Zero Hunger: What Archaeology can do in the Fight for Food Security

Analysis of Jordan policy and heritage initiatives on food security, biodiversity, and heritage

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The cover photo displays mansaf, Jordan’s national dish. Source: https://www.discoveryloyalty.com/Kempinski/Kempinski-Hotel-Amman/Mansaf-The-National-Dish-of-Jordan.

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Chapter 1: Introduction

This thesis asks, to what extent it is possible and feasible to use traditional knowledge and archaeological knowledge in addressing current problems in food scarcity and biodiversity. The thesis is concerned with how archaeological and heritage research can play a role in current day sustainability challenges, especially in relation to policies about food and heritage. Archaeological research on past societies can hold a great value for current day sustainability and development studies (Reed & Ryan 2019, 1-2). Sustainability studies are, since the United Nations adopted the seventeen Sustainable Development Goals (SDGs) in 2015, even more in the foreground (Leal Filho *et al.* 2018, 132). The SDGs have the aim to protect the planet, put an end to poverty and assure prosperity for everyone (Leal Filho *et al.* 2018, 132). Viewpoints and insights on the past can contribute to SDGs such as zero hunger, life underwater and life on land (SDG 2, 14 and 15) to sustainably manage resilient food production, ecosystems and restore degraded land (Reed & Ryan 2019,2). For example, archaeological studies on agricultural systems and crop resilience in areas that experienced substantial long-term changes (climatic variation, war etc.) can provide insights into the role of neglected crops and their role in food security (Reed & Ryan 2019, 2).

1.1 Background of study

Recent research on food sustainability discussed by Kapelari *et al.* showed that in sustainable food choices the factor of tradition and heritage plays a key role (2020, 1). This ties in with the notion of how valuable indigenous knowledge is to current day sustainability practices. This implies the need for emphasizing and actively promoting these practices as heritage. Heritage itself can be seen as a cultural practice, which is entangled in construction and regulation of values and understandings of cultural aspects (Smith 2006, 11). The notion of heritage as something static does not apply anymore, and the old idea of cultural heritage as material products is too limited (Lenzerini 2011, 103). Smith describes heritage as something alive, an action that can be undertaken, for example a traditional dancing practice, and therefore also something creating connections between activities at places and the place itself (2006, 83). UNESCO has therefore also expanded their safeguarding of heritage to also intangible elements, such as food practices, rituals,

oral stories, etc. (ich.unesco.org). Traditional agricultural practices are also practices that can be considered as heritage and are an area of interest for archaeological research.

Plenty of archaeological research has been done on past cultivation methods and land management. There is a rich record of past societies' successful and failing interactions with the environment (Reed & Ryan 2019, 10). For example, the *qanat* form of irrigation is an interesting system from the past, which is still used and reimplemented today (Koohafkan & Altieri 2016, 165). *Qanats* are an underground irrigation system that originated in c. 443 BCE (Al Karaimeh 2019, 114) and are extremely useful in arid zones due to their long-distance transport capabilities and minimal water loss (Koohafkan & Altieri 2016, 162). Another traditional agricultural farming system is the Ifugao rice terraces in the Philippines. These terraces are over 2000 years old and are still in use today. They not only provide high-quality food but also function as a rainwater filtration system (Koohafkan & Altieri 2011, 24). However, archaeology can also demonstrate that past agricultural systems have negative effects on the environment. A study on sediment trap soils at Engaruka Tanzania demonstrated that trapping soil to support crop productions depleted soils in the highland (Logan *et al.* 2019, 424). Thereby reducing its water-holding capacity with unreliable streams as result (Logan *et al.* 2019, 424). Nevertheless, traditional agricultural systems can be key in moving toward a sustainable agricultural and development of rural areas (Koohafkan & Altieri 2016, 5). In doing so, it is important to understand the trade-offs of traditional agricultural methods to determine the best (re-)implementation. Therefore, studies on traditional practices as heritage should work together with research on agricultural production.

1.2 Problem statement

There is still a gap in these studies of food as heritage and agricultural production. The studies on food heritage focus mainly on food politics, identity, and social meaning, thereby not linking it to agricultural production research. Often academic studies on food heritage do not consider the agricultural and ecological aspects behind food, while it is these elements (supplying of crops and animals) that are very much involved in the food that is promoted as heritage. Food heritage can be defined as the material and immaterial aspects of food cultures that are seen as a

common good or a shared legacy, for example, products, ingredients, recipes, traditions, and techniques (Ramli *et al.* 2017, 32). As mentioned above, there is archaeological research done that focuses on food systems in the past to bring new perspectives on food security and sustainability issues in the present. Yet, there is a conceptual and practical link missing between in the sense that research does not often consider cases where food is promoted as heritage in the present and what the implications are of the agricultural systems involved and their ecological impact.

1.3 Research aims and questions

This thesis aims to contribute to the debate of what role archaeological and heritage research can play in current day sustainability challenges, and responds to the call for what archaeology can contribute to today's world and its future (Reed & Ryan 2019, 10). The general question addressed in this thesis is to what extent it is possible and feasible to use traditional knowledge and archaeological knowledge in addressing current problems in food scarcity and biodiversity. The projects discussed in 1.4 will feature as case studies and aid in understanding how archaeology can contribute to showing whether initiatives about food and heritage help to increase sustainability, food security, and biodiversity and how archaeology can contribute to improving decisions and initiatives about food and heritage. The following three sub-questions will help tackle the main research problem:

1. What benefits can be gained by mobilising archaeological and traditional knowledge about past food sources and food practices as heritage?
2. Can mobilising them as heritage help to strengthen local belonging and local identity, or can it improve food security, or improve local health of people, or local social and economic sustainability?
3. Can food heritage cultivate more sustainable food production and consumption?

1.4 Research area

This thesis focuses on the East Mediterranean/Middle Eastern region, with the main focus on Jordan. I choose this region for three reasons. First, I focus on this region

because it is interesting to look at the areas that experienced substantial climatic changes, as the Mediterranean region is known to be a hot spot for global climate change (Dougall 2017,12). In addition, Jordan is described as possibly one of the most critical places when it comes to global food security (Brehm *et al.* 2016, 175). Secondly, I choose this region because of the interesting projects on food heritage and sustainability, such as the MedSnail project, that recently started in Jordan and Lebanon, which make it feasible to do this study and provide compelling cases for studying the research problem. Finally, this region's heritage discourse is often loaded with colonial archaeological approaches and Orientalism (Exell & Rico 2013, 673). This often means that Western experts' views of this region are easily accepted and used in constructing heritage, and local archaeologists or indigenous communities tend not to be actively involved (Steele 2005, 51&59). There is a need to pay more attention and reflect on this issue (Exell & Rico 2013, 673), and this thesis aims to contribute on this point by highlighting how local food-sustainability questions can be tackled.

1.5 Significance of the study

The significance of the study is that it not only discusses traditional heritage practices and their positive effects on the environment, but that it also addresses policy actions in relation to heritage, food security and biodiversity. The thesis thereby attempts to demonstrate, in its limited scope, what archaeologists can contribute to wider global issues and discussions around sustainability and food security. Furthermore, it puts a spotlight on local communities and traditional knowledge, and shows that they are increasingly more important stakeholders in creating a sustainable future.

1.6 Introducing the case studies

1.6.1 MedSNAIL

The Sustainable Networks for Agro-food Innovation Leading in the Mediterranean project (MedSNAIL) is aimed at enhancing and developing small-scale traditional agro-food value chains that can lead to an increase of business opportunities and better socio-environmental sustainability (enicbcmed.eu). The project builds among others on the method of Slow Food to promote traditional food that has a

strong link with biodiversity preservation. The project started in September 2019 and is still running, with a predicted end date of August 2022. There are several institutions responsible for this project, namely, Andalusian Federation of Towns and Provinces, Slow Food Foundation for Biodiversity, American University of Beirut, The Rural Women's Development Society Economic, social and political Empowerment for rural women, University of Sfax, Gozo Regional Development Foundation and Women for Cultural Development (Namaa). Naama is the responsible partner for executing the project in Jordan. The project is funded by the European Union.

1.6.2 UNESCO MedLiHer

The Mediterranean Living Heritage project (MedLiHer), was initiated by UNESCO and sponsored by the European Union to provide support to the implementation of the Convention for Safeguarding of the Intangible Cultural Heritage in the countries of Egypt, Jordan, Lebanon and Syria (ich.unesco.org). One of the main goals of the project is to develop a national safeguarding strategy. The project ran from January 2009 to January 2013. This project is included as a case study because it can provide insights into the intangible cultural heritage (ICH) management in Jordan.

1.6.3 BigPicnic

BigPicnic was a European Union funded project by Botanic Gardens Conservation International (BGCI) that ran from 2016 to 2019. It was aimed at bringing together the public, scientists, researchers, food and agriculture industries, and NGOs to discuss food security (BigPicnic Management Board 2019, 7). BigPicnic aimed to start a debate on the access to sufficient and safe food, the future of fertile lands, and the possibility for adaptation of food production to climate change (bgci.org). This project is included as a case study because it highlights a relation between food security and heritage and because of if its collaboration with the Royal Botanic Garden of Jordan.

1.7 Methodology

This section briefly introduces the methodology adopted in this thesis. A full elaboration of the methodology is discussed more in chapter two. To find answers

to the research questions a critical discourse analysis is applied to better understand the policy documents in relation to food security and heritage. This is followed by an analysis of the case studies mentioned in 1.6 to arrive at a general overview of policy aims in action. The critical discourse analysis was chosen as a methodology because it allows for a focus on, and critical analysis of, specific themes in the research material. The policy document discourse analysis will focus on how the idea of heritage is embedded in Jordan's policy actions towards food security, sustainability, and biodiversity. To analyse the policy documents, reports, and other material from the case studies, qualitative data analysis software (Atlas.ti) was used. Atlas.ti is an suitable software programme for analysing large bodies of text, audio and visual materials, and is a great aid in revealing connections between documents. The combination of critical discourse analysis and Atlas.ti allows me to identify and understand the values and systems of power that are currently in place and upheld due to the specific discourse adopted by the various institutions more easily. This way of analysing the policy documents offers an understanding of the use of "food heritage" in food security, which helps to examine various food security initiatives initiated in Jordan. This enables me to further explore to what extent mobilising food as heritage can contribute to food security and how, or if, it is feasible to use traditional (and archaeological) knowledge in addressing current problems in food scarcity and biodiversity.

1.8 Limitations

The main limitations of this thesis concern the number of heritage projects analysed due to time constraints and the scope of the bachelor thesis. The heritage projects are three in number, and to gain a more complete understanding it would be desirable to analyse more projects, and also in more eastern Mediterranean countries. Furthermore, the critical review and application of archaeological findings are only focused on wheat in Jordan in the thesis. This could be expanded in a further study to other crops or livestock as well. As this is a bachelor thesis, it was not possible to cover more projects and regions, but I have designed the study to show that the overall approach is nevertheless useful and the results that can be derived are meaningful.

1.9 Organisation of thesis

This thesis is divided into seven chapters, including this introduction chapter. Chapter two will discuss the methodology used to answer the research questions. I will discuss here the critical discourse approach, the qualitative research analysis software Atlast.ti, and I will outline my research material. Furthermore, I will explain the critical review of archaeological findings on wheat production in Jordan.

Chapter three will dive deeper into the concept of the Mediterranean diet, food security, and intangible cultural heritage. Next to this, the sustainability goals will be discussed in more detail and information on food heritage concepts such as slow food presidia will be given. Finally, this chapter will also provide an overview of the geographical context of the East Mediterranean and Jordan. In chapter four the results of the themed-based analysis in Atlast.ti are presented and I will analyse the discourse of the various policy documents, projects, and initiatives related to food and agricultural heritage. Chapter five is dedicated to the critical review of archaeological findings of wheat in Jordan and highlights the role archaeological research can play in contemporary food security problems.

Chapter six consists of a discussion of the results of the discourse analysis and the critical archaeological review. This chapter draws in concepts discussed in chapter three in order to critically assess to what extent Jordan's policies advocate for the use of traditional knowledge in achieving food security and maintaining biodiversity. I will identify and discuss where archaeology could contribute and where it is limited in doing so. Chapter seven forms the conclusion to my thesis, summarizing the main findings and reflecting on the research questions. Furthermore, I will provide future recommendations.

Chapter 2: Method

Introduction

This chapter will discuss the method and approach I will use to answer the main question and its sub-questions stated in chapter one. I will first describe the discourse analysis approach and methodology, followed by an archaeological comparison approach for my case study on wheat in Jordan.

2.1 Discourse analysis approach

The aim of the discourse analysis is to get a better understanding of the national policies regarding food security and sustainability currently in place in Jordan and how they relate to current or past initiatives concerning food heritage and food security/sustainability in Jordan. The critical discourse analysis of the national policy documents will focus on to what extent efforts are being made for a more sustainable future that includes the notion of food security and use of heritage and traditional practices. As described in the introduction, more awareness of the value of traditional practices for sustainability is present. I ask, how much of this awareness can be found in the policy documents and proposed actions? The discourse analysis of the heritage and sustainability initiatives provides a useful comparison as to what extent these initiatives contribute to the policies and perhaps even exceed or not at all meet the proposed actions stated in the policies. I will have a set of common themes (see 3.2.3) that will be used as a guide to identify which sections and to what extent the material discusses for example, food security, food heritage and indigenous knowledge etc. This will aid in constructing a clear overview of the policy intentions and implementations in heritage initiatives.

2.1.1 Critical discourse analysis as methodology

The term discourse can be explained in multiple ways, but in the broad sense can be explained as all of communication (Hidalgo Tenorio 2011, 185). Discourse can pertain to spoken interaction, any human interaction, or a certain way of communication in a specific context. Several fields and people have influenced the concept of discourse. One of the originators is philosopher Michel Foucault, who proposed that “discourses are practices that systematically form the objects of

which they speak" (Hidalgo Tenorio 2011, 186). Foucault's approach is important for the discourse analysis that I will apply. Critical discourse study or analysis is a way to uncover the patterned mechanisms of power reproduction asymmetries, or the reinterpreting of text created with a certain ideology (from places with power) (Hidalgo Tenorio 2011, 187-188). In the broad sense critical discourse analysis explores what people say and write about certain topics, and reveals how certain power relations and social context can influence this. The discourse analysis I employ in the thesis is based on the above-stated approach. However, as a methodology, there is not a prescribed single execution, and various scholars from different schools approach critical discourse differently, but in essence they all concern the analysis of a social problem or social wrong (Waterton *et al.* 2006, 343).

Discourse is a well-known idea in heritage studies. It offers a way to better understand how heritage is understood, discussed and put into practice (Smith 2006, 14; Waterton *et al.* 2006, 343). One of the concepts of discourse within heritage is "authorized heritage discourse" put forward by Smith (2006). Authorized heritage discourse is a term used to refer to the authority that is involved in establishing which material objects, sites, places and landscapes (usually aesthetically pleasing ones) are considered heritage and that the current generation needs to care for and preserve for the future generation so that heritage can serve educational purposes and create a common identity (Smith 2006, 29). When it comes to discourse and heritage engagement with (local) stakeholders it is important to understand what power relations are in place and what the dominant heritage discourse (Waterton *et al.* 2006, 340). Because according to Smith one of the consequences of authorized heritage discourse is that it prescribes who the spokespersons are for the past, which is often directly linked to an expert, like historians (2006, 29). This is a limitation as heritage seems to be kept away from the current generation and the role heritage can play nowadays. Local stakeholders who are part of the heritage landscape can then easily be overlooked while they are part of the heritage that the experts want to preserve.

Because critical discourse analysis methodology is not set in stone, it comes with the remark that when analysing a document related to a chosen issue certain pieces of text can be excluded while other parts are highlighted. According to Fairclough, there is no one way of analysing the chosen research problem (Hidalgo

Tenorio 2011, 190). But applying a critical discourse analysis does not come down to rephrasing and paraphrasing content, rather it is to understand what the content is doing (Waterton *et al.* 2006, 342-343). Thus, when analysing policy documents, it is not simply looking at what is written, but examining the meaning behind it and what the implications are of the wording when put in practice. In doing so, there is the possibility that the interpretation of the researcher can differ from what was intended (Hidalgo Tenorio 2011, 195).

For my thesis, the policy document discourse analysis will focus on how the idea of heritage is embedded in Jordan policy actions towards food security, sustainability, and biodiversity. There will be a focus on heritage terms, inclusivity, and local community (more elaboration in 3.2.3). This way of analysing the policy documents then provides an understanding of use of "food heritage" in food security, which makes it easier to look at various food security initiatives initiated in Jordan. This enables me to further explore to what extent mobilising food as heritage can contribute to food security and how, or if, it is feasible to use traditional (and archaeological) knowledge in addressing current problems in food scarcity and biodiversity.

2.1.2 Atlas.ti 9: qualitative data analysis software

For my critical discourse analysis, I have employed the qualitative research software Atlas.ti 9. This is a qualitative analysis programme for large bodies of text, audio, photo, and video. In Atlas.ti I can order documents, mark them, and add quotations and codes to the marked text. This allows me to trace back statements made in the documents and see common themes across multiple files of text and visual material. The software has four main principles: visualization, management of complex data; integration of databases and elements to connect researcher and data; randomness, to come to insights without deliberate searching; and the manipulation of material, to discover new links and insights between the researched data (Brito *et al.* 2016, 77). These principles make it a powerful tool for any qualitative research because the researcher can control their data while at the same time be inspired by new insights that are revealed by specific software functions, such as the network function. Important to note is that the programme works as a research assistant and that it is not a replacement, as a programme cannot replaces a researcher's perspective and creativity (Brito *et al.* 2016, 77; Hwang 2008, 524).

