PAN Germany
Pestizid Aktions-Netzwerk e.V.

Published in cooperation with PAN Africa and PAN North America




DDT and the Stockholm Convention

States on the edge of non-compliance



A healthy world for all.
Protect humanity and the enviroment from pesticides. Promote alternatives.

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Summary

It is the objective of the Stockholm Convention to protect human health and the environment from persistent organic pollutants. To meet this objective these pollutants must be eliminated at a global level. One such persistent pollutant is the insecticide DDT which is still used in the fight against malaria. The use of DDT is linked with a whole range of undesired side effects such as hormone-like effects, the development of tumours, and the disturbance of reproduction.

As of 8 April 2009, 163 contracting states (Parties) have so far ratified the Stockholm Convention, and in doing so have made a legally binding promise to comply with the Convention and thus with the elimination of DDT.

Each regulation needs some time to be put into practice. However, almost half a decade has now passed since the Stockholm Convention entered into force. Its implementation – and with it also the gradual elimination of DDT – should be perceptible.

Hence, this study aims to answer the following two questions:

1. Do all countries and/or players and financiers of malaria control programmes comply with the requirements of the legally binding Stockholm Convention?
2. How should the process towards the global elimination of DDT be evaluated within the remit of the Stockholm Convention?

The study shows that many players and financiers of malaria control programmes do not comply with the requirements of the Stockholm Convention:

Many African countries are still using the insecticide DDT against mosquitoes, with more again considering its use.

Five Parties (four from Africa plus North Korea) are in clear violation of the requirements of the Convention by not informing the Secretariat of the Stockholm Convention of their use of DDT. While over the last few years other states have informed the Secretariat, albeit not in timely manner.

When funding malaria control programmes important donors by and large orientate themselves towards chemical solutions, and in doing so follow the recommendations of the World Health Organization (WHO). The WHO, though, supports the use of DDT under certain conditions.

Over time, the continued use of DDT and the active promotion of DDT use is increasingly in contravention of the spirit and wording of the Convention. That is why countries and financial backers that do not actively support the phase-out of DDT move on the edge of non-compliance. This is particularly true for the following protagonists of the Stockholm Convention

- contracting states Botswana, Ethiopia, India, Madagascar, Malawi, the Marshall Islands, Mauritius, Morocco, Mozambique, Myanmar, Senegal, South Africa, Swaziland, Uganda, and Yemen, all of which continue to use DDT without demonstrating sufficient efforts to move towards alternatives to DDT for malaria control or consider to use DDT in the near future;
- the World Health Organization (WHO) which supports DDT use and provides guidelines for its appropriate use without having adequate monitoring capacity to ensure these guidelines are followed when DDT is used in National Malaria Control Programs;

- funders of malaria control programmes like The Global Fund to Fight AIDS, Tuberculosis, and Malaria (GFATM), and USA both finance DDT use, citing WHO guidelines as a justification. Yet, the USA is not a Party of the Stockholm Convention.

Put simply: The process towards the global elimination of DDT is virtually a non-event for many stakeholders. For this reason it can be considered to be deeply flawed. However there are signs of improvement. China, a large producer and user of DDT has announced to stop the production and use of DDT for malaria control programs and the production of dicofol.

All donor nations that are Parties to the Stockholm Convention play a special role in this scenario. In ratifying the Stockholm Convention these countries also accepted a role of responsibility in the global elimination of DDT. Even if a donor country does not actively promote the use of DDT, it can end up co-financing DDT use through its financial participation in the Global Fund to Fight AIDS, Tuberculosis and Malaria. This also results in the risk of new obsolete stocks of DDT being created. At the same time, funds from donor governments are spent on the elimination of DDT wastes. This global problem can only be solved if donor countries ensures that no funds are allocated to programmes that sanction the use of DDT. This also applies to the activities of the Global Fund. In particular, we recommend that donor nations

- guarantee that none of their citizens' tax money is spent on DDT use via bi/multilateral funds,
- encourage the Global Environment Facility (GEF) to strengthen projects on non-chemical approaches to malaria prevention,
- continue to actively support partner countries in the elimination of obsolete stocks of DDT,
- assist partner countries transparently and purposefully with a view to emulating successes seen in several countries in implementing sustainable alternative methods of malaria control so that the partner countries stop using DDT as soon as possible,
- promote an increasing commitment on the part of the EU towards the elimination of DDT,
- take a firm stand on the implementation of non-chemical methods of malaria control in international politics, e.g. during the up-coming 4th Conference of the Parties to the Stockholm Convention in Geneva in May 2009 so as to avoid the negative effects of alternative chemical methods.

An end to DDT production and usage would at once bring multiple advantages domestically for donor countries: First, donor country citizens would have increasingly less exposure to the insecticide DDT as it spreads globally from its area of application and second, donor country governments would not have to use tax money to eliminate new obsolete stocks.

From 4 – 8 May 2009 the 4th Conference of the Parties to the Stockholm Convention will be held in Geneva. This Conference will show whether Germany and the Parties to the Stockholm Convention are simply disregarding the spirit and wording of this international set of regulations or finally taking concrete and effective action to protect humans and the environment against the hazardous and persistent pollutant that is DDT.

1 Introduction and questions

Since the United Nations Conference on Environment and Development in Rio de Janeiro in 1992 environmental protection is recognised as a globally significant duty. Agenda 21, unanimously adopted in Rio, correspondingly stipulates a reduction in the risks resulting from the use of hazardous chemicals. In this spirit the community of states adopted the Stockholm Convention on Persistent Organic Pollutants in 2001. This agreement has so far been ratified by 163 states, and aims at eliminating persistent and toxic chemicals worldwide. The initial list of persistent organic pollutants subject to the Stockholm Convention comprises twelve chemicals. Among these "dirty dozen" are nine pesticides; one of them is the insecticide DDT.

The first decisive warning against DDT use was issued in 1962. Rachel Carson, USA, pointed out the unacceptable effects of DDT in her book 'Silent Spring'. Almost half a century later it is supposed to become concrete: In May 2009 the Conference of the Parties to the Stockholm Convention wants to set up a work programme to promote a global partnership for developing alternatives to DDT. The structuring of this work programme, the promise of financial resources to fund the work programme on the elimination of DDT, and the implementation of the programme will decide on whether the Stockholm Convention, an internationally binding set of regulations, becomes a mere paper tiger, or whether the Parties to the Convention will live up to their promise to eliminate DDT in the foreseeable future.

After tough negotiations DDT was recognised as a special case in the wording of the Convention. It may be used under specified conditions in the fight against malaria if no alternatives are available which are locally safe, effective and affordable. However, the goal of global elimination still applies to DDT. Both the spirit and the wording of the Convention are clear. Regarding DDT, it specifically says in the Convention: "With the goal of reducing and ultimately eliminating the use of DDT, the Conference of the Parties shall encourage …". Thus the use of DDT should have declined since the Convention entered into force. This has not been the case. Between 2003 and 2007 the use of DDT in Africa, measured according to the amount of active ingredient, increased annually by six per cent.[1] Many African states use DDT, with more planning to use the insecticide in 2009.

This leads to two questions:

1. Do all countries and/or protagonists and financiers of malaria control programmes comply with the requirements of the legally binding Stockholm Convention?
2. How should the process towards the global elimination of DDT be evaluated?

This publication evaluates the implementation of the Stockholm Convention regarding the elimination of DDT by answering those two questions.

[1] According to a Dalberg PowerPoint presentation of the 'Interim report on the development and deployment of alternatives to DDT for disease vector control' at the 'Stakeholder Meeting to Review the Draft Business Plan to Promote a Global Partnership for Developing Alternatives to DDT' on 3 November 2008 in Geneva.

Methodology

The study is based, amongst other things, on publicly accessible data from the Secretariat of the Stockholm Convention, the World Health Organization, the Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM), the US President's Malaria Initiative (PMI), the Global Environment Facility (GEF), and the Pesticide Action-Network (PAN). Further information stems from oral and written communication with malaria experts from different governments, from industry, from science and from civil society organisations which took place between August 2008 and January 2009. Presentations and talks at the stakeholder meeting on the "Global Partnership for Developing Alternatives to DDT for Disease Vector Control" were a very important source of information. The meeting was held in Geneva from 3 to 5 November 2008 at the invitation of the Secretariat of the Stockholm Convention.[2] Participating in the talks were representatives from governments (e. g. from China, Germany, India, Mosambique, the USA and Zimbabwe), industry (from Germany, and Switzerland), science (from the Netherlands, Switzerland, and the USA) and non-governmental organisations (from Germany, Kenya, and Mexico). In addition, further information from the government of Tanzania has been included as well as from non-governmental organisations from the Gambia, Uganda and the USA. This study also contains information taken from speeches and talks at the Symposium of the German Federal Ministry for Economic Cooperation (BMZ) on the problems of chemical management in emerging economies including speeches and talks from representatives from the governments of Tanzania and Vietnam. The symposium was held on 16 December 2008 in Bonn.[3]

2 DDT – a multi-regulated problem chemical[4]

DDT (dichlorodiphenyltrichloroethane) is a stable organic chlorine compound. Its half-life is 10 to 20 years. DDT is spread worldwide by mainly airborne means (experts speak of a "global distillation"), and concentrates in the cold of Arctic regions and high mountains. It accumulates in the fatty tissues of humans and animals through the food chain. The Inuit living in the cold North are among those people with the highest burden of industrial chemicals and persistent pesticides such as DDT. Current studies in Mexico and South Africa show that people whose houses were sprayed with DDT to fight malaria show significantly higher levels of the insecticide than those in comparison groups.[5]

DDT has a low acute toxicity. However, the long-term effects are alarming. In long-term studies rats, mice, and hamsters get tumours in liver, lung, and the lymphatic system. Hormone-like characteristics are also known. DDT can act like an oestrogen (similar to the female sex hormone 17ß-oestradiol) or as an anti-androgen via the degradation product DDE (dichlorodiphenylethane).

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2 See http://chm.pops.int/Programmes/DDT/Meetings/BusinessPlan/tabid/418/mctl/ViewDetails/EventModID/1421/EventID/36/xmid/1682/language/en-US/Default.aspx

3 http://www.chemicalmanagement.org

4 See one web site from the FAO (http://www.inchem.org/documents/jmpr/jmpmono/v00pr03.htm), one from the Stockholm Convention (http://chm.pops.int/Convention/12POPs/tabid/296/language/en-US/Default.aspx) and one from PANNA ((http://www.panna.org/docsPops/docsPops_030317.dv.html)

5 See The Global Status Report of DDT (see also chapter 5)

In animal tests female mice and rats present a heavier uterus and a disturbed reproduction cycle. Tests with male rodents lead to a later onset of puberty, smaller prostates and less sperms. The consequences of high DDT contamination became known in the 1960s. Birds of prey showed a disturbed breeding behaviour, many of them were unable to reproduce. For example, a lot of times their egg shells were so thin that they cracked in the nests. Some of the birds affected were peregrine falcons, sparrow hawks, hawks, sea swallows, seagulls, and cormorants. At the beginning of the 1970s the peregrine falcon was almost extinct in the USA, Great Britain and Scandinavia. Male lesser black-backed gulls at the Great Lakes (USA) were found to have ovarian-like structures in their testicles.

