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REVIEW OF THE IMPLEMENTATION OF THE RECOMMENDATIONS AND DECISIONS
ADOPTED BY THE GENERAL ASSEMBLY AT ITS TENTH SPECIAL SESSION

Protection of nature from the pernicious effects of
the arms race

Report of the Secretary-General

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* A/36/49, para. 18.

I. INTRODUCTION

1. The present report is submitted by the Secretary-General pursuant to paragraph 4 of General Assembly resolution 35/8 of 30 October 1980, and paragraph 1 of resolution 36/7 of 27 October 1981.

II. VIEWS OF GOVERNMENTS

2. Pursuant to resolution 35/8, the Executive Director of the United Nations Environment Programme (UNEP) sought the views of Governments, through a letter dated 14 April 1981, on possible measures to be taken at the international level for the protection of nature. Enclosed with the letter were the Executive Director's report on the state of the environment in 1980 (UNEP/GC.8/3 and Corr.1), chapter V of which dealt with the environmental effects of military activity, a preliminary draft of the chapter of the report on the state of the world environment 1972-1982 ^{1/} dealing with peace, security and the environment, and a study entitled "Effects of Weapons on Ecosystems" (UNEP Studies, vol. 1). The relevant conclusions of these studies are summarized in section III below.

3. As at 30 March 1982, replies to the Executive Director's letter had been received from 50 Governments. Eleven of these replies consisted of acknowledgements or notifications that the request for comments had been transmitted to the appropriate governmental authorities. Another six Governments said that their position had been clearly stated at the thirty-fifth session of the General Assembly, when their representatives abstained in the vote on resolution 35/8, and indicated their opposition to involvement of UNEP in this matter. One Government said that it did not intend to comment on the subject. The remaining replies show a great variety of reactions, ranging from a listing of relevant national legislation, through general comments on the documentation enclosed with the letter, to concrete suggestions for future action.

4. Two Governments, while recognizing the importance of the issue, considered that it should not be dealt with in the manner suggested in General Assembly resolution 35/8. In their view, to emphasize the environmental consequences of arms risked overlooking the fact that the arms race poses health risks to mankind in all aspects, and thus should be addressed within the context of concrete and comprehensive disarmament measures consistent with the national security of all States.

5. Another Government stated that, in its view, the resolution in question suffered from a lack of specificity, and did not appear capable of achieving any tangible results that would go beyond the work already carried out on the subject by UNEP.

6. A number of Governments recommended the establishment of a broader scientific, technical and legislative base within UNEP for the promotion of multilateral and

^{1/} The world environment: 1972-1982 (Dublin, Tycooly International, 1982).

bilateral co-operation in the field of the environment and of a reduction in military expenditure in favour of development and the preservation of the environment.

7. Several replies emphasized the close interrelationship between the arms race, environment and development, and some discussed the international dimensions of the arms race.

8. One Government drew attention to the two distinct aspects of resolution 35/8, the responsibility for the preservation of nature and those elements of that responsibility relating to the arms race, and recommended that each be examined separately. In its view, all States were not equally responsible for the arms race, and to state the responsibility of States for the preservation of nature in the context of nuclear warfare, without an adequate indication as to the gradation of responsibilities in the arms race, was to suggest that all States were equally accountable not only for the threat of war but for the testing of nuclear weapons, the hoarding of weapons of mass destruction, the accumulation of toxic chemicals and the adverse effects of those activities on the environment.

9. Some countries commented specifically on the documents enclosed with the Executive Director's letter, considering them to constitute important steps towards a major comprehensive study of the impact of military activity on the environment, which, in their opinion, should become one of the major lines of activity on the part of the international community.

10. Four Governments of developing countries expressed concern that both the resolution and the reports prepared by UNEP did not make clear the distinction between the responsibilities of the developed countries and those of the third world. One Government specifically indicated that, in its view, the documentation tended to highlight alleged military activities and expenditure in third world countries. In assessing global military expenditure, account should be taken of the primary responsibility for disarmament that rested with the States having the largest military arsenals, and it should be pointed out that the vast majority of conventional weapons, in both qualitative and quantitative terms, were produced, developed, retained and deployed by the nuclear-weapon States and their allies, and that six States (including the five nuclear-weapon States) were responsible for 80 per cent of the world's military expenditure.

