of each scenario on skills and employment. Then recommendations can be deduced from the action to go from main trend scenarios to more favorable scenarios.

The entire process can therefore take place over four seminars and four to five meeting days. It is also useful to write a short meeting report after each seminar for participants to review findings and prepare for the next stage.

ANNEX 1: Driver files examples

First example: This driver file comes from a Eurofound study about "platform work" performed in 2019.

A. Definition

Platform regulation refers to regulation that is specific to platform work. Platform work is work organized through a digital platform managing worker offer and customer demand. Regulation can relate to various aspects, such as:

- Business regulation, dealing for example with market access, competition, or requirements for conducting business, including sector-specific approaches

- Taxation

- Labour and employment law, including collective labour law and regulation related to social protection

- Data protection and privacy

- Intellectual property rights

- Liability

- Soft law and self-regulation of platforms, like codes of conduct

As most of these elements have been covered in other drivers, this one will focus on taxation and soft law/self-regulation.

B. Potential sources of information

- Eurofound (2018a) —— Employment and working conditions of selected types of platform work, Publications Office of the European Union, Luxembourg

- Eurofound (2018b), Platform work: Types and implications for work and employment - Literature review, Publications Office of the European Union, Luxembourg

Eurofound's web repository on the platform economy —— initiatives related to Code of conduct, standards

Eurofound's web repository on the platform economy —— initiatives related to legislation

Eurofound's web repository on the platform economy —— initiatives related to negotiating working conditions

Eurofound's web repository on the platform economy ——

publications database keyword search 'legal issues'

EU-OSHA (European Agency for Safety and Health at Work) (2017), Protecting Workers in the Online Platform Economy: An overview of regulatory and policy developments in the EU, Publications Office of the European Union, Luxembourg

OECD (2019), Policy Responses to New Forms of Work, OECD Publishing, Paris

C. Potential indicators

- Incidence of specific mention of platform work (or similar terminology) in tax regulations

- Amendments in tax regulations to cover platform work

- Reviews commissioned by governments to ascertain the need to modify the current tax regulatory framework

- Enforcement mechanisms of compliance with existing regulation

- Incidence of codes of conduct or platform-driven standards

- Incidence of public and policy discussions on specific tax regulatory frameworks for platform work (e.g., newspaper articles, public debates, and presentations)

- Academic articles discussing or suggesting regulatory (and enforcement) options specific for platform work

D. Trends over time

Regarding tax law, some legislators have introduced specific platform-related aspects in their national legislation. In Belgium, workers who are affiliated to officially registered platforms do not have to pay taxes or social security contributions on earnings up to a certain threshold. In Estonia, platform workers benefit from a simplified tax declaration. While there is a more general regulation related to part-time self-employed only 'also' affecting platform workers, there are also specific agreements between the tax authority and Taxify and Uber, hence particularly targeting the platform-determined type. In France, Law 2018-898 on the fight against fraud will oblige platforms to provide information on the tax and social security obligations of their users to the relevant authorities. Furthermore, it will establish a system of joint and several liability for the payment of Value Added Tax due by service providers using the platform.

Next to taxation, some soft law approaches are to be mentioned. In Italy, some trade unions, the Bologna city Council, and the local food-delivery platform Sgnam-MyMenu signed a Charter of Fundamental Rights of Digital work in an Urban Context in 2018. This is a voluntary framework on minimum standards for pay, working time and insurance coverage. Such approaches are also taken beyond a specific platform. In Denmark, Germany, Ireland, or the UK, for example, associations made up of platforms established standards for responsible practices in the platform economy, related to improving working conditions and fair treatment of platform workers. In Italy, individual platforms, some trade unions, and a local government signed a charter on fundamental rights for platform workers. This mainly covers payment but leaves entitlement and insurance issues.

