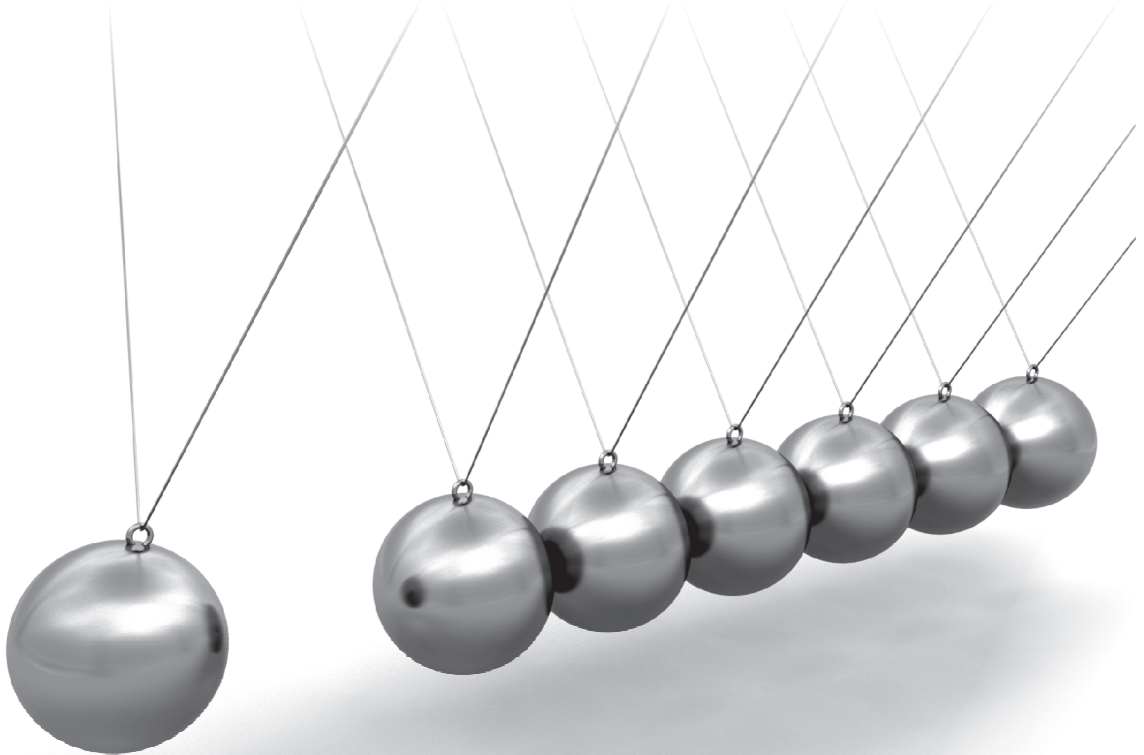


HUMANS AND SOCIETY IN TIMES OF CRISIS

# Archaeology of Crisis

Edited by Staša Babić



UNIVERSITY OF BELGRADE  
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Archaeology (in Times) of Crisis



Ana Đuričić\*

## FACING THE ENVIRONMENTAL VARIABILITY IN THE EARLY NEOLITHIC OF THE CENTRAL BALKANS: DIVERSIFICATION, STORAGE, EXCHANGE, AND MOBILITY

**Abstract:** The first farming communities appeared during the Neolithic period. The life of Neolithic and other non-industrial communities depended on environmental variations – precipitation and temperature patterns. Even minor changes in those patterns could have caused bad harvests and the lack of animal fodder, potentially leading to periods of food scarcity. To overcome periods of food scarcity, non-industrial communities applied different social buffering strategies: diversification, storage, exchange, and mobility. In this paper, social buffering strategies that Early Neolithic communities applied to overcome the environmental variability in the new territory are examined and the most plausible ones are considered.

