МИНИСТЕРСТВО СЕЛЬСКОГО ХОЗЯЙСТВА
И ПРОДОВОЛЬСТВИЯ РЕСПУБЛИКИ БЕЛАРУСЬ

ГЛАВНОЕ УПРАВЛЕНИЕ ОБРАЗОВАНИЯ,
НАУКИ И КАДРОВОЙ ПОЛИТИКИ

Учреждение образования
«БЕЛОРУССКАЯ ГОСУДАРСТВЕННАЯ
ОРДЕНОВ ОКТЯБРЬСКОЙ РЕВОЛЮЦИИ
И ТРУДОВОГО КРАСНОГО ЗНАМЕНИ
СЕЛЬСКОХОЗЯЙСТВЕННАЯ АКАДЕМИЯ»

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АНГЛИЙСКИЙ ЯЗЫК

LAND USE IN THE WORLD

Пособие
для студентов, обучающихся по специальности общего высшего образования 6-05-0532-03 Землеустройство и кадастры

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Содержит материалы, направленные на обучение разным видам чтения по широкому профилю специальности на английском языке, усвоение новой лексики, развитие навыков коммуникации.

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ПРЕДИСЛОВИЕ

Пособие предназначено для студентов специальности 6-05-0532-03 Землеустройство и кадастры. Целью пособия является совершенствование и систематизация знаний и умений студентов, достигнутых на предыдущей ступени образования, пополнение их словарного запаса по изучаемой тематике, формирование навыков понимания, перевода и реферирования текстов по специальности, развитие навыков монологического высказывания на основе письменного текста, что позволяет сформировать коммуникативную компетентность для решения социально-коммуникативных задач в профессиональной деятельности студентов.

Пособие состоит из 22 уроков, которые можно условно разделить на блоки: учеба, землепользование в мире, землеустройство и окружающая среда, новые технологии в землеустройстве. После каждого раздела предлагается урок для контроля пройденного материала. Подобраны тексты разной сложности, чтобы у преподавателя был выбор в зависимости от уровня подготовленности студентов.

Для облегчения работы перед каждым текстом даются слова и выражения для активного усвоения. В каждом уроке предлагается комплекс упражнений, способствующих активному усвоению профессиональной лексики, правильному употреблению терминов, повторению некоторых аспектов грамматики, а также упражнения, позволяющие проверить общее понимание прочитанного, стимулировать устное высказывание на базе прочитанного текста. В конце каждого раздела предусмотрены задания на развитие монологической речи, что способствует формированию у студентов навыков самостоятельной деятельности и ведения дискуссии на английском языке.

По материалам текстов составлены грамматические упражнения и упражнения на словообразование. Система упражнений направлена не только на овладение навыками чтения, перевода, но и реферирования специализированных текстов по землеустройству и кадастрам.

Unit 1. I'M A STUDENT

Vocabulary

a first-year student – студент первого курса
a full-time student – студент дневной формы обучения
to apply for admission – подать заявление на учебу
to pass exams – сдать экзамены
to succeed – добиться успеха
to work hard – упорно работать
cares and worries – заботы и тревоги
currently – в настоящее время
challenging – интересный
to enroll – поступать
to learn – изучить
to allocate a place – выделять место
a dormitory – общежитие
within 15 minutes' walk – в 15 минутах ходьбы
a shared room – общая комната
unusual – необычный
experiences – опыт
to mean (meant) – означать
to become familiar – познакомиться
a period – пара (занятия)
to take responsibility – взять на себя ответственность
accommodation – жилье
adult – взрослый
to prepare – подготовить
on average – в среднем
to spend – проводить
to attend classes – посещать занятия
disastrous – катастрофический
to last – длиться
truly – действительно
along with – наряду с
possibilities – возможности
to build confidence – создавать уверенность

I am **a first-year student** now. I'm **a full-time student** of the Belarusian state agricultural academy. I've **applied for admission to the**

academy after finishing a secondary school and **passing** successfully **exams** in maths, physics and Russian. I realize now physics is a **corner-stone** (краеугольный камень) of all sciences. I have always enjoyed it. I **worked hard** and I **succeeded**. And now I am a happy member of the great, young family of students. They say that "student life is **golden life**," because student life is the most important part of human life. It is the period of pure joy and happiness, because you are free from **cares and worries** of a grown-up life.

I am **currently** studying land-use planning which I find really interesting and also very **challenging.** I **enrolled** in this course **to learn** how land can be used, developed, and preserved in the best interest of society. I was **allocated a place** in **a dormitory** in **a shared room** with 2 other students. I'm living away from home for the first time. The dormitory is located **within 15 minutes' walk** to my faculty. When you live in the dormitory it is easier to meet other students and make friends. Some students live at home with their parents, but this is **unusual** in some other countries. Many young people prefer **to live away** from home when they go to university. Uni friends are definitely friends for life!

I have new **experiences**, and learned many new things which came into my life with it. At first, I didn't know what they meant. Now I **became familiar with** such words as "**a period**", "a seminar", "module". I know what it means "to make notes", "zachet", etc. You need to attend lectures, seminars and tutorials. You need **to take responsibility** for your learning and manage your own time. You may also be paying for your **accommodation** or rent, buying groceries and doing other "**adult**" things for the first time. But the most difficult part of being a student is having the self-discipline to study every day and prepare for exams. **On average** students **spend** around thirty hours a week **attending classes**, doing homework, and studying for exams.

I'm still to know more, and first of all how to save time to be able to study well. Because being independent sometimes mean "You can do whatever you want, whenever you want". But it can have a **disastrous** effect during exams.

I know that it will be necessary to do some practical training as part of my course. It may **last** a few weeks or months.

One of the best things about students' life is that you get a new experience every day. It is **truly** a time of discovery. In my student life, **along with** studying, I and my friends enjoy a lot of other things: we can take part in the students' life, join students' scientific society and sing in our

Academy choir or dance, become a member of our faculty sports team and visit interesting students' events. The possibilities are endless. Social life in the academy is exciting and great fun.

I love everything in my Academy. I like teachers. I like its great beautiful buildings, a sport complex, its lecture halls, laboratories, the Amphitheater, the Botanical garden and amazing surroundings!

Ex. 1. Word formation. Fill in one word to complete the phrase: *succeed, success, successful, successfully*

1. The party was a great …
2. Tom works hard, so I am sure he will … .
3. He … passed the exam.
4. We wish you a bright and … New Year.

Ex. 2. What words can follow *have or get?*

experiences, time, tutorials, self-discipline, practical training, great time

Ex. 3. Study or learn?

Мы говорим **study**, когда изучаем что-либо: мы посещаем занятия, получаем теоретические знания, прилагаем какие-то усилия, чтобы выучить что-то. Например, готовимся к экзамену, учим математику в школе, учим философию в университете. Мы говорим **learn**, когда мы обучаемся какому-либо навыку и можем пользоваться своими знаниями на практике. Это не только процесс изучения, но и результат.

For example: I studies English at school but learnt nothing.

I **learnt** the poem by heart.

I **study** many subjects at the university.

Ex. 4. Choose *learn or study.*

1. He... to become an engineer.
2. I... to play the guitar when I was at school.
3. My mother … German at the language courses. Now she speaks German fluently.
4. I decided to … harder in this semester.
5. I want to … how land can be used, developed, and preserved.

Ex. 5. Use the words in the box to fill in the blanks.

have	make	take	attend	spend	do

1. Students obtain knowledge when they … practical training during their studies.
2. It is necessary to … all classes.
3. At first it was difficult for me to … notes.

4. Every day we … six-eight hours in the classroom.

5. Not every student is ready to… responsibility for his studies.

Ex. 6. Translate words and word combinations in the sentences.

1. I'm (*студент дневной формы обучения*) of the Belarusian state agricultural academy.

2. I'm (*студент первого курса*) in land-use planning.

3. I am (*сейчас*) studying land-use planning.

4. I (*поступил*) in this course to learn how land can be used, developed, and preserved in the best interest of society.

5. (*Мне выделили место*) in a dormitory in a shared room with 2 other students.

6. The dormitory is located within (*в 15 минутах ходьбы*) from the campus.

7. I'm (*живу не дома*) for the first time.

8. I learned many new things which (*вошли в мою жизнь*) with it.

9. I realise that the most difficult part of being a student is (*быть само дисциплинированным*) to study every day.

10. It will be necessary (*проходить практику*) as part of my course.

11. One of the best things about students' life is that you (*получаешь новый опыт*) every day.

12. The possibilities for students are (*бесконечные*).

13. Students' life is (*незабываемое время*) in every person's life.

Ex. 7. Present or Past? Use *am/ is//are /was/were.*

1. I … a first-year student of the Belarusian state agricultural academy.

2. I … allocated a place in a dormitory.

3. The possibilities for students … endless.

4. Student life … full of fun and enjoyment.

5. My course … interesting and challenging.

6. Many students … are living away from home for the first time.

7. My exams in maths, physics and Russian … successful.

Ex. 8. Begin questions with *how far, why, what, where, how many, what*

1. … do you study?

2. … exams did you pass to become a student?

3. … do you study land-use planning?

4. … is your dormitory from academy campus?

5. … hours do students spend attending classes?

6. … possibilities are there for students in the academy?

Ex. 9. First-year students arrive with very different academic and social skills, and from different regions of Belarus. Many **are** also **making big life adjustments** (вносить коррективы): for example, by living away from home for the first time.

- What are the things you must do yourself living away from home?
- What are you hoping for in a roommate? Great friends? Respectful living but have own friend groups? Similar schedules, and if so what would that look like?

Ex. 10. Answer the questions

1. What do you think of your studies?
2. What is a student life for a first-year student? Choose adjectives to describe it:

exciting, active, dull, confusing, challenging, boring, difficult, independent.

3. How could you describe your course or whatever you're studying now? Is it easy to understand?
4. Do you like what you're studying? Why or why not?
5. Is geodesy interesting or boring? Why?
6. Is it difficult or easy? Try to explain why!
7. Do you agree that "**student life is golden life**"?

Ex. 11. Say true things about yourself.

- Choosing a career is an important event in life.
- At school I changed my choices regularly: today I want to be a fireman, the next day a journalist etc.
- I'm taking a course in land use planning/land cadaster.
- I'm studying to become an engineer in land management.
- I like it but it's hard work, because we have to do different subjects, and there's a lot of work for each one, so I don't have much free time.
- To be honest it's very easy and I find it quite boring.
- Geodesy is a corner-stone of my course.
- I find it quite hard, because there's a lot of maths, physics and things you have to understand and to remember.
- The one thing that we have in common is that we all came to the academy to learn.
- I spend around 50 hours a week attending classes and doing homework.
- For me it's not very easy to live in the dormitory because I share the room with 3 other students.

- I'm happy I'm independent now, as I can spend my time and money as I like.
- I enjoy being a member of a sports club/a dancing group/ singing in a choir etc.
- Students' life is remarkable/boring!
- We often have parties in the dormitory.
- Living in a dormitory is a new experience for me.
- Being a student is stressful, with all of the studying and pressures of getting good grades, and living away from home for the first time.
- But, it's also a time of great freedom; there is so much choice and so much newness as a student.
- I can't see my future.

Ex. 12. Exchange ideas with your groupmates.

What chores do you hate doing **around the house?** Perhaps you hate doing dishes and your roomie hates cleaning the bathroom. Why not share the responsibilities?

- What is something everyone should know about you?
- What do you value (as a person, as a student, etc.)?
- What is your worst habit?

Ex. 13. Mixed sentences. Rearrange the words to make complete sentences.

1. applied / academy / admission / for / she / to /the
2. land management/ she / /4 years/will study
3. we / exams / we / studying / because / hard / want / are / pass / to
4. in land-use planning /I/ the course/ interesting/ challenging /find /and
5. dormitory the/ most/live/students, in
6. my/ take/I/for/ responsibility/studies
7. spend/ students/ a week/ attending classes / thirty hours/
8. some /in/ I/training/geodesy/practical/will do
9. enjoy/ life /my groupmates/student
10. at / year / of / the end / are / the / difficult / exams /there
12. roommate/my/friendly/is/cooperative/and
13. 2025 / geodesy / in /will be/ in / qualified / he
14. everything/I/in/academy/love/the
15. school / geography / physics / at / favorite / my / were / subjects / and

Ex. 14. Read the article below and answer the questions.

It is becoming increasingly popular for students to take a year out before going to university, and this is called 'taking a gap year'.

Some students travel, others work, and many combine these into an international working holiday. The most popular option for these gap year students, known as gappers, is international volunteering. There is no salary for volunteering, but they will usually get food and housing free and a small amount to cover personal expenses.

Many gappers also earn money overseas, often in the hospitality industry. Another growing trend for them is to enroll in global education programmes that combine language study, cultural immersion, community service, and independent study.

1. What do most gappers do?
2. What do the volunteers receive money for?
3. How do some gappers earn money whilst abroad?
4. What type of courses are becoming more popular?

Ex. 15. Test. Choose one word.

1. We study some science/*humanities* such as history, sociology and languages.
2. The course aims to educate students in theory and also provide them with practical *skills*/*qualifications*.
3. The mark is 3 (three) and any students who *fails*/*passes* will have to retake the exam.
4. Students will be *assessed*/*asked* by way of three pieces of coursework and an end-of-year test.
5. Land-use planning faculty is the best place for people studying this *field*/*course* of science.
6. It is a purely *academic*/*vocational* course, so students don't get much opportunity to learn job skills.
7. We've finished studying soils and we've now started a *topic*/*idea* – land cover.
8. Students may apply for *admission*/*dormitory* to the programme in September.
9. I'm going to *learn*/*study* how land can be used, developed, and preserved.

Unit 2. THE FACULTY OF LAND USE PLANNING

Vocabulary

huge – огромный
approximately – приблизительно
job security – гарантия занятости
to date back – относиться к
at present – в настоящее время
lawn – лужайка
to connect – связывать(ся)
to deal with – иметь дело с
to be aware – быть знакомым
to provide – обеспечивать
knowledge – знания
state-of-the-art – современный
a variety – ряд
equipment – оборудование
to divide – делить
to spread – располагаться
all over – по всей (н-р, территории)
strict – строгий
to be in great demand – пользоваться большим спросом

I study at the Belarusian state agricultural academy which is one of the best agrarian universities in Belarus. Situated in a small town of Horki it is a nice place to live and to study at.

It has a **huge** campus with **approximately** 10,000 students of different courses. I take the course in Land use planning because it is an ideal career for my personal goals. I value financial stability and job security in my life.

The history of the Faculty of Land Management **dates back** to 1859. The training of land use planners began in 1924, when the Faculty of Engineering and Land Management was opened in Gorki. **At present**, this is a unique and the only faculty in the Republic of Belarus, training specialists in land management which are **in great demand** in Belarus

Our faculty is situated in building No 4 surrounded with beautiful **lawn**s, trees and plants.

Land-use planning is **connected** with geography, soil science, law, computer, space technology etc. The work of a land-user planner often **deals with** agriculture.

Land-use planners must be well-educated and be able to use modern technologies. They must **be aware of** modern land information systems and space research technology, and use a **variety** of equipment, including GPS systems, measuring tools, and geographic information systems (GIS), and also use maps and software platforms.

The faculty has three departments: the department of land use planning, land cadaster, geodesy and photogrammetry. As first-year students we study higher maths, physics soil science, geodesy, philosophy, engineering graphics, a foreign language. We have lectures, tutorials, field work. In fact we are busy five or eight hours every day. Our lecture halls are **state-of-the-art** – they have very modern **equipment,** even a drone. The classrooms in the academy are **spread all over the** campus. Sometimes it makes us late for class as we go from one to the other.

We have some really great teachers at our faculty. They are very helpful and give us a lot of advice. The lecturers at our faculty have a very **strict** 'no phones' policy.

The academic year is **divide**d into 2 terms – from September to January and from February to June. In July we have a practical period in geodesy. Later we will study a lot of special disciplines such as:

Land law
Geodetic support for land management and cadastral works
Photogrammetry and remote sensing of the Earth
Land cadastre
Inter-farm land management
Cartography
Arrangement of the territory of agricultural land
Forecasting and planning the use of land resources
State control over the use and protection of land, etc.

Most students live in dormitory No 12. There is a curfew (строгое расписание) in our dormitory – we have to be inside before twelve at night or they lock the door. It's great living in the halls of residence. All my friends are there, so I never feel lonely.

I believe I made the right choice when I chose land use planning. On the one hand, I always liked engineering. On the other hand, after finishing the faculty the doors are open to many different careers.

Ex. 1. Translate the words and word combinations into Russian.

one of the best universities, a huge campus, personal goals, job security, a unique and the only faculty, to use modern technologies, surrounded with

beautiful lawns, to deal with agriculture, to be aware of modern land information systems, to use a variety of equipment, to provide a range of knowledge and skills, helpful teachers, to study o lot of special disciplines, remote sensing of the Earth, to lock the door, to feel lonely.

Ex. 2. Combine part A and part B. Translate word combinations.

A. equipment, campus, graduates, land-use planners, 'no phones' policy".

B. in great demand, state of the art, huge, strict, well-educated.

Ex. 3. Translate the words and word combinations in parenthesis into English.

1. Land-use planners are (пользуются большим спросом).
2. Lecture halls are spread (по всей территории академии).
3. The academy has a (огромный) campus.
4. Land-use planning (связано с) soil science, law, computer, space technology.
5. Land-use planners must be able (использовать современные технологии).
6. Students are taught to use modern technologies (включая) GPS systems, physical measuring tools, and geographic information systems (GIS).
7. Classrooms and lecture halls have very modern (оборудование).
8. We will study a lot of special disciplines (таких как): geodetic support for land management and cadastral works, photogrammetry and remote sensing of the Earth, land cadaster
9. Specialists in land management are in great demand (на рынке труда).

Ex. 4. Fill in the necessary prepositions.

1. The history of the Faculty of Land Management dates back … 1859.
2. … present, this is a unique and the only faculty in the Republic of Belarus.
3. I take the course … land management.
4. Land-use planning is connected … geography, soil science, law, computer, space technology etc.
5. The work of a land-user planner often deals … agriculture.
6. Land use planners must be aware … modern land information systems and space research technology.
7. The classrooms in the academy are spread all … the campus.
8. Our teachers are very helpful and give us a lot … advice.
9. The academic year is divided … 2 terms.
10. The graduates are … great demand in the labor market.

Ex. 5. Complete the sentences.

1. The academy has a huge campus with approximately …
2. The history of the Faculty of Land Management dates back …
3. The training of land use planners began in …
4. Land-use planning is connected with …
5. Land-use planners must be aware of …
6. The programme provides a range of knowledge and skills in …
7. Our lecture halls and laboratories are …
8. First-year students study such disciplines as …
9. Students of "Land management" will study a lot of special disciplines such as: …
10. It's great living in the halls of residence because…

Ex. 6. Translate the sentences into English.

