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THE ROLE OF CONSERVATION EDUCATION IN THE FUTURE OF LATIN AMERICA

By

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Introduction

To begin with, we should paraphrase the title of this conference into a statement, that the future of Latin America depends on the conservation education of its citizens.

In the report on the Latin American Timber Trends and Prospects, prepared by FAO in Santiago 1962, it is suggested that:"in its own long-run interest each Latin American country should formulate immediately a definite policy regarding its resources"....."1) Recognize publicly that the forest resources are of a major long-run importance to the country and that immediate steps must be taken to protect and develop them. " Among priorities it is recommended to "establish a program to provide qualified forestry personnel for government and industry."

Such recommendations are by no means unique, or restricted to forest resources. The need of governmental and public appreciation of the natural resources and the scarcity of trained personnel to manage them, is mentioned practically in every book, paper or report dealing with Latin American problems. Unfortunately, it is not often mentioned that the situation cannot be changed for the better until the Latin American people learn the basic facts of conservation. Economic and social growth is dependent upon the capacity to make wise decisions in resource allocation. Such rational choices among the alternatives are impossible if the values of the resources are not known to those who have to make the choices. Thus, public understanding of conservation problems would have a strong impact on resource policies.

In some European countries and in the United States of America conservation has become a sophisticated art in creating more effective ways of reaching higher goals. Economic, social, and technological relationships are considered but as far as growth contribution is concerned, the natural resources are placed at the bottom of the totem-pole. This of course, does not imply that the natural resources are becoming obsolete; they are only being taken for granted. As a general rule they are also well known and studied in these countries. Specialized organizations like the Forest Service, Soil Conservation Service, etc., are taking good care of them. The public in general can also be considered as well informed (or at least everybody who is interested enough could easily obtain adequate information through the extension services of authorized official and private agencies). In advanced countries there is also an impressive group of private organizations which comes into action when some of the natural resources are in danger of being exploited, or a new use-allocation is proposed.

As a contrast, it has to be mentioned that in most Latin American countries there is seemingly no strong public protest against the disastrous exploitation and depletion of the natural resources. On the contrary, together with industrialization a number of economic slogans have found their way into business enterprises and political parties; some of them are deliberate mis-quotations of the originals to justify the exploitation of certain resources. The people themselves are massively exposed to these distorted ideas, as all over the world there are TV sets in homes, even in homes of undernourished families, and modern cinemas in countries, where a high percentage of the population is illiterate. The same means -- TV and films -- are, however, not or seldom used to promote the knowledge of basic conservation concepts. Apart from a few scattered efforts not much has been dome in the field of conservation education in Latin America.

Before discussing what could and should be done to remedy this unfortunate situation, we must try to answer the question, why should conservation be taught at all?

Why Should Conservation Be Taught?

In order to answer this question, one has to consider first the basic ambitions of each human being. Fundamentally they are very simple: everybody wants to have food, water, shelter, and his share of the blessings of civilization. John and Jane would like to live better tomorrow than today, or, if they are content with what they have, preserve their way of living. Not only do individual human beings have their desire to preserve and improve their living standard, we can find such ambitions as motivating powers for families, communities, countries, and, we may add, the entire humanity. Let us just remember the efforts people put into building better homes, communities to improve their public services, countries to insure the future welfare of their citizenry and all the international agencies concerned with helping developing nations to reach a satisfactory living standard.

The well-being of the people and the continuing improvement of the ways of life depend mainly on the natural resources. The purpose of conservation education therefore is to increase thegeneral understanding of natural resources in order to preserve and improve the living conditions, and at the same time to develop respect for all resources and help adults and children to accept their share in the responsibility of maintaining and managing them wisely, through personal efforts, or by the power given to every Latin American adult through the voting system.

