Wild West Frisia : the role of domestic and wild resource exploitation in Bronze Age subsistence

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1. Introduction

Researching the Bronze Age

The European Bronze Age is characterized by the occurrence of multiple changes in comparison to previous periods, mainly related to, as the name suggests, the consistent use of bronze as a new source of workable material. This alloy is obtained either directly from local sources, or through exchange with other areas where it (its components) do (does) not occur locally in the environment. The exchange of metals can include either the raw metal components for local production, or the (semi-) finished metal products for (near-) immediate use. Through these and other finds of non-local materials and products, the Bronze Age can be characterized as a period in which long-distance relations are an important aspect of subsistence.

The introduction of bronze, however, does not appear everywhere at the same time, which means that "the" Bronze Age is different for different areas of Europe. For instance, the north-western European Bronze Age (2300-800 BC) starts relatively late in comparison to other areas of Europe. Besides the occurrence of extensive (metal) trading networks, it is characterized by a form of subsistence in which settlements are sedentary and inhabited year-round, and which is mainly based on agriculture, including both crop and animal husbandry. The Dutch Bronze Age in particular starts around 2000 BC with the Early Bronze Age (2000-1800 BC), followed by the Middle Bronze Age (1800-1100 BC), and the Late Bronze Age (1100-800 BC). This chronology has been established based on both cultural phenomena and 14C dating (cf. ROB 1966; Lanting & Mook 1977). The Dutch Bronze Age ends around 800 BC, when the introduction of a new metal heralds the start of the Iron Age.

The start of the Bronze Age in the Netherlands can be considered a gradual transition from the preceding Late Neolithic period, because the cultures present at the time were only introduced to the use of bronze at a relatively slow pace. These different cultural groups are mainly identified by their pottery styles,

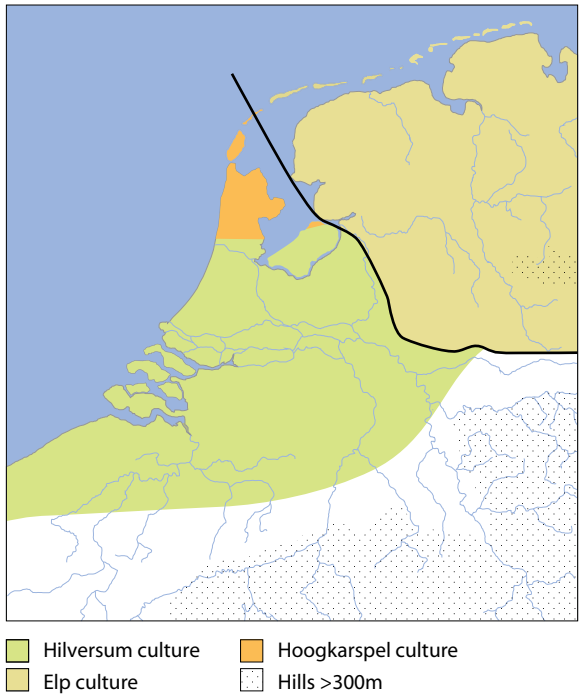

Figure 1.1. The general distribution of the three major cultures present during the Dutch Bronze Age, with the area of West Frisia indicated by the red box (underlying image adapted from: Fokkens 2005, 360-1, figure 16.3).

and include the Elp culture (1800-800 BC), situated in the north-eastern part of the Netherlands, the Hilversum culture (1800-1200 BC), located in the southern and western part, and the Hoogkarspel culture (2000-800 BC), with its seemingly isolated position in the north-west (Fokkens 2005, 360-1, figure 16.3; Figure 1.1).

