МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ

ХАРКІВСЬКА НАЦІОНАЛЬНА АКАДЕМІЯ МІСЬКОГО ГОСПОДАРСТВА

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ТЕКСТИ І ТЕСТОВІ ЗАВДАННЯ

з дисципліни “Іноземна мова професійного спрямування”

(англійська мова)

для організації самостійної роботи студентів 1-2 курсів

денної форми навчання спеціальності

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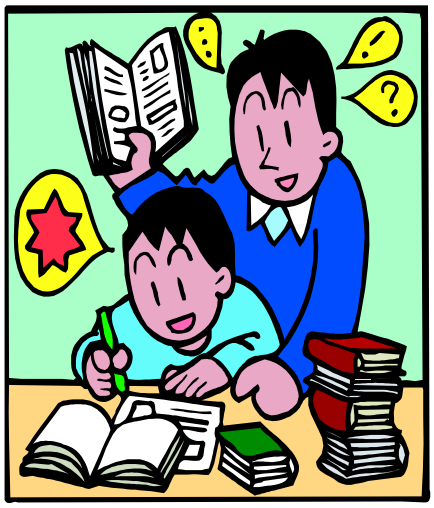

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INTRODUCTION

These **tests for self-study** have been specially designed to provide essential practice for students specializing in **Heat and Gas Supply & Ventilation.**

The course consists of **8** tests for self-study. Each test contains the following:

* The test in Modern English Grammar and the vocabulary.
* The text followed by a number of questions.

The specific benefits of this method of presentation are as follows:

1. It provides the reader with a quick, efficient, and effective means of grasping the essential subject matter.

2. It keeps the reader *active* in the learning process and increases comprehension level.

These tests can be used for self-study, to check language and to offer a diagnostic for the students' language development.

When teachers use texts for reading, they are often too concerned with what was written at the expense of *how*. Reading in any language is an affective as well as a cognitive process. The teacher's role is not that of corrector or judge, but rather that of enabler. The teacher assists with language, error, but should not replace the student's perceptions with his or her own.

The teacher who brings these tests into the study is not depriving the students of language practice, but is, instead, providing a richer context for such practice.

To facilitate the student's self-study, a comprehensive list of references has been appended.

All the students can be directed to **the Wordlist.**

TEST 1

Part A

STRUCTURE AND WRITTEN EXPRESSION

Directions: In this part each problem consists of an incomplete sentence. Below the sentence are four choices marked (A), (B), (C), and (D). You should find the one choice which best completes the sentence.

1. This is the first time in modern political history for environmental issues to be front and centre at ….. summit meeting.

(A) a

(B) an

(C) the

(D) –

2. Needles to say, conflicts remain ….. developed nations and developing nations, especially newly industrializing economies.

(A) between

(B) among

(C) in the middle of

(D) amidst

3. And a ….. look shows conflicts hidden among the nations involved, even when they are set to form a united front to combat environmental issues.

(A) close

(B) closer

(C) closest

(D) –

4. However, we should remember that the nations are forming a united front for the common benefit of humanity, going ….. the national interest.

(A) with

(B) beyond

(C) for

(D) up

5. It would therefore be contrary to this fundamental principle if nations ….. fight each other over the issue or if conflicts arose between developing nations and the newly industrializing economies or developing countries.

(A) are to

(B) were to

(C) have to

(D) had to

6. There are many ….. to the environmental issues.

(A) parts

(B) perspectives

(C) facets

(D) vistas

7. The ….. are diverse, starting with halting rises in carbon dioxide emission, which refers to the so-called global warming issue most often discussed, and also including issues of nitrogen oxide, issues of waste and the problem of desertification.

(A) subjects

(B) events

(C) questions

(D) issues

8. We need to maintain an open ….. on all these issues.

(A) thought

(B) idea

(C) mind

(D) intellect

9. ….., we should not fight with each other, for example, over something like the setting

of deadlines for reducing carbon dioxide emission.

(A) As such

(B) In such cases

(C) As yet

(D) And yet

10. Globalization refers to the massive economic and social phenomena that ….. the entire world, crossing all borders.

(A) encompass

(B) enclose

(C) envelop

(D) involve

Part B **TEXT 1**

CAN THERE BE SCIENCE-BASED PRECAUTION?

Read and translate the text using a dictionary

Keywords: precaution, science-based, risk management, standard of proof, adaptive management, risks of the status quo, economic and social costs, trade-offs, environmental decision making, innovation, nanotechnology, genetically modified foodstuffs

Scientific uncertainty lies at the heart of many of today's most important environmental controversies: climate change, endocrine disruptors, and genetically modified organisms, to name just a few. In different ways, each of these controversies raises similar questions: What level of scientific proof is needed to justify measures to avoid or mitigate environmental threats of uncertain size and probability? How can policy makers distinguish between disagreements over the science underlying the

danger, the uncertainty associated with the science, and the political, economic and social costs justified to avoid or mitigate this danger? What is the proper balance between the risks of intervention and the risks of the status quo?

For many people, precaution is the proper basis for risk management, and an essential bulwark against environmental damage due to human activity. Critics disagree. Risk management, they say, must be based on science. To these critics, the idea of precaution has become an ambiguous and heavily politicized obstacle to innovation and the very antithesis of what they regard as sound science.

Is there a middle ground? Is 'science-based precaution' possible? This is not a mere academic question. It was a central issue in the multi-hundred-billion dollar dispute before the Dispute Settlement Body of the World Trade Organization over the European Union's *de facto* prohibition of the importation of genetically modified foodstuffs – a prohibition that embodies the idea of precaution but was ruled a violation of the rules of the World Trade Organization. The ruling in this case is likely to have ramifications for nanotechnology and other advanced technologies as well.

As practical guides to action, both precaution and 'sound science' have many deficiencies. The Precautionary Principle exists in multiple versions, does not specify the level of intervention required in any given situation, and does not address the critical issue of trade-offs between risks. On the other hand, 'sound science' has been interpreted to mean that measures to protect the environment are not justified until the underlying science reaches near certainty, an unrealistic and impractical standard of proof that is sometimes used as an excuse to delay regulations that are badly needed to protect public health or the environment.

Precaution expresses only one side of the risk versus benefit argument. After all, most policy decisions involve a choice between risky alternatives; life rarely provides a simple choice between a risky proposal and a risk-free status quo. Precaution proclaims, 'look before you leap', an attitude only to be applauded. But desirable innovations can be blocked by an excess of precaution. There is a need for a principle that expresses the

complementary aphorism, ‘nothing ventured, nothing gained’.

In many situations, the costs and benefits of alternative modes of action are more closely balanced, calling for adaptive management, a well-known approach that treats the application of natural resource policies as experiments from which to learn. More formally, adaptive management is defined as a ‘systematic process for continually improving management policies and practices by learning from the outcomes of operational programmes’.

We therefore propose a new statement to make the desirability of adaptive management explicit, and to complement and balance the Precaution Principle and to guard it against over-reach. We would urge government and business to get behind a new principle of Innovation and Adaptive Management, to the effect that ‘Precautionary action should not unreasonably interfere with an innovation that promises major benefits until the dangers and benefits of this innovation are well understood’. Like precaution, this is a statement of only one side of the argument. Its purpose is to provide both precaution and innovation with a clear statement to fall back on, restoring consideration of the benefits of innovation in addition to its costs and risks, and thus creating a balanced framework within which reasoned discussion can take place.

The idea of precaution can be expanded in such a way as to help the decision maker to structure a policy discussion, and to provide at least a rough measure of uncertainty and of attitude toward risk. Reduced to its essentials, precaution is an attitude toward risk: an inclination to accept financial, political or social costs today (including the loss of possible benefits), in order to avoid or mitigate future dangers in situations in which the scientific evidence for these dangers is uncertain. The ‘strong’ version of precaution – as expressed, for example, in the Wingspread Principle – constitutes a willingness to accept substantial costs, even at a very low level of such proof.