A link between DDT and reduced numbers of sperms in humans has not been proven clearly and is difficult to prove. Monocausal evidence is also missing that this insecticide or its degradation products cause cancer in humans. However, the alleged harmlessness of DDT is cited inter alia by a number of the protagonists in the debate surrounding it as a justification for their demand to increase its future usage in the fight against malaria.

Nevertheless, there is a “but”: There is no risk assessment appropriate to today’s standards of the antiquated insecticide DDT. In the 1970s there was strong enough proof of the toxicity of DDT that led individual countries to restrict or ban its use. In 1995 49 states completely banned the use of DDT in agriculture as a result of findings in a publication by PAN International. 23 states strictly limited its use, while six other countries did not permit its use as an insecticide in agriculture.[6]

So for many years DDT has already been viewed critically in many countries. This also led to national and international regulations. The insecticide is strictly regulated in two Conventions of the United Nations.

In September 1998 the community of states agreed on the PIC Convention (Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides).[7] The Convention entered into force in February 2004. The core of the Rotterdam Convention is the defined procedure of prior informed consent in international trade relating to the chemicals of the Convention. This means that if a company from a country A wants to introduce a chemical in a country B, country A has to inform country B about it, and the import country can prohibit the import. To date, the Parties to the Convention have to comply with this procedure for 27 chemicals in total, including DDT.

In May 2001 the community of states agreed with the Stockholm Convention on Persistent Organic Pollutants (see chapter 3) regarding the elimination of DDT.

6 Pesticide Action Network (1995): Demise of the Dirty Dozen. San Francisco

7 http://www.pic.int

3 The Stockholm Convention on Persistent Organic Pollutants

Under the direction of the United Nations Environment Programme (UNEP) the international community of states drew up an agreement around the turn of the century which should free the world of persistent organic pollutants (POPs). This is the internationally used term and refers to pollutants which both show toxic properties and are also persistent and accumulate in the food chain. They are transported by air and water, and the migration of animals across international borders. This is why these pollutants get deposited far away from their place of release where they accumulate in ecosystems.

The agreement was signed on 22 May 2001 in Sweden as the Stockholm Convention on Persistent Organic Pollutants, abbreviated to the “POPs Convention”. The Convention entered into force in May 2004 as the 50th state ratified the Convention. This agreement is administered by the Secretariat of the Stockholm Convention, which has its seat in Geneva. As of 8 April 2009, 163 states have ratified the agreement.

With the Stockholm Convention the international community of states banned twelve POPs as a first step. Among the “dirty dozen” are nine pesticides and three groups of industrial chemicals: dioxins and furans created in combustion processes, and the polychlorinated biphenyls (PCBs) which for decades had been used worldwide in transformers as a coolant and an insulation. The nine pesticides are the eight insecticides aldrin, chlordane, DDT, dieldrin, endrin, heptachlor, mirex, and toxaphene, as well as hexachlorobenzene (HCB), which is, amongst other things, used as a fungicide.

All important decisions concerning the Convention are made by the Conference of the Parties – the COP. The next COP will take place in Geneva in May 2009. It will be the 4th Conference of the Parties. Here it has to be decided whether or not other persistent organic pollutants should be subject to the Convention, and if so which ones specifically (e.g. the insecticides chlordecone, and lindane). DDT will also be discussed at the 4th COP. On the one hand, a decision will once again be made regarding the specific exemptions for DDT (see chapter 3.1 and 3.3). On the other, an agreement on a programme to promote a global partnership for developing alternatives to DDT in the fight against malaria shall be reached (see chapter 7).

3.1 Exemptions of the Convention[8]

Chemicals characterised by the community of states as POPs according to the Stockholm Convention can still be produced, used, and released to some extent. The highly toxic dioxins and furans are the classic example. They are generated as unavoidable by-products during combustion processes. Since their development cannot be prevented the community of states put a minimisation requirement into the Convention.

However, there is a general ban on the use and production of the pesticides included in the Convention. Nevertheless the agreement allows for exemptions. Each specific exemption is

[8] The list of the exemptions can be found at http://chm.pops.int/Programmes/Exemptions/RegisterofSpecificExemptions/tabid/171/language/en-US/Default.aspx

limited to a period of five years and the Secretariat of the Stockholm Convention has to be notified of any exemption. The Secretariat lists the specific exemptions, but has no power of veto. Most of the exemptions concern the production and use of DDT as an insecticide (see chapter 3.2). Furthermore, China and India admitted to use DDT as intermediate for the production of the acaricide (miticide) dicofol. While China has announced its intention to stop producing dicofol from DDT starting in May 2009, India has applied for an extension of this specific exemption for another five years.[9]

3.2 The DDT Register[10]

The Convention stipulates that specific exemptions have to be listed in a special, publicly available Register maintained by the Secretariat. This formal rule applies to all Parties to the Convention. If Parties use DDT without notifying the Secretariat they are no longer acting according to the Convention. The specific exemptions listed for DDT in the Register concern three cases of production and 15 cases of application of the insecticide for disease vector control.

In the current DDT Register Ethiopia, China, and India acknowledge a wish to produce DDT. According to information from PAN Germany Ethiopia does not produce DDT itself, but rather its own formulations containing DDT. As of October 2008 the Global status report of DDT and its alternatives for use in vector control to prevent disease[11] (Global Status Report of DDT) from the Secretariat of the Stockholm Convention states that China, India, and North Korea are currently producing the insecticide (see chapter 5).

A total of 15 states are of the opinion that DDT is indispensible for their malaria control programmes. These are Botswana, China, Ethiopia, India, Madagascar, the Marshall Islands, Mauritius, Morocco, Mozambique, Myanmar, Senegal, South Africa, Swaziland, Uganda, and Yemen,. Additionally, India employs DDT in the fight against sand flies, the carriers of the parasites responsible for leishmaniasis.

3.3 Disclosure obligations

It is decided at the Conferences of the Parties (COP) to the Stockholm Convention whether or not the contracting states are allowed to continue to use DDT in malaria control programmes. At the 3rd COP, which was held in the Senegalese capital Dakar at the beginning of May in 2007, the Parties decided on the continued use. At the 4th COP in Geneva in May 2009 this will be discussed and decided upon again, as it will every two years at Conferences of the Parties to come until its ultimate elimination. These resolutions are prepared by a group of experts on DDT consisting of 17 members. This group is responsible for making recommendations. To base decision making on solid data, manufacturers and users of DDT have to make a report every three years on how and under which circumstances they produce and/or use DDT. The first report cycle ended on 16 May 2006, the second ends on 16 May 2009, the third will end on 16 May 2012

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[9] Further exemptions under the Stockholm Convention: Botswana did not want to forego the use of the termicide chlordane and Australia did not want to forego the use of the termicide mirex in 2004. At the time, China acknowledged a wish to use both substances. All four exemptions ended in May 2009. China announced that it would not be re-applying for these exemptions.

[10] The DDT Register can be found at http://chm.pops.int/Programmes/DDT/DDTRegister/tabid/389/language/en-US/Default.aspx

[11] See http://www.pops.int/documents/ddt/Global%20status%20of%20DDT%20SSC%2020Oct08.pdf

and so forth. The region “Western Europe and other states” is represented on the board by a member of the Public Health Agency of Canada and by a member of the German Technical Cooperation (GTZ) of the German Federal Ministry for Economic Cooperation (BMZ).

At the 3rd COP in Dakar the Parties also agreed on a more detailed questionnaire and a schedule for the evaluation of the questionnaires. Each Party can download the questionnaire from the webpage of the Stockholm Convention[12] . Before the end of June 2009 the Parties are to report in the questionnaire on how much DDT they produce, how much they export, how much they use themselves and under what conditions, and if they also use alternatives to DDT in their malaria control programmes. The DDT expert group of the Stockholm Convention will evaluate the information from the questionnaires and make a report before 31 December 2009. The report is supposed to be the basis for discussion for the next COP. Since no COP will take place in 2010, the report will not be discussed until the 5th COP in spring 2011.

3.4 Breaches of the Stockholm Convention

The four African Parties of Eritrea, Gambia, Namibia, and Zambia as well as North Korea do not comply with the provisions of the Stockholm Convention. They use DDT without having officially notified the Secretariat of the Convention. The Secretariat speaks of “non-compliance” to the Convention. The Convention does not contain a mechanism to guarantee compliance with the rules.

Other Parties notified the Secretariat about the use of DDT but only after the first application. These are Ethiopia, India, Mozambique, South Africa, Swaziland, and Uganda. This also does not correspond to the wording of the Convention. At the moment, at least four African countries – Cameroon, Madagascar, Malawi, Tanzania are considering the introduction of the insecticide to fight malaria. Cameroon is not a Party to the Convention.

4 DDT elimination and fighting malaria

As mentioned beforehand the specific exemptions for DDT primarily refer to malaria control. According to the World Malaria Report 2008[13] the World Health Organization (WHO) thinks that half of the global population (3.3bn people) is at risk of getting malaria. About 1.2bn people in Africa and South East Asia are particularly threatened.

According to the World Malaria Report 2008 there were 247m malaria cases worldwide and 881,000 fatalities resulting from it. Approx. 91 % of the almost 250m people suffering from malaria live in Africa. 85 % of all malaria deaths are of children under five years of age. The major infection regions lie in Ethiopia, Kenya, Congo, Nigeria, and Tanzania.

4.1 First successes against malaria

While the goal of eradicating malaria is often seen as an impossible one, there are many cases of successes in controlling malaria. Mexico is considered to be malaria-free as is Vietnam. In January 2007 the WHO classified the United Arab Emirates as ‘malaria-free’.

[12] http://chm.pops.int/Portals/0/Repository/COP3/UNEP-POPS-COP.3-SC-3-2.English.PDF

[13] See http://www.who.int/malaria/wmr2008/malaria2008.pdf

Africa shows encouraging results, too. The number of new infections and deaths is decreasing in many countries. In the World Malaria Report 2008 the WHO mentions in particular Eritrea, Rwanda, the island state Sao Tome and Principe, as well as the Tanzanian island Zanzibar. The number of deaths in these countries and on Zanzibar fell by 50 % through the combined approach using bed nets, indoor residual spraying, and effective treatment of malaria victims. While Eritrea is one of the countries using DDT, the success stories in Rwanda, Sao Tome and Principe and on the island of Zanzibar were achieved without resorting to the insecticide.

