Summary

In 1798 a British sage named Thomas Robert Malthus issued a dire warning to future generations. Modern man, he prophecied, is doomed to misery by the twin scourges of unabated population growth and a perpetually deficient food supply. Swarms of people — mostly poor — will descend on the earth like a plague, and the burden to feed them all will be eased only by a cyclical ebbing — brought about by famine, war, and disease — in the endless flood of humanity.

Written by Ma. Teresa Lingan-Debuque, ANGOC Project Officer, based on plenary discussions and country papers presented during the Second Asian Development Forum held in Cagayan de Oro City, Philippines on 22-26 February 1993.

It has been close to three centuries since our economist sage made this prediction — in a published treatise known today as the Malthusian theory on population — and for almost as long his pessimism has been shown to be famously wrong. In stark contrast to the Malthusian scenario, the world currently produces huge surpluses of food. Harvests have been increasing at an annual rate of 2.6%, well ahead of population's 2% growth rate.[1] At present levels of production, there should be more than enough to feed the six billion people anticipated by the year 2000.

On the other hand, the persistence of hunger among the majority of the world's people would tend to show that Malthus had reason to despair. At a time when technological and scientific advancement has made it possible to produce enormous quantities of food — indeed, so much food that tons of it are burned or left to rot — millions of people all over the world suffer from hunger: 14 to 18 M of them die each year; 35,000 each day; 24 each minute, 18 of whom are children under five years old.[2] Jon Bennett, in *The Hunger Machine*, likens the toll this killer exacts in human lives to "dropping a Hiroshima bomb every three days"[3].

Malthus erred when he failed to consider man's ability to find a solution to what would have been — in Malthus' thinking — his inescapable lot. But his bigger mistake lay in incorrectly identifying the cause of the coming food crisis. What was missing in Malthus' analysis, however, needs no theory to explain nor complicated extrapolations to arrive at. Indeed, one need not be an economist to recognize it. Any thoughtful observer of the human condition knows it exists.

Old-fashioned greed is what *it* is, greed, and the injustice that unfailingly attends it.

"Nothing Personal,..."

While exploring the validity of moral claims in international disputes, Fred Halliday, professor of international relations at the London School of Economics, points to a difficulty which any such attempt is bound to run into: "International affairs," he says, "are, notoriously, the area where moral considerations apply least, and we have come to accept different moral criteria for states than for individuals."[4]

For this reason the morally charged reality of greed is hardly mentioned, if at all, in most assessments of international affairs. Indeed, to use the g-word to characterize the self-interested acts and motives of certain countries is considered bad form.

Hence, in the preferred jargon for international relations, the present world system — where food is a weapon wielded by a few, and where whole nations, held hostage to poverty and debt, pay the ransom with their people's livelihood, tradition, and independence — is said merely to proceed from the laws of *expediency*. ("No offense intended.") This tempts a comparison with the moral indifference evinced by the gangster who — quite matter-of-factly — tells the soon-to-be-shot-between-the-eyes target of a mob hit: "It's nothing personal. Just business."

The record of the last few hundred years is littered with the casualties of "hits" done in the name of "expediency". This paper will examine three waves of events which have led us down the road to the current crisis in agriculture.

THE FIRST WAVE: The Price of Assimilation

The First Wave began with the "discovery" of the "New World". In a classic display of *expediency*, the imperialists came, saw, and conquered. Wide stretches of land in the colonies, planted

previously to food crops, were cleared and turned into private estates. The subjugated peoples were put to work in these lands and forced to grow crops which they had little or no need for but which their taskmasters coveted for their value in trade. Thus, the island country of Sri Lanka was converted by the British into one big tea plantation, while the Portuguese decided that Brazil would grow only sugar. More capriciously, an entirely new crop would sometimes be ordered grown in the overseas plantations simply because the king or queen had developed a fetish for it.

The imperialists then embarked on a frenzied extraction of resources in the colonies to launch and bolster industries at home. However, their domestic markets were soon saturated and could no longer absorb the volume of goods being produced. Here, the colonies again proved useful. For instance, Lancashire cloth was exported to India even though this then-British colony had a thriving textile industry. By the middle of the 19th century, India was importing a quarter of all British cotton exports, its indigenous textile industry all but completely destroyed. Similarly, in Bangladesh a fledgling industry based on the production of silk and muslin was nipped in the bud so that British manufacturers could unload some more of their surplus.

This started a process which to this day moves inexorably on in the form of a vicious cycle. Euphemistically called *specialization* and *international division of labor*, this process rests on the assumption that it is more beneficial for some Third World countries to produce 1 or 2 primary crops for export, while the developed countries produce the bulk of the world's industrial goods .

The colonies became so closely integrated into this process that at the time of their independence most of them found they had little choice but to continue exporting primary commodities. It was also business-as-usual for their former-masters who continued to churn out industrial, high-value products using Third World raw material exports: chocolate from cocoa, aluminum from bauxite, tyres from rubber, soap from palm or coconut oil.

This situation has had serious and endu-

during consequences on the food-producing capacity of the Third World. In recent years, cash crops have accounted for an ever rising share of total cultivable land in these countries. Traditional food crops have been neglected and are now being grown mostly in a few rows of vegetable plots. The threatened extinction of a traditional Indian staple, the millets, is a case in point. In 1954, 5 to 6 M ha. were planted to many varieties of this crop, 30 years later, the area was down to 3.6 M ha.; today, only a few millet varieties remain and they can be found only in isolated pockets of the country where NGOs are working to preserve them. Malaysia, the world's leading exporter of natural rubber and palm oil, is a net importer of food: 40% of the rice, and much of the vegetables, consumed in this country is imported.