11. Some Governments expressed the view that the increased military expenditure taking place in many developing countries was dictated by internal and external factors. Some replies emphasized the external factors, stating that the conflicts and tensions in the world had been exacerbated by the intensification of great-Power rivalry and the competition among great Powers for spheres of influence.

12. Nuclear weapons were singled out as posing the most comprehensive threat to the environment on a global scale. Some Governments expressed the view that UNEP should accordingly give the highest priority to effective measures for nuclear disarmament, as called for by the General Assembly at its tenth special session in 1978. Some countries felt that the international community should pay close attention to the environmental risks of:

- (a) Nuclear weapons testing, particularly in the atmosphere;
- (b) Large stockpiles of nuclear and chemical and radiological weapons;
- (c) Waste from industries producing nuclear weapons.

13. Some Governments stated that opposition should be expressed to the use of force in settling international conflicts, the use of weapons to destroy crops or forests, the squandering of resources on the arms race, the proliferation of nuclear weapons, the use of asphyxiating, poisonous or other gases and of bacteriological methods of warfare, and the testing of nuclear weapons in the atmosphere, in outer space and under water.

14. Some countries suggested that efforts should be aimed at the conclusion of a comprehensive test-ban treaty and of conventions on the prohibition of chemical and radiological weapons, and at the urgent ratification and entry into force of the Treaty on the Limitation of Underground Nuclear Explosions for Peaceful Purposes.

15. Two Governments emphasized the impact of the arms race on island ecosystems, which were particularly vulnerable to outside disturbance as a result of abnormal environmental stresses caused by military activity. One of them pointed out that Pacific islands were affected by nuclear tests, the full effects of which might not be established for a considerable time. Reports indicated that radionuclides (caesium 137 and strontium 90 among others) appeared to be incorporated in the biogeochemical cycle of the local ecosystems. The increasingly militarized nature of the South Pacific ocean involved most island countries which were economically dependent on the sea, and posed risks to such agreements as the Treaty on the Prohibition of the Emplacement of Nuclear Weapons and other Weapons of Mass Destruction on the Sea-Bed and the Ocean Floor and in the Subsoil Thereof and the forthcoming convention on the law of the sea.

16. Five countries suggested that UNEP should organize regular seminars and symposiums to review and analyse the arms race and its impact on the environment. Another suggested that the advice of UNEP should be sought in drafting model legislation on the matter.

17. In general, the replies stress the role of the United Nations system in relation to the issue; but while the majority of developed countries which replied are against the involvement of UNEP, the replies from developing countries clearly visualize a role to be played by UNEP.

III. SUMMARY OF THE STUDIES TRANSMITTED TO GOVERNMENTS

18. The arms race absorbs vast human and natural resources. One estimate sets the annual world military consumption of oil at 5 to 6 per cent of total annual world oil consumption (see A/36/356). Military activities also consume vast amounts of non-fuel minerals. It has been estimated that such activities account for about 6.3 per cent of the total aluminium consumed in the world per year; the percentages for some other minerals are even higher (copper, 11.1 per cent; lead, 8.1;

nickel, 6.3; silver, 6.3; zinc, 6.3). About 60 million people, equivalent to the entire labour force in manufacturing industries in Europe outside the Union of Soviet Socialist Republics, are engaged in military or related occupations. 2/ Moreover, many of these are highly qualified people: one estimate suggests that military research and development absorbs scientific and technological capabilities 10 times as great as are available to all the developing countries together. 2/ On a global basis, it has been estimated that about 20 per cent of the world's qualified scientists and engineers were engaged in military work during the 1970s (see A/36/356). Global expenditure on military research and development in 1980 was about \$35 billion or about 25 per cent of the estimated \$150 billion expended for all research and development in that year (ibid.).

