

SUBSISTENCE, PROSPERITY AND ABANDONMENT OF ALPINE ISOLATED FARMS IN THE DYNAMIC 17TH CENTURY ENVIRONMENT: CASE STUDY FROM THE UPPER SAVINJA VALLEY WITH SPECIAL EMPHASIS ON TENANTS' INVENTORIES

OPSTANAK, PROSPERITET I NAPUŠTANJE OSAMLJENIH GOSPODARSTAVA U DINAMIČNOM OKOLIŠU 17. STOLJEĆA (PRIMJER DOLINE GORNJE SAVINJE S POSEBNIM NAGLASKOM NA OSTAVINSKE INVENTARE KMETOVA)

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Summary

Archival sources, mostly tenants' inventories presented in the context of further documents from archives of seigneuries, state and ecclesiastical administration, prove that environmental, economic and societal changes in the dynamic 17th century did not affect mountainous isolated farms in the western part of Eastern Karawanks and in central Kamnik-Savinja Alps in a uniform way. I presented opportunities and pitfalls of this kind of analysis of tenants' inventories. The method for assessing environmental loading of the 17th century animal husbandry is based on comparison of tenants' inventories with descriptions of farms. Its fundamental components include the weight of the 17th century livestock and the relationship between feed requirements of different animal species, obtained from seigneurial accounts and visitation proceedings. I analysed cereal production with special emphasis on species diversity, quantities of home-grown grain and cereal stocks. Trade in and lending of cereals took place. Inventoried ploughing implements and damage caused by slope processes prove unsustainable use of some fields. In the case of environmentally or socially caused economic difficulties lenders were in many cases able to provide lacking resources or tolerated arrears, but the scale and characteristics of tenants' indebtedness differed greatly. On the figure representing the sums of values attributed to livestock, cereals and of active debts from which debts are subtracted, environmental impact of bad harvests in the Late Maunder Minimum can be observed, but further factors, e.g. the extent and quality of agricultural land, non-agricultural sources of income, dowries and shares of inheritance, caused the non-uniform distribution of positive and negative balances of different farms. Population statistics prove that in comparison with the 19th century considerable numbers of inhabitants lived in the area even in the late 17th century.

Key words: environmental history, historical climatology, agricultural history, soil history, agroecosystems, demographic history, livestock weight, rural credit, wealth studies, probate inventories, Early Modern Period, Alps

Ključne riječi: povijest okoliša, povijesna klimatologija, poljoprivredna povijest, povijest tla, agroekosustavi, demografska povijest, težina stoke, ruralno kreditiranje, studije bogatstva, ostavinski inventari, rani novi vijek, Alpe

1. INTRODUCTION

The observed territory (Figs. 1–3) is situated on the south-easternmost edge of the Alps, in northern Slovenia. Isolated farmsteads¹ are spread on altitudes ranging from almost 500 to above 1 300 m a.s.l., a lot of pastures and alpine meadows lay higher, some of them above the upper forest line. Growing of cereals is still possible at 13 °C as mean July temperature where the mean annual precipitation is around 1 000 mm, or at mean July temperature of 16 °C at 1 400–1 500 mm mean annual precipitation (Zwittkovits 1983, 47). These are rough estimations, but they make clear why in some periods of climatic history these farms were highly climatically vulnerable, even though the altitudes of the highest ones are not extreme in the broader Alpine context. In the period of 1961–1990 mean July temperature of a considerable number of farms in the **region of Solčava** lay below 16 °C (Cegnar 1998, 103) – in the period 1971–2000 even below 14 °C – at annual precipitation exceeding 1 600 mm, in the western part of the mentioned region even 1 800 mm in both periods (Environmental Atlas...). The majority of precipitation falls in the growing season of spring-sown cereals (Meze 1963, 235). In the **region of Luče**, the mean July temperature on the majority of farms in the periods 1961–1990 and 1971–2000 was 16–18 °C, in some parts even below 16 °C, at more than 1 600 mm mean annual precipitation characteristic at least for the majority of the inhabited parts of this region (Cegnar 1998, 103; Environmental Atlas...). In the mid-20th century cereals were cut in August on the low farms in the region of Luče, mostly in September on the highest farms of the same region and on many farms in the region of Solčava, where harvest on the highest farms continued till the beginning of October, often after the first snow cover. According to data from the same period, the first grass was cut after 10 June on the low farms of the region of Luče and in the beginning of July on the highest farms of that region, in the middle of July at Strevc (Fig. 3, no. 52) and the neighbouring farms in the region of Solčava, but not before the beginning of August at the hundred-metre higher Bukovnik (Fig. 3, no. 62). The second mowing began after 10 July on the low farms of the region of Luče; on a well-situated farm at the entrance of the valley Robanov kot in the region of Solčava, it was cut before the first mowing at Bukovnik. On the highest farms of the region of Luče the aftermath was cut in the beginning of September, whereas it could not be mown on the highest farms in the region of Solčava (Meze 1963, 234–35, 249; Meze 1965, 202).

Late onset of the growing season was an advantage in the case of weather induced damage in spring. In 1673, for instance, 9.000 specimens of young plants were bought in Luče by the seigneurie of Gornji



Figure 1: Territory observed (black lines) in a broader Alpine context. For easier orientation, boundaries are represented in their present-day outline

Source of background:
Žerovnik 2001,
additions: Ž.
Zwitter.

¹ In words from the 17th century: »populu[s] inter rupes et alpes longe dispersu[s]« (NŠAL, KAL, fasc. 43, U 25, Visitation proceedings, 27 July 1668).



Figure 2: *Isolated farms of the former Luče AU (Amt) of the seignury of Gornji Grad, behind the gorge snowy forest clearings of high-situated farms in the region of Solčava*
Photograph: Rok Dovjak, 2009.

Grad to replace those on the demesne destroyed by hail or rain in April (NŠAL 20, box 39, account 1672/73, Lit. C).

Climatic differences at mezzo- and micro-level are considerable. The case of isolated farms in and above the valley of Robanov kot in the region of Solčava is instructive. There were, namely, better conditions for cereal growth at Knez (Fig. 3, no. 36), the highest farm there (1 220 m a.s.l.) than at Roban (Fig. 3, no. 35), which lies five hundred metres lower at the bottom of the valley (Fajgelj 1953, 132). However, it was often only possible to start ploughing in spring on the same days on the highest farms above Robanov kot (Fig. 3, nos. 36, 37) as at Bukovnik (Fig. 3, no. 62), the highest farm in the region of Solčava, situated hundred metres higher, but the cereals ripened even a week later above Robanov kot (interview with Ančka and Marija Prepotnik, Haudej farmstead (Fig. 3, no. 37), 21/12/2012).

The agricultural land of a typical isolated farm extends over different altitudes and mostly lies on slopes, fields were almost exclusively confined to soils on impermeable rocks (Meze 1963, 228; Meze 1965, 191–92). Despite the considerable extent of the farms, the area suitable for permanent fields was limited (Dodgshon 2011, 145, 159). The main advantage of steep fields was favourable insolation, but there were also disadvantages. Despite the high mean annual precipitation drought could affect the harvest (Gams 1993, 7–9). In the early 20th century, slope processes, in particular, threatened fields, climbing slopes with inclinations up to 30° (Gams 1959, 26). Landslide hazard is characteristic for the observed territory. Even nowadays there is a possibility for landslides to appear on almost 64%² of the Savinja river basin above Ljubno (Komac, and Zorn 2007, 152), but the extent of treeless area was much greater in the 17th century.

Only the livestock of some of the isolated farms in the regions of Solčava and Luče in the 17th century grazed on common alps; individually managed alps were also present (Zwitter 2014a, 217–19). Additionally, there was no collaboration between farms in connection with field rotation as field pattern of compact holdings was ubiquitous. Thus the rural community played only a small role—if the community existed at all. The role of help among neighbours and relatives was pronounced (Vilfan 1980, 73–74). The vicinity of all permanent fields, characteristic for the field pattern of compact holdings, caused high vulnerability to events such as hailstorm (Sieferle, and Müller-Herold 1996, 140) or landslide. There were hailstorms on the observed territory in the 17th century; just before its beginning hail caused damage to cereals in fields southwest of Luče in 1597, it also caused great damage at least to the isolated farm

² Additionally, 34 % are so steep that soil cover is interrupted—if it exists at all.

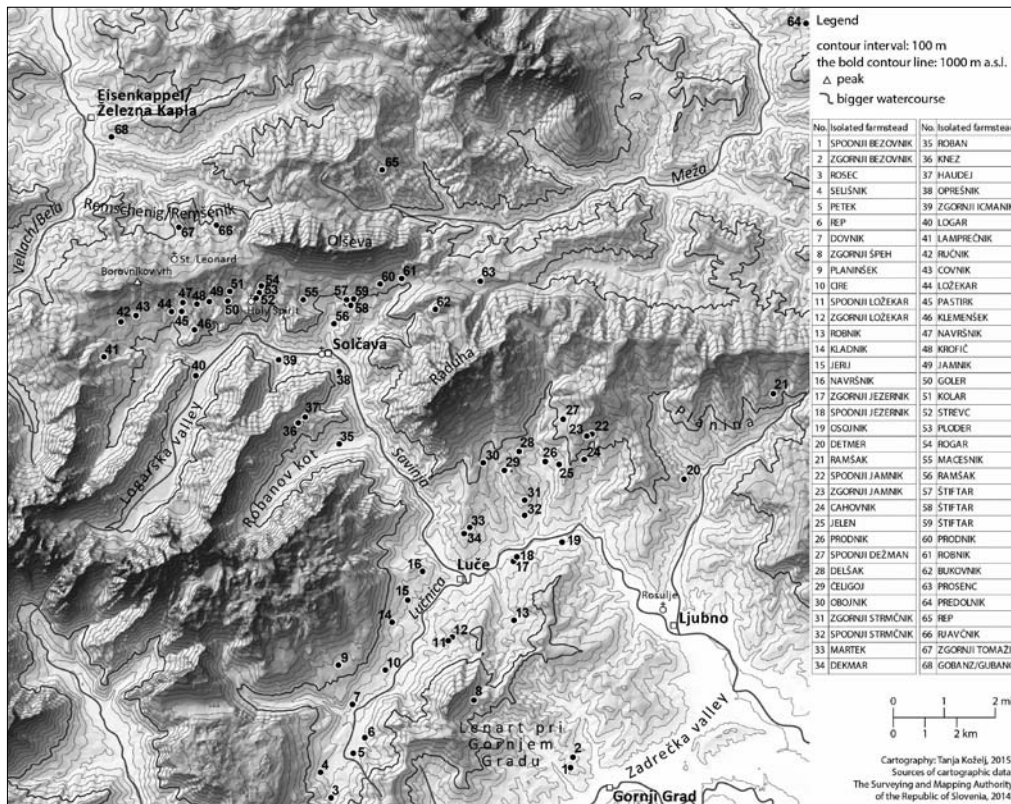


Figure 3: Locations of the isolated farmsteads and selected other settlements mentioned in the article

Ramšak north of Solčava in 1627 (Fig. 3, no. 56), or in one of the previous years, along with other similar events (Zwitter 2013, 348–50). The presence of swidden cultivation, proven by the sources from the 17th century (Zwitter 2014a, 221–23), contributed to the dispersion of agricultural land. Its consequence was increased variety of fields' spatial distribution and altitudes, lowering the probability of bad harvest on all the fields (Pfister 1984, 50).

Selecting a remote Alpine area (Fig. 2) for territory of the case study on the one hand rises the probability of being able to prove considerable environmental impact on society by studying the written sources, but on the other hand promises to show considerably different environmental impact on individual farms according to unequal socio-economic but also environmental conditions at micro- and mezzo-level.

The main emphasis is placed on 23 inventories referring to eight isolated farms in the north of the region of Solčava, in the 17th century a part of the Carinthian seignery of Eberndorf/Dobrla vas.³ Additionally, 10 inventories referring to ten isolated farms from the AUs of Solčava and Luče from the seignery of Gornji grad⁴ were analysed. Although it is not a number representative for all the 17th century isolated farms in the Upper Savinja valley, it significantly upgrades the information on the topic obtained from other kinds of sources.

³ Farms Krofič (Fig. 3, no. 48), Jamnik (no. 49), Goler (no. 50), Kolar (no. 51), Strevc (no. 52), Ploder (no. 53), Rogar (no. 54) and Macesnik (no. 55). References to their inventories begin with »StiASP, Eb., A.«, except for the »StiASP, Eb., A., fasc. 16«. The name of the tenant installed on Rogar farm in 1688 after the displacement of Simon Rogar was »BläBius Oschounigg«, the well-off tenant, who died there in 1693, was »Pangräz Rogger«. However, the facts that Pangraz in 1693 possessed a copy of Simon's inventory from 1688 as well as the minute that Simon's home in 1688 was a big house suggest that both inventories—from 1688 and 1693—refer to the same farm; the fact that a big house (»dB ... grosse gebej«) is mentioned there in 1688 as Simon's home does not make the explanation possible that Simon, whose possession was so much smaller, only possessed a small part of that isolated farm (StiASP, Eb., A., fasc. 41, L. 27, no. 13; Eb., B. 155, 5 November 1688). However, this problem has not been entirely solved yet, so the conclusions drawn from Rogar's 1693 inventory should be addressed with caution throughout the article.

⁴ In the region of Luče: Rep (Fig. 3, no. 6), Dovnik (no. 7), Ložekar (no. 11 or 12), Kladnik (no. 14), Jerij (no. 15), Martek (no. 33), Delšak (no. 28), Prodnik (no. 26) or Jelen (no. 25) or both of them together; in the region of Solčava: Knez (no. 36), Ramšak (no. 56) farm together with another house in the same region. References to their inventories begin with »StLA, GB I, 3388–89«.

2. ISOLATED FARMS IN THE DYNAMIC 17TH CENTURY ENVIRONMENT WITH SPECIAL EMPHASIS ON PROBATE INVENTORIES

2.1 Importance of 17th century peasant inventories as sources for agroecosystems

Inventories are lists of chattels possessed. Their most frequent form represent probate inventories, but also indebtedness, change of the tenant, tutelage or marriage could present the cause for an inventory (Pöttler 2002, 254). Some of them record only the movable possession, others also the immovables in tenure (Roth 1979, 408). It is possible for the property of cohabitants and other people or institutions to be mentioned too—mostly, but not necessarily, if it was to be found on the deceased's farm (Garrard 1980, 62–63; Kuuse 1980, 314).

Probate inventories give basic insight into agricultural production. Was, for instance, a certain territory at a certain time oriented extremely towards stockbreeding, towards cereal production, or were both of them well represented? Which species of cereals were grown, did winter-sown or spring-sown cereals prevail, or were they both common (Overton 1980, 210–11)? These are some of the crucial elements for environmental assessment of the past agriculture and its climatic vulnerability. In order to avoid the influence of grain trade, the information on the crops grown in a certain year should be obtained from inventories dating from the time when cereals ripen. If farmers grew autumn-sown as well as spring-sown cereals, only inventories from summer time before the harvest of the former are often suitable sources for it (Baulant 1975, 508; Overton 1980, 211–12), but the harvest could in reality be severely influenced by weather conditions afterwards. Measurement units should be converted carefully as they varied in time and space (Pöttler 2000, 272–73). Were any of those agricultural implements in use which by means of their very presence testify to the existence of certain cultivation practices or are important from the point of view of the history of soil erosion? Additionally, inventories are valuable sources for agricultural improvement, though some terminological difficulties can make the picture less clear. Clover, for instance, could be recorded as 'grass', 'hay', 'stover' or 'fodder' (Overton 1980, 213), maize as millet, broad bean, etc. (Montanari 1998, 136). Especially with regard to the date of introduction of innovations, it should be stressed that as probate inventories were written after possessor's death, the overrepresented old people were certainly not among groups inclined to introduce innovations, thus there is a delay in the occurrence of innovations in probate inventories (Pöttler 2002, 255; Roth 1979, 417; Overton 1980, 213). If there are sufficient numbers of scythes, sickles, rakes and hayforks listed, there was a better possibility to cope with most crucial tasks also in case of predominately rainy summer and autumn (Lischke 1991, 84), if only enough manpower was available. Regarding the documented livestock, inventories do not tell us the average numbers characteristic for observed farms, they only provide information on the herd at a certain point in that particular year (Overton 1980, 212). Several inventories enable us an insight into supplementary activities on farms, such as crafts, and contain information on the importance of trade in peasant economy (Garrard 1980, 57; Roth 1980, 44) as well as on the role of trade for mitigation of human vulnerability to environmental processes.

Especially if inventories for the same farms from different time are preserved, they are extremely important sources for investigation of the changing rural wealth, of the unequal environmental impacts and of the changing resilience to the dynamic environmental conditions. The fact that not all deaths resulted in an inventory affects these results (Overton 1980, 209, 211).

The 17th century probate inventories thus provide valuable insight into the following aspects, characterizing sustainability of agro-ecosystems: Was the production per unit of land relatively stable, without declining yields? Were the crops grown as well as agricultural operations diverse, which limited risk and strengthened stability? Was the system characterized by resilience to short-term and seasonal disturbances? Did the system enable producers an acceptable way of life? Did their savings suffice to cover the expenditures and to invest the capital needed for maintaining long-term productivity (cf. Haberl et al. 2009, 10–11)? In order to provide general conclusions, a large number of inventories enabling quantitative analysis should be studied (Overton 1980, 210). Further general remarks on opportunities and pitfalls of inventories are given in the chapters 2.2.2, 2.4, 2.5.1 and 2.6.

2.2 Farming in the dynamic 17th century environment

2.2.1 Animal husbandry

Livestock converted biomass not suitable for human nutrition as well as some wastes into human food, raw materials (e.g. fleece, skin) and traction. By producing manure animals crucially contributed to the allocation of plant nutrients from pastures, meadows and forest and their concentration on cropland, but animal digestive system also transformed plant biomass into forms better available for cultivars (Krausmann 2004, 756). The contribution of litter extraction to the allocation of nutrients was considerable as well. Ruminants could use land not suitable for cropping (Krausmann 2008, 33, 38), however, overgrazing was a frequent problem in preindustrial Europe (Marquardt 2006, 175).

The **live weight** of early modern animals is among the crucial data for the environmental assessment of animal husbandry. Even approximate pieces of information are often lacking (Overton 1980, 212). The economic accounts of the seigneurie of Gornji Grad and the visitation proceedings from 1665 provide some data for the late 17th century Upper Savinja Valley.

Slaughter weight is defined as weight of meat of the butchered animal except for head, hide, legs beneath knees and entrails. It also includes the fat from within the body (tallow) (Löser and Zeeb 1876, 248). It corresponds in a high degree to the way of recording the weight of slaughtered animals, at least as far as cows and oxen are concerned, in financial documentation of the seigneurie of Gornji Grad from 1680s.

The accounts from 1681/82 and 1686/87 include information on weight of 11 cows. The minimal recorded weight was about⁵ 53 kg⁶, the maximal one about 80 kg, with an average value of 66 kg (NŠAL 20, box 39, account 1 April 1681–31 March 1682, tables; NŠAL 20, box 40, account 29 April 1686–28 April 1687, expenditures for beef). The common weight of 6 cows butchered at the end of 1686 is recorded as 750 pounds (420 kg). It says in the following chapters that 270 pounds of the same meat were eaten soon afterwards; the other 480 pounds were smoked. So it was only the flesh with a part of bones. Thus a considerable quantity of (blood- or meat-?) sausages, made from the same cows, is not included in the weight of cows listed (Zwitter 2014a, 216). Additionally, for a cow weighing 130 pounds (73 kg) we are explicitly told that the weight stands only for meat (and probably a part of bones). The weight of this cow was above average, so the same criterion was used also while recording the weight of the others, for which there is also evidence that the weights listed were more or less wholly edible, except for the very probable amount of bones (NŠAL 20, box 39, account 1 April 1681–31 March 1682, tables). Meat from the legs is not listed separately, so it is probably entirely included in the recorded weights. Thus unlike the aforementioned definition, the numbers also comprise lower parts of legs, but the weights do not include tallow, which is recorded separately, its weight—if given—is not listed in a way enabling the calculation of that kind of fat for a single animal. However, it does not influence the calculations significantly.⁷

The accounts of the seigneurie of Gornji Grad from 1681/82 and 1682/83 include information on weight of three oxen. The minimal recorded weight was 112 kg, the maximal one 172 kg, with an average value of 151 kg. The ox weighing 170 kg was entirely smoked later on, so it is a good approximation for slaughter weight. The same criteria were used for the heaviest ox, characterized as old, listed in the same source right in front of the one weighing 170 kg (NŠAL 20, box 39, account 1 April 1681–31 March 1682, tables). The lightest ox was 5 years old; this one was later on entirely smoked as well (NŠAL 20, box 39, account 1 April 1682–25 April 1683).

The account of the seigneurie of Gornji Grad from the autumn of 1694 includes information on weight of 12 wethers. The minimal recorded weight was 10 kg, the maximal one 18 kg, with an average value of 15 kg (NŠAL 20, box 40, account 1694/95, *Wochen Zedl*).

⁵ The weight of 8 cows is given as weight of four pairs of animals; these cases include also the lightest and the heaviest cows mentioned in the article thus both values are only average weights per animal of two cows documented together.

⁶ The value in pounds was multiplied by 0.56 in order to convert it into kilograms—see Vilfan (1954, 68).

⁷ There were only 55 pounds (31 kg) of tallow obtained from 2 oxen, 5 cows and an unmentioned number of sheep in the year 1681/82 (NŠAL 20, box 39, account 1 April 1681–31 March 1682, tables).

The accounts of the seignury of Gornji Grad from 1672/73, 1673/74, 1682/83, 1686/87, 1688/89, and 1694/95 include information on weight of 80 calves. The minimal recorded weight was about⁸ 12 kg, the maximal one about 26 kg, with an average value of 17 kg (NŠAL 20, box 39, accounts 1672/73, Lit. A–D; 1673/74, Lit. B and C; 1 April 1682–25 April 1683; box 40, accounts 1686/87, expenditures for veal; 1688/89, slips; 1694/95 slips and *Wochen Zedl*). For some of the calves there is evidence that head and legs are not comprised within the weight listed as their purchase is mentioned separately. There are also such examples among those which were heavier than the average so this statement probably applies to all calves (NŠAL 20, box 40, accounts 1686/87, expenditures for veal; 1688/89, slips; 1694/95 slips and *Wochen Zedl*). The source contains information that weight includes bones of several calves, some of which were among the lightest ones, thus it is probably often the case, but it is explicitly mentioned only in some cases (NŠAL 20, box 40, account 1688/89, slips). Exceptionally, the hide or the entrails are reported to be included in the weight (NŠAL 20, box 39, accounts 1672/73, Lit. A; box 40, 1694/95 slips).

Table 1: Livestock weight and feed requirements in the 17th century Upper Savinja valley.

Animals	Cow	Ox A ¹	Ox B ²	Wether	Calf
Average weight (kg) (chapter 2.2.1)	66	112	151	15	17
Slaughter weight (% of live weight) (Krausmann 2008, Table 14)	46 %	55 %	55 %	45 % ³	55 %
Approximate live weight ⁴ (kg)	143	204	275	33	31
Minimum feed demand ⁵ (SE ⁶ /kg live weight/day) (Krausmann 2008, Table 14)	7.0	6.0	6.0	8.0	10.0
Standard feed demand ⁷ (SE/kg live weight/day) (Krausmann 2008, Table 14)	10.0	9.0	9.0	11.0	15.0
Minimum annual feed demand, 17 th century, Upper Savinja Valley (kSE ⁸), approximation	365	447	602	96	113
Standard annual feed demand, 17 th century, Upper Savinja Valley (kSE), approximation	522	670	903	132	170

Source: data in the chapter 2.2.1.

