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Moskou, UdSSR 17-21 augustus 1987



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nzake
Natuur- en Milieu-educatie
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Nederlandse verslaglegging
voor de
Interdepartementale werkgroep
Natuur- en Milieu-educatie (IWNME).
C.A. Fuykschot
Ministerie van Onderwijs en Wetenschappen
Zoetermeer.
Moskou, 21 augustus 1987.

Toegezonden organisaties:

1. IWNME (7 departementen; LaVi 2x)
2. O&W/IB (2x)
3. OECD (1x)
4. SLO (4x)
5. Natuurbeschermingsraad (22x)
6. DGI, DI/VZ, RA, LO, OR, BG, DI/SC (7x)
7. DGBO/UNESCO (1x)
8. VO/BO, VO/AL, VO/VB (3x)
9. BO/BO (1x)
10. SVO (1x)
11. CITO (1x)
12. LSNME (2x)
13. VALO'S (1x)
14. VO-netwerkscholen (4x)
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- Outline international strategy for action in the field of environmental education and training for the 1990s.
- Environmental education in the Netherlands: progress and problems in a decade.

INLEIDING

Het wereldcongres UNESCO-UNEP 1987 is het vervolg op de eerste Intergouvermentele wereldconferentie omtrent milieu-educatie te Tbilisi, Georgie (UdSSR) 1977.
Ongeveer 300 experts, deelnemers en observanten uit alle werelddelen (ca. 80 landen) namen aan het congres deel. De Nederlandse deelname werd zeer beperkt tot één vertegenwoordiger van de IWNME en de secretaris van de Natuurbeschermingsraad namens de NUC. De hoofddoelstelling van het congres was een overzicht te krijgen van de 10 jaar na Tbilisi met het oog op het formuleren van een strategie voor de jaren 1990 e.v. inzake de ontwikkelingsrichting voor natuur- en milieu-educatie binnen de UNESCO-UNEP reikwijdte.
Organisatorisch gezien werden 3 hoofdcomponenten in parallelle sessies aan de orde gesteld, te weten:

Commissie I:

"Environmental education and training of teaching personel for school and out-of-school activities and priorities for their development in the 1990s."

Commissie II:

"Environmental education in general university education and priorities for its development in the 1990s."

Commissie III:

"Specialized environmental training and priorities for its development in the 1990s."

Gelet op het IWNME-kader wordt in dit verslag vooral ingegaan op de algemene inleidingen en wordt tevens meer specifieke aandacht besteed aan de aangelegenheden van commissie I.
In tegenstelling tot 10 jaar geleden op de Tbilisi-conferentie, waar vooral de beleidsstandpunten op gouvernementeel niveau aan de orde kwamen, werd nu veel aandacht besteed aan de meer vakinhoudelijke en beleidsmatige aspecten en omstandigheden op het terrein van het onderwijs in natuur en milieu.
Het nakomende congres literatuuraanbod zal voor Nederland gecoördineerd worden door het secretariaat van de Natuurbeschermingsraad.*
De Nederlandse congresbijdrage vanuit de Natuurbeschermingsraad is als bijlage bijgevoegd.
Eveneens is de besproken "outline-strategy" bijgevoegd.
Voor de aanvang van het Congres is aan de UNEP het regeringsdocument "Nature and environmental education in the Netherlands" toegezonden.

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1. De openingssessies.

a. Namens de Raad van Ministers van de UdSSR verzorgde Mr. G. Yagodin, Minister of Higher Education of the UdSSR, de openingsspeech. Hij waarschuwde ervoor dat de wereldwijde milieuproblematiek tegen de achtergrond van vraagstukken als oorlog en vrede de toekomst van onze beschaving tragisch zou kunnen beïnvloeden. Hierin kunnen we niet onverschillig blijven aangezien het leven op deze aarde vermoedelijk het enige is in het heelal. Er is een gezamenlijke interesse om de bestaande problemen aan te pakken om de totale vernietiging van de wereld te voorkomen. Hij wees erop dat Mr. M.S. Gorbachov voorstander was van een nieuw politiek denken, waarbij de interrelatie tussen de mens en de natuur een belangrijke categorie is.
Het potentieel van de biosfeer is beperkt en het is naïef om te denken dat verbetering van het milieu zal plaatsvinden zonder organisatorische maatregelen en verandering van attitude.
Wie anders dan de opvoeders zouden hieraan aandacht moeten besteden?
Milieubewustwording, als een ethische categorie, vereist levenslang onderwijs en training. Natuur- en milieu-educatie moeten als categorie zeer nauw verweven zijn met het algemene onderwijsprogramma en de daarbij behorende professionele training.
Hij wees er tenslotte op dat de UdSSR er veel aan doet om te voorzien in programma's van natuur- en milieu-educatie voor schoolkinderen, jongeren en volwassenen. Maar ook dit land moet nog een lange weg gaan. Een brede internationale uitwisseling van ervaringen samen met de ontwikkeling van nieuwe benaderingen is wenselijk om de meest grote milieuproblemen op te lossen. Ook de UdSSR kampt met grote problemen. Recent zijn een groot aantal resoluties op dit punt aangenomen.
Wellicht dat we ooit eens de "noösphere" kunnen creëren, de biosfeer van wijsheid, als de droom van de geleerde V.I. Vernadsky.

b. Vervolgens hield Mr. A.M. M'Bow, directeur-generaal van de UNESCO, een openingsrede. Hij wees er allereerst op dat integratie van natuur- en milieu-educatie in het practische onderwijs een lange termijn programmering vereist.
Onderwijs en de publieke opinie te samen zijn belangrijke instrumenten daarbij. De uitkomsten van dit congres gaan alle autoriteiten en beleidsmakers over de hele wereld aan. Daarbij is implementatie van basisconcepten, doelen en maatregelen via de massa-media en de nieuwe technologische ontwikkelingen een must. Omdat de scope van problemen inzake het milieu van een interdisciplinair karakter heeft, zijn ook de daarbij behorende onderwijsprogramma's en trainingsprogramma's van een interdisciplinair karakter. Dat betekent dat zowel de inhoud als het proces van integratie van natuur- en milieu-educatie in het algemene onderwijs interdisciplinair zal zijn. Na

Tbilisi is duidelijk geworden dat in dit perspectief natuur- en milieu-educatie tevens gezien moet worden als een belangrijke innovatiefactor voor het gehele onderwijs en als een stimulans voor de vernieuwing van de algemene onderwijs-inhoud.
Voorts wees M'Bow op het buitengewoon grote belang van internationale samenwerking. Deze samenwerking is de drijvende kracht achter oplossingsmodellen voor milieuproblemen.
Tenslotte wees M'Bow op het belang om tot een strategie-bepaling voor de jaren 1990 te komen. Het congres kan daar richting en inhoud aan geven. UNESCO/UNEP willen gaarne alle hulp bieden om tot internationale bundeling van krachten te komen.

c. Namens de UNEP ging Mr. H.W. Mansfield in op de relatie tussen economie en ecologie.
Als het ware twee kanten van een munt. De moderne maatschappij behoort de grenzen van de natuur te respecteren, maar ze kent ook een groot verschil tussen economie en ecologie.
Environment is een zaak van iedereen. De relatie tussen economie en ecologie is een kwestie van leven en dood. Rond beide begrippen is een race in de tijd ontstaan.
Economie is iets waar je bezorgd over bent als je in moeilijkheden verkeert.
Ecologie is iets waar je bezorgd over bent als alle andere zaken tamelijk goed in orde zijn.
Tien jaar na Tbilisi is het nog meer nodig onderwijsaandacht te geven aan de problemen inzake natuur en milieu.
Meer en meer blijkt dat de internationale vredessituatie een belangrijke randvoorwaarde is voor de ontwikkeling van een evenwichtig beheert environment. Twee hoofdvragen houden de UNEP bezig:

a. Waarom is implementatie van natuur en milieu in de curricula zo moeilijk?
b. Waarom gaan de ontwikkelingen in het opzetten van natuur- en milieu educatieve programma's zo langzaam?

Dit congres zal nieuwe wegen en doelen moeten aangeven.
Onderwijsprogramma's dienen in te spelen op een tweetal prioriteiten die boven alle andere gaan.
De eerste is resource management.
De belangrijkste boodschap is daarbij dat economische ontwikkeling niet mogelijk moet zijn als het milieu daarvan grote schade zal ondervinden.
De tweede is aandacht geven aan rural development in de 3e wereld.
Grote gevaren als woestijnvorming, ontbossing, macroverstedelijking zijn aspecten die voor de ontwikkeling van de 3e wereld beheersbaar moeten zijn.

2. Plenaire mainsessies

a. De State of the environment:
Educational and training implications.

Namens UNEP sprak Mr. G.N. Golubev over de 10 belangrijkste onderwerpen op wereldniveau met implicaties voor het onderwijs:

- lost of productive land
- change of climat; greenhouses;
  stijging temperatuur; stijging zeeniveau
- verlies van tropisch oerwoud
- mismanagement of fresh water;
  80% van alle ziekten in de wereld ontstaat door slecht water
- mismanagement and pollution of oceans
- threat of human life by chemicals.
  Van de 76.000 chemicaliën is slechts 10% onderzocht op de gevolgen voor de natuur en het milieu
- inadequaat energiegebruik van de natuurlijke hulpbronnen; houtgebruik
- verlies van genetische variëteiten
- problematiek macro-verstedelijking bijv. Mexico-stad
- atmosferische vervuiling.

Mr. Golubev schetste 3 hoofdkenmerken inzake deze milieu-aspecten:

- de problemen zijn wereldwijd van betekenis
- het betreft een multi-dimensionale problematiek
- het gaat om een interrelationele problematiek.

De UNEP wijst erop dat deze gegevens bepalend zijn voor de wijzigingen van de onderwijsprogramma's. Daarbij zijn de volgende omstandigheden van belang:

- veel projecten in het onderwijs geven goede resultaten
- het is absoluut noodzakelijk om meer internationale onderwijsprogramma's op te zetten met gebruik van de projectenvorm
- er is grote interesse voor natuur- en milieu-educatie op wereldniveau
- er moet worden uitgegaan van een positieve impact in educatief opzicht. Leerlingen dienen niet alleen geïnformeerd te worden over de rampen etc. maar ook gewezen te worden op de bereikte resultaten bij een gerichte aanpak van de milieu-problematiek
- het onderwijs richten op "long-term sustainable environment development" moeten alle landen accepteren als prioriteit.

b. Environmental education since the Tbilisi-conference and through the 1990s.

Namens UNESCO sprak Mr. A. Chiba over het belang van de IEEP-projecten als activiteit van UNESCO-UNEP.
Hij gaf een globaal overzicht van deze programma's. Tevens wees hij op het belang van de informatie-uitwisseling via CONNECT, een kwartaalblad van UNESCO-UNEP.
Hij vroeg veel aandacht voor het belang van de doorwerking van internationale projectresultaten naar de landen-onderwijs-programma's.

c. Contribution of international scientific programmes to environmental education and training.

Namens UNESCO sprak Mr. S. Dumitrescu over belangrijke topics inzake natuur- en milieu-educatie:

- de noodzaak van goede informatievoorziening
- het belang van internationale samenwerkingsprogramma's op het gebied van onderwijs en training.

d. Situation of environmental education and training: practical response to the Tbilisi-conference recommendations in the UdSSR.

Uiteraard kreeg het gastland via de Vice-Minister of Higher Education Mr. N. Egorov de gelegenheid om in te gaan op de resultaten na Tbilisi.
Het spreekt vanzelf dat de UdSSR kon meedelen dat op alle Tbilisi-aanbevelingen belangrijke voortgang is geboekt.

3. General discussion

In de algemene discussie na de specifieke bijdragen in de plenaire mainsessies werd door een aantal experts suggesties naar voren gebracht om te verwerken in de UNEP-ontwikkelingskaders.
De volgende punten vielen daarbij op:

a. Politieke besluitvorming moet meer plaatsvinden in een "economie-ecologie" kontekst.
b. Meest bedreigend voor milieu en biosfeer lijken nucleaire aangelegenheden.
c. Het is hoog tijd om een nieuw begrip wereldwijd in te voeren zijnde "ecologische veiligheid".
d. Het onderwijs moet veel sterker gericht worden op de biosfeer.
e. In relatie met bevolkingsplanning, ruimtelijke ordening en industriële vestigingsbeleid moeten "nature development laws" worden ontwikkeld.
f. Geen land kan meer leven in een milieu isolement; het onderwijs moet daar rekening mee houden; meer internationale onderwijsprogramma's moeten worden opgezet.
g. Op alle internationale congressen blijkt in toenemende mate dat topmanagement, politici en beleidsbeslissers veel beter geïnformeerd en geschoold moeten worden.
h. Elk land op de wereld moet een apart milieu-ministerie hebben.
i. Het wordt tijd een wereldraad op te richten met een referee-task waar het gaat om essentiële natuur- en milieu-belangen.
j. Elke toekomstige leraar moet ecologiecursussen in zijn opleidingspakket hebben gehad.

4. Outline international strategy for action in the field of environmental education and training for the 1990s.

Van het congres werd een belangrijke bijdrage verwacht voor het uitzetten van de lijnen voor de komende 10 jaar UNESCO/UNEP programma's. Als belangrijkste concept-document werd de "outline" gehanteerd (bijgevoegd).
Na vele interventies van vooral onderwijs vakinhoudelijke experts op het gebied van natuur- en milieu-educatie werden de volgende algemene conclusies geformuleerd:

a. Er bestaat een hoge acceptatiegraad voor het concept-rapport.
b. Aan de non-formal education moet meer ruimte worden toegekend, evenals aan de volwasseneneducatie.
c. Er moeten programma's voor decision-makers komen.
d. Het begrip "interdisciplinarity" moet meer onderbouwd worden en duidelijk gemaakt worden aan decision-makers.
e. Gelet op de aandacht van vele educatieve aandachtsvelden moet gewerkt worden aan integratie en prioriteiten, zodat de praktijk van het onderwijs niet overspoeld wordt.
f. Kwesties als attitude en feelings moeten meer benadrukt worden.
g. De WCS moet steeds gezien worden als framework voor het handelen.
h. Natuur- en milieu-educatie moet in nauwe relatie gezien worden met sociale en culturele aspecten.
i. In officiële documenten moet meer aandacht voor de praktische onderwijssituatie komen.
j. In de onderwijsprogramma's moet veel aandacht gegeven worden aan oplossingen van milieuknelpunten en niet alleen aan rampen etc.
k. De kinderen in de wereld moet een positief toekomstperspectief geboden worden, ze hebben er recht op.
l. Informatie-voorzieningssystemen moeten geoptimaliseerd en geïntegreerd worden.
m. De overal teruglopende economie vraagt de grootste aandacht.
n. Meer aandacht in het beroepsonderwijs voor natuur- en milieu-educatie is van toenemend belang.

