The Politics of Pesticides

Rafael V. Mariano, National Chairperson,
Kilusang Magbubukid ng Pilipinas (KMP) – Peasant Movement of the Philippines
November 11, 1999

The increasing use of pesticides and other agrochemicals has changed agriculture drastically during the last decades. The introduction of new technology, like genetic engineering, will bring even more dramatic changes to the world of agriculture as we know it.

The impact of these changes, however, goes far beyond technicalities as they affect the daily lives of millions of peasants the world over. For example, every year an estimated 25 million workers suffer from pesticide poisoning. Moreover, the Third World accounts for 99 percent of deaths from pesticides even though it uses only 20 percent of the pesticides produced globally.[1]

The introduction of pesticides has even altered our ecosystem dramatically. Over 500 species of insects and mites are reported resistant to one or more insecticides while 216 weed species are resistant to at least one class of chemical weed killers.[2] Therefore, the whole world population feels the consequences of these developments in agriculture.

These simple facts demonstrate that it is necessary to keep a close watch on the technological developments in agriculture. Moreover, they show that we have to study them in their political and economic context. The analysis of the politics of pesticides reveals how the world economic system is prioritizing the interest of a few to the expense of the majority of the world population. Moreover, it enables us to invigorate the resistance through people's struggle.

1 Pesticides, Politics and Monopolies

Due to the evolutions in agriculture in the last 50 years, the agrochemical industry has developed into a big business opportunity for a few giant conglomerates. Two developments have spurred tremendous sales of pesticides and other chemical agricultural inputs: industrialization of agriculture in Europe and North America and the dependency-creating innovations in the agriculture of the Third World since the Green Revolution.

In 1998, the global sales of agrochemical products amounted to $30.9 billion[2]. The market is dominated by ten companies, who control an ever increasing share of the world market. (Table 1)The top ten agrochemical companies controlled almost 90 percent of the market in 1998, compared to “only” 75 percent in 1988.[3] The agrochemical industries of Third World countries like India, China, Brazil and Mexico are almost negligible in comparison with these ten giants.

Nine of the top ten agrochemical companies increased sales in 1998. US-based DuPont posted the highest growth rate as its agrochemical and biotechnology sales increased by over 25 percent since 1997. Another US company, Monsanto, enjoyed an almost equally impressive increase in sales. Its growth rate of 23 percent brought its 1998 sales figures close those of the market leader, Switzerland’s Novartis. Monsanto’s success was due to a 25 percent increase in volume

sales of the herbicide glyphosate (Roundup) and a tripling of the area planted with Monsanto's genetically modified crops.[4]

The main markets for agrochemicals remain in North America and Europe. They account for 29.4 percent and 26.2 percent of pesticide sales respectively. Asia is a close third with 24.5 percent. (Figure 1) However, the pesticide markets in the industrialized countries are already saturated. The growth rate of the agricultural sector is steadily decreasing in the US, while it already turned negative in Japan. (Table 2) Therefore, the agrochemical companies are targeting Asia and Latin America as growth areas for their obnoxious trade.

The importance, and potential for agrochemical companies, of the Asian agricultural market can be understood in relation to Asia's major crop: rice. Of the world's annual rice production of 535 million tons, 91 percent is produced by Asian farmers. As rice is the most important food crop in populous Asia, 60 percent of the world population is dependent on it as a staple food. It is expected that by 2025, more than 5 billion of the world's anticipated 10 billion people will depend on rice as their principal food.[5]

The Asian agricultural market, and especially its rice production, is therefore strategic for the expansion of pesticide consumption. The huge Chinese market is particularly challenging as its farmers are able to obtain a high productivity while their consumption of pesticides per hectare is only 1 percent of Japan's farmers.[6]

1.1 Increasing Monopoly Control

That the leading agrochemical companies are posting impressive sales figures does not mean that they are spared from the global economic crisis. Just like in other industries, overproduction transformed the agrochemical industry into a battlefield among monopolies. As the world's economic outlook is looking increasingly dim, the trend is toward intensifying monopoly domination of the market. A few big transnational corporations (TNCs) are trying to elbow each other out. If not through fierce competition, it is through mergers and takeovers that they are consolidating their monopolies.