- ¹ The number of oxen is much too low to be representative. In the column Ox A the data refer only to the lightest ox.
- ² The column Ox B represents the average of the three oxen.
- ³ All three pieces of information from this column where Krausmann 2008 is cited refer to sheep.
- ⁴ Average weights from chapter 2.2.1 taken as slaughter weights.
- ⁵ It is »an estimation for the required intake to maintain the stock at the assumed live weight, but allows only for very limited performance« (Krausmann 2008, 25).
- ⁶ Starch equivalents. »One starch equivalent ... equals the digestive value of one gramme of starch« (Krausmann 2008, 11).
- ⁷ »Standard feed demand reflects the recommended feed intake based upon the assumed performance of nineteenth-century farm animals (concerning milk yield, weight gain, work)« (Krausmann 2008, 25).
- ⁸ Thousands of starch equivalents.

Table 2: Grazing taxes paid to the priest of Solčava for different animal species according to the visitation proceedings from 1665¹

Animals	Cow	Heifer	Calf	Sheep	Goat
Grazing tax	20 kr	10 kr	10 kr	2 kr	3 kr
Grazing tax ratio to cow	1.00	0.50	0.50	0.10	0.15

Source: NŠAL, KAL, fasc. 43, U 22, fol. 14r.

¹ The importance of local data is clearly revealed by the comparison with the different data of Marquardt: »Para otras especies [i.e. other than cows; Ž. Z.] existió una clave de conversión, de acuerdo con lo que cada especie consumía o deterioraba, por ejemplo, una vaca equivalía a tres cabras« (Marquardt 2006, 184).

⁸ In eight cases only the sum of weights of 2 or 3 animals is given, the weight of the lightest calf mentioned in the article is only the average weight of two animals in a pair.

Table 3: *Approximate annual livestock feed requirements for comparison with peasant probate inventories from the 17th century Upper Savinja Valley.*

Animals	Cow	Ox	Heifer	Calf	Sheep	Goat	Pig ¹	Horse ²
Minimum annual feed demand (kSE)	365	447	146	146	37	55	114	492
Standard annual feed demand (kSE)	522	670	209	209	52	78	285	871

- ¹ The listed products from 6 pigs slaughtered in 1681/82 were: 76 pounds of smoked meat, 326 and 30 pounds of bacon, 18 and 44 pounds of grease, 12 shoulders and 112 sausages. It means 82 pounds (46 kg) plus a pair of shoulders and 19 sausages per animal but especially the weight of smoked meat is much lower than the fresh one (NŠAL 20, box 39, account 1 April 1681–31 March 1682, tables). The registered products from 8 pigs butchered in 1682/83 were: 146.5 pounds of smoked meat, 488 pounds of bacon, 61.5 pounds of grease, 16 shoulders and 140 sausages. It means 87 pounds (49 kg) plus a part of hams and 23 sausages per animal (NŠAL 20, box 39, account 1 April 1682–25 April 1683). Slaughter weight of a pig represents 75 % of its live weight (Krausmann 2008, Table 14), so the average live weight of each of the 6 pigs must have strongly exceeded 61 kg and the live weight of each of the 8 pigs 65 kg. The average weight of the 14 animals exceeded 63 kg. The weight of pigs can vary extremely with regard to the nutrition. An experiment showed that the well-fed individual weighed 127 kg, his malnourished twin only 26.5 kg after 8.5 months, thus only a fifth as much as his brother (Doll 2003, 153). So the values in Table 3 presuppose the surely too low live weight 39 kg (the average of 65 kg obtained from sources for the seigneurial seat and its fifth, i.e. 13 kg), multiplied by 365 days and the standard and minimal daily feed demand for pigs according to Krausmann (2008, Table 14).
- ² Rough estimation based on the fact that the minimal feed demand of a light horse is about 1.1 times as high as of a light ox and standard feed demand about 1.3 times as high as of an ox (Krausmann 2008, Table 14).

The average cow from Großarl in Austrian Pongau weighed 230 kg in the first half of the 19th century (Krausmann 2008, 27). It is clear from Table 1 that cows in the 17th century Upper Savinja valley were much lighter.

We are not informed about the age of calves at butchering. Additionally, the wethers eaten at seigneurial seat were probably much heavier than an average sheep. Finally, data for some animal species are missing. These problems can partly be solved by the 1665 listing of grazing taxes collected by the priest of Solčava (Table 2).

In order to examine whether the 17th century livestock in the Upper Savinja valley did not exceed the carrying capacity, data on the maximal possible numbers of animals that could be sustained on single farms in their 17th century state as well as the feed demand of animals bred on the same farms in reality are needed. The former are provided by the description of the farms from 1665, the latter by the inventories and Table 3. Taking into consideration the previously mentioned fact that inventories do not provide the average annual numbers of livestock, only inventories from the barn-feeding period⁹ were analysed for this purpose. Data in Table 3 are with exception of heifers and calves low in comparison with those in Table 1, a decision made in order to be sure not to show exaggerated environmental loading and thus be able to test the common notion that preindustrial agriculture did not overuse the natural potential. The average weight of cow from Table 1 is fairly low in comparison with the early 19th century Großarl, so the cow's feed demand from the same table is also included in Table 3. For oxen data from the Ox A column of Table 1 are used in further analysis.¹⁰ For calves and heifers 2/5 of a cow feed demand are taken as the average of the calf/heifer-to-cow ratio from Table 1 (1/3 of the cow) and Table 2 (1/2 of the cow). For sheep 1/10 of the cow feed consumption was taken as suggested by Table 2 because the data on wethers in

⁹ Approximately from 1 November to 30 April; for some data on the beginning of the grazing season on alpine pastures above the Upper Savinja Valley from the 16th to the early 18th century according to judicial sources see Zwitter 2014a, 220; according to a proverb from the region of Solčava, documented in the 20th century, grazing season began roughly on 24 April and ended on 11 November (Vršnik 2005, 172).

¹⁰ Also the early 18th century information from the seigneurie of Millstatt in Carinthia, if it refers to slaughter weight, proves that the column Ox A from Table 1 contains the right weight for our purpose: an average tenants' fattened ox weighed 130 kg (Dinklage 1966, 130) but all the oxen in the Upper Savinja Valley were not fattened so the average weight was lower. The facts that live oxen weighing 196 kg and more are mentioned in 1675 and those weighing 225 kg and more in 1696, both in connection with livestock trade from Carinthia to Italy (Dinklage 1966, 136–37, 142), prove that the mentioned 130 kg from the early 18th century really refer to the slaughter weight.

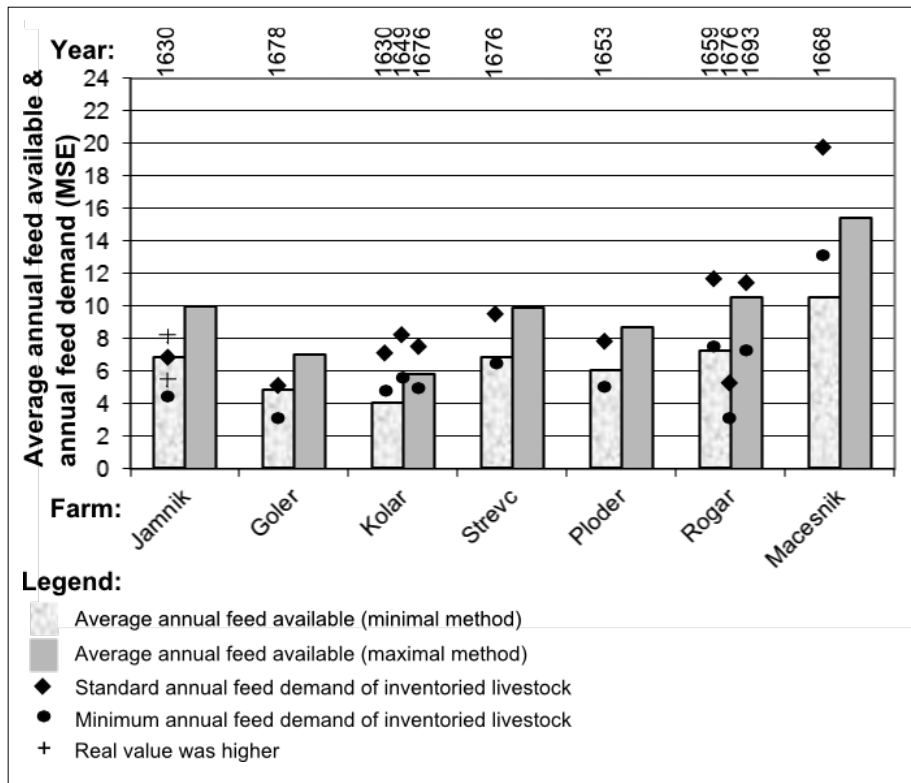


Figure 4: Annual feed available according to the description from 1665 and annual feed demand according to inventories from barn-feeding periods for 7 isolated farms.¹ All values in MSE². Conversion according to Table 3.³

Sources: StiASP, Eb., A., fasc. 35, L. 11, nr. 62 & 112 & 115 & L. 13, nr. 76 & L. 14, nr. 141; fasc. 36, L. 15, nr. 204; fasc. 38, L. 19, nr. 14; fasc. 39, L. 21, nr. 14 & 15 & 17 & L. 22, nr. 35; fasc. 41, L. 27, nr. 13; StiASP, Eb., B. 4, pp. 685–89.

¹ The expression »frischling« was in the context interpreted as lamb (cf. Adelung 1808, 312; Mravljak 1932, 179). »Terzel«, »terzen« are counted as calves or heifers, which used to be the meaning of this word in Carinthia; it is also possible that these animals were already three years old (Grimm, Grimm 1935, 261–62), but according to the already mentioned principle to be sure not to present the data in an exaggerated way, the first explanation was used. For the same reason »stierlein« was interpreted as calf (Grimm, Grimm 1941, 2864). The same for other diminutives, although some of these animals were probably older but of small constitution—there is, for instance, a pair of four-year-old »stierlein« listed on Rogar farm in 1633 (Fig. 3, no. 54); but in this case the age of 2 years was initially recorded, additionally corrected to 4 (StiASP, Eb., A., fasc. 35, L. 12, no. 7). The feed demand of bulls is presupposed to be equal to that of oxen, mares equal to horses. Lambs, kids, young pigs and horses played a subordinate role, a half of the feed demand of the adults was counted as their feed demand. The inventory referring to the Rogar farm in 1633 containing information on livestock from the barn-feeding period is incomplete. Namely, rearing of church livestock is mentioned but its numbers are not recorded, thus that inventory is not included in the Fig. 4.

² Mega starch equivalents.

³ Within the category of cattle the description does not distinguish between cows, oxen and bulls. As cows and oxen were common, the conversion factors 406 kSE for minimal feed demand and 596 kSE for standard feed demand as averages of values for cows and oxen were used in Fig. 4. It is possible that the columns are higher than the real nutritive value of fodder available in an average year in the early or middle 1660s. There are namely 8 cows, 2 heifers, 5 oxen and 4 terzen (19 animals altogether only counting the cattle) listed in the inventory of Krofič (Fig. 3, no. 48) from 3 June 1681 (StiASP, Eb., A., fasc. 39, L. 23, no. 27). Referring to this inventory it says in the early 18th century manorial minute that 19 heads of cattle can be kept on this farm in the summer time (StiASP, Eb., B. 151, 1032). The data in the description from 1665 were not collected from the older inventories, they are based on field work (Zwitter 2014a, 207), but it is possible that the numbers of animals which could be kept on a farm are unloaded sums of young animals and adults.

Table 1 are most probably much above an average sheep. And for goats 3 halves of the sheep feed demand are used in accordance with the visitation proceedings. Values for pigs and horses are rough estimations; fortunately, their numbers on the territory observed were extremely low.

In Fig. 4, the right column represents the fodder available on each farm in an average year according to the description of farms from 1665 if the animals were supposed to meet the standard feed demand; the left one represents the fodder available on the same farm if the herd was supposed to meet only the minimum feed demand. Points represent minimal feed demand of the real herd, diamonds its standard

feed demand according to the inventories from the barn-feeding period.¹¹ Where there are data from barn-feeding periods in different years, they are represented in chronological order from left to right.

Despite the roughness of these estimations Fig. 4 proves the existence of considerable spatial, but also temporal differences in **livestock related environmental loading**. Especially situations where the spot is close to the right column probably already resulted in loss of weight due to malnutrition (cf. Krausmann 2008, 25) because of the minimal method used for calculations, but also in exceeded carrying capacity and important environmental consequences unless the herd was considerably reduced or additional fodder bought. Among those rearing close to as much or more livestock than their farm could sustain there was no uniformity. On the one hand there are cases near the edge of or exceeding the carrying capacity. This group is represented by Kolar farm in the 17th century (Fig. 3, no. 51), which was repeatedly in difficult economic situation. According to the inventory from the early March 1676 this tenant reared considerable numbers of foreign livestock—26 sheep, 2 oxen, 2 *terzen* and 2 heifers apart from the cow and 20 sheep, belonging to the church, and his own small herd (StiASP, Eb., A., fasc. 39, L. 21, nr. 17). If the animals were malnourished, the rate of growth as well as milk production declined. When to cows, which consumed barely enough fodder to suffice for moderate milk production, only a small number of additional cows were added, the total milk production of the herd declined sharply (Pfister 1984, 38, 91–92, 96; Vasey 1992, 55). Rearing other farmers' animals was either a source of income or a way of settling one's debts. The situation of Macesnik farm (Fig. 3, no. 55), where the herd present in December 1668 could possibly also not have met standard feed demand till the end of the barn-feeding period, was entirely different. This well-situated farmer did not feed foreign animals, but had additional four oxen, not included in Fig. 4, reared at other farmers, most probably at Logar in the Logarska Valley (Fig. 3, no. 40) and Pasterk above the valley of Vellach/Bela in Carinthia¹² (StiASP, Eb., A., fasc. 38, L. 19, no. 14). He could afford to buy additional fodder or use a part of the extensive cereal stocks to feed selected animals.¹³ While interpreting Fig. 4 one should not forget that the columns refer to the early or mid-1660s, but these values were not constant during the whole 17th century. In the case of rainy periods when hay was drying, the columns in Fig. 4 would be much lower.

The vital source of feed was grazing, where pastures on clearances or in forest played an important role, along with fields and meadows after harvest (Krausmann 2004, 746–47). In the warm part of the year, **grazing rights** were in some cases resilient enough **to overcome intervals of unfavourable weather conditions**, mainly occasional formation of snow cover on alpine pastures.¹⁴ The judgement from 1588 ordered preservation of the old custom referring to some alpine pastures above Planinšek farm (Fig. 3, no. 9)—herders were allowed to take livestock to a shelter that lay lower, but higher than Planinšek farmstead, in the case of unfavourable weather¹⁵ (NŠAL 20, box 97, Various tenants' cases, 16th–19th century: 1588). Nine years earlier a severe decrease in use of some high alpine pastures is documented in the western Karawanks due to frequent snow cover (Zwitter 2014b, 669).

The farms of the seignury of Eberndorf/Dobrla was in the region of Solčava, with the exception of Macesnik, had the right to graze the herds on the alpine pasture of the seignury of Hagenegg, extend-

¹¹ The plus at Jamnik (Fig. 3, no. 49) marks that the number should be higher as the presence of young pigs is mentioned but their number is not recorded. The sums for Ploder (Fig. 3, no. 53) could also be lower according to the inventory because the livestock belonging to the widow in accordance with the wedding agreement was included in Fig. 4; the interpretation that this livestock was not present but a part of the possession assessed to the same value was excluded from the inventory and attributed to her cannot be entirely excluded. In this case the point would lie at 4.0 MSE, the diamond at 6.2 MSE.

¹² »Lager« in the region of Solčava and »Pastierkh Vbieli« (»V Beli« means in Slovene »in (the valley of) Vellach/Bela«).

¹³ See chapters 2.2.2 and 2.5.

¹⁴ On 14 June 1882, e.g., farmers had to take their livestock kept on alpine pastures on the Menina plateau (south of Gornji Grad; Figs. 1, 3) home for a couple of days because on 13 June considerable snow cover formed in altitudes down to about 1100 m a.s.l., locally even some hundreds of meters lower. According to the eyewitness report animals were exhausted when they reached the valley because they were so hungry (ŽA Ljubno, Chronicle, year 1882).

¹⁵ »... diejenigen, so Irer Flür[stlichen] G[naden] [= to the seignury of Gornji Grad where prince bishop of Ljubljana was the feudal lord] dß albm recht reichen, wan ein vngewitter angefallen, ir viechl als vnder ainen schermb herab, wo er [Planinšek] im ain aigenthumb zu rechnet, getriben, dabey solle es noch als von alter heer khumen ist, beleiben«.

ing mostly on the upper part of the north-facing slope of the ridge splitting the region of Solčava and the Remschenig/Remšenik valley (Fig. 3). It extended about 3.8 km in the east-west direction between the forest and the alpine pasture of Rogar on the eastern edge (Fig. 3, no. 54) and Borovnikov vrh or its vicinity on the western edge (Fig. 3). The record on the state of this alp copied in 1677 from an older source,¹⁶ reveals that a third of the territory was entirely **treeless**¹⁷ (StiASP, Eb., B. 4, 689 & B. 183, fol. 88–89) **although** lying much **below the natural upper forest line**¹⁸, proving the human impact. According to the Franciscan Cadastre map pastures extended over quite a similar proportion of the mentioned territory¹⁹, but these were pastures with trees, thus the treeless area was at the time, to which the in 1677 copied inscription refers, probably even greater than in the early 19th century (AS 177, C 101, A01–04; Kärnten Atlas: Franziszeischer Kataster). The mentioned (over)grazing belonged to the ways of creating, or at least, maintaining the extensive clearings.

Slope processes in some cases caused temporal changes in spatial distribution of pastures and meadows. After the medieval colonisation and prior to 1665 accumulation as a result of debris flow covered a nice meadow, a part of Macesnik farm (Fig. 3, no. 55), leading to abandonment of agricultural use of that plot. Combination of archival sources, geological data and geomorphic evidences obtained by field work proved that this meadow lay below the colluvium beneath the ravines that formed on the steep southern slope of Olševa north of Macesnik farmstead (Fig. 3). During heavy rain events regolith carried through stream flow down the steep slope together with material, accumulated in colluvium, and water form alpine debris avalanches which in some cases cover hundreds of meters of gentler slope beneath, apparently also the mentioned meadow (Mrak, Novak, Zwitter forthcoming).

Scythes were probably not available on all the farms in numbers which would have enabled the optimal use of manpower in the period of optimal stage of plant development or even in case of only few days of dry weather in the time of mowing. The number of scythes in those inventories, where they are explicitly recorded (76 % of inventories), ranges between 1 and 4 (StiASP, Eb., A., fasc. 35, L. 11, nos. 112 & 115 & L. 12, no. 7 & L. 13, nos. 13 & 76 & L. 14, no. 141; fasc. 36, L. 15, no. 204; fasc. 38, L. 19, nos. 14 & 59; fasc. 39, L. 21, nos. 15 & 17; fasc. 40, L. 25, nos. 39 & 40; fasc. 41, L. 27, no. 13; fasc. 42, L. 28, no. 24; StLA, GB I, 3388–89, Delšak, Dovník, Prodnik (Jelen), Jerij, Kladnik, Knez, Ložekar, Martek, Rep. Schetty). The quality of the grass cut too late declined, the onset of rainy period made the situation even worse as a great majority of nutrients were lost, the taste declined, in extreme cases the hay could only be used for litter (Pfister 1984, 40–42) or the entire mown grass rotted (Makarovič 1982, 151; author's interview with Ančka and Marija Prepotnik, Haudej farmstead (Fig. 3, no. 37), 21/12/2012). Relevance of this kind of interpretation of farming equipment is attested by the description of the wet year 1882 by local priest who stated that for those farmers who failed to mow and dry enough grass on few appropriate days, there was no opportunity to do it later (ŽA Ljubno, Chronicle, year 1882).

Quantities of **winter fodder** were included in inventories only exceptionally. On Kolar farm (Fig. 3, no. 51) 8 wagons of hay and 9 wagons of straw of various cereal species, but no livestock belonging to the at that time displaced tenant, are recorded in September 1682. 40 wagons of hay are listed in the inventory of Rogar (Fig. 3, no. 54) in September 1688, but only about 12²⁰ wagons in the inventory of Strevc (Fig. 3, no. 52) from the same year, although the herds of both tenants were extremely small as a result of severe economic difficulties. Inventories do not prove reliably whether the »hay« recorded was only hay or hay and straw; in the inventory of Strevc from 1688 only hay is recorded, but in the range of the division of the property hay and straw of the same value as previously »hay« alone are mentioned (StiASP, Eb.,

¹⁶ Probably from 1585 which contains a very similar description of the borders of this alp (cf. Wutte 1924, 102).

¹⁷ »Der drite thaill dises waldts ist bloß, daran khein holz stehet.«

¹⁸ The highest peaks of this ridge only reach 1 500 m a.s.l., natural upper forest line on the nearby Olševa would nowadays lie near 1 900 m a.s.l. (Lovrenčak 2007 [1984], 15–16) thus despite the climatic fluctuations it would not have lain 400 m lower in the 16th or 17th century.

¹⁹ Exact borders of the alp will have to be studied in detail.

²⁰ Only the assessed value (12 fl) is given, not also the quantity, which is computed on the basis of the inventory of Rogar (Fig. 3, no. 54) from the same day.

A., fasc. 40, L. 24, no. 1 & L. 25, nos. 39 & 40). Inventories reveal two ways out if the stocks of fodder were insufficient. One either sold superfluous animals, or let them to farms with enough fodder, which is proven, for instance, by the inventory of Jamnik in 1696, whose debt to the nearby Klemenšek for feeding amounted to 1.33 fl²¹ (Fig. 3, nos. 46, 49) (StiASP, Eb., A., fasc. 42, L. 28, no. 24). Fodder in form of dried tree-leaves recorded in the 17th century judicial source for the nearby Alpine territory (Kotnik 2003, 62) is not mentioned in the inventories, which still does not prove that it was not commonplace. At least some oxen were usually fed better than other animals as they had to be ready for ploughing in early spring (Krausmann 2004, 748, 761; Lerche 1986, 139).

Breeding of different animal species, cattle and sheep were prevailing, enabled better exploitation of natural resources. Cattle prefer grass, sheep prefer forbs (Dodgshon 2011, 153); the latter can graze on pastures not suitable for cattle and in winter they can be fed with fodder of lower quality than cattle (Razvoj... 2011, 55–56). The breeds of domestic animals were not uniform. On the territory observed, a judicial source from 1575 mentions a fair-haired ox with a white patch, a red ox with a white face and patches, a white-and-black ox, a brown ox. Red oxen and a black ox, along with a red pig and a black pig, are recorded in the inventory referring to an isolated farm in the nearby Zadrečka valley from 1614 (Zwitter 2014a, 216; Fig. 3). On Strevc farm (Fig. 3, no. 52) a black heifer is mentioned in 1676 (StiASP, Eb., A., fasc. 39, L. 21, no. 27). 15 »Italian« sheep at Strmčnik near Luče in 1683 (Fig. 3, no. 31 or 32) prove that crossbreeding with Italian sheep occurred as well (Zwitter 2014a, 216).

