

# IGEO 2015 FIELDWORK 1

Name: _____	Number: _____	Team: _____
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## GUIDANCE FOR FWE 1

You are now in the central part of Staritsa, an historical settlement of the Tver oblast. Staritsa will be the venue for today's field exercise. Please read the following notes carefully and follow all the instructions provided. Start by completing the header of this sheet with your personal data (given and family names, student number and team).

Today's exercise consists of four stages and you have to pass through all stages in order. For the exercise, you will work in groups of 40 participants, all from different countries. Do not attempt to change groups. Remain with your group at all times; volunteers will guide you, and you must follow all their instructions. If you have any sort of emergency, please ask for help from the volunteers. You may make additional notes in the space provided on the back of this sheet before you leave each stage.

At each stage, you will receive a task sheet to complete and instruments to use (if necessary). At each stage you have **5 minutes** to complete the front sheet and read the task, and then **30 minutes** for observations and completing your answer.

Please note that mobile phones, tablets or other means of communication are strictly prohibited during fieldwork. All violations of this rule will result in a penalty score. Take care at all times in the field; stay away from dangerous slopes.



PLEASE USE THE OTHER SIDE OF THIS SHEET FOR YOUR INDIVIDUAL NOTES

INDIVIDUAL NOTES

A large, empty rectangular box with a thin black border, occupying most of the page below the header. It is intended for the student to write their individual notes.



# **12<sup>th</sup> International Geography Olympiad**

## **FIELDWORK EXERCISE 1 Task 1.2**

**Student number**

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**Tver 2015**

**TIME LIMIT 30 MINUTES. 4 MARKS MAXIMUM**

You are now just below Point B on the side of the Starchonka (Verkhnyaya Staritsa) river valley. Identify and explain the most common uses of the quarried rock that can be seen at the outcrop on the other side of the valley (west-southwest from you) by doing the following:

- using the template (1.2.1), draw a cross-section (profile) of the Starchonka river valley along the A-B line shown on the map provided in Fig.1,
- identify the rock (1.2.2) using drilling data from site A (Table.1),
- describe known uses of the rock identified in the table provided (1.2.3).

**HINTS&TIPS**

- To make sure you identify the correct outcrop, use your compasses.
- The vertical scale at the template 1.2.1 shows absolute height in metres.

Fig.1

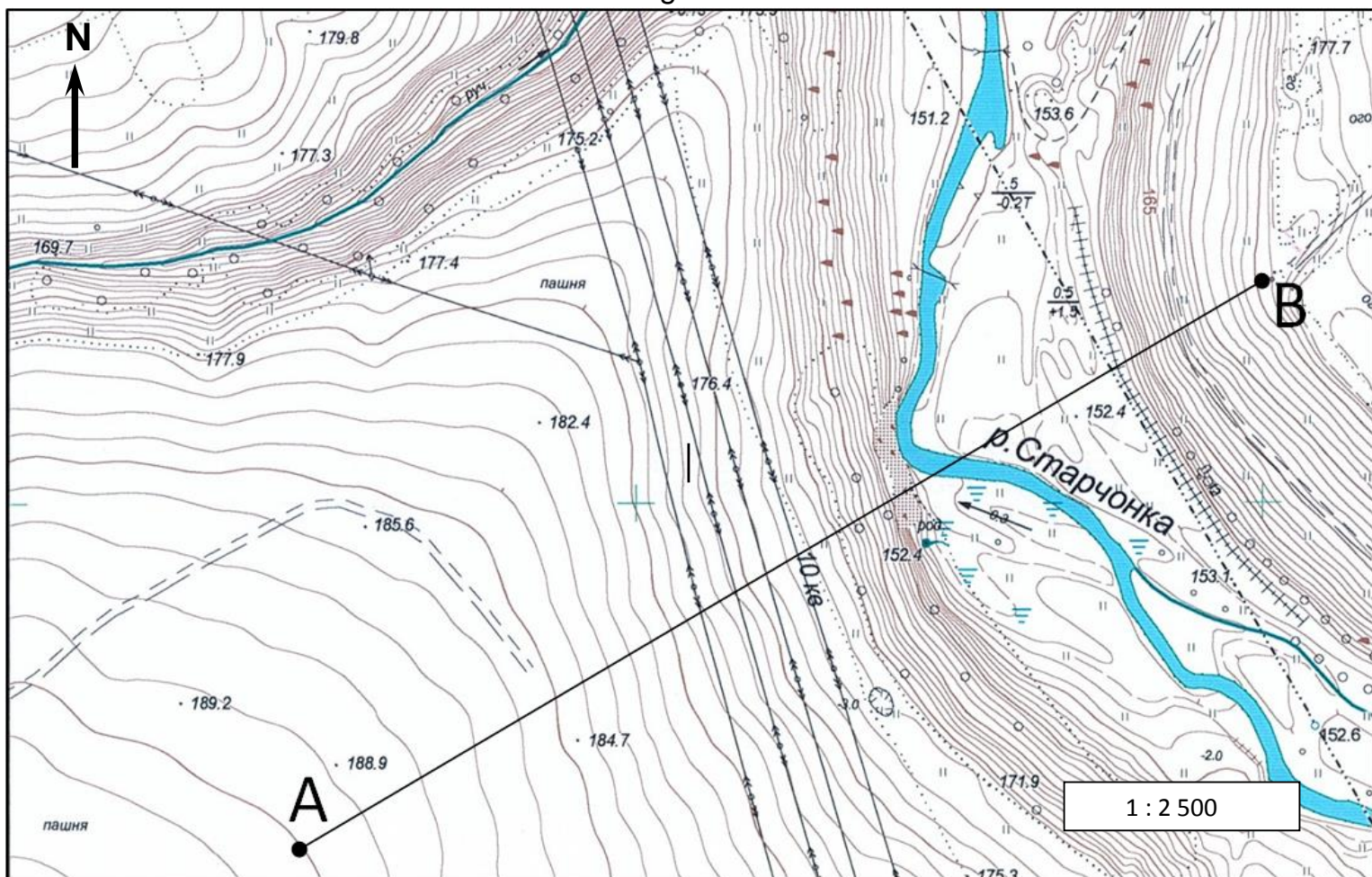
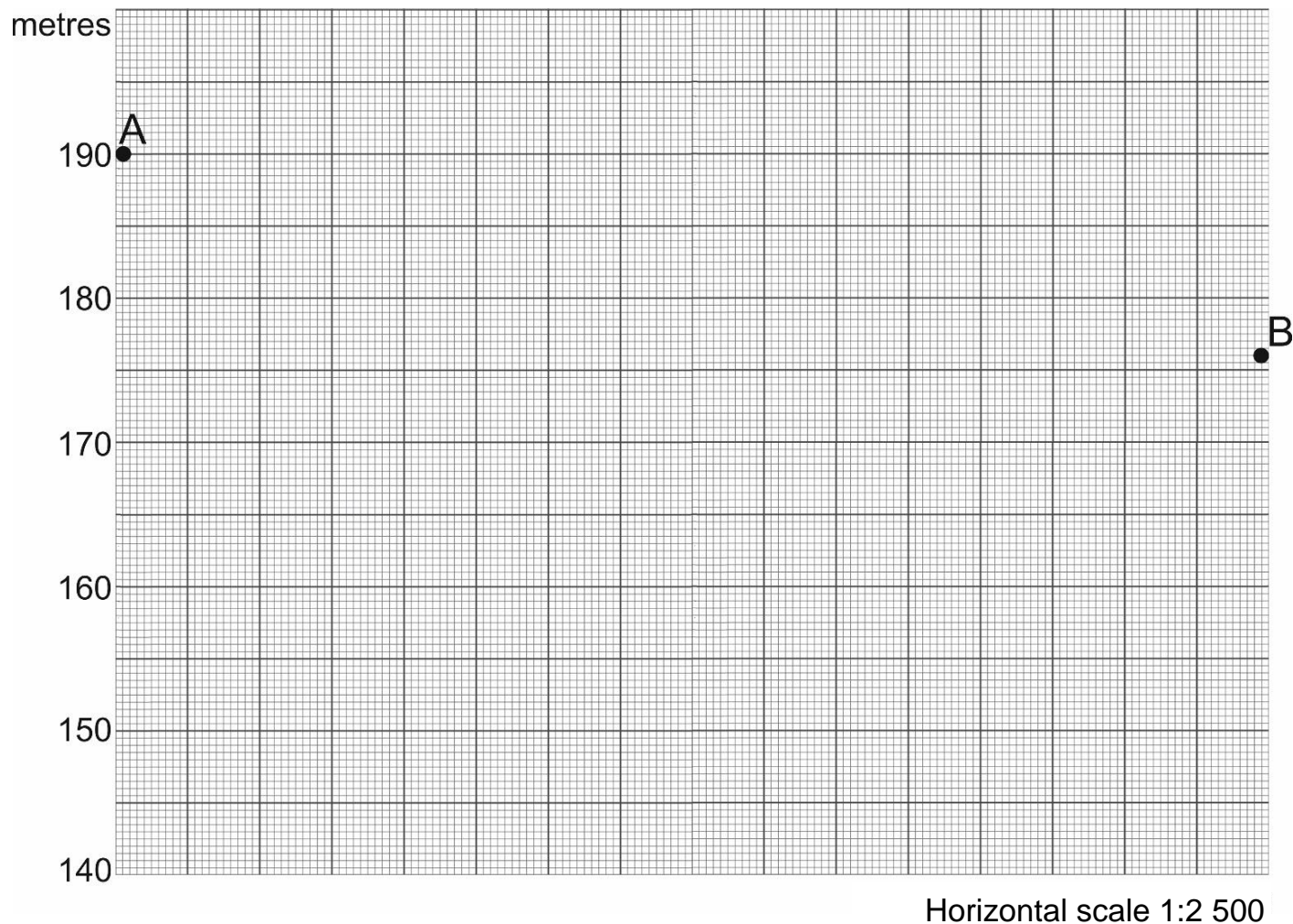


