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Workshop on Fermentation Alcohol for Use as
Fuel and Chemical Feedstock in Developing Countries

Vienna, Austria, 26 - 30 March 1979

GOVERNMENTAL RESPONSIBILITY IN ENERGY AND ENVIRONMENTAL POLITICS*

by

Markus Frits**

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GOVERNMENTAL RESPONSIBILITY IN ENERGY AND ENVIRONMENTAL POLITICS*

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Markus Fritz**

The warning cry of the great international environmental conference in Stockholm June 1972 - "Only One World" - was (and is still) nothing more than the verbal expression of a political vision that does - as all visions do - actually not exist. Because "only one world" would mean that political, economical - and especially income - structures all over the world are similar. But this is not the base case, this is not the truth. We are rather facing two very different worlds, one in the north and one in the south, splitted up - roughly speaking - into two regions in the north (OECD and centrally planned economies) and two in the south (Third and the so called Fourth World). And these two hemispheres have each their own economic laws; again roughly speaking: the north lives on behalf of the south, consuming in bulk energy (i.e. oil) and other resources of the latter. It is indeed a oneway deal, determinated by the needs of the north (east and west, there is no difference) respectively by the economic power of the rich.

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Accordingly the energy and environmental problems are very diffrent in these two great hemispheres:

In the north only 30 percent of the world population use 84 percent of the world energy production (mostly imported) and pollute the basis of their life practically in all sectors - industry, domestic and agriculture, whilst in the south, especially in the lower income countries, people are starving in a not so much industrially polluted but insanitary world, with less hope for betterment, lacking of rather all that makes life worth living. But is this indeed a hopeless situation for the poor in the south - and quite the contrary for the rich in the north? I mean no, because the structures - economically and politically - are very inflexible in the northern part of our world (again: no difference if west or east) and so governments there are forced to follow this beaten main track without great, revolutionary

changes, even in the consciousness that this way will finally lead into a dead end; escalated by even more energy and more growth - and that means: more destruction of the basis of life. The political leaders of this northern hemisphere they are not in the position to stop certain technologies they have developed with billions of dollars or Deutch-Marks over decades and/or to change the attitudes of their peoples in short or medium term (propably not even in long term)- first being afraid of losing political power and second, what is more important, being afraid of losing the throat-cutting economic competition these countries are involved. Just one example: In case the government of a certain OECD country would come to the final conclusion that electricity should not be produced e.g. by nuclear power but from solar energy, this could hardly materialize since this country is engaged in the horse-race called economic competition (especially on the export market) and so has to watch most carfully not to spend more money on new energy systems than other OECD countries do. What is good or bad is not the question in the developed countries - what is cheap or not it is.

Exactly this is the chance of the developing countries, being very often just at the starting point to a new economic and/or political order. Their governments should recognize that the development that has taken place in the DCs cannot be the right one since the increase in standard of living has been paid by a sharp decrease in quality of life. Their responsibility is not to copy that wrong example, but to learn from the mistakes the DCs can no more undo.

What is the alternative for the developing world? Of course there is no pat solution because more than the developed countries the developing ones are different in their - although flexible - structures. But there are some "basic rules" that should be applied: Like in the People's Republic of China which is a good example since it has defeated hunger, the concerned countries should "walk on two legs"; i.e. instead of developing mainly industry, urban and rural areas have to be developed in the same rhythm, observing that this development is based on

- manpower (which is abundant in the LDCs), saving technical energy and preserving the environment in the last analysis, and on
- indigenous resources, especially in the energy sector,

to gain real independence - the greatest value at all. Of course this kind of development is not possible without technology - modern technology, but not each modern technology is "appropriate" for this kind of process - what is essential.

I have not come to give you a statement of the environmental and energy situation in the developing world, and I have not come to offer you a model for sanitation of both, a model which very probably would have the same disease like most models designed on the writing table, located very far from reality - the disease of being mere theory. Especially I have not come to feed you with hopes on a new political or economic world order that will solve all environmental and energy problems by a broad and peaceful consensus, spanning the differences of east and west, north and south, black and white, poor and rich. Because this new world order - of which politicians and scientists often are talking, especially at conferences, as if they expected the Messiah - will never become reality, for two reasons: First, the geographic, racial, economic and political differences as mentioned above are the basic elements of world power politics and thus will not be withdrawn from the political stage, and second, the industrialized countries, according to their tradition, will further on do only things that are advantageous to themselves, i.e. the well being of their peoples. And to share wealth, although derived from the wealth of resources of the Third World, is not at all advantageous to them. If a representative of the industrialized world is telling you that the rich countries are most concerned about the poverty in the LDCs, he is either scenting some kind of business or he is not talking the truth.