Another reason why everybody should be aware of conservation methods and techniques, problems and solutions is, because in one way or another, all human beings are involved in the process of conservation. Producers and consumers, adults and children, mankind in general, has the power to change his environment for the better or worse. With every cough and sneeze man adds to air pollution, with every tree he plants, he might improve the landscape. Each of man's actions (and sometimes inactions) influence nature, it is essential therefore to know their consequences. Nobody destroys intentionally the natural bounty upon which his own future welfare depends, but nevertheless it is often done and not so much out of ill will, as through ignorance. The child, who forgets to turn off the water faucet does not know that it may endanger the water supply of his family and their neighbors. The farmer who lets too many cattle graze on a hill slope ignores the fact that as a consequence of his practice erosion is promoted and a desert begins to form. In some cases people might even think that they are doing something good, while in reality they are upsetting the natural balance. A dam in the wrong place, or the excessive killing of predators, are well known illustrations of such malpractices.

From the above it becomes quite evident, that the knowledge of conservation principles is essential to the individuals as well as to the community as a whole. But now other questions arise, such as how and to which age group can conservation be taught and how would the people of Latin America react to the impact of a large scale conservation education program? To be able to answer these questions one has to consider the history of conservation practices and education on our continent, as our present is in every sense linked with and based upon out past.

Conservation Tradition in Latin America

From his first voyage Columbus returned to Spain with corn, different kinds of sharp pepper, sweet potatoes and other fruits and vegetables. Most of them were cultivated plants, which clearly show that the natives were familiar with principles of plant breeding such as the selection and crossing for desirable characteristics. Their manipulations were often so successful indeed, that in some cases, e.g.; corn, it is nowadays difficult to trace the cultivated plant back to its wild growing ancestor.

The Incas were growing their crop with special care. It is recorded, that the Inca Urion (who was an engineer, architect and agriculturist) transported soil (which was favorable for potato growth) from Quito to Cuzco.

Improving the soil with guano, terracing slopes with rock walls were common practices in Precolumbian times. The natives all over the continent had an intimate knowledge of their environment and made indeed a "wise use" of natural resources. In the "Manuscrito Badiano" (which was finished in 1552) for example, two native priests give the latin and aztec description of 183 Mexican medical plants. It is amazing to learn, that "cacalozochilt" (in our times known as Plumiera rubra) was one of 37 plants used for brewing a tea which cured nervous breakdowns of public employees.

In ancient times, however, the plants were not only used for practical purposes, their esthetic values were also appreciated. The Quechuas and Aimaras loved the flower, which is now called Passiflora. The Incas had a predilection for the red "cantuta".

Every ship which left the Old World had a chronic writer on board, whose narrations called attention to the natural resources of the New World. Already the first explorers of the La Plata region described its flora and fauna and the use the natives made of them. Diego Garcia wrote in 1526-1527 that the Guarani Indians grew corn and squash in the Delta Islands of the Parana. He also observed many seals on the Island of Flores.

The redwood of "Pau Brasil" (Caesalpinia echinata) soon became in Europe a highly appreciated dye, and the land where it grew and which was originally denominated "Santa Cruz" was later on referred to by the Portuguese as "Terra de Pau Brasil" or for short "Brasil". Many other Latin American trees were transported and used in great scale over seas. The conquerors, however, at least theoretically, did not intend an unscrupulous exploitation of the forests, laws were enacted as early as 1552 (Leyes de Indias) requesting planting of trees, observing the right time for cutting and other silvicultural practices.

The conquerors also tried to improve and supplement the existing natural resources by introducing livestock and seeds of crop plants from over the Ocean. Cattle, horses, and coffee had undoubtedly a great influence on the development of the Latin American countries.

After the independence was achieved, a free commerce with the rest of the world began. Latin America rapidly became an important supplier of agricultural products and other raw materials. It seemed, that a limitless bounty of natural resources would insure a constant growing process and a carefree future for all involved. Expeditions explored the continent and discovered new resources. Many of the plants and animals were previously unknown to scientists.

