Effects of an environmental tax on pesticides in Mexico

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Summary

An optimal pesticide tax would discriminate among the substances marketed according to their toxicity levels. Adopting such a tax in Mexico is the most efficient way to prepare for compliance with the future extension of the list of pesticides subject to phase-outs and elimination under international agreements. This article examines the implications of three different environmental tax options: a general 15% tax on all pesticides (compensating for their current exemption from the value added tax); a differential tax of 15, 10, 5 or 0% based on toxicity levels; and a 10% tax focused on the most toxic substances currently authorized. Tax revenues should be used to pay for restoring human and ecosystem health as well as to compensate for other types of damage as appropriate.

Résumé

Pour être optimale, toute taxe sur les pesticides doit faire une distinction entre les substances commercialisées en fonction de leur degré de toxicité. L'adoption d'une taxe de ce type au Mexique est le moyen le plus efficace de préparer le pays à l'allongement futur de la liste des pesticides qui risquent d'être progressivement abandonnés et éliminés en vertu d'accords internationaux. L'article étudie les implications de trois options différentes d'écotaxe : une taxe générale de 15 % sur tous les pesticides (compensant leur exemption actuelle de TVA) ; une taxe differentielle de 15, 10, 5 ou 0 % en fonction du degré de toxicité ; et une taxe de 10 % qui toucherait les produits les plus toxiques actuellement autorisés. Les recettes fiscales correspondantes seraient utilisées pour améliorer l'état de santé de la population et des écosystèmes, ainsi que pour compenser tout autre type de préjudice si nécessaire.

Resumen

El impuesto ideal sobre pesticidas discriminaría las sustancias comercializadas en función de sus niveles de toxicidad. La adopción de este impuesto en México representa la manera más eficaz de preparar al país para cumplir con la próxima extensión de la lista de pesticidas sujetos a procesos de eliminación gradual y total en el marco de los acuerdos internacionales. Este artículo analiza las implicaciones de tres impuestos ambientales distintos: un impuesto general de 15% sobre todos los pesticidas (para corregir el hecho de que actualmente están exentos de IVA); un impuesto diferencial de 15, 10 ó 0% con base en su nivel de toxicidad; un impuesto de 10% sobre las sustancias más tóxicas autorizadas. Los ingresos derivados de dichos impuestos deberán destinarse al pago de los costos que implica la restauración de la salud humana y del ecosistema, y a cubrir otros tipos de indemnizaciones.

Pesticides are generally a good investment for farmers. It was estimated by Carrasco-Tauber (1990) that farmers obtained US$3-6 in crop damage reduction for every dollar spent on pesticides in the United States. Similar outcomes must be the case worldwide, as every year agricultural producers purchase close to 2.5 million tonnes of 55,000 different pesticides (Pimentel, et al. 1992). Most of the demand stems from the real profitability of the technology. However, farm support policies contribute to an increase in the demand for pesticides, in some cases to the extent that their marginal benefits are less than the private cost of production.

With or without subsidies, from an environmental point of view we face a problem with pesticides. Generalized use of herbicides, insecticides and fungicides has increased risks and resulted in direct or indirect damage to human health, wildlife and ecosystems. The number of cases of intoxication by pesticides reported to the Mexican Health Ministry has increased steadily over the last decade. Water pollution, damage to ecosystems or fisheries, and other types of environmental damage receive less attention or systematic analysis, even if anecdotal evidence suggests that this issue is not irrelevant.

Environmental costs are not paid by pesticide producers or by users. This implies that some current use of pesticides is beyond the point at which society as a whole actually benefits from their use.

Mexico is an active participant in the major international agreements concerning pesticides. It has signed the Stockholm and Rotterdam Conventions, although it is still in the process of ratifying the Stockholm Convention. Full compliance with the Conventions' current requirements is not considered a problem. But we believe that current agricultural policy in Mexico is an obstacle to any phase-out policy for new pesticides to be listed under the Stockholm Convention.