Atlas.ti has several tools to examine research materials, for example it provides the option to connect documents, codes, and quotations in networks. Codes are labels you can stick to bodies of text, a sentence, a word, and picture/video material that you can mark as quotations. Quotations are marked texts or visual material that you can apply codes to and write comments by. Importantly in this research process, codes are not yet interpretations but merely define what the data is by coding at the level of data. It is a way of identifying concepts and categories within cultural data and the relationships between them. Therefore, the codes and the interpretation that follows are based on the context of the coded data. For example, by using the function of networks, codes and their corresponding data can be visualized in networks. The networks can then highlight connections between, for example, codes and documents, codes and quotations, and quotations and documents. I will use this tool to gain a clearer overview of how documents relate to a set of common themes and to highlight important quotations made in the documents. Using this tool means that the quality of analysing is subject to my own effort put into it. Furthermore, the results and discussions are based on the quotations and codes I use and therefore the analysis is subject to my interpretation and use of codes in the material.

I will use this scientific tool to analyse eighteen documents, including three video screenshots. These documents are part of the project file FOOHARC, which can be expanded and built on in the future and by other researchers. This offers the opportunity to verify, expand and review the research in the future. The themes that guided the document analysis can be found in
Table 1. An overview of the documents can be found in the next section (3.2.3, Table 2). A list of used codes can be found in Figure 1.

2.2.3 Discourse material and common themes

This section presents my list of common themes and a table containing all analysed material. The common themes are broad themes or concepts that I have looked for in the research material. There are terms that relate to the common theme, such as education to empowerment, or eco-tourism to sustainability. Thus, the common themes can also be indirectly present in the researched documents. The choice of policy documents is made on the topic of the policy. The policy documents had to concern food security and biodiversity. I limited the policy documents to only six

due to time constraints. The material on food and heritage initiatives in Jordan are gathered based on initiatives in place regarding heritage and food security. The initiatives are limited to only three different ones due to time constraints.

Common themes
Biodiversity
Empowerment
Food heritage
Food security
Heritage
Local community
Sustainability
Traditional knowledge

Table 1 List of common themes

Figure 1 List of applied codes (colour grouped) (created by author)

Jordan policy documents		
NR	**Document**	**Reference**
1	The National Climate Change Policy of the Hashemite Kingdom of Jordan 2013-2020.	MoE, 2013. The National Climate Change Policy of the Hashemite Kingdom of Jordan 2013-2020. Report Ministry of Environment, Jordan.
2	*The Second Country Report on the State of the Plant Genetic Resources for Food and Agriculture in Jordan.*	Al-Fyad, M., Migdadi, H., Brake, M., Syouf, M., Aljoni, M., AbuLila, K., and Z. Tahebsum, 2007. *The Second Country Report on the State of the Plant Genetic Resources for Food and Agriculture in Jordan.* Country report on the state of the Plant Genetic Resources for Food and Agriculture. NCARTT, Amman Jordan.
3	The National Biodiversity Strategy and Action Plan 2015-2020	El Shaer, H., R.B. Hani, B. Qteshat, T. Abulhawa, A.A. Fattah & F. Musmar, 2014. *The National Biodiversity Strategy and Action Plan 2015-2020. Report* Ministry of Environment, Amman Jordan.
4	Towards a Green Economy in Jordan: A Scoping Study	EnConsult Jordan, 2011. *Towards a Green Economy in Jordan: A Scoping study*. Report UNEP and MoE, Jordan.
5	The Fifth National Report on the Implementation of the Convention on Biodiversity	ICUN-ROWA, 2014. *The Fifth National Report on the Implementation of the Convention on Biodiversity.* Report Ministry of Environment, Jordan.
6	Updated Rangeland Strategy for Jordan	Ministry of Agriculture and ICUN, 2013. *Updated Rangeland Strategy for Jordan.* Report Ministry of Agriculture Directorate of Rangelands and Badia Development, Jordan.
MedSNAIL Jordan		
NR	**Document**	**Reference**
7	MedSNAIL Jordan Desk Review	NAMAA, 2020. *MedSNAIL Jordan Desk Review.* Report Desk Review on MedSNAIL Topics in Target Regions, MedSNAIL.
8	Rediscovering the culinary heritage of Jordan	http://www.enicbcmed.eu/rediscovering-culinary-heritage-jordan-thanks-medsnail-compliance-slow-food-criteria, accessed 27 April 2021.
9	Second MedSNAIL Newsletter	http://www.enicbcmed.eu/projects/medsnail, accessed 27 April 2021.
10	Video:Mapping Balqa	http://www.enicbcmed.eu/jordan-partners-show-us-their-mapping-balqa-thanks-medsnail-project, accessed 28 April 2021.
11	Video:Qors Al-Nar	http://www.enicbcmed.eu/medsnail-typical-local-meal-qors-al-nar-bread-fire-salt-jordan, accessed 28 April 2021.
12	Video: Local Ghee	http://www.enicbcmed.eu/medsnail-typical-local-meal-samneh-local-ghee-salt-jordan, accessed 28 April 2021.
UNESCO Jordan		
NR	**Document**	**Reference**
13	MedLiHer: National assessment on the state of safeguarding intangible cultural heritage in Jordan	UNESCO, 2009. National assessment on the state of safeguarding intangible cultural heritage in Jordan. Report UNESCO, Jordan.
14	Report on the implementation of the Convention and on the status of elements inscribed on the Representative List of the Intangible Cultural Heritage of Humanity	UNESCO, 2014. Report on the implementation of the Convention and on the status of elements inscribed on the Representative List of the Intangible Cultural Heritage of Humanity. Report UNESCO, Paris.
15	Examples of Intagible Cultural Heritage in Egypt, Jordan, Lebanon and Syria	https://ich.unesco.org/en/examples-of-regional-living-heritage-00379, accessed 28 April 2021.
16	Elements on the UNESCO ICH list Jordan	https://ich.unesco.org/en/state/jordan-JO?info=elements-on-the-lists, accessed 28 April 2021.
BigPicnic		
NR	**Document**	**Reference**
17	Public views and recommendations for RRI on food security	BigPicnic Management Board, 2019. *Public views and recommendations for RRI on food security.* London: BGCI.
18	BGCI Royal botanic garden Jordan and Rangeland rehabilitation	Al Shudiefat, M., H.B. Dingwall & K. Al Khalidi, 2013. Community-based rangeland rehabilitation: addressing food security and biodeiversity rehabilitation at the Royal Botanic Garden of Jordan, *BGjournal* 10(2), 16–19.

Table 2 Material analysed in the Critical Discourse Analysis

2.2 Critically applying archaeological insights

2.2.1 Critical review: Wheat in Jordan

The critical review will discuss the application of archaeological approaches and findings to contemporary problems, in this case food security. The main aim of this critical review is to provide a general overview of what agricultural and ecological bio-environment wheat related to in the past and what archaeological studies can tell us about its management, and then to compare it with today's foodscape, diet, and agricultural practices. The goal of this is to put current food-ecological relations into a better perspective.

The policy documents used for the discourse analysis contain some information on today's wheat production in Jordan. Focussing on this one food element, which is linked to many traditional Jordanian meals, represents an effort to visualize a gap between heritage and cultural identity and policies regarding food security and sustainability.

Chapter 3: Background on concepts and research area

Introduction

This chapter will provide extra background on the Sustainable Development Goals and food security in relation to archaeological research. Furthermore, attention will be paid to the Mediterranean Diet and its role in heritage and sustainability. Finally, I will highlight the geographical context of the research area and will zoom in on Jordan specifically as this country is the host of my case studies presented later in this thesis.

3.1 Sustainable Development Goals (SDGs) in relation to heritage

The term sustainable development refers to addressing the needs of current and future generations, making use of natural resources and ecosystems in a way that they are preserved and sustained (UNEP/MAP 2016, 12). The seventeen SDGs (Figure 2) are part of the 2030 UN sustainable development agenda, aimed to undertake urgent action to put an end to poverty, move towards global peace, reduce inequality, stimulate economic growth while considering the environment and the threat of climate change (WHO 2020,1).

Heritage (cultural and natural, tangible and intangible) can play an essential role in addressing the SDGs (Labadi *et al.* 2021, 8). ICOMOS is arguing that heritage plays a vital role in the achievement of the SDGs as heritage is a resource that can enable social cohesion, foster socio-economic regeneration and can improve the appeal and creativity of regions (Labadi *et al.* 2021, 12). Linking this statement to the main theme of this thesis, food heritage, ICOMOS highlights the value of agriculture and cultural landscapes in relation to sustainable ecosystems (Labadi *et al.* 2021, 27). This makes sense as often indigenous practices are associated with environment-friendly and sustainable. ICOMOS also addresses this also in goal twelve, responsible consumption and production. They stress that community heritage practices show respect to the carrying capacity and regenerative cycles of the natural environment (Labadi *et al.* 2021, 83). The important role of heritage in the sustainability goals opens the door for archaeologists. An archaeological approach on for example traditional food practices can be very valuable, as is discussed in the next section.

Figure 2 The 17 UN SDGs (Unicef.org)

3.2 Food security and archaeology

Food or food security is most outspoken in goal two, zero hunger, but can in general be linked to all seventeen goals (Dougall 2017, 14). Food security as a goal does not only imply the ability to produce food but also access to food, ensuring quality and sustainable agriculture (Dougall 2017, 14). There are four factors that are of importance when looking at food security, namely availability (production, distribution and exchange), accessibility (affordability, allocation and preference), use and utilization (nutritional value, social value and food safety), and stability (Reed & Ryan 2019, 4). Archaeological and ethnographical research can contribute to long-term insights on solutions regarding agricultural resilience and sustainability (Reed & Ryan 2019, 1).

Food security is a reoccurring theme in archaeological research. For example, it is often assumed that decline in food security can be associated with European inventions and forcing market-based and cash-cropping economies (Logan *et al.* 2019, 422). Cash-cropping or monocropping makes the crops more vulnerable to threats like pests, disease and now climate change (Reed & Ryan 2019,6). However, monocropping practices do not have a European origin. Archaeology shows that it started in the Middle East before the Europeans. A decline in food security due to cash-cropping economies is illustrated by Laparidou and Rosen, who did a case study on Medieval Jordan. She researched, through

phytoliths, the negative impact that the implementation of sugarcane plantations by the Mamluks had on the environment in Jordan (Laparidou & Rosen 2015, 1686).

The above example quickly illustrates that ancient crop histories and agrobiodiversity can be valuable and provide essential context to food practices, like future crop introductions and identification of crop origin regions (Reed & Ryan 2019, 6). Furthermore, the example shows that the type of agriculture (production) plays an essential part in the sustainability of the land and thus also a role in food security. The traditional agricultural practices were abandoned, not only resulting in a less sustainable landscape, but also in losing indigenous knowledge and culture. Koohafkan, founder and president of the World Agricultural Heritage Foundation and former FAO director, is specialized in globally important agricultural heritage systems (GIAHS) (Koohafkan & Altieri 2016). GIAHS are defined as "Remarkable land use systems and landscapes which are rich in globally significant biological diversity evolving from the co-adaptation of a community with its environment and its need and aspirations for sustainable development" (Koohafkan & Altieri 2016, 37). Examples of GIAHS are Qanat irrigation systems, the marshland agriculture in Iraq, the Dutch polder system and rice terraces (Koohafkan & Altieri 2016, 86-252). More about GIAHS and how they relate to the food heritage discourse will follow later in this chapter. The next section will dive deeper into the concept of intangible cultural heritage, followed by a section on Slow Food foundation relevant for local farmer empowerment and local product recognition.

3.3 Intangible cultural heritage

Intangible cultural heritage (ICH) can be a powerful tool to promote traditional practices and therefore could possibly have the ability to aid in sustainable practices. ICH as defined by UNESCO:

"*The 'Intangible Cultural Heritage' means the practices, representations, expressions, knowledge, skills – as well as the instruments, objects, artefacts and cultural spaces associated therewith – that communities, groups and, in some cases, individuals recognize as part of their cultural heritage. This intangible cultural heritage, transmitted from generation to generation, is constantly recreated by communities and groups in response to their environment, their interaction with*

nature and their history, and provides them with a sense of identity and continuity, thus promoting respect for cultural diversity and human creativity." (UNESCO 2018).

In other words, ICH is an embodiment of immaterial manifestations of culture that represent a variety of living heritage and is essential to cultural diversity (Lenzerini 2011, 101). Furthermore, ICH aids in sustainable practices as the various elements on the UNESCO representative list are connected to the SDGs, for example, the date palm, knowledge, skills, traditions and practices is among others linked to SDG 2 (zero hunger) and SGD 11 (sustainable cities and communities) (ich.unesco.org). The date palm thrives in arid conditions and therefore is an excellent cultivate in desert areas (ich.unesco.org). Next to this, ICH and sustainable practices are also connected through workshops and exhibitions facilitated through UNESCO, for example the 2013 Intangible Cultural Heritage: A force for sustainable development exhibition in Paris. This exhibition was aimed at highlighting the value of culture as an enabler for sustainable development and that it can be a resource in finding solutions for challenges in natural resource management (ich.unesco.org).

The above examples illustrate that ICH is a very dynamic concept, as it represents a living heritage that is always subject to change. This can be something positive as it then can embody contemporary cultural identity, but on the other hand, it makes it vulnerable as it can be absorbed by larger stereotype ideas of a culture (Lenzerini 2011, 118). This dynamic characteristic will be further highlighted in section 3.6 The Mediterranean diet, which is also inscribed on the UNESCO Representative List of Intangible Cultural Heritage of Humanity.

3.4 Slow Food Presidia

Slow Food is an international movement that originates in Italy, the movement focuses on farm-to-market systems to promote sustainable local high-quality products (Peano *et al.* 2014, 1). The Slow Food Foundation has as primary goal to preserve old traditions linked to food, with the aim to preserve the diversity of locally grown crops and traditional crop management systems (Peano *et al.* 2014, 1). To further protect traditional local products, the foundation launched the Slow Food Presidia programme (Fernandez *et al.* 2020, 9). A Presidia label is designated

to a product, which makes it more specific than for example the Mediterranean diet. A presidium can enable small-scale farmers to come together and reflect on practice, improvements, and the promotion of products. Thus, forming a community that empowers local produces (Fernandez *et al.* 2020, 9). For a product to meet the presidia requirement it has to be good in taste, recognisable, have a specific history in the region and belong to a traditional culture (Peano *et al.* 2014, 2).

3.5 Globally important agricultural heritage systems

Globally important agricultural heritage systems (GIAHS), is a programme by the Food and Agriculture Organization (FAO) to identify and preserve traditional agriculture (Fernandez *et al.* 2020, 3). It highlights the variety of unique agricultural practices in communities that connect food with security, agro-biodiversity, culture and landscape (Fernandez *et al.* 2020, 3). To get a designation the traditional agriculture has to meet five criteria (Koohafkan & Altieri 2016, 42):

1. The agricultural system needs to contribute to food, nutrition and livelihood security of the local communities.
2. The system must be provided with global or national significant biodiversity and genetic resources for agriculture and food.
3. The system should maintain the knowledge, indigenous technology and management systems of the natural resources, and maintain the social organizations and institutions.
4. Local institutions should have a vital role in the balancing of environmental and socio-economic goals, creating resilience and reproduction of elements essential to the agricultural system
5. They have to be landscape features with aesthetic qualities

In contrast to the Slow Food Presidia, a GIAHS designation is not meant for a single food product but an agricultural system as a whole. The GIAHS label cannot be used for commercial purposes, unlike the Slow Food Presidia label (and GI, Geographical Indications) (Fernandez *et al.* 2020, 5). More characteristics of Slow Food Presidia, GI and GIAHS can be found in Figure 3.

Characteristics	GIAHS	GI	Slow Food Presidia
Object of designation	An agricultural system composed of traditional knowledge and practices, landscapes, culture and biodiversity	The name of a product, its characteristics, production methods and delimited geographical area of production	A product and its associated biodiversity and/or knowledge
Objective of designation	1. Highlighting unique knowledge, practices and landscapes 2. Dynamic conservation (as well as adaptation and development) of a site	Highlighting of the name, geographical origin and reputation of a product, and protection from misuse in markets	Highlighting products related with endangered biodiversity as well as social and cultural aspects, and integrating them into a strong network
Applying body	Ministry of agriculture or of environment, or national GIAHS committee	Farmers' and food processors' organizations (including all value chain stakeholders)	Farmers' and food processors' organizations (Slow Food members)
Criteria for designation/ decision/ selection	Selection criteria focus on: i) Food and livelihood security, ii) agro biodiversity, iii) traditional knowledge, iv) cultures and v) landscapes	Selection criteria relate to the quality, specific characteristics or reputation of a product as linked to its geographical origin	Selection criteria focus on products at risk of extinction, and relate to the local and traditional nature of a product, as well as associated unique agrobiodiversity, and farmers' and/or producers' knowledge
Governance body	GIAHS Programme (FAO) • FAO Committee on Agriculture • Decision on designation: Scientific Advisory GroupSAG • Management of designated GIAHS sites: site stakeholders (local and/or national government)	National government authorities • Decision on designation: experts' committee	Slow Food Foundation for Biodiversity • Decision on designation: experts' committee
Endorsement from government	Not mandatory but considered as basic requirement	Mandatory	Not mandatory
Protocols/systems for quality management of agrifood products	Not required	Required and certified	Required in the new system but not certified
Biodiversity	Mandatory	Not mandatory but one of its characteristics	Mandatory
Promotion of sustainable methods	Mandatory (all GIAHS sites are designated based on their sustainability)	Not mandatory but sought after	Mandatory
Dynamic conservation approach (flexibility for changes in practice)	Yes	Yes, but only if revisions to the code of practice are approved	Yes
Focus on nutrition, healthy diet, food safety and quality	No	No explicit focus on nutrition, but food safety and quality are very important	In progress
Juridical protection	No	Yes (TRIPS Agreement and Geneva Act)	Yes (for products using the Slow Food logo as a trademark)

Figure 3 List of characteristics of GIAHS, GI (geographical indications), and Slow Food Presidia (Fernandez et al. 2020, 11.)