These countries and the island of Zanzibar are relatively small and/or located on the edges of high-infection regions. Management measures can be well coordinated in these places. However, there are also success stories from highly affected regions such as Congo, Ethiopia, Kenya, Nigeria, and Tanzania as well as in Mexico and in countries in Central America: The number of malaria cases in Kenya has declined as a result of the use of insecticide-treated bed nets, and the treatment of the malaria victims with artemisinin.

Precautionary measures are becoming increasingly important in African countries. Whereas only 3 % of the children in 18 African countries had access to insecticide-treated bed nets in 2001, this figure has risen to 23 % by 2006[14]. In these 18 countries 100 million people were protected through spraying in 2006, a four-fold increase compared to the 2001 figure. According to another investigation 18 % of all pregnant women in 16 African countries were treated against malaria as a precaution. This treatment results in a higher birth weight for the babies, and thus, probably a greater chance of survival.

Nevertheless, the WHO stresses that malaria still presents a challenge. Although 125 million bed nets have already been distributed in Africa, the actual number required is closer to 650 million bed nets.

4.2 The current DDT recommendations of the WHO

The WHO recommends only a few pesticides for malaria control programmes. These recommendations come from the WHO Pesticides Evaluation Scheme (WHOPES).[15] However, DDT was not risk evaluated by WHOPES.

The WHO recommends six insecticides from the pyrethroid group for insecticide-treated bed nets. To find out which insecticide is most appropriate for indoor residual spraying WHOPES compared the impact of six pyrethroids, three organophosphates, two carbamates, and the organiochlorine compound DDT in 2006. The result is that all of these insecticides are effective. But DDT stands out because it sticks to the walls and is effective for more than six months due to its high persistance.[16]

However, this is no carte blanche for DDT use: This insecticide may only be used if the recommendations of the WHO and the Stockholm Convention on Persistent Organic Pollutions are adhered to. The WHO makes the following stipulations: DDT may only be used by trained staff; it has to be ensured and reviewed that DDT is used in the right way; only inside walls may be sprayed; the disease vectors should not be resistant to DDT; DDT formulations have to be

[14] Sleeping under insecticide-treated bed nets is not hazard-free because both children and adults sleep below an „insecticidal cloud“. This has to do with the pyrethroids used in the bed nets slowly evaporating.

[15] See http://www.who.int/whopes/en/

[16] See http://www.who.int/whopes/Insecticides_IRS_Malaria_ok.pdf

produced according to the WHO specifications (e.g. they have to contain 75 % of the active ingredient).

According to the WHO adequate set of rules and monitoring systems are often missing where DDT is used. The use of DDT is not always done according to the WHO standards, as well as sufficient protective equipment is not always given. And it is not always checked before an application if DDT is effective against malaria mosquitoes, or if the mosquitoes are resistant.

The WHO also does not state who is allowed to train personnel for DDT spraying. It assumes that state health departments and centres have qualified staff which can train employees and monitor DDT usage. However, in many African countries this is not the case.[17] This can be seen from reports from Uganda according to which employees of private companies commissioned to spray indoor walls with DDT dumped a large share of the insecticide in the fields (see chapter 6.4.1). A report from Ethiopia said that DDT for indoor residual spraying was instead sold in villages or dumped into rivers. PAN is of the opinion that the structures for controlling DDT use are missing in many countries. Furthermore, neither the WHO nor many African states allow non-governmental organisations the possibility to monitor how DDT is used. PAN calls on the WHO to harmonise its recommendations with the objectives of the Stockholm Convention.

4.3 Pros and cons of DDT

Advocates of DDT say that DDT is the most effective and most economical insecticide for fighting malaria mosquitoes. Whether the pesticide lives up to this “image” has to be examined from different perspectives, as is explained as follows.

4.3.1 Resistances

Many mosquitoes are resistant to DDT. Resistance emerged widely in the 1950s and 1960s when large quantities of DDT were used both in agriculture and in the fight against malaria. However, resistance has not been observed everywhere and may be manageable in some contexts with strong oversight and analysis programs at country level, as the case of the South African malaria control program illustrates. Resistance can disappear again if DDT has not been used for an extended period of time. However, resistances of the malaria vector to DDT remains a serious issue.

It is known that Anopheles mosquitoes are resistant to DDT in a few regions of India as well as in West African countries such as Ghana and Ivory Coast. This does not guarantee that DDT is effective in all other regions. Information on where which mosquitoes are resistant in Africa is incomplete, thus pointing to further concerns with the ability of many African countries managing resistance related issues in their use of DDT for malaria vector control.

What is more, mosquitoes in Africa are increasingly resistant to pyrethroids. Here an old mistake is being repeated: If insecticides are used on a regular basis in the health system and in agriculture, the probability of the emergence of resistances increases. In this case, mosquitoes develop a kdr gene which makes them resistant to both DDT and pyrethroids (cross-resistance). It also means that wherever DDT is used mosquitoes can also become resistant to pyrethroids.

[17] Paul Saoke, Physicians for Social Responsibility Kenya (November 2008): Vortrag auf dem Stakeholder-Treffen zur „Globalen Partnerschaft zur Entwicklung von Alternativen zu DDT in der Malariabekämpfung“

4.3.2 Effectiveness

It is contentious if DDT is more effective indoors than other insecticides. Only a few studies exist which demonstrate clearly that DDT is also effective after six months. Nevertheless, these studies do not cover all application scenarios, such as its use under varying temperature and humidity.

DDT is less effective on painted or cemented walls because it leaves “patches”, so it does not disperse well. That is why South Africa adjusted its Malaria Control Programme according to the type of inside walls.

Industrial enterprises are currently working on alternatives, said a representative of the Innovative Vector Control Consortium (IVCC) at the Stockholm Convention’s Stakeholder Meeting to Review the Draft Business Plan to Promote a Global Partnership for Developing Alternatives to DDT in the fight against malaria. This meeting took place in Geneva at the beginning of November 2008. New formulations with known active ingredients are developed which stick to the walls for more than six months; these new insecticides will be launched in approximately two years. Furthermore, efforts are being made by the industry to develop new active ingredients which would have the advantage of also killing those mosquitoes which are resistant to pyrethroids and DDT (cross-resistance). However, it is estimated that it will take ten years before these active ingredients can be brought onto the market.

4.3.3 Costs

The low purchase price of DDT is partly offset by higher safety and transport expenses. According to the WHO recommendations DDT may only be sprayed in a way that avoids releasing it into the environment. If DDT is used, greater quantities of the insecticide have to be used and transported: Up to 2 g of DDT have to be sprayed for every square metre of wall surface area, while, for example, with deltamethrin, an often used insecticide from the pyrethroid group, only up to 0.025 g is required.

Prices for the different insecticides have become more closely aligned according to information contained in the Global Status Report of DDT from the Secretariat of the Stockholm Convention (see chapter 5). It was clearly more economical to spray homes with DDT in 1990. In 1995 the price for spraying a house with DDT, or with the phosphoric acid ester malathion, or with the pyrethroids deltamethrin or lambda-cyhalothrin was approx. $4 in each case.

4.4 Underestimated and neglected sanitary and environmental measures

Mexico’s success in combating malaria has essentially to do with sanitary measures and improved environmental management. The breeding grounds and hiding places of the mosquitoes were targeted specifically in this program.[18]

A key of the environmental measure that was used in the Mexican malaria control program was larval control. One of the primary means of larval control was by drying swamps or covering water tanks and other collection of stagnant water, as well as by using the bacterium bacillus thuringiensis to control mosquito larvae. If the bacterium is applied in crystalline form onto lakes,

[18] Jorge F. Méndez-Galván, IPEN-Mexiko (November 2008): personal communication on the stakeholder meeting on the “Global Partnership for Developing Alternatives to DDT for Disease Vector Control”, Geneva

rivers or puddles the mosquito larvae take it in with their food. Inside the intestine of the larvae the bacteria hatch from a protective protein coat and destroy the intestine of the larvae through a toxin, the Bt toxin, within a short period of time. This is considered to be environmentally safe. It is also considered to be harmless for both humans and farm animals, although the larvae of other insects are also susceptible to it.

Other successful measures in the fight against mosquitoes used in Mexico and several Central American countries included removing grasses and plants from around houses, improving sanitary facilities, and improving personal hygiene at community level by propagating that people wash themselves regularly. The experience from Mexico and Central America has shown that mosquitoes are not attracted to all houses to the same extent and it is worth examining the individual local situations instead of just blanket spraying with pesticides.

Two aspects were really important to Mexico's and Central America's success in combating malaria without DDT:

- the detailed analysis of the local situation (including determining which mosquitoes on site transmit malaria, and the identification of breeding grounds and hiding places) plus
- good cooperation with the local population.

Only in those places where the population is informed about the concrete risks of a malaria infection, the possibilities for preventing this and the treatments available, and where health centres monitor the area and good agricultural practise is in place, can lasting success be achieved.

Many African governments have already initiated national malaria control programmes. In the East African country of Kenya, for example, 25m of the 34m population, mainly those living in coastal regions and close to Lake Victoria face malaria risk. There the government adopted the *Kenya National Malaria Strategy*. The strategy includes the treatment of malaria sufferers and pregnant women, as well as a multitude of vector control measures, including:

- the use of insecticide-treated bed nets for personal protection. In this way, it was possible to reduce the malaria mortality rate by between 30 and 60 per cent. In 2007 two third of all children already slept under such bed nets.
- Control of the breeding grounds and hiding places of the malaria mosquitoes through improved hygiene inside homes, and corresponding protective measures at roads, railways, forests, and in agriculture.

However the Anopheles mosquitoes which transmit the malaria parasites are very widespread in Africa. They breed successfully even in places where there is only a little water for a short time. The International Centre of Insect Physiology and Ecology (ICIPE) recommends as an immediate measure to use the natural Bt toxin of the bacillus thuringiensis which is toxic for mosquito larvae. Such larvicides are almost one hundred per cent effective for more than two days.

Here, it is also essential to critically analyse the local situation. One example: The International Centre of Insect Physiology and Ecology (ICIPE) examined 186 fish ponds in the highland of Kisii in the western part of Kenya, of which 76 ponds were no longer in use. It was found that most mosquito larvae live in the unused ponds.

5 The Global Status Report of DDT

The most up-to-date overview on where DDT is produced and used is the Global status report of DDT and its alternatives for use in vector control to prevent disease[19]. This was compiled on behalf of the Secretariat of the Stockholm Convention and served as a basis for discussion between government representatives at the beginning of November 2008 in Geneva at the Stakeholder Meeting on Global Partnership for Developing Alternatives to DDT in the fight against malaria.

The information in the Global Status Report of DDT stems from the World Health Organization (WHO), the Secretariat of the Stockholm Convention, the United Nations Institute for Training and Research (UNITAR) as well as workshops within the Stockholm Convention, and talks which the author of the status report had with national authorities.

The data presented in the following, if not stated otherwise, were taken from the Global Status Report of DDT.