Table 1. Drilling data from site A

Layers (from surface downwards)	Layer thickness, metres
soil and humus	0.3
dark-yellow clay with inclusions of boulder and pebble	4.7
dark-brown clay with inclusions of boulder and pebble	10.0
white limestone of various hardness	52.0

### 1.2.1 Cross-section diagram



1.2.2. The rock observed at the outcrop

1.2.3. What are common uses of the identified rock? What industries use this rock? Describe how each of them uses this rock.

Industries	Use of the rock



# **12<sup>th</sup> International Geography Olympiad**

## **FIELDWORK EXERCISE 1 Task 1.3**

**Student number**

1	2				
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**Tver 2015**

**TIME LIMIT 30 MINUTES.  
4 MARKS MAXIMUM**

From the viewing area, observe 'Moon Valley' (a recently created facility providing accommodation, fishing and other recreational activities). Draw a land use map of the area highlighted on the satellite image on the right.

The map should contain general features such as paths, streams, etc. The key should contain descriptions of a minimum of six land uses identified in this part of Moon Valley.

Draw your map on the template with the title Land use in Moon Valley in 2015. The locational accuracy and size of features will be assessed, along with the use of symbols and descriptive text reported in your key.

You may use your compasses.



# Land use in Moon Valley in 2015

1 : 2 000

Legend (key)





# **12<sup>th</sup> International Geography Olympiad**

## **FIELDWORK EXERCISE 1**

### **Task 1.4**

**Student number**

1	2				
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**Tver 2015**

**TIME LIMIT 30 MINUTES. 4 MARKS MAXIMUM**

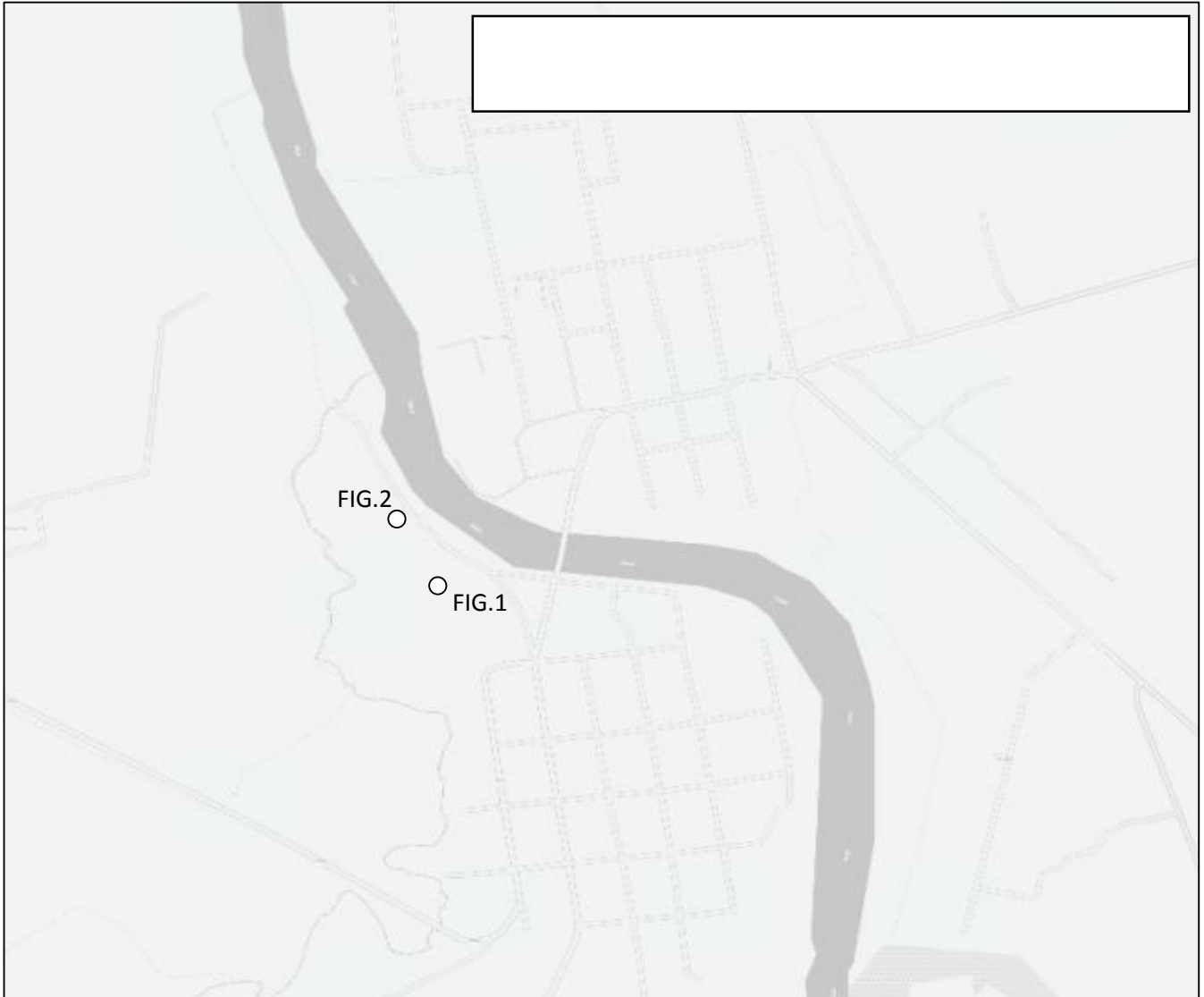
Look at the two historic photographs (Figs. 1, 2) of Staritsa taken in the summer of 1910. The photographs were taken from near where you now stand. Compare the photographs with the present-day view, and then complete the mapping task using the instructions on the following pages.