1. БГСХА является одним из лучших учебных заведений в Республике Беларусь.
2. Это хорошее место для жизни и учебы.
3. Академия имеет огромный кампус с приблизительно 8000 студентов, которые учатся на разных факультетах.
4. Я учусь на землеустроительном факультете.
5. Это уникальный и единственный факультет в Республике Беларусь, готовящий специалистов по землеустройству.
6. Планирование землепользования связано с географией, почвоведением, правом, информационными технологиями, космической техникой и т. д.
7. Студенты должны уметь использовать различное оборудование, включая системы GPS, измерительные инструменты и географические информационные системы (ГИС), а также пользоваться картами и специальными программами.
8. Факультет имеет три кафедры: кафедра землеустройства, земельного кадастра, геодезии и фотограмметрии.
9. На первом курсе мы изучаем высшую математику, физику-почвоведение, геодезию, философию, инженерную графику, иностранный язык.
10. На самом деле мы заняты пять или восемь часов каждый день.
11. Учебный год делится на 2 семестра – с сентября по январь и с февраля по июнь. В июле у нас практика по геодезии.
12. Большинство студентов проживает в общежитии № 12.
13. Здорово жить в общежитии. Я никогда не чувствую себя одиноким.

14. Я считаю, что сделал правильный выбор, изучая землеустройство, потому что я буду иметь финансовую стабильность и гарантию работы.

Ex. 7. Speak about your studies at the faculty.

Unit 3. MY SPECIALITY

What options do I have within spatial science?

Vocabulary

to measure – измерять
point – точка
in order to – чтобы
to establish – установить
to determine – определить
boundaries – границы
utilizing – используя
accurate – точные
readings – показания
measurements – измерения
shape – форма
size – размер
properties – владения
to process – обрабатывать
vital– важный
delineation – определение
to quantify – определять
depth – глубина
in the field – в полевых условиях
deposits – залежи
waterway – водные пути
offshore – в открытом море
inland – на суше
chart – карта
rare – редкий
to depict – изображать
at useable scales – в пригодных для использования масштабах
obsolete – устаревший
to update – совершенствовать

to record – регистрировать
knowledge – знания
skills – навыки
to act – действовать

Read the text paying attention to new words.

Land surveying is all about **measuring** the distance between different **points** on the Earth **in order to establish** the topography of a land area, or to **determine** property **boundaries** for private ownership. Essentially, you'll be working out in the field, **utilising** a series of high-tech instruments to take **accurate readings** and **measurements**. You might be conducting geodetic surveys (topographical surveys determining the **shape** of the land) or cadastral surveys (measuring the boundaries and the **size** of **properties** and territories).

You'll then be **processing** the data that you've accumulated. This **vital** information can be used by energy companies looking for oil and gas **deposits**, government agencies that wish to monitor and develop waterways, and marine transport organisations that utilise navigational **charts**.

For the most part, you'll be working out **in the field**; either **offshore**, or **inland**, surveying canals, lakes and rivers.

Cartography (i.e. mapmaking) is a very **rare** industry for people to get into. Although much of the world has already been mapped out, many parts are not **depicted at useable scales**. Moreover, the world's landscape and travel routes change frequently and thus many maps become **obsolete**. Cartographers are therefore still very much needed.

Cartography is essentially the art, science and technology of making maps. These specialists might simply reproduce and **update** old maps, or they might use **state-of-the-art** surveying techniques to analyse and **record** topography and geographical information, before using this data to help them produce maps for the internet, computer systems and traditional paper formats.

To work in modern cartography, you need good design skills, IT skills and **knowledge** of specialist technologies, such as GIS, photogrammetry and 3D visualization.

Ex. 1. Translate the words and word combinations into English.

Измерение расстояния, измерить границы, установить топографию земельного участка, определение границ собственности, снятие точных показаний и замеров, проведение геодезических изысканий, определять форму земли, использовать современные технологии, обрабатывать данные, количественно определять глубину, искать месторождения нефти и газа, устаревать, воспроизводить и обновлять старые карты, использовать самые современные геодезические методы, для анализа и записи топографии и географической информации, иметь хорошие навыки проектирования.

Ex. 2. Form word combinations and translate them into Russian.

to establish	property boundaries
to conduct	accurate readings and measurements
to determine	the topography of an area
to update	the data
to take	geodetic surveys
to process	the shape of the land

Ex. 3. Translate the words and word combinations into English.

1. Land surveying can (*определять границы собственности*) for private ownership.
2. High-tech instruments are used (*делать точные показания и измерения*).
3. Many parts of the world are not (*изображены*) at useable scales.
4. Many maps become (*устаревшими*) because the world‘s landscape change frequently.
5. Cartographers might simply reproduce and (*обновлять*) old maps.
6. Cartographers might use (*современные геодезические методы*) to analyse and record topography and geographical information.

Ex. 4. What would you prefer doing as a land use planner?

1. to measure the distance(the boundaries, the size of properties)
2. to establish the topography of a land area
3. to determine property boundaries
4. to utilize high-tech instruments
5. to take readings and measurements
6. to conduct geodetic surveys
7. to process the data
8. to accumulate data
9. to depict parts of the world

10. to look for oil and gas deposits
11. to get into cartography
12. to update old maps
13. to analyse and record topography and geographical information
14. to survey canals, lakes and rivers
15. to work in the fields, offshore, inland

Ex. 5. Make sentences uniting parts A and B, translate them into Russian.

A	B
1. Land surveying establishes	a) because maps become obsolete.
2. You'll need	b) such as Geographical Information Systems.
3. Surveyors use modern technologies,	c) are topographical surveys.
4. Geodetic surveys	d) high-tech instruments to take accurate readings and measurements.
5. Cartographers might use state-of-the-art surveying techniques	e) you need good design skills, IT skills and knowledge of specialist technologies.
6. Cartographers are very much needed	f) to analyse and record topography and geographical information.
7. To become a surveyor	g) the topography of a land area.

Ex. 6. Complete the sentences.

1. Land surveying is…
2. Your job will be …
3. Geodetic surveys determine …
4. Cadastral surveys measure …
5. Geodic data is important for …
6. Cartography is the art of …
7. To be a cartographer, you need …

Ex. 7. Text B. Read about land planners' job and then complete the sentences.

A land planner develops blueprints (планы) for land development. It's their job to analyze recently acquired rural and urban land **to ensure**

(*чтобы убедиться*) that all land use plans are safe, efficient, and environmentally-friendly. As a land planner, your duties include creating development proposals, processing zoning permits, and mapping out land use logistics. A land planner works closely with land developers, government officials, and community members. The first step is gathering data about the site and its surroundings. Topographic and detail surveys, wetlands and environmental considerations, and soils data are key factors in determining the best use of a parcel.

Ex. 8. Complete the sentences using the information from the text.

1. A land planner's job is …
2. A land planner's duties are …
3. Key factors in determining the best use of a parcel of land are …

Ex. 9. Read the text and find verbs in the text describing duties of a surveyor. Translate the text in a written form

Primary duties of a surveyor: Surveyors are responsible for determining property boundaries for legal purposes. Surveyors conduct physical land surveys using various tools, reference previous surveys, maps and deeds, collect data in the field and prepare official reports on their findings. While doing their work, they often coordinate with business owners, real estate agents, mapmakers, civil engineers government officials and architects. Surveyors use a variety of equipment to do their work, including GPS systems, physical measuring tools, and geographic information systems (GIS), and may also use maps and software platforms.

Ex. 10. Describe duties of a surveyor. Begin with:

Duties of a surveyor are: to …

Unit 4. PRACTICE IN LAND MANAGEMENT

Vocabulary

compulsory – обязательный
knowledge – знания
application – применение
to explore – исследовать
career paths – карьерные пути
to gain experience – приобретать опыт
a bridge – мост
to prepare – приготовить
to increase – увеличивать
confidence – уверенность

soft skills – универсальные навыки
employability rate – показатели трудоустройства
basics – основы
processing – обработка
storage – хранение
urban – городской
rural – сельский
real estate objects – объекты недвижимости
as well as – а также
support – поддержка
to master – освоить
measurement – измерение, замер
condition – состояние
drawing up – составление
to take part in – принимать участие в
to carry out – осуществлять
associated – связанный с
to subordinate – подчинять
subsidiaries – подчиненные предприятия
choice – выбор
to consider – считать, полагать
inter-farm and intra-farm land management – межхозяйственное и внутрихозяйственное землеустройство

Ex. 1. What can't be compulsory?

experience, application, subject, knowledge, land, bridge, field, skills.

Ex. 2. Make collocations and translate them into English.

- Apply *теоретические знания*
- Provide with *практические навыки, гибкие или универсальные навыки*
- Learn *основы земельного кадастра, автоматические системы регистрации земли*

В английском языке многие слова многозначны и могут выступать как глаголами, так и существительными. Одни меняют ударение (ˈprocess/ proˈcess), другие не отличаются по форме и произношению. ***water*** *– вода или поливать?*

Ex. 3. Find words which can be both nouns and verbs. You can use a dictionary to check if you are right.

Increase, subordinate, master, explore, support, provide, object, decide, record, produce, design, process, use.

Ex. 4. Word formation.

Form nouns from the verbs below and use them in the above sentences*: integrate, know, prepare, employ, process, store, equip, choose, decide.*

1. Practical training is the … of classroom …and theory with practice. (integrate, know).
2. Graduates of land management have a very high … rate (employ).
3. During practice students learn the technology of collecting … and … of information (process, store) and data.
4. Students master the use of modern geodetic … (equip).
5. Students also do graphical processing of the results of geodetic … (measure).
6. I consider my … to be one of the best … I've made in my life (choose, decide).

Read the text paying attention to new words.

Practice in land management

Practice is a **compulsory** part of the course in land management. The most important element of it is the integration of classroom **knowledge** and theory with practical **application** and skills. Learning is one thing, but applying them is a great way to **explore** different **career paths**. Practice is important because it helps with **gaining experience** and then getting a good job, and serves as a **bridge** between university training and a career in land management. It also **prepares** students for the future in their field and **increases confidence** in their work. Practice can provide students with the **soft skills** needed in the workplace and in leadership positions. Skills, such as communication, leadership, problem-solving, and teamwork can all be learned through a working practice. Graduates of land management have a very high **employability rate** because the studies are very practically oriented.

During the practice students learn the **basics** of real estate cadaster, the technology of collecting, **processing** and **storage** of information about the urban or rural areas and **real estate objects**.

Automated land registration systems are being studied **as well as** the information **support** of urban planning activities. Students **master** the use of modern geodetic equipment and methods of work with them, new methods of computing and graphical processing of the results of geodetic **measurements**.

During the internship, students ***study*:**

- condition of lands and organization of their rational use;
- principles and methods of land surveying of real estate objects;
- how to draw up projects of **inter-farm and intra-farm land management**.

They also **take part in** topographic and geodetic works, process the results, and **carry out** other types of land management works.

Industrial practices are carried out, as a rule, in places of future employment of graduates, such as: cadaster and design institutes for land management and land monitoring; regional cadastral centers; institutions of architecture and construction; other enterprises and institutions associated with the work on land management and cadastre.

Students have industrial and undergraduate practice at enterprises subordinate to the state Property Committee of Belarus, the design Institute Belgiprozem and its **subsidiaries** in regions.

The course is **definitely** preparing me for the **choices** I've made and what I'll be doing in the future. I feel I've leant quite a lot in my first year of studies here. I consider my choice to be one of the best decisions I've made in my life.

Ex. 5. Answer the questions.

Is practice a compulsory part of the course in land management?

Why is practice important?

What are soft skills? Are they important for graduates?

Why do students of land management have a very high employability rate?

What do students learn during practice?

Where do they have industrial and undergraduate practice?

Where would you like to have your industrial practice?

Ex. 6. Translate the following word combinations into Russian:

a compulsory part of the course, the integration of classroom knowledge and theory with practical application and skills, to apply knowledge, to explore different career paths, to gain experience, a bridge between university training and a career in land management, to increase confidence, to provide students with the soft skills, to have a high employability rate, to learn the basics, to master the use of modern geodetic equipment, methods of computing and graphical processing, the results of geodetic measurements, to draw up projects, to carry out land management works, enterprises subordinate to the state Property Committee of Belarus.

Ex. 7. Translate into English.

Проходить производственную и преддипломную практику, интеграция теории с практикой, получить хорошую работу, такие навыки как, приобретать опыт, решение проблем, увеличивать уверенность в работе, сбор, хранение и обработка информации, объекты недвижимости, работа в команде, землеустроительные работы, использовать геодезическое оборудование, предприятия, государственный Комитет по имуществу, обязательный элемент учебы, изучать основы кадастра, составлять проекты.

Ex. 8. What can be processed and stored?

Knowledge, data, soft skills, equipment, information, confidence, results, experience, application.

Ex. 9. Make sentences combining parts A and B.

A	B
The most important element of practice is the integration of theory	topographic and geodetic works.
Practice can provide students with the soft skill	Because the studies are very practically oriented.
During the internship, students take part in	such as communication, leadership, problem-solving, and teamwork.
Graduates of land management have a very high employability rate	with practical application and skills.

Ex. 10. Translate the words in parenthesis into English.

1. Practice helps with (приобретение опыта) and then (получение хорошего рабочего места).
2. (Гибкие навыки) can be learned through a working practice.
3. During the practice students learn the technology of (сбора, обработки и хранения информации о земле и объектах недвижимости).
4. Students also study (аавтоматизированные системы земельной регистрации).
5. Students master the use of modern (геодезического оборудования).
6. Students (составляют проекты межхозяйственного и внутрихозяйственного землеустройства).
7. Students (проходят производственную и преддипломную практику) at enterprises subordinate to the state Property Committee of Belarus and other enterprises.

Ex. 11. Make a summary of the text and retell it.

MODULE 1

Read the text *Land administration in Bergen university* and do the tasks.

Education in Norway in land administration and land surveying is offered by several universities and university colleges. In some of the surveying universities we have as few as 5–10 students every year. The study program in Bergen has no problem with student recruitment. Each year we have about 70 applicants.

Bergen University College is one of the largest regional colleges in Norway. We have about 6000 students and the number of staff is 600. The faculty of engineering has all traditional engineering subjects and the total number of students is 1500. The number of students is increasing and the engineering education in Bergen has no difficulties in attracting students.

Our study program is the only program in Norway in cadastral surveying. The students have courses in all aspects of cadastral survey and they learn land surveying, GIS, land use planning, land administration, land tenure and legal topics. The students work with projects and an important aim is to teach the students teamwork.

In the 3rd semester in the program the students have cadastral practice. The cadastral practice is carried out in cooperation with Fjell municipality. The cadastral practice starts with meetings between cadastral surveyors in Fjell and the professors from BUC. The land surveying is done by the students but they are followed up by a professor. The professor controls the survey and looks after that the students have done the work according to the national standards.

For the students it is an advantage to be part of the real world also in the course of their studies. They are "learning by doing". The students are well prepared to start cadastral surveying in municipalities and are often offered jobs before they have finished their studies.

Ex. 1. True/false statements.

1. Each year the university has 5–10 applicants.
2. Engineering education is not attractive for studies.
3. The study program is the only program in Norway in cadastral surveying.
4. The students have cadastral practice from the first year.
5. Students have jobs while they study at the university.

Ex. 2. Find equivalents to the words.

1) applicant	a) всего
2) staff	b) предмет
3) subject	c) единственный
4) jobs	d) абитуриент
5) as few as	e) штат
6) total	f) рабочие места
7) the only	g) привлекать
8) attract	h) общее количество

Ex. 3. Make as many collocations as you can using words from A and B parts.

A. have, attract, learn, offer, look after, control, offer, start

B. students, jobs, land surveying, applicants, studies, course

Ex. 4. Answer the questions in a written form.

1. How many applicants does the university Bergen have each year?
2. How big is Bergen University College?
3. Is the number of students increasing or decreasing?
4. What subjects do students learn?
5. When do they have cadastral practice?
6. Why are students offered jobs before they have finished their studies?

Unit 5. WHY IS LAND USE PLANNING NECESSARY?

What do you think: Why is land use planning necessary?

Vocabulary

proper – соответствующий
to pollute – загрязнять
residences – жилые районы
to reduce – снижать
quality – качество
unwalkable – непригодный для передвижения
to damage – наносить вред
to waste – бесполезно растрачивать
ancient – древний
rather than – а не
remnants – остатки
ancestor – предок

to recognize – признавать
to encompass – включать в себя
the amount of space – количество места (земли)
shaped – в форме
to include – включать
issue – вопрос
purpose – цель
rights – права
designation – предназначение
responsibility – ответственность
approach – подход
variable – разные
reflecting – отражая
land tenure – землепользование
to adopt – принимать
authority – орган
further – далее
implementation – выполнение
expansion – расширение
threat – угроза
loss – потеря
provisions – условия
sprawl – распространение
to encourage densification – стимулировать плотность застройки
within – в пределах
built-up areas – застроенные площади
issuance of permits – выдача разрешений
implementation – реализация

Without a **proper** land-use plan, cities and communities would be in disarray (в беспорядке). Transportation would not run efficiently. Industrial plants would **pollute residences**, waterways and **reduce** air **quality**. Cities would be **unwalkable**. Communities would be unsafe. Economies would stop. The environment would be **damage**d and resources **wasted**, which would leave the area unusable for future generations.

Land planning has been around since **ancien**t times. When people began to gather in larger and larger groups **rather than** as individuals, when villages developed into larger metropolitan areas, land planning became essential to daily life.

You can still see the **remnants** of land zoning and development in the ruins of Greece, Rome, Mexico, Egypt, and others. This is because our **ancestors recognized** the benefits of having areas to live, work, shop, manage their waste, and bury their dead.

Land-use planning often leads to land-use regulation, which typically **encompasses** zoning. Zoning regulates the types of activities that can take place on a given piece of land, as well as **the amount of space** devoted to those activities, and the ways that buildings may be situated and **shaped**.

Land-use planning thus **includes issues** relating to spatial planning, the zoning of land for specific **purposes**, and **rights** to manage land in both urban and rural areas. **Approaches** to land-use planning are **variable** in different countries, **reflecting** the different national contexts of development and **land tenure**.

However, there are some common **approache**s to land-use planning across the countries, with decentralised **responsibility** and spatial planning approaches being widely used. In most countries, decentralised responsibility for land-use planning involves national governments setting framework legislation, providing guidelines and standards for how **to adopt** the most appropriate land use options. In most cases, land-use planning **authority** is **further** split between state-, region- or provincial-level governments, and carried out through the development of spatial plans, the **designation** of protected areas, **the issuance of permits**, and the **implementation** of national-level policies.

Ex. 1. Answer the questions.

1. When did land-use planning appear?
2. In what countries can you see the remnants of land zoning and development?
3. What benefits did our ancestors see in land-use planning?
4. Why is zoning necessary?
5. Are approaches to land-use planning the same in all countries?
6. What authorities are responsible for land use planning?

Ex. 2. Make collocations combining part A and part B.

A. pollute, reduce, recognize, encompass, regulate, use, reflect, carry out.

B. zoning, the benefits, development plans, approaches, air quality, residences, activities, national contexts of development.

Ex. 3. Find equivalents of the words in part A for the words in part B.

A	B
to reduce	urban
essential	to include
to encompass	important
responsibility	realization
implementation	habitation
metropolitan	duty
residences	to decrease

Ex. 4. Combine sentences using *both … and, as well as, when, because, how.*

1. Land planning became essential to daily life …, villages developed into larger metropolitan areas.
2. Land zoning was used in Greece, Rome, Mexico, Egypt, and others …, our ancestors recognized the benefits of land zoning.
3. Zoning regulates the types of activities … the amount of space devoted to those activities.
4. Land-use planning deals with the rights to manage land in … urban … rural areas.
5. National governments provide guidelines … to adopt the most appropriate land uses.