The experience of two African countries in the mid-1980s further demonstrates the extent to which the most basic food needs can be sacrificed in the drive to increase cash crop earnings. In the 1984 drought Zimbabwe and Kenya imported 26,000 and 39,000 tons of maize, respectively, for their hungry populations. At the same time, Zimbabwe announced a record harvest of tobacco, soya beans and cotton for export, while Kenya was exporting strawberries and asparagus to Europe![5]

Unfortunately for the cash-crop dependent Third World, the prices of their exports have been plummeting since the 1970s, due in part to cut-throat competition among the developing countries for the same shrinking markets, and partly as a result of un-free trade policies adopted by the United States and European Community (now European Union) member countries. Hard-hit by falling export earnings, Third World governments could have opted to break away from their dependence on primary commodities and developed their manufacturing sectors. However, such a move requires huge capital investments, something which the cash-strapped, debt-ridden countries could not afford.

On the other hand, the stunning — and loudly eulogized — transformation of Malaysia, Indonesia, and Thailand (and very soon, India) into Asia's emerging tigers has been held up as proof that Asia's laggards, too, can successfully industrialize. However, what is largely obscured in all the panegyric offered to progress in these countries is the fact that income disparities among their people have worsened: the rich have become fabulously richer, true, but the poor have also grown more destitute. Farmers driven to bankruptcy — and off their lands — are migrating to the cities in search of work. In ever growing pockets of desperation, hunger reigns, giving the lie to the promise of economic growth.

THE SECOND WAVE: Mirage in a Man-Made Desert

The Second Wave came in the guise of a

The Second Wave came in the guise of a miracle and was trumpeted throughout Asia as the Green Revolution

miracle and was trumpeted throughout Asia as the Green Revolution.

In the 1960s a global effort to stave off hunger in the Third World was launched. It was founded on the use of special seeds called HYVs (high-yielding varieties) which produced exceptionally high yields. Of course, the seeds had to be bought (read: imported), and they came with a package of pricey chemicals (imported, too) plus lots of water (care of the customer). Another thing, the carabao had to go; a tractor (imported as well) was the thing to have.

Anyone who still harbors illusions about the motives for introducing this technology to the Third World should be able to take the hint from Arthur Moses, president of the Agricultural Development Council founded by John D. Rockefeller III, who "argued early in the Green Revolution that the cooperative social structure evident in many agrarian communities needed to be dismantled in order to encourage "aggressive interest in the marketplace".[6]

The spread of the Green Revolution in Asia was broad and swift. Self-reliant economies were broken up. Farmers were encouraged, oftentimes coerced into producing goods primarily for the market. Asia witnessed an erosion of indigenous, traditional agricultural practices and knowledge developed over countless generations. Taking their place was the quick technological fix provided by HYV agriculture with its heavy use of chemicals and pesticides on monocultured farms.

The first few years of HYV cultivation rewarded Asian farmers with bumper harvests, and for a while they thought that they had finally struck it rich. The price paid for such gains, however, was enormous. After years of heavy use of chemical fertilizers, the soil's fertility declined. Progressively more fertilizers had to be applied to obtain the same farm yields.

In Bangladesh, yield per acre has suffered a 10% decline over a 15-year period despite a three-fold increase in fertilizer consumption. Pakistan has nearly doubled its own consumption: from 1,000 tons in 1952 to 1,892.9 tons in 1990. Over in Thailand, farmers are using 10% more fertilizers to attain yields which have been declining since 1969.

The effects of pesticides were even more sinister. Beneficial insects and organisms, which help control the proliferation of destructive pests, were needlessly exterminated. On the other hand, the offending insects soon became immune to the toxic chemicals, and with the monocropped fields providing an ideal breeding ground for the pesticide-resistant insects, crops became even more vulnerable to infestation despite increasing applications of pesticides.

Thailand's pesticide consumption has increased by almost 45,000 tons in the last 10 years, yet in the same period it suffered some of the worst recorded outbreaks of brown plant hopper (BPH) infestation. The first major outbreak took place in 1975, just six years after the introduction of HYVs in the country and at which time less than 5% of paddy land was using pesticides. An estimated 666,796 rai of riceland were reportedly destroyed. The second major outbreak was even more catastrophic, striking 13 provinces and damaging 937,846 rai. By the 1990-1991 season, the hopper had spread to 39 provinces, bringing the total affected area to over 2,300,000 rai. This has cost the country no less than 2.5 M tons of rice with an estimated value of 10B baht (US$400M). Pakistan, in the meantime, is plagued by another kind of pest. Weed infestation accounts for 15 to 20% of its losses in wheat yield; this is equivalent to about 2 to 3 M tons of wheat lost per year. In the Philippines, close to 500 species of mites and insects, 100 plant pathogens, 55 kinds of weeds, two kinds of nematodes, and five kinds of rodents have developed a resistance to pesticides. The BPH has also paid a lethal visit here: in its first major outbreak in the country 30,000 ha. of riceland were destroyed.

Intensive use of agrochemicals has also caused varying degrees of soil erosion. About 8.1 M ha. of cropland in the Philippines are eroded; of this only 5.8 M ha. are still considered suitable for cultivation. In Thailand, 39 M rai, or over a quarter, of total agricultural land suffer from "severe" to "very severe" erosion. India's problem in this area is just as serious: 6,000 tons of precious topsoil are lost every year to erosion, and with it, an estimated 5.37 M tons of chemical fertilizers.

