Московский государственный технический университет

имени Н.Э. Баумана

Методические указания

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МЕТОДИЧЕСКИЕ УКАЗАНИЯ

по обучению чтению
на английском языке научно-технической литературы
по специальности «Экология»

Москва

Издательство МГТУ имени Н.Э.Баумана

2002г.

UNIT 1

1. Words and word-combinations to memorize:

1. environment — окружающая среда
2. ecosystem — экосистема
3. to interact — взаимодействовать
4. moisture — влажность
5. chemicals — химические продукты
6. to recycle — рециркулировать, повторно использовать
7. to be concerned with — быть связанным с чем-то
8. species — вид, разновидность
9. consumer — потребитель
10. waste products — отходы производства
11. usable — годный к употреблению
12. variation — изменение
13. to determine — определять
14. to prevent — предотвращать, предупреждать
15. eventually — в конечном счете, в конце концов
16. to decompose — разлагать на составные части
17. in terms of — в терминах, в выражениях, с точки зрения
18. to intrude — вторгаться, вмешиваться
19. interspecific — межвидовой
20. typically — обычно, как правило.

2. Read and translate the international words paying attention to the part of speech.

Energy, organism, ecosphere, ecological, ecosystem, recycling, biosphere, organic, community, biomass, resources, result, bacteria, transform, activity, typically, intrusion, compensate, odjectively, component, effect, phenomenon.

3. Find the English equivalents to the following word-combinations:

взаимодействие между живой и неживой средой	particular range of tolerance
теплота низкого качества	compounds needed by organisms
для повторного использования	organic wastes
остальная энергия	oxygen-consuming organisms
органические отходы	low-quality heat
описан в выражениях	for reuse by producers
организмы, потребляющие кислород	major types of living components
вещества, необходимые организмам	the rest of the energy

межвидовое соревнование	the loss of usable energy
потеря пригодной энергии	eventually
неживая среда	to keep alive
в конечном счете	described in terms of
предотвратить рост	nonliving environment
основные типы элементов	interspecific competition
имеющаяся энергия высокого класса	to prevent growth
сохранить живыми	chemicals required
необходимые химические вещества	high-quality energy available
определенная область допустимых значений	interaction between living and nonliving environment

4. Give the definitions of the following terms

Ecology, environment, ecosystem, biosphere, biogeochemical cycles, communities, aquatic ecosystem, abiotic environment, net primary productivity.

5. Translate the following terms into Russian.

Chemical environment, solar energy, moisture, lithosphere, chemicals, high-quality energy, net primary productivity, low-quality heat, recycling of nutrients, ecology, organic wastes, energy consumer, one-way flow of energy, decomposers, biomass, oxygen, carbon, phosphorus, sulphur, water cycles.

6. Read and translate the Text 1A.

Text 1A. ECOLOGY

Ecology is the study of interactions between organisms and their living and nonliving environment.

This study is based on examining different ecosystems, communities of organisms interacting with one another and with their chemical environment (the elements and compounds needed by organisms to remain alive and reproduce) and physical environment (solar energy, wind, moisture, and other factors).

The living and dead organisms found near the earth's surface in parts of the atmosphere, hydrosphere, and lithosphere make up what is called the biosphere. The collection of living and dead organisms interacting with one another and their nonliving environment (energy, and chemicals) throughout the world is called the ecosphere.

Life on earth depends on the one-way flow of high-quality from the sun through the ecosphere and back into space as degraded, low-quality heat and on the recycling of nutrients — chemicals required by living organisms — through parts of the ecosphere. This recycling of nutrients from the nonliving environment to living organisms and back to the environment takes place in biogeochemical cycles.

Ecology is primarily concerned with interactions among organisms (any form of life), population (a group of organisms of the same kind living in a particular area or habitat), communities (populations of different species living and interacting in a particular place), ecosystems, and the ecosphere.

Major land ecosystems (deserts, grasslands, and forests) are called biomes, and major ecosystems found in the hydrosphere (oceans, rivers, lakes) are called aquatic ecosystems. The major types of living (biotic) components of ecosystems are (1) producers (mostly green plants that can make the organic nutrients they need through photosynthesis), (2) consumers (herbivores, carnivores, and omnivores) that feed on living organisms, and (3) detritivores that feed directly on dead organisms and organic wastes or that break down the remains of dead animals into simpler chemicals for reuse by producers (decomposers, mostly bacteria, and fungi). Oxygen-consuming organisms break down the nutrients they make or consume by cellular aerobic respiration.

Each individual organism of a species has a particular range of tolerance to variations in chemical and physical factors in its environment. The existence, abundance, and distribution of an organism is determined by whether one or more physical or chemical factors in its environment fall above or below the levels most individuals in the population of a species can tolerate (law of tolerance). Too much or too little of any abiotic factor can limit or prevent growth of a population of a species in an ecosystem even if all other factors are at or near the optimum range of tolerance for the species (limiting factor principle).

The one-way flow of energy from producers to consumers in a particular ecosystem can be described in terms of food chains and food webs. An average of only about 10 % of the high-quality chemical energy available at one trophic level is typically transferred and stored in usable form as chemical energy in the bodies of the organisms at the next level. The rest of this energy is used to keep the organisms alive, and most is eventually degraded and lost as low-quality heat to the environment.

The loss of usable high-quality energy at each step in a food chain can be diagrammed as a pyramid of energy flow. Pyramids of numbers and pyramids of biomass can also be used to describe what happens in ecosystems. The rate at which the plants in a particular ecosystem produce usable chemical energy or biomass is called net primary productivity.