On the template below, map and label two areas of significant change in land or river use since 1910. In addition, use symbols to show locations where four features have either appeared or disappeared.

### HINTS

- Using compasses if necessary, map and provide a key or legend only for the two areas of significant change and the four features.
- Provide a map title and key or legend.



**LEGEND (KEY)**



12<sup>th</sup> International Geography Olympiad

## FIELDWORK EXERCISE 2

**Staritsa and sustainable settlement systems**

**Resource Book**

Tver 2015

# TABLE OF CONTENTS

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Introduction.....	3
Statistical data and graphs .....	5
Gravity model and zones of influence.....	6
Historical views of Staritsa .....	8
Land use map, 2010.....	9
Population density, 2015.....	10
Sustainability development plan.....	11

### Sustainable futures for settlements in rural areas

Many small settlements in long-settled areas have suffered the same fate in the last 60 years; once thriving communities have lost out to larger metropolitan areas as their functions have been superseded by better transport links, declines in demand for rural labour and the centralisation of administrative functions. In the last 60 years, the market areas for goods and services have increased in size, and mass production is the dominant mode of industry. Local goods (seasonal fresh food) and services (vehicle repair) survive in small settlements. Public transport and vehicle ownership have increased labour force mobility and services such as hospitals, schools and universities are increasingly found in larger urban settlements. *Central place theory*, described by the German Geographer Walter Christaller, noted the importance of (i) the market place in settlements, (ii) transportation within a settlement system and (iii) the role of administrative functions (like schools and hospitals) offered by small settlements.

Figure 1 is the widely recognised description of the sustainability process. The economic sustainability of small settlements is a key question. Attracting new opportunities like tourism services, small/light industries, hospitals and training facilities like Computera, or new resource developments, are projects often considered to influence economic sustainability. Social sustainability is affected by an ageing population with the out movement of young people for employment, education and training along with new family formation. Community actives like sport and leisure activities promote social sustainability. Environmentally sustainable settlements depend on things like the protection of the water supply, waste management and controls on air pollution.



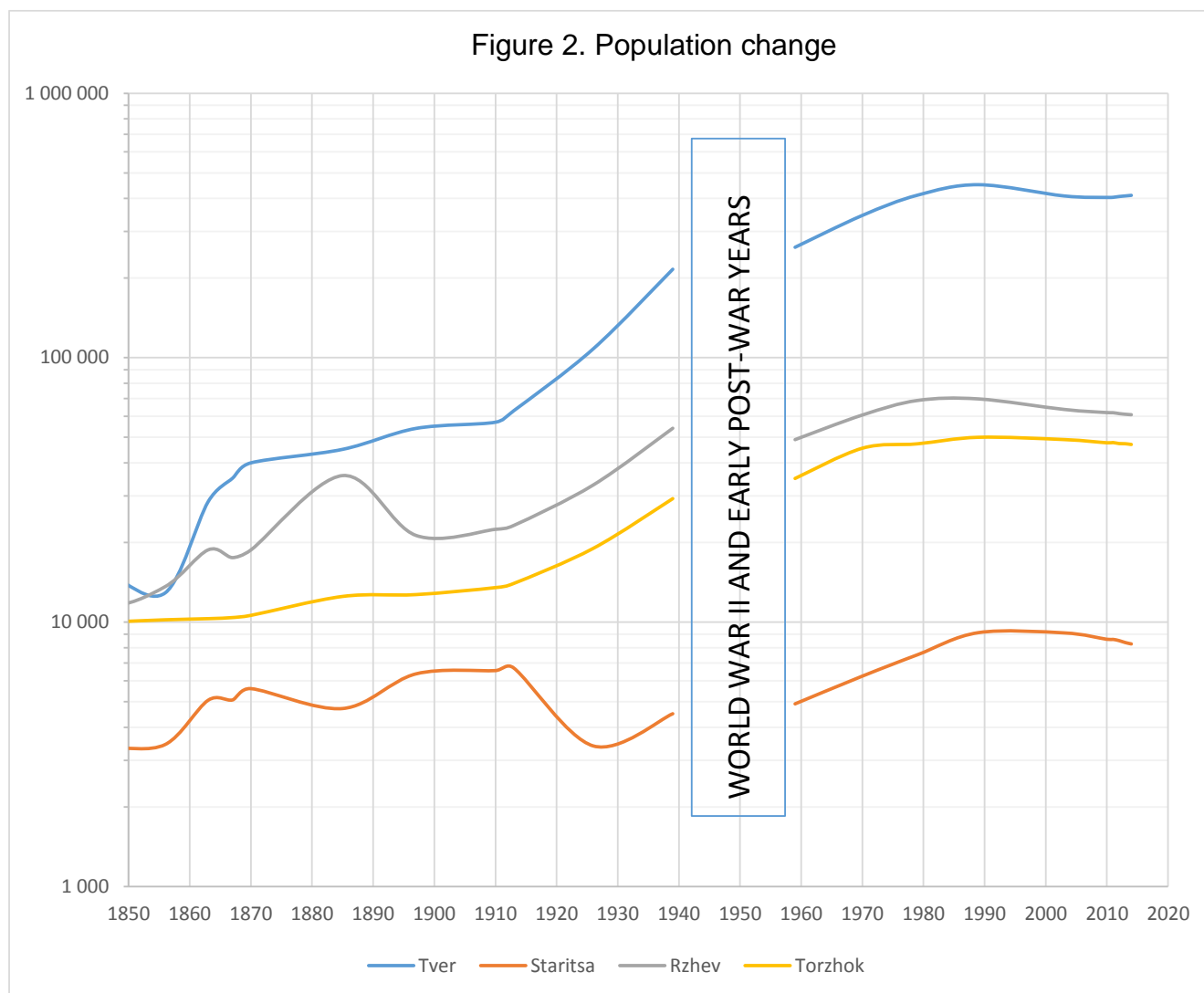
**Figure 1. The sustainable development process**