Another indicator of increasing monopoly control is the trend toward integration of the pesticide industry with the seed, biotechnology, food and pharmaceutical industries. Agrochemical companies have repackaged themselves as "life science" companies, partly in order to clean their record as dealers in poison but, more importantly, to consolidate their monopolies.

US-based DuPont, one of the market leaders in pesticides, acquired Pioneer Hi-Bred, the world's largest seed company that controls 42 percent of the seed market in the US[4] and 65 percent in the Philippines.[7] In December 1998, Germany's Hoechst and France's Rhone-Poulenc merged to form Aventis -- "the world's biggest life science company." With combined sales of $20 billion per year, Aventis becomes a global powerhouse spanning the markets of pharmaceuticals, agrochemicals and veterinary medicines. Aventis' research and development budget will reach $3 billion -- roughly 40 percent of all funding for agricultural research in the private sector.[2]

Days after the announcement of the birth of Aventis, UK-based Zeneca and Astra of Sweden announced another spectacular European merger. The integration of Astra and Zeneca transforms two second-tier drug firms into a leading pharmaceutical and agrochemical company with $14.3 billion in sales. With combined assets of more than $70 billion, the new company will be larger than the 1997 gross national product of 93 of the world's Third World nations.[2]

1.2 Science to the TNCs' Rescue

The trend toward "horizontal" integration of different economic sectors and the ensuing monopolization is stimulated by recent developments in biotechnology that expand the corporate world's grip on agriculture and could have tremendous consequences for the agricultural and food sectors of the future. Through genetic engineering, the industry is developing "terminator" seeds whose genetic traits can be turned on and off by an external chemical "inducer." With these genetically altered seeds, farmers are not only obliged to purchase new seeds every planting season, they will also be dependent on the same company's chemicals.

The latest version of Monsanto's suicide seeds won't even germinate unless it is treated with a special chemical. AstraZeneca is spending its research budget on technologies that make crops become stunted or otherwise impaired if they are not regularly exposed to the company's chemicals. One of Novartis' patents describes a procedure for chemically regulating a number of developmental processes in plants such as germination, sprouting, flowering and fruit ripening. The patent specifically mentions that the chemical regulator can be applied to plants in combination with a fertilizer or herbicide.[2]

Several companies are racing to develop herbicide tolerant rice that is supposed to reduce pesticide use. At least, that is the assertion of the agrochemical industry's propaganda machinery. Yet the opposite may be expected as any new development introduced by the TNCs since the Green Revolution was effectively increasing the use of chemicals in agriculture. With herbicide tolerant rice, there will be no limits to the use of herbicide as the rice will not be affected, even when herbicide is used abundantly. Cyanamid, AgrEvo and Monsanto are all developing rice varieties that are resistant to their respective proprietary herbicides.[8] Farmers will have no other choice but to use the company's products. Consequently, TNC control of agriculture will be tightened even further.

For the agrochemical industry, the gains of these new technologies will be phenomenal. Insiders expect that this new wave of agricultural technology could take the global "crop protection market" up to a $100 billion a year industry. Indeed, the huge sums the companies are spending on biotechnology research are an indication that they are expecting to make big money.[9]

1.3 Political Domination and Economic Control

In their struggle for the domination of the world's agricultural markets, the agrochemical monopolies find an ally in the governments of their home countries in order to consolidate their domination of the world's markets. It is not surprising that the US, Germany, Switzerland and the European Union, where the top ten agrochemical corporations are located, are among the top funders of the Con-

sultative Group on Agricultural Research (CGIAR), the world's most influential "independent" agricultural research body. (Table 3)

Research of the US based Center for Public Integrity has documented how the US pesticide industry has established organizations like the Food Chain Coalition that poured $84.7 million into congressional campaigns between 1987 and 1996. Monsanto, DuPont, Dow Agro-Sciences, and 32 other pesticide companies have also banded together in an organization that ironically calls itself Responsible Industry for a Sound Environment (RISE) and spent $15 million on lobbyists in 1996 alone.[10]