Meanwhile, the new seeds' huge demand for water has resulted in waterlogging, increased soil salinity, and in extreme cases, desertification. In India, groundwater sources are being tapped beyond their existing capacity to irrigate roughly 35 M ha. of farmland. Since the 1950s, but more markedly in the last 20 years, diesel and electric pumpsets have proliferated all over the country: from just 87,000 in 1950 their number increased to a staggering 12,581 M in 1990. Water tables have dropped as a result, especially in areas underlain by hard rocks or with low recharge levels. Bangladesh has had to cope with an assortment of problems — falling water

level, salinity, desertification and deteriorating water quality, among others — ever since HYVs were introduced into the country. In the northern part of Bangladesh, ground water has dropped 30 to 40 ft. below original levels, while in certain districts some 50,000 ponds and ditches have already dried up. Over in drought-prone Thailand, the government, which prefers to invest on huge reservoirs rather than improve the water storage capacity of the soil, now proposes to siphon water from the Mekhong River to refill two of its dams whose reserves have been exhausted by increased demand for irrigation water. This move, however, is expected to have serious downstream consequences for neighboring Cambodia and Vietnam.

Given the pernicious effects of the Green Revolution, prospecting for a sustainable future based on it is a little like holding a time bomb and wishing, as it ticks away, that it won't hurt too much when the bomb goes boom. Nature goes by simple rules, and torturing it to make it yield its fruits is not one of them.

The sustainability of agriculture as a means of livelihood for thousands of small farmers is also seriously in doubt under the HYV regime. After almost three decades of Green Revolution, Asian farmers have become poorer than ever. When HYVs were introduced in Bangladesh majority of its farmers were only "moderately poor"; 10 years later, more of them have become extremely so.

With yields falling and production costs rising, the "miracle seeds" have become a millstone around the neck of small farmers and tenants struggling to keep afloat in a sea of debt. Just a few years after HYVs were cultivated in Thailand, 4.3 M farming families were already "caught in the debt cycle"; in 1990 there were 5 M such families. In Isan or Northeast Thailand, the poorest region in the country, up to 85% of the population earn less than they need to survive; hence, an average 2 M of them (mostly under 30 years old) leave their homes each year (i.e. during the dry season) to find work elsewhere, returning just before the rainy season. In the Philippines, half of the rural families earn incomes below the poverty level; at least 2/3 of them suffer from undernourishment. In Sri Lanka, a country believed to have a large small holder sector, majority of the rural population are now having to work as wage earners in plantations and export crop farms, or as laborers in public works and house construction projects. Their wages have fallen so low while their numbers have grown so high that poverty in this sector has been cited to explain poverty in the country as a whole.

Given the pernicious effects of the Green Revolution, prospecting for a sustainable future based on it is a little like holding a time bomb and wishing, as it ticks away, that it won't hurt too much when the bomb goes boom. Nature goes by simple rules, and torturing it to make it yield its fruits is not one of them.

The Local Connection

International capital, working alone, could not have accomplished such a sweeping impoverishment of the countryside. The highly uneven distribution of land in most Third World countries is as much to blame for this.

A common feature of former agrarian societies in Asia that have since become models for industrialization is the implementation of a comprehensive agrarian reform. Japan, the original dragon, as well as South Korea and Taiwan, the dragons of the '80s, had all embarked on a state-mandated, state-enforced land redistribution program which enabled them to transform their economies — after decades of consistently high GNP growth — into economic powerhouses. Unfortunately, their industrial success has been achieved at great cost to their agricultural sector.

In pursuit of rapid economic development governments in these countries have subordinated agriculture to industrial growth and have encouraged the expansion of industries into rural areas. As developers moved in to put up buildings and lay down roads, land values in the countryside skyrocketed. Given the general decline in farm incomes and ever-rising production costs, the temptation to trade their land for cash proved irresistible for most of the farmers. Not long after, thousands of otherwise productive farms began to disappear under kilometers of concrete. "Today, instead of supplying fruit and vegetables to [urban consumers], many farmers [in Japan, South Korea, and Taiwan] provide an even more vital commodity — housing."[7] Awash with cash, they've traded in their simple rural abodes for townhouses, and exchanged their tractors for cars.

No wonder that farming has become a distinctly unattractive prospect for the young. More and more of them are abandoning the farm for glamorous high-paying jobs in the cities. The few who remain belong mostly to an ageing generation of farmers, and when this generation dies off, farming as a way of life in these countries will probably die with them.

Among Asia's aspirants for "NIC-hood" (Newly Industrialized Country status), a similar situation exists, except for two important differences: one, their governments are unable — and unwilling — to implement genuine agrarian reform; and two, majority of farmers here have no land to sell.

In Thailand, successive land reform efforts of the government have come to naught because of a failure in implementation. The Fair Land Lease for Rent Act, for instance, was issued by the government purportedly to ease the suffering of over 500,000 landless farmers (1983 estimate). However, powerful landlords have been allowed — at times,

aided — by the government to circumvent it. The Land Reform Act of 1989 is another example. This law aimed to correct the highly skewed landownership structure in Thailand by putting a limit (50 rai) on the amount of land which an individual farmer can own. Unfortunately, government has scrupulously avoided applying the law to large private landholders. The Act has also been criticized for stretching the meaning of the word 'farmer' to include those who are not already farmers, yet *intend* to be one in the future.