In a cross-national cooperation, worker representatives from Austria, Denmark, Germany, and Sweden drafted the 'Frankfurt Declaration on Platform-based Work'. It outlines the conditions for fair platform work, e.g., minimum income and working hours and access to social protection. Similarly, the Fairwork Foundation set standards for fairness in the platform economy and evaluates whether platforms meet these standards. It plans to create a certification scheme for platforms following these standards.

For the time being, little is known about the effectiveness of the implemented specific regulations, nor do there seem to be a lot of discussions about their enforcement (or enforceability).

E. Hypotheses

H1: Comprehensive platform-specific regulation and enforcement or soft law

All platforms must submit data on the revenue generated by workers for tasks assigned through the platform to the relevant tax authority, which has sufficient resources and legal capacity to enforce the legislation. If not, platform providers are highly willing to engage in soft law and commit themselves to strict codes of conduct, including peer-review mechanisms and sanctions to ensure enforcement.

H2: Comprehensive platform-specific regulation, but lack of enforcement and no soft law

All platforms must submit data on the revenue generated by workers for tasks assigned through the platform to the relevant tax authority, but enforcement is not guaranteed due to lack of resources of the authorities. Platform providers are not willing to engage in soft law and to commit themselves to any codes of conduct.

H3: Platform-specific regulation is limited or non-existing, but general frameworks are enforceable in the platform economy

There are no platform-specific tax regulations. However, general regulations are clear enough to be also applied to platform work and allow for effective enforcement. Because Platform providers are more willing to engage in soft law and committed themselves to strict codes of conduct, including peer-review mechanisms and sanctions to ensure enforcement.

H4: Platform-specific regulation is non-existing, and general frameworks are not enforceable

There are no platform-specific tax regulations and general regulations are not fit for purpose as they do not provide sufficient clarity on whether and how they apply to platform work (e.g., unclear whether platforms, clients or workers must provide revenue information to the tax authorities, which thresholds apply etc.). Accordingly, they cannot be effectively enforced. Moreover, Platform providers are not willing to engage in soft law nor commit themselves to any code of conduct.

A second example of driver file written in 2008 for a European project (called FEUFAR) about the future of fishing and aquaculture. This driver file is about fish processing by the agri-food industry.

A. Driver definition

Before any fishery product is marketed, it is often handled, prepared, or processed in some way. This includes cutting, filleting, salting, drying, smoking, cooking, smoking, freezing, or canning.

B. Pertinent indicators

- Employment
- Processed products and raw material flows
- Turn over of the processing industry (globalization)

C. Past development (last 20 years, what, how and who)

Processing

In 2004, about 75 per cent of world fish production was used for direct human consumption, while 25 per cent was used for fishmeal and oil. Another important trend is that the most important types of products produced by the fish processing industry are preparations and canned fish (€6.7 billion) followed by fresh, chilled, frozen, smoked, or dried fish (€5.2 billion). Companies in the fish processing sector are especially vulnerable to the fluctuations in supply. To ensure a regular supply of fishery products, EU companies must rely on imports.

The consumption of processed fish products, especially in the form of prepared meals, has increased in the Community. The value of processed fishery products produced by the sector stands at about €18 billion a year, almost twice the value of landings and aquaculture production combined. Production has continued to grow in recent years.

The EU market for seafood is steadily growing, with about 1.5 per cent a year (Salz, 2006). Increasing demand for seafood in the EU results leads to new business opportunities for some, while other businesses struggle to survive. The processing industry faces problems related to labour costs, raw material supply and competition from imports.

Globalisation put a pressure on EU processing

Some firms in the seafood industry have grown to become true MNCs, with both production facilities and sales offices on all continents. Alliances and joint ventures, along with mergers and acquisitions, are surely in vogue. This has led firms to become larger, more integrated, and more international. This development is in many ways a response to the restructuring of supply chains and retail markets. With large retail chains oligopolizing the market, fish producers need to be larger and more international to be able to serve these customers.