Extra attentie kregen daarnaast nog de volgende uitspraken:

a. In de 90er jaren zal een wereldwijde onderwijsaanpak van het grootste belang zijn. Samenwerking tussen alle instellingen en instituties is meer en meer noodzakelijk.
b. Van alle landen wordt meer financiële steun voor natuur- en milieuprogramma's verwacht.
c. Alle landen zullen moeten toezien op de implementatie van de UNEP-programma's in de nationale programma's.
d. Geïntegreerde aandacht van alle disciplines op alle onderwijsniveau's ligt voor de hand.
e. Onderwijsprogramma's moeten een continu effect hebben.
f. Kinderen zijn voor de wereld zeer kostbaar materiaal.
g. Maak gebruik van de advanced-technology, maar vergeet ook de traditionele wijsheid niet.

h. Elk model-curriculum heeft een meervoudige betekenis, uitwerking naar het schoolniveau is een delicate kwestie.
i. Van UNESCO/UNEP wordt meer "development guideliness" verwacht.
j. Curriculum-development is een uiterst gecompliceerd proces; alle landen moeten van elkaar leren.
k. Teacher-training moet hand in hand gaan met curriculum-development.

Tenslotte kan vermeld worden dat het congres veel waardering had voor het motto:

"Think globally, act locally;
think locally, act globally".

5. International and regional cooperation in the field of environmental education and training

In deze mainsessie kwamen de volgende hoofdzaken aan de orde:

a. In veel landen blijken problemen te bestaan met het formuleren van evaluatiekriteria. In verband met het goed definiëren van curriculumprogramma's zou een wereldstandaard voor deze problematiek ontwikkeld moeten worden. Tevens werd gevraagd om internationale aandacht voor het opnemen in de examens van items voor natuur- en milieu-educatie.

b. De uitkomsten van nationaal gevoerd onderwijsbeleid zou veel meer en veel beter kunnen doorwerken naar het wereldniveau, waarna een terugkoppelingsmechanisme ontwikkeld zou moeten worden naar het landelijk niveau.

c. Er is veel meer horizontale afstemming tussen instellingen en instituties op nationaal niveau noodzakelijk. Op wereldniveau met UNESCO-UNEP-IUCN-ICSU wordt alle aandacht aan de hier vereiste afstemming gegeven.

d. Internationale onderwijsprogramma's zullen de onderwijskundige benadering van "problem-oriënted-approach" meer in een positief perspectief moeten zetten.

e. Internationaal verworven resultaten en uitkomsten van congressen en seminars zullen systematisch via de massa-media verspreid moeten worden.

f. Er moet aandacht komen voor een internationaal zuivere terminologie. Dit voorkomt veel tijdverlies met interpretatie-kwesties. Termen moeten op wetenschappelijk niveau geunificeerd worden. UNESCO en UNEP zouden hierin een taak moeten zien. Het begrip "regen" bijvoorbeeld betekent voor de noordelijke landen "acidrain" en voor de Afrikaanse "life or dead". Tussen de begrippen ecologie en environment development kan groot verschil bestaan.

Ten slotte kregen twee aardige uitspraken veel waardering:

- "Earth is not from man, but man belongs to the earth".
- "De aarde is vermoedelijk het enige ruimteschip in het heelal met ons type leven".

6. Specifieke onderwerpen

Tijdens het congres werd door specialisten een meer wetenschappelijke bijdrage geleverd op de thema's:

a. Environmental problems and international understanding and cooperation: role of environmental education.
b. Environmental education and training: contribution to sustainable socio-economic development.
c. Role of media and new communication systems in the promotions of environmental education and information.
d. Role of biosphere reserves and other protected areas in the dissemination of ecological knowledge and traning of specialists in ecology.

Deze thema's zullen later in UNESCO/UNEP-bijdragen worden verwerkt en t.z.t. ter beschikking komen.

Tevens was er de mogelijkheid voor enkele tientallen sprekers in te gaan op specifieke problemen in het eigen land.
De bijdrage van de Natuurbeschermingsraad, alsmede een Nederlandse co-productie met de Schotse vertegenwoordiger van de IUCN werden in het congres ingebracht.

7. Slotzitting

Ter afsluiting werden door de rapporteur enkele constateringen geformuleerd in relatie tot 10-jaar Tbilisi:

a. Er is een groei van ecologische bewustwording in de hele wereld zichtbaar.
b. Er is meer inzicht in ecologische processen tot stand gekomen.
c. Er is meer begrip voor "ecological development" in relatie tot het begrip "environmental security".
d. Nog te langzaam groeit bij decisionmakers het besef dat meer inzicht op politiek niveau vereist is inzake de begrippen rond natuur- en milieu-educatie.
e. Internationale en regionale samenwerking moet veel meer ontwikkeld worden. De bestaande barrières moeten geslecht worden. Ook horizontale samenwerking tussen organisaties in één land is belangrijk.
f. Er is meer besef ontstaan voor de noodzaak van een politieke conceptie van natuur- en milieu-educatie.
g. Er moet nog zeer veel werk gedaan worden op het theoretisch-wetenschappelijke niveau voor de verdere ontwikkeling van natuur- en milieu-educatie.
h. Wereldwijde "international understanding and cooperation" is een noodzakelijke grondslag voor een toekomst in een optimistisch perspectief.

Voorts werd duidelijk dat het strategie-document bijgesteld zal worden op basis van de discussies in het congres, waarna het voorgelegd zal worden aan UNESCO/UNEP ter verdere procedurele afhandeling en vaststelling op regeringsniveau.
Algemeen was het congres van oordeel dat de organisatie goed geregeld werd, met de aantekening dat het strategie-document voor sommige deelnemers te algemeen van karakter werd bevonden. Organisatorisch bleek het niet goed mogelijk op dit punt diepgaande kritiek te leveren. Bovendien heeft een dergelijk werelddocument een zekere globaliteit in zich nodig om een hoge acceptatiegraad te verwerven.
Voor het Nederlandse onderwijs is het aangereikte kader voor de komende tien jaar, juist gelet op deze globaliteit, zeker bruikbaar.
Tenslotte zal worden gestudeerd op de suggestie van de zijde van "The North American Association for Environmental Education" en "The International Society for Environmental Education" om de periode 1990-2000 uit te roepen tot "A World decade for environmental education".

8. Aanbevelingen voor Nederland

a. De "Outline international strategy for action in the field of environmental education and training for the 1990s" is in zodanig algemene termen gesteld dat de Nederlandse activiteiten goed inpasbaar zijn in deze wereldstrategie.

b. De doorkoppeling van activiteitenkaders Nederland-UNESCO/UNEP-Nederland verdient meer aandacht.

c. Wil Nederland, internationaal gezien, een zeker niveau op NME-gebied willen blijven nastreven, dan is goede aandacht noodzakelijk voor het volume en de kwaliteit van de NME-activiteiten.

d. Bij de invoering van de basisvorming, met de nadruk op een geselecteerde vakkenaanpak, is het bewaken van de inter-disciplinariteit van NME van het grootste belang; zowel op het algemene leerplanontwikkelingsniveau als op het niveau van de klasse/groepsuitvoering. Attentie van de SLO op dit punt is noodzakelijk.

e. De internationale informatie uitwisselingssystemen en data-banken krijgen de komende 10 jaar meer aandacht. Voor Nederland is stroomlijning met ADION-Verbreed noodzakelijk. De ontwikkeling van andere elektronische informatiedragers dient daarbij in het oog te worden gehouden.

f. Aan de informatievoorziening via CONNECT zou meer attentie kunnen worden gegeven, mogelijk in combinatie met aanbeveling b.

g. Alle, mede door Nederland officieel onderschreven, actiepunten uit het Tbilisi-programma zijn nog onverkort geldig en worden in de 1990-strategie verder geactualiseerd en nader gepreciseerd. Gelet op de algemeen verslechtende wereld-situatie (biosfeer) is meer geconcentreerde aandacht voor NME in het onderwijs van cruciaal belang.

h. Meer research naar de verschillende aspecten van NME, met aandacht voor de pedagogische benadering, wordt aanbevolen. Internationale verworvenheden dienen daarbij betrokken te worden uit oogpunt van efficiency en kwaliteit.

i. Het strategie-rapport vraagt om meer prioriteit voor NME bij de initiële opleidingen. Voor Nederland zou via "inspectie/ swp-advisering" gevraagd kunnen worden om advisering op dit punt.

j. Het strategie-rapport gaat in het bijzonder in op extra aandacht voor het technisch-beroepsonderwijs. De NME-dimensie moet in dit onderwijstype wereldwijd meer prioriteit krijgen.

k. Het congres gaf grote aandacht aan de gevolgen van het toenemend toerisme. Het toeristisch onderwijs neemt hier voor NME een sleutelpositie in.

l. NME-bewustwordingsprocessen via de massa-media moeten waar mogelijk gestimuleerd worden. Programmering voor het onderwijs via de NOT kan hier aan bijdragen.

m. Het congres vroeg aan alle landen aandacht voor opname van NME-items in examenprogramma's. Voor Nederland kan hiervoor advies aan het CITO gevraagd worden.

n. Meer internationale afstemming, alsmede meer horizontale regionale afstemming, is noodzakelijk. Organisatie-overlap komt overal in de wereld voor. Het subsidiebeleid NME, vanwege de Nederlandse overheid, dient met grote zorgvuldigheid op dit punt in de IWNME bezien te worden.

o. Interdepartementale aandacht voor NME, mede in het licht van de uitvoering van de 1990-2000 strategie van UNESCO/UNEP, is van groot belang uit oogpunt van kostenbewaking en efficiënte inzet van algemene middelen. De IWNME is hiervoor een adequaat interdepartementaal afstemmingsinstrument van LaVi, V&W, BuZa/OS, EZ, VROM, WVC en O&W.

p. Toezending van de MOSKOU-congresresultaten dient op ruime schaal plaats te vinden. De Natuurbeschermingsraad zal op dit punt mede actief zijn. Deze rapportage zal aan zoveel mogelijk belanghebbenden bij NME worden toegezonden.

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OUTLINE INTERNATIONAL STRATEGY FOR ACTION IN THE FIELD OF ENVIRONMENTAL EDUCATION AND TRAINING FOR THE 1990s

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INTRODUCTION

This working document, prepared by the Secretariat of Unesco in collaboration with the Secretariat of the United Nations Environment Programme (UNEP), seeks to highlight certain needs and priorities in respect of the development of environmental education and training as they emerge from the action taken in this field since the Intergovernmental Conference on Environmental Education (Tbilisi, USSR, 1977). It does not claim to deal exhaustively with the questions under review but to provide the participants in the Congress with material that might help them to think more deeply about the activities to be undertaken at the international, regional and national levels in the coming decade.

The information used in this document, together with certain ideas and suggestions it contains, is based on international studies and surveys, pilot projects and research carried out, and the conclusions of national, regional and international meetings held, since 1975 within the framework of the action taken by Unesco and UNEP in the field of environmental education and training. It is also derived from various consultations of Member States and governmental and non-governmental organizations carried out by Unesco and UNEP in connection with their programming activities.

The document is in two parts. The first describes the main aspects of the action taken by Unesco and UNEP since the Tbilisi conference. The second part outlines an international strategy for action in the field of environmental education and training for the 1990s. It contains three chapters, the first of which proposes a summary of the main present-day environmental problems and sketches out the possible aims of an international strategy for action in this field. The second presents an overview of the essential principles and characteristics of environmental education and training in the past ten years that may usefully be taken into account in framing and implementing the strategy. The third, which is the main part of the document, makes specific proposals for international action in this field.

This last chapter is structured around nine sections, each corresponding to an important aspect of environmental education and training or to particular forms or types of education and training considered in this context: access to information, research and experimentation, programmes of study and teaching materials, training of personnel, technical and vocational education, educating and informing the public, general university education, specialist training and international and regional co-operation. Each section first recalls the guidelines for the strategy as they emerge from the recommendations of the Tbilisi Conference and changes that have occurred in the area considered over the past ten years; it then highlights the suggested objective with a view to meeting needs for the development of environmental education and training in coming years; and lastly, it proposes a series of specific activities that might be of assistance in attaining the suggested objective.

PART ONE

INTERNATIONAL ACTION IN THE FIELD OF ENVIRONMENTAL EDUCATION AND TRAINING SINCE THE TBILISI CONFERENCE

'It is recommended that the Secretary-General, the organizations of the United Nations system, especially the United Nations Educational, Scientific and Cultural Organization, and the other international agencies concerned, should, after consultation and agreement, take the necessary steps to establish an international programme in environmental education, interdisciplinary in approach, in school and out of school, encompassing all levels of education and directed towards the general public, in particular the ordinary citizen living in rural and urban areas, youth and adult alike, with a view to educating him as to the simple steps he might take, within his means, to manage and control his environment.'

(United Nations Conference on the Human Environment, Stockholm, 1972)

1. In 1975, in pursuance of the above recommendation of the United Nations Conference on the Human Environment (Stockholm, 1972), Unesco and the United Nations Environmental Programme (UNEP) launched the International Environmental Education Programme (IEEP). In 1977 the Intergovernmental Conference on Environmental Education (Tbilisi, USSR), considering that there was a sharply felt need in all countries for international co-operation in this field, called upon Unesco and UNEP to continue their efforts to further the development of this education within the international community.