The carbon, oxygen, nitrogen, phosphorus, sulphur and water cycles are the major ways that the key elements and compounds needed for life are recycled within the ecosphere in forms usable by plant and animal life. Human activities are increasingly intruding into these cycles.

An ecological niche describes the physical, chemical, and biological factors that a species needs to live, grow, and reproduce in an ecosystem. Interspecific competition, predation, parasitisms, mutualisms, and commensalism are the main ways that different species interact in ecosystems as part of their ecological niches. The key message of ecol-

ogy is that all forms of life on earth are either directly or indirectly dependent on one another and on their nonliving environment.

7. Answer the following questions.

1. What is ecology? 2. What is this study based on? 3. Where do we find living and dead organisms? 4. What is called ecosphere? 5. What does life on earth depend on? 6. What is ecology primary concerned with? 7. What major types of living components do you know? 8. What factor can limit or prevent the growth of a population of a species in an ecosystem? 9. What can be described in terms of food chain and food webs? 10. What is called net primary productivity? 11. Why is the rest of the energy used?

8. Translate sentences paying attention to Passive Voice.

1. Ecology is primary concerned with interactions among organisms, populations, communities, ecosystems and the ecosphere.

2. The existence, abundance and distribution of an organisms is dertermined by whether one or more physical or chemical factors in its environment fall above or below the levels.

3. On the one hand, finite oil, coil, and mineral resource supplies are significantly depleted — some wearing exhaustion; on the other hand, air, water, and land are contaminated, some beyond restoring.

4. An average of only about 10 % of the high-quality chemical energy available is typically transferred and stored in usable form.

5. The rest energy is used to keep the organisms alive and most is eventually degraded and lost as low-quality heat to the environment.

6. Furthermore, a problem that has not been solved is the deposition of fuel before risky landings and also is referred to as fuel dumping.

7. Resources are depleted when we consume them faster than they can be regenerated.

8. Therefore, the direction of new investment in both energy-using and energy-producing capabilities probably will be heavily influenced by current prices.

9. Mineral deposits are distributed unevenly on the continents, and for that reason many countries are forced to import oil, various metal ores and the like.

10. Radioactive elements formed during the explosion are taken in by the human body in different ways and have different effect.

11. Studies of climatic changes have shown that atmospheric greenhouse gases content is rising at unprecedented rates and that the global climate change has been followed by greenhouse gas concentration.

12. Adverse health affects associated with poor quality of indoor air are referred to as the Sick Building Syndrome.

9. Translate the following sentences paying attention to Participle I, II and Gerund.

1. The study is based on examining different ecosystems, communities of organisms interacting with one another and with their nonliving chemical environment and physical environment.

2. The recycling of nutrients from the nonliving environment to living organisms and back to the nonliving environment takes place in biogeochemical cycles.

3. Thinking one can escape the operation of these and other laws of nature is like thinking one can stop the earth from revolving or make rain fall up.

4. Nature disposed by placing an upper limit on the rate at which the earth's plants can produce organic nutrients.

5. It also disposed by using and degrading energy quality at and between all levels in biosphere and by imposing an upper limit on the total space that is available and can be occupied by humans and other species.

6. A central part of conservation, then is managing resources in such a way that the options for use of the same or other resources are maintained for future generations.

7. In measuring particulates, SO_2 and NO_2, the type of fuel burned is the key variable in the calculation.

8. Therefore, the formulas provided are given by type of fuel.

9. These extensive statements cover much of the needed information for decision makers.

10. Adequate capacity for generating electricity is necessary for people's health and the progress of society.

11. There are large uncertainties in predicting the impacts of increased atmospheric carbon dioxide and other trace gases on the climate system.

12. The experience gained from these reactors must be applied to enhanced-safety reactors.

13. Some major issues characterise the assessment of risk for disposing of radioactive wastes.

14. This has been achieved by two distinct actions: improving insulation of the walls, ceiling and floors, thereby reducing the heat loss and concerving energy.

10. Read and translate the Text 1B.

Text 1B. THE WORLD CONSERVATION STRATEGY

Human beings, in their quest for economic development and improvement of the quality of life, must come to terms with the reality of resource limitation and the carrying capacity of ecosystems, and must take account of the needs of future generations. This is the central message of modern conservation and of the World Conservation Strategy. Conservation is basic to human welfare and, indeed to human survival. But it has not always been recognized as such.

Conservation has been used with many different meanings. In the sense that we are using it here, it refers to the proper use of living resources. It can be defined more precisely as the management of the biosphere to yield the greatest sustainable benefit to present generations while maintaining its potential to meet the needs and aspirations of future generations. A central part of conservation, then is managing resources in such a way that the options for use of the same or other resources are maintained for future generations. If a species' ecosystem or ecological process is destroyed, our descendants are denied its use.

The words conservation and preservation are often used synonymously, in contrast to utilization. However, the term conservation includes both preservation and utilization. Within this definition, living resources refer to components of the biosphere that reproduce themselves — flora and fauna, including microorganisms. Living resources are renewable if they are conserved, and they can be destroyed if not conserved. This fact presents an interesting paradox. Resources are generally classified in two categories: renewable — in other words, living resources and nonrenewable — for instance, minerals. Most nonrenewable resources, such as chemicals and minerals, can be synthesized in the laboratory if they are lost in their natural state; but if renewable resources — species of living things — are exterminated, they can never be recreated. Renewable resources, then are in the absolute sense nonrenewable, and their management must take this fact into account.