19. Implicit in the arms race is the possibility that the weapons involved may be used. The most obvious and horrifying direct effects of war are on people. But past wars have also had direct and indirect effects through the changes they have brought about in the environment, changing agriculture, shifting the margins of deserts and disturbing the balance of ecosystems. Most wars have devastated farmlands. The Second World War caused a short-term reduction of 38 per cent in the agricultural productivity of 10 nations; recovery progressed at about 8.3 per cent per annum. In more recent wars, new types of weapons, including high explosive munitions, chemical agents and incendiaries, have been deployed with still greater environmental effects. In Viet Nam, chemical herbicides completely destroyed 1,500 square kilometres of mangrove forest and caused some damage to about a further 15,000 square kilometres; natural recovery is proceeding at a disturbingly slow rate. 3/ 4/ More than 100 kg of dioxin inadvertently disseminated as an impurity in one of these defoliants has since been linked to human birth defects and miscarriages, and to liver cancer. Millions of people in South-East Asia have been displaced from their settlements and cultivated lands, leading to further environmental deterioration, including development of secondary vegetation and collapse of drainage systems. Recovery from these various impacts is likely to take decades. Agricultural pests and vectors of human disease have been spread as another inadvertent consequence of warfare: during the Second World War, Italy suffered from the invasion of a moth (Hyphantria cunea) whose larvae defoliate valuable trees. 4/

20. Even worse environmental disruption is likely if new weapons now being developed and tested come into widespread use. Nuclear arsenals are increasing and constitute a major threat to mankind. A full-scale nuclear war would destroy all major cities in the northern hemisphere, killing the bulk of the urban population there by blast and fire, and the bulk of the rural population by radiation. It would, in addition, kill many millions in the southern hemisphere by radiation from

2/ Economic and Social Consequences of the Arms Race and of Military Expenditure (United Nations publication, Sales No. E.78.IX.1).

3/ Stockholm International Peace Research Institute (SIPRI), Econological Consequences of the Second Indo-China War (Stockholm, Almqvist and Wiksell, 1976).

4/ SIPRI, Warfare in a Fragile World: Military Impact on the Human Environment (London, Taylor and Francis, 1980).

fallout. The long-term consequences, though unpredictable, could affect the global climate, causing serious reduction in the ozone layer. In addition, there might well be genetic effects from radiation. 5/ The testing of nuclear weapons has seriously contaminated the atmosphere with radioactive materials and has damaged significant areas of desert. Detonation of weapons in the 10 kiloton range causes complete or severe destruction of vegetation over some 400 to 1,300 hectares. 4/ Use of these weapons in a full-scale war would destroy vegetation and lead to soil erosion over large areas, as well as inject huge amounts of radioactive dust into the stratosphere. Ecological recovery in such eroded areas would certainly be extremely slow. 6/ 7/ Nuclear explosions in the stratosphere would, at least temporarily, deplete ozone concentrations and increase the amount of ultra-violet radiation reaching the earth's surface, thereby increasing the incidence of several effects harmful to man and ecosystems. The neutron bomb (a low-yield nuclear weapon designed to kill or incapacitate people in armoured vehicles mainly by ionizing radiation, rather than blast or heat) would also do appreciable environmental damage. It is estimated that detonation of a one-kiloton bomb 200 metres above the ground would cause death to a wide range of micro-organisms over an area of 40 hectares, to many insects over 100 hectares, to many amphibians and reptiles over 330 hectares, to many species of higher plants over 350 hectares and to many species of exposed mammals and birds over 490 hectares. 8/

21. The use of chemical and biological weapons could also have serious environmental consequences since they involve, in effect, deliberate pollution by the release of toxic chemicals or harmful micro-organisms. Chemical deforestation in tropical areas with fragile soils, or semi-arid areas already delicately poised on the brink of desert, could create rapid erosion and irreversible desertification. Wide-scale use of incendiary chemicals, such as napalm, could have similar results. 7/ 9/ As experience in recent wars in South-East Asia shows, even in areas that are ecologically robust, damage by fire and chemicals to natural vegetation and to crops grown for food and fibre is often long-lasting. If, despite international agreements, chemical, bacteriological or biological weapons were used, the effects of deliberately disseminating quantities of up to a dozen species of highly virulent, pathogenic bacteria are less certain; much would depend on whether they attacked livestock or crop species as well as man, and on how long they sustained themselves in the wild. But it is easy to see ways in which agriculture and the ecological balance could be disturbed for a long time. 7/

5/ SIPRI Yearbook 1979: World Armaments and Disarmament (London, Taylor and Francis, 1979).