In Sri Lanka state-sponsored land reform is perhaps even less likely to prosper, as the state is the country's biggest landlord, owning 80% of all land. Most farmers here are "squatters" on state-owned properties. For many years, the government's response to the problem of landlessness has been to resettle people — under what is called "colonization schemes" — in uncultivated areas in the dry zone. On the other hand, the South Western part of the country, which receives the highest rainfall and is therefore highly suitable for cultivation, is rapidly being converted for commercial and industrial use. This comes as no surprise as the government — being the landlord — stands to gain more from such schemes than from letting peasants farm the land.

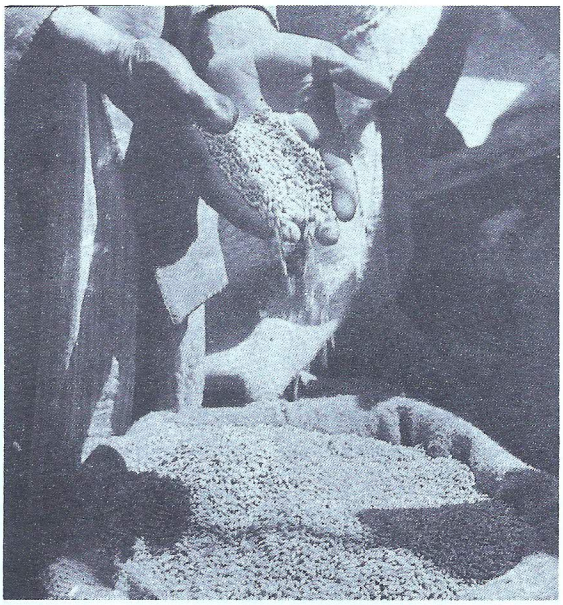
The record of such governments in providing support services for smallholders and tenants has been just as dismal: credit facilities are generally inaccessible to these sectors; research and development activities, as well as technical support and extension programs, are designed according to the needs of industrial, chemical-based agriculture; subsidies benefit the urban consumer at the expense of the producer.

THE THIRD WAVE: Profiting from Extinction

Our accounting of the price we have paid, and will go on paying, for chasing after the Green Revolution mirage would not reflect how much of our agricultural future has been squandered unless we add on the cost of extinction.

Within a few years of its adoption in the Third World, the Green Revolution decimated scores of indigenous crop varieties and rare plant breeds which had evolved over thousands of years, and which represent the life's work of many generations of Third World farmers.

The United States, which embarked on the Green Revolution much earlier in this century (and in whose laboratories the HYV package was developed), has also witnessed the loss of some of its plantspecies. Over 85%, or 6,000, of its apple varieties have disappeared. This is regrettable (although one can hardly miss the poetic justice in it) but it cannot compare with the loss of genetic diversity in many Asian countries.



In Thailand, for example, more than 5,000 indigenous varieties of rice were being grown before the introduction of HYVs; now that 80% of rice lands are planted to the hybrid rice, just over 10 indigenous varieties can still be found in the country. One expert believes that the magnitude of Thailand's loss is far greater: in the tens of thousands.

Thailand has also been called a "paradise of tropical fruit", owing to the range of exotic fruit species found there. But because of agricultural extension programs which emphasize the cultivation of hybrid species, many wild and locally developed varieties of durian, bananas, mangos, and other fruits have disappeared. Hundreds of medicinal plants have also been wiped out.

The conversion to HYVs has had similar consequences on crop diversity in other countries of the region. Close to 3,000 rice varieties used to be found in both the Philippines and Sri Lanka; today, only a few of these remain.

The implications of this genetic erosion on the future of agriculture in Asia and the rest of the world cannot be overemphasized. "When we talk about traditional varieties and rare breeds disappearing, we are really talking about extinction — the permanent loss of genes — sometimes the very genes plant breeders need now, or may need a hundred years from now, to rescue a crop from a disease or adapt the crop to new human needs. The loss of genetic diversity limits the evolution and development of agricultural crops. It narrows and eliminates options for the future."[8]

The loss of genetic diversity limits the evolution and development of agricultural crops. It narrows and eliminates options for the future.

Barley, rice, tomatoes, sugarcane, and tobacco are just a few examples of crops which have been saved from extinction by using genes from their more resistant relatives, usually found in the wild. US plant pathologists are considering this same approach to control the resurgence of *Phytopthera infestans*, the fungus which causes the deadly late blight disease, and which was responsible for the potato famine in Ireland in the mid-19th century.

For many years, the late blight fungus had been kept under control by fungicides and better farming methods. However, the accidental mating of the

Ninety-five per cent of human food comes from just 30 kinds of plants, an extremely narrow dietary basis for the species. If a major epidemic struck any of the cereal crops — such as wheat, rice, and maize — there would be death by famine on a cataclysmic scale.

fungus with a more resistant relative has bred a virulent strain. Over the past decade, it has spread to the Middle East, Asia, Africa and South America. Fungicides no longer work; neither, it seems, does engineering blight resistant genes into potato crops.

Thus, plant pathologists at Cornell University are set to try a proven strategy: they are currently "[looking] for genes in the potatoes that have withstood the disease on their own for centuries, despite the presence of both mating types of the fungus — the wild species of central Mexico"[9].

This should serve as a warning against paring down the world's genetic stocks to a few plant varieties. Already, "95% of human food comes from just 30 kinds of plants, an extremely narrow dietary basis for the species. If a major epidemic struck any of the cereal crops — such as wheat, rice, and maize — there would be death by famine on a cataclysmic scale".[10]

Scientists in developed countries have long been aware of this danger; they've known - for far longer than Third World governments have — that preserving crop diversity is a matter of national security. Hence, in recent years, hundreds of "missions" have been dispatched to Asia, Africa, and Latin America to collect plant germplasm. Today, these collections can be found in gene banks in the United States, the former Soviet Union, Japan, Italy, and other countries.