Ex. 5. Complete the sentences using the information from the text.

1. Land planning appeared when ….
2. We can see the remnants of land zoning in …
3. Land-use planning is often connected with …
4. Zoning regulates …
5. Approaches to land-use planning are variable …
6. National governments set framework legislation, …
7. In most cases, land-use planning authority is further split between …

Ex. 6. Make a summary of the text.

Ex. 7. Read the passage and say why densification (уплотнение) is important for the countries mentioned in the passage.

Urban **expansion** poses a **threat** to cropland globally, and is expected to result in the **loss** of 1.8–2.4 % of cropland by 2030. **There are provisions** limiting urban **sprawl** and **encourag**ing densification which reduce the potential additional pressure on global crop and wild lands. Both France and Ireland have specific measures to **encourage densification** in their spatial-planning systems. Since 2018, France has utilised the principle of "no net

land artificialisation", which means that agricultural and other non-urban areas should not be developed. In Ireland, the national planning framework includes the control of urban sprawl as a specific objective, with a target of 40 % of all new housing to be built **within** existing **built-up areas**.

Ex. 8. Complete the sentences

1. The principle of "no net land artificialisation" means …
2. The control of urban sprawl has the target of …

Ex. 9. What are the common types of land use?

There is no ideal classification of land use as there is considerable diversity of opinion about what constitutes land use. There are primarily six types of land use including agricultural land, recreational land, transport land, urban land, and commercial land.

Recreational

Recreational land is the type of spaces provided for recreational use, such as equestrian centers, parks, open spaces, golf courses, sporting fields, playgrounds, fishing ponds, and swimming pools.

Transport

This type of land is used for interstates and highways, bus stops, trains, light rail, airports, and other land needed to facilitate transportation. Municipal transportation buildings such as bus stations, subway stations, airports, and other facilities fall within this zoning type.

Agricultural

Land zoned for agricultural use may allow for growing and harvesting crops, farm buildings, fields for livestock, and other types of farm activities. Local regulations may dictate how many animals may be kept, what types can be raised, or what crops might be planted, along with pest control measures. Agricultural use often has water rights and restrictions that are included.

Residential

Residential zoning can vary based upon the density and types of houses that are allowed to be built within the area. These may range from low-density single-family residences to medium-density townhomes and condominiums up to high-density multi-family apartment buildings or multi-use complexes. Multi-use or mixed-use developments that have a combination of residences, commercial buildings, and recreational spaces have a different zoning category.

Commercial

This zoning allows for warehouses, restaurants, office buildings, and other commercial businesses in a particular area. Within this category, there

are separate sub-designations that place restrictions on the commercial activity in the area.

Additional zoning categories and land-use planning factors include industrial, tourism, and public use buildings, including firehouses, police stations, and hospitals.

Ex. 10. Match the type of land use and its definition.

agricultural	It allows for office buildings, warehouses, restaurants, or other commercial uses.
residential	This type of land is used for interstates and highways, bus stops, trains, light rail, airports.
recreational	Its use may allow for growing and harvesting crops, farm buildings, fields for livestock, and other types of farm activities.
commercial	It is used for parks, open spaces, golf courses, sporting fields, playgrounds, fishing ponds, and swimming pools.
urban	This type of land includes single-family residences, suburban homesteads, and other designations like houses, apartments, co-ops, and condos.
transportation	Land used or expected to be used for urban activities.

Unit 6. LAND USE IN THE WORLD

Vocabulary

wilderness – дикая местность
grasslands – луга
shrubbery – кустарник
wild habitat – дикая местность обитания
ice-free – без льда
non-barren – не бесплодный
breakdown – *зд.* распределение
glacier – ледник
desert – пустыня
salt flats – соляные равнины

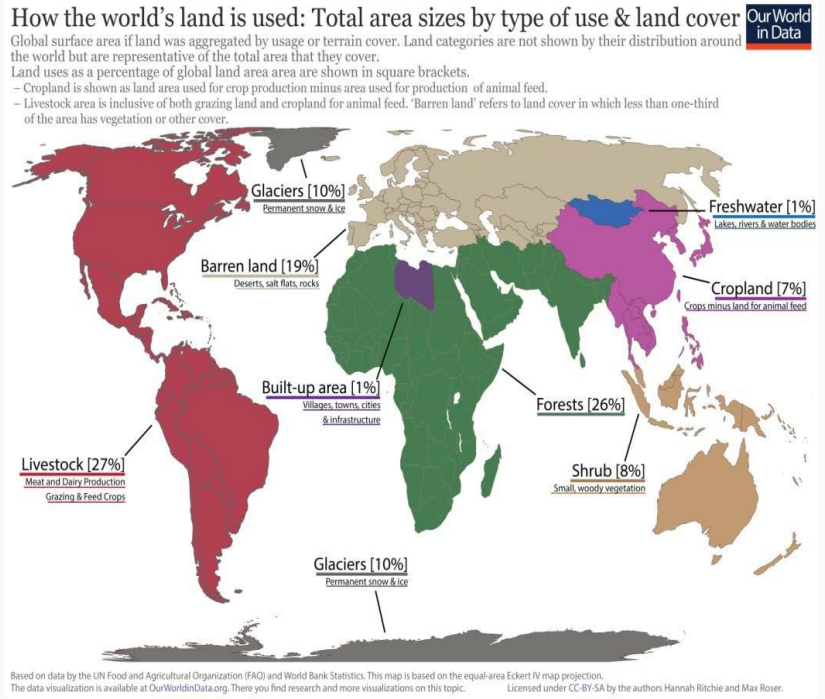
exposed rocks – голые камни
habitable (ˈhabədəb(ə)l) land – земля, пригодная для жизни to include – включать
remaining – оставшийся
built-up – застройка
urban – городской
unequal – неравный
human consumption – потребление человеком
pastures – пастбища
grazing – выпас
half – половина
to account for – составлять
take up – занимать
expansion – расширение
impact – воздействие
threatened with extinction – под угрозой исчезновения
amount – количество
solution – решение
opportunity – возможность

For much of human history, most of the world's land was **wilderness**: forests, **grasslands** and **shrubbery** dominated its landscapes. Over the last few centuries, this has changed dramatically: **wild habitats** have been turned into agricultural land.

1000 years ago only 4 million square kilometers – less than 4 % of the world's **ice-free** and **non-barren** land area was used for farming. The **breakdown** of global land area today: 10 % of the world is covered by **glaciers**, and 19 % is barren land – **desert**s, dry **salt flats**, beaches, sand dunes, and **exposed rocks.** This leaves what we call 'habitable land'. **Half** of all habitable land is used for agriculture.

This leaves only 26 % for forests; 8 % as shrubs and grasslands; 1 % as freshwater; and the **remaining** 1 % is built-up **urban** area which includes cities, towns, villages, roads and other human infrastructure.

There is also a highly **unequal** distribution of land use between livestock and crops for **human consumption**. If we combine **pastures** used for **grazing** with land used to grow crops for animal feed, livestock **accounts for** 77 % of global farming land. While livestock **takes up** most of the world's agricultural land it only produces 18 % of the world's calories and 37 % of total protein.



The **expansion** of agriculture has been one of humanity's largest **impacts** on the environment. It has transformed habitats and is one of the greatest pressures for biodiversity: of the 28,000 species **threatened with extinction** on the Red List, agriculture is listed as a threat for 24,000 of them. Crop yields have increased significantly in recent decades, meaning we have taken a lot of land from agricultural production: globally, to produce the same **amount** of crops as in 1961, we need only 30 % of the farmland.

With **solutions** from both consumers and producers, we have an important **opportunity** to restore some of this farmland back to forests and natural habitats.

Ex. 1. Answer the questions

1. What dominated in the landscapes in the past?
2. How did agricultural land appear?
3. How much land was used for farming 1000 years ago?
4. What types of landscapes can we find now?

5. Why are some areas uninhabitable?
6. What does habitable land include?
7. How is land use distributed between livestock and crops?
8. Why are so many species threatened with extinction?
9. Do we need more land for crops?
10. What solution is offered in the article?
11. Do you agree with this point of view?

Ex. 2. Word formation.

1. Long ago most of the world's land was … (wild).
2. There is also a highly … distribution of land use between livestock and crops (equal).
3. The … of agriculture had a negative effect on the environment (expand).
4. Crop yields have increased … in recent decades (significant).
5. Cooking can make food more suitable for human … (consume).

Ex. 3. Make word combinations using the noun ***land*** with the adjectives in parenthesis and translate them into Russian.

land (ice-free, non-barren, agricultural, habitable, remaining, forest), the breakdown of … area.

Ex. 4. Combine two parts and make sentences.

A	B
1. Most of the world's land was wilderness: 2. Agriculture has transformed habitats 3. To produce the same amount of crops as in 1961, 4. We have the opportunity to restore some of the farmland 5. Built-up urban area	a) we need only 30 % of the farmland. b) if consumers and producers find solutions. c) includes cities, towns, villages, roads and other human infrastructure. d) and is one of the greatest pressures for biodiversity. e) forests, grasslands and shrubbery.

Ex. 5. Translate the words and word combinations into English.

1. Most of the world's land was **(***дикая местность***)** in early history.
2. Less than 4 % of the world's (*небесплодной*) land area was used for farming.
3. Built-up urban area which (*включает*) cities, towns, villages, roads and other human infrastructure.

4. There is a highly (*неравномерное*) distribution of land use between livestock and crops.

5. Livestock (*забирает*) most of the world's agricultural land.

6. The expansion of agriculture (*угрожает исчезновению*) 24,000 species.

Ex. 6. Read the text and give examples of a) a primary land use; b) a secondary land use

Land use can be classified as a primary land use and a secondary land use. A primary economic land use is one in which there is a direct extraction of some useful product from the physical environment. Examples include hunting and gathering, grazing livestock, cultivated agriculture, timbering, and the extraction of minerals, ores, and clays.

Land uses which are not considered primary are classified as secondary land uses. These include residential, commercial, and industrial land uses. In some instances there is a blending of primary and secondary land uses. The uses of land for pasture and grazing, crop land, and forest are agricultural uses.

These land uses account for the largest proportion of, or percentage, of total country land areas that may have economic value. Cropland includes all cultivated land areas used in the production of food, feed, fiber, etc. This land use area includes not only crop land harvested but also planted areas that have suffered from crop failure and crop land areas that may be temporarily idle or fallow. Pasture land and grazing land are somewhat more complicated to understand because it involves two types of land – arable pasture plus grazing land.

Arable pasture includes all those improved and rotation pasture that are considered tillable and that can easily be shifted into crop land use.

Ex. 7. Find the definition for each type of agricultural land use

A. Other Land	1. "It is the land used permanently (five years or more) to grow herbaceous forage crops, either cultivated or growing wild (wild prairie or grazing land)".
B. Permanent crops	2. It is the cultivated land that is not seeded for one or more growing seasons. The maximum idle period is usually less than five years.

C. Permanent Meadows and Pastures	3. It includes built-up and related land, barren land, other wooded land, etc.
D. Fallow land	4. It is the land cultivated with long-term crops which do not have to be replanted for several years (such as cocoa and coffee); land under trees and shrubs producing flowers, such as roses and jasmine; and nurseries (except those for forest trees, which should be classified under „forest“).
E. Arable land	5. It is the sum of areas under arable land, permanent crops, permanent meadows and pastures.
F. Agricultural areas	6. It is the land under temporary agricultural crops, temporary meadows for mowing or pasture, land under market and kitchen gardens and land temporarily fallow (less than five years).

Ex. 8. Read the text *Land used for agriculture in the world* and fill in the table.

Land used for agriculture	%	increasing	decreasing
North America			
Saudi Arabia			
Sub-Saharan Africa			
Scandinavian countries			
Europe			
Central Asia			
UK			
South Africa			

Land used for agriculture in the world

We use about half of global habitable land for agriculture. But how much of total land area is utilised for agriculture across the world?

There is a large variability in the share of land any country uses for agriculture. It ranges from less than 10 percent in Sub-Saharan Africa and the countries of the Scandinavian region to close to 80 percent across most regions (including the UK, Uruguay, South Africa, Nigeria and Saudi Arabia). It is important to note that this includes both land used for arable (cropland) production and pasture land for livestock grazing; this means that agriculture can consume a lot of land area, even in arid and semi-arid regions where extensive arable farming is not possible.

The allocation of land to agriculture has changed over time across the global regions. The share of land used for agriculture has been slowly increasing across most of the world's regions over the past few decades. However, land use across Europe and Central Asia- particularly within the European Union (EU) zone and North America has been declining.

Remember: *less* – это сравнительная форма *little*

Ex. 9. Say if the sentences are True/False.

1. About half of global habitable land is used for agriculture.
2. In most countries about 80 percent of land is used for agriculture.
3. In arid and semi-arid regions less land is under agriculture.
4. The share of land used for agriculture is slowly decreasing across most of the world's regions.
5. Land use across Europe increases.

Unit 7. BELARUS AND ITS LANDS

Agriculture is of high value for the economy of the Republic of Belarus, providing food security and export potential. According to estimates, in 2021, the contribution of agricultural production to GDP amounted to 5.6 %, and more than 259 thousand people were employed in the industry. As of January 1, 2022, there were more than 1.4 thousand agricultural organizations and 3 thousand peasant (farm) enterprises in the industry.

Lands are the national treasure of Belarus and a major natural resource. As of late 2020 the total area of land in Belarus is 20760, 9 thousand hectares, of which 8 283, 9 thousand hectares are agricultural lands. In Europe, according to this indicator, Belarus ranks 14th, therefore, most European countries have much smaller land resources.

The lands of the Republic of Belarus are divided into the following categories:

- farm land;
- lands under settlements, horticultural associations, dacha cooperatives;
- lands of industry, transport, communications, energy, defense and other purposes;
- lands of nature protection, health improvement, recreational, historical and cultural purposes;
- forest lands;
- water fund lands;
- reserve land.

Land types. The total land area has three different types of land use: agricultural land (43.7 %); forest, and other agricultural land is further divided into *arable land* – land cultivated for crops like wheat, maize, and rice that are replanted after each harvest (27.2 %), *permanent crops* – land cultivated for crops like citrus, coffee, and rubber that are not replanted after each harvest, and includes land under flowering shrubs, fruit trees, nut trees, and vines (0.6 %), and *permanent pastures* and meadows – land used for at least five years or more to grow herbaceous forage, either cultivated or growing naturally (15.9 %); *forest* area is land spanning more than 0.5 hectare with trees higher than five meters (42.7 %); land classified as *other* includes built-up areas, roads and other transportation features, barren land, or wasteland (13.6 %).

Agricultural land decreased by 2 % in the last 20 years. The main trends in land area change by types of their use:

- gradual reduction of agricultural, including arable land;
- sustainable growth of forest land and land areas;
- very slow growth in the amount of land under water bodies and land under roads and other transport routes;
- gradual reduction in the number of disturbed, as well as unused and other lands.

At present, the land fund of the Republic of Belarus includes (16.5 % of the country's territory) drained lands.

Ex. 1. Fill in the table with the missing information on land use in Belarus.

	15.9 %
	43.7 %
	42.7 %
	27.2 %
	13.6 %
	0.6 %

Ex. 2. Complete each phrase with these words:

According to, as of late, at present

1. … drained lands make up 16.5 % of the country's territory.

2. … land area, Belarus ranks 14th in Europe in this indicator.

2. … 2020 the total area of land in Belarus is 20760, 9 thousand hectares.

Ex. 3. Read about agriculture structure in Belarus.

In general, arable land prevails in the country, which accounts for more than 60 % of the agricultural land. The largest share of arable land is located mainly in Grodno and Minsk regions. With a decrease in the share of arable land, the proportion of meadow land is growing. But this change does not greatly affect the proportion of land occupied by permanent crops (orchards and berry plants).

Crop production in Belarus

In crop production in Belarus, grains are of the greatest importance. Not only the provision of the population with bread products, but also the production of feed for livestock, and the economic situation of farms depend on the quality and quantity of grain crops. The most profitable are:

• **Rye.** It is most resistant to the natural conditions of Belarus. This crop easily tolerates adverse weather, low soil fertility and acidity, and responds well to fertilizers;

• **Wheat** is the most valuable crop. It is demanding on heat, moisture, soil fertility and good soil cultivation. The largest areas of wheat are located in areas with better soil conditions in the Grodno, Minsk and Brest regions;

• **Barley** is one of the highest yielding crops. Its growing in Belarus expanded significantly in the 70s of the XX century. The crop has excellent feed quality. Barley occupies the largest areas in the central, eastern and north-eastern parts of Belarus;

• **Oats** is a crop which demands humidity and cool weather; it is sown earlier than other spring crops. It is grown everywhere, but the concentration of crops is greater in the north of the country;

• **Buckwheat**. At the beginning of the twentieth century in terms of area it was second only to rye. Buckwheat is sown in Belarus in all regions – from Brest and Gomel to Vitebsk regions. However, the interest of most farms in this crop is constrained by its relatively low yield. So the task is to select appropriate soils where buckwheat can be cultivated;

• **Flax.** Belarus is one of the largest global regions specialising in flax. The plant is adaptable to a variety of soils and climates but grows best in well-drained sandy loam and in temperate climates. The flax plant also

prefers deep, loamy soil. Flax is cultivated in Vitebsk, Grodno, Minsk regions, as well as other regions having, suitable soil and climatic conditions.

Ex. 4. Fill in the chart.

Crops grown	Climatic conditions	Soils	Yield	Regions
rye				
wheat				
barley				
oats				
buckwheat				
flax				

Ex. 5. Complete each phrase with these words:

in general, at the beginning, as well as

1. … of the twentieth century flax was second only to rye in area in Belarus.
2. … arable land accounts for more than 60 % of the agricultural land.
3. Crop production in Belarus is used for the provision of the population with bread products … feed for livestock.

Ex. 6. Fill in the necessary prepositions.

1. The change does not greatly affect the proportion of land occupied … permanent crops.
2. Grain crops are … the greatest importance.
3. Rye is most resistant … the natural conditions of Belarus.
4. Buckwheat growing is constrained … its relatively low yield.
5. … the beginning of the twentieth century in terms of crop area it was second only to rye.

Ex. 7. Translate words and word combinations in parenthesis into English.

1. In crop production in Belarus, grains are (представляют наибольшую важность).
2. Rye (легко переносит) adverse weather, low soil fertility and acidity, and responds well to fertilizers.
3. Wheat is (ценная зерновая культура).
4. Oats is grown (повсюду), but the concentration of crops is greater in the north of the country.
5. The interest to buckwheat is limited by its relatively (низким урожаем).

Ex. 8. Guess what crop is this?

1. It can confidently be called the most important grain crop. This plant occupies one of the first places in food production.

2. It is called one of the most ancient crops. You can grow it on almost any soil, since it is not demanding on growing conditions. Because of its properties, the plant has gained popularity both in the north and in the south.

3. The advantage of this crop can be considered its resistance to acidic soils.

4. It is an excellent fodder crop. This crop is not demanding on the soil. It will grow well on clay and loamy soils, as well as on sandy and peaty soils.