Trade in livestock played an important role. Every couple of years a pair of fattened oxen was sold from the majority of isolated farms, as suggested by the data for the AU of Luče from 1693 preserved in the archives of the Inner Austrian court's treasury, only taking into account the trade across the border of the land. Additionally, local trade in livestock flourished (Zwitter 2014a, 215).

Although quantities of **cheese** are only recorded in some inventories, they make clear that the provisions of cheese often (almost) ran out before the onset of the next pasturing period, it was not a common strategy to preserve considerable amounts of cheese to cover possible food shortages in the next year. There are 21 pounds (0.56 kg each) of cheese in the inventory from Jerij near Luče from 29 December 1664 (Fig. 3, no. 15), one small cheese in the inventory of Kolar in the region of Solčava from January 1630 (Fig. 3, no. 51), 16 pairs of cheese recorded at Kladnik on 14 May 1613 (Fig. 3, no. 14), 20 pairs of cheese at Martek above Luče on 22 May 1632 (Fig. 3, no. 33), 15 pounds of cheese at the homestead Ložekar near Luče on 31 July 1610 and additional 11 pairs of cheese in the alpine cottage (Fig. 3, no. 11 or 12). Among the debts of the tenant from Rogar farmstead (Fig. 3, no. 54), who was on his deathbed in 1633, there is a debt for 9 pounds of cheese to his brother Kolar (Fig. 3, no. 51) (StLA, GB I, 3388–89, Jerij, Kladnik, Ložekar, Martek; StiASP, Eb., A., fasc. 35, L. 11, no. 112 & L. 12, no. 7).

2.2.2 Agriculture in the context of weather, climate and slope processes

The oldest known tithe register for the region of Solčava contains data from the late 18th century. There are valuable 17th century data on **crops** grown on the observed farms in 14 inventories, listing cereals sown in the harvest time, shortly before it, clearly noting the crops in fields, or shortly after harvest mentioning the sheaves still waiting to be threshed. The inventories reveal that cereals were mostly spring-sown in the 17th century. Only on Macesnik farm (Fig. 3, no. 55), which lies on 1 100 m a.s.l. and does not belong to the highest ones, rye is mentioned in field in the inventory from 7 December 1668. It means that at least a part of rye was autumn-sown there, whereas all the other cereals, and most probably²² the remaining rye, were sown in the spring of 1669 (StiASP, Eb., A., fasc. 38, L. 19, no. 14). Long-lasting snow cover, or its crusted upper part, freeze and drought are some of the factors causing damage on autumn-sown cereals in winter, especially on rye. On the other hand, on the territory where the majority of cereals were spring-sown, autumn-sowing increased the variability of the distribution of climatically

²¹ »Dem Clementschekh an der fuetererj«.

²² According to this inventory the volume of rye grain stored on 7 December was 25 times as high as the volume of the autumn-sown seed.

more sensitive phenophases of cultivars during the year. Autumn-sown crops ripened earlier and were thus independent of weather in September and October when spring-sown cereals were cut. Additionally, if winter caused great damage to autumn-sown crops, there was still time in spring to plough the fields again and sow something else (Pfister 1984, 36, 50). According to the data for the AU of Luče from 1579 cereal production in general did not decline with rising altitude of farms (Zwitter 2014a, 220–21).

The cereal species grown were moderately diverse. The diversity mitigated economic consequences if weather was unfavourable for one or some of them and reduced damage in case of diseases (Vasey 1992, 51). Even if the volume of unit for measuring oats was the same as for other cereals,²³ oat grain held the first place in all the ten inventories²⁴, enabling the calculation of the ratio among the crops sown, harvested or expected to be harvested; in 80 % of these cases the volume of grains of cereal species which held the second place did not reach, or only hardly exceeded, half of the volume of oats. It means that also in seven inventories, referring to the amount of cereals harvested, the prevalence of oats is not just a consequence of weather impact on yield in certain years or in certain microclimates, but it also reflects the predominance of oats among the cereals sown. It played an important role not only in animal, but also in human diet. For instance, a part of food pensions, assured in the inventories of Krofič (1654), Rogar (1676) and Goler (1678) was oats (Fig. 3, nos. 48, 54, 50); oat bread and rye bread were stolen from Macesnik farmstead in 1795 (Fig. 3, no. 55) (StiASP, Eb., A., fasc. 16, Sulzbach; fasc. 35, L. 14, no. 154; 39, L. 21, no. 15 & L. 22, no. 35), according to the mid-19th century data from the parish of Luče oat bread was eaten daily (ŽA Luče, Chronicle, 44). The advantage of oats is its adaptability to insolation, temperature and soil conditions, provided there is enough precipitation. Even in very wet summers the harvest of oats does not decline. Its weakness is the longest growing season among all the spring-sown cereals, preventing its maturity in years with low summer and autumn temperatures or extremely late spring, especially on high-lying farms.²⁵ The harvest of oats can be extremely low in case of drought in the early stages of plant development (Pfister 1984, 37).

Rye or wheat mostly held the second place regarding the volume of grain harvested.²⁶ Frosts in late spring or summer cut the grain growth. In the early autumn, long-lasting rainy periods just before the harvest caused germination of grain on stalks, deteriorating the nutritive value and causing difficulties in storing and baking (Pfister 1984, 36). According to the 20th century observations wheat did not ripen on all the farms every year²⁷ (author's interview with Marija and Jakob Zamernik, farm Sp. Dežman (Fig. 3, no. 27; 15/10/2009), it says in the description of Krofič farm from 1665 (Fig. 3, no. 48) that first snow

²³ See footnotes 38, 39 and note 1 below Table 4.

²⁴ The dates of inventories and quantities of grain recorded suggest the following division of the ten inventories: 1) seed sown: Krofič (3 June 1681; Fig. 3, no. 48), Strevc (6 July 1643; Fig. 3, no. 52), Goler (28 July 1672; Fig. 3, no. 50); 2) cereals harvested or expected to be harvested: Ložekar (31 July 1610: note on the 1610 crop from 10 March 1611; Fig. 3, no. 11 or 12), Strevc (18 August 1676; Fig. 3, no. 52), Rogar (16 September 1688; Fig. 3, no. 54), Kolar (22 September 1682; Fig. 3, no. 51), Jamnik (16 October 1696; Fig. 3, no. 49), Ploder (3 November 1653; Fig. 3, no. 53), and Rogar (4 November 1693; Fig. 3, no. 54) (StiASP, Eb., A., fasc. 35, L. 13, no. 13 & L. 14, no. 141; fasc. 38, L. 19, no. 59; fasc. 39, L. 21, no. 27 & L. 23, no. 27; fasc. 40, L. 24, no. 1 & L. 25, no. 40; fasc. 41, L. 27, no. 13; fasc. 42, L. 28, no. 24; StLA, GB I, 3388–89, Ložekar).

²⁵ Its relevance for the Upper Savinja Valley can be proven by the description of the bad harvest in 1864 in the chronicle of the parish of Luče. Northern winds carrying wet air and precipitation in forms of rain and snow were common in spring, summer and autumn; there was fresh snow cover on the alpine peaks each month. Due to cold weather ripening was delayed and cereals, oats in particular, had to be cut green on the high farms: »*Mensibus vernalibus, aestivalibus nec non autumnalibus flabant frequentes venti boreales, qui offerebant pluvias nivesque, ita ut singulis mensibus per annum alpium cacumina nive dealbata apparuerint ..., maturitas ob defectum calorum insufficientium diu procrastinabatur, ita ut rustici in montanis fruges, praecipue avenam adhuc viridem messuerint*« (ŽA Luče, Chronicle, year 1864).

²⁶ It was rye in four inventories reporting the cereal harvest, in two of them it shared the second place with other cereals (barley or both wheat and buckwheat), in the inventory of Goler from 1672 (Fig. 3, no. 50) the volume of rye seed shared the first place with wheat. Wheat held the second place in at least three cases of reported grain harvest (in the case of the Rogar inventory from 1693 (Fig. 3, no. 54) only oats, rye, wheat and barley are explicitly noted to be still in sheaves, so it is not clear whether the mentioned quantity of buckwheat was also harvested on that farm in that year or not; if we exclude it, this would be the fourth case) once together with both rye and buckwheat. The volume of units for measuring all the cereals is again presupposed to be equal.

²⁷ The information refers, for instance, to the farm Zgornji Špeh south of Luče (Fig. 3, no. 8).

cover often preceded ripening of cereals (Zwitter 2014a, 209). There were examples of massive lodging of cereals still in a sensitive phenophase caused e.g. by an early snow cover. The plants partially recovered, but grain turned black; it was impossible to bake normal bread from it (author's interview with Ančka and Marija Prepotnik, Haudej farmstead (Fig. 3, no. 37), 21/12/2012). When cereals could not ripen in fields but were also not stricken too early, the state of maturity could be partially ameliorated indoors, e.g. by drying it above the hearth (Winiwarter and Sonnlechner 2001, 72) or in an oven (ŽA Ljubno, Chronicle, year 1882); at least drying of wet cereals took place also in attics reached by warmth from hearths or ovens, in case of a house without a separate kitchen also by smoke. Warmth frequently led to undesired effects – grain started to germinate or was attacked by pest (Baš 1984 [1951/52], 105–6). Moreover, the size of successfully dried grain reaped unripe declined (author's interview with Silva Kotnik, Zgornja Štebarska Bajta in Tolsti Vrh, 7 & 9/8/2012). There is scarce evidence of harvestig unripe cereals in parts of western or southern territory of lower Styria in the patrimonial court records of the seignury of Gornji Grad from mid-1680s. The defendant stated in his favour that a member of plaintiff's family was a witch who admitted to have destroyed the bread and to have caused inability to bake bread the whole year long (StLA, GB I 3382, 1079, 1085–86, 1222–23).

Growing of the quickly ripening barley and buckwheat was not so important. Only according to Krofič inventory from 1681 (Fig. 3, no. 48) the volume of seed of the sown barley shared the first place with oats and just in one case, i.e. Jamnik farm in 1696 (Fig. 3, no. 49), barley held the second place regarding the volume of cereals harvested. Barley can be cut the soonest among all the main cereal crops, in some cases 60 days after the sowing. Except for the beginning of the growing season, it prefers cool weather. However, its yields are lower than those of other main cereals and too cold or too wet weather (especially in the summer) as well as inappropriate cultivation caused the greatest damage to it among all the main cereals (Pfister 1984, 37). Buckwheat only held the second place among the cereals sown at Strevc in 1643 (Fig. 3, no. 52), and shared the second place with rye and wheat among the cereals harvested at Rogar in 1688 (Fig. 3, no. 54).²⁸ On Ložekar farm near Luče (Fig. 3, no. 11 or 12) also the quickly ripening millet played a subordinate role in 1610 (StLA, GB I, 3388–89, Ložekar; duration of growing season: Valenčič 1970, 261).

The sowing of mixed cereals is proven, for instance, by the food pension promised in the inventory to the widow and children on Goler farm in 1678²⁹ (Fig. 3, no. 50) (StiASP, Eb., A., fasc. 39, L. 22, no. 35). It took advantage of the fact that owing to changing weather conditions sometimes the yield of one of the cereals from mixture was better, and sometimes the other (Pfister 1984, 50).

The strong dependence on oats was beneficial in very wet years, but especially due to its long growing season it was not always the optimal choice promoting acceptable way of life in the Upper Savinja valley in the late 17th century (cf. Pfister 1984, 59–60). The inventory referring to Strevc farm in 1676 (Fig. 3, no. 52) provides evidence that after harvest cereals were arranged in stacks and left in field to dry (StiASP, Eb., A., fasc. 39, L. 21, no. 27). If we compare the numbers of stacks of different cereal types at Strevc in 1676 with the quantity of stacks recorded in tithe registers from 1789–1792³⁰ (ZAC 536, box 84, tithe registers for Sv. Duh 1789–1792³¹), a vast difference is noticeable. Taking the number of oat stacks of each year as 1, the ratio of numbers of stacks of oats, barley, rye, wheat and buckwheat in 1676 was 1 : 0.15 : 0.5 : 0.75 : 0, however, in 1789–1792 it was 1 : 0.28–0.67 : 0–0.29 : 0–0.05 : 0–0.15. Thus an increase of

²⁸ For the case of Rogar in 1693 see footnote 3 and 26.

²⁹ Whereas the mentioning of the mixture in the food pension is obvious, it is not clear if »*Mischet getrajdt noch in garmen*« referring to the whole cereal harvest of 1678 on Goler farm really characterizes cereals sown mixed or just different kinds of cereals were assessed together (StiASP, Eb., A., fasc. 39, L. 22, no. 35).

³⁰ It is clear from the sources referring to exactly the same tithe registers though preserved in different archives that the whole harvest of cereals is recorded, including those grown as swidden cultivation (NŠAL 20, box 68, Tithes: generalia, 1557–1795: *Eintheilung der staats herrschaft Oberburger[isch]en weinn, und getraid zehende, wie solche zur versteigerung vorgeschlagen werden könnten* [1789], 2).

³¹ The names of homesteads are not listed in these tithe registers, so the identification of house number (13) was done according to the contemporary Josephinian cadastre (AS 1110, Oberburg, CM Hl. Geist, Subrepartition Summarium).

the field proportion under the cool-liking and quickly ripening but sensitive barley, along with a strong decline of wheat and rye production, was characteristic at least for this farm.

The inventory referring to the farm Kladnik near Luče (close to 800 m a.s.l.; Fig. 3, no. 14) gives insight into the **sowing dates**. Before 14 May 1613, when the possession was inventoried, oats, rye and wheat had been sown, whereas two other cereal species stored, barley and buckwheat, had not been sown yet (StLA, GB I, 3388–89, Kladnik). For wheat and rye autumn- or spring-sowing would be possible. Climatic data of Thomas Chrön/Hren, bishop of Ljubljana, partially based on weather observations from the Upper Savinja valley, reveal that the winter 1612/13 was extremely mild, almost without snow even in the mountains. The next winter was entirely different, lasting from the end of November for almost five months, and unusually cold weather continued up to the middle of May (Zwitter 2013, 341–44, 372–75). The comparison of sowing dates according to the mentioned Kladnik inventory with the sowing rules from the 20th century³² reveals that it was hardly possible to sow oats in 1614, at least on the high farms.

Like scythes, also **sickles** were probably not available on all the farms in numbers which would have enabled the optimal use of manpower in the period of optimal stage of plant development or even in case of only few days of dry weather in harvest time. The number of sickles in those inventories, where they are explicitly recorded (55 % of inventories), ranges between 2 and 8 (StiASP, Eb., A., fasc. 35, L. 11, no. 112 & L. 12, no. 7 & L. 14, no. 141; fasc. 36, L. 15, no. 204; fasc. 38, L. 19, no. 14; fasc. 39, L. 21, no. 15; fasc. 40, L. 25, no. 40; fasc. 42, L. 28, no. 24; StLA, GB I, 3388–89, Delšak, Dovnik, Prodnik (Jelen), Jerij, Kladnik, Knez, Ložekar, Martek, Rep, Schettej).³³ The »strosengsen«, »scythe for straw« in the inventory of Rogar from 1688 (Fig. 3, no. 54), but also an exceptional recording of a »strogabl«, »strawfork« in the same source (StiASP, Eb., A., fasc. 40, L. 25, no. 40), most probably means that reaping was carried out at hight so that the straw had to be cut additionally.³⁴

Cereals were arranged in **stacks** to dry as mentioned explicitly in the 1676 Strevc inventory (StiASP, Eb., A., fasc. 39, L. 21, no. 27). Its duration depended on weather, but lasted one or two, often three weeks (Medved 1961, 148; Predan 1956, 29; Petek 2007, 52; author's interview with Marija and Jakob Zamernik, farm Sp. Dežman, (Fig. 3, no. 27), 15/10/2009). Penetration of water into the interior in case of rainy weather was to a considerable degree prevented as the form of a stack promoted water to flow off along the exterior. Still, in case of a several-week-long rainy period in early autumn, the quality of grain and straw declined sharply and putrefaction began, grain started to germinate in sheaves (Pfister 1984, 120). Putrefaction of cereals e.g. destroyed the majority of harvest on high farms in the region of Ljubno in the wet year 1882 when only few grain dried indoors was saved (ŽA Ljubno, Chronicle, year 1882). Very wet summers promoted growth of grasses and other weeds in cereal fields; they were not removed at reaping, which, additionally, caused a prolonged period needed for sheaves to dry. Oat fields were most prone to weeds (author's interview with Silva Kotnik, Zgornja Štebarska bajta in Tolsti Vrh, 7 & 9/8/2012) – the very long growing season of this crop was thus in the case of a wet year followed also by a long drying

³² The main cereals had to be sown before 25 May, otherwise they did not ripen, the oats was to be sown first (author's interview with Jakob and Marija Zamernik, Sp. Dežman farmstead (Fig. 3, no. 27) on 1 040 m a.s.l., 15/10/2009). The same date, 25 May, was considered a deadline to sow oats in the region of Solčava – harvest would have declined, if it had been sown later (Vršnik 2005, 171). Buckwheat was mostly sown at the beginning of June on the highest fields (author's interview with Ančka and Marija Prepotnik, Haudej farmstead (Fig. 3, no. 37), 21/12/2012), with increasing risk of a harvest failure, they sowed it in the region of Solčava until early July (Vršnik 1962, 23).

³³ According to ethnological data also implements from other farms were used to some extent as the cereals do not ripen at all the farms at the same time, thus the equipped manpower could be invited or even the implements lent (Makarovič 1979, 33, 35, 135).

³⁴ Both possibilities of traditional cereal harvest were mentioned by A. Heiss in the lecture Archaeobotany: Theory, Methods, and Application. The other less likely possibility is to translate the term in quotes as cradle. In comparison with sickle it would be an advanced method of reaping, known to have been used in oat fields in a part of the Alps in the 16th century already. Nonetheless, Oskar Moser could not find any older than 18th century examples in the inventories from Carinthia and it was not before the 19th century that reaping with cradle became the predominant way of cereal harvest in that neighbouring province (Moser 1984, 217–18, 222, 230, 232, 239–43). According to data from 1880s cradle was not used in the region of Solčava (Janisch 1885b, 1043) and an ethnological survey of southern part of the region of Luče states that sickle was the only piece of reaping equipment until mechanization (Petek 2007, 51).

period. Excessive damage was many a time a consequence of storms when strong winds destroyed stacks causing losses of grain which fell off when wind deposited the sheaves, at the same time allowing rain to soak them. Considerable damage to cereals in stacks was sometimes caused by mice as well (author's interviews with Ančka and Marija Prepotnik, Haudej farmstead (Fig. 3, no. 37), 21/12/2012 and with Marija and Jakob Zamernik, farm Sp. Dežman (Fig. 3, no. 27), 15/10/2009).

Table 4: Approximate nutritive value (in gigajoules) of cereals in the inventories referring to three isolated farms with the exception of the inventories near the harvest time. Names of the farms are stated in brackets. The coefficient »a« stands for the share of a hectolitre represented by one Vierling.³⁵

Low stocks	Medium stocks	High stocks
(7 to 8)a GJ (Kolar 18/12/1649) (Fig. 3, no. 51)	(10 to 11)a GJ (Rogar 1/3/1633) (Fig. 3, no. 54)	(67 to 77) ² a GJ (Macesnik 7/12/1668) (Fig. 3, no. 55)
(5 to 6)a GJ (Kolar 6/1/1630)	(13 to 15)a GJ (Rogar 9/3/1676)	(45 to 52)a GJ (Rogar 3/1/1659)
(2 to 3)a GJ (Kolar 9/3/1676)		

Sources: StiASP, Eb., A., fasc. 35, L. 11, no. 112 & L. 12, no. 7 & L. 13, no. 76; fasc. 36, L. 15, no. 204; fasc. 38, L. 19, no. 14; fasc. 39, L. 21, nos. 15 & 17.

- ¹ The left value in Table 4 always represents the result if the *Vierling* (unit of volume) was uniform for all types of cereals, whereas the right value takes into account the seigneurial data from Griffen/Grebinj, where 1 *Vierling* of oats was equal to 1.28 *Vierlings* of the other cereals (Dinklage 1966, 102). The use of preposition »to« instead of »or« according to the data from footnote 39.
- ² For cereal mixture in this case representing a part of the cereal stocks only at Macesnik (Fig. 3, no. 55) the average nutritive value per *Vierling* of oats and rye as cereals with low nutritive value per unit of volume was taken into account in order to prevent exaggerated numbers.

Table 4 enables an insight into different **cereal stocks**. The ratio of cereal stocks in both inventories from December, i.e. of tenants Kolar and Macesnik, is 1 : 10. Despite the probably different demographic situation, it is clear that there were long-term cereal stocks on the extremely well-situated Macesnik farm. In spite of previous successive bad harvests,³⁶ the inventory nonetheless reveals that the farm was well capable of buying victuals, if needed. A considerable part of the stocks could also be stored to prevent possible shortage in case of further bad harvests. On the other hand Kolar farm is a representative of farms that in the 17th century often did not manage to store additional quantities of cereals, which caused higher climate and weather vulnerability of their inhabitants. It is proven by the repeatedly low values in Table 4, suggesting that the quantity of grain was not in exceptional cases around the zero point, at least at the onset of the harvest, unless additional grain was borrowed or purchased. The inventory of Kolar from 1630 proves his debt to Močnik in St. Stefan/Šteben in Jauntal/Podjuna in Carinthia for 1 *Schäfl* of wheat (StiASP, Eb., A., fasc. 35, L. 11, no. 112), scarcely revealing the existing connections of mountain farms with distant flatland characterized by much more favourable conditions for cereal growth. The priest from Solčava was forced to buy cereals each year during the bad harvests in the mid-1660s (NŠAL, KAL, fasc. 43, U 25, visitation proceedings, parish of Solčava, 1668). Visitation proceedings for the parish of Solčava in 1696 report frequent purchases of cereals in Eisenkappel/Železna Kapla in that year

³⁵ Volume weight and nutritive value of rye (70 kg/hl, 11 MJ/kg), oats (44 kg/hl, 15 MJ/kg), wheat (75 kg/hl, 12.7 MJ/kg) and barley (62 kg/hl, 13.2 MJ/kg) according to Krausmann 2008, Table 13—rough estimations especially due to the time space (the values of volume weights are divided by 10 as there is a lapse in unit of volume weights in the work quoted: it is kg/1000 litres, not kg/hl). The volume weight of buckwheat (72 kg/hl) calculated from data published by Dinklage 1966, p. 102 and its nutritive value (14 MJ/kg) from Nutrition facts: Buckwheat flour: whole-groats—a rough estimation, affecting the results only slightly due to the subordinate importance of buckwheat. Volumetric conversion from *Schaffel/Schäffel* to *Vierling* (for barley (*schl.*) at Rogar 1676, rye, wheat and buckwheat (*schäfl*) at Kolar 1630 (Fig. 3, no. 51), wheat, buckwheat and barley (*schäfl, schaffl*) at Rogar 1633) 4 : 1 according to the seigneurial data from Griffen/Grebinj (Dinklage 1966, 102).