Explorers marveled over the beauty and uniqueness of the landscape and the National Park Concept which was created in the United States of America had a multiple echo. For example, the first national park in the world, which was donated by a private citizen, the "Nahuel Huapi" in Argentina was a gift made in 1903 by Francisco P. Moreno. Andre' Pinto Reboucsas in Brasil at the end of the last century encouraged the authorities to create a national park on the Brasilian side of the famous Iguazu falls.

The interest in conservation and preservation of nature in Latin America (as we can already appreciate from the few examples we mentioned above), is really traditional and remarkable. To this, the especially lively interest of new immigrants has to be added, who discover in Latin America wilderness areas and spots of pristine beauty, which are practically non-existent in their old home countries.

Why is it then, that in spite of the understanding and good will of so many, misinterpreted development programs can cause drastic and catastrophic changes in the Latin American landscape?

Evidently this is because of lack of communication between those who see and understand the problems and the rest of their compatriots. How else would it be possible, that, for example, so few of the 108 excellent recommendations of the Interprovincial Congress on Conservation of Renewable Natural Resources held in Argentina in 1959, were enacted? Or, that the scattered efforts at conservation education remain just that, "scattered efforts".

It might well be that teachers and learners are not aware of all opportunities to teach conservation and that a general survey of the existing opportunities and facilities (or lack of them) could help to remedy the situation. It may seem elementary, but one has to get right down to first principles to discover in every country why there is no direct or specific conservation education of the general public and/or in schools. How the imagination of the learner (youth or adult) can be stirred, by what kind of teachers and what kind of teaching, and last but not least the problem of who will teach the teachers, has to be solved.

Contact of Teacher and Learner

Depending on the contact between the teacher and student, the teaching can be direct or indirect. A direct contact of teacher and learner exists in classrooms and laboratories; but a part of it also at lectures, field trips, guided visits to resource sites to conservation plants or establishments. Such occasions provide the participants with an excellent opportunity to familiarize themselves with conservation problems. To become aware of the interrelationship of the resources, to develop interest and understanding.. The advantages of such lectures and guided tours are that the students can ask questions and immediate discussions can take place. The disadvantage of such direct approaches are that the demonstrations are limited to a certain place and time and that the number of participants is naturally restricted.

To ensure the success of such lectures, field trips, etc., they have to be well prepared also from an educational point of view. Scientists and technicians are generally eager to help in conservation education, so are the practical wildlife managers, foresters, and other professional conservationists. Unfortunately, they are not always qualified to present their ideas or facts in a way, that their audience can understand and accept. When they visit schools as consultants or lecturers, the teachers have or should have already prepared the class beforehand; but when they speak in clubs or other civic organizations, they have to exercise self-criticism and carefully plan their lectures, evaluating the didactic values. (A speaker should always keep in mind the background and average knowledge of the group he is addressing, the time at his disposal and the adequate selection of illustrative material, omitting those which are not to the point or represent duplications.)

Guided visits or excursions present the special problem of handling a moving group outdoors. Inexperienced leaders tend to explain during the walk to those who immediately accompany them instead of stopping at intervals and addressing the entire group. Field trips can be more successful when the guide has previously visited the area and carefully timed and planned the visit. If he guides a class, the class has been prepared, but a group of interested adults should be provided with leaflets describing the objectives of the tour. It is also essential that the main objective -- the conservation aspect -- should be kept in the focus of the interest and activities, as it is easy to divert attention towards pure nature study problems or games.

Indirect teaching of conservation implies, that the teacher reaches his audience indirectly. The advantages of such procedures are, that a nearly unlimited number of people can be taught simultaneously (TV) that the teaching can be exactly repeated (books, films) and that there is no limiting time element (a conservation nature trail, e.g.; can be used according to the convenience of each visitor). Professionally trained conservation specialists and experienced educators can be consulted when such projects are realized, as their far reaching effect justifies the time and/or money invested in them. The only serious disadvantage of such indirect teaching is the lack of personal communication between teacher and learner.

Indirect conservation teaching takes place when expositions, visiting centers, nature trails are prepared, or when newspapers, magazines, books, radio auditions, TV shows or films are used to promote conservation knowledge.