5. This plant crop is grown both for seeds and fiber. It grows best on well-drained sandy loams.

6. It is a valuable crop for food purposes. Fertile, light and air-conditioned soil is suitable for its growing.

Ex. 9. Choose the correct form of the word (P I (-ущ, -ющ, -я) or P 11 (-мый, -нн, -мый).

1. Grain is the product *obtained*/*obtaining* by man to grow cereals. 2. Some soils are rich in all kinds of food *requiring*/*required* by plants. 3. The grain crops *required*/*requiring* cool conditions for their best growth are wheat, barley, oats and rye. 4. Crop production can be raised by *cultivated*/*cultivating* new land or by *increasing/increased* crop yields. 5. We know many environmental factors *influencing/influenced* the growth of farm crops. 6. Corn, sorghum, rice and millets are the crops *adapting/adapted* to conditions of short day.

Ex. 10. Translate into English.

Республика Беларусь расположена в центре Европы.

Ее площадь 207, 6 тыс. км^2, что составляет около 2 % всей Европы.

На 1 января 2022 года, численность населения Беларуси составила 9 255 524 человека.

Средняя плотность населения – 45 человек на км^2.

В 2020 году в сельском хозяйстве было занято 7,2 % населения.

Страна имеет благоприятные климатические условия для сельского хозяйства: умеренный климат и относительно плодородные земли.

Сельское хозяйство тесно связано с природными условиями и ресурсами.

Наилучшими условиями для сельского хозяйства располагают центральные, западные, восточные и юго-западные районы.

В сельскохозяйственном производстве две главные отрасли – растениеводство и животноводство.

Республика Беларусь более чем на 100 % покрывает собственные потребности в молоке, мясе, яйцах, картофеле и овощам.

Основные культуры – это картофель, сахарная свекла, овощи, зерновые и кормовые.

Беларусь экспортирует в основном молочные продукты, мясо свинины и птицы, овощи.

Ex. 10. Speak about agriculture and its land use of Belarus.

Unit 8. LAND RESOURCES OF RUSSIA

Vocabulary

identical – идентичный
predominantly – преимущественно
to make up – составлять
entire – весь
surface – поверхность
similar – схожие
high-quality – высококачественный
mainly – главным образом
significant – значительный
means – средство
to rank – занимать место
insignificant – незначительный
share – доля
to account for – составлять
to range from … to – колебаться от … до
qualitative – качественный
to eliminate – устранить
to undergo – подвергаться
to subject – подвергаться

Land resources of Russia

Russia is the largest country in the world in area. Today it occupies 1/8 of the planet's land mass. Its lands are located in 11 time zones: no country in the world has such coverage. There are three climatic zones: arctic, subarctic and temperate. The deepest lake on the planet, Baikal, is also

located in the Russian Federation. The Russian Federation has a border with 16 countries. The northern and eastern borders are maritime, while the western and southern borders are **predominantly** land. Eight million kilometers of Russian land are lands untouched by man, and about the same number occupies the area of virgin Russian seas. Thus, Russia is among the top five countries, along with Canada, Australia, the United States and Brazil, where more than 70 percent of **undeveloped** territories are concentrated.

The country is located on the continent of Eurasia. The majority is in Asia (75 %), and the smaller one is in Europe (25 %). The area of ussia includes the large island of Sakhalin and about 1,300 small islands.

It is washed by the waters of the world's three oceans - the Arctic, Atlantic and Pacific. The country has about 40 % of the planet's natural resources, which makes it the richest country in the world in this aspect. The total area of land resources of the Russian Federation is 1709.8 million hectares. The country's farmlands cover an area of about 210 million hectares, of which about 125 million hectares are allocated for arable land.

Land and soil resources are **similar** concepts, but not **identical**. *Land resources* are the entire physical **surface** of the Earth that can be used by humans in any way; *soil resources* are reserves of **high-quality**, fertile land suitable for use in agriculture and forestry as a **means** of production.

The land fund of Russia includes: agricultural lands, settlements (cities, towns, villages, etc...), non-agricultural (industry, transport, communications, military facilities), nature reserves; forests; water bodies. The basis of agricultural land is farmland (arable land, permanent crops, fallow lands, hayfields, pastures).

45 % of the country's land resources, **mainly** forest funds, do not participate in economic activity. This is more than half of the land area of Eurasia.

Soil resources make up an **insignificant** part of Russia's land resources. The main part of agricultural land (70 %) is located in the European region. In the Russian Federation, in the structure of agricultural land, arable land **accounts for** 61 %, hayfields – 9.5, pastures – 28, other agricultural land accounts for 1.5 %.

The structure of agricultural land depends on zonal features and has **significant** differences in economic areas. The **share** of arable land in the structure of agricultural land **ranges** from 37 % in the East Siberian Economic Region to 80 % in the Central Chernozem region, hayfields – from 2 % in the North Caucasus to 31 % in the North, pastures – from 14 % in the Central Chernozem to 47 % in the East Siberian region.

When used, the land **undergoes** structural and **qualitative** changes, which have recently been of a negative nature. So, since 1985, for various reasons, over 18.7 million hectares have been **eliminated** from agricultural use, including 10.3 million hectares of arable land.

A **significant** part of agricultural land is unsuitable for the cultivation of agricultural plants. More than half of the lands are overmoistened, have become acid, saline, and are **subject** to water and wind erosion.

Ex. 1. What do these numbers refer to?

1709.8 million hectares, 125 million hectares, 10.3 million hectares.

Ex. 2. Find synonyms.

A	B
to make up	total
entire	to account for
to eliminate	important
significant	main
major	too wet
free lands	to remove
over moistened	not used
predominantly	untouched
undeveloped	mainly

Ex. 3. Translate words and word combinations in parenthesis into English.

1. Russia is the largest country in the world (по площади).
2. There are three climatic zones: arctic, subarctic and (умеренная).
3. The Russian Federation (граничит) with 16 countries
4. 45 % of the country's land resources are (главным образом) forest funds.
5. Russia (занимает 5-е место в мире) after Brazil, the USA, Australia and China in undeveloped territories.
6. The country has about 40 % of the planet's (природных ресурсов).
7. The country's farmlands (занимают площадь) of about 210 million hectares.
8. When used, the land (подвергается) structural and qualitative changes.
9. Over 18.7 million hectares of arable land have been (исключены) from agricultural use.

10. A significant part of agricultural land is (не подходит) for the cultivation of agricultural plants.

Ex. 4. Complete the sentences with adjectives (agricultural, arable, farmland, unsuitable, fertile**).**

1. 125 million hectares are allocated for … land.
2. Soil resources are reserves of high-quality … land suitable for use in agriculture.
3. … fund of the country is 45 %.
4. A significant part of agricultural land is … for the cultivation of agricultural plants
5. The basis of agricultural land is … .
6. Arable land, permanent crops, fallow lands, hayfields, pastures is … land.

Ex. 5. Translate into English.

1. Земельные ресурсы России составляют 1/7 часть всей суши мира.
2. Только две державы в мире имеют столько земельных ресурсов – Индия и США.
3. Земельный фонд России включает: земли сельскохозяйственного назначения, населенных пунктов, несельскохозяйственные, заповедники; леса; водоемы.
4. 45 % земельных ресурсов страны, в основном лесной фонд, не участвуют в хозяйственной деятельности.
5. Основная часть сельскохозяйственных угодий (70 %) расположена в Европейском регионе.
6. Структура сельскохозяйственных угодий зависит от зональных особенностей и имеет существенные различия по хозяйственным районам.
7. Доля пашни в структуре земель сельскохозяйственного назначения колеблется от 37 % в Восточно-Сибирском экономическом районе до 80 % в Центрально-Черноземном районе.
8. При использовании земля претерпевает структурные и качественные изменения.
9. С 1985 г. из сельскохозяйственного оборота выведено более 18,7 млн га.
10. Более половины земель переувлажнены, окислились, засолились, подвержены водной и ветровой эрозии.

Ex. 6. Speak about land resources of Russia. Use such verbs as *occupies, is located, accounts for, makes up, cover.*

Unit 9. LAND USE IN GREAT BRITAIN

After you read the text answer the question: Is the area of Great Britain totally built on?

The UK is a green and pleasant land with more than half the country classed as pasture or arable land, according to a new set of maps created by an academic at the University of Sheffield.

The Land Cover Atlas of the United Kingdom shows different types of land uses across the UK. The atlas reveals that agricultural land used for animal grazing and growing crops makes up approximately 56 per cent of the country. It also shows that peat bogs (nine per cent) make up more of the UK than urban areas (six per cent).

England is the most built on of all the regions at around nine per cent, while more than half of Wales and Northern Ireland are pastures and arable land. Land cover in Scotland, on the other hand, is dominated by a mixture of peat bog, moors and forest.

Professor Rae has also created individual land cover maps for each of the UK's 391 local **authority areas** (муниципальные районы) for the first time.

The maps include 44 different types of land classification from the most built up urban areas, to 'vineyards', 'ricefields' and 'industrial and commercial units'.

They reveal that North East Scotland is covered by the most forest with 21 per cent. While Northern Ireland has the most space for grazing as 85 per cent.

The data has also been used to create an interactive online tool to show how land is used in each council area. The 44 land classifications have been grouped into four broad categories:

Farmland – pastures, arable land, orchards, vineyards etc.

Natural – moors, forests, lakes, grasslands etc.

Built on – buildings, roads, airports, quarries etc.

Urban green – parks, gardens, golf courses, football pitches etc.

The City of London is shown to be the most built up local authority in the UK with 98 per cent of the area built on.

The high number of golf courses and acres of royal parks in South West London makes it the most urban green area at 41 per cent.

Professor Rae said: "It may feel like a very densely populated urban nation, but the reality is that the vast majority of the land area of the UK is not built on.

"*Given* (*учитывая*) that 83 per cent of the population of the UK lives in urban areas it is not surprising that some people *hold the opposite to be true* (*утверждают обратное*). However, from a land cover point of view, the United Kingdom is in fact dominated by pasture and arable land.

"At a local level things can be very different from the national picture, so it is important to know how land is being used as there are often competing needs. By knowing the makeup of the local landscape it is easier to make *informed decisions* (обоснованные решения) about how land should be used and plan for the future."

Ex. 1. Remember that *make up* has several meanings!

1. She put on some **makeup** before the party.
2. Did you **make up** a story?
3. Muslims **make up** 55 per cent of the population.
4. He **made up** some excuse about his being late.
5. A natural landscape is **made up** of mountains, hills, plains, and plateaus.

Ex. 2. Look at these sentences and answer the questions.

1. Land used for animal grazing is as big as land for growing crops in the UK. Is the area for animal grazing bigger than that for growing crops, or is it the same?
2. Northern Ireland isn't as built up as England. Which country is more built in: England or Northern Ireland?
3. The more space for grazing, the more cattle is raised. What is the relationship between space for grazing and the number of cattle?

Ex. 3. Find in the text and complete the missing information.

1. The Land Cover Atlas of the United Kingdom shows … across the UK.
2. The agricultural land used for animal grazing and growing crops makes up …
3. Peat bogs make up …
4. Urban areas make up …
5. England is built on at … per cent.
6. More than half of Wales and Northern Ireland are …
7. A mixture of peat bog, moors and forest dominate in …
8. North East Scotland is covered by …
9. Northern Ireland has the most space …
10. Four broad categories of land use are…

Ex. 4. Translate the words and word combinations in parenthesis into English.

1. The City of London is (самый застроенный район) in the UK.
2. South West London is (самая зеленая часть города).
3. The majority of the population in the UK lives in (городских районах).
4. From a land cover point of view, the United Kingdom is dominated by (пастбища и пахотные земли).
5. It is important to know how land is being used because there are often (конкурирующие потребности).
6. If you know the makeup of the local landscape, it is easier (принимать обоснованные решения).

Ex. 5. Match A and B and make expressions. Words in B can be used more than once.

A	B
classed	different types of land uses
show	as pasture or arable land
make up	a new set of maps
create	an interactive online tool
include	informed decisions
reveal	how land is being used
use	peat bogs
plan	individual land cover maps
know	different types of land classification
make	

Ex. 6. Translate the sentences into English.

1. Атлас земного покрова Соединенного Королевства был создан в университете Шеффилд.
2. Он показывает различные типы землепользования в Великобритании.
3. Более половину земель – это пастбища и пахотные земли.
4. Это составляет приблизительно 56 % земель.
5. Торфяные болота составляют 9 %.
6. Городские застройки составляют 6 %.
7. Англия является самой застроенной частью в Великобритании – около 9 %.

8. Более половины Уэльса и Северной Ирландии занимают пастбища и пахотные земли.

9. В Шотландии преобладают торфяные болота, вересковые пустоши и леса.

10. В Северной Ирландии больше всего пастбищ – 85 %.

11. Северо-восточная Шотландия покрыта наибольшим количеством леса – 21 %.

12. 44 классификации земель были сгруппированы в четыре широкие категории: сельскохозяйственные, природные, застройка и городские зеленые зоны.

13. Может показаться, что это очень густонаселенная городская нация, но реальность такова, что подавляющее большинство территории Великобритании не застроено.

Ex. 7. Find in the text and fill in the missing information about types of land use in Great Britain.

Land use %	UK	England	Wales	Scotland	North east Scotland	Northern Ireland	The City of London

Unit 10. LAND USE RIGHTS IN THE NETHERLANDS

Vocabulary

overall surface – общая площадь
purpose – цель
spatial planning – территориальное планирование
to vary – изменяться
tool – орудие
designated – предназначенный
restrictions – ограничения
acquisition – приобретение
for sale – на продажу
lessor – арендодатель
transfer of ownership – передача собственности
under law – по закону
immovable property – недвижимое имущество
to apply – применять
notarial deed – нотариальная сделка

lease – аренда
agreement – соглашение
obligation – обязательство
value – ценность, стоимость
to depress – снижать

Land use rights in the Netherlands

The Netherlands has over 2 million hectares of agricultural land, which means more than half of the **overall surface** of the Netherlands is used for agricultural **purposes**. The average price of a hectare of agricultural land was €59,900 in 2018. Prices vary greatly per region. Generally prices are highest in Flevoland and lowest in Friesland.

The land in the Netherlands is divided according to governmental spatial planning. Land-use plans are the most important **tool** in **spatial planning.** These plans set down where construction may take place, what may be built, the size of the structure and what it may be used for. The land that is **designated** for agricultural purposes may not be used for other purposes such as housing.

Basically, there are no **restrictions** with respect to the acquisition of agricultural land by a foreign party. **Transfer of ownership** is not specifically regulated **under** Dutch **law**. The general provisions on **immovable property apply**, which means that the ownership of land is transferred through a **notarial deed**.

Most agricultural land usage rights in the Netherlands are acquired by a specific agricultural l**ease**. An agricultural lease agreement must be done for a definite period of time, being 12 years for farms and homesteads and six years for separate land or buildings. Lease **agreements** for longer terms are allowed but only if a clear termination date is included in the agreement.

It should also be noted that the **lessor**, who intends to offer agricultural land **for sale**, has an **obligation** to offer the land to the lessee first. Since the lessor must offer the **value** of the land under leased conditions (which **depresses** the market value of the land), land lease operations in the Netherlands are less attractive.

A lessor *is a person who leases or lets a property to another; a landlord.*

A lessee *is a person who rents land or property from a lessor. The lessee is also known as the "tenant" and must uphold specific obligations as defined in the lease agreement and by law.*

Ex. 1. True or False?

1. More than half of the overall surface of the Netherlands is used for agricultural purposes.
2. Land in the Netherlands is cheap to buy.
3. Land-use plans are the most important tool in spatial planning.
4. Governmental spatial planning regulates the use of land.
5. The land that is designated for agricultural purposes may not be used for other purposes.
6. Foreigners can buy land in the Netherlands.
7. Lease agreements are done for any period of time.
8. Land lease operations in the Netherlands are attractive.

Ex. 2. Make word combinations.

A. overall, spatial, average, leased, immovable, notarial, lease,

B. price, planning, deed, surface, agreement, property, conditions

Ex. 3. Fill in prepositions.

1. The Netherlands has … 2 million hectares of agricultural land.
2. Prices of the land vary greatly … region.
3. The land in the Netherlands is divided according … governmental spatial planning.
4. Transfer of ownership is not specifically regulated … Dutch law.
5. An agricultural lease agreement must be done … a definite period of time.
6. A lessor is the person who offers agricultural land … sale.

Ex. 4. Use the words in the box to fill in the blanks.

lease, land under lease, leassor, leasee, lease agreement, farmland to be leased

1. Agricultural businesses usually do not own land but … it.
2. Agricultural land lease is an agreement between the property owner and …
3. The property owner is a …
4. A … is a land tenant.
5. The trend over the next several decades there will be far more … rather than operated by its owners.

Ex. 5. What do you think?

- Why is the land in the Netherlands expensive?
- Why cannot you use agricultural land for housing purposes?
- How can the ownership of land be transferred?
- Why aren't land lease agreements for long periods allowed?
- Why are land lease operations in the Netherlands not very attractive?

Ex. 6. Make a summary of the land use rights in the Netherlands.

Ex. 7. Read the text *Agriculture in the Netherlands* and be ready to speak about it.

The Netherlands is a small country (41.528 km^2, including 7.750 km^2 of open water) with more than 1,300 inhabitants per square mile. Its geographic position, along the North Sea in the delta of a number of important European rivers, has always been a stimulus for transport and trade to and from the European hinterland.

Favorable natural conditions – a temperate climate with a fair rainfall distribution (total annual average 750 mm/yr), relatively fertile soils in a flat landscape – favour a varied and productive agriculture. The combination of these two factors, together with a governmental policy that strongly supports a competitive agricultural sector, good entrepreneurial skills, support from a state-of-the-art agricultural research and education system, innovative supply and processing industries, the availability of inexpensive natural gas supporting greenhouse horticulture and floriculture as well as the production of cheap fertilizers, -and since the nineteen fifties- the emergence of the European Union has resulted in a very strong agricultural sector in the Netherlands. More than half the nation's land area is used for agriculture and horticulture.

Yields of the main crops (potatoes, sugar beet, vegetables, cereals and flowers) and from dairy production are among the highest in the world. In monetary terms, the Netherlands ranks second, behind the United States, as net exporter of agricultural products. In 2007 total agricultural exports (mainly dairy products, pig- and poultry meat, vegetables, flowers and ornamental plants) amounted to about € 58 billion per year -or some 17 % of the total Netherlands' export of goods and services.

Some 10 % of the GDP is earned by the agro-sector, including processing, trade and services, and the sector employs a similar 10 % the total working population of the Netherlands. Agricultural imports amount to some € 34 billion per year and include cereals, oilseeds, vegetable proteins and fats (soy for instance) mostly as animal feed stuff. These imports originate mainly from countries outside the European Union, the United States, Brazil and Thailand in particular. For many of the imported products the Netherlands has a prime role as processor and distributor to other countries in the European Union.