**Keywords:** Neolithic, Early Neolithic, subsistence, mobility, farming

### Introduction

The concept of the “Neolithic package” was introduced by archaeologists with the intention of unifying cultural, economic, social, and ideological changes that occurred in the Near East and later on spread beyond the original territory. These novelties developed over a period of several centuries, marking different phases of the Pre-Pottery and Pottery Neolithic. The Neolithic package is often described as a number of factors that define the Neolithic lifestyle and includes agriculture, domestic animal farming, emergence of sedentary settlements, production of pottery<sup>1</sup> and polished stone tools, and the ideology compatible with the new lifestyle

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1 The earliest pottery was produced by members of hunter-gatherer communities (20000 cal BP) in the Far East of Asia. The emergence of pottery in the Near Eastern farming communities is a topic of current research and debate, but it is evident

(Çilingiroğlu, 2005; Cauvin, 2000). Neolithic innovations led to the emergence of new subsistence strategies and imposed risks.

The Neolithic lifestyle arrived to the territory of the Central Balkans in its full form around 6250 cal BC, together with the new population (Borić & Dimitrijević, 2007; Borić, 2016; Cramp et al., 2019; Ivanova, 2020; Stojanovski et al., 2020). These early farming communities of the Early and Middle Neolithic Starčevo culture (6250–5300 cal BC), mainly occupied the previously non-inhabited territories, with the exception of the Danube Gorges, where the local Mesolithic population was still thriving (where elements of both the new Neolithic and local Mesolithic culture are detectable) (Borić & Dimitrijević, 2007; Borić, 2016; Cramp et al., 2019; Đuričić, 2019; Porčić et al., 2021). The new territory differed significantly from the territories they previously inhabited, as this was the first time Neolithic populations spread beyond the Mediterranean climate zone. The temperate climate of the Central Balkans, with increased precipitation and more pronounced seasons, influenced food availability and subsistence patterns of these Early Neolithic communities (Ethier et al., 2017; Stojanovski et al., 2020; Ivanova, 2020).

Food is not optional; it is a necessity. The amount of food in farming, including Neolithic communities, depends on different environmental conditions. The abundance of food resources varies throughout the year and is conditioned by seasonal changes. Neolithic communities had to overcome these seasonal changes, in order to survive seasons with low food availability. Moreover, a minor change in temperature or the precipitation pattern could have endangered the existence of Neolithic communities, due to crop failure and the lack of animal fodder. Apart from seasonal food scarcity, environmental variability can create food shortages that last one or multiple years, forcing communities to employ one or several buffering strategies, based on the longitude of the unfavourable period and their cultural, social, economic, and ideological norms (Halstead & O’Shea, 1989). To overcome food scarcity, societies employ a wide range of practices, grouped by P. Halstead and J. O’Shea (1989) into four basic categories of social buffering strategies: 1) diversification, 2) storage, 3) exchange, and 4) mobility (Halstead & O’Shea, 1989; Groot & Lentjes, 2013). *Overcoming* implies not only actions undertaken when food shortages occur, but more so, prevention and preparation – mechanisms applied to obtain consistent food supply for the community throughout the year. In this paper, social buffering strategies applied by Early/Middle Neolithic Starčevo culture communities to prepare for, prevent, and overcome periods of food scarcity caused by

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that pottery production was a part of the same “package” brought by the farming communities from the Near East to the new territories (Jordan & Zvelebil, 2009).

the environmental variability are examined and the most plausible ones are considered.