In some cases, the teaching might not even be planned, but takes place incidentally. E.g., the daily newspapers refer to flood disasters, the prizes of agricultural products, epidemics or forest fires. These news items are not written by conservationists or for the purpose of adult education in resource use. Nevertheless they impart a select body of dramatic informations, reminding the readers of the important role which the natural resources play in our everyday life. Concern about them generally leads to further inquiries into the subject matter and a better understanding of resource problems.

Planned conservation teaching through the press, TV, may follow either the integrated or the specialized approach. Conservation concepts can be discussed together with other topics, or exclusively in special articles, books, or auditions. E.g., a nature trail may include some point where erosion, or grazing effects can be observed; or, on the other hand, the entire trail is laid out in a way to familiarize the visitors with conservation problems.

Some showcases in a museum may refer to a resource use, or there might be an exposition planned with the sole purpose to promote the understanding of conservation practices. A column, or a section of a magazine may deal with fishing, camping, etc., or the entire journal is dedicated to wildlife or conservation news.

The advantages of a specialized approach are obvious, the only disadvantage being, that it reaches a public, which is already interested in the subject and aware of the problems. To reach the other sector of the people (those who are not familiar with resource problems, or not interested enough, to look for specific literature or films), the integrated approach has to be taken. Especially in extra-curricular education this is a very important and effective factor. Intermingled with other topics an adequate presentation of world or community problems, which reflect the misuse of natural resources, may be a valuable tool to arouse concern and stimulate discussions. Articles, films, expositions which are used for such an integrated approach, have to be prepared very carefully by persons with professional insight and techniques, subject matter competences and clear point of view.

Even articles for popular magazines should be prepared by specialists, because of the tremendous impact they have on the public. Some scientists are, however, still reluctant to use magazines and television as means of adult education. Inconsequently, the same specialists often complain about the public ignorance and apathy in conservation matters. Misunderstandings and apathy can only be overcome, if everybody concerned with conservation problems contributes at least to some degree towards resource use education. The responsibilities and opportunities for all are overwhelming as the number of well prepared conservation teachers is not yet adequate to supply for the large demand in the field.

Curricular and Extra-Curricular Teaching

Extra-curricular teaching of conservation.--Most adults received no conservation education in their schooldays. However, as a better public understanding of resource management and thorough knowledge of the natural resources becomes an increasing need in our times, governmental agencies, private citizens and organizations help to keep the people informed and to stimulate extra-curricular conservation education. The teaching can be oriented towards a certain interest group (visitors of a park, scouts, members of a club, etc.) or towards the public in general. Public understanding is especially important for the promotion and solution of conservation issues. E.g., paradoxically even the incorporation of Conservation Courses into the School Curricula cannot be achieved without public support which on the other hand can be obtained only from well-informed persons.

Teaching conservation within the school curricula.--

1) Objectives - Conservation is taught in schools to help students to see conservation problems more clearly. This includes understanding the use of each resource, its importance, the problems created by its use or misuse and the interdependence of all resources. Conservation stresses the science-social significance of the natural resources; helps students understand their environment and adjust themselves to it, solve existing problems and avoid creating new ones. The teaching procedures by which these objectives can be reached are (1) arousing interest, (2) identifying a problem, (3) securing the necessary information towards solving the problem, (4) evaluating the results.

2) Types of schools where conservation is or could be taught - Conservation teaching should form an essential part of the general education. Whereas conservation is not yet a generally required course, experiences from various countries and states show, that it can be successfully incorporated into the curricula at all school levels.

The owner of a private kindergarten in Milwaukee (USA) specializes in conservation and is replacing the usual children's stories and activities with conservation oriented ones. The Public School System of a state in the USA, includes in its outdoor education program as a theme for the kindergarten, the number and kinds of living things that can be seen around the school and its neighborhood during the four seasons of the year. This activity, which could be termed as Nature Study is complemented by a conservation oriented one, as the children learn to observe how these plants and animals affect each other and help to serve many of the human needs.