Insistence on ‘good science’ is also a statement of an attitude toward risk – in this case, a willingness to trust that the danger in question will not turn out to be real, or that methods will be developed to deal with it in the future, so as to put off costs until the

reality of the danger is proven to a very high standard. As the size of the putative danger increases, everyone's willingness to accept costs will increase, until at the extreme (say an asteroid striking the Earth) even the technological optimist would be willing to accept substantial costs at a high level of uncertainty. Conversely, people are likely to be willing to accept additional risks if the possible benefits are very large.

In any particular situation, proponents and opponents of precautionary measures may actually agree on the danger, but disagree on its associated uncertainty. Alternatively, they may agree on both the danger and the uncertainty, but hold differing attitudes toward risk and hence disagree on what should be done to avoid or mitigate that danger. The policy debate on a particular danger should thus be divided into three parts: the science underlying the danger, the uncertainty surrounding that science – i.e., the degree of certainty that the danger will come to pass – and the costs that would be justified to avert or mitigate this uncertain danger.

Policy makers – and ideally, the general public – should insist that advocates and opponents of precautionary action clearly distinguish among the three elements of their position. They should press these advocates, and indeed their own advisers and trusted experts, to make the degree of uncertainty associated with scientific evidence as precise as possible. When they do so, they may discover substantial agreement on both the science and its associated uncertainty, enabling the discussion to focus on differing attitudes to acceptance of costs and risks. To be sure, this degree of uncertainty can be deliberately misstated for advocacy purposes. Even so, the explicit specification of uncertainty will expose such misstatements to discussion and criticism.

In the end, precaution and good science need not conflict. Environmental decision making must be made in the face of uncertainty, so that good science in environmental management is not always the same as good science in the laboratory. Even so, a scientific outlook should support precaution, and precaution should be based on science. 'Science-based precaution' should be a normal, and indeed an essential part of proper risk management.

Indicate whether each of the following is true or false by writing 'T' or 'F' in the space provided.

….. 1. Policy makers – and ideally, the general public – should insist that advocates and opponents of precautionary action clearly distinguish among the two elements of their position.

….. 2. In any particular situation, proponents and opponents of precautionary measures may actually agree on the danger, but disagree on its associated uncertainty.

….. 3. There is a need for a principle that expresses the complementary aphorism, 'nothing ventured, nothing gained'.

TEST 2

Part A

STRUCTURE AND WRITTEN EXPRESSION

Directions: In this part each problem consists of an incomplete sentence. Below the sentence are four choices marked (A), (B), (C), and (D). You should find the one choice which best completes the sentence.

1. Aerosols, tiny suspended particles in the atmosphere, play an important role ….. modifying the Earth's energy balance and are essential for the formation of cloud droplets.

(A) for

(B) in

(C) of

(D) at

2. Suspended dust particles lifted from the world's arid regions by strong winds contain essential minerals that ….. great distances and deposited into the ocean or on other continents where productivity is limited by lack of usable minerals.

(A) can be transported

(B) could be transported

(C) may be transported

(D) might be transported

3. Dust can transport pathogens as well as minerals great distance, contributing to the spread of human and agricultural diseases, and ….. portion of dust can be attributed to human activity suggesting that dust radiative effects should be included in estimates of anthropogenic climate forcing.

(A) a

(B) an

(C) the

(D) –

4. Even though qualitatively we recognize the extent and importance of dust transport and the role that ….. plays in fertilizing nutrient-limited regions, there is much that is still unknown.

(A) he

(B) she

(C) it

(D) –

5. We are just now beginning to quantify the amount of dust that ..... one continental region and the fraction that arrives at another continent.

(A) exit

(B) exits

(C) exiting

(D) exited

6. At the deposition end of the chain, it is still ….. how the limited minerals in the dust such as iron are released for uptake by organisms either on land or in the ocean.

(A) unclear

(B) clear

(C) evident

(D) obvious

7. Not all dust deposited into oceans results ….. a phytoplankton bloom.

(A) to

(B) of

(C) from

(D) in

8. Quantifying transport, deposition and nutrient availability are the latter ends of a puzzle that must begin by identifying and quantifying dust emission at the ….. .

(A) sources

(B) terminals

(C) poles

(D) places

9. The emission process is ….. at the microscale requiring the right conditions for saltation and bombardment, which makes identification and inclusion of sources in global transport models very difficult.

(A) simple

(B) plain

(C) complex

(D) easy

10. It ….. for several years that dust sources are not uniformly distributed over the arid regions of the Earth, but are regulated to topographic lows associated with dried lake deposits.

(A) has been recognized

(B) had been recognized

(C) will have been recognized

(D) would have been recognized

Part B **TEXT 2**

DRAINAGE BASIN MANAGEMENT – REGIONAL APPROACHES FOR FOOD AND URBAN SECURITY

Read and translate the text using a dictionary

Keywords: impact, pollutants and by-products, poverty and human misery, fresh thinking, water bodies, aquatic ecosystems, demand for food, metabolism

Strong forces of change continuously reshape our landscapes. The impact of human activities on the surface of the Earth, below ground and in the atmosphere is significant. The dynamics of drainage basins should be obvious guides, but most human activities do not recognize physical divisions, nor do people always respect the national order. Growth of urban conglomerations increases the competition for water and other resources, and there are few, if any, sites left where pollutants and by-products from production and consumption can be safely disposed.

An increasing water complexity requires an effective management strategy. Poverty and human misery still prevail side by side with conspicuous consumption and mismanagement of vital resources. It is an ethical obligation to discuss how a fair and stable social development can be accommodated within an integrated drainage basin management approach.

This increasing complexity varies from region to region, even within countries. How societies identify and implement solutions depends very much on the availability of water resources, level of economic development and political and ideological orientation. Not even communities in water-rich areas are exempt from problems.

Fresh thinking is required, particularly in basins where all the economically and technically available water is committed. Pollution troubles the West, Eastern Europe and developing countries. Eutrophication and traces of biocides in water bodies and in biological material is a problem without effective solutions in sight. Industry is both a

great hope and of great concern in urban conglomerations. To ensure an environmental flow, i.e. a flow that will sustain aquatic ecosystems, including inland and coastal fisheries, an effective drainage basin management is essential.

While some principles for water resources management have a universal relevance, the solutions must build on the relevant local and national experiences and capacities. Lessons from developed and developing countries as well as from the new states in Eastern Europe should be scrutinized to illustrate viable approaches in achieving food and urban security.

Increasing the productivity or the value per resource unit is imperative, as is reducing/containing pollution from production and consumption. One way – improved water use efficiency – yields more 'crop-per-drop,' for example. It is also essential to increase jobs/income per drop and 'care per drop,' that is, reduce risks for non-desirable impacts. Another approach is to see that excess water can be used downstream. A conjunctive use of surface and groundwater resources, or cascading reuse, is common in many river systems. But, the use of water in each activity must not degrade the quality of water more than what is acceptable.

Food production depends on hydrological and physical/biological realities yet the level of production and the cropping pattern are largely a response to demand and to social and political contexts. An increasing share of the food is produced for people who buy according to preferences and ability.

Demographic trends illuminate the need for more food, either through increased local/national production or through trade. For the poor, food insecurity is a lingering reality. Demand for food in urban centres will grow and it is likely that the composition of the diet will change.

Typically, there are no plans for how the resource flows in the urban and rural interactions should be managed. Separate planning of urban and rural areas and a division of tasks between different departments have fostered thinking that water supply, sanitation, waste management and resource utilization should be dealt with separately,

sector-wise and geographically.

Some of the most pressing challenges in many parts of the world are related to the urgent need for proper water, sanitation arrangements and waste management. When designing such systems, their links to food production and ecosystems should be taken into account. Resource flows, waste generation and deposition are part of a de facto urban-rural metabolism.

Policies for the provision of water should be supplemented with consideration to what happens to water and other resources while they are being used and also after they have been used. The after-use is an indispensable component in an integrated drainage perspective.

Effective drainage basin management presumes proper legal and institutional arrangements. Many political organizations have made far-reaching commitments about water provision, environmental status, etc.

In western countries and also in Latin America, the urban share of the total population is quite high. In other parts of the world, the agricultural and rural sectors still dominate in demographic terms and in terms of total water demand. Consumptive use of water in food production will continue to be significant, but the competition for water resources from other sectors and for environmental flow is becoming more pronounced.