So what is my message for you, the members of governments in the Third World?

I shall try to give you some ideas how the actual and further de-

gradation of the environment could be managed or avoided in the developing countries as well as the energy situation could be improved. These ideas are not concerning the "back end" of the problems, i.e. the facts of overpopulation in the cities, infected waters and deforestation af vast land due fire wood production for example, but the "front end" - the source of the energy and environmental problems, which are mainly problems of the basic needs of a population.

We are often arguing:

- How does it come that on one hand mankind is sending rockets to the moon, but on the other it is not capable to furnish itself with enough food, and so 700 million people are starving?
- How does it come that on one hand recently artificial life was born in laboratories, but on the other hand 1,5 billion people do not have adequate medical care in the world?
- How does it come that on one hand communication has improved so much that ootball games and b xing championships are shown all over the world live via satellite, but on the other hand 800 million people are analphabetics?

It is rather easy to answer that: Because there is not at all "only one world" as the Stockholm environmental conference in June 1972 was headlined, but two very different worlds resp. mankinds: the rich industrialized countries, owning and using the most advanced technologies, and the developing countries, who in many cases are not even in the position to meet the basic needs of their people, i.e. food, shelter, health care, education and employment. So other words: Since the basic needs of the people in the industrialized countries are already met, most of the research

and development work in the industrialized countries (where 90 per cent of world research work - and funding - is performed and 98 per cent of modern technology is concentrated), is shifted to aims which can sustain or improve the political, economical and prestige position of the industrialized countries.

And to keep this great margin, these technologies are classified by patents. Only 6 per cent of the 3,5 million patents in the world were granted in the Third World (5 per cent to foreigners living in that part of the world, so that 95 of those patents were not exploited in the Third World, only 1 per cent to citizens of developing countries). UNCTAD estimates that in this decade the developing countries will have to pay 10 billion dollars to the industrialized countries for exploting patents and licences. Technologies, however, are playing a key role not only in improving the environment and the production of commercial energy, but also for meeting other basic needs.

These basic facts of political reality are the actual starting point for governmental activities and responsibility in the Third World.

First - and this is the main aim - the developing countries have to try to become more self-reliant. Self-reliant does not mean "self-sufficient", because no country is really self-sufficient in this age of international division of labor, not even the USA or the Soviet Union. But it means that the countries concerned must try to get rid of the enormous economic - and thus: political - pressure put on them by the industrialized countries within the last 200 years of resp. after the industrial and technological

revolution.

It is not difficult to demand that · but how to realize?

I feel that it is most important for the developing countries to look at their tradition, culture and social conditions and from this basis will design an economic development that fits into this structure, instead of leaping over some steps, following a deceitful star. Before they are going to take over the so called "modern" technology at a time when they are not yet prepared for, they should think that also the industrialized countries have not at all leaped over just one step. Look for example at the beginning of the industrial revolution in the northern hemisphere: although coal was available already at the time of invention of the steam engine, wood had been used first because it was the appropriate energy source at this first step. What is "modern" is not the question, what is "appropriate" counts.

To give you an example of my own experience: Who will doubt that the Concorde aircraft is the most modern means of transportation, but when going from the place I live in Munich to work at the Max-Planck-Institut in Starnberg, which is located 30 kilometers south of Munich, I am not going by the Concorde, and also not by car, but by rapid train - for two reasons: firstly, it is the the most economic way, even cheaper than driving a car, and secondly it is the most convenient one; I am sitting in there and reading a newspaper or some professional material without having to pay my attention to the traffic outside.

To use appropriate means is also the way how people like Rockefeller and Henry Ford became millionaires - and not by bying the wrong things on credit at the wrong time; the latter is exactly the way of going bankrupt very soon.

"Appropriate" technology is very often misinterpreted as some kind of backwoods technology, something of the Stone Age which should not be burdened on any society of today. But in fact this technology takes into account not only the aim of the process but also the conditions on which this aim has to be based on: social, institutional, political and also environmental conditions of a region at a certain time. Appropriate technology does also not say anything about size or date of market introduction resp. invention, it only should be the technical mirror of the work that has to be done with in the most optimal way.