## Environmental Variability and Social Buffering Strategies

It is not necessary for a natural disaster to happen for non-industrial communities to face food scarcity. In temperate climate zones, like in the Central Balkan region, differences between seasons are pronounced. Uneven Solar radiation has a crucial influence on the ecosystem dynamics, making summer the most abundant season, both in local and migratory resources. On the other hand, winter is the most difficult period with the least amount of available food (Rowley-Conwy & Zvelebil, 1989). These are *seasonal* variations. They are predictable and cannot be avoided, so people use previously established mechanisms to overcome periods of food scarcity, obtaining a balanced diet throughout the year (Rowley-Conwy & Zvelebil, 1989; O’Shea, 1989; Halstead, 1989). *Interannual* variations are unpredictable. They depend on climatological factors (droughts, frosts, storms, hail, excessive rain, floods...), animals, insects, plague, plant diseases, or human activity. Although these variations are mostly unpredictable, people know how to affront them, using knowledge acquired from previous situations (O’Shea, 1989; Halstead, 1989). *Long-term* variations are the result of climate or environmental changes, and often last for a prolonged period of time, requiring communities to make considerable adaptations (Rowley-Conwy & Zvelebil, 1989). Considering these three types of variations, the strategies applied by communities vary and change, but are always in accordance with their social, cultural, and economic norms.

Farming communities depend on regular seasonal patterns which control plant and animal annual cycles. Minor shifts in seasonal patterns can affect the amount of available food, both of plant and animal origin. In order to prevent or overcome the lack of food, communities apply one of the previously mentioned strategies: diversification, storage, exchange, and mobility (Halstead & O’Shea, 1989; Groot & Lentjes, 2013). The inclusion of a greater variety of food sources is called *diversification*. Keeping food for annual periods of food scarcity is called *storage*. *Exchange* can be devised in several different social practices – trade, food sharing, obligatory reciprocity, and negative reciprocity (theft). Group and settlement relocation towards areas with available food sources is called *mobility* (Halstead & O’Shea, 1989; Groot & Lentjes, 2013). Buffering strategies can be mixed, but every community has its own preferences, so certain

strategies could be practiced as prevention, while others could be applied as a last resort. Also, the way one strategy is practiced could differ from culture to culture. For example, both hunter-gatherers and farmers apply diversification, but practices vary. Hunter-gatherers rely on different categories of wild resources (the variety of wild animal species and wild plant taxa available during different seasons), while farming communities rely primarily on agriculture and domestic animal herding with the addition of hunting and gathering (Halstead & O'Shea, 1989).

## Diversification

Diversification is a good option for overcoming seasonal, interannual, and long-term variations. Communities practice diversification in order to prevent the occurrence of food shortages by applying different food procurement strategies (hunting, gathering, agriculture, animal husbandry, and fishing) with a broad spectre of resources. It implies not only reliance on alternative resources, but also cultivation of different crops of various endurance levels and growing patterns on diverse soil types. By applying this strategy, a community reduces the possibility of crop failure (Groot & Lentjes, 2013). For farmers, agriculture and herding are forms of diversification, as domestic animals can convert non-usable plants and agricultural waste into usable food (meat, milk, and fat), thus reducing the potential of food shortages (O'Shea, 1989).

Archaeobotanical analyses from the Starčevo culture sites have shown a broad spectre of cultivated crops and wild plants used in the human diet. It should be noted that systematic sampling was conducted only at two sites (Blagotin and Drenovac), with “judgement” sampling being conducted at other sites (sampling of contexts perceived as interesting or important by archaeologists), which affected the results of the archaeobotanical analysis (Filipović & Obradović, 2013). The most extensive sampling was conducted at Drenovac, which could be the reason for greater plant taxa diversity at this site in comparison to other sites. Archaeobotanical remains from the sites of Blagotin, Drenovac, Međureč, Starčevo, and Nosa-Biserna Obala have confirmed the cultivation of 5<sup>2</sup> crops (for distribution see Filipović & Obradović, 2013, p. 41): einkorn (*Triticum monococcum*), emmer (*Triticum dicoccum*), hulled barley (*Hordeum vulgare*, hulled), lentil (*Lens culinaris*), and pea (*Pisum sativum*)

2 Recent studies have disputed Neolithic broomcorn millet (*Panicum miliaceum*) cultivation in Europe, so all millet samples should be treated as intrusions (Filipović et al., 2020), which is why they were excluded from this paper.