Indicate whether each of the following is true or false by writing 'T' or 'F' in the space provided.

….. 1. Another approach is to see that excess water can be used upstream.

….. 2. In western countries and also in Latin America, the urban share of the total population is quite low.

….. 3. The after-use is an indispensable component in an integrated irrigation perspective.

….. 4. Eutrophication and traces of biocides in water bodies and in biological material is a problem without effective solutions in sight.

TEST 3

Part A

STRUCTURE AND WRITTEN EXPRESSION

Directions: In this part each problem consists of an incomplete sentence. Below the sentence are four choices marked (A), (B), (C), and (D). You should find the one choice which best completes the sentence.

1. A growing percentage of the world's population lives in ….. areas.

(A) rural

(B) urban

(C) dry

(D) coastal

2. While developed nations ….. already highly ….., percentage of urban population in developing nations is still much lower, but rapidly increasing.

(A) are ..... being urbanized

(B) will ….. be urbanized

(C) are ….. urbanized

(D) were ….. urbanized

3. Moreover, cities are expected to be affected in numerous ways by climate change, requiring individuals ….. municipal decision-makers to identify and implement adaptation strategies to deal with the potential negative impacts of a warming climate.

(A) as well as

(B) just as well

(C) just as soon

(D) such as

4. Increasing hazards such as floods, storms, coastal erosion and inundation, landslides, fires, heat extremes and air pollution are ..... the expected impacts, all experienced in the context of multiple other stresses and global changes.

(A) between

(B) among

(C) amidst

(D) in the middle of

5. Yet individuals acting collectively ….. have two critical roles to play in climate policy and action: as a political force, they can mobilize for policy changes at local and higher levels of government, and as consumers of energy, material goods, and environmental resources, they can enact behavioural changes that are consistent with needed mitigation and adaptation measures.

(A) does

(B) do

(C) did

(D) –

6. Clearly, individuals ….. even entire urban population will not be able to ‘solve’ the climate problem through their own actions.

(A) or

(B) and

(C) but

(D) –

7. In addition, individuals in policy-making or public and private decision-making positions can have considerable influence ….. the actions and emissions-generating behaviour of many others.

(A) over

(B) under

(C) with

(D) of

8. The best policy set in place at ….. levels of government will fall short of its goals if not implemented on the ground.

(A) high

(B) higher

(C) highest

(D) –

9. The ….. intentions by countless individuals may be insufficient, inefficient and create possible unintended outcomes, if not coordinated and guided by well-designed policy.

(A) good

(B) better

(C) best

(D) –

10. It is for these reasons that the question of how to effectively communicate climate change to engage people in the necessary policy and behavioural changes ….. growing interest recently.

(A) has attracted

(B) have attracted

(C) attracted

(D) had attracted

Part B **TEXT 3**

SYSTEMS FOR SUSTAINABLE URBAN WATER SERVICES

Read and translate the text using a dictionary

Keywords: heavy pollution and water shortages, peri-urban parts, drinking water, survival, sustainable systems, urban water services, effective regulation, benchmarking and monitoring, environmental protection, wastewater treatment plants

Urban areas show an extremely dynamic development with rapidly increasing population, economic growth, heavy pollution and water shortages. In developing

countries, the most complex challenges are in non-regulated and peri-urban parts of urban settlements, where inhabitants may be illegally connected to water supply networks or take drinking water from polluted streams. The lack of controlled sanitation results in a perpetually deteriorating situation.

The technical flow of water through the city is necessary not only for the survival and health of the population but also for the functioning of industry, hospitals and other city components. It is important to develop system solutions for regulated as well as non-regulated areas. Sustainable systems require both local community involvement and commitment.

Urban security critically depends on a livelihood base which includes food, water and sanitation. Proper waste management and an energy perspective increase the potential for resource recovery. Integrated storm drainage approaches must be included. The conceptual framework for urban water management has to be reflected in a long-term strategy, where also the consequences of the choice of building materials, road materials, transport systems, etc., are taken into consideration. All providers of urban water services should be subject to effective regulation, benchmarking and monitoring. They should be efficient, accountable and protected from inappropriate pressures. There should be clear separation between the roles and responsibilities of the regulator and the service providers.

The predominant public delivery of water services can be complemented by different and innovative forms of service delivery, including self-help groups formed by the people themselves, informal service providers, co-operative societies, and local and international private enterprises. Although regulation in most parts of the world is a regional or local function, there is much to be achieved in improving its effectiveness through international networking and the application of consistent principles and good practice. The development of benchmarking approaches, which bridge national boundaries, are necessary to allow meaningful comparison of service provider performance across the world.

To achieve sustainable development, reuse of water and recycling of nutrients is essential. Similarly, a recycling of nutrients is important in efforts aimed at environmental protection and resource conservation. Reclamation, reuse and recycling of resources such as phosphorus will enable an increase in resource utilization without a corresponding increase in the pressure on limited and vulnerable natural resources.

An effective way to reduce the pressure on limited water and nutrients is to recycle the nutrients in wastewater from urban and rural areas and use it in the agriculture sector. This must be done in a way that safeguards the quality of agricultural products with reference to health standards.

To facilitate a safe reuse of wastewater and its nutrient contents, relevant laws and regulations must be enacted and enforced. This includes effective and binding demands on industries, hospitals, petrol stations and other polluting activities, which are connected to wastewater treatment plants. It is also very important that all relevant stakeholders are aware of the advantages and demands of water reuse and that they are engaged in the planning.

Indicate whether each of the following is true or false by writing 'T' or 'F' in the space provided.

….. 1. The conceptual framework for urban management has to be reflected in a short-term strategy, where also the consequences of the choice of building materials, road materials, transport systems, etc., are taken into consideration.

….. 2. In developed countries, the most complex challenges are in non-regulated and peri-urban parts of urban settlements, where inhabitants may be illegally connected to water supply networks or take drinking water from polluted streams.

….. 3. The technical flow of water through the city is necessary not only for the survival and health of the population but also for the functioning of industry, hospitals and other city components.

TEST 4

Part A

STRUCTURE AND WRITTEN EXPRESSION

Directions: In this part each problem consists of an incomplete sentence. Below the sentence are four choices marked (A), (B), (C), and (D). You should find the one choice which best completes the sentence.

1. In terms of consumptive use of water, food production by far ….. the amount of water required for household, urban and industrial uses.

(A) is surpassing

(B) will surpass

(C) surpasses

(D) surpassed

2. Water development schemes and increases in irrigated agriculture ….. radically ….. the hydrological pathways of many basins.

(A) has ….. modified

(B) have ….. modified

(C) had ….. modified

(D) would ….. modify

3. Developments in many basins have proceeded to a stage where all water has been allocated to human and ecological uses, and the catchments are deemed ‘closed’ to ..... uses.

(A) further

(B) farther

(C) furthest

(D) farthest

4. In such a situation, changes in water use in one area of the catchment are felt by ….. users.

(A) another

(B) different

(C) other

(D) others

5. Efforts to optimize locally often ….. to unintended consequences elsewhere.

(A) leads

(B) lead

(C) led

(D) leading

6. It is, ….., not acceptable that interventions are made without careful consideration to overall drainage basin security.

(A) however

(B) sometimes

(C) therefore

(D) somewhat

7. Such considerations involve scrutiny of the relative importance of different claims ….. sectors and interest groups.

(A) for

(B) on

(C) from

(D) to

8. ….. good supply of water of acceptable quality is also important for aquaculture.

(A) A

(B) An

(C) The

(D) –

9. But outflow from aquaculture ….. reduce water quality downstream and is widely blamed for eutrophication.

(A) must

(B) can

(C) should

(D) may

10. ….. also a risk of spreading disease from the cultured species to the wild, and of changes in biodiversity as a result of escapes or releases of exotic species or strains.