Conservation is everybody's business. But like most international problems, conservation depends on, and has its roots in, national, local and ultimately individual actions. Consequently, the World Conservation Strategy should not be considered in abstract terms, but instead as something that must be applied locally and individually. The following discussion should be viewed as a context for setting an individual course of action to help implement the principles of the strategy, which are the principles of conservation.

Conservation has three basic objectives:

1. To maintain essential ecological process and life support systems.

2. To preserve genetic diversity.

3. To ensure that the utilization of living resources, and the ecosystems in which they are found is sustainable.

These objectives are interrelated, in the sense that each affects the others.

1. Essential ecological processes are the natural systems that are needed to maintain and sustain the living components of the biosphere in general and more particularly, to maintain food production, health, and other necessities for human survival. These processes include the global biogeochemical cycles — such as those of nitrogen, carbon, and oxygen — and more localized phenomena, such as cycling of other nutrients, soil formation, regulation of water flow, and provision of critical habitats. Because these ecological

processes are vital to preserve life, they have become widely known as life support systems.

2. Genetic diversity refers to the genetic material in the wide range of living organisms. When a species or other class of living things is exterminated, its genetic material, and its contribution to future genetic material, is lost forever. In the long run, however, perhaps the greatest value to humans of most wild species will prove to be their role in maintaining the health and stability of their ecosystems and their component ecological processes, in other words, their role in our life support system.

3. Sustainability of living resources is the final objective of conservation. It is virtually a truism to say that if the utilization of a plant or animal is not sustainable, that is , if it is overharvested, the point will be reached when the species is so depleted that its value to man will be severely reduced or lost.

The growing world population requires ever-increasing amounts of protein. Significant quantities of protein are now provided by both commercial and subsistence harvest of wild species, particularly marine mammals, fishes, etc., but also birds, terrestrial mammals, and insects. Such foods provide a major part of the animal protein intake of people in large areas of Africa, Asia, and Latin America, and even in parts of northern Europe and America.

It is clear from the foregoing discussion that the word conservation, as we use it, covers a very broad set of environmental considerations that are of basic human concern from two points of view. First, conservation seeks to maintain the capability of the earth to support life, including human life, by maintaining the health and proper functioning of the ecological life support system, ecological processes and the genetic diversity within them, all of which are essential for human welfare and survival.

Second, for many people conservation represents an ethical imperative. This is expressed in various ways such as 'We have no right to destroy any other life form'; 'We have not inherited the earth from our parents, we have borrowed it from our children'.

Conservation is of direct concern to all peoples and all nations, whether or not they recognize it at this time. Regardless of background, nationality, type of government or political concern, and even economic status, all are immediately involved with human survival and welfare. And, of course, ethical concerns about conservation can also cut across political and ideological boundaries. It follows that conservation is important to all levels of human activity -international, national, local, and individual.

11. Answer the following questions.

1. What must human beings take account of? 2. What does the word 'conservation' mean? 3. What resources are called renewable and nonrenewable? 4. Why is the conservation everybody business? 5. What should be considered in abstract terms? 6. How many

basic objectives does the conservation have. Name them. 7. Prove that these objectives are interrelated. 8. Why is world conservation so significant for human beings?

12. Translate the following words and word-combinations into Russian.

Carrying capacity, economic development, management of the biosphere, to maintain its potential, natural state, renewable resources, implementation of principles, essential ecological process, other necessities, localized phenomena, water flow regulation, critical habitats provision, genetic diversity, life-support system, ever-increasing amounts, significant quantities, the foregoing discussion.

13. Translate the last three paragraphs into Russian.

14. Translate the following sentences paying attention to AS and Comparative Constructions.

1. The more material wealth people create, the more they realize that they cannot but be concerned about how the biosphere is changing as a result of productive activity.

2. Biosphere's inner resources can no longer compensate for society's harmful influence on the environment.

3. To the user, therefore, the earth resources seem less and less like the gifts of nature and more and more like man's own product.

4. While there will be a sharp fall in the air temperature in the lower layers of the atmosphere, the polluted atmosphere as a whole will become more heated than now.

5. The overwhelming majority of new technologies in the U.S. rely upon electricity as their principal source of energy.

6. The electrical energy shortages are significant and could be as high as or higher than those associated with the less desirable forms of energy.

7. As expected the AMA report emphasizes the medical aspects of accidents.

8. These cases probably would occur in a large population around the power plant, among as many as 10 million persons.

9. The world conservation strategy should not be considered in abstract terms, but instead as something that must be applied locally and individually.

10. It has not always been recognized as such.

11. It can be defined more precisely as the management of the biosphere.

12. These dynamic and relentless processes are as characteristics of ecosystems as are thermonuclear fusion reactions in the sun.

13. They move from the land to the water and the air, just as they move from the air and the water to the land.

14. A scientific understanding of the essence of the relation between society and nature can serve as a general theoretical foundation for solving the ecological problems.

15. Most of Western ideologists regard the ecological problem as one of the insoluble global problems of our time.

16. Various and often contradictory estimates exist as to how long the different raw materials will last.

17. The role of coal as a source of energy will increase as the supplies of oil and gas are depleted.

18. This analysis will enable us to determine whether certain firms have been performing better than others in controlling air pollution emissions.

19. The amount of radioactive material released by a nuclear plant is small and less than that from the stacks of coal-fired power plants.

20. We believe that energy and food automatically increase as people multiply.

15. Translate the following sentences paying attention to verbs 'to include' and 'to involve'.

1. These processes include the global biogeochemical cycles — such as those of nitrogen, carbon, and oxygen-and more localized phenomena.

2. The term conservation includes both resources preservation and their utilization.

3. Regardless of background, nationality, type of government or political concern, and even economical status, all are immediately involved with human survival and welfare.