In the US the entire agricultural food and fiber distribution chain is the largest single industry, accounting for approximately 16 percent of the Gross Domestic Product (GDP). US agricultural exports reached a record high of $60 billion in 1996.[11] Because of the vital importance of the sector for the US economy, it is actively supported and protected by the government. A case in point is the exemption of agricultural chemicals from state sales taxes in 29 of the 50 US states. They lose at least $674 million yearly as a result of the exemptions.[12]

However, the industrialized countries' direct support to their agricultural sectors also had unwanted effects. It worsened their budget deficits and aggravated overproduction, hence lowering world prices. Therefore, the US and Europe sought relief for their agricultural sectors through the inclusion of an Agreement on Agriculture (AoA) in the General Agreement on Tariffs and Trade (GATT) – Uruguay Round. The AoA had to reduce subsidies in order to lessen the fiscal burden of the industrialized countries, while at the same time opening new markets for their ever increasing surpluses.

With the establishment of the World Trade Organization (WTO), pressure has mounted on poor countries to liberalize markets and to remove protective measures. Their markets are left without any defense to the intrusion of the agrochemical monopolies. The farmers of the Third World are easy prey for these profit-hungry vultures in their desperate quest for expansion of their markets. At the same time, agricultural production for domestic use is being eroded while conversion to export crops is dramatically expanding in order to supply the food monopolies with cheap products for the more profitable markets of the industrialized world.

To make a long story short, the pesticide business is no different from other major industries. It is dominated by US and European TNCs that are feeling the consequences of the persistent global crisis of capitalism and are dreading its final meltdown. This drives them to increasing monopolization of the agrochemical business. Just like other monopoly capitalists, they took advantage of the imperialist "globalization" drive of the nineties to strengthen their hold on the Third World economies in order to extract whatever surplus they can lay their hands on. Not surprisingly, these evolutions do not bolster the development of Third World agriculture. On the contrary, they are pushing the agricultural economies further in their dependent roles of subservience to the needs of the TNCs while their farmers are condemned to ever worsening poverty and underdevelopment.

2 Politics and Pesticides in the Philippines

The Philippine agricultural sector can illustrate how TNCs are linking up with local monopolies, impeding the local farmers to break free from the shackles of poverty, exploitation and underdevelopment. The Philippine economy is characterized as backward, agrarian and semi-feudal. Philippines remains under the neocolonial rule of the United States. Its agriculture is backward and still no basic industries.

Only 5 percent of total landowning families controls almost half of the total landholdings in the country. Seven out of ten peasants do not own the lands they till. Share tenancy remains the predominant exploitative form of tenurial arrangement. Landlords get from 40 percent to as much as 90 percent of the produce as feudal land rent.

Due to monopoly control on farm capital and trade, farmers have to buy overpriced farm inputs and sell their produce at very low prices. Usury is rampant. Poverty, malnutrition, lack of education and inadequacy of health and social services are widespread in farming communities.

2.1 The Pesticide Invasion

Prior to the 1970s, pesticides were primarily employed on plantation crops. Small farmers began to use pesticides intensively in the early 1970s. Under the dictatorship of President Marcos, import of pesticides in the Philippines grew fivefold in the six-year period 1972-1978.[13] During the decade from 1977 to 1987, importation of insecticides grew by 93 percent. (Table 4)

From 1987 to 1989, the major pesticide companies in the Philippines put on the market 20,100 tons of pesticides. The pesticide industry grew at an annual average of 17.5 percent. In certain regions of the country, the increase in pesticide usage was a high as 500 percent annually. In Benguet province alone, the total value of chemical inputs sold in 1992 reached about $6.4 million while the total value of pesticide sales in the country was estimated to be about 120 million US dollars.[14]

Pesticide use is concentrated on three crops: vegetables, bananas and rice. Vegetable farmers are the most intensive consumers, but rice farmers are the single biggest users of pesticides in the country. They employed more than 6,000 metric tons in 1992, most of it on irrigated lands. Philippine rice farmers use highly toxic pesticides and are exposed to considerable hazard. Highly toxic organophosphates (OPs) and some organochlorines (OCs) and carbamates, remain in widespread use.[15]

Obviously, the invasion of pesticides in Philippine agriculture had tremendous impact on the majority of small farmers. Before the widespread application of agrochemicals, their rice farms also provided them with fish, snails and other viands for free. The Green Revolution, however, put an abrupt end to this kind of self-sufficiency. Moreover, due to rising input costs, real incomes of farmers declined and the debt problems among small farmers worsened.[16]

The correlation between pesticide use and productivity of the Philippines' major crops is very low. (Figure 1) Already during the 70s, the farmers experienced that the expensive "miracle" seeds with their associated farm inputs did not provide

them the miraculous harvests they were promised. While they were getting increasingly indebted, productivity improved only at a snail's pace.