(A) There is

(B) There was

(C) There are

(D) There were

Part B **TEXT 4**

RUNNING WATER

Read and translate the text using a dictionary

Keywords: safe drinking water, potable water, sanitation systems, adequate quality water, water-related disasters, climate change, sewerage works, water supply systems

Seven hundred million people in Asia and 1.1 billion people in the world do not have access to drinkable water. This means that one out of five people in developing countries do not have access to potable water. What's more, 2.6 billion people in the world and 1.9 billion in Asia lack basic sanitation systems, including toilets. This means that every second person in developing countries does not have access to a toilet. Water is a cycling resource and is sustainable if used appropriately, but due to maldistributions with regard to geographical locations, time and social conditions, many people still suffer a lack of sufficient, adequate quality water.

The first thing that should be taken into consideration with regard to water problems is Target Ten of the Millennium Development Goals (MDGs), set forth at the United

Nations Millennium Summit in September 2000, which aims, by the year 2015, to reduce by 50% the percentage of the population that has no continuous access to safe drinking water or basic sanitation facilities. The supply of safe water and improved sanitary conditions are important for resolving many MDG-related issues, including problems of health, education and gender equality, and resolving these issues will make a significant contribution to improving the security of people.

Every year, 1.8 million children die from cases of diarrhea because they do not have access to safe water and sanitation. In some countries school attendance rates for female children is low because the schools do not have girls' toilets. Destitute persons, especially women and children, have no choice but to travel far every day to get their water, depriving them of the time to engage in other productive activities such as farming or going to school and making it impossible for them to extract themselves from the poverty cycle.

Water problems are closely related to many other issues in human society. The number of water-related disasters such as flood, landslide and high tide has increased in developing countries in particular. In recent years, more than 200 million people annually have been affected by water-related natural disasters and over 50,000 of these people end up losing their lives. The water shortage has worsened along with the biodiversity loss because of climate change, increased use of water, and the fact that population has been increasing and migrating toward the cities in different parts of the world. More than 800 million people in the world suffer from hunger and malnutrition because there is not enough water for agricultural production.

Because of these statistics, the United Nations established the UN Secretary-General's Advisory Board on Water and Sanitation (UNSGAB) in 2003 in order to help reach the MDGs related to water and sanitation.

Japan has always been a leading donor and opinion leader in the area of water and sanitation. At the 4th World Water Forum, the Japanese government announced its Water and Sanitation Broad Partnership Initiative (WASABI), which pointed to measures and

specific initiatives that Japan was going to address in its effort to provide assistance for water and sanitation issues. In the areas of sanitation and supplying safe drinking water, WASABI prescribes support for preparing water-supply facilities suitable for local conditions, including deep wells and small-scale water-supply systems for villages. It also highlights the importance of providing the resources necessary for maintaining, managing and operating the infrastructure that it proposes to put into place, to make the operation of the waterworks and sewerage works in urban areas independent.

Climate change has emerged as a water-related issue, involving problems such as floods and droughts, magnified both in scale and frequency, and the shortage of agricultural water. These problems directly and immediately affect the poor.

To prevent water disasters in particular, it is important to take a comprehensive approach by combining 'hard' resources, such as the technology to build facilities for flood control and drainage, with the 'soft' resources, such as systems to enable a hazard map, early warning system, or other community-based disaster risk management.

To eradicate water and sanitation problems in developing countries, the parties concerned must cooperate in procuring the soft resources necessary for transferring maintenance and management techniques, preparing legal systems and improving the management, capacity development and institution building, not to mention establishing and renewing various facilities. When different groups of people co-operate, they must utilize know-how from waterworks and sewerage services operated by local government, applications involving technologies unique to Japan, such as night-soil treatment technology, efficient water treatment and purification technologies, development of the water recycling and reuse technology utilizing membranes, investments by the public sector through public private partnerships (PPP), and tie-ups between local government and corporations.

Indicate whether each of the following is true or false by writing 'T' or 'F' in the space provided.

….. 1. Ten hundred million people in Asia and 1.1 billion people in the world do not have access to drinkable water.

….. 2. Destitute persons, especially women and children, have no choice but to travel far every day to get their wood, depriving them of the time to engage in other productive activities such as farming or going to school and making it impossible for them to extract themselves from the poverty cycle.

TEST 5

Part A

STRUCTURE AND WRITTEN EXPRESSION

Directions: In this part each problem consists of an incomplete sentence. Below the sentence are four choices marked (A), (B), (C), and (D). You should find the one choice which best completes the sentence.

1. ….. amounts of water will have to be appropriated to food production to eradicate undernutrition and feed the expanding world population.

(A) Negligible

(B) Small

(C) Huge

(D) Insignificant

2. ….. crucial question is: from where will it come?

(A) A

(B) An

(C) The

(D) –

3. First of all, diets are important, in particular the ….. component, both in terms of its importance as protein source, for cattle-based income raising, and as the response to lifestyle drivers.

(A) vegetable

(B) meat

(C) fruit

(D) salt

4. Second, much of the evaporative losses in both irrigated and rain-fed agriculture may be gained back, increasing the water productivity – a method spoken of as vapour shift in the sense that non-productive evaporation ….. into productive transpiration by soil conservation measures and protection of the plants from dry spell damage.

(A) is being transformed

(B) are being transformed

(C) was being transformed

(D) were being transformed

5. Third, by increased irrigation, but this will involve appropriation of even more ….. water for crop production.

(A) blue

(B) green

(C) muddy

(D) sea

6. Since the result will be further river depletion, it will ….. be limited by what the aquatic ecosystems can endure in terms of reduced stream flow, defined as environmental flow.

(A) has to

(B) have to

(C) had to

(D) was to

7. In some basins with severe silt problems there is also a need for stream flow enough to flush silt to avoid ….. sedimentation.

(A) desirable

(B) wanted

(C) unwanted

(D) preferable

8. The concept of environmental flow ….. remains rather unclear, however.

(A) soon

(B) still

(C) here

(D) there

9. It lacks an agreed definition, and is ….. a certain degree seen as an issue of value judgement.

(A) to

(B) of

(C) for

(D) in

10. ….. water quality is getting more and more important as urbanization expands, it is not yet incorporated in environmental flow criteria.

(A) Although

(B) Thus

(C) However

(D) While

Part B **TEXT 5**

THE WATER CHALLENGES OF MEGACITIES

Read and translate the text using a dictionary

Keywords: wastewater disposal requirements, provision of clean water, safe disposal of wastewater and stormwater, growth of megacities, rapid urbanization

From the dawn of history, as the human population has continuously increased, so have the water and wastewater disposal requirements. Water management was not a serious problem as long as the population numbers were low and concentrations of the people were not high. As the population started to increase dramatically during the post-1950 period, and the rate of urbanization began to accelerate, provision of clean water and safe disposal of wastewater and stormwater for the megacities of developing countries became increasingly more complex and serious.

The rate of urbanization has increased significantly during the past 50 years. In 1950, about 30% of the global population lived in urban areas: the corresponding estimate at present is nearly 50%. This trend is expected to continue during foreseeable future. These global figures are averages: they mask wide disparities from one country to another. For example, in 1950, in Nigeria, less than 10% of the people lived in urban areas. At present, this proportion is approaching 50%.

The rapid growth of the megacities of the developing world has posed major water planning and management changes. In 1994, of the 10 large cities of the world, only 3 were in developed countries. By 2015, the latter number is expected to decline further to two, one of which will be Tokyo. However, whereas Tokyo's population is estimated to increase by less than 5 per cent during this period, cities like Jakarta, Indonesia; Karachi, India; Lagos, Nigeria; and Dhaka, Bangladesh are expected to grow by 60 to 75%.

Urbanization and growth of megacities are not new phenomena: cities such as London or New York started to grow in the nineteenth century. However, two important differences should be noted between the past and the present developments.

The first is the rate of growth. The development of the megacities of the developed countries was a gradual process. Thus, much of the population growth in cities like London and New York was spread over a century. This enabled these cities to progressively and effectively develop the necessary infrastructures and management capacities for all their water-related activities and services.

In contrast, the megacities of the developing world witnessed explosive growth during

the post-1950 period, and especially after 1960. For example, the population of the Mexico City Metropolitan Area increased from 3.1 million in 1950 to 13.4 million in 1980, a 425% increase in only 30 years. This expansion still continues as the city's population has now exceeded 18 million. These megacities simply have been unable to manage explosive growth rates. They had to run faster and faster to stay in the same place!