In a recent past, most fish were landed by coastal vessels, processed by local industry, and then exported. An important technological shift is the growth of on-board freezing facilities, thus enabling the long-distance transportation of frozen fish for processing anywhere. With improved logistics and cheaper transportation, frozen cod may be sourced in the north Atlantic, processed in low-wage countries like China or the Baltic, and then brought back to traditional core markets for cod, like the UK or Germany. Thus, the advantage of being located close to the fishing grounds is highly reduced (Iversen, 2004). As a result, during the last 10 years, processing of seafood has to a larger extent moved to locations with cheaper labour.

As a result, employment in processing is decreasing in many European countries. Much production is rationalized or automated, while a restructuring of the processing industry takes place. Many smaller companies stop their business as customers get larger and fewer. This is especially the case in regions dependent on fisheries.

In processing of aquaculture products, employment is increasing. Processing of farmed salmon is estimated to support 31.000 jobs in the EU (Winther, Sandberg et al., 2005).

Employment

The European fish processing sector employs a significant number of people throughout the Union. More than 135,000 people are employed in the sector Union-wide.[1] Processing of seafood is an important activity in many parts of Europe. Employment in the European fish processing industry has seen a steady overall decrease, but with different development for different countries and regions. In 2002–03, the EU fish processing industry employed 147.000 people.[2] In 2005 this was reduced to 137.000.[3]

Updated s are hard to come by, but here is a 1999 (?) report from Megapesca[4]:

Employment in fish processing

The distribution of employment in fish processing is quite different from that of employment in marine fishing. Fish processing is more evenly distributed throughout the EU, with the UK accounting for 18,140 jobs (20 per cent of the EU total in this activity). France and Spain, respectively with 11,899 (13 per cent) and 15,449 (17 per cent) employed, also have significant employment in fish processing. Italy and Greece, despite having relatively high numbers employed in fishing (18 per cent and 17 per cent of fishers) have only relatively low levels of employment in processing (accounting for 7 per cent and 3 per cent of processing employment). This is opposite to the situation in Germany, which has a relatively large processing sector of 11,280 (13 per cent of the EU processing employment), compared to employment in fishing of only 2,932 (1 per cent of fishers).

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1   According to the European Commission: http://ec.europa.eu/fisheries/cfp/aquaculture_processing/processing_en.htm

2   http://ec.europa.eu/fisheries/publications/studies/employment_study_2006_summary.pdf

3   http://ec.europa.eu/fisheries/publications/transformation05_en.pdf

4   This segment is included although the numbers are no longer accurate (they are mostly lower, but the relation between them has probably not changed a lot) because it shows very well some of the structure of the processing industry, as well as some interesting changes.

Despite the expansion of the EU, employment in fish processing fell from 104,316 in 1990 to 89,468 in 1998 (a decline of just over 14 per cent). Portugal and Denmark experienced the largest apparent declines in employment in processing. Significant declines were also suffered in Italy, France, and the UK (around 20 per cent over the period). Spain experienced a lesser decline (around 12 per cent) and numbers employed in fish processing appear to have increased slightly in Belgium and in Germany.

Dependency of the processing sector on the EU fishing industry

Whereas the numbers employed in processing have fallen by 14 per cent, employment in fishing has declined by 21 per cent over the same period. In many sectors of the EU processing industry there is no directly proportional link between employment at sea and employment in processing. It is known that the EU imports substantial quantities of fish to be used as raw material for processing and the importance of imported raw material in sustaining employment in the fish processing industry is recognized by the Common Fisheries Policy in the establishment of import tariffs for fishery products.

Some of the major imports are white fish fillet blocks, herring, tuna for canning and frozen crustacea[5]. Overall, only an estimated 53 per cent of processing jobs appeared to be dependent on EU landings in 1996/97. Sectors of the EU processing industry which are considered to still be substantially dependent on EU landings are tuna and sardine canning, and the primary processing of white fish.