5.1 DDT production

In recent years China, India, and North Korea have annually produced a total of more than 9,000 t of DDT. Approx. 5,000 t were earmarked for vector control. Ethiopia does not produce the active ingredient DDT itself but makes its own DDT formulations. Another 4,000 t of DDT were used for the production of the acaricide dicofol. Moreover, in China a small part of it was added to paint as a biocide.

5.2 DDT use

The Secretariat of the Stockholm Convention estimates that 5,000 t of DDT as insecticide were used annually in recent years; 80 % of it was used against the Anopheles mosquitoes transmitting the malaria parasites, and approx. 20 % against sand flies transmitting the parasite responsible for leishmaniasis (kala-azar, Aleppo boil).

According to the Global Status Report of DDT it seems that in 2007 quantitatively less DDT was used worldwide. The report “only” mentions 3,725 t. Though, this figure has to be viewed carefully: On the one hand, India stated that it used 1,000 t of DDT less than in the previous years. On the other, information from countries such as China, the Dominican Republic, Morocco, Mozambique, Myanmar, and Papua New Guinea is missing.

For a long time India has been the biggest user of DDT for vector control. Almost all of the remaining states that use it against malaria are situated in Africa. Ethiopia used between 200 t and 400 t per year. South Africa, Namibia, Zambia, Eritrea, Zimbabwe, Swaziland, and North Korea are among those countries using quantities of the insecticide below 100 t.

[19] See http://www.pops.int/documents/ddt/Global%20status%20of%20DDT%20SSC%2020Oct08.pdf

5.3 Old stocks of DDT

The Stockholm Convention also determines that old stocks of persistent organic pollutants like DDT have to be disposed in a safe manner.

In general, old stocks of pesticides involve many risks: They can cause considerable environmental pollution and pose a threat to human health by contaminating ground water. This is particularly true if they are stored inadequately. The need for action is especially high if children, for example, have direct access to old stockpiles. Old pesticides can also be used illegally – be it close to the storage facilities or in neighbouring countries if they are transported across borders.

Regarding DDT it is known that large quantities are to some extent stored under high-risk circumstances, in particular in various developing countries. Many times reliable detailed information is missing on where and how many tons of DDT are stored. The Secretariat of the Stockholm Convention in its Global Status Report of DDT talks about more than 10,000 t in 40 countries. For example, more than 5,000 t of obsolete DDT stocks still wait for environmentally sound disposal in Azerbaijan. Syria[20] and the Ivory Coast have more than 1,000 t, while in Japan the amount is just below 1,000 t. There are further stockpiles, for example, in Ethiopia, Botswana, Ecuador, the Philippines and Senegal. These five countries state that they store DDT or use in case of a malaria outbreak. If these insecticides are not used, there is a risk that new obsolete stocks could result.

Most of these insecticides have already been in storage for years. If DDT has not yet broken down, the insecticide could still be used legally or illegally. However, the formulation frequently alters as it ages or as a result of climatic conditions: for instance, if original DDT powder or granulate has clotted and cannot be used anymore. Sometimes the DDT is mixed in with other waste.

It is difficult and costly to dispose of obsolete stocks. One example: The German Technical Cooperation (GTZ) was commissioned by Tanzania to clear a storage facility that was more than 30 years old at the site of a former sisal factory in Korogwe in the north east of the country. The DDT-containing waste (approx. 80 t of DDT and additionally 26 t of DDT-contaminated material) was burned in the modern hazardous waste incineration plant of the disposal specialist Currenta (formerly Bayer Industrial Services, B.I.S.) in Dormagen, Germany. The Federal Ministry for Economic Cooperation (BMZ) provided a total of approx. €200,000 for the disposal.[21] The costs of this operation give us an idea of the financial means required to eliminate obsolete stocks of DDT.

The GTZ project serves as a model for Tanzania.[22] On the one hand, the DDT storage facility in Korogwe is the first pesticide storage facility which was completely eliminated, including the contaminated building, in an environmentally sound manner. On the other, employees of the Tanzanian National Environment Management Council (NEMC) were present during the clean-up operations to get trained for future disposal operations. In this way, within the next three years Tanzania wants to eliminate in an environmentally sound manner around 350 old pesticide waste

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[20] This information is taken from the Global Status Report. According to Jan Betlem, UNEP, April 2009, Syria has about 5 tons of DDT stocks.

[21] According to the German Technical Cooperation for International Development GTZ (Gesellschaft für Technische Zusammenarbeit), Eschborn

[22] According to the Tanzanian Environmental Minister Marc Mwandosya and the National Environmental Management Council (NEMC) (Januar 2008), Korogwe and Dar es Salaam

storage sites, with an estimated 1,200 t of old pesticide stocks, as part of the framework of the African Stockpile Programme (ASP), a GEF project executed by the FAO and the World Bank. The Global Environment Facility (GEF) has already provided US$6.8 million. The main objective of the ASP is to eliminate all obsolete pesticide stockpiles in Africa. The GEF has also agreed to co-finance the disposal of the other eight pesticides which, like DDT, are subject to the Stockholm Convention.

The origin of the DDT stockpile in Korogwe remains unclear, and is something which will probably never be clarified. In 1999 the FAO mentioned the GTZ as the source in a synopsis. According to the BMZ and the GTZ there is no evidence that Germany was responsible for the delivery of DDT.

6 The players of the fight against malaria

Many states, private organisations and international institutions support the fight against the disease malaria. In 2007 approx. $1.3 billion were made available for this purpose alone. These funds were mainly provided by the Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM), the World Bank, and the US President's Malaria Initiative (PMI). This is a significant amount of money, but the World Health Organization estimates that $3.2 billion is needed to reduce the malaria incidence rate according to the 6th Millennium Development Goal by 75 % by 2015. However, it seems that not all of these players are equally committed to the actual implementation of stipulations contained in the Stockholm Convention regarding the elimination of DDT.

6.1 The World Health Organization (WHO)

For the WHO the focus on combating malaria has, due to its internal programmatic decisions, resulted in a seeming reduction in focus on adhering to the provision of the Stockholm Convention to eliminate DDT worldwide. The WHO tried to eliminate malaria in the 1950s and 1960s. An important part of the campaign then was indoor spraying with DDT. After initial successes the project was discontinued in the beginning of the 1970s. The massive use of DDT led to the survival of those Anopheles mosquitoes which were able to adjust to the insecticide. They became resistant to DDT making it ineffective as a malaria control tool.

The second attempt to combat malaria globally started in 1998. At that time, the WHO initiated the Roll Back Malaria Initiative. Two years later, in September 2000, the United Nations agreed on eight development goals for a sustainable global development fit for the future. With those so-called Millennium Development Goals not only rich but also poor countries committed themselves to reducing poverty drastically, promoting human dignity and equality, and achieving peace, democracy and ecological cooperation.

The community of states formulated health objectives in the 6th Millennium Development Goal that people should suffer from AIDS, tuberculosis and malaria with reversals in the disease rates by certain target years. With respect to malaria the following concrete goals were set: First, the malaria infection rate should decrease by 75 % by 2015. Second, malaria should be eradicated.

The WHO is trying to curb the disease with a combined strategy. It has adopted two different approaches: one is vector control through insecticides by distributing insecticidal bed nets and carrying out indoor residual spraying, while the other is the treatment of malaria victims with a combination therapy with artemisinin as its main component, as well as the precautionary treatment of pregnant women. Many pregnant women have the malaria parasite in their blood and

placenta, though they do not exhibit symptoms themselves. As a consequence, the foetuses don't get enough nutrients, are born underweight and there are risks that they can quickly become infected.

According to the WHO, this package of measures can be complemented with a targeted environmental programme, including for example the application of larvicides and the improvement of sanitary facilities.

The WHO recommends twelve insecticides for indoor vector control. However, of this dozen the WHO highlights the insecticide DDT (see chapter 4.2) as the most effective. Arata Kochi, Director of the WHO Global Malaria Programme declared on 15 September 2006: "One of the best tools we have against malaria is indoor residual spraying. Of the dozen insecticides WHO has approved as safe for house spraying, the most effective is DDT." This controversial statement was toned down in WHO's 2007 position statement on the use of DDT in malaria vector control, by including that while DDT remained important in malaria control, "The reduction and ultimate elimination of the use of DDT for public health must be supported technically and financially".[23] However, the WHO stresses in the World Malaria Report 2008 that DDT remains effective for a relatively long time against malaria mosquitoes. This declaration was seen by several Parties as a call to use this pesticide more frequently and/or re-introduce it.

Thus, while speaking about the future need to eliminate DDT, in real terms the WHO contributed to the re-establishment and/or increase of DDT use. Since WHO's 2007 position statement it seems to support the Stockholm Convention process for finding technical and financial support for transition to DDT alternatives in malaria vector control, but has so far taken insufficient measures for developing and implementing non-chemical alternatives. Currently the WHO is re-evaluating the risks of DDT. It is unclear what conclusion the WHO will arrive at.

6.2 Funds and foundations

6.2.1 The Global Fund to Fight AIDS, Tuberculosis and Malaria

The biggest financier in combating malaria is the multilateral Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM). It was founded in 2002 by the seven biggest industrial states and Russia. According to the German Federal Ministry for Economic Cooperation (BMZ) around two thirds of the worldwide funds provided for the fight against malaria are financed by this fund.

Since 2002 the Fund has approx $5.8 billion at its disposal, $1.77 billion of which was spent on malaria control. Two examples: In November 2006 the Fund approved $202 million for anti-malaria projects in 19 countries; in November 2007 it was $471 million for 28 projects in 27 countries.[24] The main focus of these projects is, according to the BMZ, the purchase and distribution of insecticidal bed nets, of which approx. 59 million have been distributed so far, mainly in Africa.

The Global Fund approves of DDT as an insecticide, e.g. in projects in South Africa and Swaziland. Taken from a publication from 2007: "For malaria prevention, for example, the Global Fund will finance both bed net distribution and indoor residual spraying, including the use of DDT,

[23] WHO (2007): The use of DDT in Malaria Vector Control: WHO Position Statement. http://www.who.int/malaria/docs/IRS/DDTposition.pdf

[24] See http://www.theglobalfund.org/en/apply/current/

as long as each is being used in a locally appropriate and legal context."[25]

6.2.2 The Global Environment Facility (GEF)

The multilateral Global Environment Facility (GEF)[26] was founded in 1991 and finances sustainable projects to protect the environment. The GEF coordinates, for example, the financing of projects from four Conventions of the United Nations: the Convention on Climate Change, the Convention on Biological Diversity, the Convention to Combat Desertification, and the Stockholm Convention on Persistent Organic Pollutants. The Facility has already carried out Stockholm Convention projects in more than 130 countries. For this purpose, the organisation had $188.80 million at its disposal in 2007. These projects mostly involve the development of national plans for the implementation of the Stockholm Convention.