Mexican policy on pesticides has been to prohibit the most dangerous compounds,[1] while only requiring the provision of information for the rest. Despite prohibiting the 12 worst widely known pesticides, Mexico is not as advanced as other industrialized countries: pesticides banned elsewhere (e.g. paraquat, endosulfan, lindane, methyl bromide, parathion and malathion) are still authorized for use.

The problem with the authorization/prohibition policy tool is that it is too blunt. It does not allow dealing with targets that involve gradual shifts or phase-outs for pesticides that are authorized but still of concern. Moreover, there is a serious problem with policy coordination in Mexico. While agricultural policy seeks to increase production by providing subsidies for water, energy and agrochemicals, the Environmental and Resource Ministry has to address the ensuing problems of depleted aquifers and pesticide pollution. The situation with respect to pesticides is one of clearly distorting support measures: there is an exemption from the value added tax (which is 15% on all goods except medicine and food) and a system of matching grants under which selected participants pay nearly 30% less than the market price.

The case for an environmental tax

Decoupling environmentally harmful subsidies and fiscal exemptions for pesticides requires substituting direct support policies for them. Providing grants in cash instead of reducing prices would allow economic signals of the cost (private and social) of pesticides to guide farmers' decisions; at the same time real incomes would not be reduced.

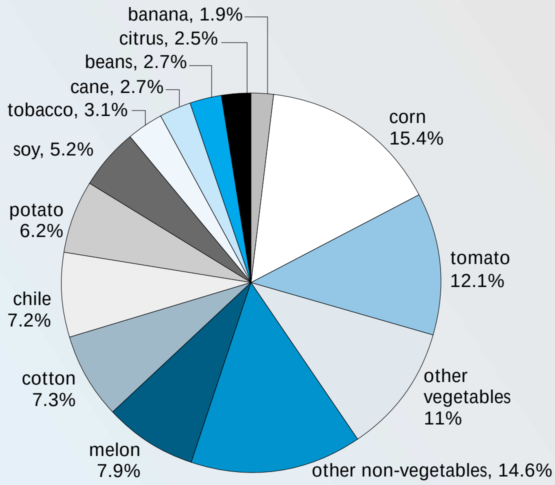
Even better, an environmental tax on pesticides (based on toxicity levels) would change the relative prices of the most problematic pesticides. This would induce a change towards the more environment-friendly products and practices, and towards a more efficient application of the more environmentally harmful options.

In the last two decades economic instruments have been widely acknowledged to be a useful but under-utilized tool for achieving environmental goals. At the same time, environmental policy has been straining to prevent environmental damage instead of repairing it. The real connection between these two ideas has not yet been made. Mexico relies heavily on command and control policies. It is argued by environmentalists (supporting government officials and industry lobbies) that these policies provide greater certainty of environmental outcomes and are less expensive for complying firms. Nevertheless, we strongly believe that the flexibility and efficiency of economic instruments in middle-income countries like Mexico should not be underestimated. In the case of pesticides, this means acting in the grey area where the case for prohibiting substances is not strong but doing nothing is not desirable either.

Among Organisation for Economic Cooperation and Development (OECD) countries, Denmark, Sweden, France and Norway have successfully introduced a levy on pesticides where there is some degree of differentiation according to toxicity. Arie Oskam (1997) summarizes (using three basic points) the main lessons from the international experience concerning how to design a successful levy on pesticides:

1. Levies should be set according to the health or environmental damage pesticides cause. The most hazardous substances should be subject to the highest tax rate. If possible, taxes should be set with reference to the economic value of the marginal externality (social) cost.
2. The levy should have adequate means of collection and be fraud-proof. The main effect of substitution will be lost if more toxic substances are taxed less.
3. Reimbursing revenues from the levy to farmers in a neutral way increases the measure's political acceptability, but this must be done using a mechanism with low transaction costs.