## **From plans to reality**

When public bodies (like the Staritsa District Council) make plans in areas like Staritsa, they need to identify who will have the responsibility for doing the planning, which groups the planners should work with, and who will be responsible for implementing the agreed plans. Sometimes other bodies propose plans. These bodies include commercial companies, family companies, individuals and interest groups like religious communities and service providers, among others. When other groups make their proposals, they are submitted to the District Council. The District Council follows the same process as above; who will have the responsibility for doing the planning, which groups the planners should work with, and who will be responsible for implementing the agreed plans.

### **Co-ordinating strategic development plans.**

Plans can be prepared at any time, but individual plans need to be co-ordinated and aligned with the strategic developments that the District has put in place, or wishes to consider for the future. Planning needs to consider the environmental, social and economic costs and benefits of every plan. Timing of plan implementation is important; plans may have a wide range of impacts on some local people and time needs to be allowed to do cost-benefit work on these impacts. Time is important, but so is space. Strategic initiatives should be co-ordinated; when Councils dig up new roads, they have probably failed to co-ordinate the transport strategic plan and the housing strategy.



	1847	1856	1863	1867	1870	1885	1897	1910	1913	1926	1939
Tver	15 000	12 900	28 500	35 000	40 000	45 000	54 000	57 000	63 000	108 000	216 000
Staritsa	3 325	3 444	5 060	5 075	5 600	4 709	6 368	6 554	6 700	3 400	4 500
Rzhev	11 618	13 621	18 746	17 528	18 732	35 810	21 265	22 423	23 200	33 000	54 070
Torzhok	10 000	10 200	10 300	10 400	10 600	12 500	12 700	13 500	14 000	19 000	29 300
	1959	1970	1979	1989	2003	2010	2011	2012	2013	2014	2015
Tver	261 500	345 112	411 548	450 941	408 900	403 606	404 030	406 918	408 877	411 042	413 960
Staritsa	4 905	6 244	7 518	9 120	9 100	8 607	8 600	8 506	8 367	8 265	8 094
Rzhev	48 971	60 671	68 858	69 808	63 700	61 982	61 916	61 439	61 091	60 831	60 349
Torzhok	34 921	45 443	47 214	49 982	49 000	47 644	47 739	47 326	47 260	46 950	46 658

**Table 1. Population of Tver, Staritsa, Rzhev and Torzhok, 1847 – 2015**



## Gravity model and zones of influence

### Theory

The zone of influence idea has been used in the 'gravity model' for over 80 years (W.J.Reilly, 1931; J.Q.Stewart, 1947); at any one location we can assess the attractiveness of competing settlements with reference to the size (population) and the distance to those settlements. We can estimate the gravity model 'attractiveness' for a village that is 60 km east of a Town A with 10000 people and 40km west of a Town B with a population of 15000.

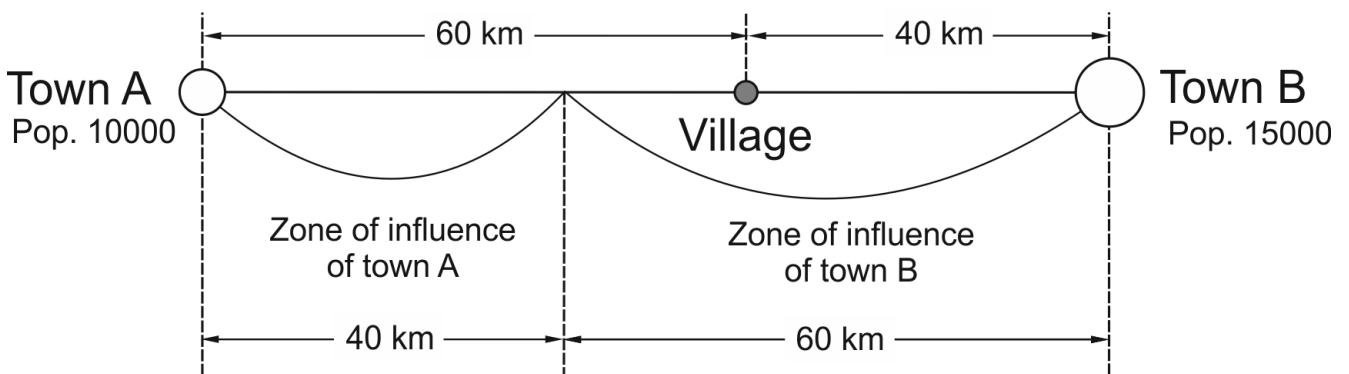


Figure 3. The 'gravity' effect

Because B is closer to the village and it has a larger population, it attracts proportionally more villagers than A ( $15000 \text{ people}/40\text{km away} = 375$ ) versus ( $10000/60 = 167$ ).

To find the boundary of the zone of influence, we must locate the point of equal gravitational attraction of the competing towns. The point at which an equal number of villagers would be attracted to A and B (the boundary of A and B's zones of influence) would be at 40 kms to A ( $10000/40 = 250$ ) and 60km to B ( $15000/60 = 250$ ).

### Worked example for mapping

Each square in the Figure 4 example of the gravity model is 1 square kilometre. The area shown is 30km west to east, and 40km south to north.

We want to estimate the zone of influence for the settlement Y which has a population of 5000, with reference to competing settlements X which has 30000 people, V (8000), W (5000) and Z (5000). To the nearest km, V is 18km away from Y. X and Z are 14km away, and W is 7km.

The spatial extent of influence of Y in the direction of V is mapped arithmetically. We calculate using 5000 people divided by the combined population of V and Y (13000) times the distance of 18km.

In another way this is:  $Y/(Y+V) * D_{Y-V} = 5000/13000 * 18 = 7\text{km}$

The arithmetic for other settlements is      X =  $5000/35000 * 14$  is 2 km

W =  $5000/10000 * 7$  is 3.5km

Z =  $5000/10000 * 14$  is 7km

The influence effect is determined by lines drawn at right angles in the direction of the competing settlement. At 7km towards V from Y, the influence of each settlement is equal. The zone of influence is the polygon drawn by the intersecting lines from competing settlements.