However, these collections are not being maintained for the collective benefit of humanity. In the same way that developed country governments use food aid to gain political and economic leverage in recipient countries, they are stockpiling seeds "as part of the arsenal of international power diplomacy"[11].

Multinational seed and chemical companies are just as interested in making proprietary claims on genetic resources taken from the Third World. They know, from experience, that the type of seed sown determines to a large extent the farmer's need for fertilizers and pesticides. It influences the need for machinery and often dictates the market for the crop, as well as the ultimate consumer. Hence, they couldn't care less about a genetic wipe-out happening in the Third World as long as they, through their governments, have monopoly control over the seeds that remain.

These companies take seeds (usually of the major staple crops) from the Third World, tinker with their genes, then slap a patent on them. Like the Green Revolution HYVs, the new seeds are bio-engineered to withstand the application of highly toxic chemicals manufactured and marketed by the same seed-chemical companies.

In her critique of biotechnology, Vandana Shiva has this to say about the other implications of the emerging "gene revolution": "While the Green Revolution focused on chemical input, with public breeding programs aimed at producing seeds that need more chemicals, the biotech focus is on the seed itself as a market[:]...patented seed cannot be reused by farmers..."[12]

This explains why the demand for intellectual property protection, especially for agricultural patents, has been so strident in the last few years. Through national patent legislation and the inclusion of IPR safeguards in the recently concluded Uruguay Round of the General Agreement on Trade and Tariffs (GATT), developed country governments and seed-chemical companies are working towards a vertical integration of the agriculture industry.

When this happens, seed and chemical companies will perfect what they started to do under the Green Revolution: make thousands of farmers a truly captive market, dependent on their products year after year. Self-reliance in agricultural production will be further undermined, if not forever lost. Genetic diversity, and the wondrous evolution and adaptation that makes it possible, will be reduced to a few genetically altered plant species, chosen for their trade value. Toxic chemicals will flood into farms as never before, and kill everything that has not beengenetically tinkered to resist them.

The ecological time bomb set off by the Green Revolution will tick on, this time faster; and unless a radical reorientation is made of current agricultural policy, we may need the peddlers of such technology to "bio-engineer" us for resistance in order to survive the explosion.

Which Way To Sustainable Agriculture?

The symptoms of an ailing agricultural system are rife in all of the countries represented in this Second Asian Development Forum. Yet, among them the perception of the cause and, therefore,

the appropriate treatment, is varied.

Three of them — the Philippines, Thailand, and India — attribute the unsustainability of agriculture to the growth-centered development orientation of their governments, in particular, and the world economic system, in general. The prevailing macroeconomic and trade policies, inequitable resource distribution, especially of land, the lack of a sustainable national policy on agricultural development, and the dominance of chemical-based agricultural systems, among others, are mere offshoots of the fundamental problem. Notwithstanding this common feature, the sustainable agriculture movement* in the three countries varies in scope and operation, and in the way it has evolved.

The movement in Thailand began quite recently (i.e. in the mid-1980s) as a search among farmers and local NGOs for alternatives to mainstream agriculture, which has trapped Thai farmers in a vicious circle of debt and disease. Others opted for organic farming methods to reduce chemical use on their farms. Central to the advocates' definition of sustainable agriculture are self-reliance and restoration of the farmer's control of the production process. It also reflects two important beliefs prevalent in the Thai NGO community. One is confidence in farmers' contribution to ecological enhancement; the other is the conviction that farmers' economic autonomy is necessary to overcome market domination and exploitation. From this it is clear that the alternative agriculture promoted by Thai NGOs is not simply a set of environmentally sound production techniques, but rather a distinct philosophical concept and political platform derived from the concern for social justice and ecological enhancement.

The sustainable agriculture movement in Thailand has been conducted primarily through model-building and policy advocacy. These strategies, however, have not been too successful as yet. Out of 5 M farming households, only 200,000, or 0.4%, have adopted sustainable farming systems.

In contrast, the movement in the Philippines has gained wide acceptability and popularity among NGOs and people's organizations in the past four years. From just 120 organizations in 1989, it has grown to 600 groups, representing about 2 M upland and lowland farmers as well as fisherfolk. Today, over 2,500 ha. of land in the Philippines are planted to rice, corn, and vegetables without the use of chemicals.

Policy advocacy is an important tool employed by NGOs involved in sustainable agriculture promotion. They have used it successfully to get the government to ban the use of hazardous pesticides.

Aside from this, Philippine NGOs have made great strides in developing alternative agricultural systems and methods. Seed banks, demonstration farms, and experimental stations have sprouted all over the country. There have also been successful attempts to demonstrate the economic viability of sustainable farming ventures.

But central to all these is the campaign for a genuine and comprehensive reform of the countryside. Philippine NGOs believe that without land tenure security, agriculture will never be sustainable.

NGOs in India share this conviction. Working primarily with landless laborers and marginal and small farmers, these NGOs have made a major issue out of the inequitable distribution of resources, especially land and water.

The most active advocates for sustainable agriculture among Indian NGOs are the environment-oriented groups. There are 2,000 such NGOs in the country: 200 of them are quite active and about 50 are highly visible and effective. The movement in India started as an initiative to let the communities manage and share their water resources equitably. It then moved on to eco-system based planning and development, with the village as the basic unit. Experiments with high-yielding, but non-chemical-dependent, seeds have also been conducted with remarkable success.