2. Environmental education (EE) is included among the objectives of Unesco's Medium-Term Plan for 1977-1982, which was approved by the Unesco General Conference at its nineteenth session (Nairobi, 1976). In accordance with the recommendations of the Tbilisi Conference, EE activities were included in the programmes and budgets approved by the Unesco General Conference at its twentieth (Paris, 1978), twenty-first (Belgrade, 1980), twenty-second (Paris, 1983) and twenty-third (Sofia, 1985) sessions. At present, environmental education is an integral part of Unesco's second Medium-Term Plan for 1984-1989, within the framework of the Organization's environmental activities grouped together in Major Programme X, 'The human environment and terrestrial and marine resources'. Similarly, since 1977 all UNEP's programme budgets have included environmental education and training as one of the main components of its programme-supporting activities.

3. The Declaration and recommendations of the Tbilisi Conference made it possible to define the nature, objectives and pedagogical principles of environmental education and to establish broad guidelines for action in this field at the national and international levels. Since the Tbilisi Conference, the environment has been seen as a whole, simultaneously comprising natural aspects and those that result from human action; EE is viewed as a dimension of the subject-matter and practice of education directed towards the solution of practical environmental problems through an interdisciplinary approach and the active and responsible involvement of each individual and of the community.

4. The Tbilisi Conference considered that EE should be made an integral part of the entire educational process and aimed at every category of the population: (i) the general public and non-specialists; (ii) socio-occupational categories whose activities have a significant impact on the environment; (iii) scientists and technicians whose fields, whether in the natural or the

social sciences concern the environment and who need to receive specialized training.

5. With regard to the first category, the results of action taken under the Unesco-UNEP International Environmental Education Programme (IEEP) may be appreciated in three complementary areas. First, this action has contributed to widespread awareness of the need for environmental education. The first steps to promote such awareness were taken in the early days of IEEP in 1975. It was also of assistance in the formulation of concepts and the working out of methodological approaches in this field, which was the main task during the period 1978-1980. Lastly, it facilitated the incorporation of an environmental dimension into the educational processes of Member States. Such are the three main permanent functions of this Programme. (Detailed information concerning IEEP action during the period 1975-1986 will be found in the reference document entitled 'Unesco-UNEP International Environmental Education Programme (1975-1987)'.)

6. Among the IEEP activities that have contributed most to international awareness of environmental education, mention should be made of a series of international and regional meetings which culminated in the intergovernmental conference at Tbilisi.

7. A policy of regularly supplying information has also done much to develop international awareness concerning environmental education. The IEEP newsletter Connect, which is published in five languages (Arabic, English, French, Russian and Spanish), has some 13,000 individual and institutional subscribers in the five regions of the world actively involved in the promotion and development of environmental education and training. Mention should also be made of the Unesco journal 'Nature and Resources' which publishes scientific articles and information concerning environmental management and the rational use and conservation of natural resources. It appears every three months in five languages (English, Chinese, French, Russian and Spanish) and has a circulation of 23,500. It aims to help inform specialists and the public at large about environmental problems and, in particular, about the activities carried out by Unesco within the framework of the Man and the Biosphere programme (MAB), the International Hydrological Programme (IHP), the International Geological Correlation Programme (IGCP) and the programmes relating to the marine sciences.

8. Mention should also be made in this connection of the development, in the context of IEEP, since 1977, of a computerized information system in the field of environmental education. This system consists of a set of six data bases which are regularly updated. The system is managed by the CDS/ISIS software developed by Unesco and considered to be a model for the management of data bases within the United Nations system. The data bases existing at present concern: (i) individuals active in the field of EE (some 10,000 persons belonging to 162 countries); (ii) institutions chosen by virtue of their activities in respect of EE (to date, 650 institutions established in more than 70 countries throughout the world); (iii) projects, programmes and activities in the field of EE (more than 300 registers); (iv) an annotated bibliography of works relating to EE, in English and French (320 titles); (v) a bibliography of periodicals concerning the field of EE, in English, French and Spanish (200 titles); (vi) the main articles published in Connect over the past two years. The IEEP information system also provides access to all the publications (books, documents, reports of meetings, etc,) prepared by Unesco in the context of its intergovernmental scientific programmes relating to the environment (MAB, IHP, IGCP) and its other fields of competence. Within the framework of its future activities, IEEP is planning gradually to provide

remote access to the information system in question so as to place its potential at the disposal of all interested parties.

9. Another important aspect of progress in environmental education at the international, regional and national levels has been the development of the concepts that characterize it and of its own methodology. Since 1977, and following on from the Tbilisi Conference, a vast effort has been made both internationally and nationally to arrive at a more precise definition of the content of environmental education and of the methods by which to promote its development. IEEP's contribution has taken the form in particular of studies and the organization of seminars, research and experimental projects, as a result of which it has been made clear that environmental education should be a dimension of all subjects and areas of education taking into account both the social and the natural aspects of the human environment. Emphasis has therefore been placed on the interdisciplinary nature of environmental education, and also on the need to reach all categories of the population through in-school and out-of-school education.

10. IEEP action has also contributed to efforts to introduce an environmental dimension into the educational practices of Member States. For example, inter-institutional committees have been set up by countries in all regions in the wake of regional conferences and national training courses or pilot projects undertaken or supported within the framework of IEEP in order to foster the incorporation of general environmental education into education systems, both in and out of school.

11. There have been two particularly important aspects to IEEP's contribution, namely the development of educational content, methods and materials and teacher training.

12. With regard to teacher training, a series of regional and subregional seminars designed to foster greater awareness of the issue among educational administrators and directors of study programmes has been organized since 1979. These seminars have dealt notably with the formulation of national environmental education policies, methods of pre- and in-service teacher training, and guidelines for the preparation of educational materials. Teacher-training courses and pilot projects designed to train personnel in the environmental field have also been organized at the national level, within the framework or with the support of IEEP.

13. As regards the development of content, methods and materials for environmental education, IEEP has conducted a series of research activities, culminating in the production of a coherent body of teaching materials, comprising methodological guides, thematic modules and textbooks for use in general education and in pre- and in-service teacher training. This material has been published in Arabic, English, French and Spanish, in the 'Environmental Education' series, which comprises to date more than 25 titles. It is also worth mentioning, in this context, the series of posters and slides, entitled 'Ecology in Action', which has been produced in more than ten languages under the MAB programme. Lastly, pilot projects carried out within the framework of IEEP in numerous countries have served not only to mobilize the national institutions concerned with environmental education, but also to train groups of educators at the national level and to develop educational content and materials suited to local conditions.

14. In addition to its role as a catalyst in the development of environmental education at the national level, IEEP also has a multiplier effect at the international level. From its inception, IEEP sought to establish co-operative

relations with the institutions of the United Nations system, and also with other intergovernmental and non-governmental organizations involved in environmental education. Formal and informal meetings have been held for this purpose. Today, a growing number of international, regional and subregional organizations have made environmental education a major component of their programmes of action.

15. As far as the training of environmental specialists is concerned, major activities have been carried out by various international organizations, in particular Unesco and UNEP. Unesco has mainly acted through its international scientific programmes relating to the human environment and terrestrial and marine resources. In this context, the Man and the Biosphere programme (MAB) is designed to provide the scientific base and the qualified personnel needed to deal with problems concerning the rational use and conservation of natural resources and the ecological management of territories and human settlements. Action under the MAB programme concerns more than a hundred countries, covering tropical forests, temperate and Mediterranean zones, arid and semi-arid zones, island and coastal ecosystems, mountains and human settlements. Through its action, MAB has made possible the extensive mobilization of national and international scientific circles, after resulting in the establishment of public and private institutions for specialized environmental research and training in a large number of Member States.

16. The International Geological Correlation Programme (IGCP) is implemented jointly by Unesco and the International Union of Geological Sciences. Its purpose is to promote and co-ordinate research on geological problems of worldwide significance by establishing spatio-temporal correlations and making better known the history of the planet and the origin and formation of mineral and energy resources. The objective of the International Hydrological Programme (IHP) is to make an exhaustive appraisal of the freshwater resources of the different regions of the world and to develop the scientific and technological base for the rational, lasting management of those resources from both the quantitative and the qualitative standpoints. The programmes of the International Oceanographic Commission (IOC) and Unesco's supplementary programme on the marine sciences are aimed at improving understanding of the ocean so as to enable its resources to be used without damage to the ecosystem. In the context of the marine sciences, the COMAR project involves the implementation of research and training activities with a view to the integrated management of coastal systems. Mention should also be made of the Programme on Natural Hazards. All these scientific programmes carried out by Unesco include a significant training component.

17. Furthermore, in the context of its policy for the promotion of self-reliant social and economic development, UNEP assigns priority to the quantitative and qualitative strengthening of the human resources of the developing countries. To this end, it has incorporated an environmental training component into all its programme activities and encourages the systematic inclusion of the environmental dimension in all training activities concerning development. The activities undertaken in this field are aimed both at decision-makers (administrators and planners, entrepreneurs and trade unionists, engineers and farmers, etc.) and at specialists whose activities have a significant impact on the quality of the environment (biologists, economists, ecologists, hydrologists, meteorologists, toxicologists, agronomists, oceanographers, sanitary engineers, etc.). In all cases UNEP has laid emphasis on the strengthening of national training institutions, in particular through their integration into regional networks, and through the awarding of training grants to high-level professionals whose activities are likely to have a significant influence on the framing of national environmental training policies.

18. Through its international and regional programmes, its specialized services and centres, UNEP has in ten years trained more than 10,000 professionals and specialists from the developing countries. This action is continuing through UNEP's various institutional machinery. Mention should be made in this connection of the Coastal Areas Programme Activity Centre (OCA/PAC), which expects to train some 500 experts yearly in 1988-1989 (sources, levels and effects of various pollutants and protection of biological resources); the Programme on Desertification Control, which aims to co-ordinate the activities undertaken regionally and throughout the world to combat desertification, is developing training courses for specialists in various fields, in collaboration with other international organizations, in order to increase local capacity for action; lastly, INFOTERRA, which plans, during the 1988-1989 biennium, to strengthen and develop its network of 30 environmental focal points through the implementation of training programmes aimed at computerizing some of the operations of those focal points and at establishing computer links within the network.

19. Attention should be drawn in this connection to the training courses offered by UNEP in the context of its environmental management services; particular mention should be made here of the ZAMBEZI Action Plan (ZAC PLAN) within the framework of which integrated environmental training courses are provided concerning soil, energy, hygiene, health, legislation, planning, desertification control, etc. UNEP also offers training courses for environmental specialists in relation with its world programme Earthwatch and within the framework of the activities of the International Register of Potentially Toxic Chemicals (IRPTC).

20. IEEP and the scientific programmes for research and the training of specialists developed by Unesco and UNEP have no doubt made a significant contribution, both nationally and internationally, to the development of environmental awareness, education and training. However, owing to the magnitude of the conceptual, educational and institutional changes necessitated by the universalization of a new 'environmental culture', and in view of the problems newly created by human action on the environment the efforts already made must be continued and intensified through the adoption of such measures as will enhance their effectiveness and their relevance.

21. Such is the main objective of the remainder of this document which accordingly sets out proposals that may be considered with a view to an international strategy for action in the field of environmental education and training for the 1990s.

PART TWO

OUTLINE INTERNATIONAL STRATEGY FOR ACTION IN THE FIELD OF ENVIRONMENTAL EDUCATION AND TRAINING FOR THE 1990s

I. ENVIRONMENTAL PROBLEMS AND THE AIMS OF AN INTERNATIONAL STRATEGY FOR ACTION IN THE FIELD OF ENVIRONMENTAL EDUCATION AND TRAINING

'Whereas it is a fact that biological and physical features constitute the natural basis of the human environment, its ethical, social, cultural and economic dimensions also play their part in determining the lines of approach and the instruments whereby people may understand and make better use of natural resources in satisfying their needs.'

(Final Report, Tbilisi Conference, 1977)

1. In recent years there has been a gradual awareness, both worldwide and within each individual State, of the role to be played by education in understanding, preventing and solving environmental problems. We know now that the key to these problems to a large extent lies in social, economic and cultural factors, which are at the root of these problems, and that we cannot therefore prevent or solve them by purely technological means; we know that we shall have to act primarily on the values, attitudes and behaviour of individuals and groups in respect of their environment.

2. Despite this increasing awareness of environmental problems and the undeniable efforts of many countries to develop the technical and institutional means to cope with them, we are bound to acknowledge that, in general, the actions undertaken to date have proved insufficient to counteract the steady deterioration in the quality of the environment. Rarely has the international environmental situation looked so alarming. The growing disparities in levels of development and living conditions between different countries, and in many instances within countries themselves, have tended to worsen the outlook for the future by making contemporary environmental problems especially diverse and complex.

3. In most developing countries, regardless of the region to which they belong, the basic problem is one of dire poverty, which in turn leads to deterioration of natural resources: to eat and find shelter results in the destruction of equilibria on which the preservation of ecosystems depends and hence of the natural resources that ensure their survival. In many countries over the past decade, impoverishment brought about by a combination of fast population growth and sluggish or halted economic development, or indeed in some cases economic regression, has thus continued to aggravate the process of deforestation, soil erosion and desertification, while at the same time lowering agricultural output. Impoverishment and population growth are part of a single complex phenomenon that can only be halted by means of a process of rapid, sustained development compatible with the preservation of the productive potential of natural and anthropogenic ecosystems.

4. Further, most developing countries have had to contend with environmental problems, such as desertification, unchecked urban growth, and the pollution caused by industrialization. In this context, deforestation represents one of

the paramount dangers, since it has harmful consequences both for human populations and for the preservation of flora and fauna. It has been responsible for a large number of floods, for the erosion of productive land and for the decline in hydroelectric potential. It has also resulted in the destruction of plant and animal species, in some cases irreversibly destabilizing the ecosystems on which human life and the genetic wealth of the biosphere depend. Some 25,000 plant species and more than 1,000 animal species are currently threatened with extinction.