3.6 The Mediterranean diet

This section explains the link between the Mediterranean diet and important issues in food security, such as availability, accessibility, and nutritional value. I will briefly touch upon the Mediterranean diet, the concept, and its benefits, as the case studies that I will analyse and discuss later tie into this intangible heritage. The Mediterranean diet is since 2010 listed on the UNESCO Representative List of Intangible Cultural Heritage of Humanity (ich.unesco.org - Mediterranean diet). It has been listed to protect the legacy the diet represents and to share its values and benefits across the world (Serra-Majem & Medina 2020,14). Its significance as cultural heritage is discussed by Pfeilstetter (2015). He illustrates that by promoting the Mediterranean Diet as a heritage it makes the ordinary food different qualitatively as well as culturally, thereby contributing in a positive way to the sustainability discourse (Pfeilstetter 2015, 2015). This perception change of ordinary food is due to the fact that a sense of romance, elite and exclusive value is attached to the notion of heritage (Pfeilstetter 2015, 228). This can spark interest among customers to acquire these "heritage" products and opens a market for entrepreneurs to exploit (also in a positive sense). Which can result in local and national food promotion within the country and to tourists and thereby giving certain products a bigger stage in the nation's culture. The Mediterranean Diet's value for the sustainability discourse is elaborated upon later in this section.

The Mediterranean diet can be defined as the diet that developed in the 1950s and 1960s in a few regions in the Mediterranean basin. The diet is characterized by an abundance of plants foods like whole grain, fruits, vegetables, legumes (chickpeas, lentils, beans), nuts (hazelnuts, almonds, walnuts, pine nuts, seeds), herb and spices, followed by olive oil, seafood, eggs, fermented dairy products, low consumption of red meat and processed foods and finally by moderate consumption of wine (Serra-Majem & Medina 2020, 5). The diet as heritage is not a determined lists of food, it is more a process as the list is constantly being updated and there are also major variations between countries in terms of traditional food products (Serra-Majem & Medina 2020, 7 & 15).

The Mediterranean diet is globally recognized for its health benefits and environmental sustainability (Dougall 2017, 4). However, more people are abandoning the traditional diet (Serra-Majem & Medina 2020,7). Also in Lebanon

and Jordan there has been a shift away from traditional Mediterranean diets (Naja *et al.* 2019, 1). Several causes are mentioned for the shifting away. One is the expansion of western culture and food globalization, leading to eating more processed foods (Serra-Majem & Medina 2020, 8). Second, the faster way of living and being able to store foods for longer makes it easier to quickly grab some food that is already lying around thereby not eating a diverse fresh meal (Serra-Majem & Medina 2020, 8). Finally, it may be the case that the pricing of certain products (e.g. virgin olive oil) of the Mediterranean diet is too high and that people resort to cheaper alternatives like sunflower oil (Serra-Majem & Medina 2020, 8).

The Mediterranean diet and its struggles can be linked to the some of the key themes of food security mentioned earlier in this chapter. While all the products may be available, it is not accessible for everyone (pricing, rush). Therefore, its utilization value drops as well, as eating more process foods leads to less nutritional value. With the notion that the Mediterranean diet is an intangible heritage, it will be interesting to analyse the initiatives and food products discussed in the chapters to come. The concept of the Mediterranean diet can help to argue to what extent mobilising traditional food as heritage can help in food security, sustainability, and local identity.

3.7 Geographical context of research area

3.7.1 East Mediterranean

Figure 4 The 22 East Mediterranean countries according to the WHO - Lebanon (orange) and Jordan (green) (After iapb.org)

The East Mediterranean region (Figure 4) consists, according to the World Health Organization (WHO) of twenty-two countries. It is a very climatically diverse region which shows in the variety of flora and fauna across the countries (Eastwood 2004, 25). Notwithstanding the differences between the countries, they also experience similar challenges such as climate change, environmental degradation, water shortages and rural depopulation (Dougall 2017, 12).

3.7.2 Jordan

Figure 5 Jordan (After Fao 2021)

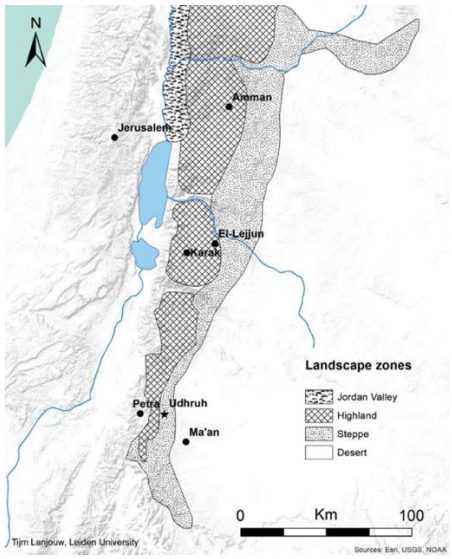

Figure 6 Landscape zones Jordan (T. Lanjouw, in Al Karaimeh 2019)

Facing the challenges of climate change, the rainfed agricultural sector in Jordan already has its difficulties, including growing population, urbanisation, warmer climate, soil erosion and water shortages (Ababsa 2014). Jordan, or the Hashemite Kingdom of Jordan (Figure 5), has a Mediterranean climate in the highlands, semitropical in the Rift Valley, and a more continental climate in the plains and eastern desert (Figure 6) (FAO 2008, 3). The rain season is in the winter, with an annual rainfall variation between 50 mm in the east and south and 650 mm in the highlands (FAO 2008, 3). With the current climate change and greenhouse emissions, there will be a severe increase in temperature and rainfall by 2100, which would have a major impact on Jordan's landscape and its use (WHO 2016, 2).

Some main issues are erosion of the top soils and limited available water resources (FAO 2008,4). As can be seen in Figure 7 most water is used by the

agricultural sector. Only ten percent of the total area suitable for cultivation, the field crop production is mainly fed through rainwater, while for vegetable cultivation the water comes mainly through irrigation (FAO 2008, 1 & 11). With the danger of water shortage, the agricultural sector could suffer a lot. Intensive irrigation projects to get high yields are carried out in the south, but these modern systems are not well suited for that specific environment (Al Karaimeh 2019,109). The groundwater levels drop too fast, and thus only creating more problems for the future. Jordan is already in the top ten of countries with the poorest water resources, with a drop of 3440 m^3 annual capital share between 1946 and 2007 (Ababsa 2014, 68-71).

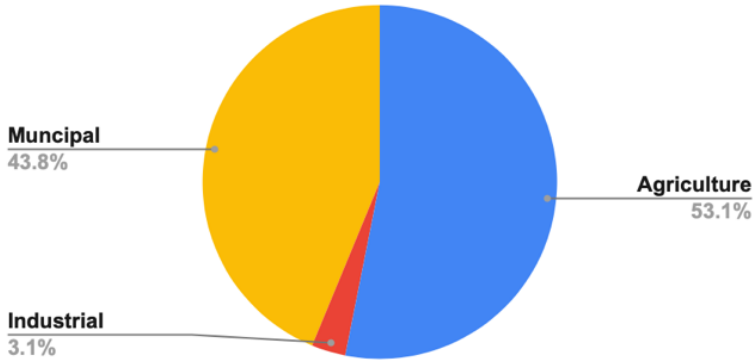

Figure 7 Jordan % water withdrawal of total water withdrawal 2013-2017 (After FAOSTAT)

Chapter 4: Discourse Analysis Results

Introduction

This chapter will present the results from the discourse analysis of policy documents and the heritage initiatives in Jordan selected for the study. The results are presented per policy document and initiative. The full references of the documents can be found in chapter two, Table 2. Throughout this presentation, the quotations with page numbers refer to the document stated in each section below.

4.1 Jordan National Policies

NR	Document
1	The National Climate Change Policy of the Hashemite Kingdom of Jordan 2013-2020.
2	*The Second Country Report on the State of the Plant Genetic Resources for Food and Agriculture in Jordan.*
3	The National Biodiversity Strategy and Action Plan 2015-2020
4	Towards a Green Economy in Jordan: A Scoping Study
5	The Fifth National Report on the Implementation of the Convention on Biodiversity
6	Updated Rangeland Strategy for Jordan

Table 3 Analysed Policy Documents Jordan

4.1.1 The National Climate Change Policy of the Hashemite Kingdom of Jordan 2013-2020

The National Climate Change Policy of the Hashemite Kingdom of Jordan 2013-2020 policy report discusses the national climate change policy of Jordan. Reporting on what is already in place and what is still to be done. It mentioned some aspects relevant to agriculture and food security, as climate change of course has a vital role in this. When it comes to food security it emphasizes the importance to work with locals and promote sustainable agriculture (p.27). For example, the following statement:

"To engage local communities, farmers, farmer associations, local experts, and local and national government representatives in helping craft response options to climate change in agricultural Ecosystems."

This illustrates that traditional or local practices are valued in developing practices for a more sustainable agriculture. Official bodies recognize that collaboration

between all stakeholders is desired and needed to tackle the challenges that come with climate change.

Additionally, the report mentioned the important role of women in food security as they have a vital role in agriculture because of their indigenous knowledge (p.46):

"Women make crucial contributions in agriculture and rural enterprises in drylands as farmers, animal husbandry, workers and entrepreneurs through their indigenous knowledge."

This indicates not only again the relevance of indigenous/traditional knowledge, but also acknowledges the value of women, which opens the opportunity for empowering local women and women in general. This is also evident in the report's section on policy and legal framework which expressively mentions that, with the development of the National Adaptation Action Plan, next to the participation of local affected communities, women organizations should also be involved (p.50).

The report also stresses the importance of the tourism sector in the Jordan economy and how eco-tourism can aid in the preservation of biodiversity and cultural heritage (p.32):

"Tourism is a very important economic sector in Jordan. Also, tourism can support the preservation of the natural and bio-diversity resources (through eco-tourism), and the preservation of Jordan's cultural heritage. Tourism could be impacted by climate change in different ways."

It is evident that traditional knowledge can play a key part in agricultural development and tourism also plays a big role in conservation, but there is no specific notion of *food heritage* as an action policy to raise awareness and tackle the food sustainability challenges. Figure 8 illustrates the link between the policy report and the common themes (Table 1), illustrating the themes that are (in)directly present. Some subthemes (ecotourism and local knowledge) are included to demonstrate what the theme can refer to. It shows that a majority of the common themes are present. From an official level there is the ambition to work with locals

and heritage elements, taking a step towards not solving problems from only a top-down perspective.

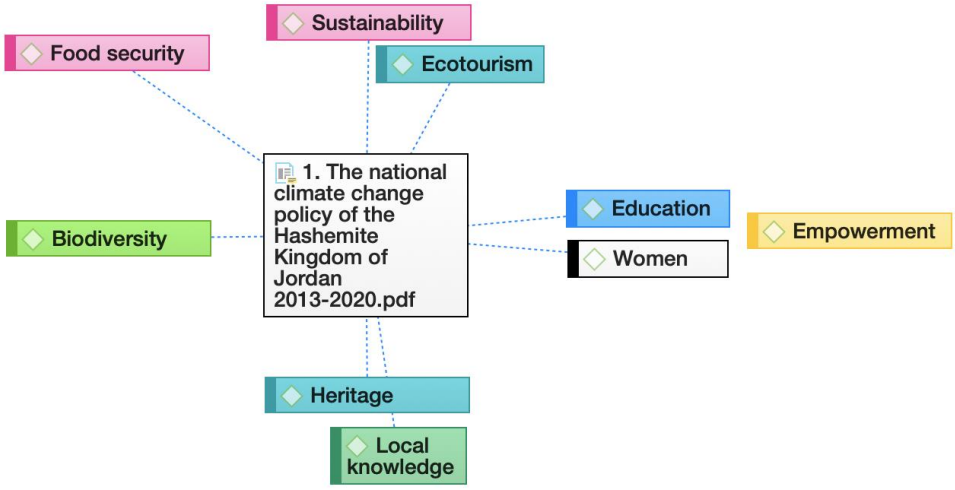

Figure 8 The National Climate Change Policy of the Hashemite Kingdom of Jordan 2013-2020 and its relation to the common themes (created by author).

4.1.2 The Second Country Report on the State of the Plant Genetic Resources for Food and Agriculture in Jordan

The Second Country Report on the State of the Plant Genetic Resources for Food and Agriculture in Jordan highlights the issues that Jordan faces when it comes to mainly plant biodiversity. Plant diversity is declining rapidly in Jordan due to degradation of the landscape and habitat loss (p.15). The government expresses in this report that having a big (genetic) plant diversity is positive for human livelihood (food security etc.) and environmental preservation (p.27):

"*Plants are vital for the development of human society. They are the key to food security, providing us with cereals and other foods in addition to feeding the livestock that produce milk, meat and eggs and provide farm power. The wise use of plant genetic resources can help eradicate poverty, both by lowering the price of food and other commodities and by raising and diversifying the incomes of producers and processors. They also protect and enhance the environment, for example by preventing erosion and desertification and by absorbing atmospheric carbon."*

National policies are implemented to document and preserve biodiversity and actions are implemented towards raising social awareness on the importance of biodiversity and sustainability. They state in the report that there is still a need to raise public awareness (p15). However, there are some interesting programs put in place. The report mentions weekly TV and radio programs on the importance of biodiversity and its importance in achieving food security, emphasizing the relevance of education in raising awareness to battle food sustainability (p.35):

"*There are weekly programs by TV and radio about the importance of biodiversity, genetic resources and its importance for future food security. They invited specialists from universities research intuitions and privet sector to talk about this issues."*

Instigating awareness campaigns are a great way to reach out to the general public, using scholars and experts to demonstrate the importance of biodiversity is a great way to add credibility to the policy aims and action points. Like the National Climate Change report, this report also states that more involvement of rural women is required and that traditional knowledge should be considered when designing new policies to tackle challenges concerning the conservation of biodiversity (p.36):

"Traditional knowledge should be respected in designing new policies or reforming current policies and legislations related to the conservation of biodiversity and utilizing neglected species."

Valuing traditional knowledge in biodiversity preservation would offer a great opportunity to also include local people to participate in the awareness campaigns, in the policy report there is no specific mention of including this group in education or awareness campaigns. Only, as mentioned above, specialists are specifically mentioned, giving the idea that traditional knowledge is valued but should still come from a so-called expert point of view. For Jordan, to overcome the challenges and improve their biodiversity, the document states the importance of collaboration and cooperation with NGOs, the private sector, government institutions and the local communities (p.7). Next to the challenges the report also describes

achievements of activities regarding food security and biodiversity conservation. It expresses the value of research activities with local farmers concerning wheat yields, demonstrating the importance of collaboration and environmentally suited crop species (p39):

"Participatory research activities with local farmers were conducted with the objective of evaluating and screening best performing wheat materials for grain yield and other agronomical characteristics. Recently research is being targeted toward the improvement of varieties adapted to local environments…"

Furthermore, the report specifies the value of eco-tourism and the positive effect it can have on biodiversity (p.31) The report expressively states it has implemented projects aimed at the conservation of biological heritage (p.30), but the report does not further specify what this heritage includes exactly, other than stating the promotion of herbal and medicinal plant sector (p.11). Figure 9 illustrates the relation of the common themes to the policy document, it highlights some subthemes (ecotourism and traditional knowledge) to demonstrate what the theme can refer to.

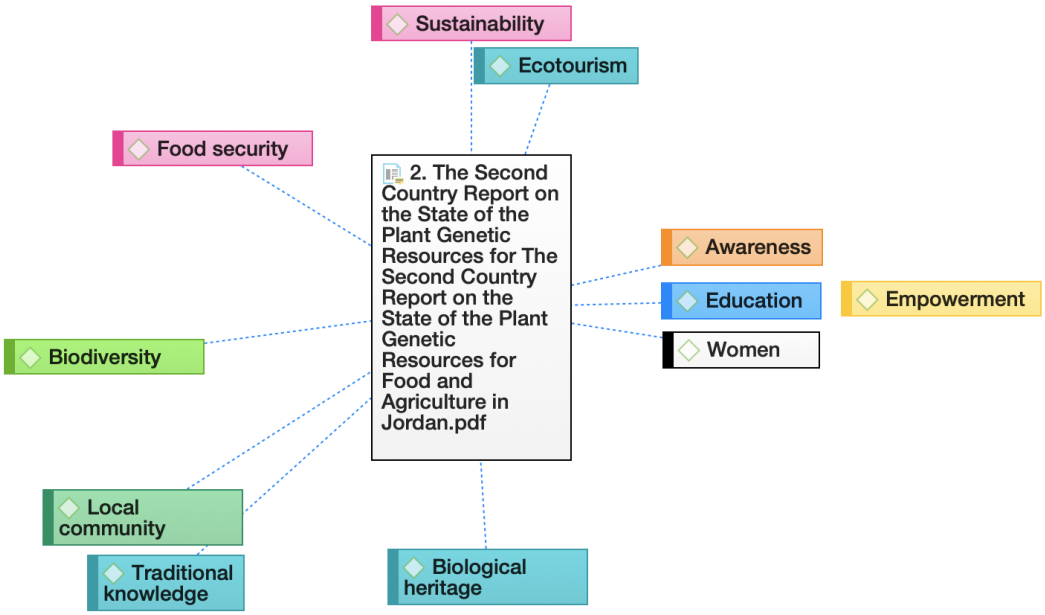

Figure 9 The Second Country Report on the State of the Plant Genetic Resources for Food and Agriculture in Jordan and its relation to the common themes (created by author).