³⁶ See chapter 2.5.2.

because of harvest failures³⁷ (NŠAL, KAL, fasc. 166, U 2–3). Loaning of cereals also took place among mountain farms. The inventory of Rogar from 1688 (Fig. 3, no. 54) proves his debt to »Potuetschnigg«, i.e. most probably his neighbour Potočnik, for 1 *Vierling* of oats (StiASP, Eb., A., fasc. 40, L. 25, no. 40). The data on Rogar from Table 4 provide a basic insight into the changing cereal stocks influenced by a combination of environmental and also human factors, the latter include breeding of a mare and two colts as important oats consumers in 1659, which represents an exception in the observed farms that should be noted; but a mare had also been kept there in 1633 (StiASP, Eb., A., fasc. 35, L. 12, no. 7; 36, L. 15, no. 204). Stocks of victuals had to be stored on safe locations (Haberl et al. 2009, 3). In order to mitigate the risk of burglars the tenant from the Krofič farmstead (Fig. 3, no. 48) bought a double lock for the granary at the end of the 17th or in the early 18th century (StiASP, Eb., A., fasc. 45, L. 34, *Verzaichnuß*).

In order to obtain a better insight into the quantities of **home-grown cereals**, six 17th century inventories from the seignury of Eberndorf/Dobrla vas in the region of Solčava were analysed, dating from 18 August to 4 November and containing detailed data on cereals in fields or in sheaves shortly after harvest (StiASP, Eb., A., fasc. 35, L. 14, no. 141; fasc. 39, L. 21, no. 27; fasc. 40, L. 24, no. 1 & L. 25, no. 40; fasc. 41, L. 27, no. 13; fasc. 42, L. 28, no. 24). They reveal that importance of local cereal production was considerable. The rough approximation as result of a computation based on a series of presumptions³⁸ is that about 2.9 to 3.5 (1.8 to 2.1)³⁹ people could live on four of these six farms not suffering from malnutrition if one takes into account only the nutritive value of home-grown cereals. It is the case of Ploder farm in 1653, Strevc in 1676, Rogar in 1688 and Jamnik in 1696 (Fig. 3, nos. 49, 52–54); also animal products were definitely very important but were excluded from these calculations in order to assess local cereal production. Using the same method, the cereals harvested at Rogar in 1693 would have even sufficed for sustaining 5.5 (3.4) people,⁴⁰ which is evidence for an at least not too bad harvest of oats, barley and wheat,⁴¹ unlike the bad harvest in 1682 proven by Kolar's inventory (Fig. 3, no. 51), at least of oats, unless it was a consequence of specific demographic situation; home-grown cereals would only suffice for 1.2 (0.8) persons there. The sample is small, some of the presumptions may not be entirely accurate, precise demographic data for the same farms from the same time are lacking, the same goes

³⁷ It is reported in an exaggerated way—the reason why only very few people came to church in Solčava on Sundays should be that they had to go to Eisenkappel/Železna Kapla in order to buy cereals due to the great scarcity of that year. They visited the mass there: »*Parochiani hoc anno ideo rarioris comparuerunt diebus dom[inicis], quia plures coemendis granis in huius anni universali penuria Capellam excurrere debebunt, ibidemque missas interfuerunt*«. But it is most probably true that people from each farm had to visit this market-town many times because the journey was long, it took about 5 hours in each direction and it included considerable difference in altitude (passes in the north of the region of Solčava lie at about 1400 m a.s.l., Eisenkappel/Železna Kapla at about 550 m a.s.l.). However, it did not represent a severe obstacle for food supply. It was e.g. common for women in the 19th century to walk from the region of Solčava to Eisenkappel with empty vessels and to return in the same day carrying 30 kg and more commodities bought there (Vršnik 2005, 56–57; cf. author's interview with Marija and Jakob Zamernik, farm Sp. Dežman (Fig. 3, no. 27), 15/10/2009).

³⁸ 1) Volumetric conversions: 1 *Vierling* = 4 *Schaffel* = 75 litres for all the cereals except for oats, for which 1 *Vierling* = 5 piled *Schaffel* = 96 litres. These were the relations according to seigneurial data from Griffen/Grebinj (Dinklage 1966, 102) and it is only a possibility that equal or similar conversion factors were in use in the seignury of Eberndorf/Dobrla vas. 2) Volume weight and nutritive values as in Table 4. 3) A rough estimation for the daily food requirement is about 9 MJ per person; this value has not been constant, e.g. due to the fact that average height of people has changed, due to different amount of physical work etc. (Krausmann 2008, 13, 30). 4) A third of the grain was subtracted before the computation as a possible amount preserved for seed.

³⁹ For numbers in brackets the conversion 1 *Vierling* = 50.9 litres and 54 litres for oats was used—in accordance with information referring to Villach/Beljak in 1543. According to data from the same year the volume of a *Vierling* in St. Veit an der Glan/Št. Vid ob Glini (59.6 litres, approximately 76 litres for oats), or Klagenfurt/Celovec (71.9 litres, again approximately 76 litres for oats) lay in between the numbers for Villach/Beljak (Vilfan 1954, 73) and the mentioned data for Griffen/Grebinj.

⁴⁰ In reality it was surely not entirely used for human consumption as a mare is proven at that farm by the same inventory. The buckwheat was not taken into account as it is not mentioned whether it was in sheaves or not.

⁴¹ The grain harvest on this farm in 1688 was 6 *Vierlings* of oats, 5 *Vierlings* of rye, 5 *Vierlings* of wheat, 1 *Vierling* of barley, 5 *Vierlings* of buckwheat (StiASP, Eb., A., fasc. 40, L. 25, no. 40) and most probably the harvest of oats, rye and wheat, assured for the food of the retired couple (StiASP, Eb., A., fasc. 39, L. 21, no. 15). But it was at least 25 *Vierlings* of oats, 4 *Vierlings* of rye, 9 *Vierlings* of wheat, 4 *Vierlings* of barley in 1693 if it really is the same farm (StiASP, Eb., A., fasc. 41, L. 27, no. 13).

for the quantity of grain stored from the previous years as well as for the following. Setting the data from the inventories of Rogar 1688 and Jamnik 1696 (Fig. 3, nos. 54, 49) into context reveals that at least the harvest of some basic cereals in both years was very bad, but in these cases the whole harvest was by no means lost. Holistic mentioning reveals that 27 *Vierlings* of cereals were harvested at Strevc (Fig. 3, no. 52) in 1676 as compared to only 20 *Vierlings* in 1688, i.e. a quarter less. Additionally, the fact that oats, rye, wheat and even buckwheat and barley were still in field⁴² on 16 September 1688 reveals that the ripening of cereals was late that year (StiASP, Eb., A., fasc. 39, L. 21, no. 27; fasc. 40, L. 25, no. 39); in the 1950s spring-sown oats were cut there on 5 September (Meze 1963, 234). The at-first-glance-considerable cereal harvest at Jamnik in 1696 is possibly the consequence of the above-average field acreage of this farm,⁴³ according to the data from 1665, but yokes as units of area in the 17th century cannot be easily transformed to objective units.⁴⁴

Grain had to be milled, at least mostly, by means of water power. Some mills of isolated farms were inoperable a couple of winter months due to ice and snow cover (Struna 1955, 28), operating period of some others was restricted because of insufficient volumetric flow rates of brooks (Melik 1953, 5). It refers e.g. to the mill of Krofič farm in mid-1660s (Fig. 3, no. 48) (StiASP, Eb., B. 4, 689).⁴⁵ The analysed inventories contribute to the history of mills in two ways; firstly, they give us a better insight into the territorial distribution of usable mills and its changes in time. Secondly, the values attributed to milling equipment, as well as its rarely explicitly recorded state, enable conclusions about the very different quality and even technical characteristics of mills on, in some cases, neighbouring farms. The density of mills on the territory of isolated farms varied considerably. Whereas there was a mill on every fourth farm, at the very most, in the AU of Luče in the seigneurie of Gornji Grad in 1581, as revealed by judicial sources, three quarters of the eight farms of the seigneurie of Eberndorf/Dobrla vas in the region of Solčava possessed a mill in 1665. The register from 1542 made for taxation purposes mentions only 3 or 4 grain mills on the isolated farms in the AU of Luče; the land register from the early 17th century just lists 6 grain mills in this entire AU.⁴⁶ Despite the fact that the number of preserved inventories of isolated farms in the AU of Luče from the early 17th century is extremely low, the inventory of Ložekar (Fig. 3, no. 11 or 12) from 1610 records a mill not mentioned in the contemporary land register (Zwitter 2014a, 226). The inventory reveals the existence of milling equipment on Strevc farm in 1688 (Fig. 3, no. 52) where it is not mentioned in the description from 1665. On the other hand the mills mentioned on two farms in 1665 were not usable some decades later: Goler's mill lay broken in 1678 and the pair of millstones at Jamnik were entirely worn out and thus rendered useless in 1696 (Fig. 3, nos. 50, 49) (StiASP, Eb., A., fasc. 39, L. 22, no. 35; fasc. 40, L. 25, no. 39; fasc. 42, L. 28, no. 24; Eb., B. 4, 687–89).

The fact that the majority of mills on observed isolated farms were driven by small brooks on steep slopes assures that the form of waterwheel was either overshot or breastshot, but not undershot (Melik 1953, 5). Exceptionally, inventories contribute to the knowledge whether vertical-wheeled or horizontal-wheeled watermills were in use. In the former group a pair of cogwheels transmits the energy from the horizontal axle of the vertical waterwheel to the vertical spindle, driving the millstone above. The latter group is simpler, without gearing. The horizontal waterwheel lies beneath the millstone; they are

⁴² »Ansaath alß waizen, roggen, haiden, vnd habern, vnd gersten, ist noch am feldt stehendter zusammen geschätzt worden.« It is not clear, whether some of them had been cut and were only drying in fields at that time. But due to the great differences in time between sowing and harvest it could not be the case for all the species.

⁴³ The fields of Jamnik and Krofič (Fig. 3, nos. 48, 49) occupied 5 yokes as compared to 4 yokes of Macesnik (no. 55), 3.5 yokes of Rogar and Kolar (nos. 54, 51), 3 yokes of Ploder and Goler (nos. 53, 50). For Strevc (no. 52) the information is corrected from 6 to 2 yokes either in order to correct a lapse or to mark a later change (StiASP, Eb., B. 4, 685–89).

⁴⁴ The analysis of sources from the same seigneurie referring to Jauntal/Podjuna showed that a seventeenth-century yoke was not a constant unit of measurement: the biggest yokes were multiples of the smallest ones. Moreover, numerous yokes measuring close one hectare (representatives of bigger yokes) suggest that tenants tended to hide a part of the land by claiming that the surface in question equalled to less yokes than in reality (Zwitter 2015, 384–97).

⁴⁵ »Hat sein haußmüll mit 1 lauffer aber offft kein wasser«.

⁴⁶ For reasons of incompleteness of the numbers of mills recorded in sources mentioned here but also in other sources see Zwitter 2014a, 225–26.

connected and both move in the same direction. It is much easier to construct, it requires little and easy maintenance, yet it often represents a less efficient way of use of water power. However, the efficiency depends on construction details and brook characteristics. Both forms were in use for centuries (Lucas 2011, 15–17, 30–31, 34–37, 40–41, 61); a mill with horizontal waterwheel was ethnologically documented in the Alpine settlement Srednji Vrh in the Upper Sava Valley (Bogataj 1989, 84). Whereas milling equipment is often only assessed together without listing its components, or just millstones and iron are explicitly noted, there are »2 par räder mit zäkherl« in the inventory referring to Rogar farm in 1693 (Fig. 3, no. 54) (StiASP, Eb., A., fasc. 41, L. 27, no. 13). Should we understand it as two pairs of cogwheels, it would make sense to connect them with the also mentioned milling equipment, which would prove that the possibly more effective, yet a more complicated form of use of water power, was characteristic at least for some mills on the isolated farms.

The values attributed to the articles make possible certain conclusions regarding their outlook and quality (Pöttler 2000, 273–74, 278). Milling equipment is recorded in eight inventories of six farms of the seignery of Eberndorf/Dobrla vas in the region of Solčava; the value ascribed to it differed from 1 fl of the broken mill of Goler in 1678 (Fig. 3, no. 50) or 1.5 fl of Kolar's mill in 1676 (Fig. 3, no. 51) to 5 fl at Rogar in 1693 (Fig. 3, no. 54) or 5.5 fl at Macesnik in 1668 (Fig. 3, no. 55), the last two having been surely good constructions in comparison with those of the neighbouring farms, but still not comparable with the equipment of grain and sawmill of Gubanc farm near Eisenkappel/Železna Kapla (Fig. 3, no. 68), 1706 together assessed to 20 fl (StiASP, Eb., A., fasc. 36, L. 15, no. 204; fasc. 38, L. 19, no. 14; fasc. 39, L. 21, nos. 15 & 17 & L. 22, no. 35; fasc. 40, L. 25, no. 39; fasc. 41, L. 27, no. 13; fasc. 42, L. 28, no. 24; fasc. 44, L. 32, no. 24).

Especially on the common steep grain fields, a combination of natural and human-induced or -accelerated **slope processes** took place. Ploughing following along the contour of the slope is the only possible way of ploughing steep fields as animals cannot draw ploughing implement uphill (Sadar 1953, 107). At the same time it is a slope processes slowing strategy (Winiwarter and Sonnlechner 2001, 23) because the furrows lie rectangularly to the direction of downhill water flow. Still, agriculture contributed an essential part to slope processes, soil used to be heavily exposed especially from the ploughing date up to the time when plants reached the growth stage, severely reducing the effect of rain drops, at the same time binding the soil by the root system. Additionally, soil was relocated downhill during each ploughing. Despite the possibility of upslope soil transport, from several metres up to several tens of metres high accumulations at the foot of the former steep fields (Medved 1961, 146; author's fieldwork minutes, autumn 2009) speak for prevalence, several centuries long, of soil downhill transport. Ploughing, not only hoeing, was commonly practised in the 17th century Upper Savinja valley. 23 of 32⁴⁷ inventories of tenants list at least one ploughing implement, or a part of it, and in further 5 inventories it could be a part of the not clearly defined objects assessed together (StiASP, Eb., A., fasc. 35, L. 11, nos. 112 & 115 & L. 12, no. 7 & L. 13, nos. 13 & 76 & L. 14, nos. 141 & 154; fasc. 36, L. 15, no. 204; fasc. 38, L. 19, no. 14; fasc. 39, L. 21, nos. 15 & 17 & L. 22, no. 35 & L. 23, no. 27; fasc. 40, L. 25, nos. 39 & 40; fasc. 41, L. 27, no. 13; fasc. 42, L. 28, no. 24 & L. 29, no. 20; StLA, GB I, 3388–89, Delšak, Dovnik, Prodnik (Jelen), Jerij, Kladnik, Knez, Ložekar, Martek, Rep, Schettej). For the history of erosion it is important if the ploughing implements were ards mainly scratching the soil, or ploughs, turning the soil and thus accelerating its downslope transport more heavily. On steep fields even ards often turned, not only scratched the soil, but its downhill transport was still less accelerated than in the case of ploughs (Orel 1955, 53, 56). Ards and ploughs are listed in the inventories, but Oskar Moser's recommendation of caution while studying the inventories from southern Carinthia fits also to the area observed here. The fact that Slovene language of the assessors used to be translated, as inventories are written in German, could have caused confusion regarding the expressions for ploughing implements (AISN, B. O., box 4, Ard and plough, note of Dr. Moser's pers. comm. to Dr. Kuret, 5/1/1961). The specific construction details of ploughing implements proven before

⁴⁷ The inventory of Ploder from 1677 was excluded as it does not reflect the entire situation on the farm at that time—see footnote 97.

the end of the 19th century could cause further problems. At that time ploughing implements on the observed territory were ards, but the coulter was mostly not built in the ard construction so that two sets of animals were needed for ploughing—the first one only drawing the coulter, the second one the ard (Orel 1955, 51–56). The existence of this type of ploughing implements is attested by Kolar inventory from 1630 (Fig. 3, no. 51), listing »ain arl vnd ain vorschneideisen« (StiASP, Eb., A., fasc. 35, L. 11, no. 112). On the other hand, it is not certain whether »I arl vnd pflueg« recorded in the inventory of Strevc from 1643 (Fig. 3, no. 52) (StiASP, Eb., A., fasc. 35, L. 13, no. 13) refer to an ard and a plough, they could also only stand for an ard and a coulter.⁴⁸

As one century represents the timeframe observed, soil is a non-renewable resource (Winiwarter and Sonnlechner 2001, 16). Management of steep agricultural land was in some cases in pronounced discordance with the changing environment and unsustainable.⁴⁹ Data on damage caused by slope processes culminate at the end of the Late Maunder Minimum; nonetheless there is no reliable evidence that slope processes at that time in fact caused severer difficulties than in the 17th century. Fluvial erosion caused great damage to Rogar farm in the early 18th century (Fig. 3, no. 54), in 1709 at the latest; tenant's annual pecuniary dues and taxes were reduced by 4 fl, until the damage was recovered;⁵⁰ this sum, for instance, amounted to almost a fifth of pecuniary dues and taxes of this farm in 1710 (StiASP, Eb., B. 8, 454 & the added sht. s.p.; StiASP, Eb., B. 151, 1029). The reduction lasted at least up to 1715. A considerable extent of fields is most probably proven there by the harvest data in the inventory from 1693. A source from 1711 proves that also the neighbour Ploder (Fig. 3, no. 53) was stricken by fluvial erosion and also his annual pecuniary dues and taxes except for the low tax on meat were temporarily reduced by almost one fifth – to 15 fl (StiASP, Eb., B. 8, 455; StiASP, Eb., B. 151, 1029–31). Between 1714 and 1719 »wasser gus vnd lähnen«, landslides⁵¹ and running water, possibly forming gullies, caused extensive damage to Spodnji Jamnik and Zgornji Jamnik above Luče (1 160 m a.s.l.) (Fig. 3, nos. 22, 23) or to undivided Jamnik and a half of Cahovnik farm (Fig. 3, no. 24), whose agricultural land partly lies on the slope beneath; their pecuniary dues and taxes⁵² were severely reduced due to this extreme circumstance (NŠAL 20, box 62, Land register 1720, AU of Luče; NŠAL 20, box 63, Land register 1719, AU of Luče; NŠAL 23, box 48, Land register 1714, AU of Luče). A landslide or, less probably, an avalanche⁵³ caused great damage to Oprešnik isolated farm near Solčava (Fig. 3, no. 38) between 1714 and 1719; peasant's burdens listed in the land register were reduced by approximately one third, to 8 fl. Between 1714 and 1718 landslide(s)⁵⁴ or avalanche(s)⁵⁵ caused, or at least contributed to the economic collapse of the isolated farm Navršnik (Fig. 3, no. 47). Navršnik's pecuniary dues and taxes were reduced, but still, the neighbour Klemenšek

⁴⁸ This kind of mistake was made by Jakob Medved, characterizing the separate coulter as »an implement, similar to an ard« (Medved 1967, 31).

⁴⁹ Data on consequences of a severe storm with excessive rainfall in the night 29–30 October 1926, when cereal production was still important in the territory dealt with, helps us understand the early modern conditions. According to journalist's note mentioning the damage caused to Bukovnik farm (Fig. 3, no. 62), there occurred 11 landslides on the fields (ŽA Luče, Chronicle, year 1926); some fields of this farm were so steep that they were hoed, not ploughed (Meze 1963, 243–44).

⁵⁰ »Gnädiger nachlaß weegen wasser schadens, so ihme seinen grundt hinwekhgerüssen 4 fl./ so lang biß diser schaden verwachsen wirth« (StiASP, Eb., B. 8, 454). In the mountainous part of the Vellach/Bela drainage basin (Fig. 3), damage caused by fluvial erosion is attested e.g. in 1708 and again in 1709 (StiASP, Eb., B. 151, 69).

⁵¹ The term »lähn« can also refer to an avalanche (Rohr 2007, 400) but in this case »wasser gus vnd lähnen« acted (almost) at the same time. Additionally, a source from the Upper Savinja Valley from 1843 mentions »erd- und schneelehnen« (StLA, A. Göth Georg Nachlass, fasc. 39, bundle 792, Beschreibung des Bezirkes Oberburg 1843, 1) thus both meanings are possible.

⁵² Arguments for this interpretation, based on archival sources, see in Zwitter 2015, 189–90.

⁵³ »Dissen grundt hat der lähn ruiniert« (NŠAL 20, box 63, Land register 1719, AU of Solčava). Comparison with information from 1896, when a landslide allegedly moved the house of this farmstead (ŽA Nova Štifta, Chronicle of Solčava parish, 145), speaks for a landslide.

⁵⁴ The same content is recorded in the land registers from 1719 and 1720, in the former in singular (*lahn*), in the latter in plural form (*lähnen*), but the listing of equal tax reduction does not prove the thesis of one landslide/avalanche followed by another one(s) in the next year; it can also only be a lapse.

⁵⁵ It is a fact that avalanches in some winters occurred on steep agricultural fields, e.g. on 17 January 1891 when an avalanche killed two people from the farmstead Ramšak north of Ljubno (Fig. 3, no. 21) who were trying to make the path below steep fields passable (ŽA Ljubno, Chronicle, year 1891).

(Fig. 3, no. 46) bought that farm and started to pay the slightly reduced pecuniary burdens for it in 1718 (NŠAL 20, box 62, Land register 1720 & box 63, Land register 1719; NŠAL 23, box 48, Land register 1714, AU of Solčava). The relatively high extent of fields of the nearby Jamnik farm (Fig. 3, no. 49) in the 17th century was already mentioned. A source from the mid-1740s records great damage caused to them by water⁵⁶ (KLA, Theresianische Rektifikationen, fasc. 114/3, Protocoll der neÿ machenten fassion no 15, p. 38). Apart from erosion, along with the less evident raindrop impact, surface wash, throughflow and soil creep forced abandonment or extensification of use of a part of the agricultural land, especially if soil was also drawn down-hill by ploughing. In the cadastral municipality Sv. Duh, covering the western part of the region of Solčava, for a parcel in possession of the tenant Covnik (Fig. 3, no. 43) the Josephinian cadastre from the late 1780s explicitly mentions its former use as field, but it could by then not be used as field any more because the soil had gone too shallow.⁵⁷ There are other instances in the same cadastral municipality where similar course of soil history can be presumed, mentioning parts excluded from the field parcels because the soil shallowness would not allow their use as fields. On some fields, for instance, field no. 193, a part of Pastirk farm (Fig. 3, no. 45), the impact of slope processes reached a high degree by the late 18th century as the steepness of the field and at the same time thin soil, negatively affecting the yields, are recorded (AS 1110, Oberburg, CM Hl. Geist, Fassion, esp. nos. 193, 263). Due to the time lag, the Josephinian cadastre cannot reveal the fields abandoned in the 17th century, but it proves that slope processes led to abandonment of some former fields in the area observed in different times of soil history, forcing farmers either to intensify land use on another part of the farm, e.g. forming new permanent fields, or extending the swidden cultivation or, if it was not possible, to reduce the total field extent.