4. Within this definition, living resources refer to components of the biosphere that reproduce themselves flora and fauna, including microorganisms.

5. The sheer magnitude of the political and business decisions, capital investment and resources substitution or displacement involved in altering the global energy mix.

6. Between now and 2010 natural gas consumption in the US will grow at an average annual rate of 0.4 percent and this rate will probably involve diminishing consumption in some traditional uses.

7. Water vapour in airline exhaust is harmful at high altitudes although not at the lower level which are the ones mainly involved in weather processes.

8. The automobile exhaust gases being a complicated mixture of many components include both non-toxic and toxic substances.

9. Nitrogen, oxygen, hydrogen and water vapour refer to non-toxic substances; carbon dioxide may also be included in this group as it is not a threat to man.

10. Nuclear radiation involves the release of a considerable amount of energy.

11. Energy is involved in every motion, in every event.

12. The process involved aims at production of heavy water.

13. The reduction of radiation intensities to a safe level for the personnel involved is not particularly difficult.

14. When selecting the propellants to be used for any particular rocket there are obviously a great many considerations involved.

UNIT 2

1. Read and translate the following words paying attention to the part of speech.

Danger, assumption, weapons, destruction, relentlessly, nonetheless, adequate, environmental, indifference, conserve, human, disposal, hazardous, global, provide, resource, disaster, intergenerational, enforceable.

2. Read and memorize the meanings of the 'False Friends' given below:

history — изменение, зависимость; activity — деятельность; adequate — соответствующий, надлежащий; effect — влияние, воздействие; dramatic — значительный, существенный, сильный; complex — сложный, трудный; ideal — подходящий, удобный; characterize — определять, описывать, представлять; generate — порождать, получать, создавать, обеспечивать; realize — понимать, осознавать, использовать, достигать.

3. Check the meanings of the following words using a dictionary.

Environment, indifference, disposal, impact, pollution, managing, descendants, depletion, response, framework, intertemporal, degradation, access, regeneration, survival, exterminate, habitat, a truism, pollinate, breeding, subsistence.

4. Form the English verbs from the nouns and translate them:

Generation, protection, destruction, consideration, depletion, radiation, transformation, production, interaction, obligation, assumption, intention, realization, accumulation, equipment, preservation, implementation, management, maintenance, intrusion, interference, response, embodiment, convergence.

5. Words and word-combinations to memorize.

legacy — наследство, наследие
to wreast — давать выход, волю
violently — яростно, отчаяно, сильно
relentlessly — безжалостно, неумолимо
a response — реакция, реагирование, отклик
nonetheless — тем не менее, все же
a fragile — хрупкий, слабый, непрочный
irreversibly — необратимо
on a scale -в масштабе
depletion — истощение, обеднение
extinction — затухание, отмирание, исчезновение
disposal — захоронение (отходов), удаление, сброс
vulnerable — уязвимый, ранимый, беззащитный (зд. Незащищенный)
to affect — воздействовать, оказывать влияние на что-либо,
to forestall (a disaster) — предупреждать несчастье
to impose upon — возложить обязанность на кого-либо
to conserve — сохранить

environment — окружающая среда
equity ['ekwiti] — право справедливости
equitable — справедливый
enforceable — осуществимый
to embody — воплощать в жизнь, претворять в действительность
to manage resources — рационально использовать ресурсы
to bring about — вызывать, быть причиной
to consume — потреблять
to exhaust resources — истощать ресурсы
to reap benefits — извлечь пользу
staggering -неустойчивый, колеблющийся
to cleanse [klenz] — очищать
to facilitate — облегчать, способствовать
to maintain — поддерживать, сохранять
to interfere with — мешать, препятствовать

6. Read and translate the Text 2A.

Text 2A. IN FAIRNESS TO FUTURE GENERATIONS

Every generation receives a natural and cultural legacy in trust from its ancestors and holds it in trust for its descendants.

There are two great dangers of this age: one, that humanity will wreak mass destruction with weapons and two, that we destroy our civilization nonviolently — but nonetheless relentlessly — through our indifference and our lack of adequate response to the global environmental crisis that is so clear advancing upon us. The human species faces a grave obligation: to conserve this fragile planet Earth and its human cultural legacy for future generations. Recently, we, the living generation, have begun to question the centuries-old assumption that conditions will be better for the next generation than they have been for us. We now recognize that, for the first time in human history, humans have the power to alter planet Earth irreversibly, on a global scale, and in many different ways. The depletion of the ozone layer, the increasing rate of species extinction, the disposal of hazardous wastes in vulnerable areas, and the loss of arable soils are just a few of the many global environmental changes that will affect the well-being of future generations.

To be sure, new technologies may forestall some of the environmental disasters that now threaten the planet, but it is by no means certain that technology will provide a sufficient response to all of these threats. For the first time then, humans must be concerned with the condition of the planet that is passed to future generations.

Every generation receives a natural and cultural legacy in trust from its ancestors and hold it in trust for its descendants. This trust imposes upon each generation the obligation to conserve the environment and natural and cultural resources for future generations. The trust also gives each generation the right to use and benefit from the natural and cultural legacy of its ancestors. These rights and obligations, which may be called

planetary rights and obligations, form the corpus of a proposed new doctrine of intergenerational equity in international law. To be enforceable, planetary rights and obligations must become part of international, national, and local law and be embodied in new policies and institutions.