Meanwhile, the movement for sustainable agriculture in Malaysia, Bangladesh, and Sri Lanka is primarily a rejection of the pernicious effects of chemical agriculture. Hence, as their country reports will show, their initiatives and recommendations have focused — though not entirely — on finding or developing organic substitutes for toxic agricultural input.

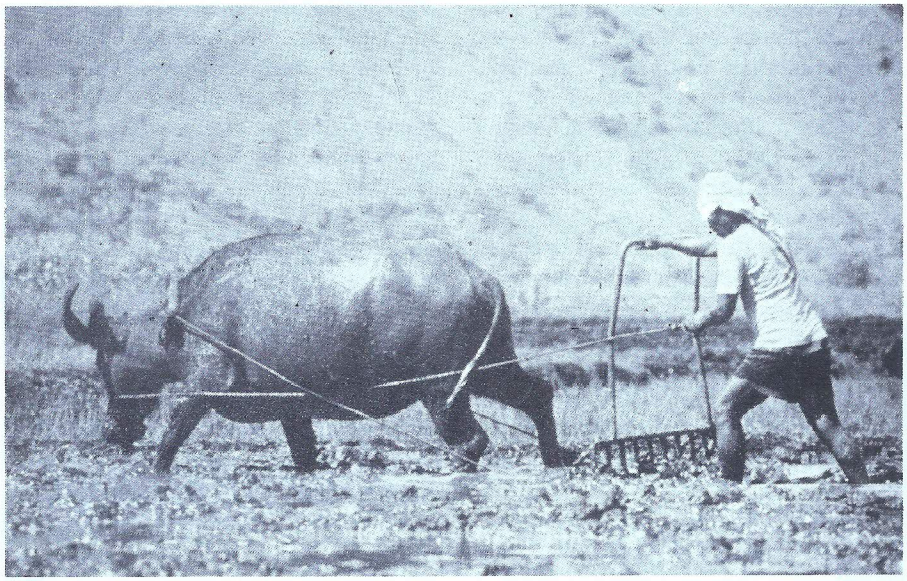
The movement in Malaysia began with the setting up of an organic farm; NGOs have followed this lead by starting similar farms. And if the National Consultation (on Sustainable Agriculture) held in January 1993 is an indication of the general approach to sustainable agriculture promotion, then it can be said that the movement in this country is focused on encouraging broadscale adoption of organic farming.

Over in Bangladesh, the primary objective of sustainable agriculture advocates is to help peasants meet their food needs and improve their standard of living, and to maintain a balanced agro-ecosystem. Organic farming is widely endorsed. In fact, Proshika, one of Bangladesh's better-known NGOs, is implementing an agricultural program in which a non-chemical regimen consist-

The ecological time bomb set off by the Green Revolution will tick on, this time faster; and unless a radical reorientation is made of current agricultural policy, we may need the peddlers of such technology to "bio-engineer" us for resistance in order to survive the explosion.

ing of experimental land preparation and irrigation techniques, as well as organic input like dried potato and hyacinth leaves, has been able to coax high yields from even the chemical-dependent rice HYVs.

Sri Lankan NGO advocates for sustainable agriculture are as much enamored with alternative farming techniques although their special interest is in putting up small integrated farms (i.e. which combine animal husbandry, the home garden concept, biomass-powered lighting and cooking equipment, etc.).



On the other hand, NGOs in Pakistan are still convinced that conventional agriculture can be sustainably maintained. While deploring the effects of excessive use of chemicals, they believe that chemical-based systems can be effectively managed.

Issues and Constraints

The experience of two countries, Thailand and the Philippines, is illustrativee of the factors which hinder sustainable agriculture promotion.

Thailand

In "Framework for the Promotion of Alternative Agriculture Markets, Vitoon Panyakul cites at least four factors to account for this low rate of adoption in Thailand. The first has to do with ECONOMIC FACTORS. The vast majority of Thai farmers live below the poverty line. Perpetually strapped for cash and caught in a cycle of debt, they can hardly afford to invest in physical improvements on the land which most sustainable agriculture systems require (e.g. pond digging, drainage), much less wait until the new technique pays off in terms of better yields. Loans have to be paid, and needs met.

It is generally believed, Panyakul writes, that (in the case of fruit tree raising), farmers would need at least three to five years before trees begin to bear and soil is rehabilitated to the extent that adequate fruit is produced... Furthermore, the lack of land tenure security discourages farmers from making sacrifices to preserve and improve on the productivity of land which they have no hope of owning.

The vastly more complicated PRODUCTION TECHNIQUES involved in sustainable agriculture systems is another disincentive to their adoption.

Understanding and making the complex cycles of the environment work for the farm is a complex process, explains Panyakul.

Sustainable farming requires serious attention and determination from the farm owners who have to put abstract principles (to work). The difficulty is further compounded by the need to adapt general techniques to varying farming environments and the farmers own socio-economic constraints. In contrast, chemical farming, which has long supplanted traditional methods not only in practice but in preference, is considerably simpler. Therefore, together with the necessary revitalization of the traditional farming culture, Thai farmers need to be helped to re-learn agriculture.

The third factor is CULTURE-bound. What the change to sustainable agriculture requires goes beyond the transfer of technique to a reorientation of the countrys rural way of life. The Green Revolution did more than just make HYV converts of Thai farmers; it changed their self-image. After many years of successful conditioning, Thai farmers, especially this generation which has never known any other way to farm, cannot conceive of controlling weeds and pests without chemicals. Indigenous methods are now considered alien, if not stupid, and certainly backward. Hence, as Panyakul says,

> Changes in farming patterns will never succeed and be sustained unless cultural battles are won.