But the GEF also finances projects with the objective of being able to forego DDT in the medium term. The GEF board of directors decided in February 2008 to also promote projects which reduce the reliance on DDT. The projects comprise biological control, improved environmental management (including sanitary measures and irrigation management), the distribution of insecticide-treated bed nets, and the combination of these three methods. In this way the GEF finances projects which directly lead to the elimination of DDT.

Five projects have already been set up: in Mexico and Central America (Belize, Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, and Panama), , in the Middle East and North Africa (Egypt, Djibouti, Iran, Jordan, Morocco, Sudan, Syria, and Yemen), in the South Caucasus and Central Asia (Georgia, Kyrgyzstan, and Tadzhikistan), and in Africa (Ethiopia, Eritrea, and Madagascar). (Originally it was planned that five countries would participate in the African project.[27] (However, Namibia and South Africa have retired from that project.) In addition, there is also one project which aims at improving data collection and evaluation for the purpose of better assessing the necessity of an application of DDT. Further projects in South East Asia, India, and Africa are under way.

The GEF co-finances two projects of the United Nations Development Programme (UNDP) in China. The country is supported in developing alternatives in the control of spider mites so as to be able to abandon the pesticide dicofol. The second project supports China in giving up on DDT in anti-fouling paint.

6.2.3 The Bill and Melinda Gates Foundation

The private Bill and Melinda Gates Foundation[28] was founded in 1999. It aims to contribute to the eradication of diseases like malaria worldwide. The foundation focuses on technical solutions such as vaccination, drugs, and bed nets. In Zambia, for example, it has provided $35 million to help provide people with mosquito nets, insecticides, and medications.

As the foundation promotes indoor residual spraying, it thus orientates itself in its projects according to the recommendations of the WHO. Even though a bulk of its spending is on non-DDT

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[25] The Global Fund to Fight AIDS, Tuberculosis and Malaria (2007): Engaging with the Global Fund to Fight AIDS, Tuberculosis and Malaria – a primer for faith-based organizations, Geneva

[26] See http://www.thegef.org

[27] http://www.thegef.org/Documents/Council_Documents/GEF_C25/POPS-Regional-Demonstrating_Cost_Effect-Executive_Summary_-_DDT_africa_-revised-final.pdf

[28] See http://www.gatesfoundation.org

tools, the Foundation does not oppose the use of DDT in the indoor residual spraying components of its programs.

6.3 National and regional financiers

6.3.1 The Federal Republic of Germany

Germany signed the Stockholm Convention in May 2001 and ratified it in April 2002. Between 2002 and 2008 Germany supported the Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM) through the Federal Ministry for Economic Cooperation (BMZ) with €532 million (see chapter 6.2.1). Another €400 million is earmarked for the period from 2009 to 2014. According to information from the BMZ, Germany financed through this Fund the distribution of around 3,776,000 bed nets before the summer of 2008.[29] But what also could be promoted through the Fund is the use of DDT because it orientates itself according to international standards like the WHO recommendations. So DDT applications could be indirectly financed by German tax money because all the funds are pooled, and Germany has not rejected a project yet.

Germany also promoted and promotes projects to combat malaria bilaterally. In Malawi the distribution of insecticide-treated mosquito nets to prevent malaria infections particularly among pregnant women and infants is financed at a cost of €1.5 million. Since 2005 the KfW Bankengruppe (banking group) supports the so-called social marketing of impregnated mosquito nets in Rwanda as part of the local health programme. The share of funding for this component amounted to approx. €1.3 million from 2005 to 2006. Since 2007 a second project phase has been implemented at a total cost of €3.25m. Additionally, malaria prevention is an element of numerous consulting operations in the context of basic health care. The insecticide DDT does not play a role in these projects.[30]

6.3.2 EU

26 of the 27 EU member states ratified the Stockholm Convention. Italy has so far only signed the treaty (May 2001). The wording of the Convention, however, applies within the whole European Union since the European Parliament and the European Council adopted Regulation No 850/2004 on persistent organic pollutants in April 2004. The European Commission signed the Stockholm Convention in May 2001 and ratified it in November 2004.

The EU takes part in the fight against malaria. Before 2007 around 55 % of all financial resources of the Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM) came from the EU.[31]

The production or use of DDT is prohibited in the EU. Nevertheless, traces can still be found in soil, animals and humans. A large share of this contamination stems from the earlier use of DDT in Europe. The insecticide also can reach the EU through global distillation (see chapter 2) as well as on foodstuffs from India and some African countries.

The EU set in its Regulation No 149/2008 the maximum residue level of DDT in foodstuffs. Accordingly, neither vegetables, nor fruit, dried pulses, oil seeds, oleaginous fruit or cereal are permitted to contain more than 50 micrograms of DDT per kilogramme (µg/kg). This content corresponds to the lower detection limit. This limit applies EU-wide since September 2008.

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[29] German Federal Ministry for Economic Development and Cooperation (BMZ), Berlin

[30] German Federal Ministry for Economic Development and Cooperation (BMZ), Berlin

[31] German Federal Ministry for Economic Development and Cooperation (BMZ), Berlin

The permissible maximum residue level for DDT has seldom been exceeded during recent years. Between 2006 and 2008 Germany's food inspection tested a total of 1255 samples from Africa and India for DDT. 15 samples showed a low DDT content: e.g. in 2008 in the fillet of a Victoria perch, and 2006 and 2007 in tea from India. There was no sample which exceeded the permissible maximum level.[32]

6.3.3 USA

The USA signed the Stockholm Convention in May 2001, but has not yet ratified it. Hence this country is not a Party to the Convention.

The US administration supports the fight against malaria. In June 2005 George W. Bush called into being the President's Malaria Initiative (PMI)[33]. Its financing has increased almost every year; $30 million in 2006, $135 million in 2007, $300 million in 2008 and 2009, while $500 million has been promised for 2010. Currently, the PMI finances malaria control programmes in 15 African countries. The projects are carried out by the United States Agency for International Development (USAID). The PMI funds insecticide-treated bed nets, the treatment of malaria victims with artemisinin, the preventive treatment of pregnant women, as well as in ten states indoor residual spraying.

The PMI finances DDT use specifically in malaria control programmes in Ethiopia, Mozambique, Zambia, and Uganda. In May 2008, the PMI informed PAN North America that IRS was about 23% of its budget in FY 2008 and that of this about $956,000 was spent on procurement of DDT in FY 2008.[34] In this same communication with PAN North America USAID stated that its plans for reducing reliance on DDT include:

- Implementation of insecticide rotational strategies to reduce reliance on a single insecticide;
- Intensive scale up of all control interventions to reduce malaria prevalence to a point where IRS can be reserved for special circumstances such as epidemic responses;
- Collaboration with WHO Pesticide Evaluation Scheme (WHOPES) and other partners on assessment of IVM strategies to focus appropriate use of pesticides (DDT and others), depending on the local entomologic, epidemiological and environmental situation and to strengthen national regulatory capacity for pesticide registration and post-registration environmental compliance;
- Tracking research and development efforts to develop new pesticides and new vector control strategies, for example, through participation in Roll Back Malaria Working Group for Scalable Malaria Vector Control.

Despite these plans and proposals, the funding of DDT through its IRS program continues. Thus it can be argued that the US has played an important role in increasing the prominence of DDT in malaria control efforts in Africa through its aid funding. Such US use of DDT for indoor residual spraying in Africa is in danger of dominating the debate on prevention strategies and can derail much needed progress to prevent malaria with the safest and most effective strategies.[35]

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[32] German Federal Office of Consumer Protection and Food Safety (BVL), Berlin

[33] http://www.figthingmalaria.gov

[34] http://www.panna.org/files/USAID%20response-%20May%2027%202008%20.pdf

[35] Pesticide Action Network North America, Preventing Malaria Promoting Health: Solutions Beyond DDT. http://panna.org/files/beyondDdt.pdf

6.4 African, Asian and Latin American countries

6.4.1 Africa

Botswana

Botswana has not signed the Stockholm Convention but acceded to it in October 2002. The country is also a Party to the Convention and informed the Secretariat of the Stockholm Convention in September 2004 that it will use DDT in emergencies to combat malaria. Botswana is not listed among those countries in the Global Status Report of DDT which has actually used DDT correctly in recent years.

The Gambia

The Gambia signed the Stockholm Convention in May 2001 and ratified it in April 2006. According to the Gambian environmental protection organisation, the Stay Green Foundation, this African country used DDT in 2008. The country did not report this violation of the DDT ban to the Secretariat of the Stockholm Convention, and is thus in breach of the Convention.[36]

Cameroon

Cameroon signed the Stockholm Convention in October 2001, but has not ratified it yet. Thus, the country is not a Party to the Convention. It announced, however, its intention to use DDT in pilot projects in 2009.

Eritrea

Eritrea has not signed the Stockholm Convention but acceded to it in March 2003. The country has regularly used approx. 13 to 15 t of DDT per year in recent years, but did not notify the Secretariat of the Stockholm Convention of this violation of the DDT ban. With this, Eritrea is in breach of the Convention.

Ethiopia

Ethiopia signed the Stockholm Convention in May 2002 and ratified it in January 2003. The country Ethiopia uses between 250 and 400 t of DDT regularly per year. Only in September 2006 it notified the Secretariat of the Stockholm Convention that it was not in compliance with the Stockholm Convention. In the period between the Stockholm Convention entering into force in May 2004 and September 2006 it used DDT without adhering to the provisions of the Convention.

Kenya

Kenya signed the Stockholm Convention in May 2001, and ratified it in September 2004. Although there are many Anopheles mosquitoes in some areas of the East African state, Kenya does not use DDT in its malaria control programmes.

Madagascar

Madagascar signed the Stockholm Convention in September 2001, and ratified the Convention in November 2005. Madagascar used DDT until 2003 (45 t in 2003 alone). Since 2004 it is no longer

[36] Personal communication with the Stay Green Foundation, The Gambia

used in vector control. However, it is considering using the insecticide again in October 2009, informing the Secretariat of the Stockholm Convention of its intention in August 2007.

Malawi

Malawi signed the Stockholm Convention in May 2002, and ratified it in February 2009. It announced its intention to use DDT in pilot projects in 2009.

Mauritius

This island state signed the Stockholm Convention in May 2001, and ratified it in July 2004. In March 2003 it notified the Secretariat of the Stockholm Convention of its intention to use 1.5 t of DDT annually. According to the Global Status Report of DDT it did not use DDT in 2007.

Morocco

Morocco signed the Stockholm Convention in May 2001, and ratified it in June 2004. In May 2005 it reported to the Secretariat of the Stockholm Convention that it uses DDT in health care. According to the Global Status Report of DDT the country used approx. 1 t of DDT in both 2003 and 2005.

Mozambique

Mozambique signed the Stockholm Convention in May 2001 and ratified it in October 2005. According to the Global Status Report of DDT this Southern African country started in 2005 to re-introduce DDT. The Secretariat of the Stockholm Convention was only notified of this in September 2007 about it. This too is a breach of the Convention.