The second major difference is that as the megacities of the industrialized countries expanded, their economies were growing concomitantly. Accordingly, these urban centres were economically able to harness financial and human resources to provide their residents with the necessary water-related services. In stark contrast, economies of the developing world have mostly performed poorly during the period of this rapid urbanization. High public debts, inefficient resource allocation, poor governance, lack of investment capital, and inadequate management capacities have ensured that the needed infrastructures could not be built on time, and the existing facilities could not be properly maintained. In addition, living conditions are particularly harsh for the large part of the urban population, maybe about a third, who live in areas which are not planned and where public services are lacking or rudimentary, with extensive air, water, land and noise pollution, and with major impacts on the health and welfare of the megacity-dwellers. The problem is further compounded by skewed income distribution, high unemployment and underemployment, pervasive corruption and increasing crime rates. The main problem of megacities often stems from the fact that the rates of urbanization have often far exceeded the capacities of the national and local government to plan and manage the demographic transition efficiently, equitably and sustainably. There is thus an urgent need for additional water and sanitation services, either from government but more probably in partnership with other responsible actors. However, even though continuing urbanization poses a major challenge in providing adequate water services to the megacities, its importance and contribution towards the development of stronger and more stable national economies should not be

underestimated. In 2000, it was considered that the urban areas of the developing world, which contained some 30% of the total population, contributed with nearly 60% of the total GDP, and played an equally important role in terms of social development and cultural enhancement. Thus, the urbanization process presents both opportunities and challenges.

Indicate whether each of the following is true or false by writing 'T' or 'F' in the space provided.

….. 1. In 1950, about 20% of the global population lived in urban areas: the corresponding estimate at present is nearly 50%.

….. 2. In addition, living conditions are particularly harsh for the large part of the urban population, maybe about a second, who live in areas which are not planned and where public services are lacking or rudimentary, with extensive air, water, land and noise pollution, and with major impacts on the health and welfare of the megacity-dwellers.

….. 3. Thus, much of the population growth in cities like Liverpool and Washington was spread over a century.

TEST 6

Part A

STRUCTURE AND WRITTEN EXPRESSION

Directions: In this part each problem consists of an incomplete sentence. Below the sentence are four choices marked (A), (B), (C), and (D). You should find the one choice which best completes the sentence.

1. Besides water supply, sanitation, stormwater and wastewater management, ….. is fundamental to megacities in many other aspects.

(A) water

(B) food

(C) electricity

(D) production

2. ….., the number of humans exposed to floods tripled from 1970s to 1990s, and is around 2 billion today.

(A) In fact

(B) For a fact

(C) For example

(D) In actual fact

3.The major factor ….. this development is the congestion of hundreds of millions of people in mushrooming cities on deltas and flood plains of the tropics and semi-tropics.

(A) behind

(B) forward

(C) in front of

(D) before

4. In contrast, many megacities ….. in desert and semi-desert regions and face opposite problems with water – they feel scarcity very specifically in their everyday lives.

(A) developed

(B) have developed

(C) had developed

(D) will have developed

5. Regarding food, megacities also devour enormous amounts of provisions which have to be imported from the countryside, often ….. .

(A) far away

(B) nearby

(C) far and wide

(D) not far away

6. Megacities ….. import as much virtual water as what crosses national borders in

international food trade.

(A) only

(B) alone

(C) merely

(D) solely

7. Megacities require massive quantities of energy ….. .

(A) also

(B) either

(C) as well

(D) ever since

8. ….., a megacity dweller consumes 5 to 10 times more energy compared to the national average.

(A) On average

(B) Above average

(C) Below average

(D) Anew

9. Furthermore, all …..-….. electricity generation requires tremendous quantities of water, either as hydropower or for cooling, as does bioenergy production.

(A) scaled-down

(B) small-scale

(C) large-scale

(D) scaled-up

10. Thus, water is an important prerequisite to satisfy the energy requirements of megacities, an issue that has been basically ignored ….. the water profession.

(A) by

(B) with

(C) for

(D) of

Part B **TEXT 6**

WATER MANAGEMENT IN THE ENLARGED EUROPEAN UNION

Read and translate the text using a dictionary

Keywords: hazardous substances, water resources, river basin management, existing legislation, urban wastewater systems, treatment facilities, coastal waters and groundwaters, water management activities, water pricing policies

Protection and management of water within the European Union (EU) has a long history. Various types of legislation have been developed and implemented since the 1970s. These have focused primarily on the efforts to reduce emissions of certain substances from different sources – such as hazardous substances from industries or eutrophying substances from wastewater or agriculture – as well as water quality objectives for drinking water, bathing, shellfish water, etc.

Implementation of these directives have had mixed results, but in general the water quality in many regions has improved considerably over the years.

During the early 1990s, however, the need to address the challenges of water management from a more integrated and holistic perspective was identified. In 1997 the European Commission forwarded the proposal for the Water Framework Directive (WFD). After negotiations between the member countries, the Directive was adopted and entered into force in December 2000, and is now subject to implementation in all 25 EU member states. The Water Framework Directive is a legislative framework to protect and improve the quality of all water resources within the European Union. The Directive establishes the principles of river basin management, ranging from the very source of the watercourses to their outfall into the sea, and requires that River Basin Management Plans should be established every six years, with the first one ready by 2009. These principles prevail equally for the big rivers, for example, in Central Europe, or the more modest watercourses in Western Europe. Key elements of the legislation include:

* The protection of all waters, including rivers, lakes, coastal waters and groundwaters
* The setting of ambitious objectives to ensure that all waters meet 'good status' by 2015
* The requirement for cross border co-operation between countries and all involved parties
* Ensuring the active participation of all stakeholders, including non-governmental organizations and local communities, in water management activities
* Requiring water pricing policies and ensuring that the polluter pays
* Balancing the interests of the environment with those who depend on it.

Old and new EU member states, together with stakeholder representatives and NGOs, have worked together since 2001 to develop guidance for the implementation of the detailed and very demanding Directive.

The challenges facing member states, old as new, when implementing the Directive, in and of itself, are huge. For those member states that joined the EU on May 1, 2004, (the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, the Slovak Republic, Slovenia, Malta and Cyprus) there are also a number of already existing directives that must be implemented simultaneously.

The development in many accession countries in recent years to meet the new requirements – for both the WFD, and for other existing legislation – have in many cases been astonishing, but of course still much remains. Each country has a specific timetable on when and how to meet different pieces of EU legislation. The co-operation between the new and the old members has been intense and very constructive.

Many of the remaining problems in Eastern Europe are backlogs from an earlier era. Some areas still suffer from historic pollution or emissions from old industries that have not modernized. Urban wastewater systems are still in many cases outdated: sewage systems and treatment facilities are in need of improvements in order to reduce pollutant loads in many rivers. Institutional capacities also need to be strengthened in order to be able to meet all the requirements in the new EU legislation.

But it is also important to recognize that in many countries in Eastern Europe there are still a lot of undisturbed and unpolluted small rivers and streams, with good water quality.

Ecological modelling is used widely today in environmental management in the developed countries and is already used in the developing countries, but will inevitably be used there more in the future.

KEY FACTS ABOUT THE EUROPEAN WATER SITUATION

***** 20% of all surface water in the European Union is seriously threatened with pollution.

* Groundwater supplies around 65% of all Europe's drinking water.
* 60% of European cities overexploit their groundwater resources.
* 50% of wetlands have 'endangered status' due to groundwater overexploitation.
* The area of irrigated land in Southern Europe has increased by 20% since 1985.

Source: European Union, www.europa. eu.int/comm./environment/water/

Indicate whether each of the following is true or false by writing 'T' or 'F' in the space provided.

….. 1. After negotiations between the member countries, the Directive was adopted and entered into force in January 2000, and is now subject to implementation in all 25 EU member states.

….. 2. Old and new EU member states, together with stakeholder representatives and NGOs, have worked together since 2002 to develop guidance for the implementation of the detailed and very demanding Directive.

….. 3. The development in many accession countries in recent years to meet the new requirements – for both the WFD, and for other existing legislation – have in many cases been astonishing, but of course still much remains.

….. 4. The co-operation between the new and the old members has been intense and very constructive.