2.3 Non-agricultural sources of income and food revealed by inventories

Hunting represented an additional source of income, food and other animal raw materials. According to Rösener weapons, for instance a halberd or a lance, were present on many farms in Europe in the 18th century. Weapons served herdsmen to defend the herd against attacks of wild beasts or dogs but were also used in peasant quarrels (Rösener 2007, 107, 117). According to data referring to the neighbouring Carniola, many simple men served abroad as soldiers in the 17th century (Valvasor 1689, II, 103) and a sabre at the Robnik farmstead (Fig. 3, no. 61) was labelled as »Turkish« in mid-20th century (SEM, Documentation, Collection of individual researches, B. O., notebook VI/23, 19); per chance not groundlessly.

A part of hunting activities was carried out legally. According to the hunting ordinance from 1539, each of the foresters of the seignury of Gornji Grad had hunting privileges in the forest under his control (NŠAL 20, box 74, hunting ordinance 1539). Various sources from the 17th century prove that lists of people from isolated farmsteads situated in the AUs of Luče and Solčava, whom hunting represented a source of legal income, were not constant (e.g., NŠAL 20, box 29, account 28 December 1663–28 December 1664; NŠAL 20, box 39, account 1 April 1681–31 March 1682, *Außgab auf allerley wiltbräth oder jagerreht*). E.g., on the list of people paid for their quarry by the administration in Gornji Grad in the year 1681/82 (for instance 0.4 fl for a chamois, 2/3 fl for a wolf fur, 1.5 fl for a deer), there are up to eight last names suggesting that these hunters might have come from isolated farmsteads in the AUs of Solčava and Luče in the seignury of Gornji Grad.⁵⁸ Additionally, the tenant of the seignury of Eberndorf from Krofič farmstead (Fig. 3, no. 48) is explicitly listed there. 6 chamois, 5 deer, a bear, a wolf, 3 specimens of

⁵⁶ »Disse akher haben von dem wasser grossen schaden geliten.«

⁵⁷ Describing field no. 263: »Ein acker Dovga Niva [the name quoted means Long field] /.../ ist santig kan vermög dine der erden nicht mer angebauht werden.«

⁵⁸ These hunters were: Jernej and Ahac Ložekar (Fig. 3, nos. 11, 12 or 44), Blaž Klemenšek (no. 46), Gregor Knez (no. 36), Martin Strmčnik (no. 31 or 32), Adam Jezernik (no. 17 or 18), Tomaž Rosec (no. 3), and Selišnik (no. 4) [the farmsteads referred to in brackets are good, but not the only possibilities of their provenance]. Apart from other hunters, whose last names do not suggest any links with isolated farmsteads in these two AUs, a certain »Mertl« is also listed who might also have come from one of the farms in question.

wild fowl and two unspecified animals were paid to these 9 hunters (NŠAL 20, box 39, account 1 April 1681–31 March 1682, *Außgab auf allerley wiltbrüth oder jagerreht*). Ethnological evidence emphasizes the importance of poaching in the Upper Savinja valley (Petek 2007, 96–98)⁵⁹, its existence in the region of Solčava in the 16th century is proven by the punishment paid by Prodnik farm in 1553 (Fig. 3, no. 60) (NŠAL 20, box 24, accounts 1553, *Pensabl*). A sabre and a pair of gauntlets were found at Dovnik farmstead in 1607 (Fig. 3, no. 7), an old halberd, a gun and an old sword at one of the two Ložekar farmsteads south of Luče in 1610 (Fig. 3, no. 11 or 12), a hunting gun at Rep in 1620 (Fig. 3, no. 6), a gun at Martek north of Luče in 1632 (Fig. 3, no. 33), a sabre, a lance and a gun at Jerij in 1664 (Fig. 3, no. 15) (StLA, GB I, 3388–89, Dovnik, Jerij, Ložekar, Martek, Rep), a sabre on Rogar farm in the region of Solčava in 1659 (Fig. 3, no. 54),⁶⁰ two guns at the nearby Macesnik in 1668 (Fig. 3, no. 55) (StiASP, Eb., A., fasc. 36, L. 15, no. 204; fasc. 38, L. 19, no. 14), a short sword at Ramšak farmstead (Fig. 3, no. 56) or another house in the region of Solčava in 1700 (StLA, GB I, 3388–89, Schettej). Inventories thus prove that possession of weapons, including firearms, was common at least among the well-situated farms in the 17th century Upper Savinja Valley. Among the poor ones other hunting equipment, e.g. snares, not leaving traces in the inventories was probably used. If the statement of the tenants of the seigneurie of Eberndorf/Dobrla vas in the region of Solčava from 1795 is correct, their possession of weapons such as pistols, guns and sabres, was encouraged by the territorial court of Gornji Grad for defence against wild beasts (StiASP, Eb., A., fasc. 16, Sulzbach).

Trade in wood was an additional source of income, reaching the region of Solčava at least in the 17th century (Zwitter 2014a, 228). The inventory referring to Rogar farm in 1659 (Fig. 3, no. 54) mentions a charter referring to the forest as a part of that farm. The charter was probably written after 1633 because it is not mentioned in the previous inventory (StiASP, Eb., A., fasc. 35, L. 12, no. 7; fasc. 36, L. 15, no. 204). In the 1610 inventory of Ložekar south from Luče (Fig. 3, no. 11 or 12), an implement for floating (*»ain eisener schwem agkhen«*) is recorded (StLA, GB I, 3388–89, Ložekar). Floating of wood on that section of Lučnica had already been an additional source of income at least before the middle of the 16th century (Zwitter 2014a, 227–28).

There are many other objects possibly not used only to meet the household demands, such as the often present spinning wheels, which in the Central Europe only became frequent in the Early Modern Period (Roth 1979, 398). There were, for instance, four spinning wheels at Rogar in 1659 and three in 1676 and 1688 (Fig. 3, no. 54), three spinning wheels at Strevc in 1688 (Fig. 3, no. 52) and in Ramšak farm (Fig. 3, no. 56) or another house in the region of Solčava in 1700, to mention only the inventories with several spinning wheels (StiASP, Eb., A., fasc. 36, L. 15, no. 204; fasc. 39, L. 21, no. 15; fasc. 40, L. 25, nos. 39 & 40; StLA, GB I, 3388–89, Schettej). A loom is mentioned in Jamnik's inventory from 1630 (Fig. 3, no. 49) (StiASP, Eb., A., fasc. 35, L. 11, no. 62), but in some cases it could be interpreted as a part of immovables.

2.4 Rural credit

Inventories are often the only written legacy of rural credit networks because usually no written contracts were made (Pfister 1994, 1342). Bad harvests, animal diseases, variable prices of agrarian products, changing taxes and family cycle (provision of a dowry, time of successive births resulting in an increased number of family members and calling for additional female workforce; post-mortem due, along with tenant's obligation of paying out the shares of inheritance to the other heirs) played important roles in rural indebtedness. Loans were also related to investment, e.g. to purchases of livestock or building of a new house. For small loans offered in form of postponed payment, interest was usually not paid. The

⁵⁹ Also descriptions from late 19th century stressed that many young men from the region of Luče were passionate and audacious hunters and that people from the region of Solčava were audacious chamois hunters (Janisch 1885a, 88; Janisch 1885b, 1042).

⁶⁰ It is possible—but highly improbable—also for a gun to be inventoried there because a *»pixen«* is mentioned. The same word was used in three other inventories where the context makes clear that it characterizes a gun: *»ein jeger pixen«*, *»ain pixen sambt der flaschen vnd spaner«*, *»pixen sambt puluer flaschen vnd spaner«* (StLA, GB I, 3388–89, Rep, Ložekar, Martek). The very low value attributed to this object in the inventory of Rogar (only 0.3 fl) suggests that it was a purse.

two basic forms of credit, money-lending and deferred payment can be distinguished only in some cases (Holderness 1976, 99, 107; Pfister 1994, 1354–55; Richter 1986, 134, 140, 145, 149). Credit networks can only be reconstructed partly since often just the first, or only the last names of involved people, or only their kinship relations are listed (Pöttler 2000, 276; Richter 1986, 139). The inventories which do not list any debts do not prove their inexistence (Roth 1979, 409).

The seignury acted as a major lender since deferred payment of rent was commonplace. The accumulation of arrears from different years was allowed up to a certain degree, not to lead tenants to bankruptcy. The Church, other seignuries, clergy, tradesmen, artisans, widows and unmarried people, rich farmers and other peasants represent some of the very frequent sources of agrarian credit in the Early Modern Period (Holderness 1976, 101–2, 104–5; Richter 1986, 134–40, 149). Rural credit flows occurred in both directions of the social scale: downwards but also upwards. Servants, for instance, often died in the role of their headship's lender, mostly because they failed to receive full wages they had earned; there were even cases of servants not receiving the wages for more than ten years. The loans up the social scale were mostly not a result of voluntary decisions; they were rather a form of exploitation (Pfister 1994, 1348, 1351–52; Richter 1986, 138).

Indebtedness to different people or institutions prevented the debtors from a too severe dependency on one creditor, which could result, for instance, in usury (Holderness 1976, 104–5; Pfister 1994, 1350). It was a strategy of getting more loans to look for different and distant lenders, who preferably did not know each other, in order to hide one's (over)indebtedness, but it was often a precondition for one to know someone personally to be able to obtain a loan (Pfister 1994, 1348, 1350, 1357). A peasant was often a lender and a borrower at the same time (Holderness 1976, 102). Some rural credits remained unsecured, while others were secured by a surety or by a part of possession pawned (Richter 1986, 141).

The inventory of the tenant from the isolated farmstead Kladnik⁶¹ near Luče (Fig. 3, no. 14) from 1613 (StLA, GB I, 3388–89, Kladnik) reveals how great the **local credit network** of some tenants was. The comparison of this inventory with the land register from 1602 (NŠAL 20, box 4, land register 1602) and the land register originally dated to the same year but completed later⁶² (NŠAL 20, box 3, land register 1602?) enabled the identification of the majority of his debtors due to the same first and last names as in this Kladnik's inventory. From the 37 debts listed, the debtors of 21 or 22 of Kladnik's active debts were tenants or previous tenants from the isolated farmsteads,⁶³ 20 to 21 of them from the same AU of the same seignury as the lender himself. It means that one sixth to one fifth of all isolated farmsteads from the AU of Luče in the seignury of Gornji Grad (or the present-day municipality of Luče) were Thomas Kladnik's debtors at the time of his death. Additionally, there were 4 to 6⁶⁴ people living in the village of Luče in the same AU and 10⁶⁵ more individuals, whose last names correspond to the names of

⁶¹ »Actum im ambt Leutsch auf der hueben na Kladnikouim«, the last two words are written in Slovene and mean »on the Kladnik farm« (StLA, GB I, 3388–89, Kladnik, 2nd version; because of very cursory handwriting some of the letters from the quotation could also be read otherwise with no influence on the meaning of the quotation).

⁶² There is, for instance, an original minute, not a later insertion, recording the event from 1603. Additionally, the names of some of the tenants are not the same any more as compared to the land register from 1602 so the headship of those farms changed in the meantime (e.g. »Jacob« was succeeded by »Marco« on one of the two Bezovnik farms above Gornji Grad (Fig. 3, nos. 1, 2). Moreover, some of the farms were divided in the meantime—there was the tenant »Jurj« on the isolated farm Detmer north of Ljubno in 1602 (Fig. 3, no. 20), but there were tenants »Jurj« and »Valenti« paying together almost the same sum paid 1602 by »Jurj« alone—1 fl 21 kr in 1602, 1 fl 22 kr in the later source (NŠAL 20, box 4, land register 1602; NŠAL 20, boxes 2–3, land register 1602? [the parts of this land register, to which I'm referring, are divided into two boxes], pp. 121, 135, 832–33)).

⁶³ According to both aforementioned early 17th century land registers Virgilius Robnik had been the tenant from the Robnik farm (Fig. 3, no. 13), but before 1602 a new tenant was installed there. Virgilius Robnik, probably the same person, was in the early 17th century cottager in the village of Luče (NŠAL 20, box 3, pp. 869, 986; box 4, Land register 1602, AU of Luče). It is not clear whether the debt listed in Kladnik's 1613 inventory originated from the time when he was in possession of the isolated farm or from the period when he was a cottager.

⁶⁴ Apart from Virgilius Robnik, as the fifth, the history of the sexton Anthony as the sixth person should be studied in closer detail in order to be sure whether he lived in this village or not.

⁶⁵ But one of them, Lukas Cire, co-owed the debt with Matheus who was according to the mentioned land registers the tenant from the isolated farm Cire (Fig. 3, no. 10) (NŠAL 20, box 3, p. 902; box 4, AU of Luče).

isolated farmsteads in the mentioned AU, but their first name is not the same as in any of the two land registers. These people were either tenants' relatives living on the same farms, they were tenants installed in a holding after the second land register mentioned was drawn up, or they were not living at the isolated farmsteads corresponding to their last names at all, being, for instance, cottagers in the village of Luče. In two cases the interest rates can be calculated, revealing that they were not universal. The interest rate for the tenant from the isolated farm Obojnik (Fig. 3, no. 30) was 7.5 %⁶⁶, whereas for the tenant from the Navršnik farm (Fig. 3, no. 16) it was 3.7 %⁶⁷. In the source referring to the division of this property the interest rate of 6.7 % is recorded for a part of the property attributed to the deceased tenant's daughter.⁶⁸ In exceptional cases it can be found out that a loan was secured by a surety or by a part of possession pawned. Urban Dekmar played the role of surety for the tenant from the half Čeligoj farm on the southern slope of Raduha (Fig. 3, nos. 29, 34); the sum in question was relatively low as Čeligoj owed to Kladnik 2 fl at the time of lender's death. For the security of the 26.67 fl, owed by Matevž Trkač, a pair of bulls was pawned. In the case of Kladnik's considerable loan to Virgilius Robnik (20 fl at the time of lender's death) the existence of a written contract (*schuldschein*) is recorded. In the case of the tenant from Petek isolated farmstead (Fig. 3, no. 5) as debtor, the reason for indebtedness is listed—it is the deferred payment of 18.5 fl for a pair of oxen⁶⁹, which Petek received from Kladnik. The loan seems to have been interest-free, but it cannot be stated for sure. The sum of the whole list of Kladnik's active debts, very close to 1000 fl⁷⁰, would suffice to buy more than 100 oxen similar to those that Petek had bought from Kladnik. The sum of active debts in the source from 1622, referring to the division of the property listed in this inventory, is 844.8 fl; some of the active debts listed 10 years earlier were lost⁷¹ (StLA, GB I, 3388–89, Kladnik). The exceptionality of Kladnik's early 17th century credit activity is obvious, if we compare his active debts with Mravljak's study of 45 inventories referring to farms at the foot of and on the slopes of Pohorje and Kozjak, again a territory of isolated farmsteads, from the period 1635–1695. The highest sum of active debts there was »merely« 288 fl in 1644 (Mravljak 1932, 172–73, 183).

Following the review of the credit activity of an important local lender in the region of Luče, we are going to change the viewpoint and focus on a sample of eight almost territorially adhering isolated farms with several inventories preserved from the 17th century—the high farms of the seignury of Eberndorf/Dobrla vas in the region of Solčava.

The numbers of people and institutions as tenant's lenders were very diverse; the same goes for the extent of **debts to the seignury**. The situation of Kolar in 1630 (Fig. 3, no. 51) represents an extreme position. The tenant's debts exceeded the sum of the inventoried possession. When he was on his deathbed, he was indebted to ten people and the local Church of Holy Spirit (Fig. 3), but the seignury did not act as lender at all. Whereas the majority of the inventories prove indebtedness to more than one person or institution, seignury and the others, in four of five cases of tenants displaced from holding the seignury is recorded as their only lender. One could doubt whether the lists of debts recorded in these cases are complete, but even according to Rogar's inventory from 1688 (Fig. 3, no. 54), the fifth case of displacement from holding, listing also indebtedness to other people and church, the debt to the seignury

⁶⁶ »Pangraz Oboinigh bleibt schuldig 20 ducatten [1.33 fl each] vnd von ein jahr interesse 2 fl« (StLA, GB I, 3388–89, *Verzeichnuß der jenen schulden* ..., 4 December 1613). 28.6 fl/26.6 fl = 1.075.

⁶⁷ »Ruprecht Nauerschnigh bleibt schuldig 20 fl vnd von fünff jahren auf dato daß interese 4 fl« (StLA, GB I, 3388–89, *Verzeichnuß der jenen schulden* ..., 4 December 1613). $\sqrt[5]{24 \text{ fl}/20 \text{ fl}}$ = 1.037.

⁶⁸ »... vnd so lang sie bei ime liegen werden mit 4 kr von ein fl jerlichen zu verzinßen schuldig« (StLA, GB I, 3388–89, Kladnik, 29/1/1622). 64 kr/60 kr = 1.067. Because of the very cursory handwriting some of the letters from the quotation could also be read otherwise with no influence on the meaning of the quotation.

⁶⁹ The source suggests that it is their whole cost: »ein par oxen dem Sijmon Pettek pro 14 d[ucatten] [80 kr each; 60 kr = 1 fl] in münz 11 kr weniger verkhaufft worden, die er Pettekh noch zubezallen schuldig verbleibt« (StLA, GB I, 3388–89, Kladnik).

⁷⁰ There are in comparison with the whole sum small differences between the preserved versions of the inventory. But in one of the versions 14.67 fl are listed twice—at the debtor Osojnik as well as at Miklavc, who in the end had to settle this debt.

⁷¹ Mentioned most clearly for 33.33 fl owed by the tenant from Osojnik isolated farm (Fig. 3, no. 19) in the early 17th century, who according to the inventory: »ist gestorben vnd hatt nichts verlassen«—died without having left anything. This is one of the debts not listed in 1622 (StLA, GB I, 3388–89, Kladnik).

represented 80 % of all debts, not taking into account the costs of inventory. It was **not a fixed sum of the debts at which the tenant was displaced from holding**. The comparison of the inventories with land registers from 1678 and 1696 shows that in the case of Kolar in 1676 (Fig. 3, no. 51) his debts to the seignury amounted to 96.1 fl, i.e. more than twelve times the majority of his annual pecuniary dues and taxes. In the case of Strevc in the same year (Fig. 3, no. 52), the indebtedness of 76.7 fl, i.e. 9.5 times the majority of his annual pecuniary dues and taxes, and at the same farm in 1688 even the indebtedness of 30.2 fl, i.e. less than four times the majority of his annual pecuniary dues and taxes caused displacement from holding (StiASP, Eb., A., fasc. 35, L. 11, no. 112; fasc. 39, L. 21, nos. 14 & 17; fasc. 40, L. 24, no. 1 & L. 25, nos. 39 & 40; StiASP, Eb., B. 7, pp. 199, 201; B. 63, fol. 463, 467). A part of the herds of the observed tenants, with the exception of Macesnik, grazed on the alpine pastures of the seignury of Hagenegg north of their farms (StiASP, Eb., B. 4, 689). The annual due for it caused Rogar's (Fig. 3, no. 54) debt to that seignury which is proven by the 1633 inventory (StiASP, Eb., A., fasc. 35, L. 12, no. 7).

In some cases a part of the tenant's **arrears** was **lost for the seignury**, e.g. at Kolar in 1676 (Fig. 3, no. 51). The displaced tenant's possession was assessed to 29.9 fl, his debts to the seignury amounted to 96.1 fl. It says in the inventory that 66.2 fl were lost for the seignury. The whole possession of the displaced, listed in the inventory—livestock, grain and implements—was left on the farm and lent to the new tenant, stepson of the displaced one. He was, namely, obliged to pay the installation due (7.3 fl) and also the 30 fl⁷² for the possession from the inventory (StiASP, Eb., A., fasc. 39, L. 21, no. 17). The debts of tenant Jamnik (Fig. 3, no. 49), who died in 1696, exceeded the balance of the possession inventoried. The sons, one of them married, did not succeed him due to poverty and lack of sanity. The seignury made sure to receive the sum owed and at the same time prevented the farm from lying desolated as »*Andree Rueprecht*«, burgher of the market-town of Eisenkappel/Železna Kapla, paid the installation due of 20 fl, the post mortem due of 8 fl, the majority of the sum of rent, dues, tax and respective arrears (22.5 fl) in 1696 and obliged himself to pay off the remaining old arrears (9.4 fl), as well as to present an appropriate new tenant in the next three years (StiASP, Eb., A., fasc. 42, L. 28, nr. 24; StiASP, Eb., B. 63, 461; B. 155, 331).

Debts to the nearby church of Holy Spirit (Fig. 3) are often recorded. The highest among them were much lower than the highest debts to the seignury. In the inventory of Rogar from 1676 and Jamnik from 1696 (Fig. 3, nos. 49, 54) the reason for indebtedness is listed—it was a loan, in the latter case it is clearly mentioned that interests were also included⁷³ (StiASP, Eb., A., fasc. 39, L. 21, no. 15; fasc. 42, L. 28, no. 24). Another possible reason for indebtedness to Church was related to livestock belonging to Church but kept on farms. For instance, in the year 1652 74 cows and 604 sheep belonged to the parish church in Solčava (Fig. 3), according to the data from the same year this parish church and the filial Church of Holy Spirit collected an annual due of 0.1 fl yearly for each cow and 0.03 fl for each sheep from farmers who were keeping their livestock (Zwitter 2014a, 212). Additionally, a part of the herd belonging to Church could be paid off instead of remaining on the farm or being returned. Seven sheep of the Church of Holy Spirit and two sheep of the parish church would in such case cause a debt of 6 fl at Jamnik farm in 1696 (Fig. 3, no. 49) (StiASP, Eb., A., fasc. 42, L. 28, no. 24). Of course, debts to churches could also be arrears for religious services.

Some **remote creditors** played important roles. In 1620s such a role was played by »*Enzj Predounigg*« or »*Vinsenz Predounikh*«, the tenant of the seignury of Bleiburg/Pliberk, living in (the vicinity of) Mežica in Carinthia⁷⁴ (StiASP, Eb., A., fasc. 35, L. 11, nos. 62 & 112 & 115). It is at least a good possibility that he was one of the household members from the about 30-kilometre-distant isolated farmstead Predolnik in Plat near Mežica (Fig. 3, no. 64), which according to the data from 1788 really

⁷² Instead of 29.9 fl (Ž. Z.).

⁷³ Among the tenants' debts: »*Der khürchen H. Geist dargelichenes.....7 fl*« (Rogar), »*Der kürchen deß H. Geists am darlechen vnd zünß 15 fl*« (Jamnik).

⁷⁴ Jamnik's inventory: »*Dem Enzj Predounigg auff Plejburg gehorigen vnderthan 10 fl*«; Kolar's inventory »*dem Vinsenzen Predounikh zu Miss 9 fl*«.

belonged to the seignury of Bleiburg/Pliberk (AS 1111, Bleiburg, CM Plat). His role of a lender is proven by both inventories from 1630 referring to Jamnik and Kolar farms (Fig. 3, nos. 49, 51), so at least the strong influence of kinship relations can probably be excluded. The debts amounted to 9 fl and 10 fl. In the late 17th century the tenant from the isolated farmstead Gubanc near Eisenkappel/Železna Kapla (Fig. 3, no. 68), subject of the seignury of Eberndorf/Dobrla vas, who was at the time of his death in 1706 additionally in possession of a free holding, played a role of an important lender (StiASP, Eb., A., fasc. 44, L. 32, no. 24). Unlike Kladnik's debtors, the majority of whom lived in the same AU of the same seignury as the lender, the credit network of Gubanc extended much further, its south-eastern edge is particularly important for us. Gubanc's loan enabled Rogar (Fig. 3, no. 54) to pay the majority of the rent in 1687⁷⁵ (StiASP, Eb., A., fasc. 40, L. 25, no. 40). A loan to Krofič (Fig. 3, no. 48) in the region of Solčava⁷⁶ is also recorded. Even a burgher of the market-town of Ljubno ob Savinji (Fig. 3), subject of the seignury of Gornji Grad⁷⁷, is mentioned as a considerable debtor of Gubanc, owing him 50 fl in 1706. Lying near the important road along the Vellach/Bela valley to the pass Jezerski vrh/Seebergsattel, the inventory of Gubanc from 1706 reveals the influence of this traffic connection for credit activity⁷⁸ (StiASP, Eb., A., fasc. 44, L. 32, no. 24).