Namibia

Namibia has not signed the Stockholm Convention, but acceded to it in June 2005. The country did not officially notify the Secretariat of the Stockholm Convention that it uses DDT for malaria control. According to the Global Status Report of DDT it uses 40 t per year. The country stands in violation of the Convention for not having informed the Secretariat.

Nigeria

Nigeria signed the Stockholm Convention in May 2001 and ratified it in May 2004. It does not use DDT in its fight against malaria.

Rwanda

Rwanda has not signed the Stockholm Convention but acceded to it in June 2002. According to the Global Status Report of DDT the country does not use DDT but was able to reduce the number of deaths drastically through the combination strategy of bed nets, spraying and the effective treatment of malaria victims.

Sao Tome and Principe

This island state signed the Stockholm Convention in April 2002, and ratified it in April 2006. It successfully fights malaria without DDT.

Senegal

Senegal signed the Stockholm Convention in May 2001, and ratified it in October 2004. It informed the Secretariat of the Convention in July 2006 of its intention to use DDT against malaria. According to the Global Status Report of DDT Senegal has, however, not taken this step.

Sudan

Sudan signed the Stockholm Convention in May 2001, and ratified it in August 2006. According to the Global Status Report of DDT it used approx. 75 t in 2003, but did not use any in 2007.

South Africa

South Africa signed the Stockholm Convention in May 2001, and ratified it in September 2002. According to the Global Status Report of DDT South Africa's DDT demand slightly increased: 54 t were used in 2003 compared to 66 t in 2007. The country notified the Secretariat in November 2004 of its use in malaria control. As the Convention came into force in May 2004 South Africa was not in compliance for a period of half a year.

South Africa had already fought malaria mosquitoes with DDT up to the middle of the 1990s. Starting in 1996 it has used pyrethroids against mosquitoes. Since mosquitoes have developed resistances to pyrethroids in the northern province of KwaZulu-Natal, DDT has been sprayed again since 2000. South Africa's malaria policy has found imitators. The neighbouring countries Botswana, Namibia, Zimbabwe, and Swaziland also use DDT indoors.

According to the DDT expert group of the Stockholm Convention South Africa produces its own formulations using DDT imported from China, and partly exports these to neighbouring countries.[37]

Swaziland

Swaziland has not signed the Stockholm Convention, but acceded to it in January 2006. It informed the Secretariat of the Convention in June 2006 of its intention to use DDT in malaria control programmes. According to the Global Status Report of DDT the country used approx. 8 t of DDT, both in 2005 and in 2007.

Tanzania

Tanzania signed the Stockholm Convention in May 2001, and ratified it in April 2004. The Tanzanian island Zanzibar is considered to be malaria-free; this was achieved without the use of DDT. On the mainland malaria is also controlled without DDT. Tanzania is considering whether or not to use DDT in future.[38]

Uganda

Uganda became a Party to the Stockholm Convention in July 2004. It notified the Secretariat on 20 July 2008 of its intention to use DDT in malaria control. Since 2004 there has been intensive debate in Uganda regarding the advantages and disadvantages of DDT. After a public hearing at the end of 2006 the National Environment Management Authority (NEMA) approved its use under certain conditions. The personnel have to be well trained. Monitoring has to take place, i.e. it has to be checked, for example, if mosquitoes are resistant to insecticides. Receptacles need to be available to collect DDT-containing house dust after spraying. Furthermore, there should be binding guidelines regarding its application, and the occupants should be informed three months

[37] Report of the DDT-Expert Group on the assessment of the production and use of DDT and its alternatives for disease vector control to the Conference of the Parties of the Stockholm Convention at its fourth meeting (December 2008)

[38] Personal communication during the Symposium of the German Federal Ministry for Economic Cooperation (BMZ) on the problems of chemical management in emerging economies (December 2008)

in advance that spraying needs to be carried out. At the beginning of 2008 the Ugandan Ministry of Health conducted two pilot projects in the northern provinces Oyam and Apac. 1,500 locals were quickly trained over the course of two half days. Within ten days they were supposed to spray the walls of almost all huts and homes with DDT. The execution of the project, however, in many instances did not correspond to the NEMA guidelines. It also did not comply with the provisions of the Stockholm Convention because Uganda only informed the Secretariat in July 2008 of its intention to use DDT. There is strong protest in Uganda against the use of DDT. For example, farmers who cultivate cotton according to standards for organic agriculture worry about the value of their cotton. If DDT residues can be detected in their cotton, trade with the EU will be hindered. This applies to all agricultural export products of Uganda, including tilapia. The consequent loss for the Ugandan economy could be great and unnecessary, because mosquitoes in Uganda can also be fought with pyrethroids. On 6 June 2008 Uganda's Supreme Court stopped DDT use for the time being after receiving numerous complaints. The attorney general announced his intention to file an objection, with the government wanting to use DDT in the western part of the country. The dispute surrounding DDT is fully under way.[39]

Zambia

Zambia signed the Stockholm Convention in May 2001, and ratified it in July 2006. According to the Global Status Report of DDT this Southern African country started using the insecticide again in 2000. According to the Environmental Council of Zambia (ECZ) 6 t were used in 2000, 5.4 t in 2001, 5.8 t in 2002, 2.2 t in 2003, 19 t in 2004, 38 t in 2005, 32.5 t in 2006, 30 t in 2007, and 43.6 t in 2008. This tonnage was at least partly financed by the USA.[40] Zambia did not notify the Secretariat of the Stockholm Convention about its use of DDT. Thus, it does not comply with the rules of the Convention.

Zimbabwe

Zimbabwe signed the Stockholm Convention in May 2001, but did not ratify it. In this way, the country is not a Party to the Convention. According to the Global Status Report of DDT the country started to use DDT again in 2004. In 2005 it used 108 t of DDT, whereas in 2007 it only used 12 t of DDT.

6.4.2 Asia and the Pacific

Azerbaijan

Azerbaijan acceded to the Stockholm Convention in January 2004. The country in the Caucasus does not officially use DDT. But according to rumours DDT is used illegally. It could be possible that the source of illegal DDT being used is old stocks of which there are more than 5,000 t.

Bangladesh

Bangladesh signed the Stockholm Convention in May 2001, and ratified it in March 2007. In contrast to its neighbour India this country at the Ganges Delta does not use DDT.

[39] Personal communication with Paul Saoke, Physicians for Social Responsibility Kenya (October 2008)

[40] Personal communication with the Environmental Council of Zambia)

China

China signed the Stockholm Convention in May 2001, and ratified it in August 2004. It applied for exemptions from the ban on DDT production and use. In both 2003 and 2005 China produced approx. 4,500 t of DDT annually. More than 3,800 t of DDT were used for the production of dicofol, an acaricide and miticide, another 200 t were added to paint. The remaining DDT, approx. 450 to 500 t, was exported to some African countries like Ethiopia, Djibouti, Eritrea, Namibia, and South Africa. Before 2002 the country also supplied South East Asian states. China states that it no longer uses DDT to control insects.

According to the director of the Chinese anti-malaria programme, who is also member of the DDT expert group of the Stockholm Convention, China wants to stop DDT production soon and export other insecticides to control malaria.

Both China and India informed the Secretariat of the Stockholm Convention of a definite intention to use DDT in the production of dicofol. But China also uses DDT as an additive in anti-fouling paint, though it did not apply for specific exemption for this application. Thus, regarding the use of DDT in anti-fouling paint China is in violation of the Stockholm Convention.

India

India signed the Stockholm Convention in May 2002, and ratified it in January 2006. In October 2006 it applied for an exemption allowing the use of DDT in vector control programmes. So the production and use of DDT between January and October 2006 was not in compliance with the provisions of the Stockholm Convention.

The country is the biggest user of DDT, and has a varied history when it comes to malaria. In 1953 around 75 million Indians suffered from the disease, with an estimated 800,000 people dying from it. In 1966 there were just 100,000 malaria cases. Then the number of malaria cases increased again. In 1978 there were 6.5 million, while in 2007 the number was 1.5 million. People in Orissa, Jharkhand, Chhattisgarh, Madhya Pradesh, West Bengal, and in the north eastern federal states are worst affected. India uses a number of measures in its fight against the Anopheles mosquito, the transmitter of the malaria parasite, including both insecticides and environmental management measures.[41]

The state-owned Indian chemical company Hindustan Insecticide Limited (HIL) produces DDT at two sites. In 2003 and 2005 it produced 4,500 t according to the Global Status Report of DDT. In 2007, after the reviewed Global Status Report of DDT, it was only 3,440 t. In any case, HIL does not take responsibility for its kind of use. On the company's internet page it states: "Since the use of the product is beyond our control we can not assume any responsibility other than the uniform quality of the product."[42]

India uses the vast majority of the DDT it produces against the carriers of the malaria and the leishmaniosis (kala-azar, Aleppo boil) parasites. This is cited as being more than 4,200 t of DDT annually. In 2007 there was a slight decrease in usage to 3,200 t.

Part of the DDT produced is exported; 15 t to Eritrea (2006/07), and to Mozambique (430 t in 2006/07 and 690 t in 2007/08). This information stems from the Indian National Vector Borne

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[41] Personal communication on the stakeholder meeting on the "Global Partnership for Developing Alternatives to DDT for Disease Vector Control" (November 2008), Geneva

[42] See http://www.hil-india.com/DDT_75WP.html

Diseases Control Project (NVBDCP). This information was already reported by the NVBDCP to the Secretariat of the Stockholm Convention in the revised questionnaire (see Chapter 3) in Autumn 2008.

India uses around an additional 280 t of DDT to produce the acaricide dicofol. The country applied for an exemption at the Secretariat of the Stockholm Convention. This exemption ends in April 2011, but India already applied for an extension of this exemption in May 2008.

Marshall Islands

The Marshall Islands have not signed the Stockholm Convention, but ratified it in January 2003. The country notified the Secretariat of the Stockholm Convention in May 2004 of its intention to use DDT against disease vectors. The Marshall Islands are not listed among those countries in the Global Status Report of DDT which have used DDT in recent years.

Myanmar

Myanmar has not signed the Stockholm Convention, but acceded to it in April 2004. The country uses small amounts of DDT (approx. a ton per year) and according to the Global Status Report of DDT is about to stop the application.

North Korea

North Korea has not signed the Stockholm Convention, but acceded to it in August 2002. According to the current Global Status Report of DDT from the Secretariat of the Stockholm Convention the country produced about 160 t of DDT in 2007 for its domestic requirements: 155 t for use in agriculture and 5 t for malaria control. Nothing is known about exports. The country did not officially report to the Secretariat of the Stockholm Convention of its production and use of DDT.

Meanwhile, with the help of international organisations North Korea is attempting to forego the usage of DDT. In this respect, UNITAR organised a study trip for North Korean experts to Germany in autumn 2008.[43]

Papua New Guinea

Papua New Guinea signed the Stockholm Convention in May 2001, and ratified it in October 2003. It is known from WHO reports that the country uses DDT. The quantities, however, are not known.