Figure 1
Pesticide market according to main crops treated (1992 data)



Source: Asociación Mexicana de la Industria de Plaguicidas y Fertilizantes, November 1993

Table 1
Types of pesticides and scenarios for environmental taxes

WHO classification of pesticides	Share of sales in Mexico 2003 (%)	Environmental tax (%) Option 1	Option 2	Option 3
WHO Ia-Ib (highest toxicity)	17	15	15	10
WHO II (high toxicity)	44	15	10	0
WHO III (medium toxicity)	21	15	5	0
WHO IV (low toxicity)	18	15	0	0
Total	100			

Source: Survey on local sales of pesticides, Instituto Nacional de Ecología, 2003

Scenarios for Mexico

If environmental taxes are to be differentiated according to potential damage, we need an objective and robust way to classify pesticides according to their toxicity. For the creation of scenarios we chose as our classification system the one used by the World Health Organization (WHO). This system looks mainly at human health. Although the ranking would hold for most mammalian species, it is not necessarily correlated with other indicators of interest such as aquifer pollution or damage to birds, fish and beneficial insects.[2] The advantage of this system is that it is widely known and has a strong appeal to a broad constituency. Of course, the main disadvantage of using a single indicator is that it considers only one dimension of the problem at hand, whereas some pesticides that are relatively benign in one respect could be relatively hazardous in another.

The amount of the tax is another issue. There are as yet no studies that monetize the value of environmental damage caused by pesticides in Mexico. Total internalization of this cost through the tax cannot be achieved. Thus, we follow a simpler rule. Given that pesticides are exempt from the 15% VAT, we set the highest tax level at 15% and the lowest at 0%, allowing for the largest possible variation. Table 1 summarizes the three options analyzed. The first option is the equivalent of eliminating the VAT exemption. The main drawback of this option is that it does not discriminate among substances that are less or more harmful. Although it strongly reduces pesticide use, there is very little change in the shares of the types of pesticides used. The second option is a gradual reduction of the tax, leaving only the best pesticides (from an environmental point of view) exempt. With the third option, the worst pesticides are taxed at 10%, leaving the rest exempt.

The tax would be applicable to all manufacturers or importers of the basic pesticides. If mixes were prepared (to be placed on the market as different products), the environmental tax would not be applied twice.

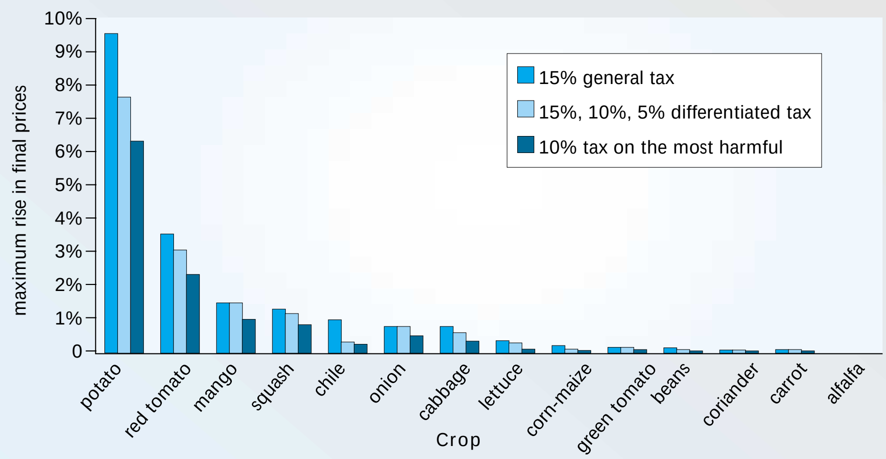
Costs to producers and consumers

Introducing an environmental tax on pesticides in Mexico would increase the costs to agricultural producers. Depending on elasticity of supply and demand, producers would pass on some of the increase to consumers. This section considers one of the extremes (i.e. when all costs are passed on to consumers) and estimates price increases for each tax option. The next section will demonstrate how different elasticities of demand would actually change patterns of pesticide use (one of the policy's stated objectives).

Table 2 shows production costs and net income for key crops in Mexico, selected because for their volume, such as corn (maize) and beans, or because of their importance as exports (e.g. tomatoes). Expenditure on pesticides varies widely (also see **Figure 1**).