(Filipović & Obradović, 2013; Filipović, 2014). Cereals could have been sown in autumn, and legumes in spring, securing crop yields in case of unpredicted circumstances. Cereals could have been used for bread production or they could have been cooked as porridges or gruels, alone or together with legumes, and legumes (lentils and peas) could have been added to stews and soups (Atalay & Hastorf, 2006). A total of 9 wild taxa, typical for this region, has been documented so far (for distribution see Filipović & Obradović, 2013, p. 41): cornelian cherry (*Cornus mas*), apple (*Malus pumila*), fruit from malus genus (*Malus* sp.), fruit from pear genus (*Pyrus* sp.), acorn (*Quercus* sp.), beech nut (*Fagus* sp.), blackberry (*Rubus fruticosus*), unidentified berries (*Rubus* sp.), and dwarf elder (*Sambucus ebulus*) (Filipović & Obradović, 2013). Acorn could have been roasted, dried, or ground into flour, while fruit and berries could have been consumed fresh, dried, or cooked (Atalay & Hastorf, 2006).

Archaeozoological analyses have shown reliance on domesticates at the majority of Starčevo culture sites (for distribution see Orton, 2012) (Greenfield, 2008). Cattle dominated, followed by goat/sheep, while pigs were barely represented in the faunal assemblage (Orton, 2012; Ethier et al., 2017). However, at the sites in the Danube Gorges, Golokut-Vizić and Nosa-Biserna Obala, a higher percentage of wild animal taxa compared to domestic ones have been documented (Orton, 2012). The majority of the wild taxa remains belongs to red deer, roe deer, wild boar, fish, birds, and smaller mammals (Greenfield, 2008). Pottery lipid analyses from several sites in the Danube Gorges showed that the majority of vessels in this region was used for cooking aquatic resources, contrary to the data from other Central Balkan sites (Cramp et al., 2019), where they were used for processing meat, milk/dairy, plant food, and storing beeswax (Ethier et al., 2017; Stojanovski et al., 2020).

Starčevo culture communities practiced diversification through a broad spectre of domesticated and wild plant and animal resources available during different seasons, obtained through multiple procurement strategies, thus reducing the potential for food shortages and providing a good base for a year-round balanced diet. Food procurement strategies can vary from settlement to settlement, so a unique diversification model cannot be ascribed to the Starčevo culture as a whole. Each settlement should be approached individually, but certain tendencies can be distinguished, such as a higher representation of domesticates in the human diet at the majority of the sites. By comparing the results of archaeobotanical and archaeozoological analyses, occupation patterns of specific settlements could be determined, based on the seasonal availability of represented taxa (year-round or seasonal occupation).

## Storage

Storage is a common practice among farming communities, especially for preventing food shortages during the winter months. Although fruit, meat, and fish can be stored (Madge, 1994), cereals are the most common type of stored food. Storage is an extremely effective survival strategy in overcoming seasonal and sometimes interannual variations, although it is not effective for long-term variations (O'Shea, 1989; Halstead, 1989).

In the archaeological record, storage can be determined via storing features (silos, storage bins, storage pots-pithoi) or carbonized plant remain caches. Other food types are less likely to be preserved. Similarly, storage containers from perishable materials (leather, wood, plant fibres, branches, cork) – wooden crates, boxes, baskets, sacks, or bags – would be hard or impossible to identify (Filipović et al., 2018).

Evidence for storage in the Starčevo culture are scarce and predominantly consist of carbonized grain caches. The Early/Middle Neolithic communities in this area practised agriculture (Filipović & Obradović, 2013), but storage contexts are ambiguous. Even though clay-lined pits with small amounts of carbonized food remains were found at the site of Nosa – Biserna Obala, the rest of the associating content, typical for refuse pits, brings into question the initial interpretation as storage features (Filipović & Obradović, 2013; Filipović et al., 2018). Pithoi finds are scarce at the Starčevo culture sites. At the site of Bandovići, a large vessel containing barley was found (Filipović et al., 2018), making it the only reported case so far. At the site of Drenovac, in the house rubble, a cache of various carbonized seeds was found, suggesting that the container was probably made from perishable material. Different crops were likely stored, next to each other but in separate baskets, bags, or wooden containers with several compartments (Filipović et al., 2018).