Traditionary, international law has focused on spatial relationships among the present generation, such as relationships between countries in the oceans, in outer space, or in managing land resources. The limited intertemporal doctrine that does exist relates the present to the past. Now, the global environmental crisis requires that we develop the intertemporal dimensions of international law to relate the present to the future. To do so, we must anticipate the legal norms that are needed to bring about justice between our generation and future generations.

Many of our actions may impose serious environmental burdens on future generations. These burdens can be divided into three groups: depletion of resources, degradation of environmental quality, and discriminatory access to the environmental resources and benefits enjoyed by previous generations.

Resources are depleted when we consume them faster than they can be regenerated. Consuming the higher-quality resources raises the real prices of those resources for future generations as, for example, when we consume high-grade fuels and leave the residues. Resources also are depleted when we consume things that have not even been identified as useful, such as the unknown species in tropical forests and certain varieties of fish. Sometimes resources are consumed before their best use is discovered. By exhausting resources, each generation narrows the range of resources available to its descendants. For example, the extinction of a species or cultivar narrows the range of genotypes available for developing new food crops and medicines.

Although it may be possible to develop substitutes for the lost resources, the price of doing so may be considerably higher than the cost of conservation, particularly for those communities that once had plentiful amounts of the resource. If future generations had the chance, they might be willing to pay us handsomely to retain some of these resources. Unfortunately, they are not represented in the decision- making processes of industries, consumers, or government bodies.

The way we dispose of waste affects the quality of the environment that we will pass on to our children and their children. If we reap short-term benefits from the cheap disposal of wastes in the air, land, freshwater, ocean, or even outer space, we may pass staggering costs on to future generations, which must either try to cleanse the disposal sites or abandon them altogether.

Humans also degrade environmental quality for future generations by destroying the service that forests, soils, and watersheds provide. Forests, for example, can prevent soil erosion, facilitate the recharge of the water table, harbor wildlife, maintain soil productivity, and buffer climate — all essential environmental services.

As a beneficiary of the planetary trust, every generation has an equitable right to use the planet's resources and enjoy the natural environment. But poor communities today are not realizing their rights to share in the resources. Many children grow up without adequate water and food supplies, for example. In many places, the disposal of wastes in public steams, lakes, and marine areas prevents others from making use of these resources. From the intergenerational perspective, if we deplete resources and degrade the quality of the environment, we interfere with the rights of future generations to share in the benefits of the planet.

7. Find the English equivalents to the following word-combinations.

Сохранить хрупкую планету	Intergenerational equity
Вырождение окружающей среды	Disposal of hazardous wastes
Налагать бремя по сохранению окружающей среды на будущее поколение	To affect the well-being of future generations
В глобальном масштабе	To conserve the fragile planet
Право всех поколений	Degradation of environment
Воздействовать на здоровье будущих поколений	To impose environmental burdens on future generations
Захоронение опасных радиоактивных отходов	To conserve high-grade fuel
Гибель окружающей среды	On a global scale
Сохранение высокосортного топлива	Managing land resources
Обеднение озонового слоя	Environmental disaster
Управление земельными ресурсами	Depletion of ozone layer

8. Translate sentences paying attention to the following verbs: to refer to, to call for, to impose on, to affect, to care for, to bring about, to have an effect on, to impact.

1. Genetic diversity refers to the Genetic material in the wide range of living organisms.

2. The impact of energy efficiency on indoor air pollution is receiving increased attention.

3. Conservation refers to the proper use of living resources.

4. This trust imposes upon each generation the obligation to conserve the environment.

5. The depletion of the ozone layer, the disposal of the hazardous wastes are just a few of the many global environmental changes that will affect the well-being of future generations.

6. We must anticipate the legal norms that are needed to bring about justice between our generation and future generations.

7. The confirmation of the operation of nuclear power plants would have a relatively insignificant effect on waste management.

8. The quantity of waste generated per unit of electricity being comparatively small, the enlargement of the waste disposal facility would insignificantly impact the design and operation of the disposal facility.

9. The reactors are sometimes referred to as inherently-safe reactors or enhanced-safe reactors.

10. The theory of intergenerational equity calls for equality among generations and among members of a generation.

11. Thus, just as between different generations, communities within the present generation have an obligation to each other to ensure that the planet is well cared for and that they have equitable opportunity to use its resources.

9. Translate sentences paying attention to Modal Verbs and their equivalents.

1. For the first time, humans must be concerned with the condition of the planet that is past to future generations.

2. While one generation or the country may be able to maximize the welfare of a few immediate successors, it is unlikely to do so at the expense of more remote descendants, who will inherit a despoiled natural and cultural environment.

3. But people living in extreme poverty cannot be expected to conserve resources for future generations when they cannot even care for the living.

4. Consequently, the World Conservation Strategy should not be considered as something that must be applied locally and individually.

5. A properly designed facility easily could satisfy the dose limits of 0.10 to 0.25 mSv per a person a year.

6. While global environmental change cannot be stopped, the pace... can be slowed... we may be able to reduce environmental damage and risk markedly by prudent policy actions.

7. The finite availability of natural gas, a premium energy source and valuable chemical feedstock, also need to be considered.

8. The general price of energy in the US could be artificially increased by limiting or taxing petroleum imports or all energy sources.

9. These systems are also more subject to the whims of climate and often have to be expensively irrigated.

10. The nuclear power plants currently operating in Sweden are to be shutdown.

10. Translate sentences paying attention to Infinitive. Define its functions in the sentence.

1. In order to assume the safety of a plane designed in this way, a safety factor is introduced to account for potential uncertainties.

2. To be sure, new technologies may forestall some of the environmental disasters that now threaten the planet.

3. We now recognize that, for the first time in human history, humans have the power to alter planet Earth irreversibly on a global scale.