Table 3 provides an upper bound for the price increases that would follow imposition of the environmental tax, where all cost increases due to the tax are passed on from growers to their buyers (also see **Figure 2**). As expected, the greatest price increases are for pesticide-intensive crops like potatoes and tomatoes. With the option of a full VAT on all pesticides, the price of potatoes would increase by nearly 10%. However, the effect on

Figure 2
Maximum rise in final prices due to a rise in pesticide costs (elasticity =0)



the prices of corn and beans, two of the basic foods consumed by lower income groups in Mexico, is less than half a percentage point.

The market for pesticides in Mexico is characterized by perfect competition. There are 163 registered firms. The nine largest accounted for 76% of total sales in 1999. The remainder are firms that import pesticides and combine them in different formulae for retail sale. It is important to note that the strategic behaviour of the large core firms could actually change these results.

The tax-changing patterns of consumption

The previous discussion assumed that the tax would just be passed on to the consumer, and that agricultural producers' decisions would not be modified at all. But the purpose of the environmental tax is not only to make polluters pay for damage caused, but also to induce changes in behaviour by forcing producers and consumers to assume the real costs.

The key concepts for determining how behaviour would be modified are the own-price elasticity and cross-price elasticity of demand. The former is the ratio of the percentage change in the quantity of a pesticide that consumers wish to acquire to the percentage change in the pesticide's price. Cross-price elasticity is similar, except that the change in price is that of competing pesticides.

The literature on demand for pesticides shows that in general the demand is inelastic. A 1% increase in price brings about less than a 1% decrease in the quantity demanded. Table 4 summarizes some of the empirical findings. The highest price elasticity recorded is -0.7 in the long term for herbicides in the United Kingdom. Most studies indicate a range of -0.2 to -0.5.

We have created three scenarios using elasticities that cover the ranges reported in the literature. The first has an elasticity of zero (no change), as in the case used to estimate the maximum price increase. The second has an elasticity of -0.7, near the high end of the spectrum of empirical studies. The third has an elasticity of -0.35, the middle point between the previous two.

Table 5 shows the revenues one would expect to be collected under each elasticity scenario, with two tax options: tax rates falling with toxicity, only the most toxic of the authorized pesticides being taxed at 10%.

Since the objective of an environmental tax is not to increase revenues *per se* but to stimulate behavioural change, the taxes collected can be used to minimize the impact on producers' profits. Likewise, the fact that those funds are due to the internalization of negative externalities with respect to the health of neighbours and ecosystems would support the argument that they must be used to compensate for damage, pay for restoration or invest in other health-enhancing policies. The public policy suggestion would be to allocate these new resources so as to maximize political support for this measure.

Table 2
Average input cost and profits (selected crops)

Crop	Production costs per hectare (US$ per year*)	Costs of pesticides per hectare (US$ per year*)	Net income per hectare (US$ per year*)	Costs of pesticides (% of total costs)	Costs of pesticides (% of net income)
Green tomato	2266	52	6820	2.3	0.8
Potato	2535	995	4681	39.3	21.3
Chile	684	47	3808	6.8	1.2
Onion	1177	66	3268	5.6	2.0
Carrot	436	4	3110	0.8	0.1
Mango	3039	295	2932	9.7	10.1
Cabbage	653	35	2178	5.3	1.6
Lettuce	514	15	2062	2.9	0.7
Squash	1300	112	2024	8.6	5.5
Red tomato	3476	685	1604	19.7	42.7
Coriander	351	4	1194	1.0	0.3
Alfalfa	782	0	299	0.0	0.0
Beans	420	5	227	1.2	2.2
Corn (maize)	454	11	147	2.4	7.3

*All data provided are for the 2002-2003 season (spring-summer or perennial)

Source: National Survey of Pesticide Use in Agriculture 2003, Instituto Nacional de Ecología

Cross-price elasticities

The issue of cross-price elasticities is a difficult one. From the point of view of economic theory, the price of close substitutes (such as two types of pesticides) would certainly influence the demand for each of them. However, we could find no empirical study that actually estimated this. Thus, to create a realistic scenario we assume cross-price elasticity between categories of pesticides is 1 (i.e. a 1% increase in the price of a pesticide would increase demand for those in a different toxicological category by 1%.) The closer the substances are in terms of their effect on pests, the higher this number would actually be. In a sense, assuming an elasticity of 1 provides us with a lower bound for the expected results.