4.1.3 National Biodiversity Strategy and Action Plan 2015-2020

The National Biodiversity Strategy and Action Plan 2015-2020 highlights the goals that the Jordan government wants to achieve by 2050 regarding improvement in the country's biodiversity state (p55). It emphasises in its vision that it wants to be valued for its national heritage vitality, as the plant genetic resources of Jordan are a national and international heritage (p.23):

"The national efforts on genetic resources in Jordan are focused on plant resources as they form the priority for national food security and human well-being."

This statement indicates that the Jordan government has a priority in protecting their plant resources, and further in the report it becomes clear that this focus will be in combination with a close collaboration with local communities and education. In their strategic directions, they speak of including local communities and of creating a strong sense of culture and ownership (p55). This ownership, however, refers to the document being acknowledged as national ownership (p50). It is quite an unclear idea in the report, and thereby seems to neglect the opportunity to tie the idea of ownership to local communities or traditional practice. This lack makes the goal to create ownership less powerful. Next to this, the report acknowledges a lack of good education on biodiversity and sustainability (p.54) but proposes to change this in the policy's action points. In the goals of the national targets set for 2020, they often mention raising awareness of the national policies in biodiversity and climate change (for example p.62 & p78). Next to this, they emphasize educating in biodiversity (p.81), a trend that is also observed in the two reports analysed in the previous sections (4.1.1 and 4.1.2). The report states one specific goal (goal 29) that focuses on the traditional knowledge on biodiversity (p.82):

"By 2020, traditional knowledge on biodiversity promoted and maintained."

Various priority actions regarding traditional knowledge are mentioned, like including a national database, training program and field centre on traditional knowledge. Another important aspect in biodiversity and awareness is the promotion and development of ecotourism (p63.) Stakeholders who are responsible for the priority actions regarding traditional knowledge and community-based

management of the rangelands (see 4.1.6 Updated Rangeland Strategy for Jordan 2013-2014), are the Royal Marine Conservation Society of Jordan (RSCN) and the Royal Botanic Garden (RBG). No other specific names of traditional knowledge programs are mentioned, furthermore, there is nothing reported on a specific role of food heritage. The lack of education and the vague concept of ownership seems to indicate that, although traditional knowledge is valued, the policy actions are mostly top-down orientated. The (in)direct relations to the common themes can be viewed in Figure 10, where there is an absence of the empowerment theme in contrast to the previously analysed reports.

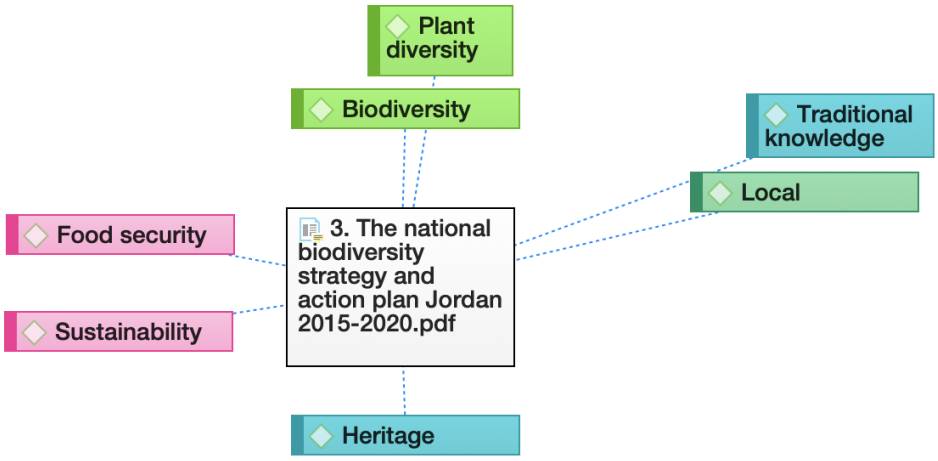

Figure 10 The National Biodiversity Strategy and Action Plan 2015-2020 and its relation to the common themes (created by author)

4.1.4 Towards a Green Economy in Jordan: a scoping study

The report *Towards a Green Economy in Jordan: a scoping study*, is aimed to identify opportunities and challenges in making a greener Jordanian economy. The specific part of interest regarding food sustainability is the section about organic farming and sustainable tourism. The report states that the government wants to promote organic farming, as it contributes to a diversity of crops (an increase of biodiversity), is less heavy on the environment and it appeals to many consumers in developed countries (p.19). With sustainable tourism (or eco-tourism) the government wants to create support for the cultural heritage, and actively work on less pressure on the environment as it aids in conserving natural heritage and biodiversity (p.21). The report also makes a specific statement on the value of communities and the living cultural heritage (p.21):

“Respect the socio-cultural authenticity of host communities, conserve their built and living cultural heritage and traditional values, and contribute to inter-cultural understanding and tolerance.”

Further included in the report are examples of archaeological sites as eco-tourism destinations (p.22/25). These sites are for example, Jawa, where the ancient people built a sophisticated water system. The report puts an emphasis on eco-tourism as “ecotourism has the potential to be not only a profitable enterprise, but also a method of preserving endangered plants and animals. This happens through increased awareness campaigns, funded in part by generated income”, giving the idea that also eco-tourism is a key in achieving food security. Altogether, the report does not connect archaeology to sustainability and furthermore, it is noticeable that the report does not connect ecotourism and organic farming to the concept of food heritage. The overview of linked common themes to the report is displayed in Figure 11.

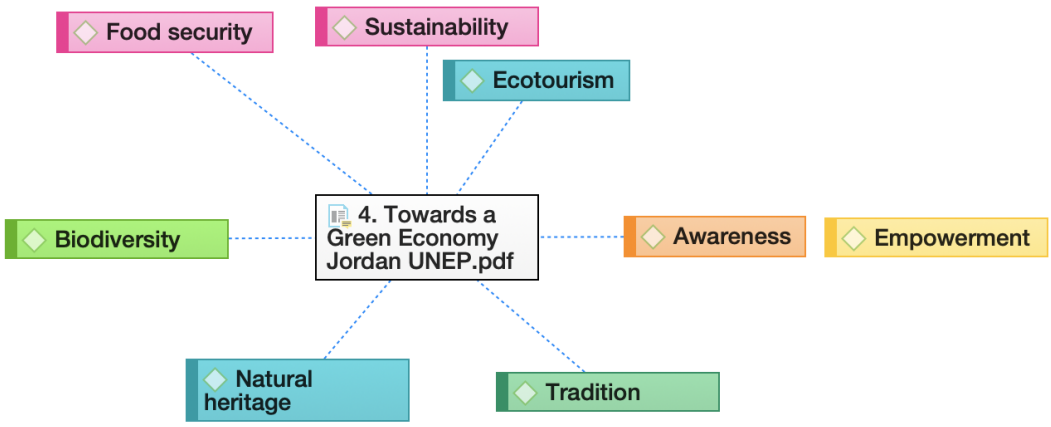

Figure 11 Towards a Green Economy in Jordan: a scoping study linked to the common themes (created by author)

4.1.5 The Fifth National Report on the Implementation of the Convention on Biological Diversity

The Fifth National Report on the Implementation of the Convention on Biological Diversity reports on the status of biodiversity in Jordan, on which of the actions stated in earlier country reports have been accomplished and which goals have not been achieved. It emphasizes the importance of biodiversity for food security (p.23) and the (medicinal) plants as part of the traditional system in Jordan.

"Furthermore, medicinal plants are an important element of traditional systems in Jordan. These resources are usually regarded as part of a culture's traditional knowledge."

Indicating, like in the previous analysed reports, the importance of traditional knowledge in biodiversity and thus also in the food security challenges. It describes the threat against the livelihood of local communities and their use of traditional grazing areas. Natural heritage is seen as an important aspect of development planning (p.34). The report emphasizes the value of working with local communities to work towards a more sustainable ecosystem. Rangeland biodiversity is one of the community approaches addressed in the report (p.41). Thus, acknowledging the value of indigenous knowledge in the fight for food security. The value of traditional and indigenous knowledge is also recognized and seen as a key element in preserving biodiversity and sustainable practices (p.42 - 44). However, the report puts mostly a focus on documenting this knowledge instead of also actively educating and promoting these practices, as can be read in the following statement:

"Documentation of the traditional knowledge on medicinal plants of Jordan in general and the Badia region in particular still needs more effort to prevent this valuable knowledge from being lost after the death of its old secret keepers and as the new Bedouin generations are not interested in these treasures of knowledge that their ancestors owned."

Interestingly the report assumes that the newer generations are not interesting in the old traditions, while this is perhaps the perfect opportunity to investigate the sense of heritage and identity in the younger generations, and actively promoting the value of the knowledge. Furthermore, the report lists the national frameworks and strategies that are in effect that are aimed at biodiversity preservation, sustainability, and food security.

"By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national

legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels."

Contrasting to the earlier statement giving the idea that younger generations are not interested in their ancestors' knowledge, this quote seems to indicate that traditional practices are still passed on to new generations. The final part of the report is dedicated to National targets and strategic goals. The report's action plans are aimed at targeting and contributing to the UN's MDGs, the predecessor of the UN's SDGs (p.78). Target 18 is dedicated to traditional knowledge and indigenous practices, next to this it dives deeper into the Rangeland and Al-Hima initiatives where participation and empowerment are important (p.73-74), indicating the idea of bottom-up collaborations. To conclude, there is no specific mention of food related heritage, despite devoting a big part to traditional knowledge in relation to biodiversity preservation. Figure 12 shows the common themes related to the policy report, again also showing the subcategory of ecotourism, a common trend in Jordan's policies.

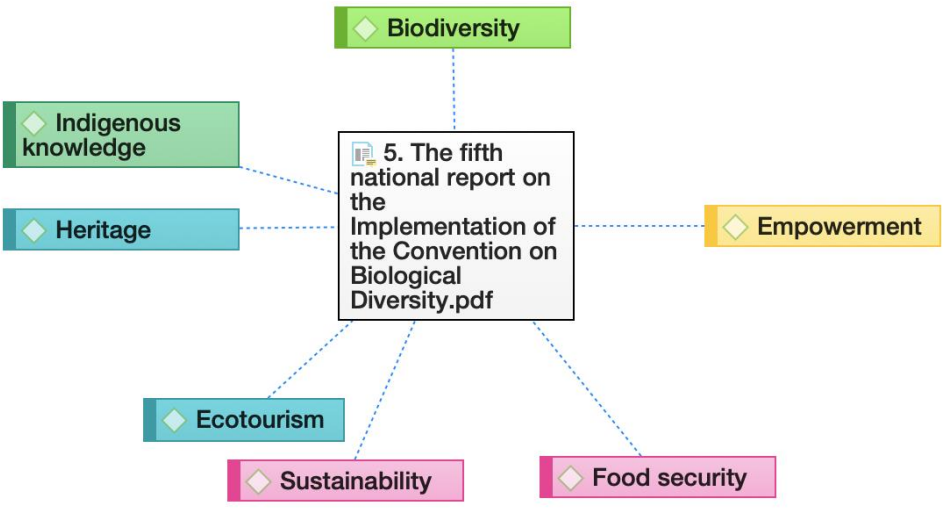

Figure 12 The Fifth National Report on the Implementation of the Convention on Biological Diversity in relation to the common themes (created by author)

4.1.6 Updated Rangeland Strategy for Jordan 2013-2014

The Updated Rangeland Strategy Plan focuses on how to stop rangelands from deteriorating, how to advocate sustainability and how to involve the local communities. It emphasizes that rangelands are a traditional land tenure that protects the natural resources and continues to advocate rangelands as a means to achieve food security (p.14), as can be read in the following statement:

"To address habitat loss and food security problems at a fundamental level, the RBG launched the Community-Based Rangeland Rehabilitation Project (CBRR) in 2007, starting with five families living near the RBG site."

Interestingly the community was first opposed to the rangelands but did collaborate with as result that vegetation and wildlife returned to the grazing lands, "The multi-faceted activities of the CBRR have brought higher and diversified incomes for local livestock owners, community mobilization, and greater understanding of sustainable land management practices, all of which are key to achieving enhanced food security locally and throughout the country." The multi-faceted activities refer to teaching locals yogurt production and handicraft skills. This demonstrates that bigger organisations play a key role in the spread and (re-)introducing of local traditions, showing that there is a need for balance between top-down and bottom-up approaches to create a sense of pride and ownership among local populations. The plan mentions the advantage of having pastoral land and connects it to the concept of Hima (p.12).

Finally, the plan provides a list of projects to achieve goals to better rangeland management (pp.13 & 21-25). None of these projects are focused on promoting the rangeland heritage, despite stating that they have a significant heritage value (p.10). This is a missed opportunity, as the plan demonstrated that with the rangeland project great achievements were accomplished with regards to an increase in biodiversity, food security and local empowerment. Figure 13 demonstrates the links between the plan and the common themes.

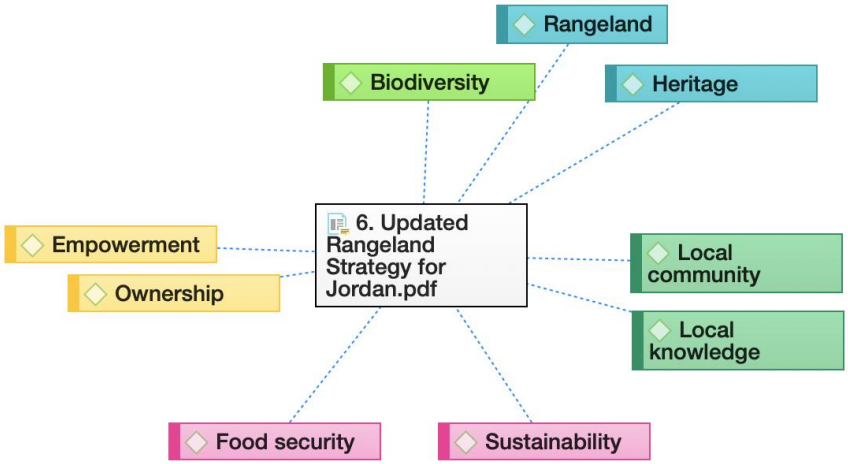

Figure 13 Updated Rangeland Strategy Plan for Jordan 2013-2014 (created by author)

4.2 Network analysis of Jordan policy documents

The figures shown below support the above analysis of the policy documents. Figure 14 shows that all documents discuss the topic of food security and biodiversity. Indicating that food security has a high priority in policies regarding climate change and biodiversity. FFigure 15 gives a general overview of the policy documents in relation to the previously determined common themes defined in the methodology (

Table 1). More terms are included in the network than the main common themes as these terms jumped out during the analysis. Especially ecotourism is a term that was present in most documents (except the Updated Rangeland Strategy for Jordan), illustrating that sustainability practices also play a role in the countries' tourism sector. This could both be beneficial for the promotion of heritage and sustainability to the local population and tourists from all over the globe.

A closer look is taken at the mentioning of traditional knowledge and heritage in the policy documents it is evident in all documents in various forms. Based on the analysis in the previous sections, this shows that heritage is a key element in biodiversity, climate, and sustainability policies. The theme of food heritage or intangible heritage, however, is not present in any of the policy documents (Figure 16). Mostly other terms concerning heritage are used in the documents like cultural heritage, biological heritage, natural heritage. From the different analysis it became clear that the heritage does refer to traditional practices, including agricultural practices. Yet a potential powerful term like food heritage

could be a great addition to the policy action points. Its potential will be illustrated with the heritage initiatives discussed in the next sections. Figure 17 demonstrates example quotes of how wheat is mentioned in the policy documents. I have included this figure as wheat is the main topic of the archaeological critical review in chapter 5. The figure demonstrates the important characteristics of wheat, and therefore highlights the valuable role wheat can play in food security challenges.