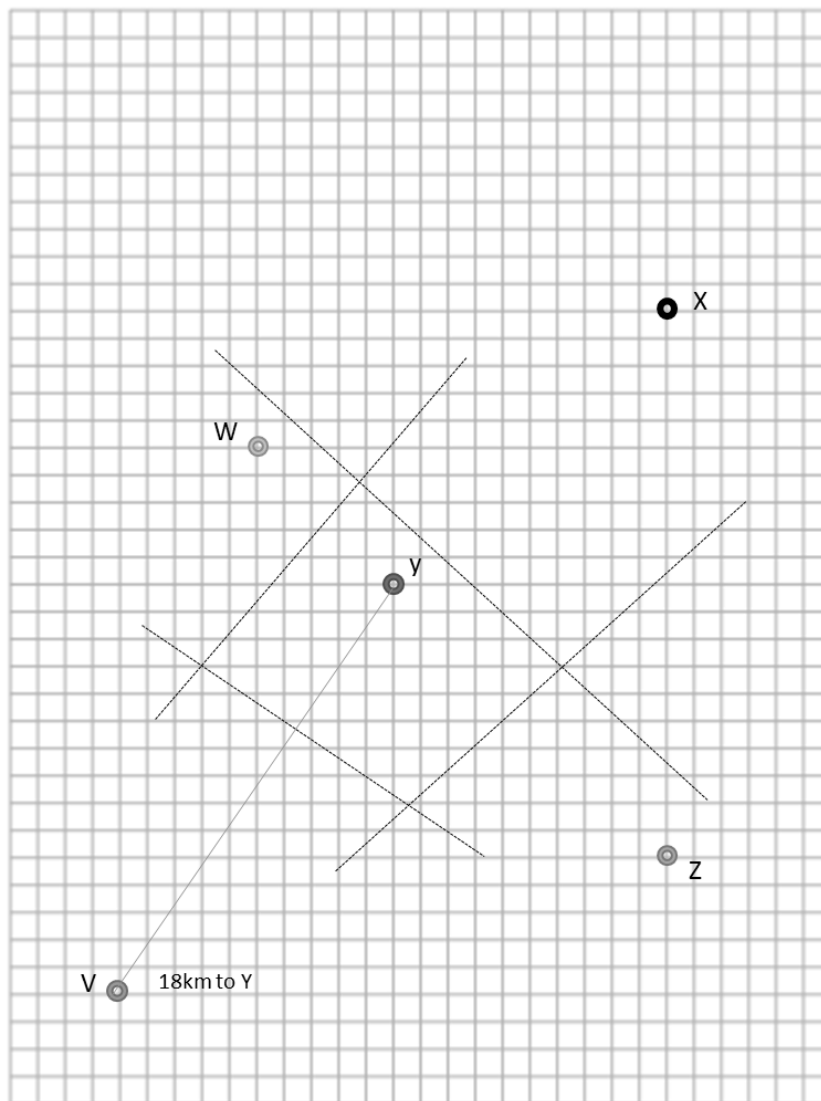


Figure 4. The zone of influence of settlement 'Y'.

## Historical views of Staritsa

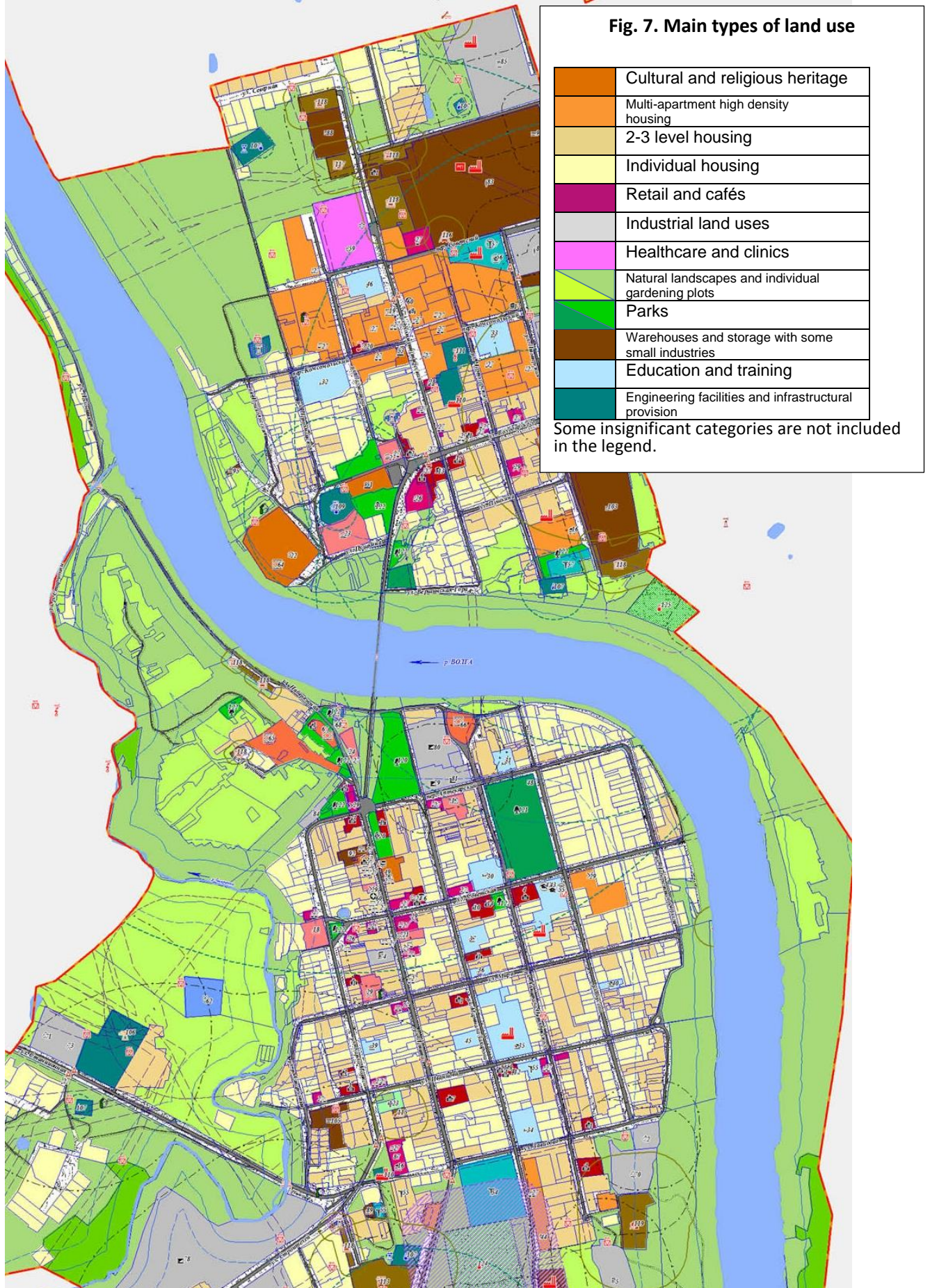


Figure 5. Staritsa in the Middle Ages. Reconstruction. Unknown painter (view from the right bank of Volga covering the hillfort / FWE 1 area)