This view is most essential, since the environmental and energy situations in the two parts of the world are very different - sometimes even contrary: In the industrialized countries only 30 per cent of the world population use 84 per cent of the world energy production (mostly imported) and pollute the basis of their life practically in all sectors - industry, agriculture, living areas, whilst in the Third World, especially in the lower income countries, people are starving in a not so much industrially polluted, however insanitary world, with less hope for betterment, lacking of rather all that makes life worth living. But is this indeed a hopeless situation for the poor in the south - and quite the contrary for the rich in the north? I say no, because the structures - economically, socially

and politically - are very inflexible in the industrialized world (no difference in west or east) and so governments there are forced to follow this beaten main track, even in the consciousness that this will finally lead to a dead end; escalated by even more energy and more growth - and that means: more degradation of the basis of life. The political leaders in the northern hemisphere thus are not in the position to stop certain technologies they have developed with billions of dollars or German marks over decades and/or to change the habits of their peoples in short or medium term (probably not even in long term) - first, being afraid of loosing political power by taking unpopular measures, and second, what is even more important, being afraid of loosing the throat-cutting economic competition that these contries are involved in. Just one example: In case the government of a certain OECD country would come to the final conclusion that electricity should not be produced e.g. by nuclear power but from solar energy, this could hardly materialize, since this country is engaged in the horse-race called economic competition (especially on the export market) and so has to watch most carefully not to spend more money on new energy systems than other OECD countries do.

The Third World however, being mainly rather at the beginning of development, without having shifted the switches by vast financial efforts, and not so much consolidated in its political structures, can still go "its" way.

Which country outside the United States for example is not jealous of the American agricultural production, but the output

is achieved under two conditions which are quite contrary from those in most of the developing countries: by the still abundant available commercial energy, especially oil, and the lack of agricultural manpower. So in spite of the enormous output, for developing countries - with very few exceptions - the American agriculture would not be "appropriate".

A very good example of going the "own" way is the use of hydro energy in the People's Republic of China. Starting with the Great Leap Forward end of the fifties, China has built up til now some 50 000 small hydrostations with an average capacity of 42 kilowatts, representing approximately 20 per cent of the whole hydro-electricity production of the country today. On the other hand, however, China has built large hydro schemes to service the big cities and industrial centers; the largest station is now going to be built in the middle part of the Yangtse river with a capacity of 2,7 million Kw - two times as much as the world's largest nuclearpower plant, which is in Biblis, in the Federal Republic of Germany.

Besides the fact that the appropriate technology is the most optimal technology under the conditions given in a country at a certain stage of development, the one-sided interest of taking over the most modern technology bears the danger that this leads into a new kind of colonialism, which is even more severe than the old one. In former times the developer and the receiver of modern technology normally belonged both to the same colonial power, i.e. the latter had not to pay for a certain technology. Today the situation is different, because the

developing countries, now in most cases sovereign, are importing technology from the industrialized world in the value of 5 billion dollars, an amount which very probably will rise to 100 or even 150 bill by the turn of the century in case dependence is going on like this. This is a one-way-business, because restrictive practices, delivery conditions and obligations as well as pricing make sure that the sellers of modern technology keep their monopoly. This trend has even intensified since the 4-fold increase of world oil price 1973/74, and unfortunately is supported by the international organizations.

The situation is not only financially alarming, but also because of the fact that,accordingly, scientific and technological knowledge is centralized in a few industrial countries. That means: The basic needs of the developing countries are met by others, and not by themselves. And where basic needs are met by others, there is an ideal starting-position for blackmail: either a country acts as expected by the supplier or it has to accept the consequences ...

To overcome this depressing situation very soon in the developing countries, they will have to put together all their efforts for mutual development, because together, at least strong in capitas, they can strenghten their self-reliance more effective in a collective way. This is not only a kind of obligation, but also a great chance, since quite contrary to the industrialized countries, countries in the developing areas know resp. understand the special economic, cultural, social and environmental conditions of their neighbour countries better. Unfortunately

yet, the trade relations among the developing countries are only 20 per cent of the whole trade volume of the Third World and this figure is even retarding. I feel, if the developing countries are stressing a new economic world order this lack of mutual relations should be the first incentive for improvement in the own regions. Only half of the LDCs have joined one of the appr. 30 regional trade associations so far. And this backwardness is not only an expression of a weak economic situation in many of these countries concerned, but also of an unsafe political and social climate, which hinders prospering development even in sectors where this could be possible, as well as the creation of a necessary organization. Not always is this the fault of the individual countries, but in many cases it is - one more field where governments of developing countries are asked to try harder.