5. The industrialized countries too are at grips with environmental problems fundamentally linked to their prevalent models of growth and that include, first and foremost, the exhaustion of certain natural resources and the various types of pollution. Industrial pollution is still the major threat to the quality of the environment. Acid rain caused by the emission of sulphur particles into the air has destroyed large tracts of forest in Europe; impairment of the ozone layer by chlorofluorocarbons, and the warming of the Earth caused by the 'greenhouse effect' resulting from the discharge into the atmosphere of larger amounts of carbon dioxide and increased pollution could represent unprecedented threats to the quality of life on our planet.

6. Aquatic environments continue to be polluted by industrial discharges and household waste. Concerning the marine environment, it should be noted however that intensification of the action taken by UNEP, under the regional seas programme, has enabled 100 coastal countries to be associated with the establishment of plans of action and conventions concerning at least ten maritime subregions. With regard to freshwater resources, progress has been achieved thanks notably to a transnational approach to the management of certain river basins.

7. This brief description of environmental problems would be incomplete if no mention were made here of the very serious industrial accidents that have brought a great deal of death, injury and disease in their wake and done harm to the environment: Seveso, Bhopal, Chernobyl and the Rhine. All these accidents have highlighted the threats that certain industries pose to human life and the quality of the environment unless they are operated under very strict safety conditions.

8. Lastly, although the worldwide health situation, which is one of the prime indicators of the global quality of the human environment, has improved in general over the past ten years, morbidity and mortality rates have risen in a number of developing countries, particularly as a result of infectious and parasitic diseases, which are often linked to situations of malnutrition affecting high-risk groups (especially women and young children). In the industrial countries, on the other hand, but also increasingly in the modern parts of the developing countries, what is mainly deplored is the higher incidence of disease connected with living conditions in urban and industrial areas: cardiovascular and respiratory diseases, cancer and psycho-social disturbances.

9. All these problems unquestionably result from socio-economic situations and inappropriate human behaviour patterns (poverty, uncontrolled economic growth, squandering of natural resources, etc.). It is therefore by acting upon systems of knowledge and values that we may hope to find adequate solutions to environmental problems. It is therefore incumbent upon education and training, as the fundamental means of integration and of social and cultural change, to envisage objectives and employ new methods capable of making individuals more aware, more responsible, and functionally better prepared to cope with the challenges of preserving the quality of the environment and life, in the context of sustained development for all peoples.

10. In response to these challenges, an international strategy for environmental education and training should seek in the 1990s to consolidate the main lines of approach charted by the Tbilisi Conference, adapting them to new concerns. In particular, an effort should be made to promote: (i) the search for and implementation of effective models of environmental education, training and information; (ii) general awareness of the causes and effects of environmental problems; (iii) training, at various levels, of the personnel needed for the rational management of the environment in the context of sustained economic development.

II. PRINCIPLES AND ESSENTIAL CHARACTERISTICS OF ENVIRONMENTAL EDUCATION AND TRAINING

'Education ... should play a leading role in creating an awareness and a better understanding of environmental problems. It must foster positive patterns of conduct towards the environment and the nations' use of their resources.'

(Final Report, Tbilisi Conference, 1977)

11. Environmental education (EE) is regarded as a permanent process in which individuals and the community gain awareness of their environment and acquire the knowledge, values, skills, experience, and also the determination which will enable them to act - individually and collectively - to solve present and future environmental problems.

12. The goals of EE cannot be defined without taking account of the economic, social and ecological realities of each society, or of the objectives it has set for its development. However, one can point to certain objectives of EE that are common to the entire international community.

13. Where knowledge is concerned, it falls to EE to supply - in ways worked out according to the groups at which it is aimed - the means of perceiving and understanding the various biological, physical, social, economic and cultural factors which interact in time and space to shape the environment, and of acting to prevent and solve problems in this sphere. Wherever possible, the knowledge in question should be acquired through observation, study and practical experience of specific environments.

14. It also falls to EE to define values and motivations conducive to behaviour patterns and measures that are instrumental in preserving and improving the environment. Behaviour patterns will never really be able to change as long as most members of a given society have not freely and consciously internalized more positive values vis-à-vis the environment, values capable of underpinning self-discipline. To this end, EE seeks to clarify and harmonize the ethical, aesthetic and economic concerns and values of individuals and communities in so far as these influence their perception of the environment.

15. No doubt the most important factor contributing to the specificity of EE is its emphasis on the resolution of practical problems affecting the human environment. From this derives another of its fundamental characteristics, namely, the interdisciplinary approach it adopts to take account of the complexity of environmental problems and of the multiplicity of the factors accounting for them.

16. By virtue of its objectives and its functions EE is necessarily a form of educational practice attuned to the life of society. It can only be effective if all members of society - workers, students, specialists, decision-makers - take part according to their abilities in the complex and manifold task of improving people's relationships with their environment. This can only be achieved if people take their own education in hand and become aware of their involvement and their responsibilities.

17. Because EE is a lifelong process, it can help to improve the relevance of general education. EE is more than just a particular aspect of the educational process; it should be regarded as an excellent basis on which to develop a new way of living in harmony with the environment, a new lifestyle. EE should be aimed at all members of a community, in ways corresponding to the needs, interests and motivations of the different age-groups and socio-occupational categories; it should be adapted to different socio-economic and cultural contexts and to different living conditions, and should take account of regional and national differences. In this way, EE will be able to provide the different actors in society with the scientific and technical knowledge and the moral qualities that will enable them to play an effective part in preparing and then managing a development process compatible with preservation of the productive potential and the aesthetic values of the environment.

18. In view of the environmental problems facing contemporary society and the role that EE can play in solving them, the following chapter of this document proposes an outline international strategy for action to develop environmental education and training in the 1990s.

III. GUIDELINES, OBJECTIVES AND ACTIONS FOR AN INTERNATIONAL STRATEGY

1. ACCESS TO INFORMATION

Guideline for the strategy:

'The dissemination of specialized and general knowledge on the environment and the development of public awareness of the need for a correct approach to the problems of the environment are of ... possibly crucial importance, both for further economic development and for rational use of the earth's resources for the good of ... humanity as a whole. The full use of the mass media for truly educational ends would help ... to ensure widespread awareness and understanding of these matters.'

(Final Report, Tbilisi Conference, 1977)

19. Over the past decade, the international community, especially Unesco and UNEP, has devoted considerable efforts to promoting exchanges of information and the dissemination of new knowledge and ideas on the subject of environmental education. We are bound to acknowledge, however, that there remain considerable needs for information on this subject, not only because of the relative shortage of resources employed for this purpose, but also because of the multiplier effect of the needs aroused by what has been achieved. In a growing number of countries, new people and new groups concerned by activities designed to develop environmental education, are demanding information, or are even producing information themselves.

20. It looks today as if, much as the exchange of information and experience is imperative for the achievement of universal environmental education, the prevalent information strategies seem ill-suited to meet new needs. It is essential, in this respect, to favour those approaches that have proven most effective, and above all to envisage new means of gaining access to information, reorganizing it and disseminating it for the different users.

Objective: Strengthening of the international system for information and exchange of experience of the International Environmental Education Programme (IEEP)

Action 1: Setting up a computerized service

21. For swifter and more systematic collection of the findings of environmental research and other information relevant to environmental education, and their dissemination to pedagogical research institutions, as well as to improve the flow of information between the latter and the institutions and specialists responsible for preparing educational and training programmes, an International Computerized Information Service for EE - ICISEE - should be set up. All institutions actively involved in this sphere should have free access to this service through switched networks (conventional or packet switching networks).

22. This service could be run within an international institutional framework designed to facilitate access to data from a variety of sources, providing reasonably rapid dissemination and capable of keeping the system operating properly and technically well maintained. To reduce operating costs, the service should make use of technical facilities existing within the framework of IEEP.

23. The ICISEE would be responsible for processing and disseminating general and technical information capable of promoting EE and helping to enhance the effectiveness of efforts in this direction. To this end, it ought gradually to implement, over the next ten years, a series of data bases containing selected, annotated bibliographies, summaries of articles and books, and progress reports on national action, news on current events, as well as directories of institutions, programmes and people involved in environmental education activities. The ICISEE could be launched at relatively low cost by initially computerizing a selection of technical and general information published over a period of at least ten years by the newsletter Connect, and then disseminating it, again through the use of teleprocessing.

24. Among themes especially deserving of attention, it is worth mentioning the results of pedagogical research and experiments in the field of EE, suggested models for national planning of EE, and the approaches and strategies employed for the design and transmission of educational messages. Similarly, priority should be given to the gathering and processing of information on legal measures taken by Member States with regard to EE.

Action 2: Strengthening regional networks of institutions of excellence and documentation centres

25. The development first of the international network of environmental education, but also of other networks existing in Unesco and UNEP (Unesco's networks of educational innovation, the regional training networks or the INFOTERRA network of environmental focal points, within the framework of UNEP, etc.), together with the strengthening of the documentation units of the

Regional Offices of Unesco and UNEP, is another necessary aspect of the development of the international information system existing within the framework of IEEP. With this end in view, the documentation centres would serve as focal points for sorting and channelling local information, in order to impart an international character to the data bases made available to the world community via the computerized service. Apart from contributing to the gathering of information, institutions of excellence would communicate the results of their research and experiments in environmental education and training to the documentation centres.

26. Regional activities for the documentation centres could include the grouping together of available information on EE, in particular by way of the following measures: (i) updating publications; (ii) preparing summaries in respect of EE for different target groups (researchers, specialists by theme, curriculum development specialists, educational planners, teachers, etc.); (iii) translation of certain materials; (iv) selective dissemination of information. On this basis, the regional documentation centres would be ideally placed to produce regional supplements for the newsletter Connect.

27. The implementation of specialized documentation activities in the field of EE should necessarily be accompanied by programmes to train the personnel of the documentation centres concerned.

Action 3: Publication of the newsletter Connect

28. The Unesco-UNEP IEEP quarterly newsletter Connect, which currently has a circulation of some 13,000 in five languages, has proved to be one of the most effective international information media in the field of environmental education to date. Publication of this periodical should be continued and expanded. The production of the newsletter in other languages with the help of new sources of funding, and the publication of half-yearly regional supplements focusing on items of local interest, would add to the relevance of Connect and encourage the growth of its regional readership.

29. Further, in line with what has already been done in Latin America and the USSR, decentralization of the printing and distribution of Connect to other regions should help to reduce current production costs and boost circulation, in response to fast-growing demand.

2. RESEARCH AND EXPERIMENTATION

Guideline for the strategy:

'All /environmental education/ activities call for ... research and experimentation on the lines of emphasis, content, methods and instruments necessary for ... /this/ education ... /as well as the/ ... constant evaluation of the many innovations /in this field/ ... in order to encourage and improve them and to extend them to other educational institutions and programmes.'

(Final Report, Tbilisi Conference, 1977)

30. Over the past decade, a great deal of educational research and experimentation has been undertaken in Member States in all regions with a view to devising innovations, on the basis of a rational analysis of needs and problems, in the content, methods and strategies of an education and training in keeping with the principles and objectives of EE.

31. This research has made it possible to work out new ways of integrating educational content, through the use of integrative themes and systems approaches, as well as activity teaching methods designed to foster involvement, social commitment and a sense of responsibility on the part of the target populations for environmental education.

32. The development of EE is still incomplete, however, and longstanding, as well as new, conceptual and methodological questions remain insufficiently elucidated. For example, after a series of experiments in a number of Member States, certain specialists question whether, given the psychological and corporative resistance encountered, it is advisable to go on envisaging the content of EE in an exclusively interdisciplinary perspective, or whether, owing to their high cost, it is realistic to continue to advocate such pedagogical strategies as the use of multidisciplinary teaching teams.

33. In the same vein, at a time when important educational and training needs remain unmet, and when new needs are arising as a result of the extension of EE to new categories (general higher education, technical and vocational education, education for the general public, training for computer specialists, etc.), it may reasonably be wondered whether it is appropriate to go on thinking in terms of isolated educational and training measures at the international, regional and subregional levels (seminars, workshops, ad hoc courses, etc.), whose quantitative effectiveness and institutional impact sometimes appear to be very limited. The fact is that in most cases these initiatives concern only a very small number of teachers, administrators or specialists in a region or subregion (one or two in each country). They themselves do not generally have the means to encourage the institutional, organizational and financial mobilization necessary to have an effective impact on the framing of national policies in the fields of education, environment or development. The need to train a sufficient number of qualified personnel (teachers, environmental specialists, educational planners, administrators, etc.) capable of playing a significant role in national decision-making, should be borne in mind when new ways and means of providing environmental training are being sought.

34. The shortage of available financial resources for education in general and for environmental education and training in particular, make it essential to define clear and realistic aims in this sphere, and hence to undertake research and experiments aimed at developing more relevant educational content and devising more effective methods of organizing and transmitting educational messages.

Objective: Strengthening of research and experimentation on educational content and methods and strategies for the organization and transmission of messages concerning environmental education and training

Action 1: Research and experiments concerning educational content and methods

35. Experiments and pilot projects should be undertaken with a view to developing and implementing education, training and information programmes, notably for general university education and for public information on environmental issues, in keeping with the objectives, institutional possibilities and needs of Member States in this sphere.

36. Research activities and experiments concerning teaching and learning methods conducive to the development of education programmes slanted towards

the solving of practical environmental problems and generating a sense of social responsibility in the various parties involved in the educational process should be continued and strengthened.

37. Because environmental problems are to a large extent the outcome of human choices, a special effort should be made through research and experimentation to develop content for environmental education and training that takes into account research findings in the various social sciences.

Action 2: Research and experimentation concerning other complementary aspects of environmental education

38. Research should be undertaken with a view to identifying points of convergence and complementarity with other educational activities whose subject-matter relates to fundamental aspects of the human environment, in particular population education and education concerning questions of nutrition and health. Experimental and pilot projects incorporating these various dimensions should be launched on the basis of the resulting research findings, with a view to developing content making it possible to increase the relevance and functionality of environmental education and training. To this end, appropriate links should be established with existing international programmes in these spheres.