The tuna canning sectors of Spain, France and Portugal are respectively substantially dependent on EU landings into Galicia, Brittany, and the Azores. The Italian tuna canning industry is considered to be exceptional, since it is now almost 100 per cent dependent on imported raw material from third countries.

In most of northern EU countries such as Belgium, Germany, Denmark, Sweden, and in parts of the UK, the EU-landing related employment in processing is limited to primary processing of whitefish and some shellfish processing (e.g. shrimp processing in Netherlands and Denmark). In Germany, nearly 100 per cent of the processing inputs (fillet blocks and herring) are imported, and there are few, if any links to landings. In Belgium also, the larger industrial processors rely on imports. In Denmark, although the fish meal industry does rely exclusively on local landings, it provides little employment relative to the volume of material processed.

Employment in other fisheries activities

The aquaculture sector accounts for 61,898 of the fishery-related jobs in the EU (about 15 per cent) and more than 80 per cent of these are in marine aquaculture. Spain and France are the two countries with substantial employment in marine aquaculture, with 14,500 employed in the former and 14,055 in the latter, between them they account for 57 per cent of employment in the marine aquaculture sector. Most of these jobs are in the culture of bivalve mollusca. Italy also has substantial employment in this activity (8,665 jobs). Greece and UK (Scotland) are the two regions where there is a substantial production of fish (seabass/ seabream and salmon respectively). Here employment is lower at 2,910 (5.8 per cent of EU employed in the sector) and 1,617 (3.24 per cent) respectively, despite the relatively higher value of production. Inland aquaculture in the EU employs 11,569, with the major centres of employment found in Germany (2,825), Austria (2,300) and Italy (2,142). Although all other regions have some employment in this activity, France is the only other country in which employment exceeds 1,000.

Inland fishing accounts for only 2.3 per cent of fishery sector employment. However, there is no data for some regions and under-recording is suspected in the regions where zero employment is reported. Greece (2,701 employed), France (2,501 employed), Portugal (1,939 employed) and Finland (995) are the regions in which substantial numbers are recorded.

D. Hypotheses (2020)

Hyp. 1 Name: Lost business
Most processing will take place in low-labour-cost countries due to prohibitive labour costs.

Hyp. 2 Name: Inbound work
Processing of seafood is brought back to Europe due to tariffs, environmental regulation, and consumer preferences for short-travelled food (basically the Food-miles argument)

Hyp. 3 Name: Technofish
Improved technology, requiring less labour in production, makes possible the profitable production of more processed products, new varieties, and more advanced products. EU processing industry thrives.

Hyp. 4 Name: Regional fish
The processing industry leaves frozen products to China, while thriving on the exploiting of non-imitable competitive advantages: fresh fish distributed daily, traditional treatment, fish with a story to tell, fish with regional particularities. "Single fjord" salmon marketed by the estuary from which it gets its fresh water.

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5   Today white-fish fillet blocks is less important, as production of white-fish to a certain extent has moved to China or other low-labour-cost countries. Salmon, on the other hand, has increased in importance, to (probably) the most important.

ANNEX 2: Water network maintenance training exercise (Lebanon)

Step 1

The driver impacting the "water distribution maintenance" that are uncertain and important for skills and competencies.

Water Sector : the value chain

| Ressource exploration and collection | Water distribution Maintenance | Water purification | Water collection (sewage) and treatment |
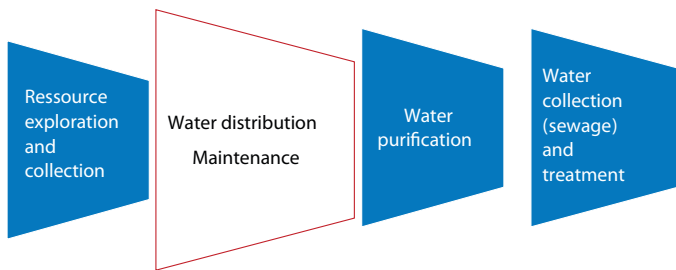
The SWOT analysis is performed on one step of the value chain