TEST 7

Part A

STRUCTURE AND WRITTEN EXPRESSION

Directions: In this part each problem consists of an incomplete sentence. Below the sentence are four choices marked (A), (B), (C), and (D). You should find the one choice which best completes the sentence.

1. Perhaps this has happened to you – you are out on a summer picnic, and the chicken salad seems a little … *off*, but you wolf down your sandwich ….. .

(A) nonetheless

(B) especially

(C) however

(D) though

2. Several ….. later, you start feeling nauseated, and before you know it, you are vomiting or suffering from diarrhea.

(A) seconds

(B) minutes

(C) hours

(D) days

3. It’s a ..... case of food poisoning.

(A) classic

(B) unimaginable

(C) inconceivable

(D) improbable

4. A small ….. significant portion of food poisoning cases can be traced to the family of bacteria known as *Staphylococcus aureus.*

(A) and

(B) but

(C) or

(D) yet

5. Once ingested in contaminated food, these bacterial toxins are hearty enough proteins to survive the highly ….. environment of the stomach and the equally lethal enzymes of the intestines, which normally break down proteins into peptides that can be used by the body.

(A) acidic

(B) bitter

(C) salty

(D) sweet

6. When the toxins cross the surface tissue of the gut, known ….. the epithelium, and get into the body tissues and bloodstream, the real trouble begins.

(A) there

(B) here

(C) as

(D) obviously

7. There ….. even be a superantigen connection to AIDS.

(A) may

(B) can

(C) must

(D) should

8. It turns ….. that a retrovirus in mice called mouse mammary tumour virus can function as a superantigen.

(A) down

(B) out

(C) in

(D) over

9. ….. finding inspired researchers to investigate the possibility that the human

immunodeficiency virus (HIV), a retrovirus, might also do that.

(A) These

(B) This

(C) That

(D) Those

10. The HIV connection remains theoretical at this point, but there is nothing theoretical about the problems superantigens can cause at a ….. .

(A) picnic

(B) canteen

(C) coffee break

(D) mess

Part B **TEXT 7**

WHEN THE SYSTEM FAILS: TOO LITTLE OR TOO MUCH IMMUNITY.

TOO MUCH: AUTOIMMUNE DISEASES

Read and translate the text using a dictionary

Keywords: immunologists, T cells, B cells, macrophages, immune-system cells, protein lymphocytes, immunodeficiency, molecular biology, microbes

Immunology is a complex and challenging subject for scientists and non-scientists alike. Immunologists have, for example, identified the specific cells and molecules that are the essential components of the immune system: T cells, B cells, macrophages, and so on – all of them vital to our bodies' ability to survive the constant onslaughts of a hostile world.

Should an alien microbe ever land on earth from outer space, it would find at least a few weapons in our immune systems that seem made to order, ready and waiting to fight

it. Our immunological armories are astoundingly well-stocked. They contain such a variety of warheads that one of them is bound to be the type to home in on any invader. In addition, we have a repertoire of about 100 trillion different T cell receptors that can recognize as many different substances, leading the T cells to call the alarm, mobilize the troops, and launch a counterattack. We need all these weapons because 'Every day is a battle against microorganisms,' as Don Wiley, an HHMI investigator at Harvard University, puts it, adding, 'The immune system is really the reason that we're not dead.' In order to survive, we must not only have the right kind of weapons but be able to produce them rapidly and abundantly enough to protect us before being overwhelmed by the invaders. Each person's set of immunological weapons is unique. 'No two people, even if they're identical twins, have the same immune system,' explains Charles Janeway, an HHMI investigator at the Yale University School of Medicine, 'because the genes for T and B cell receptors are defined by gene rearrangement and that, in turn, has a degree of randomness.' Each of the molecules resulting from these rearrangements is as different from the others as if they had all emerged from a slot machine. Vaccination is the most efficient way to make the immune system work for us, scientists agree. Essentially, it gets the system ready to respond more swiftly to a specific attack.

Always prepared for emergencies – attacks by bacteria or viruses, damage from radiation, wounds – the body makes billions of immune-system cells every day, far more than are generally needed. Most of these cells die without ever being called to duty.

While some of the cells just wither away from old age, a surprisingly large number commit suicide right after birth. They sacrifice themselves after they prove incapable of telling friend from foe, 'self' from 'non-self,' which indicates they are extremely dangerous. Such sells would have no built-in restrictions against attacking the body's own tissues. The body then orders them to self-destruct, and they obey.

'Inevitably, because of the random gene rearrangement process that brings about their diversity, some lymphocyte receptors will be generated that react to the body's own proteins,' explains Charles Janeway, a professor of immunology at Yale University and

an HHMI investigator who has written a leading textbook in the field. To prevent cells with such receptors from causing havoc, the body gets rid of them early in development.

'Before T cells are allowed out to go on patrol in the rest of the body, they're checked for whether or not they can react with anything in the thymus, where they grow up,' says Philippa Marrack, one of the researchers who discovered how such T cells are identified and destroyed. 'If their receptors react with some bit of self, this causes the cell bearing these receptors to die.' First the cell's nucleus condenses, then the cell disintegrates in an orderly process called apoptosis, or programmed cell death. Only those lymphocytes that are tolerant of self are allowed to mature.

Any cells that escape this dragnet become outlaws. Sometimes they go on a rampage, attacking their own mother and sister cells and producing severe autoimmune diseases such as multiple sclerosis (MS), rheumatoid arthritis, systemic lupus erythematosus, or juvenile diabetes.

Autoimmune diseases used to seem very mysterious, but they are increasingly well understood. 'Look at juvenile diabetes. We now know definitely that it is a T cell-mediated disease,' says Emil Unanue, of Washington University School of Medicine. 'It is caused by T cells that migrate toward the islets of Langerhans and kill the beta cells of the pancreas that make insulin. Then that individual, for life, is deprived of insulin and has to depend on daily injections to metabolize his sugar.'

Once the beta cells are gone, it is too late to treat the disease by clamping down on the T cell response. But other autoimmune diseases might be controlled in this way. 'A lot of people hope to treat such disorders by deflecting the T cell response one way or the other – to interrupt the reaction,' Max Cooper says. 'On the other hand, you don't want to go too far. You don't want to create a generalized immunodeficiency, or a significant gap in immunity, while you turn off an attack on your joint in rheumatoid arthritis or on your brain in multiple sclerosis.'

Researchers who want to find the right balance are now turning to animal models, where they can study a variety of treatments. Molecular biology has made it possible 'to

create almost any autoimmune disease in mice just by knocking out some element of the immune system,' Cooper points out. He hopes that studies of these mice will help scientists answer a fundamental question about diseases that are caused by either too little or too much immunity: 'How do you adjust the thermostat in a really precise way?'

Indicate whether each of the following is true or false by writing 'T' or 'F' in the space provided.

….. 1. Always prepared for emergencies – attacks by bacteria or viruses, damage from radiation, wounds – the body makes billions of immune-system cells every hour, far more than are generally needed.

….. 2. Autoimmune diseases used to seem very mysterious, and they aren't well understood.

….. 3. Such sells would have built-in restrictions against attacking the body's own tissues.

….. 4. While some of the cells just wither away from old age, a surprisingly large number commit suicide right after birth.

Part A **TEST 8**

STRUCTURE AND WRITTEN EXPRESSION

Directions: In this part each problem consists of an incomplete sentence. Below the sentence are four choices marked (A), (B), (C), and (D). You should find the one choice which best completes the sentence.

1. Ever longer wastewater pipes, declining amounts of wastewater, increasing dirt concentrations and the steady expansion of separate systems for sewage and surface water all increase the level ….. degradation in the sewage system.

(A) to

(B) on

(C) of

(D) for

2. The consequences are the formation of hydrogene sulphide with ….. associated phenomena of unpleasant odours and corrosion.

(A) the

(B) an

(C) a

(D) –

3. Biological and biochemical processes ….. in sewage systems.

(A) would take place

(B) had taken place

(C) were taking place

(D) take place

4. ….. there is sufficient reducible oxygen in the wastewater, no anaerobic degradation processes will occur and so no secondary odour substances, which initially form in the sewage system, will be given off.