The lack of an ALTERNATIVE TRADING SYSTEM FOR AGRICULTURAL PRODUCTS poses the fourth obstacle to sustainable agriculture adoption. A necessary feature of sustainable agriculture practice is that it be economically viable. In the present trading structure, in Thailand as in most Third World countries, farmers are at the mercy of the vagaries of free trade which artificially depress the valuation of their crop in the world market. In the domestic scene, the middleman dominates and sets the price of agricultural produce. Farmers crops are undervalued and farmers often earn too little to pay off their debts, and much less to subsist on. Unless farmers can be guaranteed at least a fair price for their produce, they will be reluctant to make the change to sustainable farming which would initially require some capital investment and much more labor.

Still another factor has been cited to account for the slow rate of adoption of sustainable agriculture systems in Thailand: the lack of a basic, common definition of sustainable agriculture is one. Thai NGOs recognize several orientations within their own movement, with various groups using different—and often mixed—philosophies and approaches. Some see sustainable agriculture as a package of appropriate tech-

nologies, tools, seeds, and processes. For others, it is a manifestation of the democratization happening in the countryside, an indication of a conscientized and politicized peasantry seeking self-determination. Sustainable agriculture is also thought to incorporate an entire lifestyle. For many, it fits well with Buddhist theology and the search by many people in present day society for something which is missing in their lives—connectedness with the environment. For this last group, sustainable agriculture begins with a thought process and evolves into practice.

Philippines

On the other hand, in the Philippines, where sustainable agriculture is now widely accepted, a number of factors still stand in the way of broadscale adoption.

Nicanor Perlas, forerunner of bio-dynamic farming in the country, cites, for instance, the prevailing attitude of resignation among the population as a major stumbling block. Most people, producer and consumer alike, are aware of the hazards posed by chemical agriculture to their health and the nations environment. Yet, they credit it for effectively answering the food needs of the countrys growing population, a feat which they doubt any alternative farming method can match.

Such pessimism is ingrained, with even more formidable consequences for sustainable agriculture promotion, in the thinking of government bureaucrats. Former environment and natural resources secretary Fulgencio Factoran Jr hassaid, for instance, that alternative technologies still need to be perfected before they can be transferred to the countrys tradition-bound farming communities. According to him, the transformation to soft agriculture could take a generation so that meanwhile we have almost no choice but to live dangerously with our Faustian agriculture.

But perhaps the biggest stumbling block to successful NGO promotion of sustainable agriculture in the Philippines is the enduring problem of inequitable resource distribution, especially of land. The Philippine landholding pattern is basically skewedwith only a few landowners having control of large part of the total agricultural area. This situation has changed only slightly through several generations despite the implementation of different agrarian reform programs by the various administrations as the political power of feudal families has enabled them to circumvent, if not totally evade, agrarian reform.

Of 10 million Filipinos comprising the agricultural labor force, only 15 per cent are owner cultivators while 85 per cent have no control over the lands they till. With the double cost-price squeeze, the lack of credit facilities, perpetual indebtedness, and runaway inflation, poverty has become endemic to farming. Thirty per cent of the poorest Filipinos are from the rural areas, and the vast majority (62 to 68 per cent) of the rural poor are farmers.

Under these conditions, concerns of land resource sustainability pale beside the more compelling demands of survival. To ask farmers to sink money, time, and extra labor into land which belongs to oftentimes resented landlords is really asking too much unless the farmers are convinced that they, too, will benefit.

Philippine NGOs advocating for the implementation of a comprehensive and genuine agrarian reform are many and their work covers not just lobbying but also land tenure improvement. However, landed interests which are deeply entrenched in positions of power continue to hold back the movement for reform.

Another institutional constraint to sustainable agriculture promotion is the governments development framework which prioritizes industrial growth and neglects agricultural development. Massive conversion of prime agricultural land for industrial use has attended this national policy, resulting in the displacement of farmers and undermining local food production capacity.

Sustainable Agriculture Lessons and Future Directions

- Sustainable Agriculture (SA) presupposes a holistic, systems-approach to agriculture. Success in sustainable agriculture depends on reliably accounting for and effectively responding to all factors relevant to the farming system.
- SA entails a deep understanding of biological cycles. Traditional agricultural practices are an enormous storehouse of knowledge of these cycles accumulated through thousands of years of experience. SA practitioners ought to develop these indigenous knowledge systems, adapting them to existing conditions, and supplementing them with the findings of modern science. There is no inconsistency in drawing upon the discoveries of both traditions.
- The adoption of indigenous knowledge systems likewise demonstrates the cultural sensitivity of SA. Using the indigenous people's knowhow accords renewed value to their cultural identity, and helps arrest the degeneration of their societies in the face of modernization.
- SA is not limited to alternative regenerative agricultural techniques. It is equally concerned with social justice issues, and recognizes the need for economic and political restructuring. SA practitioners must acknowledge the indissoluble link between agricultural sustainability and equity. SA should form part of efforts to build a people-centered economy. It advocates a bottom-up, participatory approach to development, instead of a top-down centralized growth-centered system.
- SA advocates ought to recognize the crucial role of women in agricultural production, and must make their liberation from gender oppression a prime concern.
- The transition from conventional HYV agriculture to SA is not a painless, worry-free undertaking. Because of the damage inflicted on the soil and the ecosystem as a whole, it may take time for farmers newly converted to regenerative farming techniques to achieve sufficiently large farm yields in the short transition period. In case this happens, NGOs and sympathetic government units must be prepared to help supply adequate social safety nets to ease the transition and prevent farmers from being discouraged by the move.
- SA is a highly knowledge-intensive system. Unlike conventional agriculture, where research is very highly concentrated in well-endowed research centers in government extension units, the universities and in laboratories of corporate

manufacturers of agricultural inputs, SA relies greatly on local, site specific research. SA requires that a farmer be a research scientist of sorts, to enable him or her to tailor the appropriate SA techniques to particular farm conditions. There is no universally applicable package of SA techniques. Since conditions in each farm are unique, the SA regimen for each farm will likewise vary.