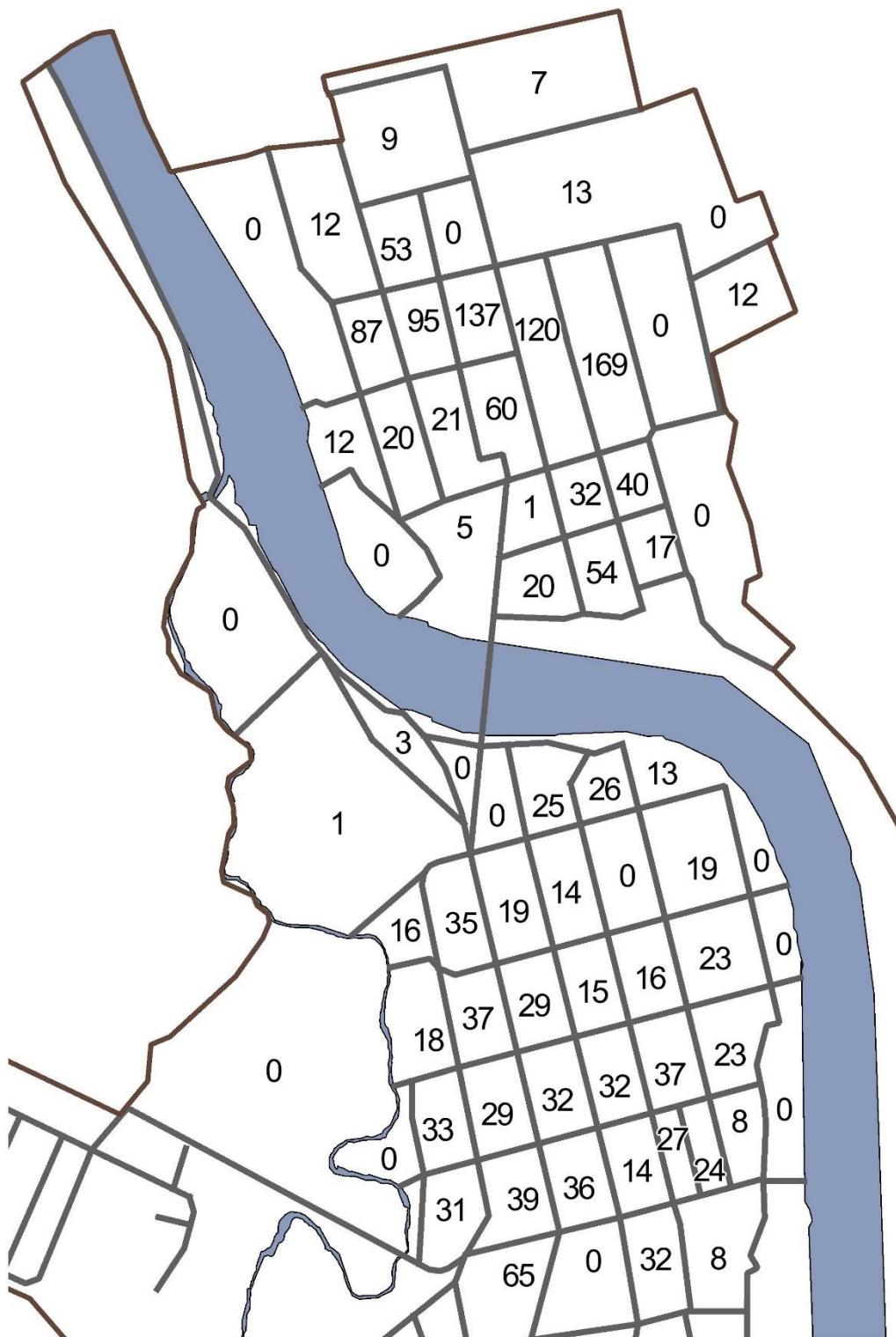
Figure 6. Residential land uses on the North bank side of Staritsa.

# Land use map, 2010



# Population density, 2015

Fig.8. Population density within town blocks (quarters) of Staritsa (per ha).



## Sustainability development plan

### Major issues to be considered in Staritsa sustainability development plan

1. **Relatively low income of local population.** Low incomes encourage local people to grow their own food. Some keep poultry and livestock to supply themselves with milk, meat and eggs.
2. **Workforce drain.** Nearly 1/3 of the local workforce are employed outside Staritsa (mainly in Tver but also in Rzhev and in Moscow). Weekly commuting occurs both because there are few local jobs and low wages in industrial employment (20-40% less than in nearby locations).
3. **Housing.** Despite the decreasing population, housing is one of the most striking problems for Staritsa, as significant parts of the housing stock are old and/or not equipped with electricity, gas or sewage connections. The District Council has provided new housing in multi-apartment buildings (much cheaper to accommodate people moving from old houses), but there is a consumer preference for individual housing.
4. **Low public revenues (budget income) collected from tourism.** Many tourist attractions – buildings of heritage interest, both churches and civil - are abandoned, ruined or closed to visitors. There is only one hotel in Staritsa and a significant lack of restaurants and cafes to accommodate tourists. Most tourists are therefore transit visitors, spending only 2-3 hours in Staritsa; 90% of them visit only one attraction, the Monastery.
5. **Strategic co-ordination.** The District Council is the co-ordination agency for planning, but individuals, sector groups (e.g. those with tourism interests) and companies can advocate, plan and implement sustainable development strategies with Council approval and support. Regional and national government can also become involved (e.g. in health and education initiatives).

#### Sustainable development plan for Staritsa: food, tourism, industry ...

Historically, settlements in rural space often grew as market places for local food production. **Local food markets** often operate in central “market squares”, at times known to producers and quickly learned by local consumers. More recently, local markets have developed as *social and community-building* events that happen perhaps twice a week in small settlements, but almost daily in larger rural settlements. While the vendors may bring produce some distance, the consumers are generally local people. The *economic* benefits are high, as expenditure recirculates in the local economy.

		
<p>The market offers value-added products like honey, and customers are encouraged to taste before buying.</p>	<p>Local people sell fruit and vegetables (girl selling berries) harvested from the natural <i>environment</i>.</p>	<p>Vegetables are also commonly offered for sale in the markets of rural settlements.</p>

Markets are best located at focal points in small settlements. They may be run in local halls in winter, but often stalls are set up outside in summer. Once they have reached a threshold of about 10 stalls, and they have operated for six weeks, consumers start to use them for weekly ‘provisioning’ rather than casual purchases.