In this connection it seems important to me that the GNP should not be considered as the most appropriate measure of development in the Third World - as it is in the industrialized countries today. Because

- GNP does not show the enormous differences between poor and rich;
- at the first stages of development the costs for a national economy are much higher than the yield, GNP however only favours profit making economic activities, that is why basic needs are often neglected - especially in the developing countries; and
- GNP does not reveal if everyone in a certain country can develop his personality, if all people actually have the same

chance and not only some priviledged.

Another problem is obviously the form of the trade associations, which by intention of the governments should be in a "modern" resp. "western" style, i.e. a competitive profit system - free trade associations or common markets. Although in most developing countries traditional relations between production, distribution and consumption exist. Also the domestic capital cannot compete with the money of the foreign, often multinational companies with regard to the production costs - the most important factor in a competetive profit system. Despite of some success in these associations there are still three main problems hindering a better integration of economic activities in the Third World:

- a lack of cooperative politics against foreign capital
- a lack of common methods for investments
- a free and competetive profit system that prevents the distribution of the advantages of such an integration and even reinforces the differences between the developing countries with regard to their different stages of development.

To change or at least modify this unhealthy development is an important task for the governments too.

Of course, cooperation among developing countries should not exhaust on demand and supply of technology or the education of scientists, but especially should share experience. This is why international conferences and seminars should not only be organized for scientists, but also more for parliamentarians,

as it happens regularly at the East-West Environment and Policy Institute of the East-West Center on Hawaii, which I paid a visit December last year. There members of governments of the Asian and Pacific regions have the opportunity to discuss the practicability of technological proposals, made by physicists, economists and other scientists.

One of the main reason of the lack of mutual information is the lack of scientific power in the developing area:

1970 out of 10 000 African people only 6 were scientists, engineers or technicians, in Asia 22 - but 112 (6 to 10 times as much) in the developed world. In addition, the developing countries are suffering a "brain-drain", the emigration of qualified personnel into the industrialized world where better working as well as living conditions sometimes are beckoning. Of course it is difficult for developing countries to cope with these incentives, but if the money that is in some cases invested in a few rich families regardlsee their merits for the whole society, would be spent on better education of those who could be of actual advantage for the development, and if on the other hand the rich oil producing countries would help even more the poor ones also for that purpose, this situation could definitely improve.

The disadvantages due to the lack of information are especially visible in the energy field, which is of immediate interest: "No studies are available in the developing countries that has analysed the energy sector in relation to the total economy of the country", Shishir K. Mukherjee of the Indian Institute of Management, Ahmedabad, assures in his paper "Energy Planning

Methodology for Developing Countri s". Studies like these have been carried out partly in industrialized countries, but they are not transferable to the Third World because of the very different conditions. The more difficult it is of course to get a regional or even continental impression, since there are too many intercountry differences in energy use like

- the quality of energy, labor, and other material inputs,
- technologies being used in production,
- locational distribution of industry and population, or
- culture and life style -

just to give you 4 out of 10 examples, stated by David O. Wood of the Sloan School of Management at the Massachusetts Institute of Technology in his paper "International Energy Consumption Comparison-Discussion".

Accordingly up till now only one country in Asia has worked out a comprehensive future energy study untill the end of the century - Bangladesh - which represents only 3.5 per cent of the Asian population. Next New Caledonia is following with a study till 1985 and Sri Lanka with a preview til 1982. In other figures: For more than 90 per cent of the Asian population, living in 35 countries, no energy planning has been performed (excluded in this analysis is the People's Republic of China, from which energy data are very rare). In Africa the situation is not so much different: Only Senegal and South Africa, representing 6.5 per cent of the African population, have worked out studies til the year 2000, another 11 countries have made extrapolations so far (partly only for electricity demand);

i.s. for 60 per cent of the African population no projections are available. Dr. Jürgen Kraft, German member of the European Community and now advisor of the Liberian Government, answered my letter asking for data about the probable future energy demand like following: Energy data? There is nobody who could give you any reliable data, not today and not tomorrow. A little better, but not satisfying is the data situation in Latin America: Roughly for two thirds of the population (4 countries) projections have been made, but for 20 per cent (18 countries), no plannings at all.