Ex. 8. Translate the sentences into English and speak about agriculture of the Netherlands.

a) Нидерланды – это маленькая страна.

b) Ее площадь составляет 41.528 километров.

c) Средняя плотность населения составляет более 400 человек на квадратный км.

d) Ее географическое положение является стимулом для развития транспортировки и торговли.

e) Страна имеет благоприятные климатические условия для сельского хозяйства: умеренный климат и плодородные земли.

f) Хорошие предпринимательские навыки, сельскохозяйственные исследования, система образования, дешевый природный газ и удобрения привели к сильному сельскохозяйственному сектору.

g) Основные культуры – это картофель, сахарная свекла, овощи, зерновые и цветы.

h) Надои молочного животноводства являются одними из самых высоких в мире.

i) Нидерланды занимают второе место в мире после США по экспорту сельскохозяйственной продукции.

j) Нидерланды экспортируют в основном молочные продукты, мясо свинины и птицы, овощи, цветы и декоративные растения.

k) Сельское хозяйство дает работу 10 % работающего населения.

MODULE 2

A. Read the text *Land use in Turkey* and do the tasks after the text.

Turkey occupies a unique geographic position, lying partly in Asia and partly in Europe. It is among the largest countries of the region in territory and population, and its land area is greater than that of any European state. Nearly all of the country is in Asia. Turkey's varied climate is generally a dry semi continental Mediterranean variant. Turkey is surrounded by seas on three of its sides. Turkey has a great variety of natural resources.

Turkey is one of the few self-sufficient countries in the world in terms of food. Turkey's fertile soil, favorable climate, and abundant rainfall permit growing almost any kinds of crops. Natural structure consisting of soil, topography, climate and vegetation is the first and most fundamental factor determining land use.

Turkey is a predominantly mountainous country. Turkey has about 50 lakes with areas larger than four square miles and more than 200 smaller ones. Numerous small rivers drain into the Sea of Marmara.

Seven main soil groups may be distinguished, each containing several soil types.

Red and gray-brown podzolic soils, along with brown forest soils, represent the most extensive group, covering about one-third of the country.

The land area of Turkey is about 77.945 thousand hectares in total. The distribution of land use is as follows; 49.07 % agriculture, 29.8 % forest, 27.6 % pasture and grassland, and 6.6 % other area. About one-third of Turkey's land area is utilized for agriculture, much of it extensively. About half of the agricultural land is used for field crops and about one-third for grazing. Agricultural land in Turkey was reported at 49.12 % in 2018.

The most important field crops are cereals; these occupy one half of the cultivated area. The majority of the cereal land is sown in wheat, with smaller areas of barley, rye, oats, corn (maize), and rice. Other important crops are cotton, sugar beets, tobacco, and potatoes. About one-sixth of the cropland is irrigated. Livestock farming is a major activity; Turkey has vast numbers of cattle, sheep, goats, and water buffalo.

Although agriculture accounts for 40 % of employment in Turkey, its share in overall income has fallen progressively, declining from almost 50 % of GNP in 1950 to 13 % of GNP in 2003.

Much of the population lives in villages, which are estimated to number at least 23, 43 %.

Ex. 1. Answer the questions in a written form.

1. What makes Turkey unique?
2. Is it a big country?
3. What kind of climate is there in Turkey?
4. What factors determine land use?
5. Are there any natural resources?
6. How many soil groups may be distinguished?
7. What are the major crops in Turkey?
8. What is the importance of agriculture in Turkey?

Ex. 2. Combine two parts and make sentences.

1. Turkey occupies a unique geographic position	a) these occupy one half of the cultivated area.
2. It is among the larger countries of the region	b) each containing several soil types.
3. Seven main soil groups may be distinguished,	c) and it lies partly in Asia and partly in Europe.
4. The most important field crops are cereals	d) because it has fertile soil, favorable climate, and abundant rainfall.
5. Turkey grows almost any kinds of crops	e) in terms of territory and population.

Ex. 3. Make sentences from these words.

1. position**,** unique, Turkey, a, geographic, occupies.
2. population, it, among, in, countries, is, the largest, of, the, territory, and region.
3. natural, has, great, of, resources, Turkey, a variety.
4. food, is, Turkey, in, self-sufficient.
5. main, may be, groups, seven, soil, distinguished.
6. 40 %, agriculture, for, employment, in, accounts, of, Turkey.
7. one-third, for, utilized, about, land, of, Turkey's, is, agriculture.

Ex. 4. Speak about Turkey:

its geographical position, seas, rivers and lakes, soils, the distribution of the agricultural land, crops grown, employment rate in agriculture.

B. China, its landscape and agriculture.

Read about China provinces and fill in the chart.

1. The Northeast. As a vast plain, this zone has fertile soils for agriculture and forest and plenty of water, but a relatively shorter duration of the growing season. Industry and communications are developed, and agriculture scale is large, but the population engaged in agriculture is low. It is the most important base for cereals, soybean and sugar beet.

2. Inna Mongolia and along the Great Wall. With a temperate climate, low precipitation and shortage of water, there is less arable and forest land, but vast grasslands. The agricultural environment is very vulnerable because of frequent drought, windy weather and increasing desertification. The main agricultural sector is livestock, and mixed farming.

3. Yellow river, Huai River and Hai River. The climate is temperate monsoon with simultaneous rainfall and solar radiation. Water is relatively scarce. With vast plains, modern farm machinery, a long history of cultivation and a high proportion of arable land, it is an important area for wheat, cotton, maize, groundnuts and fruits production.

4. Loess Plateau. The topography is characterized by plateau and hills covered with loess; soil erosion is very high. Solar radiation is plentiful, but water scarce. Agriculture structure is unitary with grain production, but there is the potential for developing grassland farming and fruit growing.

Middle and Lower reaches of Yangtze River. Solar radiation, temperatures and water are all favorable, The arable area is large and fertile. City density is quite high. Agriculture is highly developed with high yields. It is the main area for the growing of rice, cotton, oil crops, tea, silk, pigs and fish.

5. The Southwest. The climate is warm and humid. The terrain is dominated by hills with little flat land. There is plenty of biodiversity and rare species. Agriculture is poor with extensive systems and low productivity. Grain production is for subsistence.

6. Gunsu and Xinjiang. There is much natural grassland but little forests and arable land. Solar radiation is abundant, but water is very scarce. Desertification and salinization are very severe, and the agricultural environment is very fragile. Grain resources are high as well as cotton, sugar beet, fruits, melon. Grassland animal husbandry is well developed.

7. Quinghai-Tibet. This zone is characterized by high altitude, strong solar radiation and low temperatures. It takes the first place in the area of natural grassland and the second in the forest area. Arable land is very small and unevenly distributed. Water is plentiful. Yields are very low.

Ex. Find the information in the text about each of the seven provinces. Do it in a written form.

Province	Climatic conditions	Soils	Water availability	Crops and animals
1. The Northeast				
etc.				

Unit 11. LAND AND ITS SUSTAINABLE USE

Vocabulary

availability – наличие
development – развитие
demand – спрос
environment – окружающая среда
impact – воздействие
pressure –давление
layer – слой
estimation – оценка
threat – угроза
loss – потеря
necessities – потребности
destruction – разрушение
wealth – богатство
desertification – опустынивание

finite – ограниченный
crucial – очень важный
growing – растущий
thin – тонкий
drastic – сильный
useless – бесполезный
tremendous – огромный
clean – чистый
to face – сталкиваться с
to decline – снижаться
to expand – расширяться
to provide – обеспечивать
to suffer – испытывать
to affect – воздействовать
to destroy – разрушать
about – около
currently – в настоящее время
as well as – а также
in particular – в частности
directly – непосредственно
nonetheless – тем не менее
as a whole – в целом
at least – по крайней мере
at surprising speed – с удивительной скоростью
because of – из-за

Land is the most important natural resource. Land is a **finite** resource. Land **availability** is only **about** 20 % of the earth's **surface**. Land is **crucial** for all **developmental** activities, for natural resources, ecosystem services and for agriculture. Growing population, **growing** needs and **demands** for economic development, **clean** water, food and other products from natural resources, **as well as** degradation of land and negative **environmental impact**s are posing increasing **pressure**s to the land resources in many countries of the world. The efficient use of the Earth's land is becoming more and more important.

At present, the world's land resources are **facing** the most serious challenge in history, **because of** excessive cultivation and other activities. Soil erosion of arable land is about 24 billion tons per year throughout the world. The soil **layer** becomes **thin**, the productivity of the land **decline**s,

and **desertification** of land **expand**s. According to United Nations (U.N.) **estimation**s, every year about 21 million hectares of agricultural land are becoming **useless** or almost useless. Some 35 % of land in the world is **currently** under direct **threat** of desertification. The situation is especially serious in Asia, Africa, and South America. **Drastic loss** of land resources, arable land **in particular**, has **directly affect**ed the grain production of the world.

Forest and grassland, which cover 84 % of the surface of the earth, also **provide** basic **necessities** such as timber, meat, and milk. **Nonetheless**, forest and grassland in countries all around the world are **suffer**ing different degrees of **destruction**. Since 1950, forests have been **destroy**ed by half in the world; from 1980 to 1995, the world **as a whole** lost **at least** 0.2 billion hectares of forest. And tropical rainforest, which represents **tremendous wealth**, is also disappearing **at surprising speed**. Since the 1960s, 40 % tropical rainforest has been destroyed and one-fifth has disappeared, through massive deforestation.

Ex. 1. Answer the questions.

1. What percentage of the earth's surface is land?
2. What are increasing pressures to the land resources in many countries of the world?
3. What is the most serious challenge in history for land resources now?
4. Why are some lands becoming useless or almost useless?
5. What is the effect of drastic loss of arable land?
6. What do forest and grassland provide?
7. What happens to rainforests?

Ex. 2. Word formation. Form nouns from these words using the following suffixes: *-tion, -sion, -ment, -ility, less.*

available-, develop-, desert-, destruct-, estimate-, deforest-, necessary-, erode-, power-.

1. Land … is only about 20 % of the earth's surface (available).
2. Land is important for all … activities (develop).
3. 35 % of land in the world is under direct threat of … (desert).
4. Every year about 21 million hectares of agricultural land are becoming … (use).
5. Forest and grassland in countries all around the world are suffering different degrees of … (destroy).

Ex. 3. Make word combinations and translate them into Russian.

A. affect, pose, become, face, provide, disappear, be

B. pressure, basic necessities, the most serious challenge, under threat, destruction, useless, grain production, at surprising speed.

Ex. 4. Fill in the necessary prepositions.

1. The world's land resources are facing the most serious challenge in history, because … excessive cultivation and other activities.
2. According … United Nations (U.N.) estimations, every year about 21 million hectares of… agricultural land are becoming useless.
3. Some 35 % of land in the world is currently … threat of desertification.
4. Forest and grassland provide basic necessities such … timber, meat, and milk.
5. Since 1950, forests have been destroyed … half in the world.
6. The world lost … least 0.2 billion hectares of forest.
7. Tropical rainforest is disappearing … surprising speed.

Ex. 5. Choose the word to use in the sentence.

1. Land *demand/availability* is only about 20 % of the earth's surface.
2. At present, the world's land resources are *growing/facing* the most serious challenge in history.
3. Every year about 21 million hectares of agricultural land are becoming *useless*/*useful.*
4. The productivity of the land *declines/raises.*
5. Forest and grassland provide basic *pressure*/*necessities.*

Ex. 6. Translate into English.

1. Доступные земли составляют всего около 20 % земной поверхности.
2. В настоящее время мировые земельные ресурсы сталкиваются с самой серьезной проблемой в истории.
3. Ежегодно около 21 млн га сельскохозяйственных угодий приходят в негодность или становятся почти бесполезными.
4. Потеря пахотных земель, напрямую повлияла на производство зерна в мире.
5. Леса и пастбища в странах по всему миру подвергаются разрушению.
6. 40 % тропических лесов было уничтожено, а пятая часть исчезла из-за массовой вырубки лесов.

Ex. 7. Read the text and say if the statements are true or false.

The cities and towns we live in account for less than 3 % of the Earth's total land area, but between 35 % and 40 % is used for agriculture. As populations grow, many fear that more land will be used up to grow more food. And land management ***has a lot to do*** (во многом связано) with resource management – what we eat, how we grow it, and how we eat it.

To feed the world's growing population, a study by researchers at Stanford University estimated that between 2.7 million and 4.9 million hectares of additional land will be required. There are around 445 million hectares suitable for growing crops left in the world.

The researchers predicted that increasing demand for food, biofuels, industrial forestry and the spread of urbanisation will result in this reserve of land being completely used up by 2050.

The demand for new cropland and pastures for animals has already caused 80 % of the deforestation around the world today, contributing to greenhouse gases.

The way we use land right now is extremely inefficient. So much of our land is being used to grow food for livestock – 75 % of the world's agricultural land is used for feeding animals that we then eat ourselves. About 40 % of the food grown in the world is also never eaten by anybody – it is thrown away. That means all that is grown on the land is being wasted."

Ex. 8. True or false?

1. The cities and towns occupy less than 30 % of the Earth's total land area.
2. There is enough land in the world to feed the growing population.
3. By 2030 the reserve of land will be completely used up.
4. New cropland and pastures for animals have already caused 50 % of the deforestation around the world today.
5. About 50 % of the food is wasted today.

Unit 12. GLOBAL MAP PROVIDES NEW INSIGHTS INTO LAND USE

Vocabulary

indicator – показатель
to identify – определять
to replace – заменять
impact – воздействие
to disappear – исчезать
in order to – чтобы
to contribute – способствовать
to happen – происходить
consequences – последствия
to assess – оценить

to create – создавать
to include – включать
to represent – представлять
terrestrial – земной
density – плотность
inputs – снесение (удобрений)
access – доступ
under conditions – в условиях
to belong to – принадлежать
similar to – схожие с

Global map provides new insights into land use

Land use changes come in various forms: maize fields **replace** meadows and grasslands, tropical forests are cleared for pastures, steppes become cropland. The reasons are complex, the **impact**s are great: animal and plant communities change, ecosystem functions **disappea**r, carbon emissions **contribute** to climate change. Whatever **happens** regionally has global **consequences**.

In order to better **assess** these impacts and help provide effective countermeasures, the researchers **created** a world map that **identifies** twelve global land-use systems, also called archetypes. These **include** barren lands in the developing world, pastoral systems or extensive cropping systems. Germany, for instance, together with most of the Western Europe, Eastern USA and Western Australia **represents** the 'intensive cropping system' that **covers** about 5 % of the **terrestrial** Earth surface. This system is characterized by high **density** of cropland, high **inputs** of nitrogen fertilizers, temperate climate, high crop yields, large capital investments in the agricultural sector, low proportion of GDP from agriculture and good **access** to market places.

In contrast to traditional models of land use, over 30 factors with more than one million data points were processed. For example, we didn't know before which regions had an **unfulfilled** (нереализованный) potential for agricultural intensification **under** the environmental and socio-economic conditions, or in which regions the maximum agricultural yields were already achieved.

This new analysis also shows a different picture of land use than scientists had before. China, for example, **belongs to** five different archetypes. It was surprising to see that the intensity and type of land use in

some regions of China was quite **similar to** the situation in Western Europe or the United States. Thus, parts of China, together with particular regions of India and, of course, large areas of Europe, belong to the 'intensive cropping systems' archetype. Though. China has only 10 % of arable land worldwide, it produces a quarter of the global grain output. It leads the agriculture production of fruit, vegetables, cereals, cotton, eggs and poultry.

Ex. 1. Fill in the prepositions.

impact … the environment, based .. various indicators, carbon emissions contribute … climate change, Germany together … most of the West Germany, good access … market places, in contrast … traditional models of land use, China belongs … five different architypes, quite similar …

Ex. 2. Translate into English.

Какие	изменения условия урожаи возможности архетипы последствия причины инвестиции	происходят в землепользовании?

Ex. 3. Make sentences from these words.

1. in, come, forms, land use, changes, various.
2. A, systems, global, world, identifies, land-use, map, twelve.
3. 5 %, covers, Earth the 'intensive cropping system' about, of, the surface.
4. data points, over, with, processed, one million, more, than, were, 30 factors.
5. land use, picture, this, new, also, a, different, of, shows, analysis.
6. in, the, type, of, land use, China, some, of, regions, was, similar to, the, Western Europe, in, situation.

Ex. 4. Translate into Russian.

to replace meadows and grasslands, to clear tropical forests, to contribute to climate change, to assess impacts, to provide effective countermeasures, called archetypes, to include barren lands, to process data, to have an unfulfilled potential, to achieve maximum agricultural yields, to belong to archetypes, to be assigned to the intensive cropping systems′ archetype.

Ex. 5. Translate the words in brackets into English.

1. Maize fields (заменяют) meadows and grasslands.
2. Animal and plant communities (изменяются).
3. Ecosystem functions (исчезают).
4. The researchers (создали) a world map that (выделяет) twelve global land-use systems, also called archetypes.
5. The 'intensive cropping system' (занимает) about 5 % of the Earth surface.
6. Over 30 factors with more than one million data points were (обработаны).
7. We didn't know before which regions had an (нереализованный) potential for agricultural intensification.
8. We didn't know before in which regions the maximum (урожаи) were already achieved.
9. The type of land use in some regions of China was quite (схож) the situation in Western Europe or the United States.
10. Parts of China, India and, of course, large areas of Europe, (принадлежат) to the 'intensive cropping systems' archetype.

The text "Burn, then build?"

After you read the text say what problem is discussed in the article? Why does the problem exist?

In Greece, there is a lot of unused land classed as agricultural or forest. Greece has a complex, outdated and incomplete legal **land title** (права собственности) system, where efforts to create a land registry (or cadastre) have been ongoing since the early 2000s and are still not even close to completion. Add in the **pervasive corruption** (повсеместная коррупция) of **land registry offices**, forestry commissions and relevant state administration, and what you get is an opportunity for real estate development.

In Western Europe, it is generally not possible to build without first obtaining appropriate permits. Those who try to do so without permission are frequently discovered, stopped, fined, and even forced to **alter** or **demolish** what they've built. The severe legal and financial **implications** of building illegally makes this only a very limited problem.

In Greece, however, you could **clear up a bit of brushland** or cut down a section of forest, put down the foundation for a building, **connect utilities** by **bribing** local officials, and then wait for the amnesty for illegal buildings that tends to come around periodically, usually close to a general election. **The latest legalisation effort has been lauded** as a revenue raising exercise, **regardless of** consequences in other areas such as –

ecological management and fire security. And so enterprising people **take advantage of** fire to the forest so that they can build homes, without care for regulations, in inaccessible areas, on land they often do not **own**. The forest burns, people die, developers build, and votes are won.

Vocabulary

land registry offices – органы земельного кадастра

obtaining appropriate permits – получение соответствующих разрешений

to alter – изменить

to demolish – снести

implications - последствия

to clear up a bit of brush land – расчистить немного кустарника

to connect utilities – подключить коммуникации

The latest legalisation effort has been lauded – Последние усилия по легализации получили высокую оценку.

bribing – дача взяток

regardless – несмотря на

without care for regulations – не заботясь о правилах

to take advantage of – воспользоваться

to own – владеть

Ex. 6. True/false.

1. In Greece there is a lot of agricultural land which is not used.
2. Legal land title system in Greece is archaic.
3. In Europe you cannot build without first obtaining appropriate permits.
4. Building without permission has severe legal and financial implications in Greece.
5. Building illegally in Europe is a limited problem.
6. Some people in Greece build on land they often do not own, without care for regulations.