There were also important connections with individuals from Wackendorf/Večna vas near Bleiburg/Pliberk and Buchbrunn/Bukovje near Eberndorf/Dobrla vas in the late 17th century. From the livestock bred on Kolar farm in 1676 (Fig. 3, no. 51) two young oxen belonged to »Khoreschnig zu Puchprun«⁷⁹ and two sheep to »Schonne zu Wackendorff«⁸⁰; the latter was also possessor of two sheep bred at Strevc (Fig. 3, no. 52) that same year. When the old Jamnik died in 1696 (Fig. 3, no. 49), he also owed considerable debts to two persons with these two names of homesteads—7 fl to »Schanne« and 4 fl to »Koreschnigg« (StiASP, Eb., A., fasc. 39, L. 21, nos. 14 & 17; fasc. 42, L. 28, no. 24).

Some farmers owed considerable amounts to **craftsmen or merchants**, revealing their gravitation to Eisenkappel/Železna Kapla as well as the existence of works which farmers did not carry out themselves. In 1620s the cooperation with butcher Krältnig, burgher of the market-town of Eisenkappel/Železna Kapla, is revealed by Kolar's and Jamnik's inventories from 1630 (Fig. 3, nos. 51, 49); the former owed him 19.3 fl, the latter 7 fl (StiASP, Eb., A., fasc. 35, L. 11, nos. 62 & 112). There is a debt of 11.2 fl to a dyer⁸¹ from the same market-town recorded in Goler's inventory from 1698 (Fig. 3, no. 50), 11 fl in the inventory referring to Ramšak farm (Fig. 3, no. 56) and another house in the region of Solčava in 1700 (StiASP, Eb., A., fasc. 42, L. 29, no. 20; StLA, GB I, 3388–89, Schettey) and a much smaller debt of 0.5 fl to a dyer from the same market-town in Rogar's inventory from 1659 (Fig. 3, no. 54) (StiASP, Eb., A., fasc. 36, L. 15, no. 204). The inventory of the poor Goler from 1678 (Fig. 3, no. 50) lists the debt to a carpenter amounting to 6.25 fl, related to the erection of a new house, which was clearly not built (exclusively) by the household members and their neighbours. 6 fl of this debt had to be paid later by the next tenant (StiASP, Eb., A., fasc. 39, L. 22, no. 35); it was at least not exceptional for isolated farms in the Upper Savinja valley at that time that their farmsteads consisted of a group of buildings and the inventory of Ložekar from 1610 (Fig. 3, no. 11 or 12) reveals that roofs of the house and granary were in a bad condition (Zwitter 2014a, 227). The tenant of Rogar farm (Fig. 3, no. 54) owed 4 fl for salt to Kazl from Eisenkappel/Železna Kapla in 1688, also Rogar's inventory from 1633 provides evidence of deferred payment for salt (0.67 fl) (StiASP, Eb., A., fasc. 35, L. 12, no. 7; fasc. 40, L. 25, no. 40). A debt to the blacksmith in Eisenkappel/Železna Kapla (0.7 fl) is listed in Goler's inventory from 1678 (Fig. 3, no. 50) (StiASP, Eb., A., fasc. 39, L. 22, no. 35). Small debts to a weaver and tailor in the inventory of the

⁷⁵ Among Rogar's debts in 1688: »Dem Gubänz in der Capl dargelichnes zur 1687. stüfft 10 [fl]«.

⁷⁶ »Khrofitsch [in the 2nd version Krophiz] in Sulzbach«.

⁷⁷ »Schollar [in the 2nd version »Solar«, in the 3rd version »Sollär«] zu Lauffen in Vndter Steyer ein burger nach Oberburg geherig«.

⁷⁸ There was »Poduerschnigg in Seelant [or »in Seeländer pfarr«]« – from Jezersko (close to the mentioned pass Jezerski vrh/Seebergsattel) among the debtors.

⁷⁹ It really is a name of homestead in Buchbrunn/Bukovje (Kulterer 1965, 362).

⁸⁰ And this really is a name of homestead in Wackendorf/Večna vas (Kotnik 1999, 151).

⁸¹ Provided that »ferber« is understood as an occupation, not only as last name.

poor Jamnik from 1696 (Fig. 3, no. 49) prove that not all textile and clothes were home-made (StiASP, Eb., A., fasc. 42, L. 28, no. 24).

The **debts to the local priest**⁸² were, for instance, a consequence of arrears for tithe and for the due to priest—there is a debt of 1 fl for tithe in Goler's inventory from 1678 (Fig. 3, no. 50), 5 fl for the undelivered tithe and the due to priest in Jamnik's inventory from 1696 (Fig. 3, no. 49) (StiASP, Eb., A., fasc. 39, L. 22, no. 35; fasc. 42, L. 28, no. 24). The observed tenants were also debtors of **a number of other locals**. Beside the spatial closeness also kinship relations played an important role. Among the cases where lending is the explicitly mentioned cause for indebtedness, the case from Jamnik's inventory from 1696 draws special attention, revealing the riskiness of rural credits and the important role which seigneurie could play in such cases. The daughter-in-law lent 22 fl in cash to her father-in-law, the tenant from Jamnik farm in a difficult economic situation.⁸³ According to the contemporary calculation the debts exceeded the sum of the whole inventoried possession for 35.25 fl. Thus the debts were divided into those of priority and others. All the debts to the seigneurie, seigneurial officials, churches and priest belonged to the former group, while others belonged to the latter. After the debts of priority were subtracted, only 14.5 fl, i.e. 17 % of the whole inventoried possession, remained. As long as it did not threaten the rights of the privileged group of creditors, the seigneurie paid regard to the fact that the daughter-in-law lent her money, moreover, she was doing unpaid housework for more than 10 years, and that two sons of the deceased, one about 40, the other about 50 years old, were up to their father's death working on the farm as farmhands and none of the three mentioned persons received any payment for it. Thus the whole remaining 14.5 fl entirely fell to the mentioned three relatives' share, which still means that the daughter-in-law lost the majority of her loan. The remaining seven creditors lost everything that Jamnik owed them, together a total of 27.7 fl (StiASP, Eb., A., fasc. 42, L. 28, no. 24).

Masters often **owed money or objects to their servants**—farmhands, maids or herders. There are 16 such cases mentioned in 5 of the 23 inventories (StiASP, Eb., A., fasc. 35, L. 13, no. 76; fasc. 38, L. 19, no. 14; fasc. 41, L. 27, no. 13; fasc. 42, L. 28, no. 24 & L. 29, no. 20–21). In half of the cases with debt amount recorded, the debt ranged from 1.2 to 2 fl. It was frequently the deferred payment for their work. The highest debts to servants were 4 fl (in 1649) and 5.73 fl (in 1698); as we are told that these referred to deferred payment (StiASP, Eb., A., fasc. 35, L. 13, no. 76; fasc. 42, L. 29, no. 20), those servants had not been given their wages for years. Similarly, it is explicitly mentioned at Rogar in 1693 (Fig. 3, no. 54) that the debt to the farmhand referred to his work on the farm in the previous year (StiASP, Eb., A., fasc. 41, L. 27, no. 13). Still, the farmhand whose master's debt was the highest was additionally rewarded as the master assured him a bequest of 4 fl (StiASP, Eb., A., fasc. 42, L. 29, no. 20–21). However, in some cases servants served also as real money lenders. 3 fl were owed to the maid⁸⁴ on Jamnik farm in 1696 (Fig. 3, no. 49) for covering the cost of her master's funeral. Her loan was secured by a heifer pawned to her (StiASP, Eb., A., fasc. 42, L. 28, no. 24).

According to ethnological data usual forms of help among farmers, e.g. neighbours, were most often not expected to be returned until assistance was required by the farm which had offered it before (Makarovič 1979, esp. 7–8, 77, 84, 121). The lists of debts and active debts in the inventories prove that it was not always the case in the 17th century, however, a part of informal help among the farmers is most probably missed in this type of sources as the farms to which this form of help was offered did not owe anybody anything except for future willingness to help in a similar or in a diverse manner.

⁸² The debts to church do not seem to be in all cases clearly distinguished from debts to the priest. Whereas the tithe really belonged to the priest as he was one of the tithe leaseholders there (NŠAL 20, box 3, 1307), the situation with Rogar's debt to the priest for 6 sheep in 1633 is less clear (StiASP, Eb., A., fasc. 35, L. 12, no. 7).

⁸³ »Der Eva Jämbniggin an par dargelichnem geldt.....22 fl«, »von ihrem eigenen zuebringen der 22 fl, welche sye ihme vattern [i.e. father-in-law] in seiner hohen noth dargelichen«.

⁸⁴ Here name is not given and the possibility that it was the master's daughter-in-law cannot be entirely excluded.

2.5 The changing rural wealth

The land register of the seigneurie of Eberndorf/Dobrla vas contains a minute referring to the farm Goler (Fig. 3, no. 50): »1699. Ligt dise hueben lähr auß mangl geldt vnnd leiüth, die wißmätter aber, sein in bestandt verlassen worden, den Stüffter daselbst pro 7 fl«, meaning that the farmstead lay abandoned in the year 1699 due to lack of money and people, the meadows were let to one (possibly two or three)⁸⁵ of the neighbouring farms from the seigneurie of Gornji Grad, lying north of the village of Solčava, named in the early modern sources as Štiftar (Fig. 3, no. 57–59) (StiASP, Eb., B. 63, fol. 462).⁸⁶ But the inventory referring to the same farm in 1698 reveals high bequests to the parish church in Solčava, the Church of Holy Spirit near the Goler farm, the Church of St. Leonard on the other side of the mountain ridge on the way to Eisenkappel/Železna Kapla (Fig. 3)—together 61 fl, accompanied by additional 8 fl bequeathed for food and drink at the funeral and a heifer estimated to 5 fl to be slaughtered and distributed to the poor. The mentioned bequests accounted for 40 % of the whole inventoried possession (StiASP, Eb., A., fasc. 42, L. 29, nos. 20–21). His charity in form of gifts to the poor was shown publically. Bequests to churches were in the 17th century commonplace (Verginella 1996, 7, 95, 161, 166–68, 194–95), but the sum bequeathed by Goler (Fig. 3, no. 50) is entirely exceptional in comparison with other 17th century inventories of the tenants of the seigneurie of Eberndorf/Dobrla vas in the region of Solčava, where the wealthy Macesnik (Fig. 3, no. 55) in 1668 only bequeathed 3 fl to the parish church and 9 fl for the masses (StiASP, Eb., A., fasc. 38, L. 19, no. 14). The inventory clearly reveals that conclusions about the environmental impact of the successive bad harvests on the economic situation of Goler farm (Fig. 3, no. 50) based only on the land register minute would be wrong.

2.5.1 General critical remarks on 17th century peasant inventories as sources for tenants' assets

Data on rural wealth, documented in inventories, are of considerable relative importance because the values attributed to the articles inventoried are often underestimations as compared to the market prices (Pöttler 2000, 273–74, 277–78). Cereals and livestock products, strongly affected by environmental conditions, often represented a great proportion of the value of the whole estimated tenant's property. Notwithstanding the fact that some items of low general importance, e.g. a clothesline, can be mentioned, probate inventories are far from being exhaustive (Baulant 1975, 506, 510–11, 517). The absence of a part of the property can be a sum of various factors. Inventory instructions differed between seigneuries and could change in time (Gadd 1980, 233; Pöttler 2000, 267; Pöttler 2002, 254). If other people removed something declaring that it belonged to them, e.g. a widow the linen made from thread she had spun herself, such an article could also not be listed in the deceased's inventory. A part of the property could have been hidden before the possession was inventoried, but it was not unlikely for such a crime to be revealed by other household members, neighbours, etc. Additionally, some mistakes were made through carelessness of persons in charge of the inventory procedure; if a large number of inventories is investigated, errors of this type cancel themselves out due to their normal distribution (Baulant 1975, 507; Borscheid 1980, 92–93; Overton 1980, 207; Pöttler 2000, 277; Roth 1979, 405). In the region of Meaux in France about 1700 and in the middle of the 18th century, for instance, the provisions of cereals, fodder, wine, wood, yarn and linen seem to have been documented precisely—unlike apples, cabbage, nuts, etc. listed with varying degree of exhaustiveness. Although cows were reared by half of the households analysed there, milk or butter are not listed in any of the inventories, whereas cheese is only documented exceptionally, the same applies to eggs, although poultry was commonly reared. There is no honey or wax

⁸⁵ The definite article »den« speaks for plural, whereas the verb form »zahlte«, referring to the due for these meadows, proves that it is one person unless it is just a part of the phrase not adjusted to the real situation.

⁸⁶ The three farms formed a hamlet up to the arson during World War II. Only one of them is known as Štiftar now, the house names of the other two later relocated houses were only known as Martinc and Majdač in the mid-20th century (for the 20th century data Meze 1963, 267–68; historical data according to my study of early modern land registers, e.g. NŠAL 23, box 48, book 39, AU of Solčava).

in the inventories of beekeepers and dogs are only mentioned exceptionally (Baulant 1975, 506–7). A part of the property in some cases remained unassessed, being bequeathed to heir(s) (Pöttler 2000, 276). For objects which could be interpreted as part of the fixed property, e.g. tables or banks, it was possible not to be listed at all (Garrard 1980, 63; Roth 1979, 404; Pöttler 2000, 266–67; Pöttler 2002, 265). Possible existence of displaced money or livestock could strongly affect the total property assessment (Roth 1979, 397). The numbers of articles given as twelve or its multiples should be addressed with caution; namely, twelve is a synonym for a dozen, which could be used either exactly or as an approximation (Pöttler 2000, 279). Consequently, researchers must organize the data at the beginning of the analysis in order to find out the strong and weak points of the particular sample of inventories (Baulant 1975, 516). It is thus obvious that it is not an appropriate way of analysis to compare the balances given in inventories themselves. The fact that balances given are often false makes things even worse. The adjusted balances, including only the comparable contents of inventories, should be calculated (Garrard 1980, 64).

2.5.2 The changing assets of tenants from isolated farmsteads in the 17th century Upper Savinja Valley

Fig. 5 presents modified balances of assets. It reveals the capability of tenants to pay off the debts with main agricultural products—cereals and livestock.⁸⁷ The great majority of the analysed inventories are probate inventories, thus listing also the debts related to the tenant's

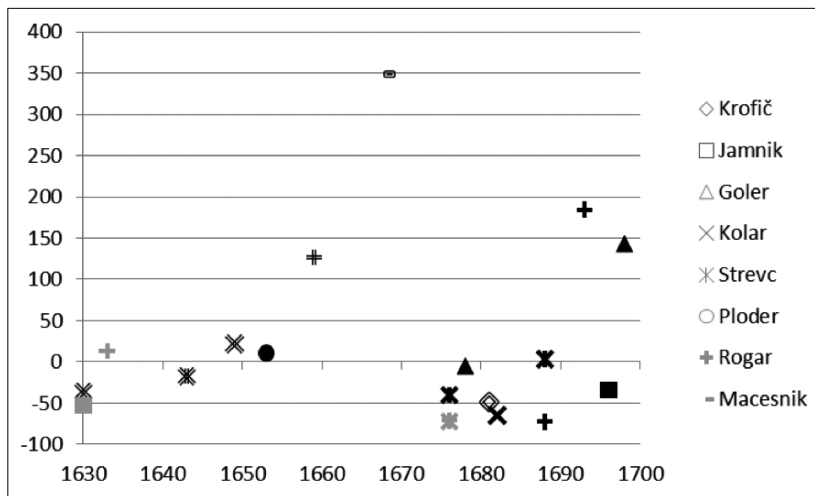


Figure 5: Sums (in fl) of estimated values of livestock, cereals and active debts, the debts subtracted for eight farms of the seignury of Eberndorf/Dobrla vas in the region of Solčava according to the inventories from 1630–1698. Timeframe is given with years on abscissa. Data from inventories from 1 August to 30 November are black, those from 1 February to 31 May grey. The double black line stands for the inventories from both remaining periods.¹

Sources: StiASP, Eb., A., fasc. 35, L. 11, nos. 62 & 112 & 115 & L. 12, no. 7 & L. 13, nos. 13 & 76 & L. 14, no. 141; fasc. 36, L. 15, no. 204; fasc. 38, L. 19, no. 14; fasc. 39, L. 21, nos. 15 & 17 & 27 & L. 22, no. 35 & L. 23, no. 27; fasc. 40, L. 24, no. 1 & L. 25, nos. 39 & 40; fasc. 41, L. 27, no. 13; fasc. 42, L. 28, no. 24 & L. 29, no. 20.

¹ 1) The overlapping grey marks in 1676 represent the data for Rogar and Kolar (Fig. 3, nos. 51, 54). 2) The exact value for Jamnik in 1630 (Fig. 3, no. 49) would lie even a bit lower, but it is impossible to calculate it because only the value of the majority of livestock owed by the deceased to the siblings is given. 3) The value for Kolar in 1630 is almost precise—the assessment of a heifer is missing, but most probably also the debt for two sheep, so these two small sums almost cancel themselves out. 4) The value for Goler in 1698 (Fig. 3, no. 50) is too low (e.g. cereals were bequeathed to the widow and thus remained unestimated). 5) Four of the 23 inventories are not included in Fig. 5: the inventory of Krofič from 1654 (Fig. 3, no. 48) is only a summary inventory not enabling such calculations; the inventory of Goler from 1672 (Fig. 3, no. 50) is not fully-fledged; the inventory of Simon Ploder from 1677 refers to the tenant who resigned in 1674 (see footnote 97), additionally, it seems that even as far as Simon is concerned it is not a fully-fledged inventory; there are two unequal inventories referring to Strevc farm in 1676 (Fig. 3, no. 52); only the one including the 1676 cereal harvest data is included in Fig. 5.

⁸⁷ As mentioned, values of cereals and livestock are probably underestimated. All the species, with the exception of bees, for which it is not always clear whether the hives were populated or empty, are included in Fig. 5.

death, for instance expenses for the funeral, the post mortem due, the expenses for the survey of the possession and costs for writing down the inventory. These debts, along with the deceased's bequests, are not included in Fig. 5 in order to obtain an insight into potentially real situations on the observed farms.⁸⁸ The conditions on the farm, namely, changed tremendously shortly afterwards. The future tenant had to pay installation due and changes concerning society, environment and economy affected conditions of the farm.

The inventories are classified in three groups in Fig. 5. Those from August to November present data from the time of cereal harvest, the second half of pasturing season and the very beginning of the barn-feeding period. At that time animals were best fed in the whole year and, at least in the first months, the selling of a part of the herd before the beginning of barn-feeding period had not taken place yet. Also cereal stocks were the best in the whole year unless the influence of trade caused a deviation. Thus the

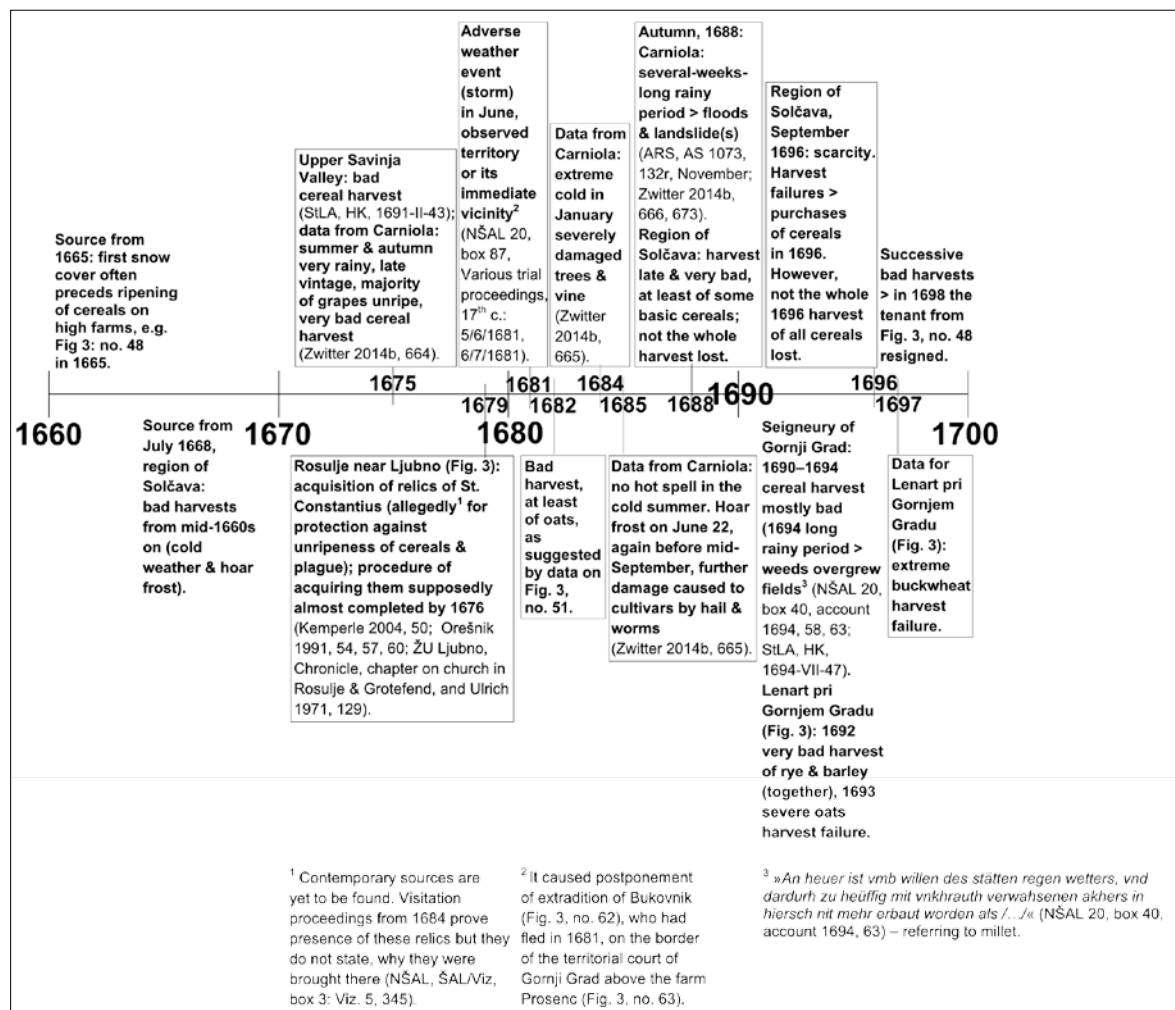


Figure 6: Timeline of collected data on weather and climate in the observed territory and its immediate vicinity, as well as on their adverse impacts on agriculture (1660–1700).¹

¹ Sources are cited if they are not given elsewhere in this article.