Not only data about the future demand are very often missing, but also about the reserve situation. Bangladesh for example does not know exactly its hydro potential, although it has worked out a detailed energy study, and Mexico, oil producing and exporting country, and living on this wealth, is not sure about its oil potential; at the end of 1975 it stated reserves of 6.3 billion barrels, 1977/78 of 16,8 bbls Of course this is not always the "fault" of the countries themselves, as the example of coal reserve assessment in Bangladesh shows: The IAEA worked out a potential of 700 million tons, the German Friedrich Krupp company 1 billion tons - roughly 50 per cent more. And not only poor LDCs are quite unsure about their energy situation, also in Oman for example, a rather wealthy oil country, statistical basic data in the energy sector are officially "estimates".

One reason for that lack of data is, as already mentioned, the missing personnel to gather and work with these data, but it

is not the only reason. An other, very important one is revealed by the "Preliminary Energy Forecast 1978 - 82" of Jamaica, representative for many countries in the Third World: "... very little interest had existed in collecting information on the energy flows during the 1960's and early 1970's. Hence, no detailed and reliable historical information on energy is available with any of the Government agencies." And this gap cannot be filled over night.

Without data, however, no long-term planning is possible, not in the environmental and not in the energy field. Especially the development of an own - "appropriate" - technological way is not possible. Such a development, arising from strenghtening of national technical and scientific capability, is not only necessary for becoming more self-reliant, but - and this might be even more relevant - as a motive power for progress in all sectors of life.

The nuclear planning chief of a Latin American country told me, the purpose of studying the feasibility of nuclear power in his country, i.e. to take over this technology from the industrialized world, is to give his people a star of progress which they could follow. I don't think personally that this would be a better star than to develop the creativity of a people by developing things available domestically.

I do know of course that development does need much money, but I feel there would be already some financial means left if the devloping world did not spend so much money in arms

race - 5.2 per cent of GNP, which is not much less than in the DCs (5.6 p.c.). In contrast to that, Asia is investing 0,3 per cent of GNP in research and development, Latin America 0.2 per cent, and Africa 0.1 per cent. I don't say it is wrong in any case to follow the indistrialized countries, but to follow them in arms race is wrong by all means.

I also do not say that it is wrong to import any technology from the developed countries - the Third World would follow behind even more in future - but when doing so, it is wise to buy not only the production elements, but also the elements for research and development. Otherwise the importing country will be completely dependent even for decades. Accordingly, agreements for technological transfers at least should include labs and training facilities.

A good example for building up an own technology by help of the industrialized countries is the use of alcahol fermentation for fuel subsidy in developing countries with the necessary conditions like Brazil. This bio-technological process, subject also of this workshop, has special advantages:

- use of national resp. local resources (sugar cane)
- use of know-how that is not too "sphisticated" and dependent on the industrialized world
- saving of foreign exchange by reducing oil imports,
- promotion of economic development in less resp. non developed rural areas (not only by raising the sugar cane but also by building up local industries - and creation of working places).

Especially the rural areas are the problem child of development of the Third World, from the environmental as well as from the energy point of view. Because in contrary to the more "visible" cities (where the well endowed people of the nations live), the rural population (91 per cent in Africa, 75 per cent in Asia and 50 per cent in Latin America) is following behind in actually everything. See for example the electrification degrees of some of the LDCs:

	electrification degree (p.c.)	
	urban households	rural households
Algeria	70	10
Iran	65	2
Philippines	60	5
Peru	45	2

(Source: Forum Vereinte Nationen, January/February 1976)

But even these alarming figures do not tell the whole truth. According to a World Bank study of 1971 total rural electrification had reached then 15 per cent of the rural population in Asia - close enough to be available to those who could afford it. Similarily, World Bank is expecting that by 1985 25 per cent of rural population in the Third World will have electricity within reach, but not more than half of it will be in the financial position to afford it. And without electricity or some other kind of usable energy no development is possible.