(A) As long as

(B) Before long

(C) Long before

(D) Long after

5. If the nitrate is almost used up, fermentative bacteria that degrade the ….. substances are favoured.

(A) inorganic

(B) organic

(C) toxic

(D) harmful

6. These degradation products ….. have an unpleasant smell and can cause odour problems even when the concentration of hydrogen sulphide is close to zero.

(A) may

(B) can

(C) must

(D) should

7. When sulphides ….. in the wastewater, hydrogen sulphide is released into the air because the sulphides are not very soluble in water.

(A) will have been produced

(B) have been produced

(C) had been produced

(D) would have been produced

8. On the surface of the sewer slime there are bacteria ….. take up gaseous hydrogen sulphide and oxidize it to sulphur.

(A) that

(B) which

(C) who

(D) what

9. The thiobacilli convert the sulphur that is ….. present in the sewer slime into sulphuric acid, which is ultimately to blame for the corrosion.

(A) also

(B) too

(C) as yet

(D) seldom

10. Nitrate prevents fermentative bacteria ….. gaining competitive advantages and stops the wastewater becoming septic.

(A) of

(B) for

(C) from

(D) in

Part B **TEXT 8**

THE GOOD AND THE BAD NATURAL VARIATON

Read and translate the text using a dictionary

Keywords: biosphere, biomass, risks and hazards, hurricanes, loss of livelihood and habitat, human intervention, centralization and decentralization, water management

Natural variations in the hydrosphere constitute the very context for human existence. For good and bad, these variations are a major driver of processes in the landscape and the biosphere. Food production and biomass in general thrive as a result of a mix of wet and dry periods. Variation in flow regime is fundamental for aquatic ecosystems. In aesthetic terms, natural variations are at the heart of our fascination for Nature.

Yet, it is also true that the natural order is not necessarily benign. Erratic rainfall brings risks and hazards, especially in areas where the evaporative demand is high. Extremes, in terms of floods, prolonged droughts, hurricanes and other natural hazards wreak havoc on cultivated fields, physical structures and lead to human despair and loss of livelihood and habitat.

Equally important, the geographical distribution of precipitation and water resources only partially coincides with human settlement patterns. Water in a river or lake is something quite different compared to the water that is accessible in fields, households, industry, and elsewhere. Unfortunately, water and society are often mismatched. Activities in the household, food production, industry, transport, energy sector and leisure are affecting water quality, sometimes quite badly and, thus, the usability of

water.

For both water provision and the safeguarding of water and environmental quality, human intervention is necessary. Adapting resource accessibility to societal needs is a recurrent theme. Historically, and recently, we have relied on physical structures to store water or to change its path. But the scale of the interventions and the degree of centralization and decentralization has varied. Although direct interventions in blue water systems, i.e. rivers, lakes and aquifers, are in focus when water management is discussed, it is important to recognize that river flow originates from land. Hence, land use is a significant indirect intervention in water flows.

In terms of overall food production and livelihood, rain-fed systems and natural flow regimes are most important. By contrast, household water supplies, urban growth, energy generation, leisure, industry and the recent expansion of food production, have all been achieved through greater control over blue water flows. The rapidly expanding urban system cannot function in the absence of management of blue water flows, both in terms of supply and in coping with serious increases in pollution.

Humans have restored to a combination of two complementary strategies to cope with these challenges. One may be labelled the ‘hard path’ approach. It often refers to large-scale structures such as facilities for water development, storage, conveyance, productivity enhancement and treatment. Another strategy is referred to as the ‘soft approach’.

Three factors – variations in climatic conditions, already secured storage and socio-political contexts – must determine what mix of solutions could and should be promoted. For communities exposed to strong seasonal variation in precipitation, for instance, the need for arrangements to store water from rainy season to dry season is noticeable. The amount of infrastructure facilities varies tremendously in the world. In the United States, for instance, the storage capacity is about 5,000 m^3 per person, whereas in part of the Nile region it is about 50 m^3.

Choices are always made. Even if the process of identifying the best combination of

hard and soft solutions is a delicate task, delayed decision making can lead to poor decisions being made. Today, there is a much more elaborate basis for the decisions. Design of physical structures and the probable benefits and impacts can be carefully evaluated beforehand.

Similarly, governing institutions are under increasing pressure to increase transparency and to enter into a public dialogue. An omission to invest in the best possible solutions, or prolonged periods of no-go decisions, could have serious environmental consequences and imply lost opportunities to reduce poverty.

The physical drainage basin is often considered the natural unit for water management. Drainage basins are of prime importance for an integrated approach to land use, water and ecology. Socio-economic systems, however, are not confined within these geographic boundaries. Planning processes usually follow political borders. Provision of water to many rapidly growing urban conglomerations cannot be arranged within basins. Political decisions to develop certain regions have also meant that the basin as a unit for water management is not always the sole context. Trans-basin water transfer schemes illustrate the need for overarching political decisions in addition to the basin-specific approaches. The national level is a key for strategic and long-term water policy. At the same time, the active involvement of stakeholders at different levels of decision making is increasingly important. Management in the various water sectors, i.e. irrigation, water supply and sanitation, etc., must also be organized and harmonized with other arrangements in society such as land policies and social programmes to achieve essential development objectives. In transboundary rivers, additional and supplementary institutional and political arrangements are required to harmonize differences between national and sub-national units and to pave the way for basin-wide strategies of international significance.

The distinction between hard and soft approaches is a simplification. Irrespective of the quality and efficiency of the various arrangements, it is crucial to remember that solutions are being conceived of, implemented and run by people, not by institutions.

The mindset, motivation, ideas and diligence of individuals are extremely important. Human history is full of examples where technical and institutional arrangements have been promising but where the human factor has failed. The slogan from the 2nd World Water Forum, 'Water is Everybody's Business,' illustrates the importance to see people for what they are: individuals, a resource and a barrier. People are Part of Nature, for good and bad.

Indicate whether each of the following is true or false by writing 'T' or 'F' in the space provided.

….. 1. Extremes, in terms of floods, prolonged droughts, hurricanes and other natural hazards wreak havoc on cultivated fields, physical structures and lead to human despair and loss of livelihood and habitat.

….. 2. People are part of Nature, for good and bad.

….. 3. Equally important, the geographical distribution of precipitation and water resources completely coincides with human settlement patterns.

….. 4. The rapidly expanding urban system cannot function in the absence of management of blue water flows, both in terms of supply and in coping with serious increases in pollution.

….. 5. Three factors – variations in climatic conditions, already secured storage and socio-political contexts – must not determine what mix of solutions could and should be promoted.

….. 6. Management in the various water sectors, i.e. irrigation, water supply and sanitation, etc., must also be organized and harmonized with other arrangements in society such as land policies and social programmes to achieve essential development objectives.

WORDLIST

acid rain – Rain, containing harmful acids.
activity – Activity is a situation in which a lot of things are happening or being done.
adapt – If you adapt to a new situation or adapt yourself to it, you change your ideas or behaviour in order to deal with it successfully.
aerobe – A bacterium requiring oxygen for life.
agriculture – Agriculture is farming and the methods that are used to raise and look after crops and animals.
AIDS – Acquired Immune Deficiency Syndrome (a very serious disease that stops your body from defending itself against infections, and usually causes death).
alga (pl. algae) – Any of a numerous class of plants that grow in sea and fresh water.
arable – Fit for ploughing and tillage.
area – An area is a particular part of a city, a country, or the world.
atmosphere – A planet's atmosphere is the layer of air or other gas around it.

barrier – A barrier is any fence or structure erected to bar passage.
balance – A state of equilibrium.