⁸⁸ For the same reason, 4.6 fl owed by Rogar (Fig. 3, no. 54) to Mr Sebastian Ruprecht from Eisenkappel/Železna Kapla in 1659 were not subtracted from the balance. Namely, in the case of Macesnik's (Fig. 3, no. 55) debt to the same man in 1668, inventory reveals that these expense was a consequence of the survey of the possession (StiASP, Eb., A., fasc. 36, L. 15, no. 204; fasc. 38, L. 19, no. 14).

black symbols in Fig. 5 would lie lower in a less favourable part of the year. The situation in the time of inventories from February until May was just the opposite. It is the concluding part of the barn-feeding season (with the scarcest milk production on average as well as lowest weights of livestock) and the beginning of the pasturing season, additionally, no or hardly any edible plants could be collected outside. The grey symbols would lie much higher in the harvest time.

Fig. 5 shows different impacts of changing environmental, economic and social conditions on different farms in different parts of the observed seven decades of the 17th century. The **culmination of farms incapable of paying off the debts with main agricultural products in the late Maunder minimum** is evident (Fig. 6). Quantities of tithe collected in Lenart pri Gornjem Gradu (Fig. 3) in 1692–1694⁸⁹ and 1696–1697 prove that harvests of all cereal species were not equally affected. The lowest volume of oats was harvested in 1693, whereas quantities of tithe collected in 1696 and 1697, i.e. the best ones among discussed years, were for a half higher. Extreme buckwheat harvest failure of 1697 represented only one ninth of the crop of 1692, when tithe in buckwheat was the highest in these years. Rye and barley were documented together; their worst harvest in 1692 amounted to less than a half of the volume in 1694 or 1696. Fluctuations of wheat harvest were not so pronounced in discussed years (NŠAL 20, box 40, account 1 January 1692–31 December 1693, 85–86, 92–93, 98–99, 102; account 1 January 1694–31 December 1694, 54, 60, 71; account 1695/96 [and 1697], chapters on collected wheat, rye, oats and buckwheat in 1696 and 1697).

In September 1696 the scarcity, especially of cereals, is mentioned in the visitation record from the parish of Solčava as a common feature (NŠAL, KAL, fasc. 166, U 2–3). The tenant Krofič (Fig. 3, no. 48) resigned in 1698 because of the successive bad harvests⁹⁰ (StiASP, Eb., B. 63, 466). According to the statement of the sexton from the parish of Solčava from 1699, the reason for his inability to collect all the dues he would have been entitled to, was that at that time a lot of farms lay abandoned: »*Collectura importaret 10 staria, si omnes solverent ast quia nunc multi fundi sunt vacui, non obtinetur tota*« (NŠAL, KAL, fasc. 82, U 5 (2nd unit with the same number), 21 May 1699; underlined by Ž. Z.). The register of arrears from 1699–1701 proves that the statement is partly exaggerated but by no means unfounded. This register confirms the existence of at least five abandoned isolated farms among about forty in the AU of Solčava in the seignury of Gornji Grad, four of them are listed with names of homesteads: Pastirk (Fig. 3, no. 45), Navršnik (Fig. 3, no. 47), Ručnik (Fig. 3, no. 42), and Lamprečnik (Fig. 3, no. 41)⁹¹ (NŠAL 20, box 4, register 1699–1701), the fifth one lay at the entrance to the Logarska Valley (Zwitter 2015, 206).

On the other hand, there was an attempt to repopulate the abandoned high isolated farmstead Rep in Koprivna in 1692 (Fig. 3, no. 65) after almost 13 years but it failed due to harvest failure of 1692⁹²; nonetheless, a new tenant was successfully installed there in 1693 (KLA, AHS, A 2450, shts. 41, 57; KLA, AHS, A 2451, shts. 95, 114–15).⁹³ The same phenomenon – **re-population of former farms** in high altitudes at the time of frequent harvest failures can be observed on the northern side of the ridge dividing the Savinja and the Vellach/Bela drainage basins. At least two among the few high isolated farms situated there had been used as alpine pastures and temporary settlements (Rjavčnik from 1670 on; Zgornji Tomažič at least from 1673 on) but were both permanently populated again in 1694 (Fig. 3, nos. 66, 67). In the case of Rjavčnik the reason is stated – extensified land use and the related lower tenants' dues were

⁸⁹ Regarding buckwheat no data is available for 1694.

⁹⁰ »... wegen der solangen müßgeratteten jahren«.

⁹¹ The mean of annual precipitation rises from east to west in the region of Solčava, at Ručnik and Lamprečnik, which were abandoned at that time, it exceeds the mean annual precipitation of Macesnik (Fig. 3, no. 55) by at least 100 mm (Environmental Atlas...). Less favourable conditions for growth of cultivars at Lamprečnik than at Krofič were also proven by my fieldwork on 26/9/2009–blackberries (*Rubus sp.*) were ripe at Krofič (where according to the note from 1665 snow often covered unripe cereals) but still red at Lamprečnik.

⁹² Harsh winter 1691/92 that caused a complete harvest failure of autumn-sown wheat in the low hills east of Celje in southern Styria (NŠAL 20, box 40, account 1693, 60; location of Slom according to Gestrin 1952/53, map s.p.) was thus not the only adverse weather impact on cultivars in this year; it is not credible that on the altitude of the Rep farm winter-sown cereals played an important role.

⁹³ For more details see Zwitter 2015, 205–6.

harmful to the seignury (StiASP, Eb., B. 151, 75, 78). In June the same year, 1694, the seignury of Gornji Grad ordered its high official (*Anwalt*) to do his best to collect tenants' arrears from the previous two years of harvest failures in order to prevent a further accumulation of arrears in the future. The official promised to consider it with respect to the ensuing harvest and to follow it if only possible (NŠAL 20, box 40, imperfections in the *Anwalt's* account, 1692/94, § 37 and *Anwalt's* response).

Successive bad harvests did not cause severe economic difficulties to all the farms, which is partly due to their different quality (Table 5).

Table 5: Quality classes of the farms of the seignury of Eberndorf/Dobrla vas in the region of Solčava as recorded by the land register from 1678

Farm (no. on Fig. 3)	Macesnik (55)	Krofič (48)	Jamnik (49)	Rogar (54)	Goler (50)	Kolar (51)	Strevc (52)	Ploder (53)
Quality (class)	1 st	2 nd	2 nd	2 nd	3 rd	3 rd	3 rd	3 rd

Source: StiASP, Eb., B. 7, 199–201. 1st class = *bona*, 2nd class = *mediocris*, 3rd class = *exigua*.

The inventory of Macesnik from 1668 makes clear that the preceding accumulated bad harvests in the mid-1660s did not have evident consequences for this first-class farm. Namely, on 27 July 1668 the priest of Solčava mentioned bad harvests, caused partly by cold weather (*frigus*) during those phenophases when cereals could not tolerate it and thus killing (*neicare*) the plants, partly by hoar frost (*pruina*) since he was in charge of that parish (NŠAL, KAL, fasc. 43, U 25, visitation proceedings, parish of Solčava, 1668), i.e. from the mid-1660s (NŠAL, KAL, fasc. 43, U 26, visitation proceedings, Solčava, 1669). The emergence of snow cover before the cereals ripened is also recorded for Krofič farm in 1665 (Fig. 3, no. 48) (StiASP, Eb., B. 4, 689). In Fig. 5 the value of Macesnik is by far the greatest of all. Additionally, it is the only one among the analysed inventories of tenants belonging to the seignury of Eberndorf/Dobrla vas, listing also cash—no less than another 435.33 fl (StiASP, Eb., A., fasc. 38, L. 19, no. 14)! The picture of the more numerous second- and third-class farms is less uniform. While the possession of the tenants at Kolar was never considerable (Fig. 3, no. 51), the tenant of the also third-class Goler farm (Fig. 3, no. 50) was poor in 1678, but his successor was well off in 1698—in the time of bad harvests. Thus also the social component played an important role. It is most clearly demonstrated by Rogar farm (Fig. 3, no. 54) in Fig. 5, where the tremendous change from negative values to almost 200 fl took place in only five years, if it refers to the same farm.⁹⁴

The **dowry** represented on the one hand an important economic basis and a burden on the other. The dowry of the wife of the in 1653 deceased tenant from Ploder farm (Fig. 3, no. 53) amounted to 1 cow, 1 heifer, 2 calves, 6 sheep and 1 pig (StiASP, Eb., A., fasc. 35, L. 14, no. 141). Considerable dowries and husband's contribution to the wife prevented the very poor from marrying, which limited the number of starving people. It says in the 1688 inventory of the tenant from Strevc farm (Fig. 3, no. 52), that none of his sons married due to his poverty (StiASP, Eb., A., fasc. 40, L. 25, no. 39). The dowry provided to the daughter by the tenant from Jamnik farm, who died in 1696 (Fig. 3, no. 49), amounted to 36.7 fl—the same man borrowed at an unknown time 22 fl from the dowry of his daughter-in-law, but was unable to repay the sum in question (StiASP, Eb., A., fasc. 42, L. 28, no. 24). The economic part of the wedding agreement was not always respected. The widow of the strongly indebted tenant from Jamnik farm (Fig. 3, no. 49), who had died in 1630, maintained that according to the nuptial agreement, she was to be given 19 fl. Since she failed to prove it, either by means of a nuptial agreement or witnesses, only 4.3 fl, i.e. the sum equal to the share of each of inheriting children, were attributed to her. Quite contrary to the widow of the tenant Kolar (Fig. 3, no. 51), who also was not in the possession of a nuptial contract at the time of her husband's death in 1649; she lost a part of the property, but nevertheless the possession attributed to her still exceeded the shares of children—the tenant's debts according to this inventory did not exceed the sum of the possession. According to the nuptial contract, the widow of the in 1659 deceased tenant from

⁹⁴ See footnote 3.

Rogar farm (Fig. 3, no. 54) should have been attributed 50 fl. The in 1676 retired tenant of Rogar farm still owed her as the mother of his wife's half-brother 17 fl and she was only attributed a part of it in 1676 (StASP, Eb., A., fasc. 35, L. 11, no. 115 & L. 13, no. 76; fasc. 36, L. 15, no. 204; fasc. 39, L. 21, no. 15).

The number of heirs and the value attributed to the inventoried possession subtracted by the sum of debts were the basic factors influencing the amount of the **shares of inheritance**. Additionally, in some cases the division was severely influenced by a wedding contract and bequests. In case of the wealthy Macesnik in 1668 (Fig. 3, no. 55) the largest two of his bequests amounted to 200 fl to the youngest son, who was installed in holding after his father's death, and 100 fl to one of his daughters. After the subtraction of the debts (among them a mare for post-mortem due), and all the items from the will, according to the inventory, an equal share of 42.5 fl was assigned to each of the seven listed inheriting children and his widow. With help of the seignery the youngest son made an agreement with the coheirs to get their shares paid step by step in the next four years with the exception of the married brother Anthony, who was to get his share that same year (StiASP, Eb., A., fasc. 38, L. 19, no. 14). The whole shares of inheritance were not paid out in all cases. The inventory referring to Jamnik farm in 1630 (Fig. 3, no. 49) reveals that the tenant seven years after his father's death still owed his two brothers and sister huge parts of shares of parental inheritance. The whole shares of inheritance would have represented for each of the two brothers 20 fl, 2 big oxen, 2 bulls, 2 cows, 1 heifer, 10 sheep and 4 goats, for the sister 30 fl and an equal herd of animals as for each of the brothers. But the possession from their brother's inventory did not enable the payment in its entirety; therefore it was only paid out partly. Furthermore, the future tenant was requested to allow the two uncles (i.e. deceased's brothers) to keep a pair of oxen using his fodder. The uncles were then to sell those oxen in order to obtain another part of the shares of parental inheritance. The remaining part of the shares of inheritance of the deceased's siblings was lost⁹⁵ (StASP, Eb., A., fasc. 35, L. 11, no. 115; B. 151, 1021–22). The in 1676 retired tenant from the Rogar farm (Fig. 3, no. 54) after 17 years still owed his wife's half-brother the whole share of inheritance (55.8 fl). The latter was only attributed less than two fifths of it in 1676, the remaining part of his share of inheritance was to be paid by the tenant retired in 1676, not the one installed there in the same year. It is not certain whether it was paid out later on or not at all (StiASP, Eb., A., fasc. 36, L. 15, no. 204; fasc. 39, L. 21, no. 15).

Some changes of tenants from those **farms whose master changed frequently**, especially Kolar and Ploder from 1660s on, present a further evidence that these **farms did not enable producers to subsist there**. In the last seven decades of the 17th century, tenants on Kolar farm (Fig. 3, no. 51) changed in 1630, 1649, 1668, 1676 after the displacement of the tenant, however, the new one was again displaced in 1682,⁹⁶ then there was no tenant present on the farm until 1684, but the 1684 installed tenant resigned in 1688 due to poverty and a new tenant was installed, in 1698 following the tenant's flight from the farm, and again in 1700 when the tenant, who had left the nearby Krofič farm in 1698/99 (Fig. 3, no. 48) because of bad harvests, was installed on Kolar farm. In the last mentioned case, seigneurial official noted to the land register that this tenant owed to the seignery 78.8 fl from the time when he had been master of Krofič farm and that when his economic situation on Kolar farm would improve, he would have to settle this debt. In the second half of the century the tenants on Ploder farm (Fig. 3, no. 53) changed in 1653, due to great indebtedness in 1665, but the new tenant fled in 1670 (i.e. after successive bad harvests), in 1674,⁹⁷ after the flight of the then-current tenant in 1685, because of an injured leg in 1687, the newly installed tenant resigned in 1689. On the other hand, no change of the tenant occurred at excellent

⁹⁵ »... daß überig aber alles, waß diese drej geschwistigten ihres vätter- vnd mütterlichen erbseits zu praetendirn gehabt alles aberkhe[n]dt worden vnd ferrer diss orts, alß waß die a[n]gedeiten posten sein, nichts zuesuchen haben sollen.«

⁹⁶ In the previous spring (1681) heavily indebted tenant from Bukovnik farm (Fig. 3, no. 62: more than 1320 m a.s.l.), subservient to the seignery of Gornji Grad, fled. It was thus another unsuccessful attempt to populate a high alpine farmstead which was according to data from 1673 unpopulated and used by Robnik farm (Fig. 3, no. 61) as alpine pasture (Zwitter 2015, 209–10). Livestock disease could have contributed to it since scabies are mentioned in his barn in a source from 1680 (Zwitter 2014a, 215).

⁹⁷ There is also the inventory »Simon Ploders auß dem amt Sulzpach, welicher sich von selbsten von der hueben begeben /.../« dated »Den 13. Julij 1677« (StiASP, Eb., A., fasc. 39, L. 21, no. 43). The chronological order of tenants from this farm reveals that there was no change of the tenant in 1677. Simon namely ceded the headship position to his son in 1674 (StiASP, Eb., B. 151, 1031), thus it is the inventory of a former tenant.

Macesnik farm from 1618 to mid-1660s, when a new tenant was installed in holding; he led this farm until 1715! From 1648 to 1696, even the tenant on the second class farm Jamnik did not change (Fig. 3, nos. 49, 55) (StiASP, Eb., A., fasc. 35, L. 11, no. 112 & L. 13, no. 76 & L. 14, no. 141; fasc. 38, L. 19, no. 14; fasc. 39, L. 21, no. 17; fasc. 40, L. 24, no. 1; fasc. 42, L. 28, no. 24; StiASP, Eb., B. 63, 463, 466; B. 151, 1023, 1026–27, 1031, 1036–37; B. 154, column 22–21).

Displacement of a tenant from holding was a rare occasion in Carinthian context; it was practised when a seignury rendered the situation as without resource. Following the study of history of several hundreds of farms in various parts of Carinthia, Karl Dinklage only listed one such case, and even there a relative, i.e. the displaced tenant's sister-in-law, was installed in holding; Dinklage sporadically came across other such examples on other farms (Dinklage 1966, 124–25). If we only concentrate on the explicit mentionings of displaced tenants in the inventories of the isolated farms of the seignury of Eberndorf/Dobrla vas in the region of Solčava, five such cases can be proven, Strevc and Kolar in 1676, again Kolar in 1682, Strevc and Rogar in 1688 (Fig. 3, nos. 51, 52, 54). In accordance with results on frequency of changes of masters, also these tenants came from bad farms and in one case from a middle-class farm (Tab. 5). They are all connected with indebtedness to the seignury. In both cases from 1676 it is clear that a relative was installed in a holding then—a son and a stepson. In the case of Kolar in 1682 the farm, as previously stated, lay abandoned until 1684. In this case, as well as in the cases of Strevc and Rogar in 1688, whose children did not succeed him, as they remained unmarried due to poverty, it is not clear from the analysed inventories whether the new tenant was a relative of the displaced one at all (StiASP, Eb., A., fasc. 39, L. 21, nos. 14 & 17; fasc. 40, L. 24, no. 1 & L. 25, nos. 39, 40).

The fate of a family which ceased to be in charge of a farm could be diverse. On Goler farm (Fig. 3, no. 50) following the death of a tenant whose debts exceeded the sum of the inventoried possession, the new tenant was obliged to offer food pension to the widow and children for seven years according to the inventory from 1678; their further fate was not foreseen (StiASP, Eb., A., fasc. 39, L. 22, nr. 35). It was different in the case of Rogar farm in 1676 (Fig. 3, no. 54). The tenant Matthias, whose inventory balance was also negative, resigned due to poverty and physical weakness. The new tenant Simon, his son-in-law, was required to offer his parents-in-law food pension during the course of his entire lifetime (StiASP, Eb., A., fasc. 39, L. 21, no. 15). However, in 1688 Simon, whose debts again exceeded the sum of the inventoried possession, was displaced. One of the possibilities is that the farmhand Matthias, named in the Rogar inventory from 1693, was the former tenant still living on the farm after Simon's displacement (StiASP, Eb., A., fasc. 41, L. 27, no. 13). Simon himself migrated to the neighbouring Ploder farm (Fig. 3, no. 53) where he was tenant from 1689 on (StiASP, Eb., B. 155, p. 143).

Material culture of isolated farmsteads in the Upper Savinja Valley in the 17th century was very diverse. Whereas it was noted that Petek farmstead (Fig. 3, no. 5) was a great building in 1601 and the wooden ceiling at Rep (Fig. 3, no. 6) was decorated in the 17th century, the floor in house of a low quality farmstead in Planina north of Ljubno (Fig. 3) was not even levelled in the late 19th century (Zwitter 2014a, 227). Urban Schetteč, subject of the seignury of Gornji Grad, was in possession of Ramšak isolated farm (Fig. 3, no. 56) and another house in the region of Solčava. The inventory of the couple Schetteč from 1700 reveals exceptional luxury in the late 17th century. At least one of the household members was not only literate, but possibly even in command of foreign languages. The six listed books were written in Latin, German, French and Slovene; their contents were either religious or they were handbooks on learning how to read.⁹⁸ From the description of the jewellery—the luxury of some women's garments is also obvious—only the most luxurious articles shall be presented. There was a silver belt made of old coins, a gold ring and three gilded silver rings with (precious?) stones, at least eight garments were decorated with black or white lace—once even Lyon lace is mentioned⁹⁹—and silk¹⁰⁰ was present in the wardrobe,

⁹⁸ Many thanks to Dr Anja Dular for the explanation what »*plateltaff*« is, and for the opinion that the objective of the French booklet characterised in the inventory as »*Tibl Ala Jeunessa*« was probably similar.

⁹⁹ In France, lace at that time belonged to new patterns of dress (Fairchild and Forrester 1994, 63).

¹⁰⁰ In Tuscany, silk spread among opulent peasants mostly from the middle of the 18th century on (Malanima 1994, 120–21), but

which, for instance, in Tuscany spread among opulent peasants mostly from the middle of the 18th century onwards (Malanima 1994, 120–21). Four tables, 13 pitchers, 25 earthen bowls, 7 majolicas, a dessert bowl and provisions of wine could speak either for an inn or could be related with the luxurious lifestyle of the couple. The equipment for drawing wood could be a scarce legacy of economic reasons for such opulent people to buy that isolated farm (StLA, GB I, 3388–89, Schettej); trade in wood down the stream of the river Savinja began to bloom in the region of Solčava at least in the late 17th century (Zwitter 2014a, 228).

2.6 Demographic conditions

Registers of baptism, marriage and death, along with the extensive statuses animarum, are not known to be preserved for the parishes of Solčava and Luče for the timeframe observed.¹⁰¹ Still, some of the visitation proceedings, summary statuses animarum and some of the probate inventories contain demographic data—including the visitation from as early as 1614. The church sources provide a basic insight into the age structure, separately listing *communicantes*, which usually refers to people of more than twelve years of age, and children younger than that (Zwitter 1970, 34), though exceptions with regard to the age were possible in individual cases (Lilijana Žnidaršič Golec, pers. comm.).

The long-lasting notion that the Alpine population in general was characterized by the slow-paced rise in the 18th century which was followed by an accelerated population growth in the first half of the 19th century is an extrapolation of some studies referring to the Western Alps, which do not represent the state of the art any longer. The population of the Alpine parts of the present-day Austria grew from 1 395 000 to 2 122 000 between 1700 and 1850, and thus increased by more than 50 %. However, the

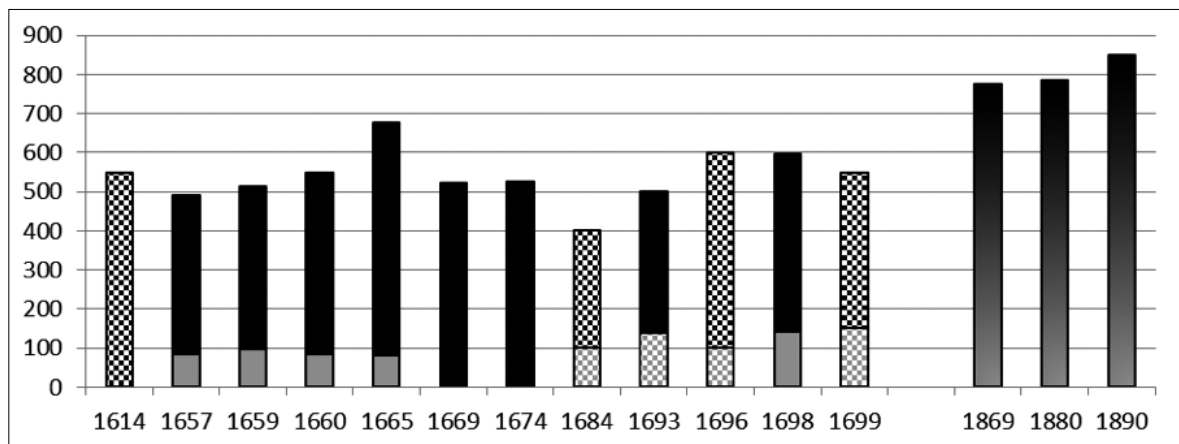


Figure 7¹: Population of the Solčava parish in the 17th and the late 19th century.

Sources: NŠAL, KAL, fasc. 43, U 22; fasc. 43, U 26; fasc. 43, U 29; fasc. 51, U 3; fasc. 58, U 17; fasc. 59, U 28; fasc. 82, U 5 (2nd unit with the same number); fasc. 82, U 16; fasc. 149, U 2; fasc. 166, U 2–3; NŠAL, ŠAL/Viz, box 2: Viz. 2, Styria & Carinthia, 159; box 3: Viz. 5, 356; Orts-Repertorium 1872, 22; Special-Orts-Repertorium 1883, 35; Special-Orts-Repertorium 1893, 57.