During the 1980s, the scientific community finally admitted that insecticide use is generally not economical in rice cultivation while the yield-enhancing effects of pesticides are very small. Insecticides were even shown to induce resurgence of some pests.[15] Nevertheless, Philippine imports of pesticides were still soaring throughout the 90s while yields in rice have stagnated throughout the decade and corn productivity has risen only marginally. With the further liberalization of the economy under the WTO, importation of pesticides rose to $53.66 million in 1997.[17]

2.2 Feudal Exploitation and Imperialist Control

If the massive use of pesticides in Philippine agriculture did not benefit the productivity nor the Philippine peasantry, why did the Filipino farmers resort to it? The answer can be found in the very foundations of Philippine society, its semi-feudal and semi-colonial characteristics. Philippine farmers are still trapped in age-old feudal relations while the whole agricultural economy is in the grip of neo-colonial relations with its imperialist masters, especially the US. Therefore, the politics of pesticides reflects the converging interests between the local landlords, the comprador factions of the elite and foreign TNCs.

2.2.1 Marcos' Green Revolution

In 1973, the Marcos regime ushered in the era of the Green Revolution in the Philippines with his Masagana 99 program for rice and similar programs for corn and vegetables. This program had to spruce up the bogus land reform program he had launched in 1972, shortly after declaring martial law. While his so-called land reform program was supposed to give the farmers the illusion of agrarian justice, Marcos' enthusiastic support for the Green Revolution had to project the image of modernization of the Philippines' backward agriculture. In reality, both programs were a means for Marcos and his cronies to consolidate their power in the countryside as well as an opportunity for TNCs to take advantage of the dictatorship to advance their business interests.

Masagana 99 provided credit opportunities for small rice farmers on the condition that they would plant government-recommended high-yielding varieties (HYVs) and purchase fertilizer and pesticides. As only ten varieties were on the program's list, the program was successful in eradicating indigenous rice varieties and destroying the Philippine biodiversity. By 1982, 93 percent of irrigated lowlands were planted to Green Revolution varieties.[18]

By linking credit with compulsory membership in the barrio farmers' association (Samahang Nayon), Marcos strengthened his political power in the countryside. Making fertilizer and pesticide purchases mandatory was an effective means of consolidating the feudal characteristics of rural society in the Philippines. The feudal and semi-feudal exploitation of the landlords, rural bankers, traders and merchant- usurers pushed the peasants more deeply in the quagmire of perennial indebtedness.

Not only the local potentates were benefiting from this policy. Agrochemical TNCs raked in the profits as pesticide imports and sales were increasing. It is therefore not surprising that Marcos' agricultural policy was enthusiastically sup-

ported by the World Bank and its affiliates. The World Bank increased its lending for agriculture from 6 percent of the total bank lending in fiscal years 1948-1960, to 24 percent in 1973-1974.[16] The World Bank and the Asian Development Bank opened a credit line for irrigation projects – indispensable for the success of Marcos' Green Revolution – in 1973 and provided a total of more than $1 billion until 1984.[19] These and other agricultural input loans had to prop up Marcos' TNC-friendly agricultural policies.

To support the Green Revolution, the Fertilizer and Pesticide Authority (FPA) was created in May 1977. It serves as an instrument of the agrochemical industry that provided the first three administrators of this government agency. Although changes have been made in the leadership and "Integrated Pest Management" became one of its catchphrases, the FPA is still a vehicle for the pesticide industry. For example, FPA's training programs on the safe use of pesticides are conducted in collaboration with the Crop Protection Association of the Philippines (CPAP), an association of agrochemical companies.[15]