Water distribution and network drivers

NEW DRIVERS

1. International Help (NGO, WB)
2. Extend and renewal of the network/network status
3. Maintenance equipment (heavy and light)
4. Standard operation procedure
5. Leaks monitoring
6. Household and district meters
7. vocational training for pipe network
8. Water company cooperation
9. water network operator job attractivity

Most important drivers for SKILLS are underlined

One driver less important than others might be «water companiescooperation»

The relationships among drivers: the system

THE SYSTEM
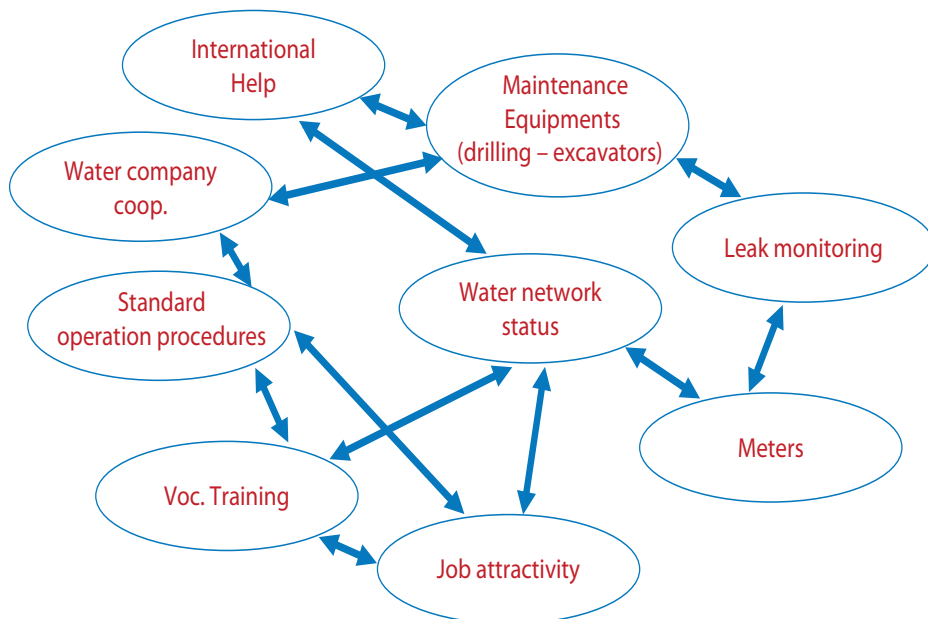
Step 2

DRIVER DEFINITION/uncertainties	POSSIBLE INDICATORS
International hel **Unc : nature of help, actors** **Finance amount,**	Funding targeted for water Number, size and history of water NGO in Lebanon or nearby region
Network status **Unc: extension and renewal**	Length and population covered Share of the network older than 20 years
Leak monitoring **Unc: tools except meters;**	Tools (old and new) Meters
SOP for maintenance: **4 steps** **Unc: speed of renewal; type of SOP (emergency/regular); number of technicians by SOP**	Number of time procedure is followed Length of procedure (when call for tender/offer) Types of work orders Age of SOP
Maintenance equipment **Unc: availability, skills to use and maintain**	Running cost Part of equipment rented/bought Preventive maintenance by equipment type
Household and district meters **Unc: price according to consumption, availability**	Part of the network covered quantity Duration between calibrations Log sheet of meters (history) Map for concentration
Vocational training pipe network **Unc: Integration of water training, Institute distance to water companies**	Number/type of pipe training: Oil and gas training; plumbing Level of certificate (duration of internship) Institute workshop availability Location Institute versus company
Water company cooperation **Unc: increased area of cooperation (SOP, equipment, employees…)**	Number of areas of cooperation (training….)

We are in a training exercise, thus there is no documentation of drivers. Hypotheses are found directly by participants.