However, raw cereals cannot be stored for a long period of time, due to spoilage, exposure to insects and rodents. Storing cooked or fermented cereals prolongs their shelf-life. Bulgur is prepared by cooking, drying, and grinding cereals, resulting in hard textured grain, less prone to spoilage and infestation. Dried fermented cereal products kishik and trahans are made by cooking either bulgur, raw grains, or flour in milk or soured milk. Lactic acid fermentation from milk preserves food, so it can be stored for up to two or three years (Valamonti, 2011). This practice would be extremely hard to detect in the archaeological record, but should be taken into consideration, as fermentation was documented on the Starčevo culture pottery (Vuković, 2011). Herbs, certain grasses, and weeds could have been dried, stored, and used as medicines or spices (Filipović et al., 2018).

## Exchange

Exchange is a broad term for social practices of reciprocity between individuals, social groups, or communities. Exchange does not have to be literal – goods for goods or goods for services. It also includes an exchange of goods between households in social settings – feasts or house hospitality. These actions consolidate social bonds and set rules for reciprocity. By giving food in exchange for labour, or giving food for tokens which symbolize the commitment of a household to return the favour, communities perform the act of social storage. These forms of exchange are hard to detect in the archaeological record (Halstead, 1989). Thermal structures in open spaces are considered indicators of food sharing practices between households (Byrd, 1994; Halstead, 1989). This can be perceived as a form of exchange, as groups that prepare food together, tend to share it. Exchange within one community is possible only at a seasonal and interannual level, as long-term bad conditions would deprive every household in the community of food, in which case, help would have to be searched for outside of the community. Alliances with outside communities could be created via marriages or trading partnerships. These partnerships are extremely important, as they are insurance and serve in preventing the emergence of hostile relationships (Halstead, 1989). Contacts and exchange between settlements of the same culture were probable, but hard to determine in the archaeological record, due to similarities in the material.

Indications of communal food preparation have been detected at several Early/Middle Neolithic sites. In the Starčevo culture, only four hearths (Bogdanović, 1988; Minichreiter, 2001; Đuričić, 2019) and six cooking trenches (Đuričić, 2019), previously interpreted as tubular ovens (Minichreiter, 1992, 2007; Bánffy et al., 2010), were found outside dwellings. On the contrary, all of the ovens and the majority of hearths were found inside dwellings (Bogdanović, 1988, 2008; Minichreiter, 1992, 2001, 2007; Bánffy et al., 2010; Марић, 2013; Đuričić, 2019), indicating both indoor and outdoor food preparation (Đuričić, 2019). Although it can be implied that at least a portion of cooking activities was conducted in a communal setting, it is unclear whether this happened on a daily/seasonal basis or during special occasions. Food sharing practice was probable, but it is unclear how much different households relied on each other (Đuričić, 2019). The practice of intra-settlement food sharing was proposed as one of the buffering mechanisms applied by the Early Neolithic communities in Thessaly. It was not only conducted in times of need, but regularly, resulting in consolidation of neighboring relations. Also, contacts with other

settlements were documented through fine pottery, indicating some degree of inter-settlement exchange (Halstead, 1989). Food sharing could have been similarly employed at the Starčevo culture settlements.

## Mobility

Mobility is a typical survival strategy for hunting-gathering and pastoral communities. It is considered an unfavourable option for agricultural communities, as storage (characteristic for them) and mobility are mutually exclusive (Halstead & O'Shea, 1989). Forced mobility in agricultural communities occurs if long-term variations disable farming for a prolonged period of time. These communities perceive mobility as a last resort (Rowley-Conwy & Zvelebil, 1989). Mobility is often determined via architecture. Cross-cultural studies conducted on modern non-industrial communities have shown that settlements with pit-dwellings imply mobility, contrary to above-ground houses which imply sedentism (Greenfield & Jongsma, 2006).