4. The efforts in the US to clean up just a fraction of the hazardous waste sites show how costly cleaning up can be.

5. The purpose of the partnership is to protect the welfare of every generation.

6. Although it may be possible to develop substitutes for the lost resources.

7. To protect the integrity of the natural environment, all communities must cooperate.

8. To explain this simple fact is not so very easy.

9. The problem to consider next is conserned with the conservation of the environment and natural and cultural resources for future generations.

10. However, if these acts have failed to reduce pollution emissions significantly, then alternative solutions need to be considered.

11. To be enforceable, planetary rights and obligations must become part of international, national and local law.

12. In order to improve energy efficiency in older operating plants incentives must be provided for industry to achieve a high degree of energy efficiency.

11. Read the Text 2B and entitle it.

Text 2B

The theory of intergenerational equity says that humans as a species hold the natural and cultural environment of Earth in common both with other members of the present generation and with other generations, past and future. Each generation is both a trustee or custodian of the planet for future generations and a beneficiary of previous generation's stewardship. This circumstance imposes certain obligations upon us to care for our legacy as it gives us certain rights to use the legacy.

Understanding intergenerational equity entails viewing the human community as a partnership among all generations. It was observed that as the ends of such a partnership cannot be obtained in many generations. it becomes a partnership not only between those who are living but between those who are living, those who are dead, and those who are yet to be born . The purpose of the partnership is to protect the welfare of every generation. To do so, each generation must recognize that it is part of the natural system with special responsibilities as well as rights.

No generation knows in advance when along the spectrum of time it will become the living generation. But every generation wants to inherit the common partrimony of the planet in as good conditions as it has been for previous generations and to have as much access to it as did previous generations. The theory of intergenerational equity thus calls for equality among generations and among members of a generation, with the understanding that all are entitled to a certain level of quality and access.

The theory of intergenerational equity has an important intergenerational dimension. All members of the present generation have an equal right to use and benefit from the planet. They also have obligations to care for it. Thus, just as between different generations, communities within the present generation have an obligation to each other to ensure that the planet is well cared for and that they have equitable opportunity to use its resources.

Even if a country is only concerned about its own future citizens, it must consider the well-being of all future generations to ensure the environmental integrity desired for its own direct descendants. The theory of intergenerational equity postulates that all countries have an intergenerational obligation to future generations as a whole, regardless of nationality, because the condition of the planet will have a profound impact on the welfare of all our descendants. While one generation or country may be able to maximize the welfare of a few immediate successors, it is unlikely to do so except at the expense of more remote descendants, who will inherit a despoiled natural and cultural environment. Humans are becoming increasingly interdependent in using the environment and its resources; technological advances ensure that this interdependence will grow. Thus, as this generation extends its concerns into longer time horizons and broader geographic scales, concern even for one's own country should lead one to protect the cultural and environmental quality of the whole planet.

To protect the integrity of the natural environment, all communities must cooperate. But people living in extreme poverty cannot be expected to conserve resources for future generations when they cannot even care for the living. Nevertheless, their participation is essential because poverty is a primary cause of ecological degradation. To satisfy integenerational fairness, wealthier countries and communities (whose own future generations will benefit from protecting the environment) must help poor communities protect these resources, gain acess to the economic benefits of them, and prevent or mitigate the degradation of environmental quality.

What are the principles of intergenerational equity that must guide human actions? These principles should meet four criteria: They should encourage equality among generations, neither authorizing the present generation to exploit resources to the exclusion of future generations nor imposing unreasonable burdens on the present generation to meet indeterminate future needs; they should not require one generation to predict the prefer-

ences of future generations but, instead, should give future generations flexibility to achieve their goals according to their own values; they should be reasonably clear when applied; and they must be generally shared by different cultural traditions. Here are three principles that might serve:

- Each generation should conserve the diversity of the natural and cultural resource base so that it does not unduly restrict the options available to future generations in solving their problems and satisfying their own values, and each generation is entitled to a diversity comparable to those of previous generations.

This principle could be called the conservation of options.

- Each generation should maintain the quality of the planet so that it is passed on in no worse condition than that generation received it, and each generation is entitled to an environmental quality comparable to that enjoyed by previous generations. This principle could be called the conservation of equality.

- Each generation should provide its members with equitable rights of access to the planetary legacy of past generations and should conserve this access for future generations. This principle could be called the conservation of access.

12. Answer the following questions.

1. What is the theory of intergenerational equity? 2. What obligations has the present generation? 3. Name the main principals of intergenerational equity that must guid human actions? 4. Why must all countries and communities cooperate?

13. Divide the text into parts and entitle each of them.

14. Retell the text.

15. Translate the 5-th and 6-th paragraphs of the text into Russian.

UNIT 3

1. Check the meanings of the following words using a dictionary.

Advent, protection, relationship, investment, conservation, improvement, management, contribution, decisionmaking, interaction, nuclear fusion energy, groundwork, option, contamination, long-term.

2. Give the Russian equivalents to the following pairs of words paying attention to the negative prefixes and suffixes.

Numerable — innumerable, perfect — imperfect, significant — insignificant, carefull — careless, finite — infinite, harmfull — harmless, appearance — disappearance,

controlled — uncontrolled, balance — unbalance, commercial — noncommercial, accounted — unaccounted, practical — impractical, evitable — inevitable.