The occurrence of different cultures is only one of the apparent variations during the Dutch Bronze Age, since there is also a clear difference in soil types throughout large parts of the country. On the one hand, clay forms the major soil type in the coastal areas in the west behind the dunes, and the large river systems in the central part of the country part of the Netherlands (Louwe Kooijmans 1993; Figure 1.2). Combined with a low position in the landscape and a relatively high water table, these

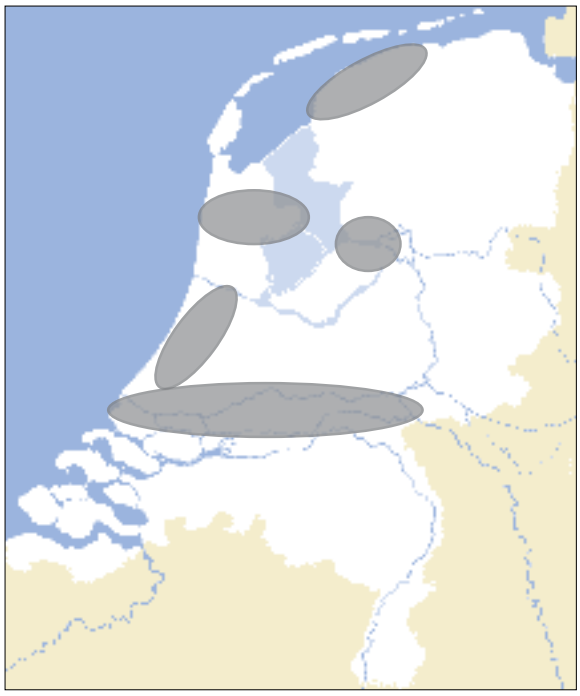

Figure 1.2. Overview of the major clayey wetland areas inhabited in the Dutch Bronze Age (indicated in grey), including the coastal areas in the west behind the dunes, and the large river systems in the central part of the country (after: Louwe Kooijmans 1993, 72, figure 6.1).

clayey areas mostly result in large wetland[1] areas. On the other hand, most areas in the south and the east of the Netherlands are distinctly different, being located on drier, sandy deposits. This type of subsoil results in a relatively higher position in the landscape which means in the Netherlands they are considered to be upland areas. However, in this thesis, the term upland will be substituted by the term well-drained areas, since elevation differences in the Netherlands are negligible in comparison with other countries.

The cultures present in the wetland areas of the Netherlands experience more pronounced changes in their subsistence during Bronze Age than cultures in most of the other areas. Whereas a true mixed farming system, in which crop and animal husbandry are fully integrated, had already been a part of many agricultural societies living on the well-drained soils in the Netherlands since the Neolithic (Bakels 2009), its introduction in the wetland areas occurs for the first time in the Bronze Age (Louwe Kooijmans 1993, 104).

Of the different cultures living in wetland areas, the Hoogkarspel culture in the north-western Netherlands, situated mostly in the present-day area of West Frisia (Figure 1.1), has been a major research focus for many years. This research has been equally focused on excavating and on studying the numerous remains which these excavations have yielded. The large number of excavations which have taken place in West Frisia for instance have led to enormous datasets on settlements and habitation here can be regarded as being very dense and as being organised into permanent settlements with separate houses. The house-plans are clearly recognisable by the distinct configuration of their post-holes and surrounding house ditches (Appendix A1.1). These house ditches, in turn, have been major sources of archaeological, but also many botanical and zoological data. Since the preservation conditions are excellent in this particular area due to the properties of the clayey subsoil and relatively high water table, organic remains are especially well preserved, both in charred and uncharred form. This preservation of remains is distinctly different from areas where the soil is well-drained, since in these areas nearly exclusively charred botanical remains and nearly no bones are preserved. The favourable conditions for these remains in West Frisia therefore results in large datasets of botanical and zoological data. The extensive data available in West Frisia in the form of excavated settlements and both archaeological and organic remains, and in combination with a good chronology covering a large part of the Bronze Age has enabled research on all the different aspects of Bronze Age life in a wetland environment.