Pit-dwelling is considered a typical form of Starčevo culture house. Pit-dwellings have been found at: Divostin (Bogdanović, 1988), Lepenski Vir (Srejović, 1969), Donja Branjevina (Karmanski, 2005), Drenovac (Perić, 2008), Grivac (Bogdanović, 2008), Zadubravlje (Minichreiter, 1992, 2001), and Galovo (Minichreiter, 2001, 2007). Their interior is divided by platforms, niches, or different floor levels, and superstructure is indicated by postholes or daub remains (Bogdanović, 2008). There is no evidence of mud plaster architectural features. Also, almost all of the ovens were underground and extremely easy to make (dug into the sides of the pit-dwelling), showing a low level of investment in living spaces, suitable for a mobile lifestyle (Đuričić, 2019).

Above-ground houses were also documented at several Starčevo culture sites: Divostin (Bogdanović, 1988), Nosa – Biserna Obala (Garašanin, 1960), Grivac (Bogdanović, 2008), Zadubravlje (Minichreiter, 2001), Vinkovci (Dizdar & Krznarić Škrtvanko, 1999), and Galovo (Minichreiter, 2007), but less frequently. Data on above-ground houses are extremely scarce, as they are only identified via postholes, trenches, or poorly preserved daub fragments (Bogdanović, 1988). Four hearths and no ovens were found inside these houses (Đuričić, 2019). They were made using the wattle and daub technique, and they had teched roofs (Bogdanović, 1988). The number of rooms and spatial organisation are undetectable. Starčevo culture architectural features – dwellings and fire installations – suggest



a lower level of sedentism. Potential reasons for mobility as a buffering strategy will be elaborated in the discussion.

## Discussion

Food is a necessity, but subsistence strategy is a social choice based on a certain lifestyle. Neolithic subsistence is based on agriculture and animal herding and is usually accompanied by a sedentary lifestyle (Çilingiroğlu, 2005; Cauvin, 2000). Having in mind that environmental variations are inevitable, communities apply buffering strategies that benefit them the most, in order to maintain the preferred lifestyle. Early/Middle Neolithic communities of the Central Balkans show some of the characteristics that traditionally are not attributed to Neolithic farming cultures. They practiced agriculture and herding, but evidence of storage is scarce and caches of plant food indicate storage inside perishable containers (Filipović et al., 2018). Based on the current data, it is hard to determine the amount of surplus and the extensiveness of storage, so it is impossible to assess how reliant they were on this buffering strategy. They cultivated crops with diverse growing patterns, sown during different seasons (Atalay & Hastorf, 2006), providing balanced food supply at the seasonal level and lowering the risk of crop failure in case of interannual variations. Cultivation of multiple crops, domestic animal herding, hunting and wild plant gathering are part of the diversification strategy. These different procurement strategies are mutually complementary and are applied with the intention to feed the community at the seasonal and interannual level. Even though the subsistence seems typically Neolithic, the majority of settlements implies increased mobility (Greenfield & Jongma, 2006). Pit-dwellings and above-ground houses with a lack of thermal structures and architectural features are indicators of less investment in house construction and furnishing. Various recent studies offer some clarifications (Ethier et al., 2017; Živaljević i dr., 2017; Stojanovski et al., 2020; Ivanova, 2020). Early Neolithic Near Eastern migrants brought domesticated plants and animals from their original territory. The temperate climate of the Balkan inland may have created problems for early farmers. This new climate with winter frosts and a higher percentage of annual precipitations could have provided challenges for plant taxa, accustomed to the warmer and dryer Mediterranean climate. As time had to pass in order for crops to acclimate to new conditions, communities that relied primarily on agriculture had to make new subsistence patterns (Ethier et al., 2017; Stojanovski et al., 2020; Ivanova, 2020). The prominent role of cattle meat, milk, and dairy products, may have been a way

