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WORLD SOILS POLICY AND PEOPLE'S LIFE

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Peoples of the world moved from the hunting-gathering way of life towards a form of agriculture or animal husbandry at different historical times, some as early as 5000 years ago (China, Middle East), some only nowadays (Amazon tribal communities). Such a transformation in way-of-living implied the need to know which particular tract of land in the area of settlement was best suited to produce crops, fodder or fibers, and which was s8e best way to maintain or improve its productive capacity. So-called "primitive" farmers may have had only simple fertilizers, implements or traction at their disposition. At the risk of starvation, however, they learned very quickly how to handle the soil on hand and to supply needed water or get rid of its excess. This not only by trial-and-error but also by daily and seasonal observations on the interplay between weather conditions, soil properties and plant growth. An invaluable pool of local knowledge on soils and their management was accumulated from one generation of farmers to another, and invariably it became the foundation of all land-based civilizations.

Increase in plant production above the immediate needs of a farmer's family resulted in the emergence of towns. The towns' population developed its own cultural needs and ambitions, including socio-economic and military-strategic goals, due to man's in-born trait of never being satisfied with one's own status and level of prosperity. More often than not a sharp antagonism developed between the larger towns and capitals on the one hand, and the countryside farming communities on the other hand; townspeople developed a distaste to direct contact with such down-to-earth and earthy matter as "soil". A notion often prevailed that soil is a simple renewable natural resource instead of one that would be finite unless continuously and carefully managed and nurtured.

The meagerness of written documentation in early civilisations on how to distinguish the various soils and how to handle them properly is not because of absence of such knowledge in the farming communities, but because of the disdain of the educated townspeople to deal with such a dirty subject in favour of astrology and the fine arts. Rarely one reads of anything more precise than "sand", "clay", or "peat" soils; "red" versus "black" soils, or "ash" soils.

Townspeople wanted (and still want) cheap food and clothing and governments tended to accommodate for it, for fear of nearby political unrest. Low food prices forced farmers to strive for maximum production at the short term, leading to neglect of long-term husbandry needs of the soil and water resources. Mining of these resources was often the result: decrease of inherent chemical soil fertility and of organic matter, salinisation, or erosion by wind or water. Territorial expansion was then needed to capture good land from neighbouring peoples, and the resulting warfare resulted usually in further neglect of the land through devastation and acute disruption of rural communities.

Climatic change may have contributed to the decline and disappearance of civilisations, but by-and-large the main reason was this semi-automatic disregard for quality maintenance of soil and water resources.

Such a sequence of events is not a thing of the past only. In many countries of the so-called Third World of the tropics and subtropics it is happening right now - and at an alarming scale - even though agronomy-soils research institutes were established as early as hundred years ago in some tropical countries (Campinas in Brazil, Amani in Tanzania, Bogor in Indonesia, Coimbatore in South India). In Europe, farm-land neglect was prevalent in the early industrial period - until during the pre-war

depression years a movement of "return to the land" as the backbone of a nation's economy emerged. In Northern America, such a neglect led to the infamous dustbowls and land qullying of the twenties and thirties. These events gave origin or impetus to state soil conservation institutions and a first awareness that some kind of national soils policy was needed.

The strong increase in medical and educational facilities everywhere in the world since the forties, both among town and rural communities, have led to an unprecedented rate of population increase in many parts. From 3 billion in 1950 the world population will reach the 5 billion mark any day this year, with an expected absolute peak of 10 billion in the year 2050 (graph). Prospects of mass starvation loomed high in the fifties. The notion of that all this human population has to be fed, clothed and sheltered led to a massive effort to increase plant production worldwide. The necessary agricultural research received much impetus, and maximising of crop yields became the theme of the day. The Worldbank, the United Nations Development Programme and the UN's Food and Agricultural Organisation (FAO) started many production-oriented development projects in third world countries. A number of International Agricultural Research Centres was created to stimulate the production of annual food crops, such as CIMMYT in Mexico, IRRI in the Philippines, CIAT in Colombia, IITA in Nigeria, and ICRISAT in India. These facilities bore quite spectacular results and became known as the "green revolution" - admittedly only on the better soils and where good climatical conditions prevailed.

In the industrialised countries themselves, especially the ones with non-centralised planning economies of such as Western Europe, North America and Japan, the crop production increase was even more spectacular (graphs). This not only because of the strengthening of national agricultural reserch with effective links to education and extension to the farming communities, and the promotion of cheap chemical fertilizers, but also because of huge direct or indirect price supports for farm produce. The latter was and still is maintained because of the fact that the rural population in those industrialized countries, though relatively small in absolute numbers, more often than not hold the balance of power in the democracies concerned. This time therefore not the townspeople have to be kept satisfied but the rural communities!

The combination of successful agricultural research and political support has resulted in excessive production in the last decade, and storage facilities require ever larger financial provisions from the public coffers. Grain, beet sugar, butter and olive "mountains", and milk and wine "lakes", are now everyday catch words.