The scenario under which we would observe more significant changes in the demand for pesticides is that of setting the environmental tax according to toxicity (15-10-5-0%), where own-price elasticity is high (-0.7) and there is a cross-price elasticity of 1.0. Table 6 shows how the market share would shift from the status quo to this last scenario. It can be observed that it does indeed create a gradual shift away from the more toxic pesticides towards more environmentally friendly options. This is not as drastic a change as would be induced by a prohibition, but it would be a strong move to prepare producers for an eventual ban, and probably a combination closer to the social optimum where all the external costs of pesticides are internalized.

Table 3
Maximum price increases for selected crops following imposition of an environmental tax

Crop	% increase in farm gate prices		
	Option 1: 15% tax on all pesticides	Option 2: 15-10-5-0%	Option 3: 10% tax on group with highest toxicity
Potato	9.7	7.8	6.5
Red tomato	3.7	3.2	2.5
Mango	1.6	1.6	1.1
Squash	1.4	1.2	1.0
Chile	1.1	0.4	0.4
Onion	0.9	0.8	0.6
Cabbage	0.8	0.7	0.5
Lettuce	0.5	0.4	0.2
Corn (maize)	0.4	0.2	0.2
Green tomato	0.2	0.2	0.2
Coriander	0.2	0.1	0.1
Beans	0.2	0.1	0.1
Carrot	0.1	0.0	0.0
Alfalfa	0.0	0.0	0.0

Conclusions

The most important conclusions to be drawn are:

1. When policies are developed to reduce the use of harmful substances, standards set in international agreements have an important influence on decision-makers in terms of the tools to be used and the criteria for applying them.

2. The most efficient way to comply with international agreements, and to eliminate from the market several substances whose use is dangerous, is to create economic incentives so that these substances gradually disappear. If the price of the most harmful pesticides increases, the market will gradually shift to less damaging practices at the minimum possible cost.

3. The literature considers a low elasticity of pesticide demand. This means that it is more likely that the chemical industry will not lose revenues; instead, the farmer or the final consumer will absorb the impact of a price increase. It also means that revenues would be relatively high, as farming practices will not change (at least in the short term). These revenues need to be used to compensate for damages, pay for restoration or invest in other health-enhancing policies.

4. When the most important agricultural

Table 4
Estimates of own-price elasticities of pesticide demand

Study	Country	Estimated elasticity	% change in demand as response to 15% price increase	Remarks
Oskam (1992)	Netherlands	-0.1 (mixed farms) -0.5 (specialized farms)	1.5-7.5	Medium-term
Oskam (1997)	European Union	-0.2 to -0.5	3-7.5	Review of several studies
DHV and LUW (1991)	Netherlands	-0.2 (arable farms) -0.3 (horticulture)	3.5-4.5	Short-term
Oude Lansink and Peerlings (1995)	Netherlands	-0.5 -0.7 (with CAP reform)	7.5-10.5	1970-92
Russell (1995)	UK	-1.1	16.5	For cereal only; 1989-93
Falconer (1997)	UK	-0.3	4.5	Using linear programming model
ECOTEC (1997)	UK	-0.5 to -0.7	7.5-10.5	Herbicides; long-term; cereal crops
Dubgaard (1987)	Denmark	-0.3	4.5	Using threshold model
Dubgaard (1991)	Denmark	-0.7 to -0.8	10.5-12	Long-term; 1971-85
Rude (1992)	Denmark	-0.2 to -0.3	3-4.5	Only herbicides
Schulze (1983)	Germany	-0.5	7.5	Only fungicides
Johnsson (1991)	Sweden	-0.3 (insecticides) -0.4 (fungicides)	4.5-6	Based on field experiments
Gren (1994)	Sweden	-0.4 (fungicides) -0.5 (insecticides) 0.9 (herbicides)	6-13.5	Econometric model
SEPA (1997)	Sweden	-0.2 to -0.4	3-6	Review of studies
Rude	Norway	-0.2 to -0.3	3-4.5	
Carpentier (1994)	France	-0.3	4.5	Arable farms
Papanagiotou (1995)	Greece	-0.28	4.2	