Action 3: Research concerning the pedagogical approach to the question of values

39. EE is not an educational approach confined purely to the transmission of knowledge; it is also concerned with affective and axiological matters. These are essential when one is seeking to generate permanent patterns of behaviour calculated to preserve and improve the quality of the human environment. With this end in view, it seems necessary to conduct research and experiments on ways of dealing, in the educational context and in the light of the different target populations, with questions relating to the shaping of attitudes and values in respect of the environment.

Action 4: Research concerning new strategies for the transmission of messages to develop environmental awareness, education and training

40. In response to increasingly urgent quantitative and qualitative demand from the international community for environmental education, and in view of the necessarily limited amount of available resources, it is essential to conduct research and experiments designed to define more effective, including more cost-effective, strategies for the transmission of educational messages.

41. It is particularly urgent, in this respect, to devise new approaches to the training of teaching staff, in the light of the various objectives being pursued (awareness, transmitting knowledge, shaping values, etc.), and to educating and informing the public so as to design EE programmes that provide a more specific and more relevant response to the needs of the various target populations. To this end, research on ways of using new information and communication technologies (data processing, teleprocessing, video, etc.) would be especially desirable.

Action 5: Comparative evaluation research on the different components of the educational process

42. One essential, though often overlooked, aspect of the implementation of EE is the need to evaluate the complex teaching and learning processes that it

involves. Effective development of EE at the international and national levels depends on the formulation of relevant educational messages, tailored to well-defined objectives adapted to the needs of different sections of the population.

43. It therefore seems essential to undertake systematic research to evaluate the real effectiveness of educational and training processes, with a view to making, where appropriate, the necessary adjustments to improve their relevance. Methods of evaluating the results of education that involve simulation of environmental issues or practical measures for acting upon the environment would appear to be best suited to assess the complex skills - other than cognitive - which EE ought to be capable of inculcating. These involve decision-making abilities, problem-solving skills, the ability to plan actions and to induce values capable of shaping appropriate individual and group attitudes towards the environment.

44. Similarly, research on the respective advantages of different strategies, both old and new, directed towards the organization and transmission of educational messages is essential if we are to increase the cost-effectiveness of efforts to develop EE. This holds for action taken by Member States as well as for initiatives on the part of the international bodies concerned.

3. EDUCATIONAL PROGRAMMES AND TEACHING MATERIALS

Guideline for the strategy:

'Environmental education should not be just one more subject to add to existing programmes, but should be incorporated into programmes intended for all learners, whatever their age ... Its subject-matter should permeate every part of formal and non-formal programmes and constitute one and the same continuous, organic process ... The central idea is to attain, by means of growing interdisciplinarity and of prior co-ordination of disciplines, or practical education oriented towards a solution of the problems of the environment, or at least to make pupils better equipped ... to participate in decision-making.'

(Final Report, Tbilisi Conference, 1977)

45. EE is now acknowledged to be an excellent means of enhancing the relevance and functionality of general education, but persistent difficulties of a conceptual and structural nature within education systems still prevent it from being implemented in truly interdisciplinary ways. For this reason, Member States have been led to consider various methods of incorporating the environmental dimension into curricula and of designing appropriate teaching materials.

46. The adoption of an interdisciplinary approach presupposes a shift in the emphasis of the entire educational process, affecting content, teaching methods, institutional organization and teacher training. These far-reaching changes can only take effect very slowly, as educational reforms are gradually introduced.

47. Without relinquishing the ideal of a more 'holistic' approach to education, drawing on inputs from the different environment-related disciplines, it does however seem advisable to focus future efforts on more modest strategies.

48. For instance, experience shows that in a fair number of cases EE consists in practice in simply giving more appropriate treatment to environmental questions already featured in the curricula of various subjects; or, more ambitiously, in introducing environmental components into certain disciplines, particularly in the natural sciences and, to a lesser extent, the social and human sciences. In some cases, these components have been introduced in preference in what are known as 'pivotal' disciplines, such as geography and ecology: because they cover a very broad field, they lend themselves more readily to an understanding of the complexity of environmental problems and to the development of interdisciplinary approaches.

Objective: Promotion of EE through the development of curricula and teaching materials for general education

Action 1: Exchange of information on curriculum development

49. The exchange of information and experience concerning educational programmes and materials adopted by Member States is an essential factor in the spread and rationalization of efforts to make EE available throughout the world. With this end in view, the international information system for environmental education (ICISEE) should ensure the systematic gathering of data on national achievements and should make these data available to users through various media and in various forms.

Action 2: Development of model curricula

50. While it is true that curricula and teaching materials are not enough in themselves to engender the desired pedagogical practice, or to encourage educators to adopt the appropriate attitudes and acquire the requisite knowledge for the development of EE, they nevertheless represent an essential basis for guiding the work of teachers and pupils in so complex a field.

51. With this end in view, it would be desirable to step up measures for the development of model curricula for the different levels and forms of education and of pre-service teacher training. In addition, short courses treating contemporary environmental issues in an integrated manner should be developed to facilitate the retraining of teachers and other personnel in general education and intermediate technical and vocational education in the principal subjects concerned.

52. These measures should be taken in the context of an overall programme that takes past experience and existing curricula into account, thereby making it possible to ensure the relevance of the pedagogical approaches adopted and to rationalize the efforts involved. In this context, practical activities should be carried out in conjunction with the national institutions responsible for the design and implementation of curricula and educational materials, so that they can be suitably adapted to national educational, environmental and development policies. The pilot projects of IEEP and the operational education projects implemented by Unesco with the support of UNDP or the World Bank may serve as excellent means of attaining this end.

Action 3: Development of new teaching aids

53. Conventional teaching materials (teachers' guides and handbooks, modules, etc.), which convey information essentially in printed form, will continue to be developed, but there is a need for new teaching aids capable of organizing the requisite knowledge in ways that are more representative of the real environmental issues.

54. Thus, for instance, games and simulations which take the environment as their subject and use various micro-environments (towns, forests, parks, factories, zoological gardens, etc.) as educational itineraries should throw into sharper relief the role of scientific knowledge in both the social and the natural sciences, together with the functions to be fulfilled by technological know-how, as well as the place of social and ethical values in the taking of complex decisions and in the preparation of measures to solve environmental problems.

Action 4: Promoting curriculum evaluation

55. Systematic evaluation of curricula and of educational materials is essential if environmental education is to achieve its objectives, at both the national and international levels. To encourage the general adoption of this practice, a critical survey should be made of approaches, methods and instruments used for the purposes of evaluation in different contexts. If necessary, more appropriate and more reliable instruments should be developed. Lastly, provision should be made for an evaluation component in the implementation of all educational programmes and in the utilization of teaching materials.

4. TRAINING OF PERSONNEL

Guideline for the strategy:

'The training of qualified personnel is ... a priority activity. This holds good for both pre- and in-service training, for the purpose of familiarizing teachers in formal education and organizers of non-formal activities for young people and adults with environment-linked subject-matter and educational and methodological guidelines.'

(Final Report, Tbilisi Conference, 1977)

56. Teacher training is a key factor in the development of EE. The application of new environmental education programmes and proper use of teaching materials depends on suitably-trained personnel, as regards both the content and the methods specific to this form of education. Teacher training, if it is properly designed from the pedagogical and institutional standpoints, can also play a crucial role in spreading the impact of EE at the national level, thereby increasing the cost-effectiveness of the efforts made by Member States to develop environmental education.

57. Despite undeniable progress achieved in the training of personnel for EE over the past decade, and despite the value of certain national initiatives, considerable needs remain unmet in all regions of the world, and these needs are likely to become even more pressing in the future as a result of growing demand. There is a shortage of qualified teachers for EE at all levels, but especially for intermediate formal instruction, general university education and the education of the public.

58. A number of strategies have been devised to provide environment-linked teacher training, and their effectiveness has proved highly variable. For example, pre-service teacher training might legitimately be considered the best possible means of inculcating qualitatively and quantitatively suitable knowledge, yet inherent pedagogical and institutional difficulties in most countries have generally caused such training to be confined to limited

attempts to introduce some basic knowledge of the environment into the disciplines that have historically been most concerned with environmental questions (biology, ecology, chemistry, etc.).

59. Furthermore, a growing number of Member States in all regions have introduced in-service teacher-training programmes on the environment, in the form of seminars, classes, practical courses, etc. In-service training is often a starting-point, and sometimes even the sole means of providing appropriate environmental training for teachers already in service. These retraining activities, or at least those organized along traditional lines, such as short courses, seminars or workshops, are still very expensive and affect only a small proportion of teachers; as a result, unit costs are sometimes much higher than for pre-service training.

Objective: Promotion of pre- and in-service training for qualified formal and non-formal environmental education personnel

Action 1: Promoting pre-service training

60. In both the medium and the long term, the best way of ensuring the sustained development of EE at the national level is to incorporate the environmental dimension into the pre-service training of teachers and other educational personnel, particularly for the various natural and social science disciplines and for intermediate-level technological disciplines. Through the educational reforms undertaken by Member States, an effort should be made to ensure a proper place for this essential approach in new national education plans and programmes.

Action 2: Promoting in-service training

61. Because only the retraining of personnel at all levels and in all categories of education can meet the immediate requirements of the development of EE, this is a training priority. It is therefore desirable to strengthen retraining activities and to devise, try out and evaluate new forms of in-service training, in order to enhance the qualitative and quantitative impact of retraining, while at the same time reducing the financial burden for States.

62. In this respect, experiments in self-instruction and distance training involving the use of various media (press, radio, television, video and computer-assisted education), which have been conducted in a number of countries, should be systematically evaluated in order to determine whether they are suitable for transposition to other regions or countries. The experimental projects conducted within the framework of IEEP in co-operation with the competent institutions of Member States could serve as an excellent framework for this kind of venture.

63. To enhance the effectiveness of training, the logistic aspects of in-service training activities for teachers and other key educational personnel (by means of meetings, seminars, workshops, courses, etc.) carried out in the context of IEEP at the regional, subregional and national levels, should gradually be decentralized to Unesco's Regional Offices. Through their familiarity with national structures and local human resources, the latter would be in a good position to enhance the immediate impact of activities and ensure appropriate long-term follow-up.

64. Among the educational personnel for whom environmental training is a priority, particular mention should be made of the personnel in charge of

non-formal educational activities, especially instructors for adult education, rural education, health and nutrition education, literacy training, etc. An environmental training component should also be included in all projects relating to non-formal education, particularly those undertaken within the framework of IEEP, and in Unesco's operational projects.

5. TECHNICAL AND VOCATIONAL EDUCATION

Guideline for the strategy:

'The integration of environmental education with other forms of education, in particular with education concerning the working environment ... represents an urgent need ... At [the] technical and occupational level ... environmental education could really be provided in contact with the actual conditions of working life [thereby reaching] a priority group because of [the] numbers and ... role, in society [of those concerned].'

(Final Report, Tbilisi Conference, 1977)

65. The work of technicians and intermediate-level professionals - blue-collar workers, farmers, craftsmen, etc. - often has a considerable impact on natural resources and, consequently, on the conservation of the productive potential of both natural and anthropogenic ecosystems.

66. Notwithstanding the substantial efforts made by a number of Member States, the environmental dimension is still only marginally and insufficiently integrated into initial training for various intermediate technical and occupational specializations and into that of teaching personnel in most countries. In any case, such training still lags a long way behind what is provided in general formal education. The reinforcement of environmental education in technical and vocational education should be a major priority for improving the quality of the environment in the context of sustained development.

Objective: Incorporation of an environmental dimension into technical and vocational education

Action 1: Development of programmes and materials for education and training

67. Encouragement should be given to measures to develop study programmes for the education of intermediate-level technicians and professionals, and for the training of teachers to provide this education. In this connection, care should be taken to avoid over-emphasis on problems specific to certain occupations in the content of these courses; rather, their content should seek to offer all categories concerned a general education in environmental matters.

68. With this end in mind, the model curricula and teaching materials already developed for general environmental education, notably within the framework of IEEP, need to be supplemented by the development of study programmes and materials tailored to various technical and vocational specializations in the fields of agriculture, industry and the services, selected in the light of their potential impact on the quality of the environment. These programmes could be effectively developed, tested and evaluated in the context of pilot

projects undertaken within the framework of IEEP in close collaboration with the competent national and regional institutions.

Action 2: Training and developing the awareness of teachers

69. As in the case of general education, the most appropriate stage at which to train teachers is that of pre-service training. Environment-linked subject-matter could, for instance, be integrated into specialist training courses in polytechnical colleges and agricultural and industrial training colleges, as well as in other institutions that train instructors for technical and vocational education.

70. Environmental awareness should also be developed through in-service training for teachers, instructors and other key personnel in various technical and vocational training institutions (agricultural colleges, technical high schools, trade union technical training colleges, etc.). The development of short courses, comprising both general parts on environmental problems, and parts targeted by specialization, would appear to be the most appropriate way of achieving this.

Action 3: A priority activity in the service sector

71. Tourism is one of the activities in the service sector which, by its international scope and its intensity, has the greatest impact on the environment. It is therefore urgent in some cases to devise forms of organized tourism which, while ensuring the growth of this industry, will be more compatible with the conservation of the resources and aesthetic qualities of the environment. For this purpose, an international course on environmental education should be organized for those responsible for the national tourism services of the principal countries concerned. This course could be organized within the framework of IEEP which should try to identify potential national and international sources of funding for such a venture.

6. EDUCATING AND INFORMING THE PUBLIC

Guideline for the strategy:

'[There is a] need for environmental education programmes which introduce awareness among the general public of its own environment ... [and for] active participation of the general public in solving the environmental problems of contemporary society ... The mass media play an important part in the promotion of environmental education [for they] constitute ideal media for reaching the widest possible audience.'

(Final Report, Tbilisi Conference, 1977)

72. Considerable progress has been made over the past ten years, particularly in the industrialized countries, in educating and informing the public (young people and adults, producers and consumers, executants and decision-makers alike), as a result of media exposure and greater public involvement in the activities of associations concerned with improving the environment. In a growing number of Member States, thousands of grass-roots associations have sprung up and performed an important educational role, either directly through the work of their members or through media follow-up to their activities. Furthermore, the media have devoted tens of thousands of hours of broadcasting

time to general public information programmes focusing on fundamental or other aspects of the environment.