6/ Long-term Worldwide Effects of Multiple Nuclear Weapons Detonations (Washington, D.C., United States Academy of Science, 1975).

7/ SIPRI, Weapons of Mass Destruction and the Environment (London, Taylor and Francis, 1977).

8/ A. H. Westing, Ambio, vol. 7, No. 3 (1978), p. 93.

9/ J. P. Robinson, The Effects of Weapons on Ecosystems, UNEP Studies, vol. 1 (Oxford, Pergamon Press, 1979).

22. The UNEP study of the effects of weapons on ecosystems analysed the types of ecological impact that various military activities impose on ecosystems. The most fundamental and persistent effects arise when vegetation disruption is accompanied by massive soil erosion, and by alternations to the hydrological régime and to the likely pattern of plant succession. Under such circumstances, there is no guarantee that the original ecosystem will be restored. Major ecological changes of this kind are especially likely in tropical forest regions and semi-arid areas, and also in polar tundra zones where recovery from any disturbance is very slow.
23. There have been speculations about the possibility of causing economic or other damage to the population of an enemy through environmental modifications. Methods of weather modification are being developed for peaceful purposes, and there is concern not only that those using them could cause accidental damage to neighbouring States, but that such techniques could have hostile applications. For example, cloud and rainfall might be deliberately increased in one area in order to create drought and agricultural damage elsewhere. Such operations could be carried out covertly, and would be very hard to detect and counteract. The mere possibility of such actions could poison international relations, because of the difficulty in deciding whether a flood, drought or crop failure was due to natural causes or to the actions of an enemy.
24. The hazards of war do not end with the coming of peace. Unexploded mines, bombs and shells can hamper mineral exploitation, make land unsafe to farm, hamper development and endanger people who disturb them. Bomb craters, wrecked vehicles or derelict defences and buildings are a blot on the landscape and reduce its value for recreation. Mines in rivers or at sea can be a serious danger to fishermen, hamper their work, and, if washed ashore, also imperil those living on the coast. The safe disposal of these remnants demands skills that many developing countries lack and imposes costs they cannot easily meet. Records of where mines were laid may have been lost, or be held by the original belligerents and not be readily available.
25. The disposal of obsolete weapon stocks also poses threats to the environment. Even conventional weapons can present disposal problems. The safe storage and ultimate disposal of chemical or biological weapons poses greater difficulties. High-level radioactive wastes need to be stored in isolation for many centuries, and satisfactory ways of doing this are still being sought.
26. Another important impact of military activity is human migration. The millions of refugees have not only suffered economic and social losses and disruption, but have also exerted pressures on the ecosystems in the areas to which they migrated. In most cases, the living conditions in the new habitat are intolerable in human terms, and the lack of adequate infrastructures means that disease, malnutrition and social disruptions have become common problems. In spite of the different international efforts to alleviate the problems of refugees, they will continue to augment with increases in tension and military activity.
27. The growing volume and destructive power of the world's weapon stocks pose an obvious risk to man and to his environment. Even the testing of these weapons can cause serious environmental damage, as can accidents in their handling, transport,

storage and disposal. The use of weapons against the environment - especially to remove sheltering forests or to destroy the crops on which an enemy depends - brings with it the risk of long-term or even irreversible damage to soil, agriculture and the ecological balance. If environmental manipulation became an effective agent of war, a further dimension for damage would be added.

28. While these direct impacts on man and his settlements, food and environment have in one form or another been familiar features of wars through the centuries, wars have become increasingly disruptive of the environment, and the power of the world's armed forces to devastate large areas is many times greater now than it has ever been. Moreover, the arms race is also having serious environmental consequences because it competes for resources with other forms of development which are essential if the quality of life on earth is to be raised to more acceptable levels.