Source: Hoevenagel, et al. (1999)

Table 5
Estimated revenues generated by an environmental tax on pesticides
(US$ million)

Own price elasticity	Tax option 1 15-10-5-0%	Tax option 2 10-0-0-0%
0	132.7	25.0
-0.35	127.9	23.7
-0.70	123.1	22.4

Table 6
Estimated revenues generated by an environmental tax on pesticides

WHO classification of pesticides	Share of sales in Mexico: Status quo 2003(%)	Tax option 1 (%) 15-10-5-0%
WHO Ia-Ib (highest toxicity)	17	11
WHO II (high toxicity)	44	30
WHO III (medium toxicity)	21	28
WHO IV (low toxicity)	18	30
TOTAL	100	100

crops marketed in Mexico are considered, the most radical scenario is a 15% VAT on all pesticides. In this case, the highest impact is a 9.7% rise in the price of potatoes, followed by tomatoes with a 3.7% rise in the worst case. This article considers the case in which the agrochemical industry and the farmer pass the impact on to the final consumer by increasing the price of final goods.

5. If a differential tax were imposed, the tax on potatoes would increase by 7.8% while the price of other crops would increase by less than half a percentage point. This scenario allows the farmer to shift to less harmful pesticides; the impact on farmers' revenues appears not to be significant. The third scenario considers a 10% tax on the most harmful pesticides. Tomatoes would be subject to a 6.5% increase in the final price, potatoes to 2.5% and the rest of crops a 1.1% or less increase.

6. Although large quantities of pesticide are used on crops such as corn (maize), the impact on individual farmers does not appear to be important. In the case of corn, the highest impact is a 0.4% rise in the final price. The other basic food consumed by lower-income groups in Mexico, beans, would be subject to less than half a percentage if there were a 15% tax on all pesticides.

7. The design of the instrument is meant to be complemented by the introduction of additional measures to enhance environmental effectiveness. These additional measures could include education, investment in alternative technologies, research and best practice management.

8. It is recommended that revenues be used to finance the additional measures mentioned, and to achieve acceptability at the political and social level.

Notes

1. There are some exceptions in the prohibitions. For example, only the Health Ministry can use DDT and then only in the case of an outbreak of malaria.

2. The report *Design of a Tax or Charge Scheme for Pesticides* (see References) make a comparison between various pesticide rankings according to toxicity to different elements of biodiversity. It shows a positive, but not perfect correlation.

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The Africa Stockpiles Programme: cleaning up obsolete pesticides; contributing to a healthier future

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An innovative, on-the-ground initiative is nearing operational launch in Africa, following nearly four years of preparations. The Africa Stockpiles Programme (ASP) is a multi-stakeholder partnership involving African countries, international agencies, non-governmental organizations, the private sector through CropLife International (CLI), and regional bodies. ASP's goal is ambitious: to clean up and dispose of existing pesticide stockpiles throughout Africa within the next ten to 15 years, and to help prevent future accumulations, at a total cost of US$ 250-300 million. Thanks to Global Environment Facility (GEF) foundational support of $25 million, and co-financing from donor governments, over $50 million has been raised for the first phase of activities in 15 countries. Close to another $20 million, however, is still required for phase 1 work and phase 2 planning.

What is the problem?

Stockpiles of obsolete pesticides have been identified throughout the African continent, many in rotting, rusting containers or bags that were stored or discarded up to 40 years ago. Some of the stockpiles contain extremely toxic pesticides including persistent organic pollutants (POPs), which are banned internationally by the Stockholm POPs Convention. As these chemicals spill and leach from their containers, they threaten rural and urban populations and contribute to land, air and water degradation. Contamination of soil, air and water affects some of the poorest, most ill-fated communities across the continent. Many governments are aware of the dangers but lack sufficient funding and technical capacity to address this ever-worsening problem.