**Tourism.** Given the historical significance of Staritsa, the number of heritage sites is high, and there are opportunities to use these features of the settlement as a basis for sustainable development initiatives in tourism. The Assumption Church and Monastery show what is possible, but accommodation options and activities in the Moon Valley indicate that local people can become involved in providing tourism services using the local *environment*. The sites of tourism are widely distributed, so a tourism bureau in the central civic area would be important and would co-ordinate the *economic* development of tourism. The strategies for development would focus on the 137 listed heritage sites, with preservation of 14<sup>th</sup> and 15<sup>th</sup> Century buildings a priority.

The use of *social* media to promote Staritsa's heritage and the limestone caves in the vicinity has already indicated where the promotional opportunities lie; there are numerous abandoned limestone quarries in the town's vicinity, explaining an abundance of limestone buildings in the town. The river is no longer used for transport, but there are popular swimming beaches at a number of places on the banks of the river.

		
<p>All three buildings of Prokudin-Gorskii's classic tourist image are in disrepair today. Left, Piatnitskaia Church; centre Hotel and right, Bell Tower of Saints Boris and Gleb.</p>	<p>Richard Lozin's image of a Staritsa Ice cave; a potential site of tourism.</p>	<p>Assumption Church and Dormition Monastery.</p>

**Investment in new industry** is a strategy often advocated as part of sustainable development initiatives, especially where there is an experienced workforce or a potential resource that can be developed. In settlements like Staritsa, *social and cultural* participation in religion and administration have dominated the history, and the only resource that is freely available is labour.

		
<p>Work environment featuring custom-built, Russian wooden furniture.</p>	<p>1940 image of a start-up jam industry based on the collection of local fruit.</p>	<p>Russian monk Agapy makes local cheeses at Valaam.</p>

Skilled labour is critical in attracting technology-based investment, but in small settlements industries that can offer semi-skilled employment and focus on processing local resources are more likely to succeed. Industries based on processing agricultural produce are possible, despite the *environmental* constraints of a reasonably short growing season and the absence of organizational infrastructure (such as the security of supply provided by a production co-operative). Small industries such as cheese making and honey extraction may be seasonal. An initiative in a timber-related industry could be proposed for the manufacture of toys and ornamental items from the local timber supply, and a craft industry co-operative is also possible. In an *economic* sense these are start-up industries that could be supported by the District Council providing access to vacant buildings in Staritsa.

The capital requirements of small local industry are generally low, and the site of manufacture can be located wherever there is available space. The distribution of outputs from locally-based industrial output requires only local transport systems; most of the consumption will be within the region, with craft and timber products promoted through a linked tourism facility.



# **12<sup>th</sup> International Geography Olympiad**

## **FIELDWORK EXERCISE 2**

**Staritsa and sustainable settlement systems  
(Tasks 2.1 - 2.3)**

**Student number**

1	2				
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**Tver 2015**



**Instructions**

*All tasks must be completed individually, using the answer templates provided.*

*The Resource Book provides important supporting materials.*

*Time management:*

- *You may have ten minutes to read the paper and Resource Book. No writing in this time.*
- *Students with English as the language of instruction then have two hours to complete the test.*
- *All other students have two hours and 20 minutes.*

*Write your answers in pen.*

*You may use coloured pencils/pens for map work or diagrams.*

*You may refer to material in the Resource Book in your answers, and you may use material included in earlier answers you have provided.*

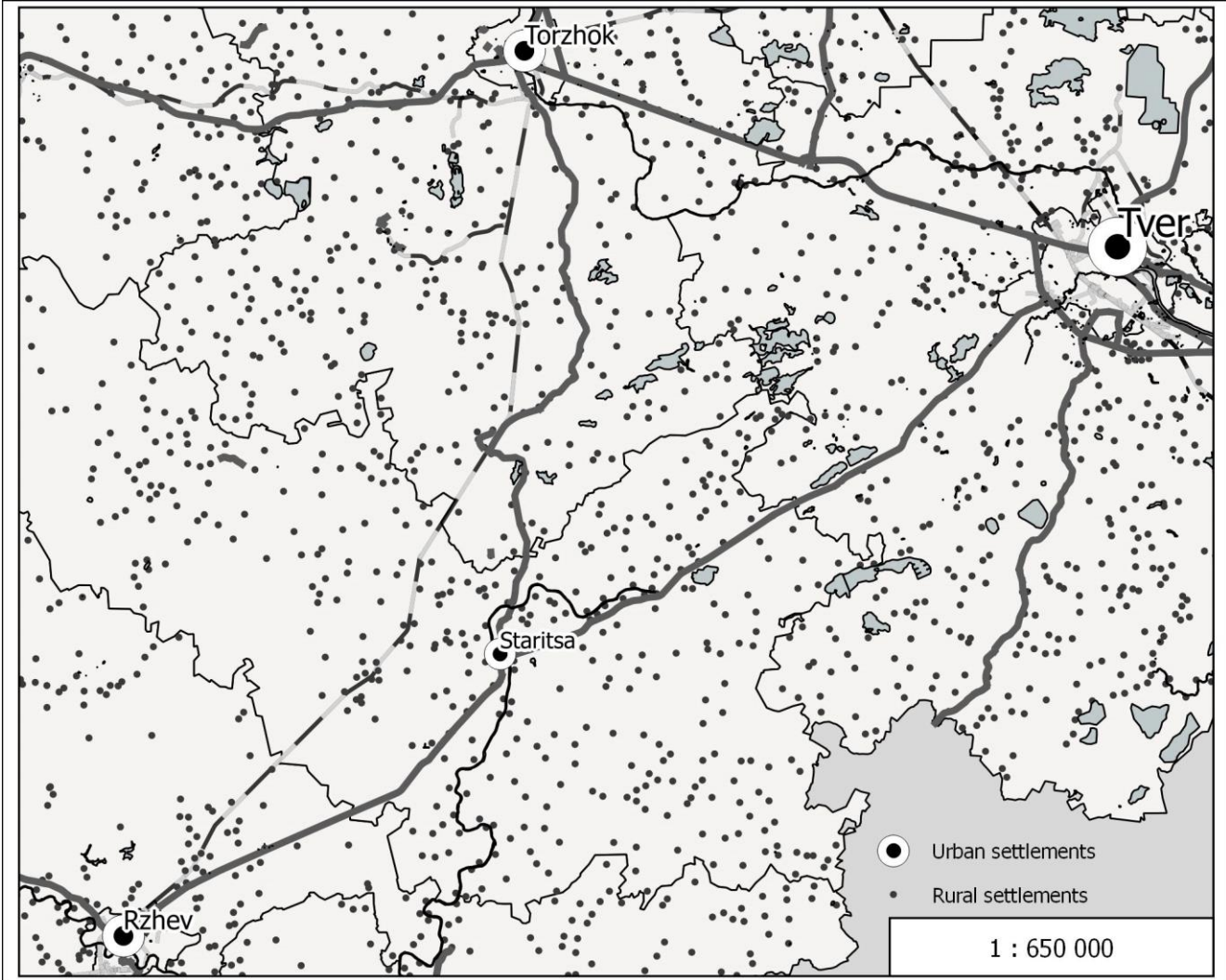
**Task 2.1. Staritsa’s changing zone of influence (maximum 6 marks).**

In the last 150 years, Staritsa (established in 1297) has had a declining zone of influence as three other settlements in the southern Tver oblast (region) have grown much more rapidly for a variety of reasons. Rzhev and Torzhok, for example, have much better transport linkages and Tver is on major road and rail links as well as having been a regional administrative centre for several centuries.