Maybe the government of the People's Republic of China has not

realized the problem first, but it has tackled it best:

Facing the aim of providing the rural population (75 per cent in China) with an infrastructure necessary to meet the basic needs and financial means for self-sustained development, and diminishing the gap of modernization between urban and rural areas, the government has made special efforts in energy supplies. As already mentioned above, some 50 000 small hydroschemes have been built with an average capacity of 42 kilowatts (7 types of turbogenerators are ranging from only 0.6 kw to 12 kw), a real unusual size in the industrialized countries - as it seems (if you look around carefully, you will find the small size generator also there, especially in mountain areas). But the question is not, if a certain size looks unusual, but what you can do with it. With a turbogenerator of 3 kw capacity for example, you can operate machines, with 12 kw capacity appliances for irrigation and drainage, and even a generator of only 250 watts, not bigger than a tea pot, is used in the Liaoning province of China to supply two families with electricity (otherwise they would not have any). And this development has even a multiplication effect, since the electricity produced by the small stations is not only good for lightning, but especially for running "small local industries, including fertilizer production, as well as for irrigation and drainage, grain threshing and milling, fodder crushing, oil extracting and timber sawing" (Vaclav Smil: "Intermediate energy technology in China") - very often the first step to modernization.

Parallel to the development of the hydropotential in the rural areas, China developed the coal industry on a small scale too; one third of the Chinese coal production comes from small mines which could be opened more easily and much faster than the big ones with approximately ten years of lead time before the first kilogram of coal is digged out.

Hydro and coal are very good examples not only for China, but also for the rest of the Third World, which is abundantly endowed with:

71 per cent of the world's rivers are located on the three developing continents (Asia 34 p.c., Latin America 26 p.c., and Africa 11 p.c.), representing two thirds of the world's technically and economically recoverable hydroreserves for electricity production: 1.4 TW, of which not even 5 per cent is developed til now. And the technically and economically recoverable coal reserves in the developing countries are 215 TW, also well distributed over the three continents. (To give you a comparison: The recent world energy consumption is 8 TW.)

A third example of rural energy - and environmental - development in China is the production of marsh gas individually by 75 per cent of the farm households by anaerobic fermentation of dung, straw, grass, vegetable waste, etc. This not only saves oil, coal and especially fire wood (deforestation!), but also other expensive resources like cement, timber or steel; instead of, stone, sand or clay is used, locally available, for

building the fermentation tanks. And as already mentioned, it has also an environmental effect: it improves sanitation and prevents diseases by destroying disease-carrying eggs and bacteria during the fermentation process.

This Chinese strategy of developing the rural areas has two most essential features:

- mobilization of the population, and
- use of cheap and locally available resources, very often waste materials.

With the same basic ideology China has integrated ecological and social objectives in the economic development. Not waiting for help from outside - from "above", the industrialized countries - but by mobilizing large quantities of people to let them participate in that development process and let the people influence this campaign. This means to give the campaign a local basis, i.e. a local planning fundament which can effectively control undesired ecological effects of industrial development (without hindering modern technologies to develop, however). This is important not only to give the people a chance for democratic co-determination, but also for making sure that the different conditions of different areas - like climate, resources, vegetation, etc. - are not neglected by governments who are interested not only in the "upper tens" but in the whole population. China has mobilized some 100 million people in the first half of this decade, organized by brigades and communes, to improve farmland and build irrigation and drainage systems. Also, the mobilization has led to eradication of the schistosomias by draining and collecting

the snail-infested mud and disposing it on other places.

A similar campaign has been started in Tanzania at the beginning of this decade - called "Mtu ni Afya" (Human Being and Health) - to improve the hygienic conditions in the country. 65 000 - 70 000 so called "radioclubs" had been organized whose appr. 2 million members met once a week in small groups to hear about and discuss symptoms and reasons of diseases and methods of defeating them. Of course this campaign was not possible without financial means, but since the radio-communication had been chosen (80 per cent of the Tanzanian population is analphabetic, but 100 per cent understand Suaheli), the costs were only 14 cents per capita - less than the Third World is spending on arms per capita.

Summing up my message in just three sentences - due to time pressure: I feel that governmental responsibility in energy and environmental politics in the Third World is mainly not a question of a new economic world order and/or large credit sums, but much more dependent on the will of the governments of developing the whole population by mobilizing it, primarily in the rural areas, and using basically the means given nationally and locally - especially labor force -, taking into account the special social, cultural, economic, environmental and political situation of each country individually. Because: " Labor-intensive agriculture, including the building of dikes, dams, wells, irrigation canals, drainage ditches, feeder roads, bridges, terraces, and storage facilities will be seen as the only feasible way to simultaneously (1) reduce unemployment,

(2) increase food production, (3) stem the drain of scarce foreign exchange, (4) reverse the trend of cityward migration, (5) halt the destruction of the carrying capacity of the countryside, and (6) restore the eroded sense of dignity and efficacy of the poor individual." (Richard Lee Clinton:" The never-to-be developed countries in Latin America"). To achieve a sociaty with such an ideology is definitely the main task within the responsibility of governments in the Third World - in energy, environmental, and any other politics.