Massive "food aid" to the starving millions in the tropics became suddenly possible. But what started as an altruistic measure gradually has degenerated in dumping of excess produce and fierce competition between power blocks. Southern temperate countries such as Argentina and Australia have seen their traditional markets in the north becoming more and more protected. Townspeople in the developing world have become even stronger accustomed to cheap grain from temperate regions - often of a kind not grown in their own country. The traditional antagonism of cheap food for the townspeople in the tropics versus stable and fair prices for the indigenous farm produce has now become very acute (a glaring example is the introduction of wheat bread in Nigeria, doing away with the traditional staple foods of sorghum, millets, yams and cassava). Mining of the local soil resources is increasing, not only internally in the developing countries, but also at an international level: casava and soja for the western bio-industry, tropical timber for luxury housing in Europe and Japan, beef for the expensive tastes of the U.S. ("the hamburger connection").

The green revolution itself, with its stress on chemical fertilizing for highly productive crop cultivars, have brought farmers in areas of marginal soils and climatic conditions in acute distress.

We are now faced, precisely because of the drive for maximising food production, with a situation of strong soil degradation in many parts of the world. Chemical fertilizing in the temperate regions is not anymore accompanied by adequate attention to maintenance of soil organic matter; large-scale mechanisation has resulted in soil structure decline, ever more intensive crop protection against insect pests, and chemical weed control, has thinned the microbiological life in the soils. Industrial fall-out ("acid rain") and the local dumping of the bio-industrial waste has resulted in acidification of soil and water resources: dying of the few remaining forests and stillness of fresh water lakes.

Short-term maximising of production from marginal soils in the tropics has depleted chemical fertility and has greatly increased wind and water erosion. In many instances this has been aggregated by catastrophic weather conditions (the Sahel drought in Africa, the El Nino event in Latin America) - which may or may not be man-induced.

Of course these trends have not gone unnoticed. As early as 1972 a special UN Conference was held in Stockholm that called attention to problems of the world's environment, and the establishment of a special United Nations Environment Programme (UNEP) was the result. The Sahelian drought period prompted the calling of a UN Conference on desertification (Nairobi, 1977) and UNEP was charged additionally with an action plan to control land degradation and desertification.

UNEP also took part in the establishment of a World Conservation Strategy document (1980) by the International Union of the Conservation of Nature (IUCN), an influential non-governmental organisation of conservationists. This document gave rather more attention to flora and fauna ("living resource conservation for sustainable development") than to soils. In the meantime, UNESCO's Man and the Biosphere (MAB) programme, started in 1970, was building up a network of research at a number of sites that were presumably representative for main biotopes, from cold deserts to hot tropical rainforests. There again, the soil was given scant attention - until in the eighties Unesco obtained the cooperation of ISRIC to carry out soil characterisation work in some of the MAB reserves and research sites and the elaboration of Guidelines for soil survey and land evaluation in ecological research.

Being charged with development of Environmental Management Guidelines, UNEP convened three expert meetings on the soils element. It resulted in the adoption by its Governing Council of a World Soils Policy document (1982; "aimed at conserving this most important of natural resources and using it on a sustained basis") and its elaboration into Environmental Guidelines for the Formulation of National Soil Policies (1983).

Not to be outdone, FAO adopted a World Soils Charter in 1981 ("as a basis for international cooperation towards the most rational use of the world's soil resources"), acting rather belatedly upon a recommendation of the World Food Conference in Rome of 1974.

The International Council of Scientific Unions (ICSU), through its Special Committee on Problems of the Environment (SCOPE), stressed the relationship between waters-soils-vegetation-climate and the hazards of substantial global change through changing global element cycles (the "green house" effect), but it based the soils aspect on rather imprecise data bases.

Did all this inter-governmental and inter-scientific focus on soils change anything for the better? Hardly so! There were the different outlooks of the three UN organisations concerned: FAO's orientation on food versus Unesco's scientific interest, versus UNEP's conservation interests. In practise there has been a rather unhealthy competition between these Agencies as to whom should talk and act on soil-related matters - with the professional community of soil scientists (ISSS) caught in-between. Also, the funds for each of the three have shrunk considerably, and soil programmes tended to be the first to be axed - because it is such an ungainly subject with any remedial actions likely to be unspectacularly slow.

The scientific basis for soil-related development is moreover found to be wanting, with western/temperate knowledge overriding local farmer's experience as being out-of-date. Many large development schemes have failed because of inadequate attention to local soil conditions and management practices in the tropics and subtropics.

Precisely because the subject is so down-to-earth and location-specific, any formal action by UN Agencies, or national Government Agencies, or Scientific Groups is bound to be rather ineffective. One needs intensive contacts between scientists/project staff and local farming communities, and grass-root level non-government organisations to rally the land users to the cause of soil conservation. Every farmer loves his land and would dearly like to conserve it and keep it productive for his children and grandchildren. But how can they, if national government policies and international competition in food and trade force him to maximize his short-term production instead of optimise it in view of the sustainable capacity of his land?.