29. Global military expenditure has increased more than thirtyfold since 1900. It now absorbs about \$US 500 billion a year - approaching \$1 million per minute - ^{10/} and if the current average annual rate of growth of military expenditure of 3.2 per cent continues, it could reach \$1,000 billion a year in current prices by the year 2000 (see A/36/356). The current increase in military expenditure is taking place at a time when 1,500 million people (nearly 40 per cent of the world's population) have no effective medical services, nearly 570 million people were severely undernourished, about 3,000 million lack access to safe water, and nearly 750,000 die each month from water-borne diseases. About 800 million people are illiterate and nearly 250 million children under the age of 14 do not attend school. ^{11/} Yet it is in the developing countries, where these problems are most acute, that military expenditure, including expenditure on arms imports, is growing most rapidly. These countries are choosing, sometimes for compelling reasons of security, to spend less money on economic development in order to buy weapons. Scarce scientific and technical manpower is being diverted from the development of the social and environmental foundation for prosperity to the development of military power. The developing countries, where millions of people live in absolute poverty, are spending about 3 to 4 per cent of their gross national production (mostly less than \$500 per capita) on military activities, a percentage equal to that spent by more affluent societies, where GNP per capita is more than \$4,500. In the Middle East, the percentage is much higher, more than 13 per cent. And world military spending is nearly 19 times greater than the total official development aid given by developed to developing countries.

30. The effects of the arms race and military expenditure on trade, aid, technological and scientific co-operation, and other kinds of exchange between

^{10/} SIPRI Yearbook 1981: World Armaments and Disarmament (London, Taylor and Francis, 1981).

^{11/} World Bank, World Development Report 1979 (Washington, D.C., 1979).

countries are far-reaching. Political and strategic considerations distort the flow of trade and aid. The only politically realistic way for most rich countries to increase their aid to poor ones is to reduce military spending, since money cannot be taken from other parts of national budgets. In the absence of such action, the diversion of resources away from investment that could increase the wiser use of the environment for production and growth can only contribute to inflation and economic crisis and to a widening of the gap between developed and developing countries. On any logical analysis, the world cannot afford the arms race - the developing countries least of all. Yet as long as suspicion and uncertainty remain so prevalent in international affairs, this situation is likely to continue.

31. For obvious reasons, international actions in this field tend to aim not at reducing the environmental impact of military activity, but at seeking to reduce the likelihood of such activity taking place. In addition to reducing the risk of war through strict observance of the United Nations Charter, one main way of limiting the hostile use of military weapons is the negotiation of international agreements concerning the use of certain weapons. Parallel to this approach is the effort since the Second World War to seek agreements that curb the arms race in one way or another. The two approaches overlap. There are international conventions of both kinds, although they are limited in scope and not all States are yet parties to them. These treaties and agreements have contributed to building better international understanding, as did the special session of the General Assembly devoted to disarmament, held in 1978.

32. The questions of disarmament, development and environmental protection are closely linked, and constitute some of the most important issues before the international community today. Development can hardly proceed at the required pace, and a healthy environment cannot be guaranteed, amidst a widening and constantly escalating arms race. Moreover, development and environmental efforts are threatened by the armaments, especially nuclear weapons, already stockpiled, the use of which either by intent or in error or sheer madness would severely jeopardize mankind's very existence.

33. One of the most urgent tasks, therefore, is to arrest the technological spiral at the centre of the international arms race and, through substantial and substantive disarmament measures, to pave the way for major reductions in world military expenditures. A major breakthrough in the disarmament field would release vast financial, technological and human resources for more productive uses in both developing and developed countries in an international political climate of much-reduced tension. Even if only 20 per cent, for example, of annual military expenditures were to be diverted, for instance, to an international fund for sustainable development projects, the developing countries would thus be enabled to attain their socio-economic objectives more effectively.

34. In the environmental field, the immediate needs are, first, to develop means of predicting the kinds of stress various weapon systems will place upon different ecosystems, and, second, to improve methods for the restoration of lands devastated by war. More needs to be known about the ecological disruption that could be caused through the hostile use of all weapons, especially weapons of mass destruction, including the deliberate dispersion of pathogenic micro-organisms, and

special attention must be given to the possible military use of weather modification techniques. In addition, the restoration of farmlands and forests, provisions to secure the removal of hazardous relics of past wars and international action to ensure safe disposal of radioactive wastes, obsolete explosives, and chemical and biological weapons all merit continuing attention and effective action.