Each of the elementary grades all over the world, includes in its curriculum some themes which are, or could be extended in a way to serve conservation understandings and to arouse particular interest for, or to stimulate conservation activities. It has to be remembered however, that conservation at the elementary level is generally taught in simple terms, concepts and skills are simplified as well. These elementary ideas need to be expanded and complemented at the higher levels with additional philosophical, biological and economical concepts, so that sound conservation attitudes can be adopted.

Already before World War II in many schools Nature Study became replaced in the curricula by Elementary Sciences, which embraces not only the biological but the physical sciences as well. Conservation concepts are incorporated in such courses. The integration of Conservation with Biology, Science, Geography, History, Government, Economics at different grade levels has become of common habit. This integration is a very useful complement to a special course in Conservation in secondary schools but cannot replace it completely.

Some Colleges and Universities offer conservation courses; preservice or professional courses in conservation education are organized. At the General Assembly of the IUCN, unanimous support was given to the project to introduce special courses "Conservation of Nature" as obligatory subject into the curricula of universities, pedasogical, agricultural, forest, technical and medical higher educational establishments. A postgraduate diploma course in Conservation at the University College in London (England) is held for graduates in Botany, Ecology, Geography, Geology, Forestry, Agriculture and Civil Engineering.

3) Teaching methods - The most effective way is to offer a special course in conservation. Such a course can be taught throughout the grades by specialized teachers efficiently presenting the unique aspects of Conservation, without getting the pupils confused as to where the boundaries of the subject are. Descriptive Sciences and Natural History, e.g.; provide an indispensible background for conservation understandings, but cannot substitute for each other. The basic reasons and needs for conservation find their fundaments in the principles of sciences. The differences in aims between teaching conservation and any other subject becomes evident when the objectives are selected. Conservation instruction can offer a continuous and enlarging program throughout the school curricula which leads to an intimate knowledge of conservation problems of the daily life, a genuine concern about them, and subsequent adjustment.

Conservation is also frequently taught as a part of other courses. The effectiveness of such an integrated approach depends greatly on the conservation training of the instructor. Its very definite advantage is, that it shows the interrelatedness of conservation with subject matters such as Science, Biology, Sociology, etc. It makes even the teachers of such subjects sensitive to resource problems. The main disadvantage of integration is, that when conservation is mentioned within another course, it is very likely, that more emphasis (in teaching and grading) is given to the subject into which it is integrated, than to conservation itself. Another disadvantage is, that the depth of coverage can not readily be appraised as the scope of coverage can never be considered as an adequate measure. The problems of soil erosion will receive, e.g.; an entirely different treatment in a History class or in Economics, than if they would be dealt with in a Conservation course. A poetry describing the benefits produced by a tree, discussed in Literature class, cannot substitute for a Forestry unit in Conservation.

In both the special and the integrated courses several approaches can be taken to insure the understanding (e.g., description, demonstration, experimentation, and interpretation). All these methods should be flexible and used alternately as occasions and individual cases warrant it.

4) Teaching aids - Text books, charts, maps, pictures, slides, films, recordings, clippings, collections, experiments, etc. (Some of these aids can be efficiently prepared by the teachers and/or the class.) The successful presentation of each teaching unit greatly depends on the adequate selection of the teaching aid. Presenting a film, where class activity could provide a more intimate contact with the subject (e.g., tree planting) might be poor policy. The use of aids must naturally be just as flexible as the methods applied.

The number of teaching aids which were prepared especially for Latin America is still very small and the imported conservation material is not always adequately adapted.

5) Where can the teaching be performed? - Conservation can best be taught by giving the students first hand experiences. These can be obtained on field trips, which might last from a few hours up to a few days, through camping, by visits to plants and installations and through observations of the local environment. Field trips can be arranged for a special purpose, to deal with a single problem (e.g., erosion control), or to get a general view of the conservation situation of a region. Camping can be considered the best outdoor conservation workshop. Visits to units such as municipal sewage purification plants, dams, fish hatcheries, etc., are rewarding experiences. Frequent visits to the same site in the vicinity of the school are highly recommended to demonstrate the evAluation of problems or the solving of the same (e.g., the increasing erosion after each rainfall on a hill slope; or the progressive soilbinding by a grass cover, can be observed). In all such areas the students have ample opportunity to interpret and observe, they might even have a chance to work on projects. The out-of-school activities are guided by local authorities and consultants who assist the teachers (but naturally the teachers are already familiar with the area and its problems before they arrive there with their students).