Also the Philippines-based International Rice Research Institute (IRRI), established by the Rockefeller and the Ford Foundation in 1960, has been instrumental in the Green Revolution. Its research and the HYVs it developed were essential for Marcos' Masagana 99 program. Recently, IRRI's promotion of direct seeding strategies gave a new boost to herbicide use in Asia.[20] IRRI is now developing a "super rice" that is supposed to provide yields of 15 ton and is likely to create super pests, increasing pesticide use even more.[21]

Expectedly, IRRI relies on financing from pesticide producing countries. (Table 5) The institute is said to collaborate with major pesticide manufacturers like Ciba-Geigy (now Novartis)[20] and, as was recently exposed by PAN-AP, Monsanto.[22] It is noteworthy that IRRI has also been hounded by complaints it has failed to sufficiently protect its workers from chemical poisoning. Even if there would be proof, however, the institute may not be sued, according to a 1979 presidential decree signed by Dictator Marcos granting it immunity.[23]

2.2.2 Continuation of a Fiasco

Although presidents and slogans changed after Marcos' Masagana 99, the essence of government's pesticide policy remained very much the same. President Aquino's Rice Productivity Enhancement Programs (RPEP I and II), Ramos' Gintong Ani, and presently Estrada's Agrikulturang Makamasa are still promoting the massive use of pesticides in combination with HYVs and export crops. Credit is provided by the local traders, landlords and loan sharks and tied to overpriced seed, fertilizer and pesticide purchases at the expense of the Filipino peasantry.

The trend is not toward land distribution, but re-concentration. The government is actively promoting all kinds of landlord- and TNC-controlled commercial farms. These were deferred from land reform until 1998. Now, they are given a new alternative through Department of Agrarian Reform (DAR) Administrative Order 9, series of 1998 that introduced the so-called "corporative scheme." This twisted kind of land reform promotes joint-ventures between landlords and farmers. Under this arrangement, landlords retain the control over their landholdings through their majority stake in the corporation, while the farmers remain landless as ever.

Contract growing is another scheme for the re-concentration of lands under the control of landlords and TNCs. Under contract growing, the farmers are providing

the land and the labor to grow a crop as specified by a corporation. The farmers are bound by contracts of ten years or more to buy farm inputs from and sell their produce to the same corporation. TNCs like Dolefil and Del Monte are thus gaining effective control over vast tracts of land without actually owning it. The farmers are completely dependent on the company that requires them to grow export crops using the chemicals they prescribe and sell. Massive indebtedness is the result for the farmers while super profits are made by the TNCs.[24]

The 1997 Agriculture and Fisheries Modernization Act (AFMA) provides the framework for further TNC-oriented restructuring of Philippine agriculture. The law also provides a 5-year exemption of tariffs and import duties for any agricultural or fisheries enterprise.[25] Hence pesticides and equipment can be imported without any import tax – a clear incentive for TNCs to expand their pesticide-dependent agriculture.

The big agrochemical companies are given free rein to mislead and exploit the Philippine peasantry. Moreover, they can still count on the government's active support. The Department of Agriculture, for example, together with other government agencies, supported a paid advertisement in Philippine newspapers that praised the Monsanto's field tests of genetically modified Bt corn.[26]

One of Monsanto's projects in Mindanao is neatly integrated with the government's Agrarian Reform Communities. Monsanto claims that it is implementing a "cradle to grave" pilot program, including credit, land preparation and marketing systems. Probably, any resemblance with Marcos' Masagana 99 -- that effectively brought Philippine agriculture to the grave -- is coincidental.

Miraculously, the government prioritized road improvements in Monsanto's program area, and the Land Bank began a loan program that is now providing $1.6 million for farmers to buy Monsanto's products. Surely, it is no coincidence that Roundup sales have increased six-fold from 1995 to 1997 according to Jade Jarbadan, sales supervisor for Monsanto Philippines in Mindanao, who also projects that by the year 2000 sales will reach 30 times the 1995 level.[27]

The Novartis Foundation, which ridiculously claims to be independent from Novartis, is funding groups like the Provincial Advocates for Sustainable Development (PASAD) in Bacolod, Negros. PASAD is training farmers in "ecologically and economically sustainable agricultural methods." Novartis itself operates a "Crop Productivity and Farmer Training Center" in Santa Rosa, Nueva Ecija. The company claims that its training center has already made contact with more than 20 percent of the farmers in the heart of the Luzon "rice bowl."[28]

The Philippine agriculture was tailored to the needs of the industrialized countries and their TNCs. Land planted with staple crops were converted to export crop production. The use of imported farm inputs was promoted. Foreign corporations got the control over large chunks of agricultural lands. The agricultural trade became increasingly export-oriented, import-dependent and foreign-dominated in order to ensure maximum neo-colonial exploitation.