Results of the previous research on West Frisia have resulted in a model for subsistence in West Frisia during the Bronze Age, mostly concentrating on the Middle (1800-1100 BC) and Late (1100-800 BC) Bronze Age periods. This current model discusses both landscape, habitation, and subsistence. In the

1. Throughout this thesis, the general term wetland will be applied to different types of wet area according to the definition provided in Appendix A1.1.

model, the Middle Bronze Age West Frisian landscape consisted mainly of low-lying, clayey areas, representing the actual wetlands, alternated with relatively high sandy ridges, which were regarded as the drier areas in this wetland environment. Farmers situated their houses at the edge of these sandy ridges in the landscape, and cultivated arable fields on top (van Regteren Altena 1977, 20), producing emmer wheat (*Triticum dicoccum*) and hulled barley (*Hordeum vulgare var. vulgare*) in equal ratios, and also linseed (*Linum usitatissimum*) (Bloemers *et al.* 1981, 58; Buurman 1996). The landscape outside the settlements was reconstructed in general as nearly treeless, and the lower-lying wetland areas surrounding the sandy ridges formed the grazing areas for livestock (van Regteren Altena 1977, 20). Cattle formed the most dominant livestock species in West Frisia (IJzereef 1981), which is a common observation for the Bronze Age (Bartosiewicz 2013). Around 20 cattle were thought to be kept per household, as well as five to ten sheep and a few pigs (Bloemers *et al.* 1981). Cattle would have been kept inside throughout the winter and would have provided ample manure for fertilizing the arable fields.

During the Late Bronze Age, environmental conditions rapidly worsened. The combination of a rising groundwater table and a change in climate resulting in more rain and subsequent peat growth (van Geel *et al.* 1982, 274; van Geel *et al*. 1997, 45) resulted in shifts in habitation and subsistence strategies. Cattle, which was previously mainly kept for specialised meat production, was bred for milk production instead (IJzereef 1981), and hulled barley was almost exclusively cultivated at the expense of emmer wheat (Buurman 1996). Because of the increasing wetness in the environment, farms in the Late Bronze Age were no longer built at the edge of the sandy ridges, but rather on top of mounds on the sandy ridges, where the arable fields were also still situated (van Regteren Altena, 20). The Late Bronze Age climate led thus to an increasing shortage of suitable land for cultivation and habitation, which ultimately led to the abandonment of this area at the end of the Late Bronze Age (van Geel *et al.* 1996).

The model discussed in the previous paragraph has been the leading model for West Frisia for almost 40 years. Excavations performed in recent years however, have consistently brought forth new data that do not match the main components of the current model. For instance, entire settlements consisting of both Middle and Late Bronze Age houses were found situated in the lower-lying wetland areas (Roessingh & Lohof 2011), which were previously exclusively the domain of grazing livestock. These types of new observations indicate that the current model is no longer able to explain the West Frisian Bronze Age situation based on the entire dataset available for this area, and both the model and the underlying data should be re-evaluated. Apart from the insufficient coverage of the data by the current model, there are still other reasons why West Frisia should be a primary focus for new research. Although many excavations have taken place and much data has been gathered here, the number of publications incorporating this abundance of information has been surprisingly low. Much of the available data lay unpublished, even though the potential it holds for obtaining a better understanding of the Bronze Age wetland communities is great. Cultures inhabiting wetland areas in the Netherlands, Denmark, and north-western Germany are often described as being distinctly different from neighbouring communities on well-drained soils by their settlement dynamics (*e.g.* IJzereef 1988; Bech 1997; Ethelberg 2000), cultivation regimes, and burial traditions (cf. Bakker *et al.*1977; IJzereef 1988; Buurman 1996; Bech 1997; Boas 1997), giving them an entirely unique character. Sadly, comparatively little focus is given to these interesting communities in present-day studies towards the Bronze Age.