73. However, although in some countries there has been a great change in the level of awareness of the environment and its problems, there still remain substantial unmet needs when one considers that the objective should be the creation of a genuine mass culture in respect of the environment, that is to say, a culture that is shared by all sectors of the population and by the majority of countries.

74. The difficulties and constraints that account for this situation are varied. First, one finds in general that the preparation and production of programmes carried by the media (especially films and TV series), as well as royalty payments on productions already paid for, are often extremely costly. This seriously curtails the production and distribution of programmes in many countries, especially the developing countries.

75. It has also been noted that, many information programmes, while seeking to reach all types of audiences, have had little impact on large sections of the population - and sometimes on those very people whose day-to-day activity most affects the quality of the environment.

76. Among the main obstacles to the development of genuine 'environmental literacy', mention should also be made of the ambiguity of the information on this subject carried by the media. This is due to the diversity of the objectives and priorities that underlie these messages. It thus transpires that it is not always possible for people who lack the requisite education to interpret the messages aimed at them.

77. Another difficulty encountered in efforts to educate the public, which considerably limits their impact, is the absence of any practical content capable of giving rise to more appropriate behaviour vis-à-vis the environment. This is due in part to the relatively non-interactive nature of the conventional media, which do not allow the questions of individuals and groups to be easily answered, and partly to insufficient co-ordination between educational specialists and communication specialists when media programmes are being prepared.

78. Certain measures are urgently required to resolve these difficulties. Apart from playing an essential role in developing general 'environmental literacy', action to educate and inform the public in this sphere is an ideal means of making up for the shortcomings of the formal education system by providing environmental education for large sections of the population that have not yet received any schooling.

Objective: More effectively educating and informing the public about the environment through the use of the media and the new communication and information technologies

Action 1: Producing media-related education programmes

79. It is essential to produce media-related education programmes in order to develop in individuals a greater capacity to analyse and evaluate the nature, aims and purpose of the information put out by the media bearing directly or indirectly on the environment. After experimentation, these programmes should be systematically incorporated into all general education processes relating to the environment, starting with primary education.

80. At the same time, any improvement in the quality of the messages concerning the environment that are carried by the media depends to a large extent on the relevant knowledge and awareness of professional communicators. It should therefore be a priority to incorporate an environmental dimension into training programmes for journalists, television and film directors, for people in advertising, specialists in information technology, etc., with a view to making environmental education generally available at the national level. One appropriate approach might be to offer short interdisciplinary courses on environmental issues, either within the framework of their initial training programmes, or on an ad hoc basis for personnel in service.

Action 2: Use of new communication media and activity teaching methods

81. It is urgent to develop more relevant, less expensive programmes to educate and inform the public. This presupposes that environment-related programmes meet various educational objectives (develop awareness, shape values, provide scientific and technical information, technical instruction, etc.), and be tailored to the needs and interests of various types of user. These programmes should make use of the interactive and iconographic possibilities offered by the new communication media (data processing, teleprocessing, video). For this purpose, priority should be given to those educational methods (such as environmental games and simulations) capable of reproducing complex situations resembling those encountered in real life.

82. Similarly, existing programmes for general and technical distance education aimed at certain socio-occupational groups, such as the radio programmes for farmers broadcast by the Latin American Association for School Broadcasting (ALER) in several countries of Latin America, should be systematically reinforced by the addition of an environmental education component.

Action 3: Creation of a bank of audiovisual programmes

83. The identification and utilization of mechanisms to facilitate the production and circulation of audiovisual (video and computer) environmental programmes could make an appreciable contribution to the development of education in this sphere. To this end, steps could be taken in particular to set up a freely-accessible bank of environmental programmes, consisting of audiovisual works in the public domain, or transferred to the international public domain by their authors (individuals and institutions). Further, information on available resources should be made widely available by means of regularly updated directories and data bases, disseminated through the ICISEE and the newsletter Connect.

7. GENERAL UNIVERSITY EDUCATION

Guideline for the strategy:

'Although environmental education should constitute one single organic and continuous process, each stage of this process has its own particular educative value ... University-level education should see the introduction, as a basis for all specialized courses, ... of thorough knowledge of ecosystems ... [and of] the socio-economic factors governing the relations between people and the environment.'

(Final Report, Tbilisi Conference, 1977)

84. The purpose of general university education, given to students either before or during their specialized training, is to enable them to find their bearings in the context of existing knowledge and current trends, and to heighten their awareness of the main problems facing the contemporary world.

85. Within this framework, general environmental education is taken to mean effectively-structured educational activities whose objectives and content relate to essential aspects of environmental issues.

86. The need to consider environmental concerns within the framework of general university education is now recognized by the institutions of higher education of a growing number of Member States. In many instances, it is considered that measures to familiarize students with the complex problems of the environment offer an ideal means of acquainting them with the various facets of reality, and subsequently fostering the interdisciplinary dialogue and work essential to effective environmental action.

87. Nevertheless, although environmental education at the general university level is rapidly gaining ground, it is developing very unevenly from one country to another. As yet, it is included only occasionally, if at all, in the curricula of most universities around the world, especially in developing countries. This gives some idea of the magnitude of the needs remaining to be met, and shows how important it is to regard action in this sphere as one of the priorities for the coming decade.

88. The main obstacles to be overcome derive, firstly, from the fact that teachers of various university subjects (natural and social sciences, philosophy, arts, etc.) are insufficiently receptive to the multidisciplinary and interdisciplinary outlook that an understanding of environmental issues requires and, secondly, from the scarcity of environment-linked educational programmes designed for general university education. In the last analysis, these obstacles usually derive from the excessive compartmentalization of knowledge in universities.

Objective: More effective incorporation of the environmental dimension into general university education through the development of study programmes, teaching materials and training, and through the establishment of appropriate institutional machinery

Action 1: Developing the awareness of academic authorities

89. In order to intensify co-operation among specialists in various disciplines and among faculties, urgent measures should be taken, in the fields of knowledge concerned by the environment, to make the authorities aware of the importance that environmental education should have in general university education, and to familiarize them with the concepts, methods and means that are best suited to the development of this education. Short seminars at the national level might serve this purpose.

Action 2: Development of study programmes

90. It is also urgent to devise study programmes, preferably in the form of integrated courses on environmental issues, for all students during their general education. To foster understanding of contemporary environmental issues, these courses should draw on the contributions of various academic disciplines in dealing with such questions as the design and application of

self-reliant development models based on the rational use of natural resources and designed to preserve the biological diversity and aesthetic qualities of the environment.

91. In carrying through this task, systematic use should be made of the social sciences with a view to highlighting the links between social systems and nature, and in particular the importance of socio-cultural factors in the genesis of present-day environmental problems.

Action 3: In-service teacher training

92. To speed up the incorporation of environmental education into general university-level education, efforts should be made to develop educational content and tools (teaching methods, information sources, modern communication media, etc.) so that in-service training for teachers in various traditional disciplines can be intensified by updating their knowledge of contemporary environmental problems, particularly in the national context.

Action 4: Institutional intra-university co-operation

93. To ensure that, as scientific research advances, environmental education programmes for general university education are constantly brought up to date, efforts should be made to foster closer and more regular working relations between natural and social science research institutions and specialists in the educational sciences.

94. More systematic co-operation between the appropriate university authorities and the services that design curricula for other levels of the education system (primary, secondary, technical and vocational education, etc.) should also help to improve the relevance and functional character of the education provided.

8. SPECIALIST TRAINING

Guideline for the strategy:

'The basic training of all environmental specialists will need to include study of the principles of environmental education, sociology and ecology which are necessary to enable the learners to foresee the consequences of their environmental work.'

(Final Report, Tbilisi Conference, 1977)

95. It is essential to provide environmental training for specialists in the various scientific and technological disciplines, in order to ensure more rational, and hence more harmonious, interactions between social systems and the human environment, in the context of sustained development.

96. Institutions of higher education in many countries have made great efforts to provide specialized environmental training, in particular by introducing international postgraduate courses supported by Unesco and UNEP and by other governmental and non-governmental agencies. However, these efforts are not enough and need to be stepped up in the future and supplemented by field training activities.

97. Specialized training programmes in the various disciplines concerned with the environment should be regarded as being of priority importance in

promoting general awareness of the environmental problems connected with the future of humanity. This makes it necessary for specialists to be given training that lays emphasis on the interactions between development and the environment and thus enables them to understand the impact of human activities on the environment and to contribute effectively to the implementation of development programmes capable of maintaining a dynamic environmental balance. The object is to promote the concept of sustained socio-economic development able to meet present needs while preserving the quality and productive potential of the environment, and hence its capacity to meet the needs of future generations.

Objective: Promoting specialized scientific and technical environmental training

Action 1: Initial training for environmental specialists

98. Measures to bring about qualitative and quantitative improvements in the training of specialists in disciplines concerned with the environment consist essentially in working permanently to strengthen existing programmes in higher education and in creating others at all levels. The competent national institutions in collaboration with specialized international bodies should make increased efforts, particularly in the developing countries, to train a sufficient number of high-level personnel to ensure sustained development and economic growth.

99. The management of natural resources and land-use planning call for sustained attention both to the interrelations between the components and resources of the environment and to each resource considered individually. Measures should therefore be taken to strengthen the advanced interdisciplinary courses that provide specialists in the various disciplines with a better understanding of the complexity of environmental problems and encourage the application of integrated approaches to conceptualization and to the implementation of solutions.

Action 2: Further training for professionals

100. In-service training for environmental specialists, teachers and researchers is clearly a priority if the object is to have high-level personnel with an awareness of environmental problems. The sites of UNEP programmes (OAC/PAC, GEMS and Desertification Control) and those of Unesco's intergovernmental programmes (MAB, IHP, IGCP) provide natural settings for the further training of such specialists. These programmes, together with the competent international governmental and non-governmental organizations, should intensify their action to introduce at the national and subregional levels courses of further training and courses to develop awareness for the specialists and non-professionals concerned with the formulation and application of environmental management policies in the context of self-reliant development.

Action 3: Training through research

101. Existing fellowship programmes should be evaluated and strengthened so that advanced training, in the form of participation in specialized research, can be offered to researchers in the places where UNEP's and Unesco's environmental programmes are being carried out, for instance: research vessels and oceanographic laboratories for IOC; pilot projects and biosphere reserves for MAB; specific activities within the framework of the major regional projects

concerning the earth, water and marine sciences; regional and national projects within the framework of GEMS, IRPTC, Earthwatch or ZACPLAN for UNEP.

Action 4: Development of suitable study programmes

102. In the qualitative and quantitative improvement of environmental training for specialists, specialized international institutions and bodies such as UNEP, Unesco, UNIDO and ILO can play a not inconsiderable role by promoting exchanges of information concerning the programmes being carried out in various countries and exchanges of specialists between institutions and between countries with different degrees of experience with a view to developing appropriate training programmes.

103. In addition, Unesco's intergovernmental scientific programmes (IHP, COMAR, MAB, etc.) and UNEP's international and regional programmes (OCA, GEMS, Desertification, etc.) may provide information for the drawing up of study programmes, particularly at university level and at the level of technical education.

Action 5: Strengthening regional training capacity

104. The strengthening and development of regional networks of research and training institutions would be an effective means of identifying, among the institutions existing in the various regions, centres of excellence capable of introducing environmental training programmes in each region. UNEP should provide support so as to help the selected institutions to start up operations.

9. INTERNATIONAL AND REGIONAL CO-OPERATION

Guideline for the strategy:

'Both the developing and the industrialized countries should benefit from increased international co-operation in environmental education ... [This education] should help to develop a sense of responsibility and solidarity among countries and regions as the foundation for a new international order which will guarantee the conservation and improvement of the environment.'

(Final Report, Tbilisi Conference, 1977)

105. Since the Tbilisi Conference, substantial efforts by Unesco, in co-operation with UNEP and Member States, have shown that environmental education is an excellent means of improving the relevance of education in general and of enhancing its contribution to the search for and implementation of effective solutions to environmental problems, solutions which themselves help to improve living conditions.

106. The conceptual and institutional changes entailed by environmental education suggest that the 1990s will witness the gradual spread of this type of education throughout national education systems. In these circumstances, continuing international co-operation is an important factor in promoting the dissemination of information, thinking and research, and in providing technical support for innovative ventures by Member States in respect of environmental education and the training of teachers and technicians in the field.

107. Experience gained by the international community in the field of EE over the past ten years, and the needs expressed by Member States, have shown that the development of this type of education ought to be viewed in terms of an integrted strategy, drawing on the various components of the educational process (information, research, educational programmes and materials, training, etc.).

108. In the light of the foregoing, international co-operation could take the following as a general framework for future action in respect of environmental education: (a) the formal education system; (b) general and specialized higher education; (c) technical and vocational education; (d) out-of-school education for youth and adults in rural and urban areas, and public information and education programmes in general.

109. Within this general framework, certain specific areas for international co-operation should be regarded as having priority for the implementation of a coherent strategy with respect to EE.

Objective: Development of environmental education through co-ordinated international and regional co-operation

Action 1: Exchange of information

110. To foster a rapid international flow of information on environmental education and facilitate closer contacts between competent governmental and non-governmental institutions, an international system, making use of the new communication technlogies, should be set up to collect, process and disseminate information. For this purpose, measures should also be taken to strengthen the activities of the regional networks of institutions of excellence, and the regional documentation units serving the Unesco and UNEP Regional Offices.

111. Similarly, Unesco, UNEP and IUCN should co-ordinate their efforts in the field of EE information; in particular, they should ensure the compatibility of future computerized data bases.

Action 2: Promotion of research and experimentation

112. The aim here is to promote research and experimental projects with a view to developing new content, educational methods and communication systems; to foster wider and more systematic dissemination of the results thus achieved by the international community as a whole; and to facilitate their adaptation to each country's specific socio-economic and cultural conditions, and to its specific environmental situation.