3. Translate the following word-combinations into English.

Управление окружающей средой, пропорциональный вклад, энерговыработка, глобальные изменения климата, атомная энергия, оставаться на переднем плане, потребление ископаемого топлива, удовлетворять требованиям, принятие решения, АЭС, экосистема, иметь огромное значение, снабжение энергией, в ближайшем будущем, энергетический источник, термоядерная энергия, неизбежный результат, защита окружающей среды, капиталозатраты, загрязнение воздуха.

4. Words and word-combinations to memorize:

environment — окружающая среда
provision — снабжение, обеспечение
proposal — предложение, план
to anticipate — предвидеть, ожидать, предчувствовать
to wane — слабеть, убывать, уменьшаться
management — управление
by-products — побочные продукты
fossil fuel — ископаемое топливо
energy consumption — расход (потребление) энергии
contribution to — вклад в
to make a decision — принимать решение
interactive — взаимодействующий, согласованный
profound — глубокий, трудный, сложный
financial burdens — финансовые расходы
investment — капиталовложение
long-term — долгосрочный, длительный
air contamination — загрязнение воздуха
related — связанный , родственный
in the near term — в ближайшем будущем
reliance — доверие, уверенность
groundwork — основа

5. Read and translate the Text 3A.

TEXT 3A. FUELING OUR GLOBAL FUTURE

Conflicts between energy provision and the environment have been a prominent force in the evolution of U.S. environmental policy. In recent years, environmental conflicts over specific energy-related proposals have been relatively infrequent, in part because of the overinvestment in energy production and the less-than-anticipated growth in energy consumption that occurred in the wake of the energy crisis of the early 1970s. Thus, since the early 1980s , the capacity to supply almost every energy source — oil, gas, electricity, and coal — has exceeded current needs. Subsequently, during the late 1980s, investment in new energy infrastructure has been minimal in the United States and

in much of the industrialized Western World, and clashes over energy projects have waned. More general energy-related issues have, however, remained in the forefront of environmental concerns. Acid rains and the nuclear energy debate are only two examples.

The transcendent environmental issue for future is likely to be the management of global climate change. Although the relationships between human activity and climate change are complex and as yet imperfectly described, the by-products of fossil fuel consumption certainly are a significant factor in modifying the atmosphere. Moreover, in considerations of environmental management, fossil fuel consumption assumes a significance that exceeds its proportional contribution to the problem both because consumption is expected to increase rapidly to meet the demands of a growing global population and because a portion of it occurs at concentrated sources, primarily power plants, which offer some possibility of public decisionmaking and control.

Given this future, the United States, both as a freestanding society and as a participant in an increasingly interactive global economic and political system, faces two related energy crises that seem certain to have profound environmental significance. First, in the immediate future, a surge in inverstment in new energy supply capability will be urgently required. The inverstment choices made from among alternative energy sources will shape the energy consumtion mix for several decades. By the mid-21st century, such conventional resources as hydroelectric power, petroleum, and even natural gas probably will be developed to capacity. Second, unless some new major energy source is introduced, dominant global reliance on coal and nuclear fission energy appears to be the inevitable result. Yet, if any major new energy option is to be introduced by the year 2050, the scientific and technological groundwork must begin now.

In the near term, clean air technology and other investments in environmental protection will add to the financial burdens of the energy industries as they strive to meet the need for investment capital. Most of the environmentally preferred choices for new energy production, moreover, are more costly than the cheapest options, such as high-sulfur fuel oil. Over the longer term, climate change and widespread contamination of air, water, and land will become more urgent environmental concerns. New energy technologies to fulfill the needs of a growing global population in the next century will play a key role in worldwide environmental management.

6. Answer the following questions:

1. What is the prominent force in the evolution of U.S. environment policy? 2. Why have the environmental conflicts been infrequent in recent years? 3. What types of energy sources are used? 4. Why does the fossil fuel consumption assume the significance? 5. Describe two energy crises that the U.S. will face in future. 6. Prove that new technologies will play a key role in worldwide environmental management.

7. Find the English equivalents to the following word-combinations.

Зависимость между деятельностью человека и окружающей средой	Reliance of coal and nuclear fusion energy
Оставаться на переднем плане	Fossil-fuel consumption
Текущие нужды	Air and water contamination
Нефтяное топливо с высоким содержанием серы	Relationship between the human activity and climate change
Потребление ископаемого топлива	To remain in the forefront
Надежда на уголь и термоядерную энергию	To meet the demands of a growing population
Глобальное изменение климата	Current needs
Загрязнение воздуха и воды	Specific proposals
Удовлетворять требованиям растущего населения	High-sulfur fuel oil
Определенные предложения	Faces two related energy crises
Сталкиваться с двумя связанными между собой энергетическими кризисами	Global climate change

8. Write the abstract to the text (3-4 sentences).

9. Write the essay of the text in Russian.

10. Translate sentences paying attention to BOTH, BOTH...AND.

1. The theory of intergenerational equity says that humans hold the natural and cultural environment of Earth in common both with other members of the present generation and with other generations, past and future.

2. Both reports describe the history of nuclear power, including various reactor types, assess nuclear power accidents and the risk of nuclear power.

3. However, the term conservation is used here, it includes both preservation and utilization.

4. Absolute limits to growth are imposed both by thermodynamics and space.

5. Significant quantities of protein are now provided by both commercial and subsistent harvest of wild species.

6. Moreover, the decrease in the ozone and the increase in carbone dioxide both leads to a cooling of the stratosphere and enhance the 'greenhouse' effect.

7. Air traffic emits a total of 3 million metric tons of nitrogen oxides annually, about 1 million metric tons of it being in the particularly sensitive layers of the atmosphere. From there they migrate gradually to both higher and lower levels.