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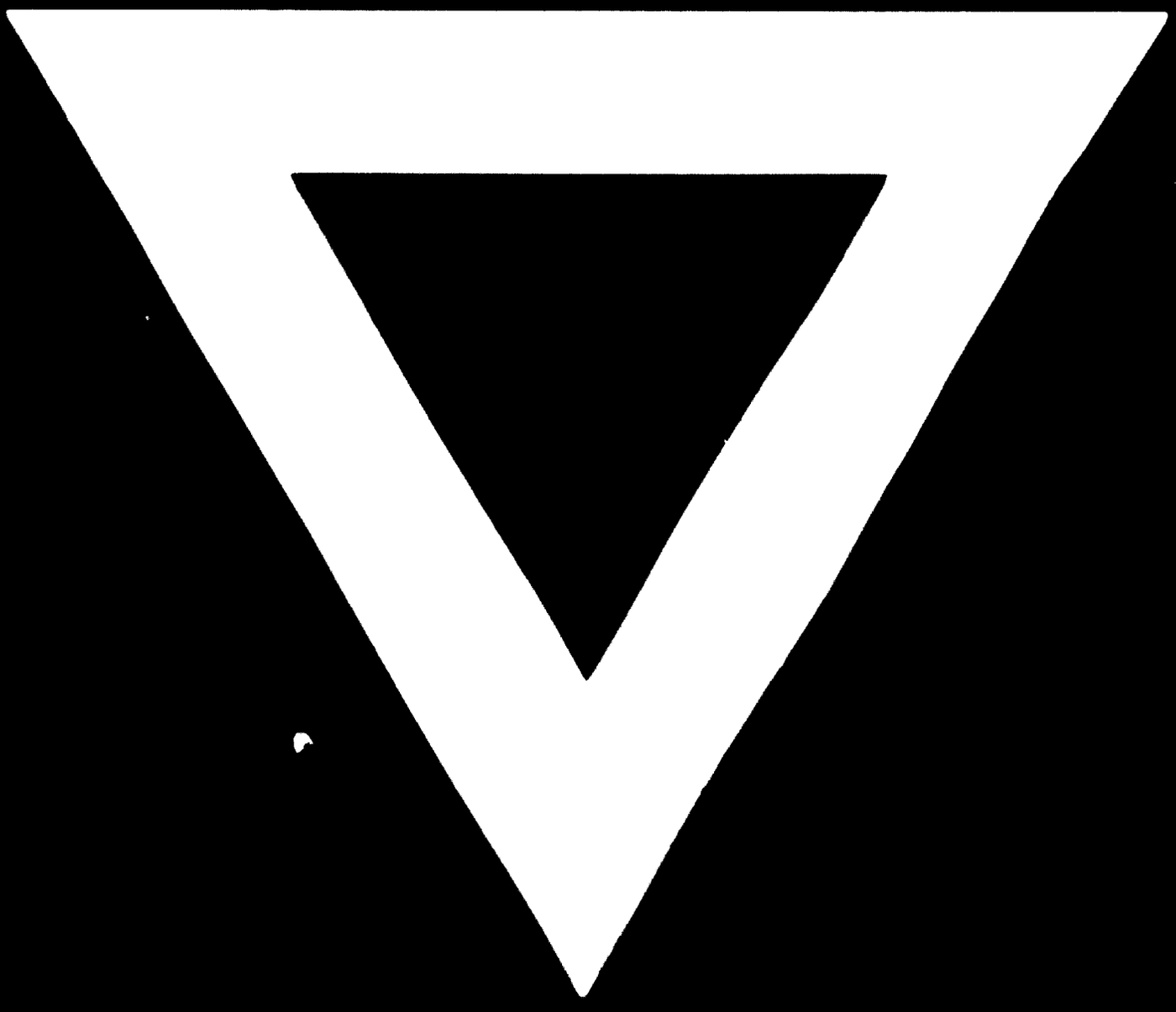

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