calorie – A calorie is a unit of measurement for the energy value of food.
carbon – Carbon is a chemical element that diamonds and coal are made of. All living things contain carbon.
carbon dioxide – Carbon dioxide is a gas. Animals and people breathe out carbon dioxide.
carbonate – To carbonate means to charge (water) with carbon dioxide.
chaos – Chaos is a state of complete disorder and confusion.
chlorine – Chlorine is a strong-smelling gas that is used to disinfect water and to make cleaning products.
civilization – A civilization is a human society which has its own highly developed social organization, culture, and way of life which makes it distinct from other societies.
clam – A clam is a kind of shellfish.
coastal – Coastal means in the sea or on the land near a coast.
combustion – Combustion is the act of burning something or the process of burning.
community – A group of animal and plant species living together and having close interactions.
conservationist – A conservationist is someone who cares greatly about conservation.
consume – To consume an amount of fuel, energy, or time means to use it up.
control – To control a machine, process, or system means to make it work in the way that is required.
crab – A crab is a sea creature with a flat round body covered by a shell, and five pairs of legs with large claws on the front pair.

crust – The hard outer layer of the Earth.

deforest – Clear of forests.
demography – The science of vital statistics relating to deaths, births, etc.
deplete – Exhaust by drawing away, as resources, strength, vital powers.
desert – A desert is a large area of land where there is very little water or rain and very few plants.
destruction – Destruction is the act of destroying something.
diet – A diet is the food that a person or animal eats regularly.
disappear – If someone or something disappears, they go where you can no longer see them.
disease – A disease is an illness in living things that is caused by infection or by a fault inside them.
disrupt – To disrupt an activity or system means to prevent it from continuing normally**.**
drought – A drought is a long period of time during which no rain falls.

earthquake – An earthquake is a shaking of the ground caused by the movement of the Earth's crust.
ecologist – An ecologist is a person who studies the pattern and balance of relationships between plants, animals, people, and their environment.
Ecology – Ecology is the study of the relationships between plants, animals, people, and their environment, and the balances between these relationships.
ecosphere – The part of the universe habitable by living organisms.
ecosystem – An ecological community.
emission – When there is an emission of gas or radiation, it is released into the atmosphere.
encroach – If someone or something encroaches on an area of land, they gradually occupy more and more of it.
environment – The environment is the natural world of land, sea, air, plants, and animals that exists around towns and cities.
environmentalist – A person who works toward protecting the environment from destruction or pollution.
erosion – Erosion is the gradual destruction or removal of something.
eutrophication – The depletion of the oxygen in water by algae, caused by excess phosphates, nitrates.
extinct – A species of animals that is extinct no longer has any living members.

FAO – Food and Agriculture Organization of the United Nations.
farming – Farming is the activity of growing crops or raising animals on a farm.
fishery – A fishery is an area of the sea where fish are caught in large quantities.
flood – If there is a flood, a large amount of water covers an area which is usually dry, for example when a river overflows.

fragile – Easily spoiled, harmed, or broken.

glacier – A glacier is a huge mass of ice which moves very slowly, often down a mountain valley.
global warming – The theory that the climate of the Earth is gradually becoming warmer as a result of the greenhouse effect.
globe – You can refer to the Earth as the globe.
grave danger – Danger that is grave is very serious and worrying.
greenhouse effect – The global heating effect that is caused when the atmosphere is more transparent to incoming short-wave solar radiation than it is to outgoing long-wave radiation.
GtC – Billion tons or gigatons of carbon.

habitat – The habitat of an animal or plant is the natural environment in which it normally lives.
harm – To harm something means to damage it or make it less effective or successful.
healthy – Something that is healthy is good for you and likely to make you healthy.
herbicide – Herbicide is a selective weed killer.
HHMI – Howard Hughes Medical Institute.

immunology – The scientific study of the prevention of disease and how the body reacts to disease.
industrial – You use 'industrial' to describe things which relate to industry or are used in it.
insect – Any member of a class of tiny winged invertebrates.
insecticide – A substance to kill insects.
irrigation – The artificial increase of water supply.
IUCN – The World Conservation Union.

keep from – To keep someone or something from doing a particular thing means to prevent them from doing it.
kill – When someone or something kills a person, animal or plant, they cause the person, animal, or plant to die.
kind – If you talk about a particular kind of thing, you are talking about one of the classes or sorts of that thing.

land – Land is an area of ground with few or no buildings on it.
latitude – The latitude of a place is its distance to the North or South of the Equator.
limestone – Limestone is a white-coloured rock which is used for building and making cement.

mammals – Mammals are particular types of animals.

man – 1 a mammal of the genus *Homo*;
2 a person; a human being;
3 the human race; mankind.
man-made – Something that is 'man-made' is made by people, rather than formed naturally.
management – Act of managing.
MDGs – Millennium Development Goals.
Mha – Million hectares.
melt – When something melts or when you melt it, it changes from a solid to a liquid because it has been heated.
meteorite – A meteorite is a large piece of rock or metal from space that has landed on the Earth.
monitor – A monitor is a machine that is used to check or record things.
mortality – Mortality is the fact that all people must die.
MtC – Metric tonne of carbon.

nitrate – A chemical compound of nitric acid, used as a fertilizer.
nitric acid – A corrosive compound of nitrogen, used in making dyes, explosives, plastics, etc.
nitrogen – A colourless, odourless, gaseous element, No. 7, symbol **N**, forming four-fifths of the volume of the Earth's atmosphere.
number – The sum of an aggregation of persons or things.
nutritious – Food that is 'nutritious' contains substances which help your body to be healthy.

occurrence – An occurrence is something that happens.
ocean – The ocean is the body of salt water covering three-fourths of the Earth's surface.
odour – An odour is a smell, especially a strong one.
oxide – A compound of oxygen with another element.
oxygen – A gaseous element, No. 8, symbol **O**, colourless, odourless, and essential to all life.
ozone – An ionized form of oxygen.

PAGE – Pilot Analysis of Global Ecosystems.
plankton – The microscopic animals and plants that drift freely in natural bodies of water and on which most marine life feeds.
pole –The Earth's poles are the two opposite ends of its axis.
pollute – To pollute the water, air, or atmosphere means to make it dirty and dangerous to live in or to use.
protein – Protein is a substance found, for example, in meat, eggs, and milk. You need protein in order to grow and be healthy.

quantity – A quantity is an amount that you can measure or count.

radiation – Radiation is very small particles of a radioactive substance that can cause illness and death.
rainforest – A rainforest is a thick forest of tall trees which is found in tropical areas where there is a lot of rain.
retreat – The act of withdrawing.

sandy dunes – Hills of sand heaped up by the wind.
search for food – If you search for food, you look carefully for it.
shellfish – A shellfish is a small creature that lives in the sea and has a shell.
shoreline – The line where water and shore meet.
shrimp – A shrimp is a small shellfish with a long tail and many legs.
snail – A snail is a small animal with a long, slimy body and a spiral-shaped shell.
soil – Soil is the top layer of earth, which plants can grow in.
Solar energy – The energy which can be produced from the Sun's rays or the effects of the Sun's rays or gravity.
species – A species is a class of animals or plants whose members have the same main characteristics and are able to breed with each other.
starfish – A starfish is a flat, star-shaped creature with five arms that lives in the sea.
stratosphere – The region of the Earth's atmosphere six to sixty miles above sea level.
sunlight – Light from the Sun.
survive – Continue to live.

thaw – A thaw is a period of warmer weather, usually at the end of winter, when the snow and ice melts.
toxin – A poisonous product of microorganisms.
trace – A very small quantity of something.
tree – A large perennial plant with a single permanent woody trunk.
tumour – A tumour is a mass of diseased or abnormal cells that has grown in a person's or animal's body.
tundra – A level, treeless plain of Arctic regions.

unprecedented – Having no precedent.

vanish – If something vanishes, it disappears suddenly.
vegetation – Vegetation is plant life in general.
vulnerable – Someone who is vulnerable is weak and easily hurt physically or emotionally.

waste – Waste is also material which has been used and is no longer wanted, for example because the valuable or useful part of it has been taken out.

water – Water is the clear, thin liquid that has no colour and no taste when it is pure.
watershed – A ridge off which water flows or drains.
WCMC – World Conservation Monitoring Centre.
wild – Animals living in the wild are living in their natural surroundings and are not being looked after by people.
Wingspread Declaration – It is the declaration of a meeting of non-governmental experts held in Wingspread, WI, in January 1998. See http://www.sehn.org/state.html visited 6 June 2006.
worm – A worm is a small animal with a long thin body, no bones, and no legs, which lives in the soil.
WRI – World Resources Institute.

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