Contrary to the claims of the agrochemical business, pesticides did not develop the agriculture in the Third World. Instead, the Green Revolution intensified feudal and imperialist domination and exploitation.

3 Sustainable Agriculture Through Genuine Land Reform and National Development

The campaigns against pesticides and the struggle for sustainable agriculture must be firmly linked and founded on to the peasants' struggle for land and against imperialist domination and exploitation.

Peasants must be freed from age-old feudal bondage of the soil they till. The emancipated peasants, with a diverse genetic materials and resources in their hands will be the staunchest advocates of the more productive, sustainable and responsive agriculture of the future.

To advance the struggle against the corporate takeover of agriculture, we have to face many challenges within the context of our analysis of the politics and economics of pesticides. Many people's organizations, grassroots groups are actively protesting and resisting the harmful practices of the agrochemical TNCs in their countries.

Last year, for instance, they were able to prevent the Grameen Bank in Bangladesh from forging an agreement with Monsanto when it was unable to resist Monsanto's offer of $150,000 to provide loans to poor farmers to buy Monsanto's products and to establish a Monsanto-Grameen Center.[22]

We must continually launch a massive education and information campaign and conduct researches for the purpose of arousing, organizing and mobilizing the broadest possible number of people for our protest actions.

More sustainable alternative agricultural practices are also gaining ground through the efforts of the same grassroots groups and organizations. For example, Community Pesticide Action Kits are raising the peasants' awareness in Indonesia, Malaysia and the Philippines. PAN-AP is coordinating an alternative pest management project involving farmers from Thailand, Indonesia, Malaysia and the Philippines. These and other grassroots initiatives are going against the flow yet they are bearing fruit. In one instance, appropriate training was able to reduce insecticide use by 60-90 percent and herbicide use by 40-60 percent while some farmers stopped pesticides application altogether.[29]

We must continue exchanging experiences and lessons to guide our present and future campaigns and action plans.

Peasants, indigenous peoples and small fishers must draw in the active support and participation of the broadest possible sectors in our countries most especially the religious groups, academe, pro-people scientists and professionals, media practitioners, government officials and parliamentarians through effective alliance and advocacy work.

We have to launch local, national, regional and international campaigns in a coordinated way that could clearly and strongly register our analysis, position and calls. We have to build, develop and strengthen solidarity linkages among us.

###

Tables and Figures

Table 1: Top ten agrochemical companies -- 1998 sales and market share

Company	Sales (in million US$)	% Change vs. 1997	Market share
Novartis (Swiss)	$4,152	-1.1%	13.4%
Monsanto (US)	$4,032	23%	13.0%
DuPont (US)	$3,156	26%	10.2%
Zeneca (UK)	$2,897	8.3%	9.4%
AgrEvo (Ger)	$2,410	2.5%	7.8%
Bayer (Ger)	$2,273	0.2%	7.4%
Rhone-Poulenc (Fr)	$2,266	2.9%	7.3%
Cyanamid (US)	$2,194	3.5%	7.1%
Dow Agro-Sci. (US)	$2,132	11%	6.9%
BASF (Ger)	$1,945	4.9%	6.3%
Total	$27,457		88.8%

Source: Global Pesticide Campaigner, Volume 9, Number 2, August 1999

Table 2: Growth of Agriculture in Japan and US

	1980-1990	1990-1996	1997-1998
Japan	1.3%	-2%	-2.1%
United States	4%	3.6%	2.9%

Source: Clairmont Frederic. “Japan and the Crisis of Overproduction.” Third World Resurgence Number 98, October 1998

Table 3: Top Ten Sources of Funding of CGIAR 1972-1998

	Total contribution in million US$
United States	871.3
World Bank	660.8
Japan	423.3
Canada	273.1
Germany	252.7
European Union	229.2
United King-dom	197.5
Switzerland	191.5
Netherlands	151.9
Sweden	121.9