Vietnam

Vietnam signed the Stockholm Convention in May 2001, and ratified it in July 2007. The country suffered greatly from malaria. From the end of the 1970s up to the beginning of the 1990s there were more than 1 million people infected with malaria, with 5,000 deaths. Instead of using more insecticides like DDT, Vietnam decided to promote the distribution of drugs and bed nets, spray homes with insecticides (pyrethroids) twice a year, inform people about the disease, and in doing so work together with the communities.[44]

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[43] Personal communication during the Symposium of the German Federal Ministry for Economic Cooperation (BMZ) on the problems of chemical management in emerging economies (December 2008)

[44] Source: http://www.panna.org/documents/vietnamMalaraStudy20071106.pdf

Yemen

Yemen signed the Stockholm Convention in December 2001 and ratified it in January 2004. It informed the Secretariat of the Stockholm Convention in March 2005 that it uses DDT for vector control, but expresses a wish to forego DDT use. Yemen is not listed among those countries in the Global Status Report of DDT which use DDT.

6.4.3 Mexico and Central America

Belize

Belize signed the Stockholm Convention in April 2002, but did not ratify it. According to the Global DDT Status Report, about 13 tons of DDT stocks have to be disposed.

Costa Rica

Costa Rica signed the Stockholm Convention in April 2002, and ratified it in February 2007. According to the Global DDT Status Report, about 8,5 tons of DDT stocks have to be disposed.

Dominican Republic

The Dominican Republic signed the Stockholm Convention in May 2001, and ratified it in May 2007. It may be the only Central American country using DDT. However, according to the Global Status Report accurate DDT data for The Dominican Republic is not available.

El Salvador

El Salvador signed the Stockholm Convention in July 2001, and ratified it in Mai 2008. According to the Global DDT Status Report, about 6 tons of DDT stocks have to be disposed.

Guatemala

Guatemala signed the Stockholm Convention in Januar 2002, and ratified it in July 2008. According to the Global DDT Status Report, about 14,6 tons of DDT stocks have to be disposed.

Honduras

Honduras signed the Stockholm Convention in May 2002, and ratified it in December 2008.

Mexico

Mexico signed the Stockholm Convention in May 2001, and ratified it in February 2003. The country relied on the insecticide DDT for malaria control up to the end of the last millennium. According to WHO data it used between 129 and 685 t annually from 1993 to 1999.

After a huge malaria outbreak in 1998 in the federal state Oaxaca the National Malaria Control Program (NMCP) decided to investigate the reasons for this epidemic. In 1999 Mexico developed a new malaria control programme. Since then the disease has been controlled systematically with a combined approach without the use of DDT: bed nets are distributed and inside walls are sprayed with pyrethroids. Breeding grounds of mosquitoes were removed in rural areas and people were systematically examined to see whether they were infected or had to be treated. In Mexico malaria no longer has to have fatal consequences, and new infections have to be

reckoned with in only a few regions in Mexico. Mexico has not used DDT since 2000.[45]

Nicaragua

Nicaragua signed the Stockholm Convention in May 2001, and ratified it in December 2005.

Panama

Panama signed the Stockholm Convention in May 2001, and ratified it in March 2003. According to the Global DDT Status Report, about 5 tons of DDT stocks have to be disposed.

7 Towards a Global Partnership

With the signing of the Stockholm Convention on Persistent Organic Pollutants, interests suddenly collided with each other. On the one hand, the community of states aimed at abandoning DDT with the Convention, while on the other, the World Health Organization, national governments and donors opted in favour of the insecticide to control malaria. Nevertheless, the community of states stressed in the wording of the Stockholm Convention that means and ways have to be found to achieve *"…the goal of reducing and ultimately eliminating the use of DDT".*

The community of states has to face the challenge of "less malaria without DDT". In 2005 the WHO, the United Nations Environment Programme, and the Secretariat of the Stockholm Convention came together as the behest of articles contained in the Convention to develop a global strategy for the elimination of DDT. At the beginning of May 2007 the Secretariat of the Convention was commissioned by the 3rd Conference of the Parties to the Stockholm Convention held in Dakar to develop together with the WHO a 'Business Plan' for the elimination of DDT. The vision: *a Global Partnership for Developing Alternatives to DDT in the fight against malaria.*

In November 2007 the Secretariat presented a draft for a first DDT elimination plan. In it, the Secretariat proposes a way to completely forego DDT in the medium term. This draft was revised by the Secretariat in the months that followed. Now the goal is to implement the Global Partnership to develop alternatives to DDT in malaria control by 2010.

- By the end of 2013 every state should be able to fight malaria without DDT.
- By June 2017 the use of DDT should no longer be necessary.
- By the end of 2020 old DDT stocks should be eliminated in an environmentally sound manner.

If this plan is implemented, the DDT story would end on New Year's Eve in 2020. Now it seems like this deadline is no longer viable. There was no further discussion of this appropriate elimination plan after the stakeholder meeting of the Global Partnership to develop alternatives to DDT in malaria control in Geneva at the beginning of November 2008 (the PowerPoint presentations of that meeting can be found on the website of the Stockholm Convention)[46]. Instead several options to increase the incentive for developing alternatives to DDT in malaria control were discussed. Representatives from 24 states, the Global Environment Facility (GEF),

[45] Keith E. Chanon et al (2003): Cooperative actions to achieve malaria contraol without the use of DDT, International Journal of Hygiene and Environmental Health 206, 387-394

[46] http://chm.pops.int/Programmes/DDT/Meetings/BusinessPlan/tabid/418/language/en-US/Default.aspx

the United Nations Environment Programme (UNEP) as well as scientists and representatives from civil society organisations, and industrial associations were present. A representative from the World Health Organization (WHO) was only present temporarily.

Three options were specifically discussed: a declaration of intent for the stakeholder meeting, a recommendation of the 4th Conference of the Parties or an agreement of the 4th Conference of the Parties for a global initiative and partnership. Most attendees thought that an agreement is the best option.

The Secretariat sent the draft for a Global Alliance for developing and deploying alternatives to DDT on 28 November 2008. This Global Alliance shall be officially approved at the next Conference of the Parties to the Stockholm Convention in May 2009.

The Global Alliance should formally exist by the end of 2010. As the next step working groups should discuss for a four-year period how malaria mosquitoes can be successfully tackled without DDT. A total of US$3,555,000 million should be provided for the purpose of developing the Global Alliance, and supporting the working groups.[47] It is not clear however, if there will be an elimination plan with concrete targets for ceasing the production and use of DDT. Even if a Global Alliance is better than a declaration of intent or a recommendation it does not seem it can live up to the requirements of the Convention. The attempt to bring together all stakeholders at a round table will lead to a lot of time being lost, and the attempt might even fail. Instead of action, the discussion goes on. The original goal of the Secretariat of the Stockholm Convention to end the story of DDT by 2020 could simply remain a vision.

8 Evaluation

With the Stockholm Convention on Persistent Organic Pollutants it was agreed to eliminate persistent organic pollutants. This was decided in May 2001. Since May 2004 the convention is in force. To date, 163 states (as of 8th of April 2009) have ratified the agreement. The implementation of the Convention is a joint task of all signatory states. They are jointly responsible for the compliance with the Convention.

The insecticide DDT holds a special position in the Convention among the persistent organic toxins. Since many states and financiers see a need for this insecticide in malaria control programmes an exemption was included in the Convention. However, the basic goal to phase-out DDT worldwide remained the same. The Convention talks of the: *"…goal of reducing and ultimately eliminating the use of DDT,…".* Nevertheless, DDT is still used.

In the following PAN Germany evaluates to what extent countries and financiers of malaria control programmes are compliant with the requirements of the Stockholm Convention, and how the process towards a global elimination of DDT should be evaluated.

Boxes 1 to 4 contain an overview of how PAN Germany, PAN Africa and PAN North America evaluate the commitment of countries/players regarding the implementation of the Stockholm Convention with respect to the elimination of DDT. Further information on the individual countries/players can be found in the text of this publication.

[47] See: Global Allinace for developing and deploying alternatives to DDT – draft business plan, 28 November 2008

8.1 Evaluation of DDT users

Since the entry into force of the Stockholm Convention, and also before that, many Parties made an effort to implement the Convention in spirit and wording. However, there are exceptions (see box 1):

The Parties Eritrea, Gambia, Namibia, Zambia and North Korea use DDT without having notified the Secretariat. This represents a violation of the provisions of the Convention.

Other Parties – Ethiopia, India, Mozambique, South Africa, Swaziland and Uganda – have used DDT before notifying the Secretariat. This is also a violation.

Since the Convention does not have a sanction mechanism, states which do not comply have nothing to worry about, unless other Parties or players would react in a way which would be detrimental to the states in violation of the rules. According to information from PAN Germany this has not happened so far.

As PAN sees it, many other states act "on the edge of non-compliance" (box 1).

Madagascar is one of them. The island state announced in 2008, i.e. 4 1/2 years after the entry into force of the Convention, that it is considering using DDT in 2009 (see box 1). This, however, contradicts the goal of the Convention to reduce the use of DDT to ultimately eliminating it.

Also those Parties, which still use DDT at the same level or want to use DDT in their malaria control programmes, act against the spirit of the Convention 4 1/2 years after its introduction.

What is more, it seems that the Parties using DDT do not comply with the obligations of disclosure. In Annex B, part II, No 4 the Convention states that "each Party that uses DDT shall provide to the Secretariat of the Convention and the World Health Organization information on the amount used, the conditions of such use and its relevance to that Party's disease management strategy". This requirement has only been implemented rudimentarily and/or insufficiently, as is the case when regarding the comprehensive consideration of DDT applications. This particularly refers to the point that regarding specific exemptions in the use of DDT for disease vector control the Convention says that this may only be allowed if locally safe, effective and affordable alternatives are not available.