Statistical data (page 5 in Resource Book) includes the size of the population in each of these centres at two important points in history (1867 and 2015). If population dynamics reflect the economic development of settlements in the region, we can make a map that shows the relative change in Staritsa’s zone of influence.

Using Map Template 1, and the processes used in the Gravity Model (Resource Book, pages 6-7) map the change in the polygon that shows Staritsa’s zone of influence between 1867 and 2015 (use contrasting line symbols with clear labels). The data you need to make the map is given in the Resource Book (page 5).

**Map Template 1**



**The map shows changes that influence the sustainability of Staritsa.**

Approximately how much did the Staritsa zone of influence change in size between 1867 and 2015? Provide a percentage estimate with a plus or minus sign as appropriate.

%

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**Task 2.2. Functional zones in Staritsa (maximum 8 marks)**

**2.2.1 Present-day land uses**

Examine the detailed map of land uses associated with each site mapped in the Staritsa area. This map was prepared in 2010 for the most recent Town Plan (page 9 of Resource Book). Compare the land uses of the two parts (right and left banks) of Staritsa. In each of the answer templates, provide three examples of common features, three features found only on the right bank, and three features found only on the left bank. Use your observations from FWE1 to and the resources provided.

<b>Common features</b>	
<b>Features found only on...</b>	
<b>...right (North) bank</b>	<b>...left (South) bank</b>

**2.2.2 Zoning map**

Zoning maps are often used in planning for sustainable development; they are the basis for making strategic decisions about parts of Staritsa that may be considered appropriate for particular activities. For example, future school or education zones can be located near recreational areas, food markets can be centrally located, and heritage zones can be protected. The map you make in this answer will help you answer Task 2.3, where you have to explain the geography behind the sustainable development initiative you propose for Staritsa.

On the Map Template 2, generalise and map the land uses into main six zones for the town’s development. You may have more than one instance of a zone type on your map; for example, there could be several “residential areas”, “areas zoned for industrial uses”, “heritage and protected areas”. You can indicate difference with overlaid symbol if this is necessary.

You may use brief map annotations if this helps to explain your zoning map. In making your map, use town blocks as your starting point. Provide a brief explanation of principles used for each zone allocation.

## Map Template 2



<b>Zone</b> (symbol and annotation)	<b>Description and principles (criteria) behind allocation</b>

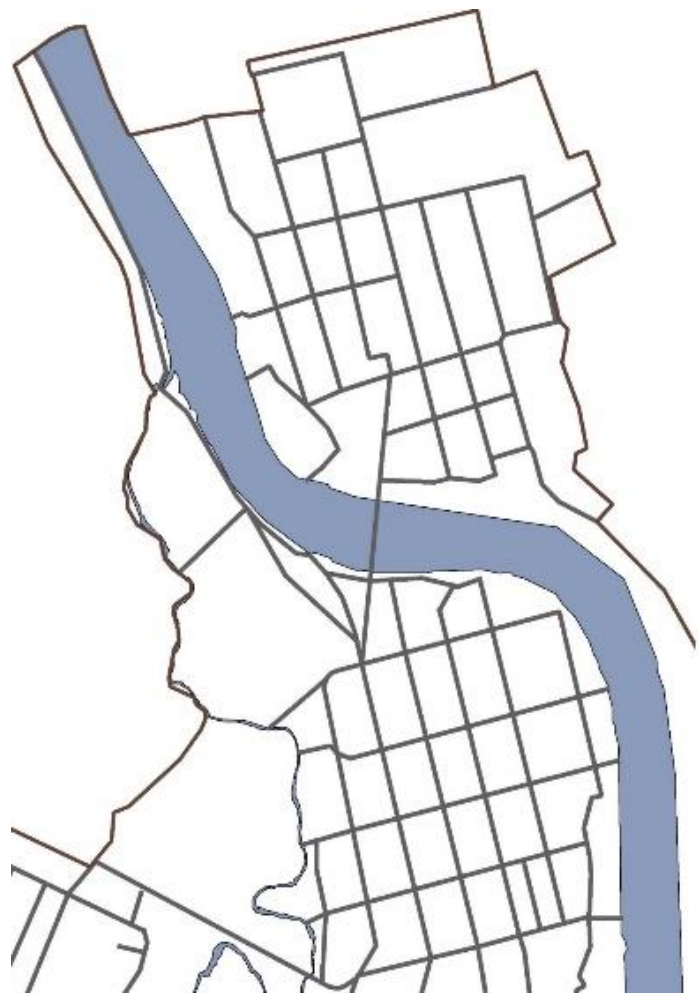
**Task 2.3. Sustainable development and Staritsa (maximum 10 marks)**

*In the four panels provided, create a written plan for the sustainable development of Staritsa for the next 20 years. Your plan should be based on (a) reading the material in the Resource Book and (b) writing up to 125 words in response to each of the four tasks described below.*

(a) Using the sustainable development model given in the Resource Book (page 3), provide a name for your sustainable development initiative. In the text box, identify and explain one economic, one environmental and one social issue that influences *your* named plan for the development of Staritsa. Some examples of environmental, social and economic issues are given in the Resource Book, and you may use these to create your own plan for tourism, housing, natural resource use, industrial or retailing development (for example).

Name of your sustainable development plan for Staritsa:

(b) Comment on the geography of your plan. Describe the spatial scale (e.g. regional: within 10km of Staritsa, settlement wide or local) and location of the sustainable development options you have in mind. Are there site-specific requirements (e.g. sites of tourism development)? For a food market, for example, some producers travel from sites of production far beyond the settlement to the centrally located market, but most of the consumers are local. You may use the Staritsa map supplied to locate your development options if you wish.



(c) Implementing *your sustainable development plan* for Staritsa will require you to identify the government (local, regional and state), companies, families, interest groups and individuals who will be involved in the sustainable development activities. For your named sustainable development initiative, who do you think would take the initiative, and what other parties would be involved? Describe those who you think would benefit most.

(d) A single development initiative may not be enough to secure the future of Staritsa, and the benefits may be limited to just one area of the settlement or sector (economic, environmental or social). Describe two examples of complementary initiatives to your plan that would have benefits in other areas of the settlement and in other sustainable development sectors.

Complementary initiative 1.

Complementary initiative 2.