For practical reasons first hand experiences can only form part of the conservation education programs. Generally the conservation problems are reconstructed and described in classrooms, auditoriums or laboratories. Here the class activities include experimentation, observation, discussion, interpretation and the evaluation of the projects.

6) Who should teach conservation? - Successful conservation education greatly depends on the skill and understanding of the teacher. Up-to-date there are, however, but few teachers who were trained at the university or college level in conservation education. This means that most of them have to be trained on the job. They might even be forced to do it themselves, or, as in some States of the United States of America, the problem is solved by employing curriculum directors who design suitable programs for the integration of conservation with other subjects. These training specialists visit the schools, deliver lectures and demonstrations, guide field trips and while on the job they are simultaneously teaching the teachers.

In other countries, teachers are encouraged to attend courses which include conservation, to obtain improvement in their professional qualifications. The UNESCO encourages also the organization of workshops in different regions, to discuss and perfect appropriate teaching and study methods.

It is hoped by all concerned, that within a reasonably short time all Latin American countries will provide opportunities to train conservation teachers just the same way as teachers of other subjects are trained.

Conservation Education in the Future

With properly trained teachers who are reinforced by adequate teaching aids the role of the educational establishment in popularizing the concept of nature conservation to the public in general will also expand. But what is more important is that when the message reaches the student (child or youth) we can be sure of his becoming a conservation-minded adult. Latin America badly needs a whole new generation of conservation-minded adults to assure the continuing existence of its natural resources on which ultimately the future well-being of all its inhabitants depend.

EXTRA CURRICULAR CONSERVATION TEACHING

CONTACT OF TEACHER AND LEARNER	MEANS OF REACHING THE PUBLIC THROUGH	ADVANTAGES	DISADVANTAGES
DIRECT	lectures field trips guided visits to conservation establishments	immediate discussion can take place	limited number of participants the demonstrations are limited to a certain time and place
INDIRECT	press { newspapers, magazines, books }	available to an unlimited number of people; can be reused without time or space restrictions	no immediate discussion with teacher possible
	radio audition T V film	can reach an unlimited number of participants; no space restriction; performance can be repeated	
	nature trail visiting center exposition	can be used by an unlimited number of visitors according to their time convenience	

TEACHING CONSERVATION TO CLASSES

STUDENT CONTACTS	WHERE TAUGHT	TEACHING METHODS	TEACHING AIDS	BY WHOM TAUGHT	CLASS ACTIVITIES
WITH PROBLEMS of reconstruction of conservation problems	CLASS	small scale demonstration small scale experiments description (reading, lecturing, illustrating)	experiments collections charts text books pictures maps	teacher	experimentation observation discussion interpretation evaluation of project
	AUDITORIUM	lecturing audio-visual demonstration	guest lecturer films slides, recordings	teacher or consultant or guest lecturer	observation
	LABORATORY	demonstration experimentation	equipment	teacher	experimentation observation projects
first hand experiences	LOCAL ENVIRONMENT (community)	demonstration interpretation	maps charts	teacher and/or local authority concerned with conservation problems	observation interpretation projects
	PLANTS and INSTALLATIONS	demonstration interpretation	prepared guide booklet	local guide	observation interpretation
	FIELD TRIP	demonstration interpretation	prepared guide book maps charts	teacher and/or consultant or local guide	observation discussion interpretation projects
	SCHOOL CAMPING	demonstration experimentation interpretation	prepared guide book maps charts	teacher and/or consultant or local guide	experimentation observation discussion projects interpretation