Even in industrialized countries the regulation and management of pesticides is often inadequate. But in developing countries the lack of adequate resources for education, control and enforcement have translated into a far more precarious situation. In Africa alone, the buildup of obsolete pesticides has reached over 50,000 tonnes and has contaminated tens of thousands of tonnes of soil.

What caused it?

The factors behind this accumulation include:

- poor import controls;
- inappropriate procurement and central purchasing policies;
- untimely distribution;
- inadequate stock management;
- aggressive sales practices;
- pressure to stockpile for unforeseen emergencies;
- lack of coordination between donor agencies;
- receipt of products that are outdated or mislabelled (or labelled in the wrong language).

Despite the committed efforts of the Food and Agriculture Organization (FAO) and others over the last decade to address the pesticide stockpiles problem, these obsolete chemicals continue to accumulate more quickly than they are being removed. The clean-up of old pesticide stocks has rarely been perceived as a priority development issue, despite their health and environmental consequences and their disproportionate impact on the poor.


Pesticide barrels (PAN-UK)

How does the ASP solve the problem?

At the national level, the ASP will contribute to national development and country assistance strategies in the areas of public health improvement, poverty alleviation, environmental protection and the strengthening of the agricultural sector. At the global level, ASP will contribute to international efforts to eliminate POPs, improve the management of toxic chemicals and promote integrated pest management. Clean-up and disposal activities will be a direct implementation of the Stockholm POPs Convention and the associated GEF operational programme aiming to reduce the impacts of POPs on the global food chain, transboundary waters, soil and biodiversity. The ASP will also contribute to the objectives of other international agreements such as the Rotterdam, Basel, Biological Diversity and Bamako Conventions, as well as the Montreal Protocol.[1]

How did the ASP come about?

The idea of an Africa-wide stockpile clean-up project started to take shape during informal discussions at the final negotiating session of the Stockholm POPs Convention in Johannesburg, South Africa, in December 2000. The initial participants included WWF, the Pesticide Action Network (PAN)-UK, CropLife International (CLI), the World Bank, the Food and Agriculture Organization of the United Nations (FAO), UNEP, the Secretariat for the Basel Convention, and the UN Industrial Development Organization (UNIDO). Expanded participation in subsequent planning has included the African Union, the Economic Commission for Africa, the New Partnership for African Development (NEPAD), PAN-Africa, the UN Institute for Training and Research (UNITAR) and the World Health Organization (WHO).

How will the ASP be executed?

The clean-up, disposal and prevention work will be done in conjunction with existing efforts related to the prevention and disposal of obsolete pesticides. Such an ambitious plan of action would only be possible with the active engagement of multiple partner organizations. NEPAD, for example, has identified the ASP as one of its highest priority initiatives, uniting Africans in finding common solutions to shared problems. At another level, CropLife International is participating as both donor and technical advisor, having committed several million dollars for disposal operations (in phase 1) and in in-kind contributions of technical assistance to countries for inventory, safeguarding, transport and destruction aspects of the programme.

ASP implementation and institutional arrangements draw heavily on cooperation among the partners, their *continued on page 38* ☞

☞ *continued from page 37*

comparative advantages, and historical involvement in developing the programme. Three entities will provide overall guidance for programme implementation:

◆ The *ASP Conference*, which will meet annually, is open to all ASP stakeholders. It will work by consensus in providing recommendations on overall direction;

◆ The *ASP Steering Committee*, comprising a 10 to15-member subset of the partners, will more regularly review and guide ASP progress;

◆ *Project Management Units* will be the principal implementers of the individual country programmes, hosted by the government agencies serving as the country-specific implementing agencies and guided by the national steering committees.

Institutionally, three global components have been created to provide coordination, oversight and technical support:

◆ The *Project Coordination Unit*, initially hosted by the World Bank and later to be transferred to an African regional development agency, will serve as the secretariat for the entire ASP. It will play a key role in organizing meetings, fundraising, monitoring and evaluation. This unit will also help ensure that contributions from individual countries and global components are focused on country needs and are in line with best technical and fiduciary approaches, as agreed by the partners.