Box 1: Conformity and Nonconformity of the Parties to the Stockholm Convention regarding the Elimination of DDT in malaria control programs

Elimination of DDT implemented or, as the case may be, contributed to it noticeably			Convention	
			signed	ratified
☺	China	according to its own information no longer uses DDT domestically in malaria control programs; does not want to use the insecticide in future	08/2004	05/2001
☺	Costa Rica	don't use DDT – at least since 2003	04/2002	05/2008
☺	El Salvador	don't use DDT – at least since 2003	07/2001	07/2008
☺	Guatemala	don't use DDT – at least since 2003	01/2002	05/2005
☺	Honduras	don't use DDT – at least since 2003	05/2002	06/2002
☺	Kenya	foregoes the use of DDT in its malaria control programmes	05/2001	09/2004
☺	Mexico	thanks to consistent and successful malaria control programmes no longer uses DDT	05/2001	02/2003
☺	Myanmar	is moving towards doing without DDT	---	04/2004
☺	Nicaragua	don't use DDT – at least since 2003	05/2001	12/2005
☺	Panama	don't use DDT – at least since 2003	05/2001	03/2003

☺	Rwanda	was able to reduce the number of malaria-infections and deaths without DDT	---	06/2002
☺	Sao Tome and Principe	was able to reduce the number of malaria-infections and deaths without DDT	04/2002	04/2006
☺	Sudan	no DDT used since 2005/2007	05/2001	08/2006
☺	Tanzania	was able to reduce in Zanzibar the number of malaria-infections and deaths without DDT	05/2001	04/2004
☺	Vietnam	thanks to consistent and successful malaria control programmes no longer uses DDT	05/2001	07/2007
☺	Yemen	has not used DDT in recent years does not want to use the insecticide in future	12/2001	01/2004
On the edge of non-compliance: are willing to use DDT				
☹	Botswana	is willing to use DDT in exceptional circumstances	---	10/2002
☹	Dominican Republic	does not provide information on whether it continues to use DDT or not	05/2007	05/2001
☹	Ethiopia	has continued to use DDT since 2000	05/2002	01/2003
☹	India	uses DDT in large quantities	05/2002	01/2006
☹	Madagascar	will re-commence DDT usage in 2009	09/2001	11/2005
☹	Malawi	wants to re-commence DDT usage in 2009	05/2002	02/2009
☹	Morocco	uses DDT, but only in exceptional circumstances	05/2001	06/2004
☹	Marshall Islands	is willing to use DDT in exceptional circumstances	---	01/2003
☹	Mauritius	uses DDT, but only in exceptional circumstances	05/2001	07/2004
☹	Mozambique	re-commenced DDT usage in 2005	05/2001	10/2005
☹	Papua New Guinea	does not provide information on whether it still uses DDT	05/2001	10/2003
☹	South Africa	uses DDT, but under strict conditions	05/2001	09/2002
☹	Swaziland	has continued to use DDT since 2000	---	01/2006
☹	Uganda	DDT was used in a few projects, the Supreme Court stopped it	---	07/2004
Used DDT illegally				
☹	Ethiopia	only registered DDT use in September 2007	05/2002	01/2003
☹	India	only registered DDT use in October 2006	05/2002	01/2006
☹	Mozambique	only registered DDT use in September 2007	05/2001	10/2005
☹	South Africa	only registered DDT use in November 2004	05/2001	09/2002
☹	Swaziland	only registered DDT use in June 2006	---	01/2006
☹	Uganda	only registered DDT use in July 2008	---	07/2004
Illegal use of DDT (the Secretariat was not informed)				
☹☹	Eritrea	has continued to use DDT since 2000	---	03/2003
☹☹	Gambia	re-commenced DDT usage in 2008	05/2001	04/2006
☹☹	Namibia	has continued to use DDT since 2000	---	06/2005
☹☹	North Korea	also uses DDT in agriculture	---	08/2002
☹☹	Zambia	re-commenced DDT usage in 2000	05/2001	07/2006

8.2 Evaluation of DDT producers

It is obvious that without the continued production of DDT the insecticide could no longer be used, and thus the option left open in the Convention allowing for its use would no longer exist. The factories producing DDT in China and India satisfy the legally permissible demand for DDT for the malaria control programmes of some African states. The registered production of DDT by India and China hereby complies with the rules of the Convention. Nevertheless, the producers, whether advertently or inadvertently, support both legal and illegal use of DDT (box 2).

Box 2: Evaluation of Parties producing DDT (*)

			Convention	
			signed	ratified
😐	China	produces DDT for malaria control (export), for use in the production of dicofol, and for use in anti-fouling paints; China wants to stop production in 2009	05/2001	08/2004
☹	India	produces DDT for vector control (domestic use, export) and for use in the production of dicofol	05/2002	01/2006
☹	North Korea	produces DDT for domestic use against mosquitoes and against pests in agriculture	---	08/2002

(*) Countries such as Ethiopia and South Africa produce own formulations with imported DDT. In the case of South Africa it is known that it also exports these formulations.

8.3 Evaluation of non-Parties and funders

Looking at those states and international organisations which are not Parties but important players in the field of implementation of the Stockholm Convention gives us an interesting picture. Some actors which are not binding stakeholders of the Convention enjoy a position of considerable and not necessarily positive influence.

The World Health Organization is a prime example (WHO, see box 4). As mentioned in chapter 6.1 the WHO has played a contentious role in the past through its pro DDT commitment. As a supporter of DDT it exerts significant influence over the use of DDT and with this the production quantity and release of the insecticide.

Many multilateral and national funders of malaria control efforts automatically promote DDT use because they refer to the recommendations of the WHO in their projects. Some of them are the Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM), the USA, and the Bill and Melinda Gates Foundation (see boxes 3 and 4). Further more, these financiers only promote practicable non-chemical alternatives to a very limited extent. This makes it all the more important for countries like Germany which are not affected by the scourge of malaria to start using their influence to promote the development of alternatives.

Box 3: Evaluation of non-Parties

			Convention	
			signed	ratified
☺	Belize	don't use DDT – at least since 2003	05/2002	---
☹	Cameroon	wants to re-commence DDT usage in 2009	10/2001	---
☹	Zimbabwe	re-commenced DDT usage in 2004	05/2001	---
☹	USA	promotes malaria control programmes which use DDT even in countries that are Parties to the Stockholm Convention	05/2001	---

It is crucial that the elimination of DDT be viewed as binding, and thus treated as an actively pursued concern. However, it should not be forgotten that the use of alternative insecticides is also not without risk. On the one hand, alternative chemical formulations are in themselves potentially problematic, while on the other malaria carriers have already demonstrably developed resistances to chemical alternatives like pyrethroids. The best way to achieve sustainable success in the fight against malaria is to increasingly opt for system-based solutions which include improved hygiene and environmental management measures, and accordingly improve the living conditions of the people living in malaria affected areas.[48]

Box 4: Evaluation of Supporters of Malaria Control Programmes		
Elimination of DDT implemented or, as the case may be, contributed to it noticeably		
☺	GEF	supports projects with the goal to make it easier for countries to abandon DDT; has approved a global program to promote alternatives to DDT
Only half-hearted in its pursuit of the global elimination of DDT		
😐	Germany	does not finance DDT applications bilaterally but pays into multilateral funds which orientate themselves according to the WHO recommendations. So the promotion of DDT programmes with German tax money is indirectly approved of
On the edge of non-compliance		
☹	GFATM	focuses on malaria, no focus on promotion of alternatives to DDT
☹	Bill and Melinda Gates Foundation	do not promote DDT, but there is no emphasis on DDT reduction strategies
☹	USA	has played an important role in increasing the prominence of DDT in malaria control efforts in Africa; finances DDT use
☹	WHO	recommends the use of DDT under certain conditions. The newest position (from 2007) illustrates a growing readiness to support alternatives to DDT and the Stockholm Convention processes for ultimate elimination of DDT. However, the actual commitment to implement this position is lacking

8.4 Evaluation of the Global Partnership in the fight against malaria without DDT

As preparation for the Global Partnership a stakeholder meeting was held in Geneva at the beginning of November 2008. The host was the Secretariat of the Stockholm Convention. Among the guests were representatives from various governments, from international organisations, from industry and civil society. Though the goal to abandon DDT use globally was already set in 2001 it should be welcomed that a Global Partnership to develop alternatives to DDT in malaria control has finally been called into being.

The WHO, often called the key organisation for developing and implementing DDT alternatives, was only represented temporarily at the stakeholder meeting for a Global Partnership through a single person who had to leave due to other engagements. This, however, is not an isolated incident. The insufficient presence of the WHO was also noted at the DDT expert group meeting of the Stockholm Convention, which was held also in Geneva in November 2008.

This insignificant commitment of the WHO, together with the illegal actions of some Parties and acting on the edge of non-compliance of other states and financiers, are from the PAN perspective clearly illustrative of the difficulties in implementing the provisions of the Stockholm

[48] Carina Weber, PAN Germany.

Convention regarding DDT. The path is proving to be a tough one, mired in contradictions and not sufficiently purposeful.

8.5 Positive developments

A positive aspect which needs to be mentioned is the work of the Global Environment Facility (GEF). The Facility promotes projects for malaria control without DDT (see box 4). It is also encouraging that the 3rd Conference to the Parties of the Stockholm Convention in spring 2007 in the Senegalese capital Dakar decided to commission the Secretariat of the Convention to form a Global Partnership to develop alternatives to DDT in malaria control.

9 PAN demands

Reducing the number of malaria deaths and infections is one of the greatest challenges faced by the global community of states. That is why even stronger efforts have to be made to decrease morbidity and mortality linked with this disease while simultaneously eliminating DDT. As time passes, the continued use of DDT becomes an ever increasing violation of the spirit and wording of the Stockholm Convention.

The current orientation of malaria control programmes largely towards chemical approaches for vector control is very risky since this course promotes resistances, and over-reliance on chemicals almost always shows undesirable “side effects”. It is one of the shortcomings of the current malaria policy and/or health and environmental policy that non-chemical methods which reduce the transmission rate of the malaria parasites have so far not been sufficiently communicated and promoted.

PAN calls on all stakeholders to take more responsibility for eliminating DDT in malaria control. This includes:

- creating public transparency about the programmes and projects for the elimination of DDT and malaria control which are promoted bilaterally and multilaterally
- ensuring a progressive decrease in financing of DDT use, as well as the promotion of DDT use in malaria control within a limited time frame
- promoting malaria control programmes without DDT with a focus on non-chemical alternatives as well as supporting the propagation of these non-chemical alternatives
- promoting a communication platform for the exchange of knowledge relating to the successful approaches to non-chemical malaria control
- increased efforts to eliminate obsolete stocks of DDT and avoid the development of new obsolete stocks
- increased efforts so that financial institutions, funds and foundations increasingly finance the use of systemic approaches such as proven hygiene and environmental management measures in malaria regions, and increasingly invest in the research and development of such measures
- Inclusion of non-governmental stakeholders in GEF co-funded initiatives related to malaria control without DDT in order to increase advocacy and awareness amongst all involved.

List of abbreviations

ASP	Africa Stockpiles Programme
BMZ	German Federal Ministry for Economic Cooperation
COP	Conference of the Parties
ECZ	Environmental Council of Zambia
GEF	Global Environment Facility
GFATM	Global Fund to Fight AIDS, Tuberculosis, and Malaria
GTZ	German Technical Cooperation
HIL	Hindustan Insecticide Limited
IVCC	Innovative Vector Control Consortium
NEMA	National Environment Management Authority (Uganda)
NEMC	Tanzanian National Environment Management Council
PAN	Pesticide Action Network
Party	A State or regional economic integration organisation that has consented to be bound by this Convention and for which the Convention is in force
PMI	US-American President's Malaria Initiative
POP	Persistant Organic Pollutant
UNEP	United Nations Environment Programme
WHO	World Health Organisation

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