	H1	H2	H3	H4
International Help	Decreasing funding, no investmentsFew NGO projects	No funding, no NGO projects, no investments	No funding, no investments but many NGO projects	Foreign investments, no funding, no NGO projects
Network status	No extension no renewal	Renewal of 20% of network and extension	20% renewal no extension	No renewal but extension
Leak Monitoring	a few controller not enough today	Enough portable equipment		
Meters	5% network with meters	Classical Household meters	Smart household meters	
Standard operation procedure	Emergency, procedure not always followed	Update (technical and method) of procedure. More adapted guidelines		
Equipments	Not enough equipt and workshop maintenance	Not enough equipt but more maintenance workshops	Enough equipt. (NGO). Better maintenance	
Vocational training for pipe network	Training with existing employees within water companies	Separate training & new curriculum for water operators	Integrated training (plumbing) with specific courses	
Operator job attractivity	low salaryNo incentives	Incentives (free water or training) but low salary	Incentives : regular training ; better salary	
SCENARIO	BAU	Project	Investors	

Stage 3

The detailed scenarios: BAU (Business as Usual)

Scenario 1:

International funding is decreasing without governmental reforms, just a few non-governmental organizations (NGOs) stay in Lebanon for help. The water network stays as it is today with neither renewal nor extension of the network. To maintain the network, the equipment is not sufficient nor are the workshops to maintain this equipment. Thus, water companies may subcontract some of the maintenance to suppliers and ask NGOs for help (in the form of new equipment or through the creation of workshops for the equipment). Since network maintenance is not a very attractive job due to low pay, skilled operators are lacking. They are trained by the water companies but do not stay long in the job. Therefore, water companies cannot put much emphasis on training new operators. Moreover, the company training is not a certification as a diploma allowing young people to value their experience another activity.

To maintain the network, the portable equipment to detect leaking is not enough and only a small part of the network (5 per cent) is equipped with metres that would allow leak detection. Thus, most of the time, the leaking is huge when detected and operators work in emergency. The SOP cannot be followed most of the time, not only because of the lack of equipment but also because maintenance operators are not numerous and skilled enough.

The network keeps degrading and some metres become useless due to lack of calibration/repair. Work is more and mor often done in emergency situations. Water service is worse for customers.

Impacts of that scenario (what could be done by the water company and educational sector to improve the scenario)

- Cooperate with equipment suppliers to train equipment maintenance
- Keep buying second hand spare parts
- In-house (water company) training/experience certification
- Operators can enter plumbing training with slight change on curriculum

Scenario 2: Project

International funding is decreasing without governmental reforms and just a few NGOs stay in Lebanon for help. Efforts must be increased to encourage NGOs to create new projects that can help the water company in designing and implementing the extension of the water network following population growth.

The water company must motivate the costumers to subscribe to install classical household metres in order to increase the income fees to upgrade the maintenance workshops and to keep the network maintained and leak free as possible.

With the help of NGOs, workshops must be led to update the standard operating procedures (SOP) for water network maintenance and create guidelines adapted to work requirements. Committees will also be created with the help of the private sector, the Ministry of Labour and all related entities, in order to create a new curriculum, a specialty from the "plumbing" training with adapted courses for water operators in the vocational training. Regular trainings and workshops will keep employees up to date.

Some incentives could be given to encourage the skilled workers to work for the water company. These could be in the form of water subscription free of charge and some training with local and international certificates.

Impacts of that scenario (what to do):

- Separate curriculum for water operators (calibration of metres)
- Regular training for employees
- Plumbing training adapted for water operators
- International certificates with NGO's
- People information about health and social cost of network water and metres compared to wells
- Cooperate with NGOs to update the SOP
- High increase in employment
  - Network extension
  - Metres installation and calibration: new skills
  - Metres data collection inspectors

Scenario 3: Investors

The significance of water resources in Lebanon is largely recognized by foreign investors. Thus, foreign investors bet on the water network in Lebanon and provide funds for its renewal and extension, maintenance equipment and smart (thus connected) household metres to help water management. But investors also know that metres will help return on their investment since they would allow payment by consumption and because smart metres allow remote and early detection of leaks. With metres deployment, the number of portable equipment to detect leaks on the network is lower and operators' work to detect the spot needing maintenance is facilitated.