113. It is urgent, in this respect, to carry out research to define the functions that the various social sciences are capable of performing, with a view to better understanding present-day environmental problems and thus introducing, at all levels of the education, socially more relevant and more functional environmental education programmes.

114. Within the framework of the efforts being made at the international and national levels, it would be desirable to conduct a world survey on the objectives of environmental education in Member States and on the strategies adopted by them with respect to education and training. This survey would provide a basis for more specific research activities and experiments aimed at

improving methods of programming educational processes and evaluating the results obtained.

Action 3: Promoting training

115. International co-operation, with the support of Unesco and UNEP, could help to promote national training programmes by providing Member States, at their request, with appropriate technical assistance and by supplying them with information and teaching materials. This could be achieved by means of pilot training projects, courses, etc., organized by national institutions in co-operation with international, regional and subregional bodies.

Action 4: Study programmes

116. Associating itself with the efforts made by Member States to develop study programmes and teaching materials incorporating the environmental dimension, IEEP should continue to prepare model educational programmes for the different levels and kinds of education, taking care to ensure the relevance and consistency of the different approaches, and to co-ordinate its efforts with interested governmental institutions.

Action 5: Information on legal texts governing environmental education

117. To assist Member States in their efforts to incorporate environmental concerns into their educational policy-making and planning, it would be worthwhile undertaking a number of case-studies and comparative studies of the legal texts governing environmental education in various countries, and on the institutional machinery established in this regard. The results of these studies should be widely circulated through the ICISEE international information system.

Action 6: Regional action within the framework of IEEP

118. In order to facilitate the adaptation to local conditions of action undertaken within the framework of IEEP, as well as to improve co-ordination and increase the impact of such action at the regional level, Unesco's Regional Offices should be provided with environmental education specialists and appropriate financial resources. With the same ends in view, machinery should be established to ensure sustained, effective co-operation between Unesco's Regional Offices and those of UNEP.

119. Furthermore, to promote the decentralization of essentially regional activities, especially in regard to the training of personnel and the adaptation of teaching materials, increased financial resources should be allocated for IEEP's regional activities.

Action 7: Mobilization of technical and financial resources

120. In order to respond to the growing demand for environmental education throughout the world, it is essential that a greater proportion of the technical resources available at the international, regional and national levels be mobilized, by associating competent governmental and non-governmental organizations more closely with international co-operation in this sphere.

121. With the same ends in view, Unesco and the UNEP should actively seek out new sources of funding, both international and national, public and private, in order to facilitate the extension of IEEP activities.

Action 8: Inter-agency co-ordination and consultation at the international level

122. The implementation of an international strategy for environmental education and training for the 1990s calls for inter-agency co-ordination and mobilization on a broader scale. To this end, priority should be assigned to strengthening, within the framework of the 'System-wide international medium-term environmental plan' (SWIMTEP-II), the machinery for co-ordination and co-operation among the Specialized Agencies of the United Nations concerned with this education.

123. There also appears to be a need, in order to make better use of the research findings of Unesco's intergovernmental programmes, in particular MAB, the International Geological Correlation Programmes (IGCP), the International Oceanographic Commission (IOC), and the International Hydrological Programme (IHP), to strengthen co-operation between IEEP and these programmes as part of concerted action to develop environmental education and training.

Action 9: International congress on EE for the beginning of the twenty-first century

124. In view of the fact that the worldwide development of EE is a lengthy process, and that educational, environmental and development problems are bound to change during the coming decade, it would be desirable to envisage the holding of another international congress on EE in 1997 to take stock of the progress achieved and to draw up, in the light of needs, priorities and means, an EE plan of action for the first decade of the twenty-first century.

COUNCIL FOR NATURE CONSERVATION

COMMISSION ON ENVIRONMENTAL EDUCATION

ENVIRONMENTAL EDUCATION IN THE NETHERLANDS: PROGRESS AND PROBLEMS IN A DECADE

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1. Introduction*

The Tbilisi conference, held in 1977, was an important instrument for national governments to compare their efforts in the field of environmental education with the recommendations approved at that conference. The Dutch delegation might have gone home with the pleasant feeling that already so many of these recommendations were carried out in the Netherlands.
It is 10 years after "Tbilisi" and therefore certainly time to draw up the balance-sheet. Did we indeed do what the recommendations asked from us and how did it work out? This paper describes the development of environmental education in the Netherlands in general terms, with reference to the main elements of the Tbilisi-recommendations.

2. The decade 1977-1987 in general

Since the Nature Conservation Year in 1970 and the publication of the first report to the Club of Rome, it was generally felt that an organizational infrastructure to cope with environmental problems - other than purely nature conservation - failed in the Netherlands. This situation made national, regional and local governments decide to establish facilities for among others environmental education. And it made citizens decide to establish non-governmental organization to carry out educational work.
These processes were in full swing at the time of the Tbilisi conference. Content, methodology, curriculum development, strategic approaches, research and other subjects received less attention than desirable, as we see it now.

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* Parts of this article have been derived from:
Commission on Environmental Education, 1985: A basic assessment of environmental education, Utrecht; and:
Ministry of Education and Science, 1986: Nature and environmental education in the Netherlands, Zoetermeer.
(Both available from the author).

It can be said that the publication of the World Conservation Strategy opened up many people's eyes after 1980. It made clear to the educational community that the environment - in its broadest sense - should be dealt with in the light of the lifestyle (culture) our society has chosen to adopt.
Changes in environmental education are thus reflected above all in a change in its starting-points and content. It is now recognised, much more than before, that man's actions and hence the quality of the natural environment are governed by a combination of social, political and economic factors. Gaining an insight into the interaction and connection between these factors is a lengthy process requiring new knowledge and skills on the part of the educator.
Formerly people often worked on the assumption that merely to communicate a message could directly bring about changes in patterns of action. But experience has shown that such changes cannot be taken for granted. It is increasingly becoming apparent that people are exposed to conflicting flows of information. Consequently the approach of environmental education has gradually become oriented more to communication of environmental problems and less to a communication of natural phenomena.

The second important factor which has changed the nature of environmental education considerably, is the view upon man as a learning individual.
Education in general is occupied with a problem area; specifically, child education and adult education are trying to understand people's attitudes and derive from those guidelines for education. These fields are going through a process of rapid development. In educational circles, better use is now being made of knowledge about the learning needs and the learning desires of children and adults at various stages in their lives than was the case years ago. But child education and adult education have broader goals. They cover a much wider field than that of nature and the environment alone; they look at the whole area of social and individual emancipation and aim at enabling people in general to function as well as possible.

It is precisely from this viewpoint that interest in and learning about nature in itself has a function of its own: looking at what happens in nature can also have personal development as its goal. In this sense, environmental education is obviously a part of the general education process.*

3. Progress and problems

Nature (conservation) education has led in an industrialized country like the Netherlands to:

1. a general acceptance that there exist environmental problems, caused bij human activities,
2. a certain readiness to take individual action,
3. organizational networks of institutions, both professional and voluntary, which continually or incidentally deal with theory and practice of environmental education.

This is - although quite an achievement in itself - insufficient to meet the need of solving environmental problems nowadays. To that end much more than an environmentally literate public is required. It is necessary to come to an analysis what in principle should be done in environmental education to bring about further improvements.
So first we have to discuss what actually has to change: is it man's behaviour, is it the role of science and technology or is it society as such? Though all three are important, I would lay stress on the latter. It is our view upon society and on the world as a whole that should be subject of a renewed introspection, leading to a global ethic.

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* See Maas Geesteranus and Smyth, 1987: An environmental education strategy; a concept for educators. (Presented as a paper for the Unesco-UNEP Congress in Moscow).

However, we are not only dealing with environmental problems, but also with people. We cannot simply transmit knowledge, insight, and skills onto people and hope that they will change themselves and change the world. Research and practice found out that it does not work that way. The most important factor we have to contend with is that each individual has his own norms, values, interests and capacities. If our message does not fit in with his value and experience system as a whole, we can forget about changes. The art of environmental education is not to transmit our ideas to the minds of others, but to find them receptive for those. Moreover, education does not work as a one way system either; instead, it is a matter of giving and taking, of teaching and learning, on both sides. Therefore, we have to make sure that our education possesses enough openness to give the target groups the feeling we really care about them, too.

In our hurry and enthousiasm to protect the environment (also through education) we may have paid insufficient attention to several aspects of education.

These may be listed as follows (although not complete):

- the full incorporation of societal (say: political, economic, cultural and social) elements into environmental education,
- the specification of our target groups and the expectations we have from each of them,
- the openness of education as a process,
- the development of adequate methodologies and learning materials for environmental education,
- the development of research,
- cooperation and exchange of knowledge and experience.

Earlier it was stated that great emphasis has been laid on the organizational development of environmental education. And indeed one may say that these efforts have resulted in a fine pattern of non-governmental voluntary organizations and professional bodies. Most of these are both horizontally (with similar organizations at the same level) and vertically (with regional consultants and national supporting bodies) linked to each other.

Most of these, however, work from outside the formal educational system which proves to be not always advantageous or at least slows down the process of incorporation of environmental education into school, vocational and adult education.
The following paragraphs deal with the actual questions listed above.

4. Societal elements

- People tend to formulate problems in concrete, clearly structured terms, because this makes for an easier way to find a solution. Since many concrete problems and their solutions relate to aspects which are merely part of more distant problems, a predetermined long-term overall educational strategy is essential for a solution. The search for a solution begins with the fundamentals of such strategies and can thus lead to better results. Technical means should support political decision-making and not direct it, as is all too often the case.
- The spatial aspect of the problems of nature and of man's environment reaches far beyond our - materially speaking - overdeveloped part of the world. Since colonial times, our actions have had major - usually negative - effects on the opportunities we have left open to other parts of the world to develop according to their own culture patterns. Our actions must be seen in a global context if we are to obtain a clear picture of our complicity in environmental problems elsewhere in the world and the economic and social problems which are directly related to them. This gives us a heavy responsibility.
- Generally speaking, people reach for technical aids to solve the various environmental problems individually. Basically there is nothing wrong with this, but it should be realized that this approach usually only tackles the consequences of man's activities, not the causes. Dealing with the consequences without fully comprehending the causes can itself lead to new problems. Such unintended side-effects often only become visible in the longer term. Measures which are in themselves logical then become part of a chain which,

viewed overall, is illogical. For these reasons, short-term solutions for problems perceived as intolerable must be viewed in the context of the longer term.

Concluding, environmental education must thus make it clear that human actions, in terms of both causing and solving problems, can be looked at from different viewpoints:

- from the need to see partial solutions in the context of a broad strategy (the aspect of function),
- from the need to relate human action to the effects they have elsewhere in the world (the aspect of place),
- from the need to view short-term solutions in the context of long-term solutions (the aspect of time).

This situation has certainly not been reached as a general rule, but progress is underway. Acceptance of these starting-points has also led to a new formulation of objectives for environmental education (Commission on Environmental Education, 1985; see footnote on p. 1). It reads, summarized, as follows:

> To enable people to acquire knowledge of and insight into nature and the way in which human actions affect its quality, so that they can make well-considered personal and social choices;
> and enable them to develop the attitudes and skills which can help them to implement these choices as effectively as possible in shaping society.

Though this is only one formulation out of many other possibilities, its tenor appears to meet with an increasing approval.

5. Target groups

For environmental education to achieve the instructional goals that have been set, it is important to distinguish between different target groups. There is nothing new about this: it has been done to a greater

or lesser exent for many years now. The selection criteria applied do, however, differ widely and lead to a great variety in the final choices of target groups made by the organizations in question.
Although this variety may be useful, here is a real chance that there may be gaps in the spectrum. The possibilities of arriving at a soundly based choice of target groups can be described in the following way.
Both individually and collectively, people effect changes in their environment, whether deliberately or not. Such changes differ in nature, intensity and range (according to place and time) from person to person. The educator must be aware of these variables if he wishes his work to be relevant to the target group.
The foregoing means that persons - and also groups of persons - should not be characterized on the basis of, for example, their level of development, degree of interest and other specific individual or educational criteria alone but also on the basis of their place in society. The following division (though other divisions are also possible) can thus be made:

- persons as members of social systems (public-oriented),
- persons with an educational task (teaching- and counselling-oriented),
- persons involved in decision-making (policy-oriented).

It cannot be said in general that one target group is more important than another. It is important, however, that environmental education makes an integrated approach to target groups. We have to reach them all, each time again. That has consequences for the matching of the education which the educator has to offer, with the characteristics and possibilities of various groups. It is in particular the handling of the part-strategies mentioned before, which may vary. This does not prejudice the need to make a connection with people's learning requirements and their level of knowledge, awareness and skills at the beginning of a learning situation.
In the next section these target groups are described somewhat more in detail.

Persons as members of social systems

Right from the beginning of environmented education there has been intensive concentration on the "general public". There is a constant stream of educational activities directed toward this audience. Usually this heterogeneity is accepted ("everyone is welcome"). A distinction is increasingly being drawn, however, according to social background, age or individual activity: e.g. schoolchildren, consumers, farmers, people engaged in recreational situations etc. People are part of various social systems, through which a more specific approach is possible with a greater chance of success.
Nature conservation education and the environmental education which is developing out of it, have now been in existence for about 25 years and - in all the diversity which characterizes these disciplines - have achieved undeniably important results: a widespread - if rather vague - awareness that man's dominant place in nature has caused a multiplicity of environmental problems.
The contribution made by nature conservation education to deepening the insight into the structural, societal character of environmental problems is by definition modest. That applies not only to the general public or persons in specific social groupings but also to people who, by their specific knowledge and public work, are precisely in a position to effect the development of that insight and its translation into societal terms. The possibilities of environmental education merit particular attention to the following two target groups.

Persons with an educational task

This description includes, for example, teachers in primary and secondary education, youth leaders, counsellors at counselling institutes, social and other academies, teacher training colleges and agricultural and horticultural colleges. In their work these people can introduce aspects of environmental problems. The voluntary and professional environmental education sector has so far been unable to offer these groups any great structural assistance. Admittedly, in the course of the years various national and regional educational projects have been set up, teaching materials have been produced, experiments have been carried out or are still being developed. There is, however, in general no fixed place for environmental education in the education,

training and general supportive structure of these target groups and their institutions at the present time.