Source: CGIAR Annual Report 1998

Table 4: Importation of Pesticides (MT), 1977-1991

	1977	1987	1991
Insecti-cides	1,556	3,007	4,707
Herbicides	760	1,843	2,044
Fungi-cides	874	5,571	1,327
Others	548	5,480	2,697
Total	3,738	15,901	10,773

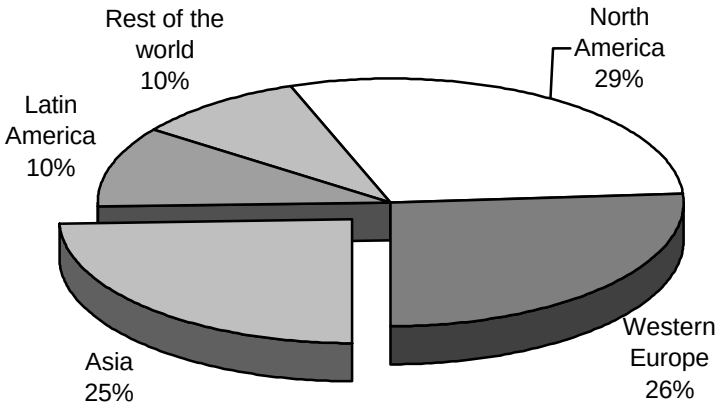
Source: Loevinsohn M. and A.C. Rola. “Linking research and policy on natural resource management: The case of pesticides and pest management in the Philippines.” In: “Closing the Loop: From research on natural resources to policy change.” Edited by S.R. Tabor and D.C. Faber. (Policy Management Report No. 8). Maastricht, European Centre for Development Policy Management, 88-113, 1998.

Table 5: Top Ten Sources of Funding of IRRI 1997

	Total contribution in US$
Japan	7,940,985
World Bank	4,500,000
US Agency for International Develop-ment	4,324,290
Australia	2,814,350
Switzerland	2,680,446
European Union	1,600,000
Denmark	1,381,175
UK Department for International De-velopment	1,261,093
The Rockefeller Foundation	1,109,630
German Agency for Technical Coop-eration	895,764

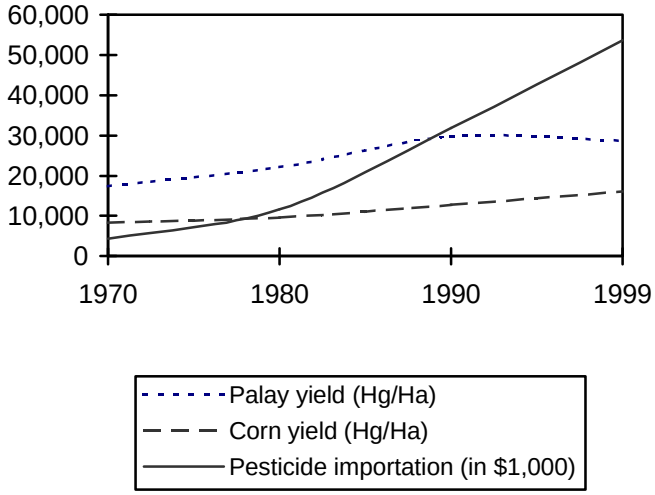
Source: IRRI 1997-1998. “Biodiversity, Maintaining the Balance.”

Figure 1: 1996 World Agrochemical Sales by Region



Source: AGROW – World Crop Protection News. In: Pesticide Monitor, July 1998

Figure 2: Trends in Pesticide Importation and Crop Yields



Source: FAOSTAT, http://www.fao.org

Notes:

[1] Rengam Sarojeni V. “First Word,” Pesticide Monitor, July 1999
[2] “The Gene Giants. Update on Consolidation in the Life Industry,” RAFI Communiqué, 3/30/99
[3] Pao-Yu Ching. “The Impact of GATT/WTO on World Agriculture and World Peasants and Workers.” November 1997
[4] “1998 Top Ten Agrochemical Companies.” Global Pesticide Campaigner, August 1999
[5] “IRRI Rice Facts.” International Rice Research Institute, July 1998
[6] Dinham Barbara. “Impact of Corporate Control on Food Security.” Pesticide Monitor, July 1999
[7] “The Corporate Takeover of Corn in Southeast Asia: Whose Agenda?” BIOTHAI, GRAIN, MASIPAG and PAN Indonesia, August 1999
[8] For example, Monsanto’s Roundup-Ready Rice will be resistant to glyphosate. The japonica version is expected to be on the market in temperate countries like Japan, China and the US by 2002, and plans to insert the gene in indica rice for cultivation in the tropics of South and Southeast Asia are underway. Source: “Rice, IRRI, and Corporate Earnings (R.I.C.E).” PAN-AP, 1999
[9] In July 1998, Novartis announced a $600 million investment to establish the world's biggest crop gene mapping project, the Novartis Agricultural Discovery Institute, in California. Source: Dinham Barbara. “The pesticide business - impact on food security.” Pesticides News No. 42, December 1998
[10] In 1996, RISE employed 219 Washington lobbyists, including 24 former House staff members, 22 former Senate staff members, ten former Executive Branch officials, nine former White House aides, four former Representatives, and three former Senators. Source: Lewis Charles et al. “Unreasonable Risk -- The Politics of Pesticides.” The Center for Public Integrity, 1998
[11] “Agribusiness Letter to Clinton: Get Tough on Biotech.” PAN AP Safe Food Campaign 1998
[12] “US Sales Tax Exemptions for Pesticides.” Global Pesticide Campaigner, August 1999
[13] Norris Ruth (editor). “Pills, Pesticides and Profits – The international Trade in Toxic Substances.” North River Press, New York, 1982
[14] “Philippine Case Study: A Developing Country's Perspective on POPs.” Prepared By The Philippines for the IFCS Meeting On Pops, June17-19, 1996, Manila, Philippines
[15] Loevinsohn M. and A.C. Rola. “Linking research and policy on natural resource management: The case of pesticides and pest management in the Philippines.” In: “Closing the Loop: From research on natural resources to policy change.” Edited by S.R. Tabor and D.C. Faber. (Policy Management Report No. 8). Maastricht, European Centre for Development Policy Management, 88-113, 1998
[16] Tiongson Mari Luz, Regalado Aurora and San Pascual Ramon. “Agriculture in the 70s and 80s: TNCs’ Boon, Peasants’ Doom.” Proceedings of the International Solidarity Conference for the Filipino Peasantry, 1986
[17] FAOSTAT, http://www.fao.org
[18] Bell Janet. “Investing in Destruction – The World Bank and Biodiversity.” Genetic Resources Action International
[19] Azarcon Yolanda and Barker Randolph. “Trends and Determinants of Public Irrigation Investments in the Philippines.” Agricultural Policy Research and Assistance Program
[20] “Rice, IRRI, and Corporate Earnings (R.I.C.E).” PAN-AP, 1999
[21] “IRRI’s 15-Tonne Super Rice.” Seedling, the Quarterly Newsletter of Genetic Resources Action International, October 1996
[22] “Monsanto, IRRI, Push Pesticides on Thai Farmers Through Thai Development NGO.” PAN-AP Press Release, April 6, 1999
[23] Boniol Leti. “Pesticide Poisoning at IRRI?” CyberDyaryo 9/10/1998, http://codewan.com.ph/CyberDyaryo/
[24] “Contract Growing: Intensifying TNC Control in Philippine Agriculture.” IBON Books, 1997
[25] Republic Act No. 8435, Section 109: "All enterprises engaged in agriculture and fisheries as duly certified by the Department in consultation with the Department of Finance and the Board and Investment, shall, for five (5) years after the effectivity of this Act, be exempted from the payment of tariff and duties for the importation of all types of agriculture and fisheries inputs, equipment and machinery such as, but not limited to, fertilizer, insecticide, pesticide, (…), hybrid seeds, genetic materials, (…); Provided, however, That the imported agricultural and fishery inputs, equipment and machinery shall be for the exclusive use of the importing enterprise."
[26] Philippine Daily Inquirer, November 1, 1999

[27] http://www.monsanto.com
[28] http://www.novartis.com
[29] “Confronting the Issues and Alternatives.” Pesticide Monitor, July 1998