Ex. 7. Fill in the necessary prepositions: *since, of, by, without, of.*

1. In Greece, there is a lot … unused land classed as agricultural or forest.
2. Efforts to create a land registry have been ongoing … the early 2000s.
3. In Western Europe, it is generally not possible to build … first obtaining appropriate permits.
4. In Greece you can build home … bribing local officials.
5. Enterprising people take advantage … fire to the forest.

Ex. 8. Combine part A and B and translate the collocations.

A	B
to create	severe legal and financial implications
to obtain	a land registry
to build	without permission
to demolish	a building
to have	a section of forest
to cut down	for the amnesty
to put down	the foundation
to wait	of fire
to take advantage	appropriate permits

Ex. 9. Do we have similar problems in our country?

Unit 13. LAND USE MAPS

Vocabulary

to provide – обеспечивать, предоставлять
applications – применения
to prepare – подготавливать
several – несколько
to generate – выпускать
available – доступны для пользования
access – доступ
to mark out – отмечать
designated – предназначенный
kind – вид
to allow – позволять
overall – общий
setting aside – выделение
utilization – использование
changes – изменения
residential – жилая
to suggest – предлагать
to indicate – указывать
highlight – подчеркивать
waste storage – свалка
covered – нанесенные

purpose – цель
record – запись, регистрация
property – собственность
to prove – доказывать
to argue – оспаривать

Land use maps

Land use maps are maps which **provide the** information about land use. There are a number of different **applications** for such maps, and in many nations, land use maps are **prepare**d by **several** government agencies, for a variety of reasons. Individual groups and organizations can also **generate** maps with land use information. Often, such maps are publicly **available**, so that people who are interested in land use trends can **access** them.

One form of land use map is a zoning map. Zoning maps are used to **mark out** areas **designated** for specific types of land use, so that people developing land know which **kinds** of uses will be **allow**ed. The creation of zoning maps is part of the **overall** process of community planning, in which communities decide how they want to develop into the future. Zoning decisions can include things like **setting aside** greenspace, isolating industrial land, and so forth.

Another type of land use map is a map which shows **utilization**. Utilization maps are often used in zoning decisions to determine whether or not zoning **changes** need to be made. If, for example, only 60% of the land designated for **residential** use is in active use or development, it would **suggest** that making more residential zoning available is not necessary. Utilization land use maps show how land is being used, and may also **indicate** historic utilization information, and provide information about how long land has been developed.

Utilization maps can be very detailed and very useful. They can **highlight** a variety of activities, including farming, mining, residential use, light industrial, heavy industrial, **waste storage**, and so forth so that people get a clear visual impression of how land in the area **covered** by the map is being used. Utilization land use maps can also be important from a development perspective because they provide data about historical use; land used for a **factory**, for example, might not be a great place for a residential development.

Land use maps, records, and archives are often kept in central government buildings for the **purpose** of maintaining a **record**. Researchers

who want to study land use or the history of a region can access these archives, as can developers who want to know more about their land use options, and government officials who monitor land use. These maps can become important in zoning and **property** disputes, as people may be able to use them to **prove** or **argue** their case.

Ex. 1. Answer the questions.

1. How can land use maps be used?
2. What are forms of land use maps?
3. What do zoning maps show?
4. What do utilization maps show?
5. How useful are utilization maps?

Ex. 2. Choose the correct word in parentheses to complete each sentence.

verb	noun
apply	application
prepare	preparation
utilise	utilisation
create	creation

1. There are a number of different … for land use maps (apply/applications).
2. … land use maps show how land is being used (utilization/utilize).
3. The … of zoning maps is part of the overall process of community planning (create/creation).
4. The festival involves a lot of … (prepare/preparation).

Ex. 3. Check if you know these words:

Verbs:

provide, prepare, generate, have access, are used, determine, decide, develop, suggest, show, highlight, include, indicate, get, cover, keep, study, know, monitor, maintain, become, prove, argue, use.

Nouns:

land use maps, information, changes, land use trends, utilization, case, a variety of activities, a record, land use, area, impression, greenspace, data, options.

Adjectives:

different, several, individual, available, specific, overall, industrial, residential, active, detailed, useful, light, heavy, clear, great, important.

Ex. 4. Fill in the necessary prepositions.

1. Land use maps provide information … land use.

2. Land use maps are available to people who are interested … land use trends.

3. The creation … zoning maps is part of the overall process of community planning.

4. Only 60 % of the land designated for residential use is … active use.

5. Utilization land use maps also provide data … about historical land use.

6. These maps can become important … zoning and property disputes.

Ex. 5. Combine parts A and B to make sentences.

A	B
1. Land use maps are maps which provide information 2. Zoning maps are used to mark out areas designated 3. Zoning decisions can include things 4. Utilization maps are used in zoning decisions 5. Land use maps, records, and archives are important	a) for specific types of land use. b) like setting aside greenspace, isolating industrial land, and so forth. c) for the purpose of maintaining a record. d) to determine whether or not zoning changes need to be made. e) about land use

Ex. 6. Passive voice. Translate these sentences into Russian.

1. Land use maps are published in different scales.
2. Land use maps are prepared by several government agencies.
3. Maps are generated by individual groups and organizations.
4. Some kinds of uses will be allowed.
5. Utilization land use maps show how land is being used.
6. These maps show how long land has been developed.
7. Land use is monitored by government officials.
8. Zoning changes need to be made.

MODULE 3

Read the text and do the exercises.

A study by researchers in Germany and in the UK estimated that there were 625 million people living in low lying coastal areas in 2000. By 2060 they predict this will increase to more than a billion. But add (добавьте) climate change, and things get a lot more complicated. Each of those people will need somewhere to live, a place to work, fertile land to provide them

with food. They will need water and energy to stay warm. They will want roads to drive on and places to park.

In Bangladesh, where 80 % of the country is a flood plain, tens of millions of people are affected by vast floods that occur every few years.

Even in developed countries like the UK, pressure on housing has resulted in large scale developments on land prone (подверженной) to flooding. In the past decade, flooding in these areas has caused damage that has run into billions of pounds.

Rising sea levels due to climate change are likely to put further pressure on these packed coastal regions. **Island** (островные) nations like the Maldives are particularly vulnerable to loss of land in this way. Miami in Florida is another famous example.

For those living in Malé, the overcrowded capital of the Maldives, there is no choice but to build upwards.

In the early 1990s the tallest buildings in the city were only two storeys high. Now the average height is eight storeys and some are 25 storeys high. People are coming here because this is where the health, education and jobs are, but overpopulation is leading to many socioeconomic problems."

Ex. 1. Find one sentence in each group which is correct.

A.

1. The article is about the researchers of Germany and UK.
2. The article is about challenges of the climate change.
3. The article is about flooding in various countries of the world.

B.

1. The capital of the Maldives has enough land to develop.
2. The capital of the Maldives loses its land due to rising sea levels.
3. The capital of the Maldives cannot solve the problem of housing.

C.

1. Malé, the capital of the Maldives is overpopulated because the climate is favorable there.

2. Malé, the capital of the Maldives is very popular with the people because there are no tall buildings.

3. Malé, the capital of the Maldives attracts people because they can find the health, education and jobs there.

D. Rising sea levels due to climate change are likely to put further pressure on these packed coastal regions.

1. Повышение уровня моря в результате изменения климата, по всей вероятности, окажет дополнительное давление на эти перенаселенные прибрежные районы.

2. Повышение уровня моря должно изменить климат и оказать дополнительное давление на перенаселенные прибрежные районы.

Ex. 2. Make sentences combining two parts.

A	B
1. It will be difficult for people to live in low lying coastal areas	a) to build upwards.
2. The only way out for the overcrowded capital of the Maldives is	b) because of the population growth and climate change.
3. Countries vulnerable to loss of land include	c) to many socioeconomic problems.
4. In Bangladesh where vast floods occur every few years,	d) island nations.
5. Overpopulation is leading	e) millions of people are affected.

Unit 14. PLANNING IN URBAN AND RURAL AREAS

Vocabulary

prone to – склонен к
value – стоимость
property ownership – владение имуществом
opportunities – возможности
is going through – претерпевает
approach – подход
compatible uses – совместимое использование
variable density – разная плотность

Urban areas. The planning process in urban areas tends to be more complex and **prone to** conflict and competition. Land values are higher, **property ownership** is more complex, and **opportunities** to change land uses are often more limited. It is important to realise that land use planning **is going through** a paradigm shift across the world. From an earlier **approach** of exclusive zones for specific uses (e.g., residential, commercial), there is a shift toward appropriate mixes of **compatible uses** (e.g., residential with small businesses, institutional with offices). From an earlier approach of flat, low-density urban development, there is a shift toward more compact cities with **variable density** correlated with urban transport systems.

Ex. 1. Which goes with which?

1. The planning process in urban areas is more complex and prone to conflict 2. It is important to realise that land use planning is going through 3. There is a shift toward mixes of compatible uses	a) such as residential with small businesses, institutional with office. b) because opportunities to change land uses are more limited. c) a paradigm shift across the world.

Ex. 2. Text A. After reading the text *Rural areas* find the information to complete the sentences.

Rural areas. Rural areas occupy a significant part of geographic space in all countries, and they play a very important role in human lives. Rural areas are places of residence or work; they are tourist destinations where people spend their free time, relax, and come into contact with nature; but above all, they are a source of products and raw materials. Rural areas are often converted (преобразуют) to other uses, most often for the purpose of urban development. For this reason, rural areas should be managed rationally in line with sustainable development principles. All inhabitants can influence the ways in which the urban environment is managed and maintained. Geographic space is transformed to meet human needs, but ecological and economic concerns should not be overlooked in this process. Effective management should aim to instill spatial order because humans have an intrinsic (внутренний) need to organize the physical space in which they live.

1. Rural areas are used as …
2. Rural areas are converted to …
3. Rural areas should be managed rationally in line with …

Ex. 4. Text B. Dutch planning system and instruments

Vocabulary

sophisticated – сложный
ahead of – впереди
structural visions – структурные модели
indicative plans – ориентировочные планы
in this sense – в этом контексте
entire – весь

empowered – уполномочены
to turn into law – превратить в закон
when updating – при обновлении
mandatory – обязательный
obligation – обязанность
binding powers – обязательная сила

The Netherlands has a **sophisticated** system of spatial planning with a long standing tradition, where practice is usually **ahead of** legislation.

As instruments, there are the **structural visions**, prepared by the three levels of government and the land use plans developed at the local level. The structural visions are **indicative plans** and they are able to integrate planning topics concerning not only spatial issues, but also water management, environmental policy, economy, etc.

The three layers of government have their role in the spatial planning system. **In this sense**, there is the National Spatial Structure, and the provinces translate the national guidelines into the provincial structural plans, indicating, for instance, which areas should serve for agricultural activities, nature or recreation.

The municipalities prepare their local structural vision and land use plans considering the **entire** area of their jurisdiction. Once (*зд.* в то время как) the provincial governments have been more **empowered** in relation to defining land uses in rural areas, the role of the municipality is **to turn** these guidelines **into law** when preparing or **updating** land use plans.

The local land use plan is the most concrete plan of the system. Initially **mandatory** for the non-built up areas, nowadays it is **an obligation** to have land use plans covering the entire municipal territory. The land use plans have **binding powers** and linked to them, there are the licenses and building permits, which are given by the municipality in accordance with these plans.

Ex. 5. True or false?

1. The Netherlands has a sophisticated system of spatial planning.
2. The structural visions are prepared by the local authorities.
3. The structural visions are the same as indicative plans.
4. Indicative plans deal only with spatial issues.
5. The municipality prepares and updates land use plans.
6. The local land use plans cover the entire municipal territory.

Ex. 6. Fill in the prepositions.

1. The land use plans are elaborated … the local level.
2. The provinces translate the national guidelines … the provincial structural plans.
3. The role of the municipality is to turn the guidelines … law.
4. The local land use plan is the most concrete plan … the system.
5. In the system of spatial planning in the Netherlands practice is usually … legislation.

Ex. 7. Choose one word to complete the sentence.

1. The Netherlands has a *simple*/*sophisticated* system of spatial planning.
2. The structural plans are prepared by *the government*/*local* authorities.
3. Indicative plans *deal with*/*use* the integrated planning.
4. The local land use plan is the most *simple*/*concrete* plan of the system.
5. It is *an obligation*/*mandatory* for the municipalities to have land use plans for the whole territory.
6. Licenses and building permits *are given*/*updated* by the municipality.

Unit 15. URBAN PLANNING

Vocabulary

to create – создавать
to improve – улучшать
settlements – поселения
pedestrians – пешеходы
cleanliness – чистота
safe – безопасно
to erect levees – возводить дамбы
disaster – бедствие
to feel at ease – чувствовать себя непринужденно
density – плотность
responsible – ответственный
high density cities – города с высокой плотностью населения
to hurt – нанести вред
lack – недостаток
satisfied –удовлетворенный
to hurt – нанести вред
lack – недостаток

satisfied – удовлетворенный
how – как
also – также
so that – чтобы
because of – из-за
which – что
such as – такие как
near – возле
during – во время
as – поскольку
without – без
with – с
every – каждый
there – там

Urban planning

Urban planning is a way to control how cities use land, **create** and **improve** transportation and to carefully develop **settlements** and communities. Urban planners help to manage the growth of cities. They try to make cities a nicer place to live in and balance the needs of cars and **pedestrians**, industry and **cleanliness**, and how to construct new things without destroying historical sites and buildings.

Cities are also designed to keep the people who live there **safe.** Urban planners decide where **to erect levees**, how to protect people from tsunamis and **earthquakes** and evacuation areas for people during **disasters**. They can also design a city so that there is less **crime (преступление)** by reducing population **density** and traffic to make people **feel** more **at ease**. Parks, gardens, and trees help people feel more relaxed and safer when **they** walk on the streets. The presence of street lights and lamps also helps to reduce crime.

Urban planners are also **responsible** for planning transportation in cities. **High density cities** with lots of traffic can be **harmful** to people because of smog and pollution. Another problem of high density cities is a **lack** of available parking, which can **hurt businesses**. **Smart** urban planners will **place** transport stations (train stations, subway stations, etc.) near high density areas such as apartment buildings and skyscrapers to help solve **these problems**. For low density areas with houses, busses are the best and most efficient form of transportation.

An example of a planned city in Japan is Tama New Town, which is located near the capital city, Tokyo. During the early 1960s, many people **moved out** from the center areas of Tokyo but the result was terrible as new cities began **without** enough roads, shops, and transport. The new cities were noisy, crowded, and polluted places. As a result, the government decided to carefully plan a new town called Tama New Town.

This town began construction in 1971 and urban planners built a train station at the center of every **neighborhood** (район). Every neighborhood corner had a koban (police station) or a shop. At the center of Tama New Town is a large shopping area with a park and a large rail station. Most residents of Tama New Town say they are very satisfied with life there.

Ex. 1. According to the article, what do urban planners help to control?

1. the existence of cities
2. the expansion of cities
3. the exception of cities
4. the exaggeration of cities

The word 'erect' in paragraph 2 could be replaced with:

1. plant
2. construct
3. destroy
4. increase

The phrase 'at ease' in paragraph 2 is closest in meaning to:

1. tranquil
2. simple
3. inhibited
4. discontent

The word 'they' in paragraph 2 refers to:

1. urban planners
2. people living in urban areas
3. people living in rural areas
4. parks, gardens, and trees

According to the article, what are three things that might help reduce crime in a city?

1. trees street lights and parks
2. good transportation systems population density and parks
3. evacuation areas shops and transport
4. urban planners pollution and low density traffic

What is the main idea of paragraph 2?

1. Cities are not very safe places
2. Reducing traffic and noise helps to reduce crime
3. It is important to evacuate when there is a disaster in your city
4. Urban planners try to design cities to keep people from danger

The word 'lack' in paragraph 3 could be replaced with:

1. shortage
2. reduction
3. shrinkage
4. depletion

The word 'smart' in paragraph 3 could be replaced with:

1. insightful
2. attractive
3. incapable
4. industrious

The phrase 'these problems' in paragraph 3 refers to:

1. high density cities
2. houses and buses
3. smog and parking
4. trains and subways

The phrase 'moved out' in paragraph 4 is closest in meaning to:

1. occupied
2. lingered
3. vacated
4. progressed

It can be understood from paragraph 4 that

1. the residents of Tama New Town were obnoxious
2. the suburbs of Tokyo were unpleasant places to live in the 1960s
3. new cities built after the construction of Tama New Town were terrible
4. the government built new cities because of Tama New Town's inadequacies

According to the article, why was Tama New Town built as a planned city?

1. To reduce crime and help keep people safe
2. To keep people safe from tsunamis and other disasters
3. To help people get to work faster
4. Because new unplanned cities had many problems

According to the article, what was at the heart of Tama New Town?

1. a police station and a neighborhood shop
2. the satisfaction of most residents of the town
3. the affection and passion of the urban planners
4. a shopping area with a park and a large train station

What would be a good title for this passage?

1. The Benefits of Urban Planning
2. Reducing Crime in Large Cities
3. Tama New Town: A Great Place to Live
4. Planning Public Transportation in Urban Areas

Ex. 2. Use the words in the box to fill in the blanks. You can watch the film about Masdar at: https://www.youtube.com/watch?v=k3T6dcoixsI

cool successful shade reuse tired narrow

Masdar is a small city – only 6 square kilometers. In the future, it will hold 50, 000 people, more than a 100 companies and a university. Its streets are very… . The houses are close to each other. The shade from the houses helps to keep the streets …

There no cars on the streets of Masdar. Because the city is so small, people can walk to most places. If they get… they can use the PRT Personal Rapid Transit. The cars have no drivers. People just tell the car where you want to go, and the car will take you there.

Masdar will … as many resources as possible. It will reuse about 80 per cent of its water. People in Madar are even using building materials which they can reuse in the future.Can this city be really… ? No one knows.

Ex. 3. Choose the correct word.

The disappearing island.

Can you imagine (1) *to live* / *living* on an island that might (2) *to disappear* / *disappear* underwater in the near future? Well, the inhabitants of Tuvalu don't need to imagine this. It's a reality and they will probably be made (3) *leave* / *to leave* their island soon. The reason for this is global warming. This is expected (4) *to bring* / *bringing* further changes to climates all over the world and cause sea levels (5) rise / to rise. Tuvalu, situated in the Pacific Ocean halfway between Hawaii and Australia, is one of the most beautiful and unique places on earth, but its highest point is just under 5m above sea level and most areas are only 1m above sea level. Tuvaluans are interested in (6) *making /to make* their problem known to the world. (7) *Living* / *Live* on the island is

already difficult and they need help in (8) *finding* / *to find* a solution. If this doesn't happen, Tuvalu, with a population of about 12,000 people, may (9) *become* / *to becom*e the first country (10) *following* / *to follow* mythical Atlantis into the ocean.

Unit 16. MAPS IN SURVEYING

Ex. 1. Read the text *Agricultural surveying* paying attention to words in bold.

The **object** of agricultural surveying is to determine and to **record** the position, area, and **shape** of a tract of land. In addition to the field work with instruments for measuring distances, **angle**s, and directions; a field record, containing figures, notes, and sketches **concerning** the work must be kept; the areas must be computed; and usually a map, a plan, or a profile are made showing land surveyed. The art of land surveying **include**s all of these various lines of work.