IV. HIGH-LEVEL EXPERT GROUP MEETING ON THE HISTORICAL RESPONSIBILITY OF STATES FOR THE PRESERVATION OF THE ENVIRONMENT FOR PRESENT AND FUTURE GENERATIONS

35. The Executive Director of UNEP convened, at Geneva in 1982, a small expert group to review the response of Governments to his letter of 14 April 1981, as well as the documentation transmitted with that letter. The group also discussed the environmental impact of arms production, focusing on the use of land and natural resources for military purposes and the environmental impacts of nuclear weapons production, biological and chemical weapons, geophysical and environmental weapons, conventional weapons testing and the military use of outer space. The report of the group is available to delegations on request.

36. The expert group reached conclusions along the following lines:

(a) Despite the huge expenditure of resources on the military, many populations feel increasingly insecure. Money spent on the military can, therefore, be seen as an unjustifiable waste of limited resources. The diversion of scientific and intellectual effort is particularly regrettable. If this effort were channelled into dealing with problems of world health or food production or of the environment, the results could be impressive;

(b) Given the current international climate, and the planned and probable increases in military budgets over the next few years, inevitable increases in negative environmental consequences can be expected as a result of the increasing requirements for limited natural resources and greater impact on the natural environment;

(c) In a world of increasing pressure on shrinking supplies of raw materials and land, the unproductive and often destructive military use of land and resources cannot be afforded, even though these may appear relatively small (perhaps 0.5 to 1 per cent of land, and 5 per cent of raw materials);

(d) Of particular concern are nuclear weapon tests in the atmosphere and those underground that vent radioactivity into the atmosphere;

(e) Military research into biological agents continues, and legally so under the 1975 Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction. Although this work may be declared to be of a defensive nature, there is great potential for very damaging accidents;

(f) Present knowledge of the interaction between environment and development indicates the risks of serious long-term effects that jeopardize the sustainable

resource base for development. Efforts should be made to increase this knowledge in co-operation with decision-makers, Governments and international organizations;

(g) Because of the historical responsibility of States for the preservation of nature for present and future generations, the ultimate goal of arms control and disarmament negotiations must remain general and complete disarmament. Of great environmental concern is the military use of space for technologies which support war-fighting capabilities with great potential for environmental destruction. Of similar environmental concern is the pollution of outer space by ever-increasing amounts of debris from military and other satellites.

V. RECOMMENDATIONS

37. On the basis of the response of Governments, the three reports summarized in section III above and the conclusions reached by the group of experts, the General Assembly may wish to consider the following measures for future action:

(a) Continuing assessment, monitoring and evaluation of the impacts of military activity on the environment. For this purpose, consideration may be given to the establishment of a network of scientific institutions and of a relevant data base which could facilitate interdisciplinary and multidisciplinary evaluation of such impacts and allow the dissemination of accurate information on the subject;

(b) The possibility of demilitarizing ecologically important regions and converting them to protected areas; regions are ecologically important if they contribute substantially to the global balance of nature, if the systems are intrinsically fragile, if they support unique habitats, or if they provide the habitat for species in danger of extinction;

(c) The encouragement of studies on the relationship between security and the stability of ecosystems at local, national and wider levels;

(d) The development of means of ensuring that outer space is not used for hostile purposes;

(e) A call upon all Powers that have not yet ratified the Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and under Water to do so; the possibility of developing a comprehensive nuclear-test ban by all States as a means of ensuring security against major destruction of the environment; the development of a treaty by which all nations would pledge themselves not to be the first to use nuclear weapons in warfare; the initiation of bilateral negotiations on a nuclear freeze;

(f) Measures to ensure the full implementation of the Treaty for the Prohibition of Nuclear Weapons in Latin America (Treaty of Tlatelolco) ^{12/} and the

^{12/} United Nations, Treaty Series, vol. 634, No. 9068, p. 326.

establishment of other such zones in various parts of the world as an important measures of environmental protection;

(g) Methods of strengthening the non-proliferation régime, to protect against the proliferation of elements of the nuclear-fuel cycle;

(h) Consideration by the conference to review the Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques envisaged for 1983, of the possibility of banning anti-plant chemical warfare, which some experts believe to be the most serious environmental threat from chemical and biological weapons, and of strengthening the Convention to prohibit all hostile uses of environmental manipulation techniques;

(i) The development of a treaty prohibiting the development, production and stockpiling of chemical weapons and calling for the destruction of existing ones;

(j) The possibility of establishing a ban on any weapon or technique, existing or potential, which would devastate a wide area and threaten the regional or local ecological balance.