It is high time that this lack of focus is remedied using the new data available. West Frisia provides an excellent starting point, a case-study. Since the preservation conditions in West Frisia are, as mentioned, so favourable, all aspects of Bronze Age life can potentially be researched based on the data already available, including landscape, habitation, subsistence, and cultural identity and communication networks. Results from the analyses of the West Frisian data could subsequently be used to compare with other wetland communities. Ultimately, this should lead to a new model for Bronze Age wetland communities along the southern

North Sea coast. An application for a research project with the aims outlined above was granted (Fokkens 2010). The research project, called Farmers of the Coast, was funded by the Netherlands Organization for Scientific Research (NWO). This overarching project consists of four sub-projects, investigating all the aspects related to Bronze Age life: the physical landscape (van Zijverden forthcoming), the cultural landscape and settlement dynamics (Roessingh in prep.), cultural identity and communication networks (Valentijn in prep.), and the subsistence economy.

Towards a new approach

This thesis is concerned with the latter subproject of the Farmers of the Coast project outlined above, and investigates the Bronze Age subsistence economy in wetlands. It aims to reconstruct this economy in its entirety through the integration of all possible aspects, resulting in a model of year-round agricultural life.

In the past, much research has been focused on separate research components, *i.e.* landscape reconstruction, reconstruction of crop husbandry, and animal husbandry. Landscape reconstruction is normally performed by analysing the pollen and botanical macro remains from a site in order to assess the surrounding landscape of a site. The reconstruction of crop husbandry is mainly concerned with the analysis of what cereals were cultivated, what the quality of the soils of the arable fields was, and how harvesting took place. Finally, archaeozoological research towards animal husbandry is usually a means to identify different domestic animals present at a site, the age at which they died, and the use they may have had to people. Although some interaction between these different types of research does happen, often no real integration of results occurs. Without this kind of integration, interpretations are restricted to conclusions that may not be supported, or may even be contradicted by other disciplines. For example, a landscape reconstruction based on on-site botanical remains can give results of an open landscape, but this type of landscape may not be at all reflected by the wild animal species present at the same site. When analysis results are not integrated, the potential to uncover added information from and for the various disciplines is lost. It is therefore key that all the available data on a subject is combined and integrated before the interpretation of the results, especially when dealing with a complex system such as a subsistence economy. Only then will the interconnectedness of the different parts of such a subsistence system become apparent.

During the Bronze Age, as briefly introduced at the beginning of this chapter, people were practicing mixed farming as their main subsistence strategy. Careful consideration of the practice of mixed farming, just like any other form of prehistoric subsistence, reveals that it is a balanced interaction between humans and the environment in which they operate. Landscape is a vital part of life as a farmer because it is in this environment that they grow their crops and breed their livestock, and where they obtain the raw materials for all aspects of their subsistence. Therefore, a reconstruction of the landscape is the first step in understanding the Bronze Age subsistence economy (Chapter 2). Although a separate sub-project already focuses on the physical landscape based on physical geography (van Zijverden forthcoming), this thesis provides additional and unique information on the environment based on organic remains. Many new insights into the local and regional environmental conditions were obtained by introducing new proxies for landscape reconstruction (*i.e.* fish, birds, mammals) and integrating these results with the conventional proxies such as pollen and macrobotanical remains. A further integration of the results from this thesis with the results of Van Zijverden has resulted in an even more clear perspective on the landscape and its dynamics throughout the Bronze Age.

Similar to the landscape,. These individual parts can, in practice, not be separated because each part requires the presence of the other in order for a mixed farm to operate successfully. This interconnectedness of practices means that it is not possible to comprehend the full extent of a subsistence economy without investigating every aspect related to it. Research focused on only one of the aspects of subsistence, such as on only crop husbandry or animal husbandry, as is often the case, will therefore miss the true scope of farming life.