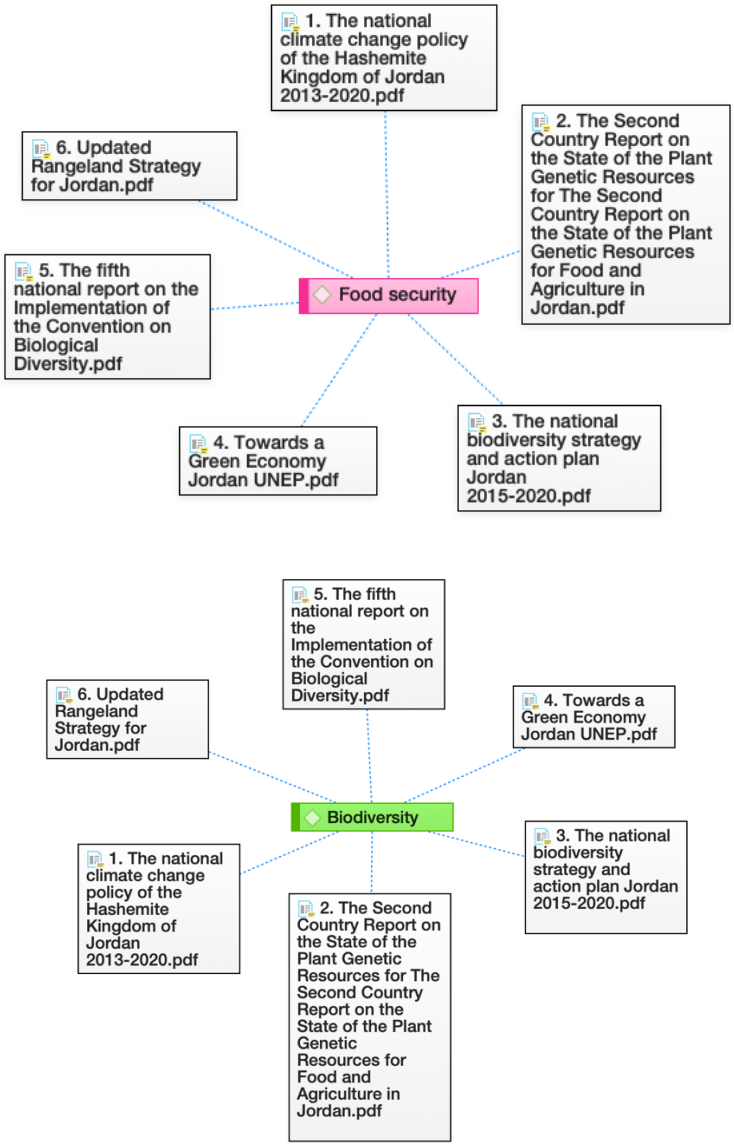

Figure 14 Food security and biodiversity is common theme in all Jordan policy documents (created by author)

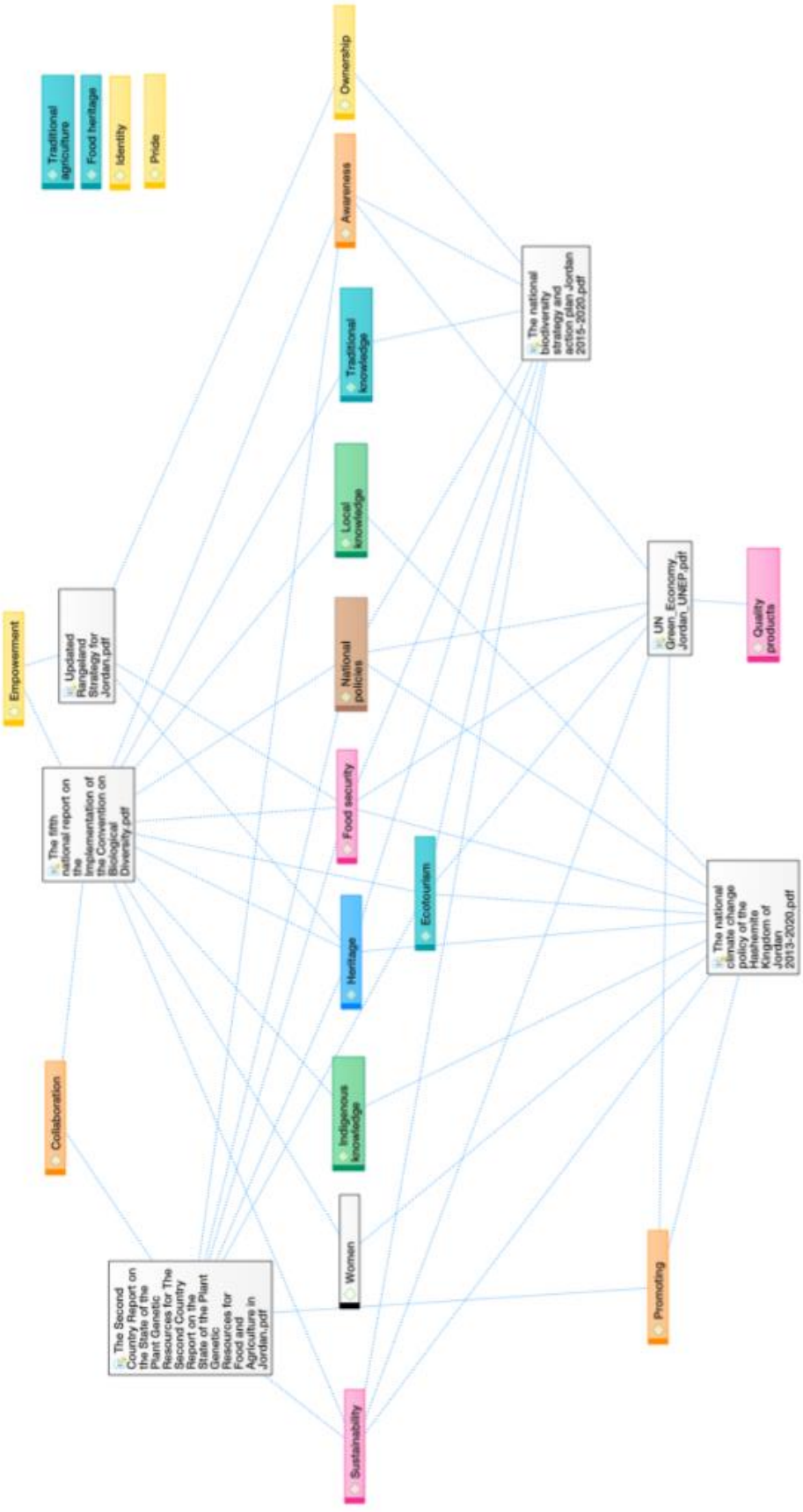

Figure 15 Network of common themes Jordan Policy documents (created by author)

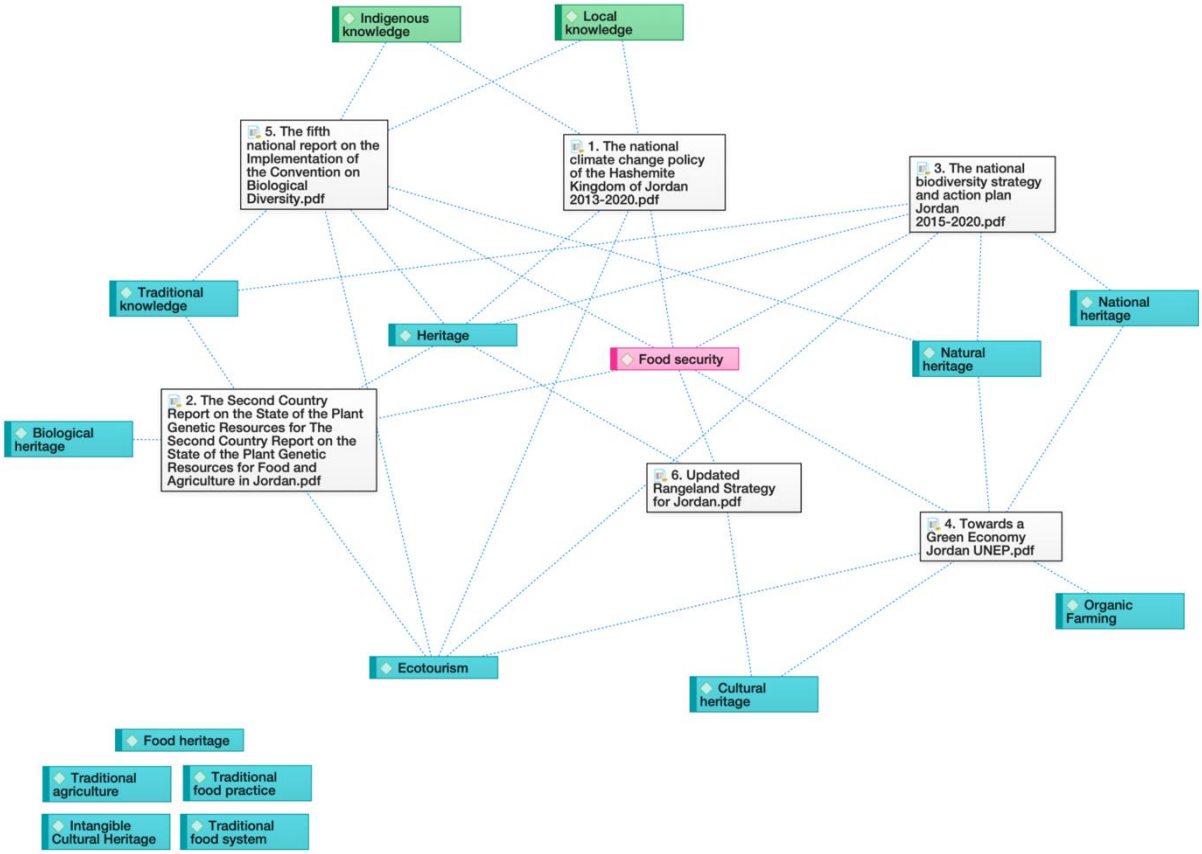

Figure 16 Heritage and traditional knowledge as theme in analysed policy documents (created by author)

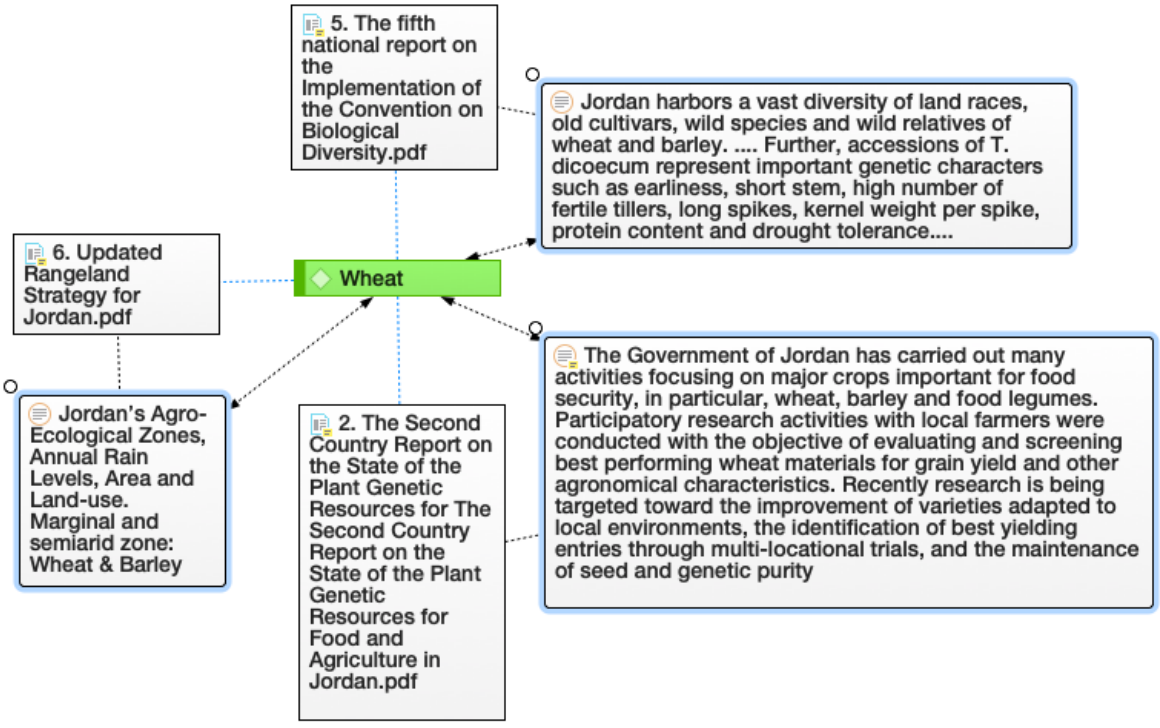

Figure 17 Examples of wheat discussed in Jordan national policy (created by author)

4.3 Heritage Initiatives Jordan

4.3.1 MedSNAIL project – Food Mapping Jordan

NR	Document
7	MedSNAIL Jordan Desk Review
8	Rediscovering the culinary heritage of Jordan
9	Second MedSNAIL Newsletter
10	Video: Mapping Balqa (Figure 19)
11	Video: Qors Al-Nar (Figure 20)
12	Video: Local Ghee (Figure 21)

Table 4 Analysed MedSNAIL Jordan Material

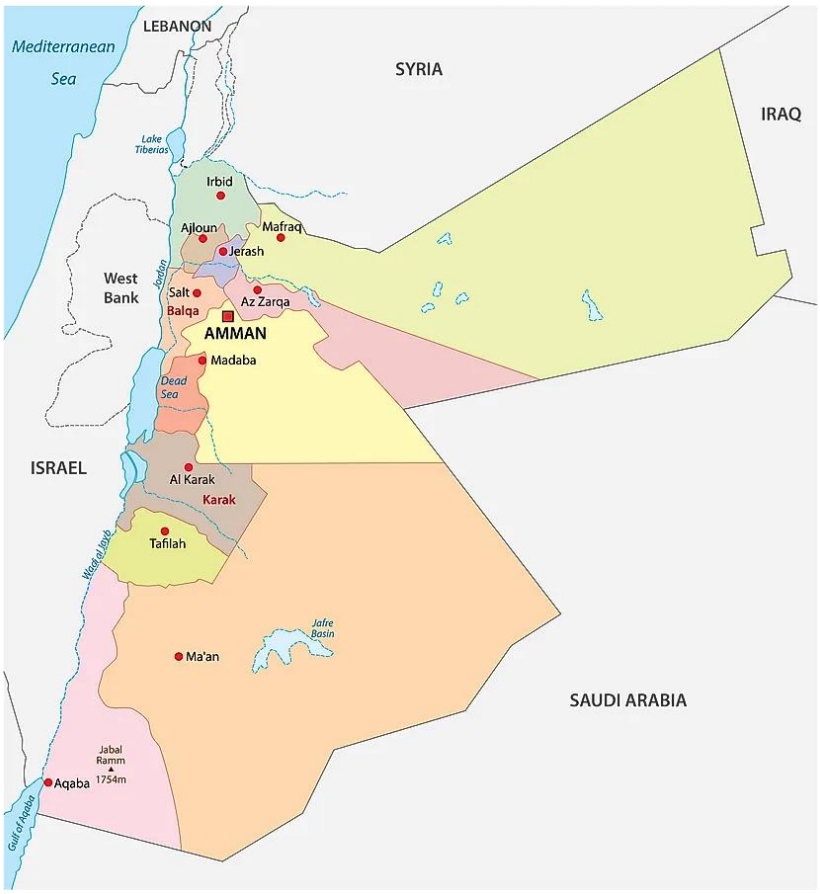

Figure 18 Map of Jordan showing the Balqa region (worldatlas.com)

Figure 19 Screenshot video MedSNAIL project: Mapping Balqa (enicbcmed.eu)

Figure 20 Screenshot video MedSNAIL project: Qors al nar (enicbcmed.eu)

Figure 21 Screenshot video MedSNAIL project: Local ghee (enicbcmed.eu)

The Jordan Desk Review Identifies the Balqa area in Jordan (Figure 18) where the mapping of traditional food will take place. The desk review intensively discusses the state of Jordan's political, economic, and natural context, highlighting the desire to achieve food security and preservation of traditional knowledge. The webpage

provides more information on the food mapping project in Jordan. It explains how the project aims to rediscover Jordan's culinary heritage (Figure 22), and how together with the Slow Food Foundation it wants to preserve the local-agro food products and empower the local farmers to a more sustainable practice and environment (Figure 23). The project is still running and so far they have highlighted *khabeesa* (a traditional sweet dish made with flour and oil), *Qors Al-Nar* (flat bread cooked on coal ash) and local ghee (clarified butter) as traditional products. Highlighting these traditional and local products is an excellent way to raise awareness among the local community on sustainable practices, but in turn, also a way for the local communities to show the rest of the world their heritage and traditional practices. This project could be a possible case study in education programs, meeting the education and awareness on traditional practices action points of the various policy documents.

