RESOLVING THE DDT DILEMMA:

Protecting Biodiversity *and* Human Health

EXECUTIVE SUMMARY

For decades, DDT has played a major role in global efforts to combat malaria and other vector-borne diseases. It was employed with striking early success against malaria. Nonetheless, malaria continues to be a global menace – approximately 2.5 billion people in over 90 countries are currently at risk of contracting the disease. It is a leading cause of illness and death in the developing world, contributing to approximately 3 million deaths and up to 500 million acute clinical cases every year. Most deaths occur in sub-Saharan Africa and over half are children under five years old – malaria kills four children per minute or 5,000 per day.

Worsening drug and insecticide resistance; wars, natural disasters and human migrations that interrupt control operations; local climate changes; and heightened risk associated with the economic exploitation of remote areas for mining, forestry or irrigated agriculture have contributed to the resurgence in malaria. Control programs have languished as a result of diminished interest in malaria by the international community and budget cuts required by international lenders to address structural and debt problems in the economies of developing countries. Flawed decentralization strategies also have hampered the effectiveness of control programs in various countries.

Today, DDT's only official use, as specified by the World Health Organization (WHO), is for the control of disease vectors in indoor house spraying. However, other (illegal) uses are suspected. It is manufactured in approximately half a dozen countries with global production estimated in 1995 at about 30,000 metric tonnes per year. DDT use has declined for a combination of reasons, including growing insecticide resistance, documented evidence of environmental damage, concern about contamination of foodstuffs, and suspicions about hazards to human health. Nonetheless, because DDT is regarded as relatively inexpensive and less acutely hazardous to human health than other pesticides, tropical disease specialists are reluctant to part with a tool still considered to be effective.

What has not been factored into the equation is the unacceptably high hazard DDT poses to global biodiversity and human health, especially since reasonable alternatives exist.

And as mass balance modeling indicates, contrary to general assumptions, indoor house spraying of DDT puts DDT into the environment and contributes to the build-up of DDT in the bodies of residents whose homes are sprayed. In recent years, evidence has grown that elevated concentrations of DDE, a breakdown product of DDT, are associated with reduced lactation by human mothers and in many areas where DDT is still used, measured concentrations exceed health guidelines. Links exist between DDT and reproductive and immunotoxic effects in wildlife due to the chemicals' disruption of sex hormones and other chemical messenger systems in these organisms. However, pesticides widely being introduced to replace DDT, particularly various synthetic pyrethroids, also have been associated with disruption of the endocrine system and adverse reproductive, developmental, immunological, neurological and behavioural outcomes.

The dilemma is that both malaria and the chemicals used to control it pose a threat to human health. The chemicals used also threaten biodiversity. Clearly, there is no room for slippage in the fight against malaria. Neither is there desire to increase environmental contamination, especially as the true magnitude of the impacts on people and wildlife comes to light.

Fortunately, there are disease control programs that are safer both for people and for the environment that maintain or improve protection from the disease at acceptable cost, eliminate DDT, and reduce insecticide dependence. These employ Integrated Vector Management (IVM) principles, reducing

the use of, and reliance on, chemical pesticides and incorporating non-chemical vector management measures without adverse conservation impacts.

Resolving the DDT Dilemma examines the use of DDT, alternative vector control insecticides, and non-chemical vector management methods in public health programs; 2) provides current information on the non-target impacts of both DDT and other pesticides; 3) investigates householder and environmental exposure to DDT resulting from anti-malaria house spraying; 4) offers evidence that safer options are available through profiles of six projects from various regions; and 5) provides a framework and tool kit for moving along a spectrum away from pesticide-dependent malaria control toward "bio-reliant" non-chemical vector management techniques.

WWF's recommendations rest on seven premises, namely that 1) disturbing information about DDT hazards to both human health and global biodiversity has emerged since the WHO's last major assessment in 1993; 2) affordable alternatives to DDT are available now; 3) eliminating the use of DDT should be part of a broader program of reduced reliance on chemical pesticides; 4) synthetic pyrethroids offer benefits of low persistence and bioaccumulation relative to DDT, but they pose other known hazards and all possible hazards have not been sufficiently characterized; 5) even with aggressive research on vaccines and other non-pesticide-based disease control, malaria's wily nature makes it difficult to predict when other solutions might be created; 6) an integrated approach to disease management requires careful consideration of development and irrigation projects that could contribute to disease outbreaks; and 7) for integrated malaria programs to have any chance of success, targeted financial assistance in many countries is essential.

WWF offers its recommendations at a time of renewed global interest in managing malaria, although the nature and organizational form of the global response to the malaria challenge remains fluid. Summarily stated, *Resolving the DDT Dilemma* sets out four core recommendations:

Recommendation #1: DDT should be phased out of use and ultimately banned. Specifically, DDT production and use should be banned globally by no later than 2007 under the terms of the proposed global Persistent Organic Pollutants (POPs) treaty. In the interim, DDT should be characterized by the WHO and international assistance agencies as a pesticide of last resort, used only when no other vector control methods (including other pesticides) are available or likely to be effective;

Recommendation #2: Targeted programs promoting Integrated Vector Management (IVM) and Integrated Disease Management (IDM), which emphasize reduced reliance on pesticides and better environmental protection, should be developed by the WHO, World Bank, United Nations Environment Program (UNEP) and other multilateral and bilateral assistance agencies, in collaboration with national health authorities. To implement these, a) each nation should have in place by 2000 a plan to implement the WHO's 1992 Global Strategy for Malaria that contains effective pesticide reduction measures, including elimination of DDT; b) special emphasis should be placed on eliminating the use of, and reliance on, pesticides and special care should be exercised in the deployment of pesticides in and around conservation areas, agricultural areas, and the habitat of vulnerable species; c) extreme caution should be taken to avoid adverse impacts on ecosystems and biodiversity; and d) strong community participation and methods to prevent illegal use of DDT for non-public health uses must be components of IVM plans.

Recommendation #3: Adequate financial and technical resources must be earmarked toward operationalizing IVM that reduces reliance on and use of chemical pesticides.

Recommendation #4: Pesticide manufacturers and public agencies should conduct collaborative research to analyze the possible hazards from chronic human exposure to synthetic pyrethroids used to spray residences and impregnate bednets.

Reliance on DDT can be dramatically reduced, and eliminated by 2007, provided there is concerted government and private sector action to achieve this goal. The international POPs treaty that will be negotiated during 1998-2000 is an essential step to help accelerate this process, but major commitments by other key decision-makers also are necessary to accomplish this objective. Since phasing out DDT requires a collaborative process, WWF directs its recommendations widely – at the negotiators of the global POPs treaty, officials in multilateral organizations, bilateral assistance agencies, national governments, the private sector, and the scientific research community.

Resolving the DDT Dilemma: Protecting Human Health and Biodiversity
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