The object of the work on surveying for students is **to enable** them to measure and calculate accurately the areas of the various fields of the farm and to locate the buildings; **to prepare** a good map **setting forth** the relative size and position of the fields, buildings, and fences, and indicating the drains.

It is necessary for the farmer to know the areas of his fields in order that he may determine accurately the yields of the various crops grown. A survey will enable the farmer to so **divide** his farm into fields as **to facilitate** a system of crop rotation.

Ex. 2. Which goes with which?

1. A survey will enable the farmer to so divide his farm into fields	a) is to determine and place on record the position, area, and shape of a tract of land.
2. The object of agricultural surveying	b) in order to determine accurately the yields of the various crops grown.
3. It is necessary for the farmer to know the areas of his fields	c) must be kept.
4. A field record with figures, notes and sketches	d) as to facilitate a system of crop rotation.

Ex. 3. Which nouns in part A may follow verbs in part B?

A	B
to determine	shape
to place on record	angle
to accomplish	object
to constitute	area
to include	distances
to enable	angles
to set forth	directions
to divide	buildings
to facilitate	fences
to direct	drains
	a system of crop rotation

Ex. 4. Answer the questions in a written form.

1. What is the object of agricultural surveying?
2. Define a survey.
3. How can knowledge of surveying be connected with agriculture?
4. In what way will a map be of use to the land-owner?

Ex. 5. Read the text *Maps.*

The agriculture industry has been using maps for years to help with growing their crops. They use them for planning where they will plant their crops, how much of each crop they should plant, and how much money they can make from each crop. When using a farming map, it's important to understand how to read it and what information it provides. The map shows different soil types and their fertility levels, as well as different types of vegetation in an area. This type of information can help farmers determine where their fields are located and what kind of crops they should plant there based on soil types and fertility levels. Also, a good map should be easy to read and understand. It should also be accurate, detailed, and up-to-date.

Field maps are usually created using aerial photos or satellite images. The most common types of field maps include:

Soil surveys: These maps show the location and type of each soil in an area.

Agricultural land use: These maps show which types of crops are grown in an area and how much they produce per acre.

Crop rotation: These maps show how often different types of crops are grown in a particular area over time. They can also show which crops are rotated with other crops or which crops are rotated with each other.

Ex. 6. Find the answer to these questions in the text.
What information does the map show?
How does the map can help farmers?
What are the requirements to a good map?
How are usually field maps created?
How many types of field maps are there?

Unit 17. LAND USE AND ENVIRONMENT

Vocabulary

access – доступ
pressure – давление
overexploitation – чрезмерная эксплуатация
desertification – опустынивание
to occur – происходить
food insecurity – отсутствие продовольственной безопасности
to threaten – угрожать
devastating – опустошающий
quantities – количества
to cause – a) вызывать, b) причина
to involve – быть связанным с
depletion – истощение
due to – из-за
to influence – влиять
inadequate – недостаточный
to contribute – способствовать
uneven – неравномерный
accelerated – ускоренный
extent – степень
to implement – выполнять
to respond – реагировать
government – правительство
variety – разнообразие
quality – качество
watersheds – водоразделы
tillage practices – методы обработки почвы
available – имеющийся в наличии
riparian zones – прибрежные зоны
to reduce – снижать

stream bank vegetation – растительность на берегу ручья
runoff – сток
to exacerbate (ekzasebeit) – усиливать
spread of invasive species – распространение инвазионных видов
to alter – изменять

Land is necessary for various human activities. So there is increasing competition for **access** to land. The **pressure** on land and the **overexploitation** of land resources have resulted in many forms of degradation such as **desertification**, loss of biodiversity, deforestation, land degradation, water degradation, etc.

Land degradation is **occurring** globally. It is **estimated** to effect over 2 billion hectares worldwide and **threatens** the livelihoods of over one billion people. Today, 52 % of all the land used for food production is impacted by soil erosion. In the long term, the lack of healthy soil can lead to low yields and **food insecurity**.

Desertification is land degradation in arid, semi-arid and dry areas. It involves progressive loss of soil productivity and **depletion** of plant cover due to human activities and climatic variations. Land use often directly **influences** desertification.

Land **overuse**, poor management of grazing areas and livestock, mechanized agriculture, bad irrigation practices, deforestation, **inadequate** land use policies all **contribute** to desertification. Additionally, natural factors (for example, aridity over several years, **uneven** rainfall and drought) also influence the process of land degradation. Poor land use decisions can result in big changes to natural land **watershed**s and water quality.

Land resources management has many components, including land-use planning. Issues relating to land use are often complex and require a high degree of understanding of the ecological balance. Environmental issues in land use are related to a combination of many complex natural and human-related phenomena.

Governments play a crucial role in **implementing** policies for wise use of land. Governments regulate the exploitation of resources and they control land use. They can and use a variety of public policy tools to implement these actions. Public policy tools include international agreements, laws, programs, and public education.

Agricultural land uses can affect the **quality of water and watersheds**, including the types of crops planted, tillage practices:

• Livestock grazing in **riparian zones** can change landscape conditions by **reducing** stream bank vegetation and increasing water temperatures, sedimentation, and nutrient levels.

• **Runoff** from pesticides, fertilizers, and nutrients from animal manure can also degrade water quality.

• Agricultural land use may also result in **loss of native habitats** or increased wind erosion and dust.

• Some land uses can accelerate the **spread of invasive species**.

Certain agricultural land use practices, such as overgrazing, land conversion, fertilization, and the use of agricultural chemicals, can accelerate the growth of invasive plants. These plants can alter fish and wildlife habitat, contribute to decreases in biodiversity, and create health risks to people.

Ex. 1. Change the words using the prefixes from the box so that they have a negative meaning.

Over-	**de-**	**un-**	**in-**

forest -
security -
sustainable -
exploitation -
adequate -
even -

1. (Чрезмерное использование земли) contributes to desertification.
2. The expansion of agriculture caused nearly 80 % of global (вырубка леса).
3. The lack of healthy soil can lead to (отсутствие продовольственной безопасности).
4. When agricultural practices are (неустойчивые) they present serious threats to species and ecosystems.
5. (Недостаточная) land use policies all contribute to desertification.

Ex. 2. Word formation

1. There is … competition for access to land (**increase**).
2. The … of land resources have resulted in many forms of degradation (**exploit**).
3. Land degradation … the livelihoods of over one billion people (**threat**).
4. … is land degradation in arid, semi-arid and dry areas (**desert).**
5. … is the effect of unsustainable farming practices (**forest**).

6. … issues in land use are related to many natural and human-related phenomena (**environment**).

7. Certain agricultural land use practices, such as … can accelerate the growth of invasive plants (**graze**).

Ex. 3. Complete the sentences.

1. There is increasing competition for …
2. The forms of degradation are …
3. Desertification involves …
4. Natural factors that influence the process of land degradation are …
5. Ecosystems are transformed by …
6. Sustainable management of land resources requires …
7. Governments regulate land resources by …
8. Agricultural land uses can affect …
9. Agricultural land use may also result in …
10. Certain agricultural land use practices can accelerate …

Ex. 4. Fill in the necessary prepositions.

1. The pressure on land and the overexploitation of land resources have resulted… many forms of degradation.
2. Land degradation involves progressive loss of soil productivity due … human activities and climatic variations.
3. Poor management of grazing areas, bad irrigation practices, deforestation, all contribute … desertification.
4. Environmental issues in land use are related … many complex natural and human-related phenomena.
5. Runoff … pesticides, fertilizers can also degrade water quality.
6. Governments play a crucial role … implementing policies for wise use of land.

Ex. 5. Translate into English.

1. Обостряется конкуренция за доступ к земле.
2. Давление на землю и чрезмерная эксплуатация земельных ресурсов привели ко многим формам деградации, таким как опустынивание, утрата биоразнообразия, вырубка лесов, деградация земель, ухудшение воды и т. д. Деградация земель происходит повсеместно и угрожает жизни более миллиарда человек.
3. Опустынивание – это деградация земель в засушливых, полузасушливых и засушливых районах.
4. Чрезмерное использование земель, плохое управление пастбищами и домашним скотом, механизированное сельское хозяйство, плохие методы орошения, вырубка лесов, неадекватная политика землепользования — все это способствует опустыниванию.

5. Управление земельными ресурсами включает в себя множество компонентов, в том числе и планирование землепользования.

6. Правительства играют решающую роль в реализации политики разумного использования земли.

7. Использование сельскохозяйственных земель может повлиять на качество воды и водосборных бассейнов, включая виды культур, методы обработки почвы.

Text. ***Landscape planning in Kazakhstan.***

Kazakhstan is the largest country in Central Asia with land plentiful resources for agricultural development. However, despite the country's great potential, more than half of its territory is prone to desertification and degradation.

It is the ninth largest country by area in the world; it has two and a half million hectares of unused land. Today, degraded lands occupy an area of 180 million hectares and cover 66 percent of Kazakhstan territory. In recent decades, the fertility of a tenth of irrigated lands has significantly decreased, up to 60 percent of pastures have been degraded and 18 million hectares of land are exposed to wind and water erosion. The pastures and hayfields near populated settlements are the most affected by degradation.

The main reason for land degradation in Kazakhstan is the current practice of land use, which leads to the loss of agricultural land fertility, degradation of rangelands, loss of landscape and biological diversity.

Sustainable planning of economic activities helps to reduce the negative impact on natural landscapes and slows the process of desertification and degradation. Today, zoning and landscape planning are fairly new trends in Kazakhstan.

The rich fauna of these areas and the diversity of their natural ecosystems – from the mountains and forest to the deserts – have created a need for the sustainable use and management of natural resources, which is based on landscape planning. According to experts' estimate, unsustainable agriculture, tourism, infrastructure development and other anthropogenic factors have had a negative impact crop rotation.

The use of **foothill** (предгорные) and plain landscapes as pasture lands leads to destruction of vegetation cover, water and wind erosion, due to which the soils are losing their fertile layer, and the lands are withdrawn from agricultural turnover. In addition, the landscapes in many areas are actively used for unstable irrigated agriculture, due to which changes in the water-salt regime of soils, their overwatering, secondary salinization and waterlogging are observed.

At the same time, a disturbance of the soil cover occurs very quickly – within a few years, but the restoration requires tens and hundreds of years. To solve these problems, functional zoning schemes were designed, potential areas for creating ecological corridors and buffer zones were identified. Experts also prepared more than 200 thematic database maps, which contain information on climate, socioeconomic conditions, demography, agriculture and biodiversity.

Ex. 6. Complete the sentences.

1. More than half of its territory of Kazakhstan is prone to …
2. Degraded lands occupy an area …
3. The main reason for land degradation in Kazakhstan is …
4. Today new trends in Kazakhstan are …
5. … have had a negative impact on the ecosystems and natural landscapes of these areas.
6. The soils are losing their fertile layer because …
7. The restoration of the soil requires …
8. Thematic database maps contain …

Unit 18. OPEN SPACE AND PROTECTED AREAS IN ISRAEL

Vocabulary

to facilitate – облегчать
versus – по сравнению
terrestrial – на суше
to total – составлять
with regard to – что касается
amount – количество
conservation – сохранение
to convert – преобразовывать
are scattered – разбросаны
to track – проследить
change – изменение
current – нынешний
to provide – представить
over time – с течением времени
updates – обновления
to implement the goals – реализовать цели

Open Space and Protected Areas in Israel

Tracking (рассмотрение) land use **facilitates** analysis of development processes and their environmental impacts, such as changes in built up areas **versus** open spaces, nature reserves and agricultural land. Some 18 % of the country area is used for agriculture, and 77 % is open space (forests, public and other open space). The different kinds of built-up areas total about 5 % of the area of Israel. Selected figures on Israel's protected areas are high by international standards. These protected areas **total** some 19 % of the land in the country. Almost all of the reserves are **terrestrial** and the rest are located in coastal and marine regions. With **regard to** type of protected area, 52 % are nature reserves and 48 % are national parks.

With regard to protected areas, about a fifth of Israel's land is protected. Most of the protected areas are located in the south, with the largest **amount** of open space and the smallest population in the country. Protected areas in the central and coastal regions are limited to about three percent of the total area of these regions, and these areas are scattered and fragmented. The concept of corridors addresses this problem. Although Israel has a long coastline, there are only a very few small protected areas along its coast and in the sea. Since most of the country's population is concentrated in the coastal zone, the **conservation** of the marine and coastal areas is a difficult task.

In recent years the trend of **converting** open space and agricultural land into built-up areas appears to be rapidly increasing. However, **current** figures can only **provide** a present snapshot of the situation, and do not allow for the backtracking of land use changes **over time**. Systematic **updates** of the current data over time are required **to track** land use changes in the future and help policy makers and planners implement the goals.

Ex. 1.

A. to facilitate, to total, to convert, to address, to provide, to, track, to implement.

B. about 5 % of the area, the problem, a snapshot, analysis, into built-up areas, the goals, land use changes.

Ex. 2. Complete the sentences.

1. Changes in built up areas take place versus …
2. The protected areas of Israel total …
3. Types of protected areas are …
4. Most of the protected areas are situated …

5. Protected areas in the central and coastal regions are …

6. The conservation of the marine and coastal areas is a difficult task because …

7. Systematic updates of the current data over time are required to …

Ex. 3. Fill in the table. Find the missing information in the text.

	18 %
Open space	
	5 % of the area
	48 %
Protected areas	
	52 %

Ex. 4. Read the text *People and the Natural Landscape* and name the effects of human activities on natural landscapes.

The growth of technology has increased our ability to change a natural landscape. An example of human impact on landscape can be seen along the coastline (береговая линия) of the Netherlands. Water from the North Sea was pumped out of certain areas, uncovering the fertile soil below. Dikes and dams were built to keep water from these areas, now used for farming and other purposes.

Dams can change a natural landscape by flooding it. The Three Gorges Dam on the Yangtze River, in Yichang, China, is the world's largest electric power plant. The Three Gorges Dam project has displaced (переселил) more than 1.2 million people and permanently altered (изменил) the flow of the Yangtze River, changing both the physical and cultural landscape of the region.

Many human activities increase the rate at which natural processes, such as weathering and erosion, shape the landscape. The cutting of forests exposes (подвергает) more soil to wind and water erosion. Pollution such as acid rain often speeds up the weathering, or breakdown, of Earth's rocky surface.

Ex. 5. Which goes with which?

to change	millions of people
to displace	the rate of weathering and erosion
to increase	dams and dikes
to expose	the soil to wind and water erosion
to speed up	the weathering
to build	natural landscape

Ex. 6. Describe human impact on the landscape in

- the Netherlands
- China

MODULE 4

SPATIAL PLANNING IN AUSTRIA

Austria accounts for a share of around 29 % of the total area of the Alpine mountains. The Alps cover almost two thirds of the country thus defining the spatial characteristics of the structure and development of the areas. For this reason, living, work and mobility concentrate in the valleys in the western parts of Austria that is dominated by the Alps. The development requirements for these regions with limited settlement space are increasing and this is creating overlaps in use which may result in conflicts of interest.

A largely constant trend in Austria is a very high land use rate. Daily land utilisation was 14.7 ha/day throughout Austria. It illustrates that the utilisation of space in a growing economy and population is still happening by the rezoning of undeveloped areas.

Therefore, a central challenge for spatial planning in Austria is to promote strategies to use less space. The principles of internal and external development, prevention of landscape destruction as well as quantitative soil protection especially areas valuable for farming and forestry production are given consideration in planning at all levels. Austria's Alpine topography means a strong axial development along the valleys and a clear limitation of usable space. Thus, the eastern Länder have a share far above 50 % of usable land. In contrast, Tyrol as an Alpine province only has 12.4 % usable land.

Agriculture focuses on the production of food and animal feed for the national and international markets, with a very diverse structure of farming enterprise. With over 160.000 enterprises, the small-scale farming and forestry enterprises make a main contribution to the preservation of rural areas and its extensive cultural landscape that is important for tourism. A key priority for Austria's agriculture is the protection of natural resources. The share of organic farming has now risen to 24 % of the cultivated area.

196 protected areas had been defined by law that covers 15 % of the entire territory of Austria. Internationally important protected areas are the

six national parks. The areas designated as national parks were mainly original river courses, ecologically valuable lake landscapes and largely untouched mountain regions. Under the nature conservation acts of the Länder, there are many further protected areas which afford protection to small parts of landscapes or even individual places or objects (caves, old trees, etc.)

Answer the questions in a written form.

1. What factor determines the spatial characteristics of the development of the areas?
2. What trend exists in Austria concerning land use?
3. Why is the preservation of rural areas important?
4. How does Austria solve the problem of limited land?
5. What is included in protected areas?

Unit 19. LAND MANAGEMENT AND DEVELOPMENT

Vocabulary

not only … but – не только… но и
field – область
significantly – значительно
as well as – а также
increasing – увеличивающийся
subsequent – последующий
application – применение
to take place – иметь место
value – ценность
greatly – сильно
to simplify – упрощать
This holds true – Это верно
allotment planning – планирование участков земли
precisely – точно
exceptionally – исключительно
pre-construction engineering studies – инженерные изыскания перед строительством
limitless – безграничный
utilities – коммунальные сооружения
transfer – передача
easily repeatable – легко воспроизводимы
to overlay– накладывать

blueprints – чертежи
bare – пустой
usefulness – полезность
purpose – цель
precisely – точно
digital surface models – цифровые модели поверхности

Ex. 1. Translate the sentences into Russian paying attention to words which can be both nouns and verbs.

change – 1) изменение; 2) изменяться
effect, affect – 1) влияние; 2) влиять
cover – 1) покров; 2) охватывать
impact – 1) воздействие; 2) воздействовать
increase – 1) увеличение; 2) увеличиваться
cause – 1) причина; 2) вызывать

1. Technologies, especially in the fields of remote sensing and geographical information systems (GIS) have changed significantly recently.
2. The changes had an impact on the methodologies applied in land use planning.
3. New technologies had a profound impact on land use.
4. Recently land-use change had an effect on ecology and climate change.
5. Land use change has affected almost a third (32 %) of the global land area in just six decades.
6. Land covers about 20 % of the earth's surface.
7. The Earth is constantly changing.
8. Unsustainable land use causes important impacts on climate.
9. Drone surveying showed the largest increases in inspecting and evaluating small or large areas of land.
10. Forest products are increasing in high-tech industries.

Ex. 2. Make adverbs using suffix -ly and translate them into Russian.

significant – значительный, great – сильный, immediate – немедленный, easy – легкий, safe – безопасный, precise – точный, except – кроме, near – рядом, particular – особенный

1. Technologies have changed … since the 1990s (significant).
2. Aerial images … simplify topographic surveys for land management (great).

3. Engineers can … start working (immediate).

4. Data collection by drones is …repeatable (easy).

5. Drone imaging provides an excellent way to … and … create models of an area (safe, precise).

6. Drones are … useful for surveying (except).

7. They have … a limitless amount of potential applications and services (near).

8. They're … useful to urban land management (particular).

Ex. 3. Study the use of the following conjunctions: *Not only… but also, both, both … and, as well as, such as*

1. *Not only* drones greatly accelerate topographic surveys, *but also* simplify them.

2. *Both* the plans *and* the registers may be stored in computers.