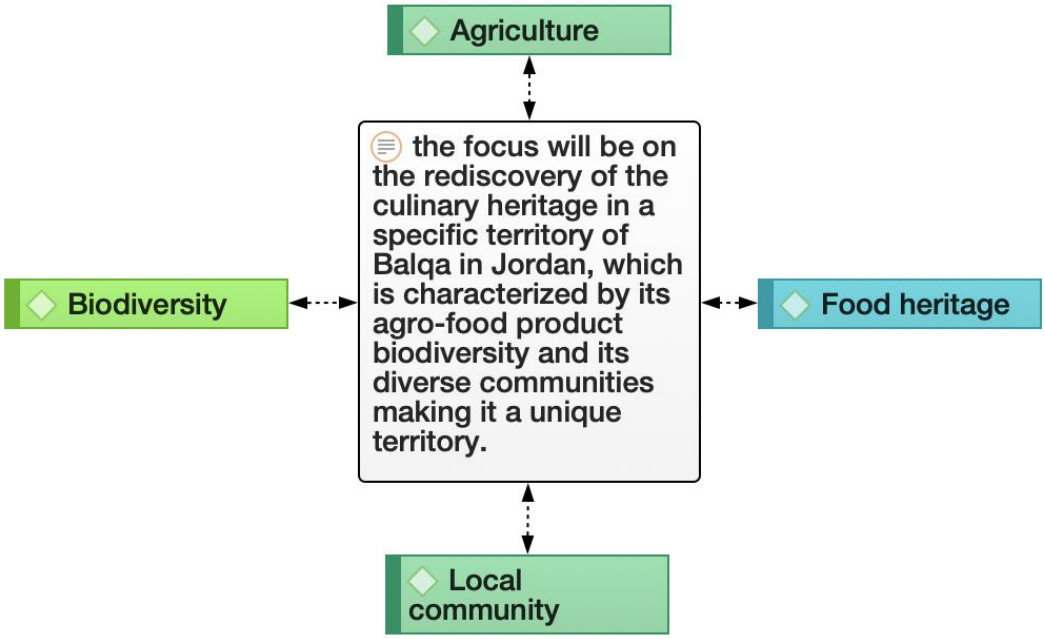

Figure 22 Quote from Rediscovering the Culinary Heritage of Jordan (created by author)

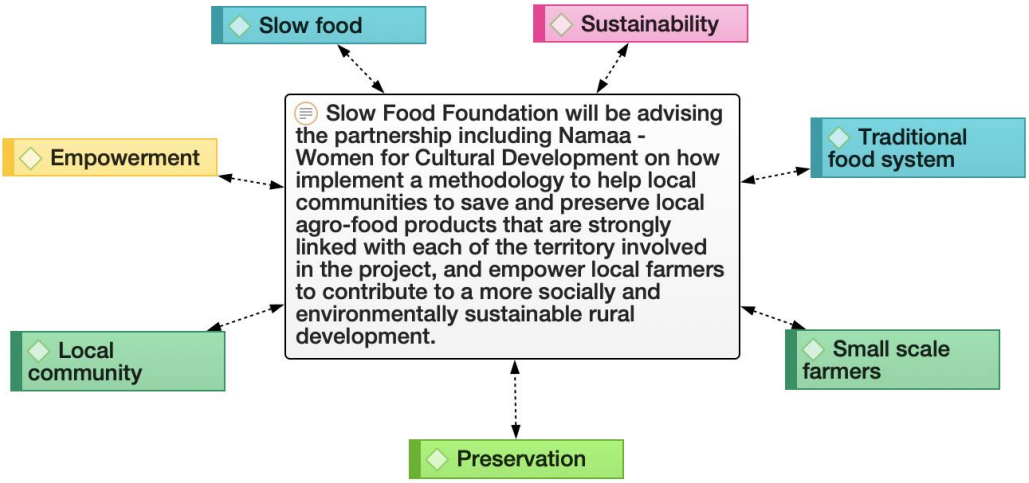

Figure 23 quote from Rediscovering the Culinary Heritage of jordan (created by author)

4.3.2 UNESCO MEDLIHER Project Jordan

NR	Document
13	MedLiHer: National assessment on the state of safeguarding intangible cultural heritage in Jordan
14	Report on the implementation of the Convention and on the status of elements inscribed on the Representative List of the Intangible Cultural Heritage of Humanity
15	Examples of Intangible Cultural Heritage in Egypt, Jordan, Lebanon and Syria
16	Elements on the UNESCO ICH list Jordan

Table 5 Analysed UNESCO documents

The MedLiHer National assessment report is a great document to get insights into what the state of intangible cultural heritage management was in Jordan. The document repeatedly emphasizes the lack of an overarching organisation, with the reoccurring statement: “Absence of a national umbrella for managing tangible and intangible heritage at present” (p. 4, 11, 34, 36, 67 & 73). The document is further focused on providing suggestions to further set the ICH management practices in motion. The report that was issued in 2014 (doc nr 14) on the implementation of the convention and representative list of ICH, highlights that the overarching organisation for central ICH documentation is still not present, “the survey of the Jordanian governmental and non-governmental cultural sectors has revealed that no

central documentation authority for the Jordanian ICH is present" (p.4) When the report discusses the role of NGO's in ICH management it becomes evident that there is no clear communication and there are too many similar activities (p4). This problem indicates that within the official bodies the ICH is not seen as an urgent matter, while the various policy documents do emphasise the value of heritage practices in food security and biodiversity. When it comes to food-related ICH activities there is not much mentioned in the document. There are two cases in the safeguarding achievements by the Directorate of Heritage that mention *traditional desserts* (p7), and *folkore dishes exhibitions* (p.8). Thus, there is still a gap in the promotion of specific food as heritage and ICH, and their relation to sustainable practices.

Sustainability, however, is a reoccurring theme in the national assessment report. Sustainability is often used to express a sustainable culture (p.3, 55) and tourism (p14), but it does not always make a clear connection to environment preservation. There is one case where there is a connection made between heritage and environment when the report discusses the role of RSCN in environmental safeguarding related to tangible heritage (p.22). Yet again this is not ICH. In the 2014 report (doc nr 14) the following statement is made about the lack of a clear policy for ICH in sustainability and sustainable community development: "*Remarkable is the lack of a clear policy concerning the concepts of implementing ICH in sustainable development"* (p.11). Showing again the absence of ICH in policies.

When it comes to food as (intangible) heritage, there is not much included in the UNESCO ICH list (doc nr 16). Only the latest listing includes a food practice, namely date palm. This listing includes the knowledge, skills, traditions, and practices, as these played a vital role in supporting a strong connection between people and the land. On an informal list, made after phase one of the MedLiHer project, the national dish *mansaf* was also mentioned (doc nr 15). Yet to this day it is not included on the UNESCO ICH list despite being an embodiment of the Jordan nation and the potential in playing an important role in sustainable farming/food practices.

Altogether the UNESCO documents reveal that when it comes to ICH implementation and ICH presence in policies, there is not much there yet. This can be an opportunity for future policies and awareness campaigns in Jordan, as

heritage and traditional practices are highly valued and vital in food security and biodiversity challenges.

4.3.3 BGCI BigPicnic and Royal Botanic Garden Jordan

NR	Document
17	Public views and recommendations for RRI on food security
18	BGCI Royal botanic garden Jordan and Rangeland rehabilitation

Table 6 Analysed BGCI documents

4.3.3a BigPicnic: Public views and recommendations for RRI on food security

BigPicnic was an EU-funded project by Botanica Gardens Conservation International (BGCI) run from 2016-2019. It was aimed at bringing together the public, scientists, researchers, food and agriculture industries, and NGOs to discuss food security. The research presented in the Public views and recommendations for RRI on food security report is in line with the SDGs and resulted in the creation of policy briefs with recommendations on how it aids in achieving food security. The report makes explicit statements on the importance of heritage in food security and the relation between food and heritage, for example, the following statement:

"*Through this work the cultural value of food, as well as the notion of food as a form of cultural heritage emerged distinctively. This is a parameter that is to a greater extent omitted by the prevalent European and global policies that deal with food and sustainable development, however, it is strongly linked with the growing awareness of the significance of cultural diversity and recognition of intangible cultural heritage by UNESCO (UNESCO, n.d.).*"

Highlighting, just as the UNESCO documents, that heritage and ICH are absent in clear policy actions. One of the policy briefs is dedicated to food and heritage, where it states that the cultural heritage value of food across all food security policy priority areas should be articulated (p.24). It advocates for the protection of cultural traditions related to food and the acquisition of traditional food products and food processing skills (p.24). The following statement demonstrates the urgent recommendation on the inclusion of heritage:

"Efforts to address food security at the policy, organisational or individual level should acknowledge the essential role that heritage plays in people's relationship with food. In particular, this should take into account the importance of food in relation to memory and the expression of national identity and different religious, political and ethical values as well as traditional ways of eating."

This notice of not including (food)heritage in policies focused on food and sustainable developments, is accompanied by the emphasis that more research is needed to show the relationship between food and heritage.

4.3.3b BGCI Royal botanic garden Jordan and Rangeland rehabilitation

BGCI Royal botanic garden Jordan and Rangeland rehabilitation article in the BG Journal describes the successful CBRR project. The CBRR collaborated with the Royal Botanic garden in Jordan (partner in the BigPicnic project). Rangelands have been ascribed to heritage, environment preservation and aid in food and economic security. A key part of the CBRR project was the participation of the local communities. Showing that a simple top-down approach would not suffice. The participatory approach gives a voice to locals and empowers them. It considers the cultural needs and creates a sense of ownership of their livelihoods.

The article further describes the benefit the collaboration had in getting to know local traditional knowledge, "*by focussing on the people first, CBRR has been able to empower and enrich the lives of dozens of families while simultaneously nurturing and restoring the environment they depend on"* (p.19). This article is in line with the analysis done in 4.1.6 Updated Rangeland Strategy for Jordan 2013-2014, which further elaborates on the benefits of rangelands. Figure 24 demonstrates the relation between public views and recommendations report and the BGCI journal article.

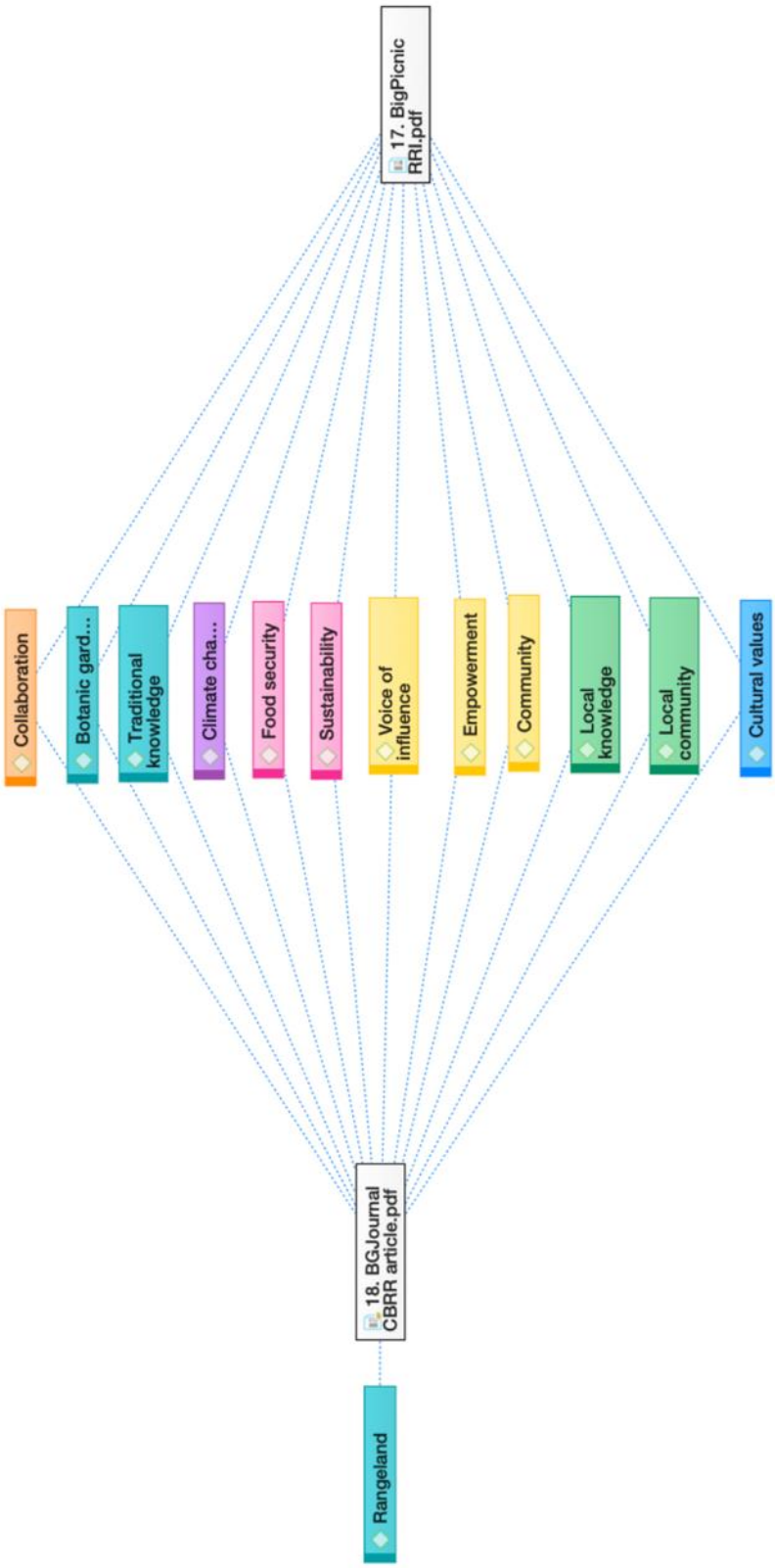

Figure 24 Relation in terms between the BGCI Journal article and the BicPicnic recommendations report

Chapter 5: Critical review – Wheat in Jordan

This critical review is included in this thesis as a demonstration of the potential role of archaeology in the current-day food security discussions. Wheat is an important part of many traditional dishes and was also highlighted in the 4.3.1 MedSNAIL project – Food Mapping Jordan. The critical review discusses several (archaeological) methods used to gain knowledge of past crop production and environments. It further provides a general overview of past wheat production that can be compared to the current day wheat production context.

5.1 Current day context

In the world's temperate regions wheat is a primary cereal, and a stable crop for 40% of the global population (Kilian *et al.* 2010, 138). In Jordan, wheat is part of its rainfed agriculture and is mostly cultivated in the marginal and semi-arid (rainfall 200-500 mm annually, Figure 25) regions of Jordan (Ministry of Agriculture & ICUN 2013, 7-8). Jordan is home to a lot of wild species and relatives of wheat, including cultivated durum (*Triticum durum*), cultivated bread wheat (*Triticum aestivum*), old wheat (*Triticum monoccocum*), and einkorn (*Triticum beoticum*) (ICUN-ROWA 2014, 29). Interestingly Jordan produces only 3% of its total need for wheat (Khader *et al.* 2019,1011). Rainfed agricultural areas in Jordan decreased due to urbanization and because they have a small holding size, which limits cultivation, wheat became uneconomically to grow (Al-Fyad *et al.* 2007, 13). Currently, most of the wheat is imported (Figure 26), yet the government has put a price support system in place to encourage the production of wheat (Khader *et al.* 2019, 1011). However, this catalysed a production in areas not suitable for wheat production causing environmental damage (Khader *et al.* 2019, 1011).

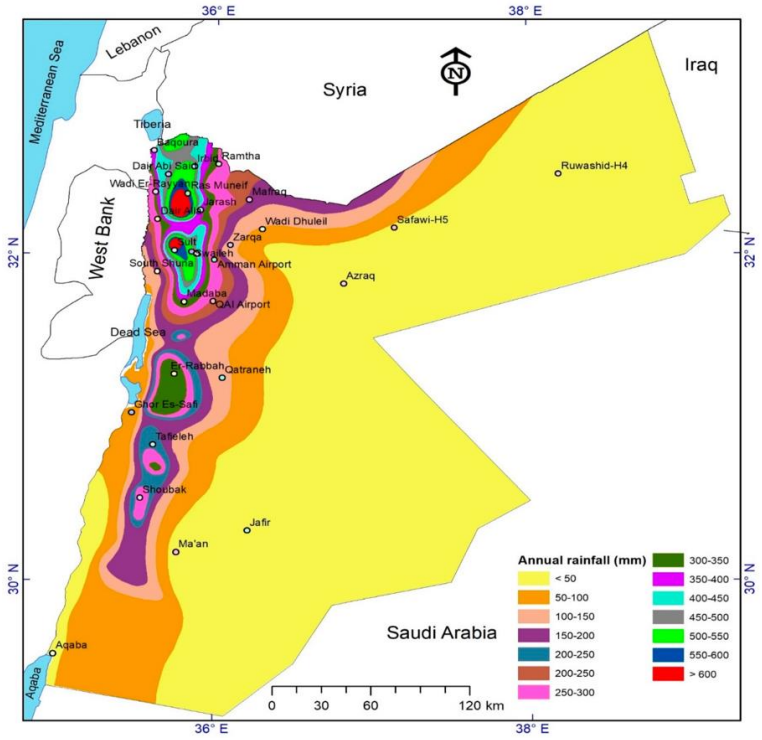

Figure 25 Annual Rainfall in mm Jordan (Aladaileh et al. 2019)

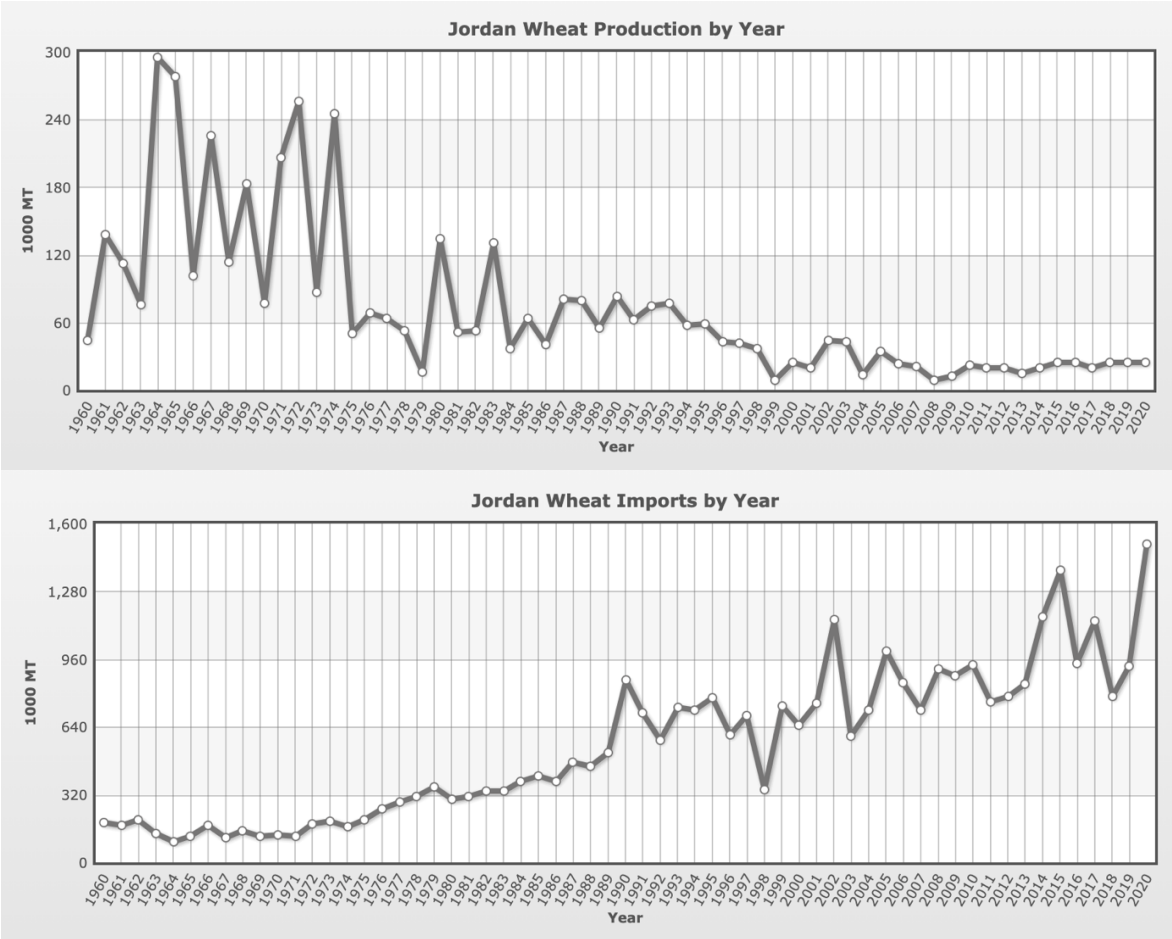

Figure 26 a (top) Jordan wheat production per year, b (bottom) Jordan wheat import per year (indexmundi.com)

The farming system in Jordan is heavily dependent on water availability (Al-Fyad *et al.* 2007, 10). Rainfed agriculture is also very sensitive to climate change, and therefore one of the most vulnerable sectors in Jordan (Al-Bakri *et al.* 2011, 125). and wheat is an important staple crop for both local farmers and Bedouin (Al-Bakri *et al.* 2011, 126), while also being essential to many traditional foods in the Near East (Palmer 2002, 173). Its traditional value was also demonstrated in the video on *Qors Al-Nar* briefly discussed in chapter four. Wheat is thus important in bread production, but also essential in various milk processing sequences like butter (Palmer 2002, 173). Wheat is also an essential product for the national dish, *Mansaf*, as the dish is often served with bread (Palmer 2002, 189).