to compensate losses in agriculture, as crops were acclimating to new conditions (Stojanovski et al., 2020). Also, goats/sheep, which had no wild relatives in this territory and were not accustomed to it, might have had problems in adjusting to the new climate, because of the changes occurring in their reproductive patterns, increasing the significance of cattle (Ethier et al., 2017; Ivanova, 2020). Another indicator of mobility that should not be left unnoticed is the extremely low percentage of pigs, even though the Balkan inland offers perfect conditions for them. Pigs are less prone to transhumance and are a good indicator of sedentary settlements (Ethier et al., 2017). Archaeozoological analyses conducted at the site of Golokut, have indicated the seasonality of the settlement with the occupation between late autumn to late winter (Živaljević i dr., 2017). Similarly, faunal remains from the site of Blagotin, indicate seasonal occupation between late autumn and late spring (Ethier et al., 2017). The importance of exchange as a buffering strategy is difficult to assess. Based on the fire installations in the outside spaces, communal food production and social storage among Starčevo culture communities were probable, serving as one of the social practices for the maintenance of relationships within the settlement. This means that households likely helped each other in time of need, especially at a seasonal or interannual level.

Starčevo culture communities have primarily relied on diversity and mobility, with limited storage and a certain degree of exchange within the settlement. Being a farming community and applying mobility as one of the two dominant buffering strategies, implies that Early Neolithic communities of the Central Balkans faced long-term variations. In this case, those variations might not have been a consequence of some tragic climatic event, but of the introduction of crops and animals from one climate zone to another. As crops and sheep/goats had to adapt to new conditions, Starčevo culture communities might have been prevented from being fully reliant on farming, resulting in an “atypical” Neolithic lifestyle.

## Conclusion

Starčevo culture sites have not been excavated extensively and the majority of data comes from excavations conducted during the second half of the 20<sup>th</sup> century, offering limited information. Large-scale research on the material from different Starčevo culture sites is necessary for the understanding of their subsistence, the intra-settlement relations between different households, the longevity of occupation of each settlement, and the mobility patterns – the key elements for the reconstruction of their lifestyle.

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## СУОЧАВАЊЕ СА ВАРИЈАЦИЈАМА ЖИВОТНЕ СРЕДИНЕ У РАНОМ НЕОЛИТУ ЦЕНТРАЛНОГ БАЛКАНА: ДИВЕРЗИФИКАЦИЈА, СКЛАДИШТЕЊЕ, РАЗМЕНА И МОБИЛНОСТ

**Апстракт:** Неолит је доба првих земљорадничких и сточарских заједница. Живот припадника неолитских, али и других неиндустријских заједница, зависио је од варијација у животној средини – количине и врсте падавина и температуре. Чак и неочекиване падавине и мање промене у темератирним обрасцима могле су довести до лоших жетви и мањка хране за стоку, што је утицало на количину доступне хране. Неиндустријске заједнице примењивале су различите социјалне стратегије како би избегле или се пак суочиле са периодима недостатка хране: диверзификацију, складиштење, размену и мобилност. У овом раду су приказане социјалне стратегије које су ранонеолитске заједнице централног Балкана користиле како би спречиле или превазишле неповољне периоде, а посебно су истакнуте доминантне стратегије.

**Кључне речи:** неолит, рани неолит, исхрана, мобилност, пољопривреда

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While writing the texts collected in this volume, the authors have been living through an extraordinary experience, coping with everyday tasks made more complex by the crisis we have been facing, and creating new habits necessary to navigate the new environment. Although exceptional from our point of view, our present experience is far from unique, and the human history is replete with turbulent periods of crisis, profoundly disrupting the habitual order.

The aim of this collection is therefore to investigate some of the situations of crisis in the past from the archaeological perspective, in a search for insights that may help us to better understand and cope with the present one. At the same time, the papers demonstrate some of the vast possibilities of archaeological investigation to contribute to our understanding of the world we live in, as well as of the past societies whose material traces we study.