Persons involved in decision-making

In all kinds of areas the decision-makers make decisions which may have repercussions on the quality of the environment. It might even be that this group of persons take the most far-reaching decisions about the quality of nature. They act on the basis of the responsibility they have within their sector of society. Decision-makers and those who prepare their policies are usually confronted by pressure groups and not by educators: "You've got to put pressure on politicians." There is a grain of truth in this attitude but politicians, civil servants, bank managers, industrialists, church leaders, board members of farmers' organizations and so on, are also educated in systems like universities and inservice training. Certainly, vested interests, financial and economic considerations, dependence on existing structures and political agreements makes their margin for changes small. Thus it is not easy to define what role environmental education can play for such groups. With a few exceptions there is virtually no systematic knowledge about this and even less about the most effective way of approaching these "forgotten" groups.
It is worthwhile to make a strong plea for gaining insight quickly into the educational possibilities for this target group.

6. The process of education

Education can be described as the deliberate organization of learning situations. In environmental education this takes place with regard to everything which is considered an environmental problem.
Therefore the following criteria for education can be formulated:

- the situation must be deliberately oriented toward teaching goals; these goals must be described in concrete terms,
- the activities must be built up logically and in a structured manner within a predetermined period of time,
- the activities must involve a clearly described group of participants.

It follows that concrete goals, specified not only by function, place and time but also by target group, cannot in themselves be the final goal of educational activities. This is certainly true if the target group cannot directly make a clear contribution to the solution of problems. Far more than this, it is the educator's task to enable his target groups to gain insight into environmental issues in their main aspects. If his target groups demand a solution to a problem which they have experienced, the educator should try to make them aware of the (consequences of) different options available. In both cases he should make it clear, in order to exclude the possibility of manipulation, that his prime concern is to bring his students up to a higher level of insight with regard to the environmental problems.
In this way environmental education tries to create an awareness which transcends the limitation of concrete part-problems.

In order to achieve a long-term objective as described above, with different target groups, a number of intermediate steps with specific objectives (instructional goals) are necessary. These are:

1. Interest
   Unless an interest in environmental issues is present, no educational process can be built up. This interest may be based on a desire for survival, on a personal experience with nature, on the need for knowledge or on the desire for better insight in for instance ecology.
   The stimulating of interest is normally a prerequisite for taking the next steps.
2. Way of thinking
   What is meant here is the formation of a cohesive worldview, the ability to see through current ideologies and received ideas.
3. Analysis of society
   This is an attempt to distantiate oneself from the conventional wisdom prevailing in society; in this way the target group is enabled to form its own picture of the way of existence which in its view are desirable.

4. Strategies for action

This is what it comes down to in the final analysis: that responsible individuals should shape their own existence on the basis of their involvement and a positive view of the future, with due regard to the limits which the community sets and on the basis of the realization that every community is a component of worldwide ecological processes.

These part-strategies: development of interest, way of thinking, analysis of society and strategies for action, form the connection between succeeding problems and solutions. They constitute a learning route for the target group.

7. Methodology and materials

Methodology development - and more in general: curriculum development - has a long tradition in the Netherlands, for instance with the science subjects. An important part of the work done in this respect comes from the Foundation for Curriculum Development. Activities in the field of environmental education are increasingly being taken up by this institute.
At primary school level this has resulted in the development of some large scale experimental projects which now slowly come to an end. The evaluation of their studies will result in the production of learning materials, inservice training for teachers, facilities for personal supervising and the like.

Since 1977 the Netherlands have participated in the European Community Environmental Education Network, a project set up by the EC Member States, which provides schools with useful material and ideas. The aim of the project is to teach children dof the 4-14 age group to appreciate and become aware of their environment, so that they take greater care of it. The first stage of this project was completed in 1982.
It is currently being continued on a national basis as the Network for Environmental Education a Primary Level, in order to round off the

work done and disseminate the materials produced and the know-how acquired. Activities include work on a school work plan section on environmental education. Eight schools are currently participating in it. Each school is supported in its environmental education activities by the school counselling service or school biology service. This network is subsidised by the Ministries of Housing, Physical Planning and the Environment, of Agriculture and Fisheries and of Education and Science. A network for secondary schools is being set up.

Although environmental education at primary school level is not provided for by law, schools show a great interest in it. This is clear, not only from the increasing number of requests for information concerning the possibility of including such activities in the school work plan section on science education, but also from the fact that it is primarily primary schools which make use of environmental education facilities such as school biology services, educational services provided by museums (including natural history museums, botanical gardens and zoos), environmental education centres, children's farms, visitors centres and facilities offered by volunteers.

Recently an interesting initiative with regard to the formation of instructional objectives for environmental education within the schoolsystem has been taken. A group of experts has now formulated such objectives for primary education, and the first half of general secondary education. The results of a working conference are being transformed into a booklet on this topic and will play a role in the ongoing discussion about the place of environmental education in the formal school system.

A survey held in 1984 showed that many Dutch secondary schools provide teaching on environmental and nature-related problems. School size and school type proved not to be a factor. 65-75% of junior secondary vocational and junior general secondary schools, as well as combined schools provide teaching of this kind. It tends to fall under such subjects as social studies, geography, biology, natural sciences, physics and chemistry, and technical subjects, and varies from a few lessons to lessons over a period of several months.

The Ministry of Education and Science has set up committees for biology, geography, physics and chemistry, and these are currently reviewing the examination syllabuses at all levels of general secondary education and developing new curricula for state schools. Where possible, use is made of the results of national innovation projects geared to the subjects in question.

Apart from several other projects on environmental education in secondary schools, 1986 saw the start of the project 'Environmental education in secondary schools', which is geared to the production of teaching material on environmental and nature topics suitable for incorporation in natural science lessons, and the development of school work plan sections on nature and environmental education.
A further aim is to ensure that this material is introduced in schools with the necessary supervision. An attempt will be made to link the project up with various other national projects, such as the 'Natural science for the 12-16 age group' project and the second EC environmental education network project.
This project can be seen as a breakthrough for environmental education in schools. It is the first time that there has been cooperation on such a scale between experts from environmental organizations, universities and educational services in the field of environmental education. In line with the integrated environmental policy of government, the project receives funds and strategic support from the Ministries of Agriculture and Fisheries, of Housing, Physical Planning and the Environment, and of Education and Science.

A national conference on environmental education in the formal school system held at the end of 1986, has further laid a firm basis for the development of environmental education in the curricula of Dutch primary and secondary schools.
The conference confirmed in particular the following starting-points for environmental education:

1. environmental education is concerned with the relationships between man, society and his environment, not solely with nature as such,
2. environmental education has a strong component of norms and values, not solely a component of knowledge,

3. environmental education is part of existing subjects, not a subject on its own,
4. environmental education is part of subjects like economy, sociology, history and geography, not the exclusive domain of the science subjects biology, chemistry and physics.

Junior and senior secondary vocational schools, young workers' educational institutes and apprenticeship training institutes are not obliged to provide environmental education nor does it form part of the final examination syllabuses.
The former touch voluntary on environmental education in a number of subjects; the form which this takes depends very much on the type of school. At junior secondary agricultural schools a number of subjects cover aspects of nature and the environment, although the amount of time devoted to such topics varies from school to school. The possibility of further integration with existing teaching material is currently under investigation with a view to providing a general basis in environmental matters.

Senior secondary vocational schools cover environmental problems in both general and vocational subjects. Again, the material covered and the amount of time spent on these topics varies depending on the type of school.
Senior secondary agricultural schools cover relevant environmental issues in general subjects, and, increasingly, in specialised subjects. In future there will be increased integration of environmental issues in existing teaching material. Individual courses are also devoting increasing attention to environmental issues.

The amount of time devoted to environmental education at higher vocational schools and colleges varies depending of the type of course. Environmental education currently comprises experimental courses in several colleges. In addition, there are various courses with environmental options in agricultural, civil engineering and technological fields.

Teacher training is crucial to the integration of environmental education in schools.
August 1984 saw the start of the first year of courses at the new Colleges of Education for Primary Teachers, where the subjects now include science. The training given to students is of course to be based on the way in which science is taught in primary schools. The teacher training institutes themselves have commissioned inservice training courses on environmental education by own initiative.
The new-style secondary teacher training institutes have up to now experimented in only a minor way with interdisciplinary courses on environmental education though several teacher training colleges are now in progress.

Implementation plans for inservice training commissioned by the government for 1986-1987, specify environmental education as an official activity. Development of several other inservice training courses now incorporate initiatives in the field of environmental education. Sometimes cooperation is sought with environmental organizations, which are directed at various categories of secondary school teachers.

Many universities have experience with the teaching of and research into nature and environmental studies, some more than others. All universities offer Environmental Studies as a subsidiary subject (4-6 months). A great many departments devote attention to aspects of nature and environmental management. At present the only first-tier (undergraduate) course of study is in Environmental Protection at Wageningen Agricultural University. Several universities are to set up a second-tier (post-graduate) course in Environmental Studies.
Within these studies there exists generally a possibility to study environmental education as a subject.
Increasingly universities are offering students facilities to study environmental education as a separate discipline.

8. Research

Recently interest in research on issues of environmental education has increased considerably. Especially the ministry of Agriculture and Fisheries and of Housing, Physical Planning and the Environment are stimulating research projects financially. Whereas the emphasis has been laid on inventories mainly, more and more research will be carried out on the effects of environmental education and on several aspects of learning situations in environmental education.
An important investigation about the current place of environmental education in the Dutch school system has been rounded off in 1987. The main recommendations are:

- development of a basic curriculum for environmental education for primary and secondary education,
- further implementation research,
- further evaluation research,
- further didactic research.

It is expected that government will stimulate ongoing and future research with respect to environmental education.

The attention for research in environmental education matters recently culminated in a workshop about this topic. Its findings have resulted in the publication of a (draft) medium-term plan by a joint group of ministries, universities and non-governmental organizations. This plan comprises the following:

- registration of existing and newly published research
- distribution of research results
- utilization of research
- programming and preparation of new research
- supervising of researchers.

9. Cooperation and exchange of knowledge and experience

In the Netherlands there exists a wide network of organizations, individuals, institutions and services involved in promotion and

support of executive environmental educational work, both within and outside the school system. They reflect a great variety in activities, which is partially due to the level they are working. These activities can be distinguished as follows:

- information and documentation
- counseling in practical situations
- training of environmental educators, teachers etc.
- development of teaching and learning materials
- development and innovation of content, methodology and didactics
- research and study.

A great many environmental education organizations have joined the National Advisory Centre for Environmental Education which was set up with a view to ensuring better harmonisation of activities and improving the quality and effectiveness of environmental education. The Advisory Centre has an important role in furthering coordination and promoting joint consultation. At present approximately 30 national and regional organizations are involved.

Crucial is the work of consultants now operating in all provinces. They support local and regional activities in the field of environmental education and are sources of innovation for policies at the national level.

Visitor centres, natural history museums, zoos and botanical gardens play a significant part in environmental education at local and regional level. Nearly all of these regard it as their duty to contribute to environmental education. Visitor centres in nature areas provide visitors with information on the area in question, and are increasingly popular among school groups.

Several issues will need much attention in the future:

- automation of information and documentation
- relations between regular supporting activities and those tied to a specific project
- role of local and provincial government

- planning of inservice training
- schooling of environmental educators (both voluntary and professional)
- development, use and evaluation of materials
- thematic and methodological innovation
- use of research results
- role of universities
- allocation of tasks between local, regional/provincial and national level.

National government nowadays plays an important role in the development and support of environmental education. This is particularly true for the ministries of Agriculture and Fisheries, of Housing, Physical Planning and the Environment and of Education and Science.
Interministerial cooperation and deliberation provides for a reasonably integrated policy in the field of environmental education.
Other ministries, like those of Transport, of Economic Affairs and of Welfare and Culture are - be it to a lesser extent - also involved.
After many years of policy development the aforementioned 3 ministries will probably publish a document about governmental medium-term policy in environmental education, within the near future.
Most importantly, it states that government will:

- advance and maintain a system of connected activities on the national level, directed towards the support of environmental education
- develop activities, directed towards policy development in environmental education.

To that end the document comes up with a great variety of policy intentions which cover all aspects of this article.
In order to help government formulate its policy on environmental education the (State Advisory) Commission on Education (now under the State Council for Nature Conservation) prepares advices in this field for the minister of Agriculture and Fisheries.
During the last 12 years it published advices about such subjects as:

- governmental policy on environmental education in general (also in English)
- field study centres (2 times)

- World Conservation Strategy (also in English)
- National Advisory Centre
- nature conservation and environmental education in urban areas
- natural history museums
- botanical gardens
- research in environmental education
- basics of environmental education (see footnote on p. 1)
- zoos
- educational aspects of species protection
- international aspects of environmental education, like IUCN-policy
- visitor centres.

Cooperation and sometimes joint operations have considerably increased during the last 5 years, on different levels and on many subjects. Joint deliberation, courses, study meetings, newsletters and the like nowadays guarantee that the community of environmental educators gets better organized. At present there exist 3 journals dealing with environmental education, 1 frequent overview of all activities in that field and 3 journals for biology teaching and environmental education (primary and secondary school).
On the international scene there exists an increasing interest in multilateral contacts. Especially the ministry of Agriculture and Fisheries and the Commission on Environmental Education are active in this field (IUCN, Unesco, UNEP, Council of Europe, European Community, Benelux).
They have a considerable input in policy development and concrete activities of these institutions.
Bilaterally contacts exist with surrounding countries, but also with other parts of the world. Joint cooperation in that field is developing.
International meetings, both with a study or a political character, are attended regularly.
An important question here remains how findings and experiences in other countries can be generalized in such a way that they can be made available to the Dutch situation.
It is still considered an important task in the Dutch environmental education community to "export" knowledge, insights and experiences on environmental education matters to other countries.

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