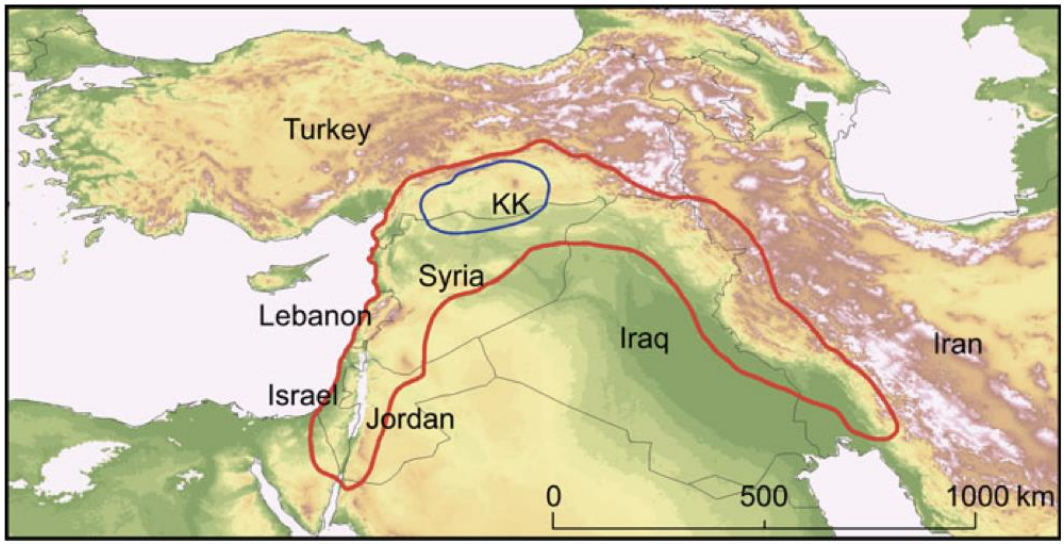

Figure 27 Map indicating the Fertile Crescent (red line) and its core area (blue line) (Kilian et al. 2010)

5.2 Archaeology and wheat

In the area often referred to as the Fertile Crescent, the so-called agricultural revolution took place 10.000 years ago (Haas *et al.* 2019, 204). Wheat and barley are two of the founder crops of this revolution and are still vital crops today (Haas *et al.* 2019, 204). It is currently accepted that the agriculture of the Fertile Crescent started in the core area (Figure 27), as the wild forms are molecularly very close related to the founder crops (Kilian *et al.* 2010, 140). Widely acknowledged is that cultivation mostly preceded domestication, as domestication is a very slow process (Araus *et al.* 2007, 132). Wild emmer wheat is one of the first species to be domesticated (around 11.000 years ago) and is still present in the Jordan Valley (Özkan *et al.* 2011, 2). The exact origin and domestication process of wheat and

especially barley is still under heavy debate and more research is needed (Haas *et al.* 2019, 212-215). Ancient kinds of wheat (*einkorn, emmer and spelt*) played a primary role in the Old World human diet during the Neolithic and Bronze age but were also strategically important during the ancient empires of Assyria, Babylonia and Egypt (Arzani & Ashraf 2017, 477). Wheat is a strategic crop because it was easy to cultivate and harvest, plus it has a long storage capacity (Arzani & Ashraf 2017, 477) which is beneficial for feeding larger populations and to have enough food for long journeys, like military campaigns. Also, in contrast to today, wheat was intensively produced in Jordan, for example when the Mamluks were in control of the area (1260-1516 AD).

During Mamluk rule, cash-cropping and plantation economy were common for sugarcane in Jordan, but also wheat was an important cash crop during this time (Walker 2008, 80). Wheat was during that time a big export product for Cairo and Damascus, research highlighted that this economic interest of the Mamluks conflicted with the local sustainable farming system and had a severe impact on the environment (Laparidou & Rosen 2015, 1691). The traditional (mixed cropping) and risk minimization strategies were damaged under the forced monocropping. The rural population in Jordan at that time was concerned about the long-term viability of the land instead of maximizing profits, while planting strategies were still left to the local farmers with exception of the plantations (Walker 2008, 95). Fertility and environment quality degraded enormously as the land could not lay fallow anymore (Laparidou & Rosen 2015, 1691). Furthermore, during the 14th and 15th-century droughts would ravage across Jordan, the desertification lead to the abandonment of cultivated fields (Walker 2008, 93). Ottoman tax registers show evidence of a return to traditional agricultural practices in the 16th century when the Mamluk rule fell (Laparidou & Rosen 2015, 1687). The plantations were now places where wheat, barley, fruit and vegetables were grown to a model closer to traditional Jordan agriculture following a two-crop rotation (Walker 2008, 95).

Valuable information on traditional crop production can be found in the written records, but also the research by Laparidou and Rosen, who studied phytoliths, is a good example of how archaeology can say something about past wheat production and past agricultural practices. Phytolith studies are valuable as they can provide direct evidence for the reconstruction of agricultural regimes at village- and state-level (Laparidou & Rosen 2015, 1688). This data can be very

useful to assess further impacts of agricultural strategies on environments and gain more information on subsistence strategies themselves.

Next to phytoliths, stable isotope research is also being used to say something about ancient crop species. Stable isotopes can be used to reconstruct site-specific growing conditions in the past for crops in semi-arid and arid environments (Riehl *et al.* 2014, 12348). These proxies enable archaeologists to make statements about past climate fluctuations and link these to past agricultural activities (Riehl *et al.* 2014, 12348). For example, Riehl has done research into changing growing conditions during the Bronze Age in the Near East with the help of carbon isotope discrimination ($\delta^{13}C$) (Riehl *et al.* 2008, 1011). Carbon isotope discrimination is a tool to say something about the relation between photosynthesis and water use in C3 plant species, if there is less water available for the plant the carbon fixation from CO_2 in the plants' vegetative tissue will be reduced (Riehl *et al.* 2008, 1012). The researchers concluded that there was an increase in aridity during the Middle Bronze Age, compared to the Late Bronze Age (Riehl *et al.* 2008, 1011).

Another research done by Riehl using showed that $\delta^{13}C$ indicated drought stress impacted ancient Near East (10.000 cal BC – 500 cal BC) agriculture, with many regional varieties due to its geography (Riehl *et al.* 2014, 12348). Linking this to Holocene climate fluctuations, it showed that cereal in the north coast of the Levant was less impacted by the fluctuations than the inland regions, where farmers had to use irrigation (Riehl *et al.* 2014, 12348). The above-mentioned studies showed that, combined with paleoclimate proxies, a stable carbon isotope discrimination statement can be made about climate shifts. The studies were mainly focused on Barley, but a same approach can be used for wheat species. Being able to detect even regional differences in climatic fluctuations, suggests that it is important to look at the local level when designing action plans for sustainable wheat farming.

By considering archaeobotanical information about wheat species' properties, like drought tolerance, (local) farmers could more efficiently cultivate wheat. Research has indicated that for example emmer wheat has a high water-holding capacity, and thus has a high drought tolerance, while Einkorn wheat has a low drought tolerance (Riehl 2009, 98). However, it should be noted that because some wheat species are more labour intensive, an economic choice could be made

to cultivate a different crop instead (Riehl *et al.* 2008, 111). Furthermore, crops with a high water need were abandoned more in times of drought, while crops that could better withstand drought are more influenced by cultural preferences (Riehl *et al.* 2008, 111). These are also important considerations for present wheat production.

5.3 Implications for the present

With current climate change policymakers, scientists and local farmers will have to come together to determine what crop species would work best in current and future circumstances. For example, it is important is to understand when wheat can grow (Figure 28) and to have an understanding of what climate change can do to wheat crop yield (Figure 29). Due to scientific breeding and genetic selection in the domestication process, the ability of the crop to adapt to the changing environment has been reduced (Charmet 2011, 218). Therefore, wild crop relatives initiatives are vital in ensuring wheat security in the future. Currently, there are several wheat species (*Triticum)* on the Royal Botanic Garden Jordan plant red list (Taifour 2017)(Taifour & El-Oqlah 2014), with the direct ancestor of durum wheat (*Triticum dicoccoides* or wild emmer) one of the most threatened species. This is worrisome as ancient kinds of wheat are known to contain better micronutrients and phytochemics than modern kinds of wheat, making them very nutritious (Arzani & Ashraf 2017, 484). Additionally, research on heritage cereals among consumers in Sweden showed that there is an increasing interest in buying products that have a known local or regional origin (Wendin *et al.* 2020, 8-9). Thus, to promote a food product or entire dishes as heritage, and develop sustainable practices, the source crop of this food must be available for future generations. Furthermore, the Swedish research demonstrates that food heritage can promote sustainable food production and consumption which ties nicely into one of the sub-questions presented in the introduction, can food heritage cultivate more sustainable food production and consumption? Looking back at the results from the discourse analysis, the Jordan government is putting a lot of effort into food security. With wheat being a major crop, (wild) crop preservation is an important policy point, both the Royal Botanic Garden and the Royal Society for the Conservation of Nature are important in preserving biodiversity and (Al-Fyad *et al.* 2007). Next to this, the government is engaging local farmers to find the best wheat and potentially farm with wild wheat

relatives (Al-Fyad *et al.* 2007, 39). As demonstrated above, archaeological research can be very valuable in this effort.

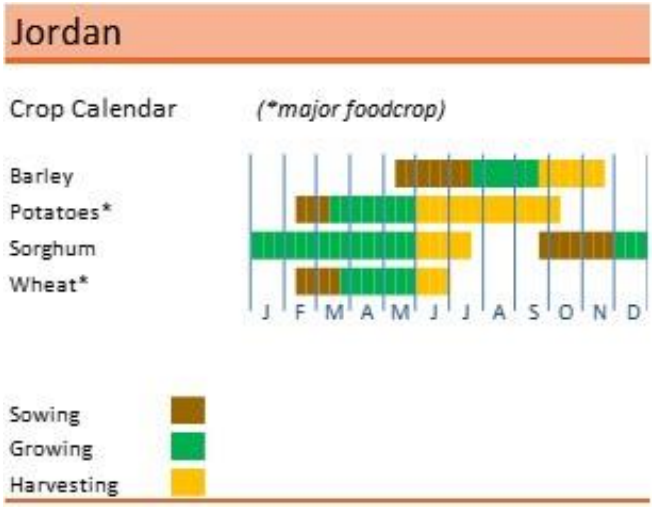

Figure 28 Jordan crop calendar showing different stages

Crop	Climate Change Scenario		Change in
	Temperature	Rainfall	Yield
Rainfed barley	+1°C	–10%	–18%
	+2°C	–20%	–35%
Rainfed wheat	+1°C	–10%	–7%
	+2°C	–20%	–21%
Rainfed olives	+1°C	–10%	–5%
	+2°C	–20%	–10%
Irrigated vegetables	+1°C	–	–5%
	+2°C	–	–10%
Rangelands	+1°C	+5%	+10%
	+2°C	+10%	+10%

Figure 29 Expected crop yield changes due to climate change Jordan (Al-Bakri et al. 2013)

Chapter 6: Discussion and comparison

Introduction

This chapter will examine in more depth the correlations between the policy documents and heritage material. It will discuss efforts and promises planned in the policy documents and to what extent they have been realized in the chosen heritage initiatives. Furthermore, there will be a focus on the role heritage can play in promoting sustainable food practices and how cultural identity is important in food security discourse. Links will be drawn with the case study on wheat to further illustrate what archaeology can do in the broader sense concerning sustainable agricultural practice, and also to point out its limitations in this regard.

6.1 National policy, heritage and food security

The results from the discourse document analysis show that food security is highly valued in national policy. The policies stressed the importance of preserving biodiversity in securing food stability (Figure 30). The various policy documents show the will and actions that the national government wants to take to safeguard food availability. The ICH report by UNESCO indicated that also that there are numerous festivals and activities organised promoting ICH. Yet in only two of these projects food was specifically a point of attention (UNESCO 2014, 8-9). The MedSNAIL desk review also indicated projects and organisations that were already implemented or focusing on sustainable agricultural development (NAMAA 2020, 17-20). These are consistent with the policy documents' proposed actions.

As presented in the results, indigenous knowledge and heritage are mentioned in the policy documents and the MedSNAIL project, it does not tie these to the idea of creating a food heritage. This is in line with the comment made in the UNESCO report that there is no clear policy on incorporating ICH in sustainability developments(UNESCO 2014, 11). The MedSNAIL Jordan food mapping initiative showed that traditional knowledge and heritage are still deeply valued when it comes to making meals. As MedSNAIL is also concerned with Slow Food and biodiversity preservation, the project would be a great steppingstone for further realisation of policy actions to incorporate traditional knowledge into sustainable agriculture projects. The food mapping project cannot only highlight the valued

heritage food but also investigate the agricultural practices and their sustainability. A slow food presidium could for example be assigned to certain identified products, this could empower local farmers, promote biodiversity, and preserve its heritage. Linking back to the subquestion of what benefits can come from mobilising traditional knowledge as heritage, this demonstrates that the label of heritage can strengthen local identity, aiding in local social and economic sustainability.

The Slow Food Foundation has no presidia in Jordan at the moment, but neighbouring country Lebanon has two items listed namely, *jabal amel freekeh* and *keckek el fouqar*a (fondazioneslowfood.com/ Presidia). As now these items are listed as a presidium, it provides the farmers with the opportunity to sell their product directly at the farmers' market and it assures the products are of high-quality and produced fair (fondazioneslowfood.com). The Slow Food Foundation does attribute three products (*arbood bread*, *midad olive oil* and *samen baladi*) to the Ark of Taste products from Jordan. The Ark of Taste initiative aims to highlight small-scale quality products rooted in heritage that face the risk of disappearance in a few generations (fondazioneslowfood.com/Ark of Taste). With the rediscovering of these products, the Foundation wants to enable support for the producers and call for the preservation of these products. These initiatives could aid in promoting the concept of food heritage.

The Slow Food Foundation is concerned with the organic way of food production. Organic food production is evident in the policies and heritage initiatives discussed in previous chapters. Organic food is associated with environmental protection, animal welfare, good for biodiversity and promotion of sustainability in rural communities. (Kearney 2010, 2800). Also for consumers, these are key factors in choosing organic food, with in addition that organic food is considered more healthy and linked to ethics and identity (Kearney 2010, 2800). However, Kearney raises the question whether organic agriculture cannot contribute enough to the global food supply due to lower yields, increased land use and scarcity of organic fertilizers (2010, 2800). The question is valid, but should not hinder the initiatives exploring organic food, as yield is important, preserving the environment necessary to produce yield is just as important.