¹ The data on *communicantes* are presented black, those on younger people grey. The single-coloured parts of columns stand for data given as accurate. The chequered column parts represent data given as approximations. The information collected by the reliable late 19th century censuses is only added for comparative purpose. The source of information representing the year 1659 on the figure is not dated (NŠAL, KAL, fasc. 59, U 28); its datation is based on the uniform datation of the previous and the following sources, the same for 1657.

the social background of the Schettej couple should be known in order to make more reliable comparisons.

¹⁰¹ In 1880s a register of death in the parish of Luče starting in 1698 was still preserved, other documented registers of baptism, marriage and death referring to both parishes did not begin before the 18th century at that time already (Janisch 1885a, 88; Janisch 1885b, 1041).

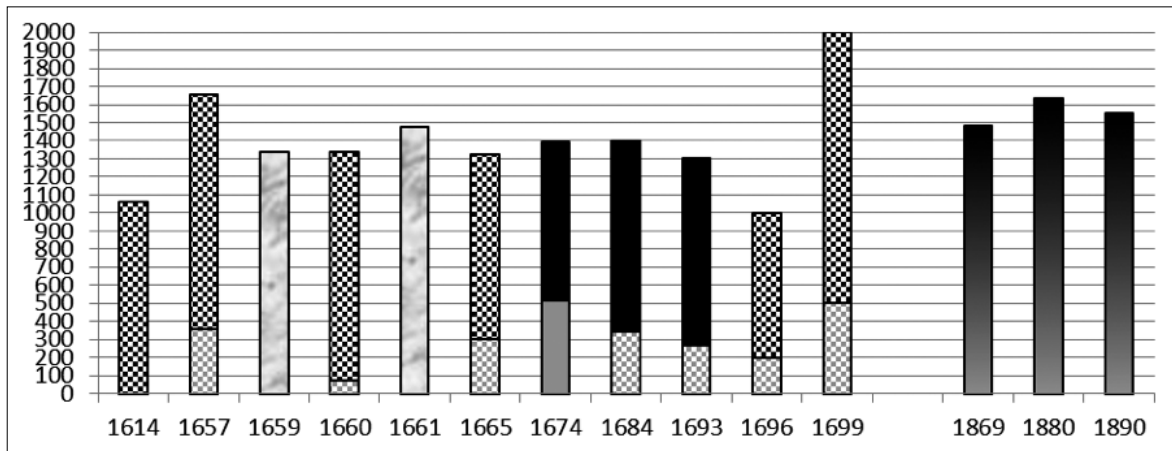


Figure 8: Population of the Luče parish in the 17th and the late 19th century.

Sources: NŠAL, KAL, fasc. 43, U 22; fasc. 43, U 29; fasc. 51, U 3; fasc. 58, U 17; fasc. 59, U 28; fasc. 82, U 5 (2nd unit with the same number); fasc. 82, U 16; fasc. 166, U 2–3; NŠAL, ŠAL/Viz, box 2: Viz. 2, Styria & Carinthia, 169; box 3: Viz. 5, 351; Orts-Repertorium 1872, 21; Special-Orts-Repertorium 1883, 33; Special-Orts-Repertorium 1893, 55.

¹ For the meaning of the colours see the note below the Figure 7. For the datation of the information represented on the Figure 8 as from the years 1659 and 1660 see the note below Figure 7. For the marbled columns see the footnote 102.

analysis at a regional scale showed that population growth in Salzburg or Tyrol was insignificant and also for the Alpine parts of Styria, using the population of 1700 (155 400) as a base indexed to 100, the 1850 population (186 456) was only 120. Demographic increase in the mountainous parts was much slower than in the lowlands (Viazzo 1989, 187–89, 193–98).

The term »*baptizati*« in some summary statuses animarum refers not only to children baptised in the year in question, but to all the children too young to attend religious education. This is why, for instance, in the parish of Luče the number of »*baptizati*« (39) was even greater than the number of »*non confitentes*« (34) in 1660 (NŠAL, KAL, fasc. 58, U 17). In the visitation proceedings and in the summary status animarum from 1698, the number of »*non communicantes*« refers not only to children able to attend religious education, but also to younger children. The summary status animarum from 1660 lists 21 »*baptizati*« and 62 »*non communicantes*« beside 464 »*communicantes*« in the parish of Solčava. The visitation proceedings from 1661 present the same data, but 83 »*non communicantes*« are mentioned—the sum of those attending religious education as well as children younger than them (NŠAL, KAL, fasc. 58, U 17; NŠAL, ŠAL/Viz, box 2: Viz. 2, Styria & Carinthia, 159).¹⁰²

Statuses animarum list *de jure* population, which includes permanent immigrants along with temporarily absent locals (Viazzo 1989, 161). **Three basic conclusions regarding the demographic history of the Upper Savinja Valley** can be drawn from Figs. 7 and 8. Firstly, the demographic data collected from the summary church statistics which are given as rough estimates in the visitation records or summary statuses animarum do not even provide a basic insight into the past reality, which is clearly demonstrated by the data from the parish of Luče referring to the years 1696 and 1699—the population surely did not double in only three years. Secondly, beside the rough approximations, a number of data are given as exact—in many cases not even rounded to ten. Although they should not be interpreted as entirely reliable, it is possible to draw the conclusion that the average population number in the parishes of Luče and

¹⁰² The data for the parish of Luče are reported in a similar way: 39 »*baptizati*« and 34 »*non communicantes*« in 1660 but 73 »*non communicantes*« in the proceedings from 1661. Additionally, 1336 »*communicantes*« are mentioned, but the number of all souls is not their sum, it is 1475; the number 1336 is possibly only a copied number of all souls from 1660, the same number was already given as approximation in 1659 (NŠAL, KAL, fasc. 58, U 17; fasc. 59, U 28; NŠAL, ŠAL/Viz, box 2: Viz. 2, Styria & Carinthia, 169).

Solčava in the 17th century represented at least two thirds of that of the second half of the 19th century, but possibly it was even closer to it—especially in the parish of Luče, however, the data from that parish are less reliable. The third conclusion suggested, especially by the data for the parish of Solčava from 1698, is that the repeated bad harvests of the 1690s did not cause a demographic catastrophe. Using the population of 1698 as a base indexed to 100, the 1869 population for the parish of Solčava was only 130, as suggested by the status animarum.

In general, some probate inventories contain demographic data, e.g. the approximate age of people, names of grown-up children and servants; unfortunately, they usually do not tell us how many of those persons mentioned cohabitated in the same household at the same time. It is possible that only some of the servants were listed—those who had not received the wages yet, or those who had been bequeathed by the deceased (Borscheid 1980, 94; Lischke 1991, 65; Pöttler 2000, 267; Roth 1979, 404). In some cases social mobility (Garrad 1980, 60) as well as migrations can also be traced.

Inventories include important further demographic data from the 17th century Upper Savinja Valley. The minute from the land register referring to Goler farm in 1699 (Fig. 3, no. 50), mentioning the lack of people as quoted in chapter 2.5, at first glance seems to be in discordance with the late 1690s demographic situation in the parish of Solčava. However, the preserved probate inventory referring to the same farm in 1698 enables us to understand the minute correctly. The tenant, who died in 1698, did not have children who outlived him (StiASP, Eb., A., fasc. 42, L. 29, no. 20–21), so it is lack of successors not a general demographical crisis in the region of Solčava that the land register refers to.

The mean rate of population growth between the end of the 17th and the middle of the 19th century at the micro level corresponded with the general trend in the Alpine parts of Austria, probably even Styria. Between the 17th and the middle of the 19th century great changes took place in agriculture, the most pronounced of them being the introduction of potato. The major cause for their weak influence on population numbers on the territory observed was the impartible inheritance of isolated farms as discovered for the nearby Austrian countryside (Viazzo 1989, 189, 191–92, 221). Potato was rooted in the local diet and eaten alongside cereals, dairy products and some vegetables several decades before 1869, as proven by the list of the most frequent peasant meals on working days in the parish of Luče from 1846. It was namely farinaceous food, e.g. a kind of porridge (*Stertz*), oat bread with mealy soup, turnips and milk the usual breakfast; the ingredients of lunch are not listed, rye bread with whey or cheese used to be most commonly eaten in the afternoon, whereas potato prepared in various ways was the most important part of dinner¹⁰³ (ŽA Luče, Chronicle, 44). Regarding the 19th century population pressure we should be aware that 3.3 times as much calories for human consumption are yielded on a given acreage growing potato instead of rye, potato is also more weather resistant (Netting 1981, 161–63, 250), its yields are considerable even where cereals cannot ripen (Vasey 1992, 170), a hailstorm shortly before the harvest does not cause any damage to the tubers (Pfister 1984, 108). However, at the same time the chronicle proves that potato only partially replaced the role of cereals, so its demographic effect must have been moderate in comparison to some other Alpine areas (cf. Viazzo 1989, 213–14, 274).

Only some of the inventories contain relevant demographic data. There were seven or eight¹⁰⁴ children still alive when their father, the tenant Macesnik, died in 1660s (Fig. 3, no. 55). Additionally, a maid and two farmhands are mentioned because their work had not been paid yet. Although the total number of servants living in this household each year, the number of children still living at home¹⁰⁵ along with the number of those who had died before their father, are not reported, it is the evidence of a household with more than ten members during a long period (StiASP, Eb., A., fasc. 38, L. 19, no. 14). The inventory referring to Goler farm in 1698 (Fig. 3, no. 50) provides a partial insight into the household with a considerable

¹⁰³ »... abends wieder 3 bis 4 Speisen, wobei Erdäpfel die Hauptrolle spielen, die auf allerlei Art zubereitet werden« (ŽA Luče, Chronicle, 44).

¹⁰⁴ Seven of them are listed with their names in the inventory, but there is also the eighth sibling recorded in the seignorial minutes, referring to the same case (StiASP, Eb., B. 154, column 22).

¹⁰⁵ The data from the Austrian Alps show that a considerable part of children often left home only after several decades (Viazzo 1989, 256).

number of members, although the couple in charge of the farm did not have children, at least not children alive at the time of father's death. Five servants are listed, as they had not received their wages before the master's death. Their different functions (a farmhand, a maid, a shepherd, an inferior herdsman and a female herder) suggest the cohabitation of at least the majority of them on this farm, together with the master and his wife (StiASP, Eb., A., fasc. 42, L. 29, no. 20–21).

The probate inventory of Jamnik from 1696 (Fig. 3, no. 49) proves that there was a certain percentage of stem families and that the marriage did not coincide with succession to headship. Apart from the father, who died in 1696 and was on the headship position until his death, several other members of his family lived on the farm: his older married son, about 50 years old, his son's wife, his younger son of about 40 years of age; they were most probably accompanied by at least one maid (StiASP, Eb., A., fasc. 42, L. 28, no. 24). It is in discordance with findings from Metnitz in Carinthia in the middle of the 18th century, where marriage depended on headship position, thus taking place after father's death or retirement (Viazzo 1989, 254–55). The labour requirements due to individually managed alps, exploitation of varied types of agricultural land, including the dispersed patches under swidden cultivation (cf. Viazzo 1989, 227–28, 246–47, 253, 255; Zwitter 2014a, 221–23), and presence of logging, requiring sufficient manpower even in winter time, were some of the reasons for the existence of the complex household structure.

When a tenant migrated to another farm and was installed as tenant there, the name of the homestead became his last name (Mravljak 1932, 174), which in our case reveals the existence of migrations across the border of the seignury. There is a note from 1679 in the inventory of Goler (Fig. 3, no. 50), that »*Jurj Hündtzman*« was installed as new tenant there. In his probate inventory from 1698, his last name was, of course, Goler, but his nephews' stepfather's last name is recorded as »*Hintzmann*«, »*Hüzmanikh*«, »*Hizmanigg*« (StiASP, Eb., A., fasc. 39, L. 22, nr. 35; fasc. 42, L. 29, no. 20), thus the deceased tenant of the Goler farm came from the nearby Icmantik farmstead (Fig. 3, no. 39) or was a cottager in Solčava; in the former, but probably also in the latter case, he had been a subject of the seignury of Gornji Grad (NŠAL 23, box 48, book 39, AU Sulzbach). Spatial and social mobility is proven by the inventory from 1654, mentioning »*Mickhlau Khrofitsch*«, burgher of the market-town of Eisenkappel/Železna Kapla among the heirs of the possession of the tenant from Krofič farm (Fig. 3, no. 48) in the region of Solčava (StiASP, Eb., A., fasc. 35, L. 14, no. 154).

3. CONCLUSIONS

Investigation of tenants' inventories examined in the context of further sources from the 17th century revealed that those isolated farms in the western part of Eastern Karawanks and central Kamnik-Savinja Alps, which were of sufficient quality—despite their distance from important roads—in general enabled the numerous household members at least subsistence even in the case of successive harvest failures, e.g. in the late 17th century, unless severe economic difficulties were caused by societal challenges. Contrary to this result, many among the families from middle and low quality isolated farms did not find an acceptable way of life there: due to low cereal stocks they were more affected by harvest failures, tenants were deeply indebted, masters changed frequently, some of them were displaced from holdings, some farms were temporarily abandoned. However, some abandoned farms were re-populated despite harvest failures.

Economy of farms was partly based on livestock rearing and agricultural production. Spring-sown cereals prevailed at least on the highest farms; oats were the most important among them thus local agriculture strongly relied on one ecologically undemanding crop, nonetheless, its bad harvest was not unlikely. After the harvest stacks of cereals were left in field to dry meaning that the period of only to a small degree controlled exposure of harvest to weather and animal pests ended only weeks after harvest. Tremendous differences in quantities of cereal stocks, attested by inventories, did not depend only on local environmental and societal conditions but also on further socio-economic factors, such as local and regional cereal trade or lending. Economy of isolated farms was also influenced by initiative of individuals to gain food and raw materials from non-agricultural activities, such as hunting, poaching or trade in

timber. In an environmentally or socially caused difficult economic situation, rural credits were a possible way to cover the lack of resources; apart from local lenders, credit networks acted over distances in some cases tens of kilometres long. But only some of the farmers in economic difficulties were indebted to several lenders. Some of the tenants from the isolated farmsteads were important lenders; credit activity was a risky source of their income.¹⁰⁶

In case of a natural disaster, e.g. a landslide or successive bad harvests, measures taken by seigneuries were not uniform. On the one hand, they helped their tenants, on the other hand, there was a tendency not to collect lower dues and taxes as they would have if there had been no natural disaster.

Agrarian overexploitation of natural resources, especially ploughing of too steep slopes, resulted in permanent loss of soil due to long-lasting slope processes, but in some cases even in landslides, possibly also avalanches; the same applies to agricultural use of land close to torrents. The trend of exceeding environmental carrying capacity through rearing of too extensive herds was not a common feature, but feed requirements of livestock reared on at least few farms were according to contemporary data in best case hardly met in a sustainable way.

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List of abbreviations:

AU	administrative unit
fasc.	fascicle
L.	liber, libri
no., nos.	number, numbers
U	unit, units

Note: for the abbreviated names of institutions preserving the archival sources as well as the abbreviations concerning the archival collections see chapter 4.1.

4. SOURCES AND LITERATURE CITED

4.1 Archival sources

1. AISN (= Arhiv Inštituta za slovensko narodopisje, SAZU = Archives of the Institute of Slovenian Ethnology, Slovenian Academy of Sciences and Arts): B. O. (= Boris Orel), box 4.
2. Arhiv Republike Slovenije (= Archives of the Republic of Slovenia): AS 177, Franciscejski kataster za Štajersko [Franciscan Cadastre for Styria], C 101, CM (= cadastral municipality) Sv. Duh pri Solčavi.
3. ARS, AS 1073, Collection of handwritings, 132r.
4. ARS, AS 1110, Jožefinski kataster za Štajersko [Josephinian Cadastre for Styria], Oberburg, CM HI. Geist.
5. ARS, AS 1111, Jožefinski kataster za Koroško [Josephinian Cadastre for Carinthia], CM Plat.
6. KLA (Kärntner Landesarchiv = Carinthian Provincial Archives, Austria): AHS (= Alte Handschriftenreihe): A 2450, A 2451.
7. KLA Theresianische Rektifikationen, Unterer Kreis: fasc. 114/3.
8. NŠAL (Nadškofijski arhiv Ljubljana = Archdiocesan Archives in Ljubljana, Slovenia): KAL (Kapiteljski arhiv Ljubljana = Archives of the Ljubljana Cathedral Chapter): fasc. 43, 51, 58, 59, 82, 149, and 166.
9. NŠAL 20, Gornji Grad A [= part of the seigneurial archives of Gornji Grad]: boxes 2, 3, 4, 24, 29, 39, 40, 62, 63, 68, 74, 87, 97.
10. NŠAL 23, Gornji Grad M [= part of the seigneurial archives of Gornji Grad]: box 48.
11. NŠAL, ŠAL/Viz. (Škofijski arhiv Ljubljana, Vizitacije = Diocesan archives, Visitation documents): boxes 2, and 3.
12. SEM (Slovenski etnografski muzej = Slovene ethnographic museum, Slovenia): Documentation, Collection of individual researches, B. O. (= Boris Orel), notebook VI/23.
13. StiASP (Stiftsarchiv St. Paul im Lavanttal = Monasterial archives of St. Paul's abbey in the Lavanttal, Austria): Eb., A. (= Eberndorf, Akten), fasc. 16, 35, 36, 38, 39, 40, 41, 42, 44, 45.

¹⁰⁶ Additional important aspects influencing subsistence possibilities were changing taxes and dues but the analysed inventories are not a proper type of source to investigate it.

14. StIASP Eb., B. (= Eberndorf, Bücher) 4, 7, 8, 63, 151, 154, 155, 183.
15. StLA (Steiermärkisches Landesarchiv = Styrian provincial archives, Austria): A. Göth Georg Nachlass, fasc. 39, bundle 792.
16. StLA GB I (= Grundbuch I): 3382; 3388–3389, Herrschaft Oberburg.
17. StLA HK (= Archiv der Innerösterreichischen Hofkammer): 1691-II-43, 1694-VII-47.
18. ZAC (Zgodovinski arhiv Celje = Historical archives Celje, Slovenia): ZAC 536, Gosposočina Gornji Grad [= part of the seigneurial archives of Gornji Grad], box 84.
19. ŽA Ljubno (Župnijski arhiv Ljubno ob Savinji = Parish archives at Ljubno ob Savinji): Chronicle of the parish.
20. ŽA Luče (Župnijski arhiv Luče ob Savinji = Parish archives at Luče ob Savinji): Chronicle of the parish.
21. ŽA Nova Štifta (Župnijski arhiv Nova Štifta = Parish archives at Nova Štifta): Chronicle of the Solčava parish.

4.2 Published sources

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POVZETEK

Pisni viri, predvsem podložniški inventarji, predstavljeni v kontekstu nadaljnjih dokumentov iz arhivov zemljiških gospostev, državne in cerkvene uprave, dokazujejo, da okoljske, gospodarske in družbene spremembe v dinamičnem 17. stoletju na gorske kmetije zahodnega dela Vzhodnih Karavank in osrednjega dela Kamniško-Savinjskih Alp niso vplivale enotno. Predstavil sem priložnosti in pasti pri tovrstni analizi podložniških inventarjev. Metoda za ugotavljanje živinorejskih okoljskih obremenitev v 17. stoletju temelji na primerjavi podložniških inventarjev in opisov kmetij. Njeni bistveni sestavini sta masa domačih živali v 17. stoletju in razmerje potreb različnih živalskih vrst po krmi glede na podatke gosposčinskih obračunov in vizitacijskega zapisnika. analiza žitne pridelave se osredotoča na žitne vrste, količino lokalno pridelanega zrnja in žitne zaloge. Z žitom so tudi trgovali in si ga izposojali. Inventirana orala in podatki o škodi, ki so jo povzročili pobočni procesi, dokazujejo netrajnostno rabo nekaterih njiv. Podložnikom, ki so zaradi okoljskih ali družbenih razlogov zašli v gospodarske težave, so upniki v številnih primerih zagotovili potrebna sredstva oziroma dopuščali plačilne zaostanke, vendar pa so se obseg in značilnosti zadolženosti podložnikov močno razlikovali. Z grafa, ki prikazuje vsote vrednosti, pripisanih živini in žitu, ter premoženja, posojenega drugim, od česar so odšteti dolgovi, je očiten okoljski vpliv slabih letin poznega Maunderjevega minimuma, vendar pa pozitivne in negativne bilance različnih kmetij niso razporejene enotno. K temu so prispevali še drugi dejavniki, npr. obseg in kakovost kmetijskih zemljišč, neagrarni viri dohodka, dote in dedni deleži. Podatki o številu prebivalstva dokazujejo, da je na obravnavanem območju celo v poznem 17. stoletju živelo v primerjavi z 19. stoletjem znatno število ljudi.

SAŽETAK

Arhivski izvori, uglavnom ostavinski inventari kmetova, predstavljeni u kontekstu drugih dokumenata iz arhiva vlastelinstava, državnih i crkvenih vlasti, dokazuju da ekološke, ekonomske i društvene promjene u dinamičnom 17. stoljeću nisu pojednako utjecale na planinska osamljena gospodarstva u zapadnom dijelu istočnih Karavanki te u središnjim Kamniško-Savinjskim Alpama. Predstavljene su mogućnosti, ali i zamke, ovakve vrste analize osobnih ostavinskih inventara kmetova. Metoda za procjenu opterećenja okoliša stočarstva 17. stoljeća temelji se na usporedbi osobnih ostavinskih inventara kmetova s opisima seljačkih imanja. Temeljne komponente uključuju podatke o težini stoke i o omjeru između potrebam različitih životinjskih vrsta po stočnoj hrani, dobivene iz obračuna vlastelinstva i crkvenog vizitacijskog zapisnika. Analizirana je proizvodnja žitarica s posebnim naglaskom na raznolikosti vrsta, količina lokalno proizvedenog zrnja i zaliha žitarica. Dolazilo je i do trgovine i posudbe žitarica. Popisana orna oruđa i podaci o šteti nastaloj procesima pomjeranja zemlje dokazale su neodrživost korištenja nekih polja. U slučaju ekološki ili socijalno uzrokovanih gospodarskih teškoća su vjerovnici kmetovima u mnogim slučajevima osiguravali potrebna sredstva ili pak dopuštali platne zaostatke, no razmjeri i karakteristike zaduženosti kmetova uvelike su se razlikovali. Na grafu koji prikazuje svotu ocijenjenih vrijednosti stoke i žitarica te imovine posuđene drugim osobama, od koje su oduzeti dugovi, može se primijetiti okolišni utjecaj loših ljetina kasnog Maunderovog minimuma. No, drugi čimbenici, kao npr. razmjeri i kvaliteta poljoprivrednog zemljišta, neagrarni izvori prihoda, mirazi i nasljedstva, proizveli su neravnomjernu raspodjelu pozitivnih i negativnih bilanci različitih seljačkih imanja. Statistika stanovništva dokazuje da je, u usporedbi s 19. stoljećem, u regiji živjeo značajan broj stanovništva, čak i krajem 17. stoljeća.

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