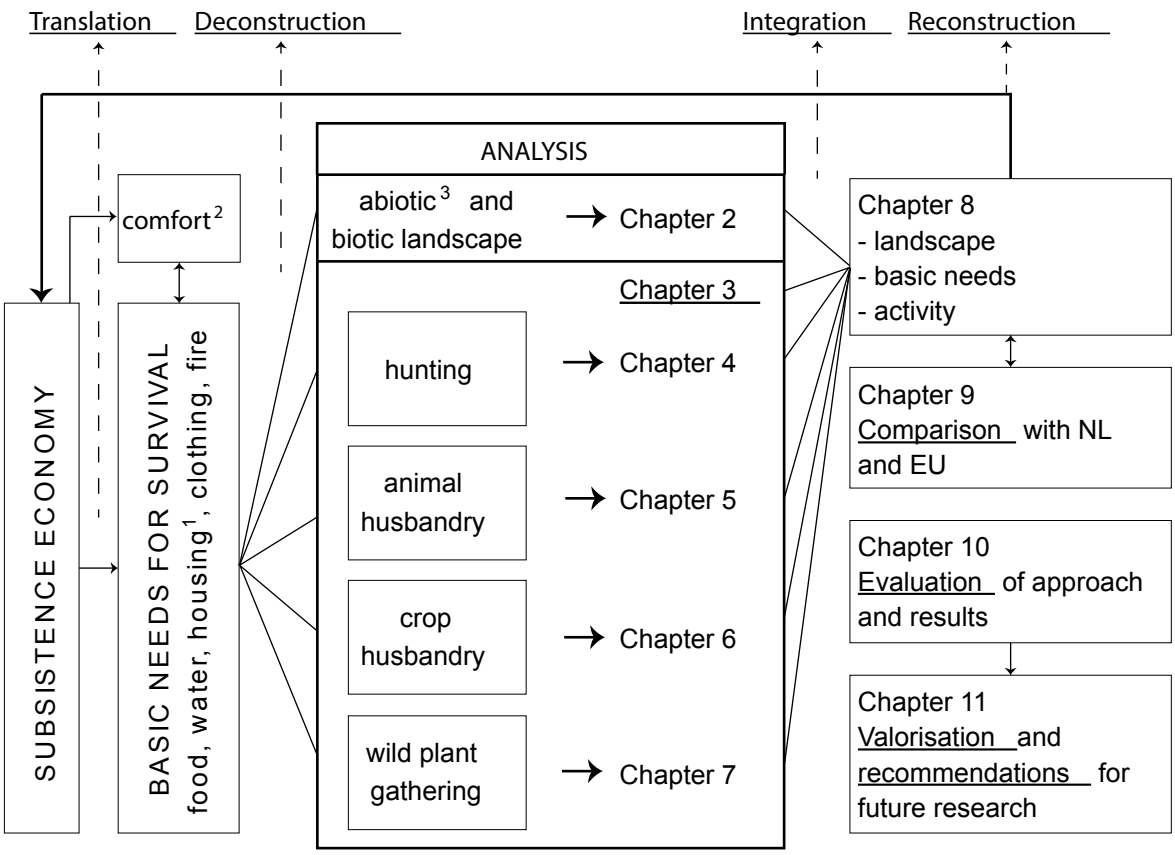

Figure 1.3. Flow chart of the approach of this thesis with regard to the analysis of the subsistence economy. 1: house structures are researched by Wouter Roessingh (Roessingh in prep.), who investigates the cultural landscape; 2: underlying cultural and social phenomena related to subsistence and to living in comfort are researched by Patrick Valentijn (Valentijn in prep.).; 3: the abiotic landscape is mainly researched by Wilko van Zijverden (van Zijverden forthcoming), on a physical geographical basis.

In this thesis, a new approach for investigating the subsistence economy is presented (Figure 1.3), which not only tries to identify (Chapter 3) and analyse (Chapter 4-7) all the aspects related to subsistence, but also integrates them (Chapter 8) in a manner that shows that farming is more than the sum of its parts.