8. Petroleum demand continues to grow to meet the serious deficiency in transportation services in both centrally planned and developing countries.

9. Therefore, the direction of new investment in both energy-using and energy-producing capabilities probably will be heavily influenced by current prices.

11. Translate sentences paying attention to BECAUSE and BECAUSE OF.

1. All countries have an intergenerational obligation to future generations because the condition of the planet will have a profound impact on the welfare of all our descendants.

2. Because of the significance of the energy conservation, it may be of interest to assess how government policies agree with the views of scientific community.

3. However, because the interests of the present generation sometimes conflicts with those of future generations, it is important to designate a representatives of future generations.

4. Because these ecological processes are vital to preserve life, they have become widely known as life support systems.

5. Fresh water resources around the world are gradually getting depleted because of the large scale withdrawals of water for agricultural operations and industry as well as human use.

6. The large input of heat at and near the equator warms large masses of air, which rise because warm air has a lower density than cold air.

7. Because these reactors have operated for a number of years, Sweden must develop waste facilities to assure safe disposal of nuclear wastes.

8. It predicts that the demand for oil will not decrease because improvements in efficiency will likely be offset by increases in demand.

9. The energy which an object has because of its motion is called kinetic energy.

10. The problem of power generation from fusion reactors is very difficult because of the difficulty of containing plasma.

11. Because of the earth's rotation, the centrifugal force developed increases the depth of the troposphere at the equator to between 9 to 11 miles.

12. Because of the very low density, it is difficult to measure directly the temperature of the upper atmosphere.

13. Petroleum may also be chosen as an expedient means of increasing electricity generation because of the universal availability of oil and the relatively low initial cost of petroleum-fired generating plants.

12. Translate sentences paying attention to COMPLEX SUBJECT.

1. The transcendent environmental issue for the future is likely to be the management of global climate change.

2. The fossil fuel consumption is expected to increase rapidly to meet the demands of a growing population.

3. The US faces two related energy crises that seem certain to have profound environmental significance.

4. Unless some new major energy source is introduced, dominant global reliance on coal and nuclear fission energy appears to be the inevitable result.

5. The share of energy consumption appears to be growing.

6. Future service demands were then allocated among the energy sources likely to be chosen.

7. A moderately more rapid escallation in the price of petroleum is assumed to be relative to both general inflation and other fuels.

8. The unique uses of petroleum for transportation fuel and feedstock are likely to support higher petroleum prices.

9. Petroleum demand is expected to continue to grow to meet the serious deficiency in transportation services in both centrally planned and developing countries as well as continually growing industrial energy requirements everywhere.

10. The availability of most energy resources appears adequate for the next 20 years.

11. Total U.S. primary energy consumption is projected to increase by about one percent annually.

12. About half of the increase is expected to occur in transportation despite increases in vehicles efficiencies.

13. Coal consumption is projected to increase at a rate 60 percent greater than that of overall energy demand.

14. The existing nuclear power plants are assumed to continue to operate at their designed output and for their expected lifetimes, oil imports are projected to ncrease to almost 13 million barrels per day by 2010.

15. The energy intensity of the economy, therefore, is projected to decline, implying that the efficiency of energy use will continue to improve despite low energy prices.

16. The current competitive and short-horizon attitudes of business and government decision makers seem to value capital conservation above long-term considerations such as energy conservation.

13. Read and translate the Text 3B.

Text 3B. GLOBAL PRIMARY ENERGY CONSUMPTION

In 1986, global consumption of primary energy totaled about 300 quadrillion British thermal units (quards) (One quard equals 10×15 British thermal units or about 1.055×18 joules). Of this amount, one-third (100 quards) is consumed in the generation of electricity, and that share appears to be growing. In addition to the consumption of en-

ergy in the form of coal, oil, gas, and other commercially traded energy resources, a large portion of energy resources are traditional, or noncommercial, energy forms, such as wood and fodder, which usually are omitted from reported energy balance. Even in industrialized countries such as the United States, the contributions of active and passive solar energy, domestic wood burning, and waste products used as fuel are not fully reflected in the reported statistics. In developing countries, the heavy reliance on animal transportation, gathered fuels for domestic cooking and heating, and a variety of biomass fuels goes unaccounted. It is reasonable to estimate that developing countries rely on one-third more noncommercial energy as the amounts reflected in energy consumption statistics.

The significance of this noncommercial energy consumption is profound. The energy services provided are real and offen fulfill the most essential energy needs. When traditional energy sources are exhausted or become impractical — as populations migrate to cities, for example — these energy requirements often are converted to increased demand for commercial fuels. For countries with large populations such as China and India, which rely heavily on traditional energy sources, this trend will be an important factor in future growth in apperant energy demand.

The industrialized countries of the Organization for Economic Cooperation and Development (including Western Europe, the United States, Japan, New Zealand, and Australia) and those with centrally planned economies historically have dominated global energy use. The global energy future appears very different, however.

Future energy requirements are estimated by examining trends in demand for energy services, such as heat, light, mechanical drive, and communications. These needs are closely correlated with basic economic and demogfraphic trends. Future service demands were then allocated among the energy sources likely to be chosen, with consideration given to the options available for particular service and the cost and constraints associated with the choices among those options. These projections assume that, during the next two decades, energy prices will escalate at the pace of general inflation and that the current relationships among the prices of alternative energy sources will remain rouphly constant. A moderately more rapid escalation in the price of petroleum is assumed relative to both general inflation and other fuels because the unique uses of petroleum for transportation fuel and feedstock are likely to support higher petroleum prices once the current oversupply has been absorbed.