Of course, SOPs are adapted to this new situation with different cases of procedure according to the emergency. With early leak detection and more maintenance equipment, less work is required to be done in an emergency and water companies can better maintain their maintenance equipment. But all these changes, such as the extension and renewal of the network as well as the smart meters, impact employment in water companies. This is due to the field work not only for installing meters, renewing, and expanding the network, but also for analysing data from the connected devices for planning water management (water pumping/treatment and recycling) as well network maintenance.

A water institute is created by the Ministry of Education in collaboration with water companies, granting different levels of certification and specialties. For employees in charge of field operations to maintain the network, a specific two-year vocational training has been set up within the institute mixing common civil engineering/pipe work courses and internship in companies. Network maintenance operators are not better paid but they have an educational certification, they work in a high tech and connected companies providing vital service.

Impacts of that scenario (what to do):

- Proactive maintenance not preventive.
- More advanced skills (data analysis and management).
- More engineers (higher level).
- Less employment than in scenario 2.
- More profits and salary increase at the end.
- Good network maintenance and new equipment.
- More electrical and IT training (IOT and 4G).
- Water management at a larger level (region).
- Better planning, real time, of maintenance needs.
- Build business plans for investors.

Remark about the scenario exercise: a plumbing training adapted for network operators occurs in two scenarios: in the storyline of the second scenario (project) and as an impact to alleviate the first scenario. Thus, this measure might be a priority since in the third scenario a more ambitious strategy (the creation of a specific water institute) is chosen.

Stage 4

Recommendations. The first scenario (Business as usual) is not satisfactory. However, the choice between scenario 2 (Project) or scenario 3 (Investors) is not simple and highly political. Thus, to end up the exercise, the foresight group can work on actions to go from scenario 1 to scenario 2.

Example of actions to go from scenario 1 to scenario 2:

- Using marketing for subscription
- Creating incentives for employees
- Working with Ministry of Education to update existing plumbing curriculum
- Creating committees for new curriculum
- Planning the extension of the network
- Enhancing contacts with local and international NGOs

ANNEX 3: Methodology tools

	Tools summary	
Steps	**Process**	**Tools**
Framing	The value chain of the activity describedDefine the foresight system in driversSorting drivers	Key questions (what infuences the issue ?) SWOT on value chain (derive drivers) Computer tool : any mind mapping sofware Importance/uncertainty rankingInfluence mapping
Future hypotheses	Driver files for documentation Alternative: survey to experts (with proposal)	Driver filesSurvey with hyp. proposal
Scenarios	Morphological analysis	Computer tool : Morphol http://en.laprospective.fr/methods-of-prospective/softwares---cloud-version/5-scenaring-tools.html
Strategy	Issues of scenariosActions from «main trend» scenarios to better scenariosRanking of actions	Multiple criteria rankingImportance/control ranking

Computer Tool Morphol:

http://en.laprospective.fr/methods-of-prospective/softwares---cloud-version/5-scenaring-tools.html

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Occupational foresight methodological guide

The Youth Employment in the Mediterranean (YEM) project, an initiative led by UNESCO and funded by the European Union, targets countries in the South Mediterranean region with the aim of supporting youth employment through improved anticipation of skill needs and assessment systems, the promotion of quality and relevant Technical and Vocational Education and Training (TVET) and regional collaboration.

This guide is to build scenarios of the future of an activity aiming to determine the skills and competencies that will be needed in the medium term (5 to 10 years) to perform the activity as well as to provide policy recommendations.

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