Identifying all the aspects of subsistence is not an easy task, but when subsistence in its purest form is viewed as a form of survival, it means that there are five basic requirements (*i.e.* food, water, housing, fire, clothing) that must be met (Figure 1.3: "basic needs for survival"). These five basic requirements form the survival threshold, but it must be emphasized that Bronze Age people will no doubt have aimed to remain comfortably above that threshold to be able to deal with potential setbacks (Figure 1.3: "comfort"). The aspects related to comfort include many social and cultural phenomena which can occur parallel to or intertwined with subsistence, such as exchange or certain rituals. Although no doubt very important to subsistence, these aspects are not the focus of this thesis, and will be discussed elsewhere (Valentijn in prep.).

Still, the principle of basic requirements is used for translation into Bronze Age practice, to result in the expectation that most activities on a farm will have been focused on satisfying these needs by means of hunting (Chapter 4), animal husbandry (Chapter 5), crop husbandry (Chapter 6), and wild plant gathering (Chapter 7) (Figure 1.3: "Deconstruction").

These four aspects of the economy are considered anew (Figure 1.3: "Analysis"). First, the main components of each subject in the current model for Bronze Age West Frisia are identified. These main components are subsequently compared to the conclusions based on the results of the re-evaluation and re-analysis of the data. When the old main components are proven inadequate after a comparison with the new results, new main components are constructed which form a new model for each researched subject. The re-evaluation and re-analysis of the data are performed in an innovative manner. Instead of listing a summary of the known data for each subsistence strategy and drawing conclusions solely based on these observations, it is first established what may have been present, but may not or no longer be visible. This expectation is based on the integrated input of a variety of disciplines which include ethnography, ecology, biology, archaeology, archaeozoology, biochemistry, statistics, ethnobotany and archaeobotany.

Ethnographical information from around the world on the different aspects of subsistence has proven to be especially helpful in creating an expectation of the basic manner in which people with comparable subsistence economies to that in West Frisia operate, regardless of climate, geographical location, and time period. By creating a clear understanding of the consistent basic elements of each subsistence strategy, the elements that are likely to be present or missing when dealing with an archaeological assemblage become apparent. The differences observed between this constructed expectation and the analysed data of West Frisia can thus be interpreted in a more detailed manner. Although these observed differences may indeed reflect (differences in) past human practice, which is the ultimate research goal in archaeology, in this thesis it is also assessed whether missing elements might be (partly) explained by taphonomical processes, methods applied during field or laboratory work, or by interpretation based on data which has not been corrected for internal biases.

The outcome of the analysis of the main components is integrated (Figure 1.3: "Integration") into three major themes related to Bronze Age daily life (Chapter 8). These themes include the landscape (discussing the relative distribution and impact of plants, animals and humans on the environment in West Frisia), the basic subsistence requirements (discussing the contribution of each of the researched strategies to the overall diet, range of clothing, and shelter options in West Frisia), and activity (discussing how, when, and where the resources for consumption and raw material were obtained in West Frisia). The results thus obtained represent the new model for the West Frisian Bronze Age subsistence economy (Figure 1.3: "Reconstruction"). As mentioned before, West Frisia was chosen as a case-study for Bronze Age farmers active in a wetland environment, for north-western Europe in general. Therefore, to test whether this case-study was aptly chosen, the new model is subsequently compared to other regions of north-western Europe, such as Denmark and Sweden, in order to assess whether the West Frisian situation is unique or whether general trends in subsistence economies can be observed in the Bronze Age (Chapter 9). In this same chapter, a short excursion into the economy practiced by Bronze Age farmers living on the borders of lakes in Switzerland serves to evaluate whether the model has a still wider application.

Chapter 10 provides a summary of the results as well as an evaluation of the applied method, followed by recommendations for further studies (Chapter 11) to ensure that research towards Bronze Age wetland communities will continue to advance in the future.