- The knowledge-intensive character of SA, means that a premium is placed on informing and educating farmers. SA's success in a particular area is correlated with the extent to which farmers have been able to understand the myriad issues related to sustainable agriculture: biological cycles, social systems, political economy, ecology, plant and animal life cycles, etc. along with specific agricultural techniques: composting, multi-cropping, etc.
- Powerful vested interests—landlords, manufacturers of chemical pesticides and fertilizers, etc.—stand behind conventional agriculture. SA advocates ought to be able to understand the workings of these groups to be able to better deal with them.
- The more highly distributed character of sustainable agriculture research does not preclude the need for "centers of research excellence" that can stand up to the best that conventional-agriculture-oriented institutions such as IRRI can offer. NGOs ought to lobby governments to create such centers, while setting up their own research institutions.
- In their work, SA practitioners feel the need for quick and ready access to technical, market, and statistical information. While NGOs and certain government institutions have begun building up knowledge bases on sustainable agriculture, these are at present woefully inadequate. Moreover, NGOs lack the means to quickly disseminate needed information. In this regard, traditional media—i.e. newsletters, books, magazines, radio—and more modern systems—i.e. microcomputers and public telecommunication networks—can be of invaluable help. In this regard, the training of committed and knowledgeable SA extentionists is likewise urgently demanded.
- Participatory management of SA programs denotes that farmers assume active roles at all stages of project implementation. Farmers are not passive receivers of knowhow from experts, who possess a monopoly of advanced expertise. Furthermore, farmers ought not occupy inferior positions in highly hierarchical management structures. Farmers are co-creaters of knowledge, and lead implementors of SA programs.
- Local people's organizations are of critical importance to the success of SA. These organizations ought to serve as the leading force in SA's spread. Farmers must unite to be able to share common costs, exchange information and knowhow, provide mutual help, and build a political force capable of defending the people's welfare and standing up to vested interests inimical to their interests.
- To ensure the permanency of SA's success, meaningful local autonomy must be vested in the most basic political unit: the small village. Farmers must have a greater say on how their lives are run to make sure policies redound to their benefit; this can only happen if their local government units—i.e. directly elected officials as well as people's councils, comprising local organizations and individuals—have the power to decide on crucial local issues, e.g. watershed and forest management, education, irrigation, public works, agricultural extension, and healthcare.
- Networking between groups and individuals involved with SA has been of invaluable help not only in knowledge sharing; equally important, is its role in lobbying efforts, and in building up a politically and economically potent force to push for the adoption of SA. Networking can be done at the local, regional, national, and international levels. Apart from farmers groups and NGOs, it is important to secure the support of professionals, unions, the academic community, and government officials.
- Cooperation between people's organization, NGOs and government holds huge potentials, for the latter's resource capability remains unmatched. Such cooperation has yet to be fully exploited. Working with the government need not mean cooptation by the highly influential elite. While working with the government, NGOs strive to make the state more responsive to the people's needs, and more representative of its interests.
- SA practitioners recognize the need for improved information dissemination and awareness-building among the general public using their own channels, and especially the mass media, which reaches a much broader audience.
- SA practitioners have to deal with the paucity of affordable credit in the rural areas. Accordingly, the establishment of accessible rural credit facilities stands as a major SA undertaking. SA advocates must work to entice government and private banks to offer more loan programs to benefit the rural poor. At the same time, they ought to develop their own rural credit coopertives, which can enter into collaborative ventures with established financial institutions.

Notes

1 Bennett, Jon (1987). *The Hunger Machine*, Polity Press, Cambridge, 18.

2 Ibid., 12.

3 Ibid.

4 Halliday, Fred. "The New World and Its Discontents," *LSE Magazine* 5(2), Autumn 1993, 8-10.

5 Bennett, Jon (1987). *The Hunger Machine*, Polity Press, Cambridge, 35.

6 Booth, B. (1992). "Germplasm: Slave Trade of the 20th Century? Who Owns the Seeds of the Earth?," *Biodynamics*, Issue No.18, 1992, 6, as cited in Perlas, Nicanor (1993). *The Seven Dimensions of Sustainable Agriculture*, Overview paper presented at the Second Asian Development Forum held in Cagayan de Oro City, Philippines on 22-26 February 1993.

7 Baum, Julian (1993). "Striking it rich," *Far Eastern Economic Review*, 4 March 1993.

8 "Agricultural Heritage," *People and Planet.*

9 *The Economist*, November 1993.

10 "Agricultural Heritage," *People and Planet.*

11 Ibid.

12 Shiva, Vandana (1993). *Revolutions of the Rich: Scientific Critique of the Green Revolution and the New Agricultural Biotechnologies*, Paper presented at the Second Asian Development Forum held in Cagayan de Oro City, Philippines on 22-26 February 1993.