◆ The *Technical Support Unit*, hosted by FAO, will coordinate delivery of technical services to countries for preparation, design, implementation, supervision and monitoring of country level activities. These will include, for example, technical guidelines for clean-up operations, assistance in managing procurement and supervision of specialized contractors, health and safety procedures, and assessment of laboratory capacities. FAO will play a lead oversight role in the transport of wastes from Africa and their disposal in EU-regulated European incinerators. CLI will manage complementary activities, focused primarily on technical assistance for safeguarding and disposal of wastes.

◆ The *Cross Cutting Activities Management Entity* will tackle issues that cross borders or that concern multiple countries, such as selecting appropriate stockpile disposal or safeguarding technologies; hosting the online information management system; coordinating communications activities in tandem with the World Bank; overseeing NGO/civil society awareness raising and capacity-building; and facilitating ASP relations with relevant international agreements such as the Stockholm POPs Convention.

Which countries will participate?

All the African countries that have ratified the Stockholm Convention will be eligible to take part in the ASP. Countries participating in the first phase of clean-up and prevention activities are Ethiopia, Mali, Morocco, South Africa, Tanzania and Tunisia. Nigeria will carry out prevention work and preparations for disposal. Inventory estimates indicate that there are about 10,000 tonnes of obsolete pesticides at more than 1400 sites in these countries.

Further preparatory operations and prevention activities are slated to begin in 2005-06 in additional countries to be selected based on their ratification of the Stockholm Convention, geographic distribution, pesticide stockpiles problems, commitment to ASP objectives and other factors. Preparations for clean-up work include a range of activities involving the training of personnel, detailed inventory of obsolete pesticide stocks, environmental risk assessment of pesticide storage sites, technical and financial planning, and emergency safeguarding (repackaging and securing) of any pesticide stocks that pose especially high risk to health or environment. Candidate countries for this follow-on phase include Benin, Botswana, Cameroon, Côte d'Ivoire, Egypt, Ghana, Lesotho, Mozambique, Rwanda and Senegal. Inventory estimates indicate that there are more than 4000 tonnes of obsolete pesticides at hundreds of sites in these countries.

Pesticide spraying of banana trees

How will ASP ensure that this problem doesn't reoccur?

Prevention activities and clean-up and disposal activities are considered by ASP partners to be of equal importance. To help prevent future accumulations of obsolete pesticides, ASP will engage in a range of activities including:

◆ *strengthening pesticide management* through improvement of pesticide registration, licensing, enforcement of import controls, stock management, waste management and formulation of effective procurement strategies;

◆ *promotion of alternatives* to chemical pesticides through improvement of pest control strategies, with particular attention to integrated pest management in agriculture and integrated vector management for public health. Prevention activities will also include the awareness and training of pesticide distributors, users and others to encourage safe pesticide handling and alternative pest control.

Who is funding the ASP?

The ASP has secured more than US$51 million to date to carry out clean-up and prevention operations in phase 1 countries. Twenty-five million dollars is coming from the new POPs focal area of the GEF. Additional funding comes from donor governments including Belgium, Canada, Denmark, Finland, France, Japan and Switzerland, as well as from the European Union and the World Bank's Development Grant Facility. CLI and other partners are also providing direct funding and/or in-kind contributions.

The Africa Stockpiles Programme brings together the skills, expertise and resources of a diverse group of stakeholders, enabling national leadership to carry out country-led activities. This exciting, path-breaking initiative offers real solutions to a difficult problem. By reducing and removing longstanding toxic threats throughout Africa, the ASP promotes improved public health, poverty reduction and environmental safety – critical elements of sustainable development.

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1. Stockholm Convention on Persistent Organic Pollutants (2001); the Rotterdam Convention on the Prior Informed Consent Procedures for Certain Hazardous Chemicals and Pesticides in International Trade (1998); the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal (1989); the Bamako Convention on the Ban of the Import into Africa and the Control of Transboundary Movement and Management of Wastes within Africa (1991); the Montreal Protocol on Substances that Deplete the Ozone Layer (1987); the Convention on Biological Diversity (1992).