3. *Both* plans are stored in the computer.

4. Drones have nearly a limitless amount of potential applications and services, *such as* the digital surface models.

5. Drone surveying is used for site scouting *as well as* for the construction of roads, buildings and utilities.

Read the text and pay attention to the words in bold.

Land management and development

Not only the conditions **but** also technologies, especially in the **field**s of remote sensing and geographical information systems (GIS), have changed **significantly** since the 1990s. Both changes had an impact on the methodologies applied in land use planning. These technological developments **as well as** new development challenges such as climate change and **increasing** competition on land and the **subsequent** new fields of **application** for land use planning made a general review of the existing land use planning guidelines necessary.

Aerial images taken by drones **greatly** accelerate and **simplify** topographic surveys for land management and planning. **This holds true** for site scouting, **allotment planning** and design, as well as final construction of roads, buildings and **utilities**.

These images also provide the foundation for detailed models of site topography for **pre-construction engineering studies**. The generated data can also be **transferr**ed to any CAD or BIM software so that engineers can immediately start working from a 3D model.

As data collection by drones is **easily repeatable** at low cost, images can be taken at regular intervals and **overlaid** on the original **blueprints** to assess whether the construction work is moving according to plan specifications.

The benefits of drone surveying are used in many different industries and provide an accurate method of inspecting and evaluating small or large areas of land. These areas may be **bare** and ready for developments, they may have thick vegetation or they may even already have developed construction. Since there are many **purpose**s for drone surveying, their **usefulness** applies to many different areas. From flatlands to deep pits, drone imaging provides an excellent way to safely and **precisely** create models of an area.

Ex. 3. Translate the following word combinations into Russian.

remote sensing, development challenges, climate change, land use planning guidelines, concept developments, disaster risk reduction, land values**,** site scouting, allotment planning and design, site topography, pre-construction engineering studies, data collection, drone surveying, urban land management.

Ex. 4. Combine parts A and B and make sentences.

A	B
1. New technologies had an impact	a) greatly accelerate and simplify topographic surveys for land management and planning.
2. Aerial images taken by drones	b) provide an accurate method of inspecting and evaluating small or large areas of land.
3. Drones are exceptionally useful	c) for surveying many different types of land sites.
4. The benefits of drone surveying	d) on the methodologies applied in land use planning.

Ex. 5. Translate into English.

1. Современные технологии, такие как дистанционное зондирование и географические информационные системы, широко используются в землеустройстве.

2. Изменение климата и усиление конкуренции за землю вызвало необходимость пересмотра принципов планирования землепользования.

3. Аэрофотоснимки, сделанные дронами, значительно ускоряют и упрощают топографическую съемку для землеустройства и планирования.

4. Полученные данные могут быть переданы в любое программное обеспечение CAD или BIM.

5. Сбор данных дронами легко воспроизводим при низких затратах.

6. Преимущества съемки с помощью дронов обеспечивают точный метод осмотра и оценки участков земли.

7. Цифровые модели поверхности, созданные дронами, используются для создания виртуальных моделей участков.

Unit 20. DIGITAL TRANSFORMATION

Vocabulary

primary – главный
to affect – воздействовать
prosperity – благосостояние
ownership – владение
updated – усовершенствованный
to bring in (brought in) – вносить
significant – значительный
with a view – с целью
to recognize – признавать
current – нынешний
commitment – взять на себя обязательство
land registry – регистр земель
speed – скорость
simplicity – простота
access – доступ
core – суть
digital – цифровой
to aim – направлять на
property – собственность
to identify – определить
solutions – решения
to implement – осуществлять
to provide – обеспечивать
importance – важность
to overestimate – переоценить
to account for – составлять
released – выпущенный
total net worth – общая чистая стоимость
asset – имущество
owned – находящийся во владении
in particular – особенно
directly – непосредственно

Read the text: ***Technology is the answer to modernizing the land registration process.***

Land is a **primary** resource for life. Buying and selling of land **affects** our social environment and **prosperity**. It gives people control in their **ownership** of land, supports housing, mobility, business development and investment.

The land registration system in England and Wales has developed over many centuries. The system was recently **updated** by the Land Registration Act 2002 which brought in significant reforms **with a view** to modernising the system.

The Land Registry **recognizes** that the **current** land registration system is in need of modernisation, and in 2017 **made a commitment** "to become the world's leading land registry for **speed**, **simplicity** and an open **access** to data. A **core** of the Land Registry's 2017–2022 Business Strategy is '**Digital** Street'

What is Digital Street?

Digital Street is the Land Registry's project which **aims** to work with the **property** industry to **identify** innovative ways and technological **solutions** to solve some of the key problems with buying and selling land and property. The project is examining how new technologies such as blockchain and smart contracts could potentially be **implemented** by the Land Registry in the future to improve the services that they **provide**.

The Land Registry aims to make buying and selling property *"simpler, quicker and cheaper through data, technology and innovation"*. However, the Digital Street project ran until 2022. But as the focus of the project is more on research than on development and implementation of new technologies, it will need some time before we see any of the fundamental changes to the Land Registration system.

The **importance** of an efficient and dynamic system of land registration to the property market, to businesses, and to the wider economy cannot be overestimated. Land **accounts for** a large proportion of the UK economy – the latest figures **released** by the Office for National Statistics show that in 2017 land accounted for 51 % of the UK's £10.2 trillion **total net worth** and is typically the most valuable **asset owned** by a company or by an individual. Commercial property **in particular** plays a significant role in the economy – according to the report that the commercial property industry **directly** employs almost one million people in the UK.

Ex. 1. Choose one word to complete the sentence.

Importance/important

1. The … of an efficient system of land registration to the property is evident.

2. … changes were made.

implemented, implementation

1. The focus isn't on the … of new technologies.

2. The project will need more time to be …

owner ownership, owned

1. Land is the most valuable asset … by a company or by an individual.

2. The land under the … of the royal family amounts to 1.4 % of England.

3. The government is the biggest land … by area.

Solve, solutions

1. The aim of the Land Registry's project is to find technological … .

2. Digital Street aims to … some of the key problems with buying and selling land and property.

Ex. 2. Translate into Russian.

влиять на среду, нынешняя система регистрации земель, взять на себя обязательство, открытый доступ к данным, стать ведущим в мире регистром земель, определить инновационные пути и решения, покупка и продажа земли и недвижимости, улучшать услуги.

Ex. 3. Find synonyms.

A. to update, property, current, to implement, to account for, to own.

B. real estate, to carry out, present, to possess, to modernize, real estate, amount to.

Ex. 4. Fill in the necessary prepositions.

1. Land gives people control in their ownership … land.

2. The system was updated … the Land Registration Act.

3. The current land registration system is … need of modernization.

4. The Land Registry aims to make buying and selling property *"simpler, quicker and cheaper ... data, technology and innovation"*.

5. Land accounts … a large proportion of the UK economy.

6. According … the report the commercial property industry directly employs almost one million people in the UK.

Ex. 5. Complete the sentences.

1. The land registration system in England and Wales was updated because …

2. The Land Registry made a commitment …

3. The Land Registry's project aims to identify …

4. The most valuable asset owned by a company is …

Unit 21. NEW TECHNOLOGIES IN SUSTANABLE LAND USE PLANNING

Vocabulary

to require – требовать
slope – уклон
availability – наличие
adequate – достаточный
humidity – влажность
frequency – частота
to determine – определять
suitability – пригодность
variety – разнообразие
to rise – повышаться
to take fuller advantage – более полно использовать
data mining – интеллектуальный анализ данных
smart changes – разумные изменения
is predicted – как предсказывают
high-resolution imagery – изображения с высоким разрешением
to ensure – обеспечить

New technologies in land use planning

General land use planning **require**s data on soil type, topography, forest cover, and other geographic factors, as well as data bases on demographic and other socioeconomic factors. Data must be available in adequate quantity and quality for central planning.

Biological, geophysical, and climatic characteristics (including natural vegetation type, soil type and condition, **slope**, slope aspect, water **availability**, rainfall, **humidity**, light, wind, storm type, and storm intensity and **frequency**) **determine** land **suitability** for different types and combinations of agricultural and forestry systems. Social, economic, and institutional conditions will determine the actual patterns of land use and the productivity levels within a landscape. Where human population density is low, more land tends to be used for agriculture, and the **variety** of land uses tends to be limited. As population pressure on the land **rises**, the variety of land uses increases, as people **take fuller advantage** of natural resources and of each production niche.

With the evolution of geographic information systems, remote sensing, **data mining** and other technologies, the concepts of land intelligent management, refined planning, big data analysis and intelligent monitoring

have moved from theory to practice. A key issue now is: how new technology can be used to promote **smart changes** in land use planning and to achieve sustainable land use. Future land use planning **is predicted** to be based on the network, with the software platform as the center, data as the element and security as the guarantee with the Internet, geographic information systems (GIS), Internet of things (IoT), artificial intelligence (AI), cloud computing and other technologies forming a diversified integrated intelligent system.

GIS and drones decrease the time spent in gathering data on land use and the environment. With **high-resolution imagery** from the drone, urban planners can detect **current** land use, as well as any change that has occurred. GIS and drones make it possible to create digital land use maps and plans, to act as a community guide for future developments. The plans can also be used **to ensure** environmental conservation, mitigating transportation issues, and limiting urban sprawl.

Ex. 1. Answer the questions

1. What data does land use planning require?
2. What determines land suitability for agricultural activities?
3. What is the relationship between human population density and land use pattern?
4. How can new technologies be used to promote smart changes in land use planning?
5. How important is high-resolution imagery from the drone?

Ex. 2. Translate into Russian

to require data, adequate quantity and quality, water availability, to determine, human population density, variety of land uses tends, to take fuller advantage of natural resources, remote sensing, land intelligent management, under the influence, to promote smart changes, to achieve sustainable land use, software platform, a diversified integrated intelligent system, gathering data, high-resolution imagery, to detect current land use, to ensure environmental conservation, mitigating transportation issues, limiting urban sprawl.

Ex. 3. Combine two parts to make a sentence.

1. Land suitability is determined by	a) where human population density is low.
2. More land tends to be used for agriculture	b) land intelligent management moved from theory to practice.
3. With the evolution of new technologies	c) biological, geophysical, and climatic characteristics.
4. Urban planners can detect current land use, as well as any change	d) having high-resolution imagery from the drone.

Ex. 4. Fill in the necessary prepositions.

1. General land use planning requires data … soil type, topography and other geographic factors.

2. Data must be available …adequate quantity and quality for central planning.

3. People take advantage …natural resources and of each production niche.

4. The concepts of land intelligent management and intelligent monitoring have moved … theory … practice.

5. … the influence of a scientific and technological revolution, new technology can be used to promote smart changes in land use planning.

6. GIS and drones decrease the time spent … gathering data on land use and the environment.

Ex. 5. Translate into English.

1. Планирование землепользования требует данных о типе почвы, топографии, лесном покрове и других географических факторах.

2. Биологические, геофизические и климатические характеристики определяют пригодность земель для различных типов сельскохозяйственных и лесохозяйственных систем.

3. Социальные, экономические и институциональные условия будут определять фактические модели землепользования.

4. С развитием географических информационных систем, дистанционного зондирования, и других технологий концепции интеллектуального управления земельными ресурсами перешли от теории к практике.

Ex. 6. Fill in the gaps with *involves, show, include, may, entered*

GIS applications … both hardware and software systems. These applications … include cartographic data, photographic data, digital data, or data in spreadsheets.

Cartographic data are already in map form, and may include such information as the location of rivers, roads, hills, and valleys. Cartographic data may also include survey data and mapping information that can be directly entered into a GIS.

Photographic interpretation is a major part of GIS. Photo interpretation … analyzing aerial photographs and assessing the features that appear.

Digital data can also be … into GIS. An example of this kind of information is computer data collected by satellites that … land use – the location of farms, towns, and forests.

Ex. 7. Which goes with which?

GPS technology	is a computer system for capturing, storing, checking, and displaying data related to positions on Earth's surface.
A geographic information system (GIS)	uses satellites to pinpoint position on Earth with the aid of a GPS device or unit.

Ex. 8. Explain the difference between GIS and GPS use.
Example: It is used for …

Unit 22. LAND USE ZONING INFORMATION SYSTEM

Vocabulary

to launch – запускать

Land Use Zoning Information System – Информационная система зонирования земель

a tech-enabled mechanism – технологический механизм

in the localities – на местах

state-of-the-art research and extension – современные исследования и консультационные услуги

to monitor – отслеживать

zoning ordinances – постановления о зонировании

to enable – давать возможность

implementation – выполнение

comprehensive land use plans – комплексные планы землепользования

organized data – систематизированные данные

idle lands – незанятые земли

housing stocks – жилищный фонд

to match – сопоставлять

to make data migration easier – упростить перемещение данных

to provide an offline access mechanism – предоставить механизм автономного доступа

intermittent – прерывистый

Lightening the LUZIS

We **launched** in February the **Land Use Zoning Information System** (LUZIS), a **tech-enabled** mechanism to manage land use and zoning **in the localities**.

I am proud to say that this system was developed through the initiative of our own Environmental, Land Use and Urban Planning and Development Bureau, with the assistance of the University of the Philippines Training Center for Applied Geodesy and Photogrammetry, an institution known for its **state-of-the-art research and extension** on surveying and mapping in the Philippines.

LUZIS is an operational geo-IT system that archives, **monitors** and models data and information. It features data essential functions such as the **comprehensive land use plans** (CLUP) and **zoning ordinances** (ZOs), development projects, homeowners' associations as well as other programs and activities.

It **enables** us to monitor changes in the actual use of land resources, agricultural land reclassification and **implementation** of the CLUPs by local government units.

I am particularly interested in the ability of the LUZIS to provide us with **organized data** on the inventory of **idle lands** and **housing stocks** as well as beneficiaries. With this information, we can better **match** land resources and housing needs from the national to the local level.

We also see the need for the exchange system between our and other relevant data agencies **to make data migration easier**, while ensuring the security and integrity of our content. More importantly, LUZIS **provided an offline access mechanism** to cater to those who have limited and **intermittent** internet connection.

Ex. 1. What do abbreviations mean? Unite abbreviations with their meaning.

LUZIS	comprehensive land use plans
LGUs	zoning ordinances
CLUPs	local government units
Zos	an operational geo-IT system

Ex. 2. Answer the questions.

1. What is Land Use Zoning Information System used for?
2. What is the Philippines Training Center famous for?

3. How can Zoning Information System be used?

4. What kind of data does the LUZIS provide?

5. What can help make data migration easier?

Ex. 3. Fill in the prepositions.

1. The Philippines Training Center is known … its state-of-the-art research on surveying.

2. It enables us to monitor changes … the actual use of land resources.

3. I am particularly interested in the ability of the LUZIS to provide us … organized data.

4. We can better match land resources and housing needs … the national … the local level.

5. We also see the need … the exchange system.

Ex. 4. Complete the sentences.

1. Land Use Zoning Information System is … .

2. The Philippines Training Center for Applied Geodesy and Photogrammetry is known for ….

3. This operational geo-IT system archives, monitors and models …

4. It features the comprehensive land use plans, …

5. The system enables to monitor changes in ….

6. LUZIS can provide us with organized data on the inventory …

7. LUZIS provided an offline access mechanism for those who …

Ex. 5. Translate the word combinations into English.

1. The Land Use Zoning Information System is a mechanism to manage land use and zoning (на местах).

2. This system was developed with the participation of the University of the Philippines Training Center for Applied Geodesy and Photogrammetry, an institution known for its (современные исследования и консультационные услуги) on surveying and mapping in the Philippines.

3. The Land Use Zoning Information System archives, отслеживает) and models data and information.

4. The system also features (комплексные планы землепользования) and zoning ordinances.

5. The system provides with (систематизированными данными) on the inventory of idle lands and housing stocks.

Ex. 6. Match the English words with the Russian translation

A	B
state-of-the-art research and extension	отслеживать изменения
to feature data essential functions	предоставлять перечень неиспользуемых земель и жилищного фонда
as well as	обеспечивать безопасность и целостность содержания
to monitor changes	современные исследования и консультационные услуги
to provide with the inventory of idle lands and housing stocks	упростить перемещение данных
to ensuree the security and integrity of the content	показать основные функции данных
to make data migration easier	а также

Ex. 7. Translate into English.

1. Информационная система зонирования земель – это технологичный механизм управления землепользованием и зонированием территорий.
2. Эта система была разработана с помощью учебного центра прикладной геодезии и фотограмметрии Филиппинского университета.
3. Это операционная геоинформационная система, которая архивирует, отслеживает и моделирует данные и информацию.
4. Она позволяет нам отслеживать изменения в фактическом использовании земельных ресурсов, сельскохозяйственной переклассификации земель.
5. Эта система предоставляет нам систематизированные данные о свободных землях и жилищном фонде.
6. LUZIS предоставил механизм автономного доступа для тех, кто имеет ограниченное и прерывистое подключение к Интернету.

MODULE 5

Read the text and do the task after the text.

OLD MACDONALD HAD A DRONE: HOW LAND SURVEYORS AND AGRICULTURE DRONES CAN HELP FARMERS

Agricultural drone technology is booming. As drones become more advanced – with longer flight times and better sensors, to start – they also become more useful to the agricultural industry.

Drones can be used for a multitude of applications on a farm, from initial planning to continued maintenance. And even better, farms don't need to ***purchase*** (*покупать*) drone technology to use it. Farmers can use ***drone technology services*** (услуги беспилотных технологий) for many of these benefits, thereby creating a more ***cost-effective*** (экономичное) solution for time-consuming and expensive tasks.

Wondering how to use drones in agriculture?

Through surveying, farmers are able to plan their planting and irrigation ahead of time. Surveys can be used to simulate a development before ground is broken, which is especially important in farming, where ***profit margins can be tight*** (размер прибыли может быть ограничен). Farmers can even simulate light and weather effects, to determine whether their irrigation is going to be efficient, and to determine whether the crops are placed correctly.

During the very initial phases of development, surveys can also be used for **land elevation** (рельеф). By using surveys for land elevation, farmers can identify the most cost-effective ways to pre-level (выравнивание) their land.

Ex. 1. Find examples of drone uses in farming mentioned in the text.

Begin with

Drones can be used for

- - - - - - - - - - -

Remember! After prepositions we use gerund. For example: *The farm is famous for* ***using*** *modern technologies.*

Ex. 2. Read and answer the question choosing one option.

Agriculture drones are becoming a key driver of innovation: they help the new generation of farmers automate crop spraying and seeding, monitor and inspect crop growth and improve farming efficiency.

Drones have already altered the agricultural industry and will continue to grow in the coming years. While drone use is becoming more useful to small farmers, there is still a way to go before they become part of every farmer's equipment roster, particularly in developing nations. Regulations around drone use need to be made and revised in many countries and more research needs to be done on their effectiveness at certain tasks, such as pesticide application and spraying. There are many ways drones can be useful to farmers but it is important to understand their limitations and functions before investing in expensive equipment.

What advice is given to farmers before buying a drone? Choose one option.

a) Drone use is becoming more and more useful to small farmers.

b) There are no regulations about drones use.

c) It is necessary to know their limitations in use.

True or false:

Certain tasks such as pesticide application and spraying are very effective while using drones.

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