This view of optimizing rather than maximizing production, and conserving fragile lands, is only nowadays emerging as a policy guidance in international circles. Autonomous institutions such as the World Resources Institute in Washington and the International Institute for Applied Systems Analysis (IIASA) in Vienna are producing substantive documents on the matter such as "World Resources 1987".

The International Union of Biological Sciences (IUBS) is starting a research network on the role of organic matter in tropical soils (Tropical Soil Biology and Fertility programme). The CGIAR system of international agricultural research centres has awakened to the plight of the farmers of marginal lands through the holding of a workshop on agroecology (Rome, 1986). The UN World Commission on Environment and Development, in its just published report (the Brundtland report, 1987), stresses that Environmental Conservation and Development are not antagonistic goals, but are intimately interwoven in a positive sense. The report emphasizes that the problems can only be tackled by concerted international and national action, with economics not as the prime and absolute goal but embedded in equal-weight attention to environment by all agencies and ministries, instead of treating it as the ineffective luxury of separate entities that receive lip-service only.

The Worldbank, this major supplier of funds for development, has finally deemed it fitting to create a special division on Environment and Development and now requires "environmental impact assessments" before any project is implemented.

The Brundtland report also calls for strengthening of UNEP, more particularly the Global Environmental Monitoring System (GEMS) with its facility Global Resource Information Database (GRID) in Nairobi/Geneva; strengthening could be effectuated through a Global Risks Assessment Programme.

Indeed, the need for reliable quantitative data bases of natural resources at both global and national levels becomes more and more evident. This not only to assess the present status of these resources in spatial/geographical contact - for instance soil degradation status - but also to project and monitor their changes in the future, in relation to the expected population growth till the year 2050, and also with respect to possible climatic change as a result of the strongly increasing demands of soils and other natural resources. The building up of a reliable soil data base as a key element in an interactive graphical computer system on resources, as envisaged by GRID, is a priority of the international community of soil scientists associated in ISSS, and of my home institute ISRIC in particular.

Assessments to be derived from such data bases on what is going to happen with Planet Earth and its soil resources, will hopefully convince very gradually the politicians that the global economy will need thorough adaptations and adjustments as regards the location of production of food, fibers, etc., and especially its pricing and marketing. Overhaul of the present General Agreement on Tariffs and Trade (GATT) would seem overdue.

This may call for a rather drastic lowering of the exigencies of peoples such as yours in Japan and mine in Holland. Luxuries of yesteryear have tended to become necessities of today (cf. statement Garbouchev), but they may have to be classed as luxuries again tomorrow. Such a painful process of adaptation, so as to assure the well-being of Planet Earth rather than the wealth of individual countries or peoples, will have to be achieved by peaceful means. A new world war to correct the present imbalances, and re-create a sense of true international cooperation, is out-of-the question because of the enormous destructive power of the new weapons that have been developed and deployed.

A forced massive drive to control population growth in some countries or a policy of benign neglect, including the lowering of medical facilities, would possibly be effective, but ethics and religion do not allow this. Everybody born, wherever on earth it happens to be, is entitled to a fair share of the cake.

Also a biotechnological revolution - with the production of food, fibers, and shelter materials in factories rather than on the soil resources - would not solve the problem. Production would then be even more concentrated in a few hands, and the rural population would have no base at all to earn a decent living from the efforts of his own hands and mind. Further congestion of marginal population groups in town slums would be the result.

Is there really a possibility for change, assuring a wise use of the world's land resources and a decent way of living for everyone, including the rural groups? May-be. There are some encouraging developments:

- the success of soil conservation and agroforestry practices in parts of eastern Africa, in the Himalaya fringe, and in the Chinese loess plateau area (slides);
- the spectacular increase in the productivity of the chemically extremely poor soils of central Brazil, easing the stress on the Amazon region with its fragile ecosystem (slides);
- the success of village-level reforestation and water conservation in many parts of India and the increase of sustained production levels on the alluvial lands of northern India, Pakistan and Bangladesh;
- the encouraging growth of all kind of national non-government organisations (NGO's) in the developing countries, promoting awareness on the wise use of land and its socio-economic implications;
- the growing influence of international non-government organisations such as IUCN, stimulating an awareness that no individual country has an absolute and single responsibility for its own land and people, but shares responsibility for planet Earth as a whole;
- the emergence of Green Political Parties of Western Europe that fight against the pollution of soils and waters, criticize the excessive production, and that are willing to forego some of our everyday-life luxuries. Directly or indirectly they may influence government decisions on farm subsidies, international tariffs, and development cooperation.

If such developments can be strengthened - and everybody of us has a responsibility to mobilize public opinion - then we may, just may, be able to cope with the worldwide problem at hand. If not, then Planet Earth, as the Gaia earth goddes of Greek mythology, will make sure that it gets rid of a good part of human life that irritates its living skin by pilfering its natural resources .... through its own means of catastrophic events.

A final statement, as the underlying philosophy of an effective world soils policy:

"We do not own our land and soil resources for us to use or misuse at will, but only have it in custody to conserve and develop it for future generations .... our own children and grandchildren."

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