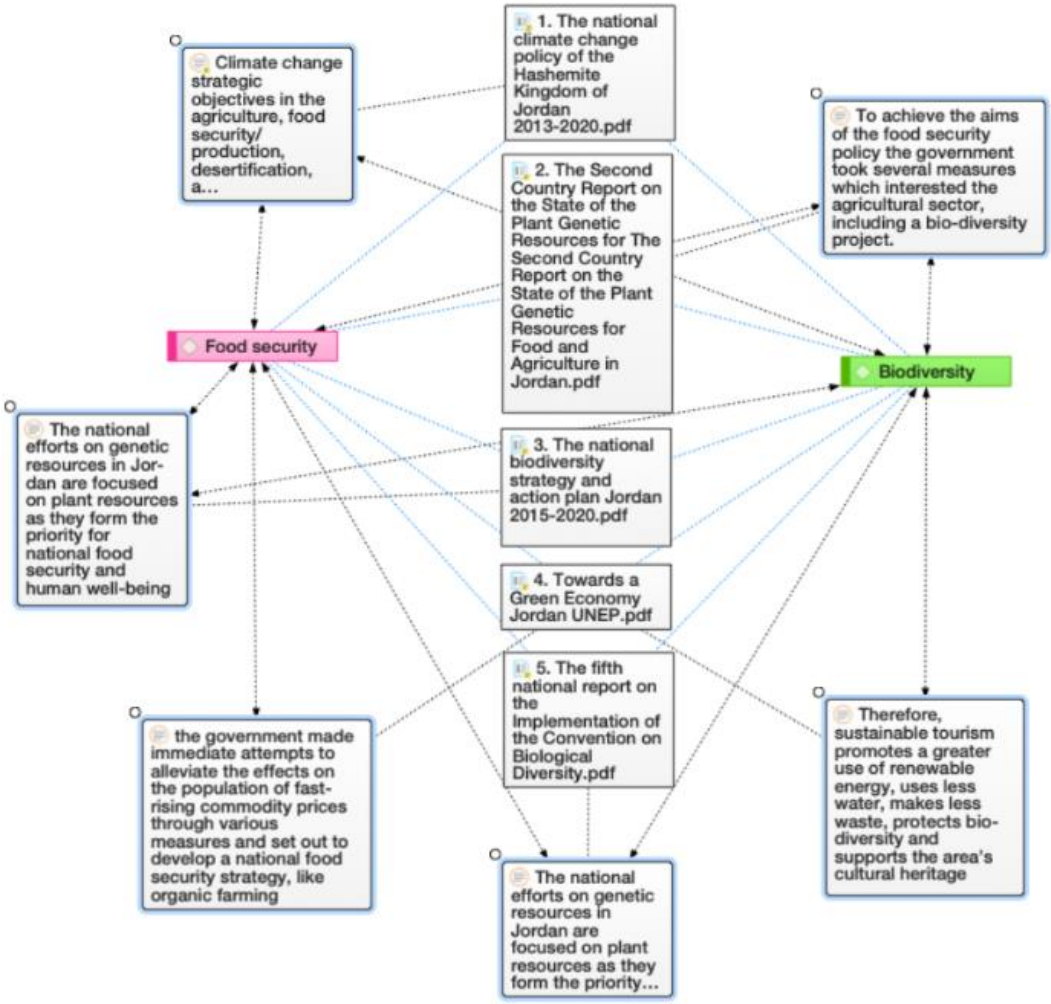

Figure 30 This network shows how the various policy documents (1-5) relate food security with biodiversity. Several quotes have been highlighted to illustrate the connection (created by author)

6.2 Identity and food security

For promoting food as heritage, people have to feel a strong connection to it. Food is known to be a marker for identity not adhering to geographic, social and political differences (Ramli *et al.* 2017, 32). A culinary heritage, especially in rural areas, is linked to collective memory and roots providing a sense of belonging to that area (Bessière 2013, 278). Food heritage or culinary heritage can be focused on foods that are embedded in our daily lives with rich histories creating a sense of belonging and pride (Ramli *et al.* 2017, 32-33). For example, the Mediterranean diet (see chapter two) and the French gastronomy, which are inscribed on the ICH world heritage list, are considered important in preserving tradition and strengthen social ties (ich.unesco.org). Looking at the research done by Bigpicnic, which emphasized that the relation between food, memory, and identity is underrepresented in policy

papers on food security (Kapelari *et al.* 2020, 4), the discourse analysis' results show a similar trend. Identity and memory are featured in the UNESCO and big picnic material, while in the policy documents the words empowerment and ownership are used (Figure 31). In chapter four, Figure 16 does show that the idea of identity and memory are more embedded in terms such as indigenous traditional knowledge and heritage.

Empowerment is not only evident in the policy documents when it comes to local farmers, more precisely, whilst analysing the various policy documents and other literature, including Palmer 2002, quite often the role of women in traditional food production came forward. As discussed in chapter two, global influences have caused a shift in diet, not only resulting in a shift away from traditional diets and practices but also impacted the role of women in the household. Women in Jordan were always in charge of storable food production, and with the shift in food use it has a negative impact on their role (Palmer 2002, 192). Worth highlighting is that in the policy documents emphasis is placed on the empowerment of women in sustainable strategies for food security (see figure 6.3). Hereby the policy documents do not only fit in with SDG goals related to food security and environment preservation (SDGs 2, 11, 14, 15) but also gender equality (SDG 5).

In Jordan, there are local restaurant initiatives that focus on preserving traditional knowledge, promoting traditional food, and are concerned with the environment. For example, Beit Sitti in Amman, who invites you to experience cooking traditional Jordan/Arabic meals yourself (beitsitti.com). Second, the restaurant Shams El Balad connect their food to simplicity and sustainability (shamselbalad.com). Third, the Jordan heritage restaurant not only serves traditional meals but also concerns itself with documenting the Jordan cuisine, focussing on heritage and empowerment of women-owned micro-businesses (Jordanheritage.jo). These restaurants are great examples of heritage initiatives in bigger cities, offering a basis to for promoting initiatives and education on food identity in relation to food security.

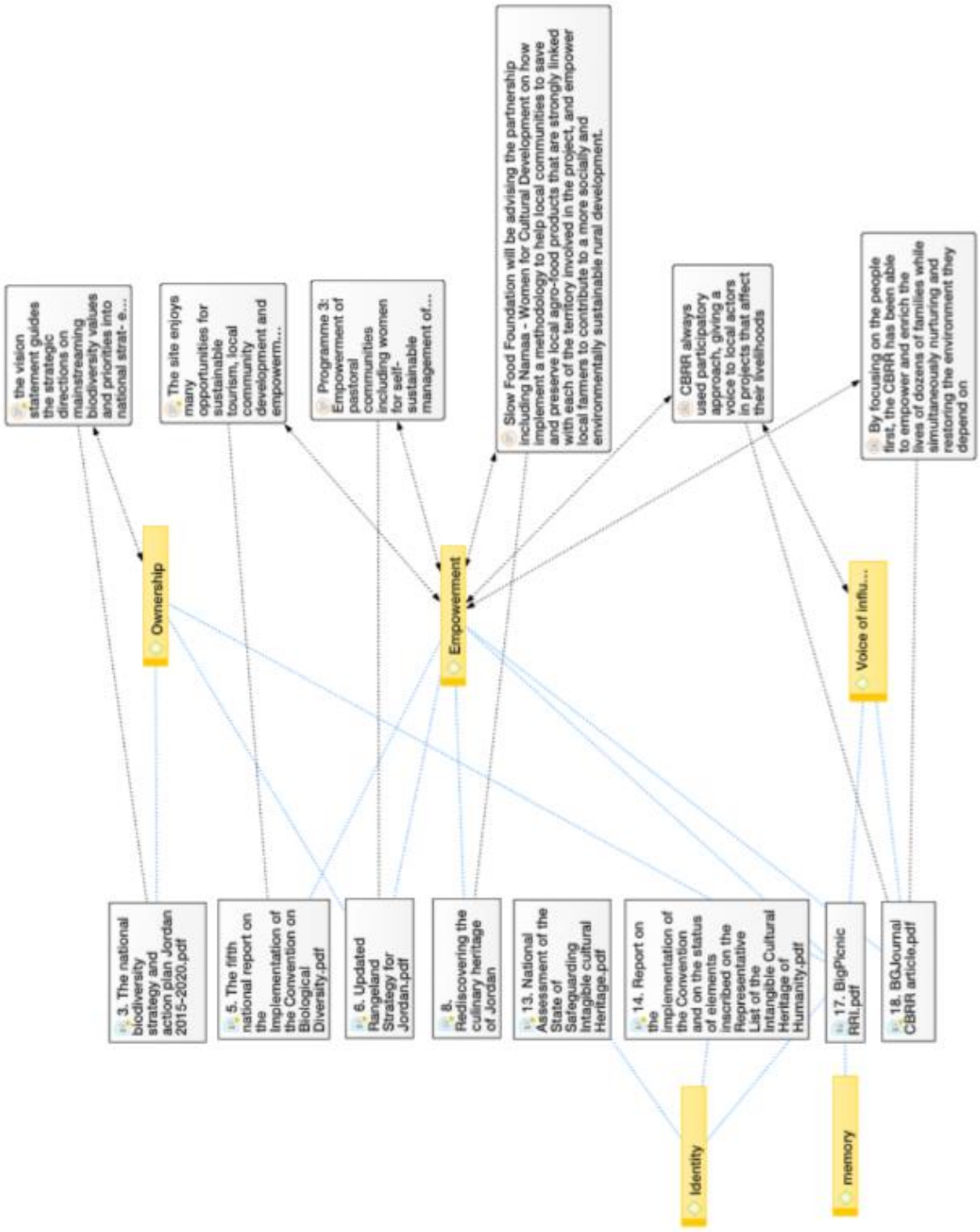

Figure 31 This network shows the relation between the discourse material (on the right) with the themes of identity, empowerment and ownership supported by quotes (on the left) (created by author)

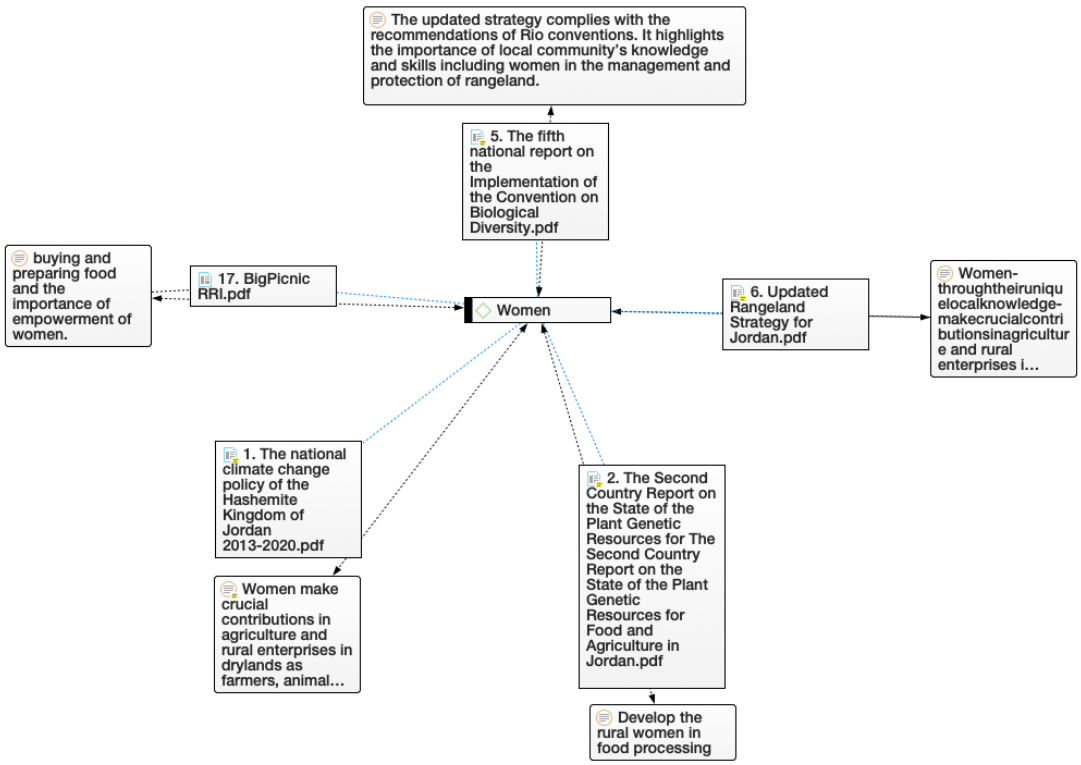

Figure 32 This network shows five documents (nrs: 1, 2, 5, 6 & 17) that include "women" and example quotations highlighting the value of women's knowledge and women involvement in sustainable strategy for food security (created by author)

6.3 Archaeology and food security

In the introduction of the thesis, it is stressed that there is currently a gap between presenting long-term perspectives for present-day sustainability and promotion of food as heritage and the implications of policies for agricultural and environmental systems. Wheat was identified as a key food for many traditional dishes. The discussion showed that cash-cropping economy has negative impacts on the environment and that crop species differ in drought tolerance. It also showed that cultural and economic values impacted the choice of wheat species. The critical review on wheat demonstrated the value of archaeological researchers in current-day food practices. This approach, investigating ancient agriculture and its resilience, is regularly used to study food security (Logan *et al.* 2019, 421). However, it is limited in the sense that even though it can provide us with a general understanding of food supply, it fails to address food accessibility. This limitation is stressed by Logan *et al.* along with the point that food preference is often not considered in archaeological studies on food security (Logan *et al.* 2019, 421). As I tried to demonstrate in the discourse analysis, heritage and tradition are indeed of high value when it comes to food security supporting the original research aim of

this thesis. The study done by BicPicnic also indicates heritage and food preference are valued when it comes to food security choices (BigPicnic 2019, 15).

The promotion of agricultural landscapes as GIAHS or traditional products as presidia contributes to attaching heritage value to these products. However, it must be kept in mind that adoption of past techniques does not equal food security achievement. This was also stressed by Stump, who explained that archaeological studies done in Engaruka and Konso showed that technologies were developed to try and achieve food security, but are not proof of achievement (Logan *et al.* 2019, 424). Research on ancient agricultural terraces in Konso Eritrea illustrates that not all landscape types are suited for terracing practices and that resource strategies change through time (Ferro-Vázquez *et al.* 2017, 511). It has a logic that past agricultural practices are not one size fits all, and therefore when choosing to adopt past strategies it is important to understand the trade-offs that specific technique has on realizing food security and maintaining ecological sustainability. Tying into the research aim of this thesis, if archaeology and heritage research can play a role in sustainability challenges, the thesis demonstrates that archaeology does have a role to play in these current-day challenges. Also, heritage research should be considered to fully grasp the impact of traditional food practices. Yet the complexity of using traditional practices today illustrates that no discipline by itself can tackle these questions.

Chapter 7: Conclusion

This thesis contributes to highlighting the value of food preference in archaeological food security studies. As mentioned in the discussion, this is a key aspect of food security debates. I have demonstrated that the will to mobilize traditional knowledge is very much present in policy documents regarding food security and is valued in UNESCO's ICH representative list. Mobilizing food as heritage does not only raise awareness for traditional practices and create a sense of identity, it also is beneficial to economic sustainability. Producing authentic products is not only about creating demand, but people are also willing to pay more for them. For local farmers, this offers thus not only a way to create a sustainable agricultural landscape, but also empowers them and provides economic stability. Traditional food, as demonstrated with the Mediterranean diet, can also be a way for people to eat more nutritiously and thereby be more beneficial to their health. Food preference is important in consumers' choice, illustrating that food heritage is a vital part of the road to food security.

The critical review on wheat showed that archaeological research can contribute a great deal in understanding past agricultural systems and environments. Combining this information with current traditional practices and ethnographic research, revitalized traditional techniques, and knowledge can be mobilized to practice sustainable agriculture, thereby not only making a sustainable landscape that can serve many generations, but also contributing to attaining the goal of food security. To answer the main question, to what extent it is possible and feasible to use traditional knowledge and archaeological knowledge in addressing current problems in food scarcity and biodiversity, this thesis demonstrated that applying archaeological and traditional knowledge can contribute to supporting biodiversity and coming closer to creating a more food secure environment.

The challenge remains however that food security is not only about being able to produce enough food safely, but that the food also needs to be accessible. Archaeology and traditional knowledge can provide insights into cultivating crops in arid areas, creating more access to food. However, food accessibility as stated before is also very political. Therefore, while archaeology and heritage can achieve a great deal in raising awareness, advocating for food heritage and sustainability in

policymaking needs the help of other disciplines, organisations, and governments. Archaeology is one piece of the puzzle of an interdisciplinary world fighting for food security.

Recommendations for future approaches

As demonstrated in the thesis, archaeology and heritage have the ability to contribute to modern-day sustainability questions. Pursuing these kinds of topics in archaeological research can already help in creating more awareness of the value of archaeology in these fields. Working together with different disciplines is needed as the sustainability questions transcend individual disciplines. Interdisciplinary research is a way forward to strengthen the impact of archaeological research and contribute to a more sustainable world. As this study was limited to only one country and three heritage initiatives, I suggest expanding this research by covering other countries and more heritage initiatives to gain a more complete and more holistic understanding of food heritage in policies and in practice.

Additionally, more can be done on the level of education as well. As many publications highlight the relevance of archaeology in modern-day struggles, it is crucial to incorporate this in archaeological teachings at schools and universities. Writing and advising as an archaeologist about awareness is important, yet more could be done. Sustainability as a topic is around us everywhere, and sharing the value of archaeology in this area with students is another key step in making archaeology relevant in modern-day challenges.

Abstract

This thesis aims to illustrate to what extent archaeology and heritage research can contribute to food security debates and challenges. Heritage and archaeological research can provide valuable contributions to the UN sustainability goals. As a case study to review and show this value, Jordan national policy documents and heritage initiatives are analysed using qualitative research software. The case study on archaeological research on wheat use in Jordan provides an understanding of how archaeologists can play a role in sustainability debates. The Jordan national policy documents and heritage initiatives show that there is an attempt to include traditional knowledge on food production in activities for preserving biodiversity and achieving food security. However, in practice, the notion of food heritage is not actively used in policy points aimed at food security. Archaeological and traditional knowledge are valuable in providing insights in cultivating crops in semi-arid and arid areas, creating more access to food. The thesis also contributes to showing that food security is a challenge that needs an interdisciplinary approach and collaboration of a variety of parties, including NGOs, governments, and academic institutes.

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